Environmental
Resources
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June 28, 2012

Mr. Mostafa Mehran
Senior Engineer, Hazardous Waste Division
Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, Arkansas 72118 Project No. 0159348

Subject: 2011/2012 Annual Ground Water Monitoring Report
Whirlpool Corporation, Fort Smith, Arkansas

Dear Mr. Mehran:

Environmental Resources Management (ERM) is pleased to provide this 2011/2012 Annual Ground Water Monitoring Report for the Whirlpool Fort Smith site.

For more than ten years, Whirlpool has implemented a regular sampling program to monitor the concentrations and distribution of affected ground water associated with a historical release of trichloroethylene (TCE) at the Whirlpool Fort Smith facility. Based on investigations conducted between 1999 and 2006, TCE and associated degradation products (primarily cis-1,2-dichloroethene) are present in shallow ground water at the Whirlpool facility and have migrated off-site into a residential area north of the facility.

In an initial effort to remediate the off-site portion of the ground water plume, Whirlpool has conducted an Interim Measure (IM). This report incorporates sampling results from monitoring conducted to evaluate the effectiveness of the IM and semiannual sampling conducted between Fall 2011 and Spring 2012.

***Background***

As discussed in earlier IM Status Reports, the IM was conducted as a two-phased program. The initial phase included two In-situ chemical oxidation (ISCO) treatment events (conducted in April 2009 and July 2009) to evaluate the effectiveness of ISCO at treating the core of the off-site plume. The second phase was conducted between July 2010 and March 2011, and consisted of continued ground water monitoring and the pilot operation of a ground water pumping system. The objective of the pumping system was to test the ability to induce gradients and pull oxidant through the plume to treat the core of the plume.

Observations through March 2011 indicated the in situ permanganate treatments applied in 2009 had reduced concentrations of 1,1,2-trichloroethylene (TCE) in the immediate vicinity of the treatment wells. However, the pilot ground water pumping operations did not create sufficient gradients across the core of the plume to pull the permanganate to areas beyond the treatment wells.

Operational difficulties associated with the ground water pumping system and limited access to certain properties indicate that using a pumping system as part of a longer-term component of the IM program is not feasible.

Whirlpool has continued the semi-annual sampling and performance monitoring to further assess the changes in ground water conditions after completion of the IM.

*Scope of Work*

The Fall 2011 semiannual ground water monitoring event for the Whirlpool Fort Smith facility was conducted October 24 through 27. The Spring 2012 semiannual event was conducted April 16 through 19. The scope of work for each semiannual event included:

- Gauging of water levels in 66 wells in the Fall and 64 wells in the Spring;
- Collection of ground water samples for analysis of VOCs, potassium, chloride, nitrate, and sulfate from 65 monitor wells during the Fall event and 39 monitor wells during the Spring event (during the Fall sampling event, several wells were added to the sampling program to provide more information on the nature of the ground water plume in areas that have not been regularly sampled in the past few years) ; and
- Collection of natural attenuation geochemical data including pH, specific conductivity (SC), temperature, dissolved oxygen (DO) Oxidation-reduction potential (ORP) and iron from 65 monitor wells during the Fall event and 39 monitor wells during the Spring event.

*Sampling and Analyses Methods*

During each semiannual sampling event, water levels in each well were gauged prior to sampling. Water level measurements are provided in Table 1 (Attachment 1). Following gauging activities, low-flow ground water sampling was performed using a peristaltic pump and dedicated polyethylene tubing. The tubing intake was placed at a depth in each well corresponding to the approximate middle of the Transmissive Zone. During low-flow purging, the wells were pumped at a rate generally less than 0.1 L/min in order to limit drawdown in the wells. Flow rate was checked using a stopwatch and Pyrex® graduated measuring cup. The drawdown and flow rate were monitored continuously during sampling, except in small diameter wells, where only flow rate was monitored.

Due to very slow recovery rates, low-flow sampling techniques were not followed at eight wells during the Fall 2011 sampling event (MW-50, MW-55, MW-56, MW-57, MW-60, MW-61, MW-62, and MW-63). These wells were purged dry once and then allowed to recover prior to sampling. Low-flow sampling techniques were successfully used on all 39 wells during the Spring 2012 sampling event.

Water quality parameters were monitored using a Troll 9000 water quality probe and flow-thru cell. Readings were recorded approximately every three minutes until parameters stabilized over three successive readings. Stabilization parameters included:

- pH within 0.1 standard units;
- Temp $\pm$ 1° C;
- SC $\pm$ 3%;
- Turbidity $\pm$ 10%;
- DO $\pm$ 10%; and
- ORP $\pm$ 10 mV.

The parameters met the stabilization criteria within 1 hour in all wells that were sampled using low-flow techniques. Purge water generated during sampling was placed in containers for proper disposal by Whirlpool.

Ground water samples were collected in laboratory-supplied containers. Samples for VOC analysis were collected in three 40-ml glass vials preserved with hydrochloric acid.. Samples collected for sulfate and chloride analysis were collected in neat 750 ml plastic jars. Samples for potassium analysis were collected in 100 ml plastic jars and preserved with nitric acid. Samples for nitrate analysis were collected in 150 ml plastic jars preserved with sulfuric acid. Samples for iron analysis were collected in a Pyrex® beaker and tested in the field using a colorimeter and Hach Accuvac Ampules. Blind duplicate samples, field blank samples, and trip blank samples were collected during each of the semiannual events.

All samples for VOC analysis were labeled, stored on ice, and shipped to Test America in Houston, Texas for analyses by SW-846 Method 8260B for trichloroethylene (TCE), related chlorinated solvents, and degradation products that have been identified in previous sampling events. Samples for analysis of natural attenuation parameters (potassium, chloride, nitrate and sulfate) were labeled, stored on ice in an on-site cooler, and picked up by Data Testing, Inc. in Fort Smith, Arkansas for analyses by EPA water/wastewater methods. Samples for ferrous iron analysis were analyzed in the field by Hach DR820 colorimeter Accuvac Ampule method 8146. Chain of custody procedures were established and followed from the time of sample collection until the analyses were complete.

***Ground Water Flow Evaluation***

Based on an evaluation of potentiometric surface maps over the last five years, it appears that there are two distinct ground water flow regimes at the Fort Smith site. As illustrated by the potentiometric surface maps for Fall 2011 and Spring 2012 (Figures 1 and 2 [Attachment 2]), there is a broad area generally east of Ferguson Street and north of Ingersol Avenue where ground water flows to the northeast. This area is referred to as the Northern Flow Regime. A Southern Flow Regime, covering the majority of the Whirlpool Facility and extends south of Ingersol Avenue, flows southwestward. The flow regimes are separated by a ground water divide that is consistently present along a zone roughly coincident with the Whirlpool North Parking Lot (Figure 3). Over the past few years, the ground water divide has become less well defined and more broad than in the past, forming a fairly flat area where there is very little flow.

In the Northern Flow Regime, ground water flow is consistently toward the northeast with a gradient north of Jacobs St. that, for this reporting period, ranged from 0.014 to 0.0148 ft/ft from Fall to Spring.

Ground water flow gradients in the Southern Flow Regime are generally much lower, ranging from 0.00057 to 0.00183 ft/ft, and also exhibit minor seasonal fluctuations. The prevailing flow direction historically exhibits seasonal shifts of as much as 90 degrees. Ground water appears to flow to the south/southwest during Fall (Figure 1), and to the southeast during Spring (Figure 2).

***Discussion of Sampling Results***

Analytical data from the Fall 2011 and Spring 2012 sampling activities are summarized in Tables 2 and 3. A total of 21 VOCs were reported in samples from on-site source area monitor wells. In most cases only TCE and cis, 1-2 DCE were detected in off-site wells. TCE and cis, 1-2 DCE concentration maps illustrating the Fall 2011 and Spring 2012 data are provided as Figures 4 and 5.

To facilitate a review of the data over time, the monitor wells have been placed into several groups based on proximity to the source area; two groups of wells have been defined for the Northern Flow Regime and three groups of wells in the Southern Flow Regime. The following groupings are illustrated and identified on Figure 3, and graphs showing concentrations over time for key wells in each group are provided in Attachment 2.

Northern Flow Regime:
- North Boundary Area Wells (Figure 6 [Attachment2])
- Off-Site Area Wells (Figure 7 [Attachment 2])

Southern Flow Regime:
- Source Area Wells (Figure 8 [Attachment 2])
- Pilot Study Area Wells (Figure 9 [Attachment 2])
- Fringe Area Wells (Figure 10 [Attachment 2])

*North Boundary Area Wells*

The North Boundary Area includes wells along Ingersoll Avenue (Figure 3). All North Boundary Area Wells are located on Whirlpool Property or on Ingersoll Avenue rights-of-way. Concentrations in most of the North Boundary Area wells appear stable with minor seasonal fluctuations (Figure 6). TCE and cis-1,2-DCE concentrations in MW-35 decreased significantly following the ISCO treatment events conducted in 2009. For example, TCE concentrations in MW-35 (situated at the southern end of the area where the ISCO treatment was applied as part of the IM) were typically near or slightly above 1 mg/L prior to treatment, but decreased to about 0.25 mg/L since the in situ treatment. However, TCE at MW-33 (located just south of Ingersol) has remained stable with TCE concentrations of 1 to 1.3 mg/L prior to and after treatment.

Two of the common daughter products (1,1-Dichloroethene [1,1-DCE] or vinyl chloride) have generally been reported at very low levels or as *Not Detected* in the North Boundary Area Wells.

*Off-Site Area Wells*

The Off-Site Area includes all the wells installed at off-site properties to the north and northeast of the North Boundary Area and includes the area that was the target of the IM activities. (Figure 3). TCE concentrations in the Off-Site Area in 2012 continue to exhibit generally stable trends, while cis1,2-DCE is generally decreasing.

Sample results from MW-41, located in the center of the ISCO treatment area, illustrate response to the ISCO Treatment. Prior to ISCO treatment, the TCE concentrations ranged from about 1 mg/L to 0.8 mg/L. Since the ISCO treatment events in 2009, TCE concentrations have reduced. With the exception of May and November 2010, TCE concentrations are below 0.7 mg/L. (Concentrations at MW-42 and MW-43 have not been measured over the past two years because these wells were damaged and temporarily sealed in place pending formal plugging and abandonment..)

Samples from wells located at the perimeter of the Off-Site Area continue to be reported as *Not Detected* or estimated ("J-flagged"). These include MW-50, MW-60, MW-61, MW-62, MW-66, and MW-67. Exceptions include MW-46R and MW-63 (located east beyond the influence of the ISCO treatment area along Jacobs Avenue) where concentrations have generally remained stable.

***Discussion of Southern Flow Regime Analytical Results***

*Source Area Wells*

The Source Area includes wells immediately adjacent to the northwest corner of the Whirlpool Factory Building and located west of the former degreaser building, the suspected source of TCE at the site (Figure 3). The highest TCE concentrations have historically been reported at MW-25 (157 mg/l in September 2002). Other Source Area Wells typically range up to about 20 mg/L. The concentration of daughter products (cis 1,2-DCE, 1,1-DCE, and vinyl chloride) are also highest in the source area wells.

During the first several years following the permanganate injection pilot test, cis-1,2-DCE and vinyl chloride concentrations at MW-25 increased slightly relative to TCE concentrations. This trend is consistent with reductive dechlorination in an anaerobic environment. Since 2010, the concentrations of both TCE and cis-1,2-DCE appear to have stabilized indicating the rate of reductive dechlorination may have decreased.

*Pilot Study Area Wells*

The Pilot Study Area Wells includes wells that are located northeast of the Source Area Wells (Figure 3) in the zone of influence of an in-situ chemical oxidation (ISCO) Pilot Study conducted in 2001. Effects of the ISCO pilot study included a sharp decrease in TCE followed by rebound as affected water moved back into the area. Observed changes also included production of daughter products evidenced by an increase in cis-1,2-DCE concentrations followed by an increase in vinyl chloride concentrations.

More recently, concentrations in the Pilot Study Area Wells appear to be generally stable to slightly increasing; the one exception being MW-37 (Figure 9). , TCE has increased in MW-37 from less than 1 mg/L to over 50 mg/L, but in the past three years the concentration appears to have stabilized between about 30 mg/L and 55 mg/L. It appears that affected ground water not influenced by the pilot study has migrated into the pilot study area resulting in the anomalous increase in concentrations at MW-37.

<u>*Fringe Area Wells*</u>

The Fringe Area Wells are located on both the Northeast and Southwest sides of the Source Area. Concentration trends in Fringe Area Wells appear to be generally stable (Figure 9).

***Data Usability***

Based on data, a limited quality review conducted in general accordance with the United States Environmental Protection Agency's (EPA's) *National Functional Guidelines for Organic Data Review* (EPA540/R-99/008, October 1999). The laboratory data were determined to be generally usable for the purpose of this study. Data validation reports are provided in Attachment 3.

***Evaluation of Natural Attenuation Data***

Observed trends in the ground water data for many source area wells are consistent with changes associated with active reductive dechlorination (Table 2 and 3 [Attachment 1]). As described above, data collected from many of the wells north and south of the ground water divide are decreasing or stable, indicating that the ground water plume is generally stable or shrinking. Additional evidence of active reductive dechlorination processes in the source area include:

- Elevated chloride concentrations in areas not impacted by the pilot study (ITMW-17, ITMW-19, ITMW-21, MW-23, MW-24, and MW-25; and
- Depleted sulfate concentrations in the vicinity of the on-site and off-site TCE plumes (ITMW-17, ITMW-19, ITMW-21, MW-25, and MW-30; and MW-40, MW-46, MW-70, MW-71, and IW-74, respectively).

These data indicate that natural attenuation processes are active in the Source Area. Outside of these areas where the aquifer is more consistently aerobic, there does not appear to be evidence of significant degradation of the TCE or cis-1,2-DCE by natural attenuation.

*Summary*

A review of water level data from on-site and off-site wells continue to indicate there are two ground water flow regimes across the Site. The Northern Flow Regime and Southern Flow Regime are separated by a ground water divide that is generally situated in a zone south of Ingersol Avenue. The divide appears to be more broad than in the past, forming a flat area where there is very little flow.

In the Northern Flow Regime, wells that are in and directly adjacent to the area where the ISCO treatment IM was conducted in 2009 exhibit lower concentrations than prior to the IM. Some TCE concentrations are rebounding slightly (e.g., MW-41). Other wells that are outside the influence of the IM appear to have stable or slightly decreasing trends.

In the Southern Flow Regime, the ground water plume also appears to be stable, however, concentrations in the Source Area continue to exhibit seasonal fluctuations and remain at historically high levels (in the range of 15 to 30 mg/L and as high as 120 mg/L at MW-25).

The overall affect of the off-site ISCO treatment appears to have reduced concentrations near the center of the IM area by about half. However, due to the very low ground water gradients in the area, TCE in the core of the off-site part of the plume remain from 0.5 to 1 mg/L.

We appreciate the opportunity to continue to assist Whirlpool with this important project. If you have any questions concerning the scope of work or need additional information, please do not hesitate to call.

Sincerely,

Environmental Resources Management

H. Reiffert Hedgcoxe
Senior Partner

Troy Meinen
Project Manager

Donald L. Whitley, Arkansas P.G.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL GEOLOGIST
No. 1948
DONALD LEE WHITLEY

TWM/tsb
Attachment

cc: Mr. Bob Karwowski, Whirlpool Corporation

# Tables

*Attachment 1*

*June 28, 2012*
*Project No. 0159348*

**Environmental Resources Management**
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TABLE 1

Water Level Elevations, Conventional Monitoring Wells
Whirlpool Corporation
Fort Smith, Arkansas

| Well ID | Top of Pipe (ftAMSL) | Water Level (ftAMSL) December 2008 | Water Level (ftAMSL) April 2009 | Water Level (ftAMSL) October 2009 | Water Level (ftAMSL) April 2010 | Water Level (ftAMSL) October 2010 | Water Level (ftAMSL) March 2011 | Water Level (ftAMSL) October 2011 | Water Level (ftAMSL) April 2012 |
|---|---|---|---|---|---|---|---|---|---|
| ITMW-1 | 476.93 | 463.90 | 462.73 | 464.22 | 463.49 | -- | 462.24 | 462.88 | 462.28 |
| ITMW-2 | 474.97 | 464.55 | 463.72 | 465.06 | 464.31 | -- | 463.06 | 463.19 | 463.43 |
| ITMW-3 | 474.72 | 464.18 | 463.29 | 464.63 | 463.91 | -- | 462.63 | 463.04 | 462.92 |
| ITMW-4 | 478.19 | 463.88 | 462.69 | 464.14 | 463.53 | -- | 462.24 | 462.77 | 462.22 |
| ITMW-5 | 478.93 | 463.64 | 462.56 | 463.98 | 463.32 | -- | 462.09 | 462.53 | 462.03 |
| ITMW-6 | 483.04 | 463.45 | 462.47 | 463.80 | 463.19 | -- | 461.94 | 462.24 | 461.86 |
| ITMW-7 | 481.95 | 463.56 | 463.31 | 464.25 | 463.55 | -- | 462.84 | 462.24 | 462.90 |
| ITMW-9 | 481.90 | 463.74 | 462.60 | 464.03 | 463.43 | -- | 462.13 | 462.63 | 462.09 |
| ITMW-10 | 480.84 | 463.66 | 462.56 | 463.98 | 463.34 | -- | 462.07 | 462.49 | 462.02 |
| ITMW-11 | 474.07 | 464.85 | 464.29 | 465.47 | 464.75 | -- | 463.44 | 463.40 | 463.95 |
| ITMW-12 | 476.67 | 464.65 | 464.03 | 465.18 | 464.48 | -- | 462.20 | 463.18 | 463.65 |
| ITMW-13 | 477.79 | 464.65 | 464.02 | 465.25 | 464.54 | -- | 463.20 | 463.20 | 463.70 |
| ITMW-14 | 477.30 | 464.69 | 463.94 | 465.18 | 464.55 | -- | 463.13 | 463.14 | 463.62 |
| ITMW-15 | 474.50 | 464.86 | 464.28 | 465.48 | 464.78 | -- | 463.34 | 463.34 | 463.97 |
| ITMW-16 | 478.79 | 464.83 | 464.27 | --- | 464.77 | -- | 463.40 | 463.34 | 463.90 |
| ITMW-17 | 477.90 | 464.70 | 464.12 | 465.28 | 464.61 | -- | 463.25 | 463.15 | 463.77 |
| ITMW-18 | 473.55 | 464.63 | 463.99 | 465.19 | 464.42 | -- | 463.18 | 463.13 | 463.67 |
| ITMW-19 | 476.25 | 464.66 | 464.07 | 465.25 | 464.57 | -- | 463.24 | 463.17 | 463.74 |
| ITMW-20 | 477.87 | 464.76 | 464.54 | 465.44 | 464.79 | -- | 463.72 | 463.30 | 464.34 |
| ITMW-21 | 476.52 | 464.62 | 464.38 | 465.32 | 464.65 | -- | 463.58 | 463.20 | 464.14 |
| IW-72 | 471.65 | -- | 464.37 | 465.30 | 464.65 | 464.48 | -- | 463.17 | 463.46 |
| IW-73 | 471.48 | -- | 464.47 | 465.85 | 464.85 | 464.66 | -- | 463.30 | 463.98 |
| IW-74 | 472.06 | -- | 464.41 | 465.37 | 464.72 | 464.58 | -- | 463.25 | 463.89 |
| IW-75 | | | | | | | | | |
| IW-76 | 472.26 | -- | 464.32 | 465.40 | 464.63 | 464.51 | -- | 463.18 | 463.77 |
| IW-77 | 473.01 | -- | 464.38 | 465.47 | 464.81 | 464.69 | -- | 463.42 | 464.00 |
| IW-78 | 473.49 | -- | 464.37 | 465.47 | 464.78 | 464.67 | -- | 463.36 | 463.58 |
| IW-79 | 473.84 | -- | 464.47 | 465.48 | 464.82 | 464.69 | -- | 463.38 | 464.01 |
| IW-80 | 473.30 | -- | 464.36 | 465.35 | 464.63 | 464.56 | -- | 463.25 | 463.88 |
| MW-22 | 473.93 | 464.24 | 463.29 | 464.66 | 463.96 | -- | 462.73 | 463.45 | 462.77 |
| MW-23 | 475.80 | 464.88 | 464.32 | 474.19 | 464.83 | -- | 463.42 | 463.37 | 464.01 |
| MW-24 | 476.39 | 464.89 | 464.31 | --- | 464.80 | -- | 463.48 | 463.37 | 463.98 |
| MW-25 | 476.89 | 464.87 | 464.36 | 465.49 | 464.83 | -- | 463.50 | 463.38 | 464.01 |
| MW-26 | 478.05 | 465.11 | 464.74 | 465.75 | 465.08 | -- | 463.93 | 463.66 | 464.56 |

NOTES:

ft = feet
AMSL = above mean sea level
BTOP = below top of pipe
Co-ordinates provided by EDM Consultants, Inc.
Elevations are taken from Table 3-1, "Draft Report, Remedial Investigation, North Side Ground Water", Malcolm Pirnie, Inc., with the exceptions of ITMW-4 and MW-22 through MW-26 (EDM Consultants, Inc.) and MW-27 through MW-30 (Philip J. Leraris, P.E., L.S.).
* = Depth to water measurements for MW-24 through MW-26 were taken on 25 February 1999.
TOC for ITMW-2 estimated pending re-survey.

TABLE 1 (Cont'd)

Water Level Elevations, Conventional Monitoring Wells
Whirlpool Corporation
Fort Smith, Arkansas

| Well ID | Top of Pipe (ftAMSL) | Water Level (ftAMSL) December 2008 | Water Level (ftAMSL) April 2009 | Water Level (ftAMSL) October 2009 | Water Level (ftAMSL) April 2010 | Water Level (ftAMSL) October 2010 | Water Level (ftAMSL) March 2011 | Water Level (ftAMSL) October 2011 | Water Level (ftAMSL) April 2012 |
|---|---|---|---|---|---|---|---|---|---|
| MW-27 | 475.42 | 464.89 | 464.31 | --- | 464.79 | -- | 463.44 | 463.34 | 463.98 |
| MW-28 | 470.49 | 464.76 | 464.13 | --- | 464.68 | -- | 463.23 | 463.38 | 463.79 |
| MW-29 | 474.91 | 463.97 | 464.30 | 464.97 | 464.17 | -- | 463.28 | 462.64 | 463.91 |
| MW-30 | 478.99 | 464.10 | 463.76 | 464.76 | 464.08 | -- | 463.02 | 462.72 | 463.55 |
| MW-31 | 476.03 | 464.28 | 464.25 | --- | 463.78 | -- | 463.45 | 463.29 | -- |
| MW-32 | 475.68 | 464.66 | 464.33 | --- | 464.80 | -- | 463.45 | 463.33 | -- |
| MW-33 | 474.88 | 464.86 | 464.33 | --- | 464.78 | -- | 463.44 | 463.28 | 463.97 |
| MW-34 | 474.29 | 464.98 | 464.43 | 465.52 | 464.86 | 464.75 | 463.54 | 463.40 | 464.07 |
| MW-35R | 473.87 | 464.86 | 464.29 | 465.36 | 464.77 | 464.65 | 463.47 | 463.35 | 464.37 |
| MW-36 | 473.30 | 465.00 | 464.49 | 465.51 | 461.86 | 464.80 | 463.59 | 463.49 | 464.12 |
| MW-37 | 473.57 | 464.87 | 464.29 | 465.48 | 464.71 | -- | 463.44 | 463.40 | 463.98 |
| MW-38 | 474.60 | 464.89 | 464.29 | 465.48 | 464.77 | -- | 463.43 | 463.38 | 463.95 |
| MW-39 | 475.46 | 464.92 | 464.39 | 465.49 | 464.85 | 464.72 | 463.51 | 463.41 | 464.05 |
| MW-40 | 473.35 | 464.92 | 464.40 | --- | 464.78 | 464.68 | 463.49 | 463.34 | 464.02 |
| MW-41 | 472.09 | 464.90 | 463.92 | 465.48 | 453.27 | 464.67 | 463.55 | 463.60 | 464.04 |
| MW-42 | 471.72 | 465.04 | 464.58 | --- | --- | -- | 463.95 | -- | -- |
| MW-43 | 470.94 | 464.97 | 464.16 | --- | --- | -- | 463.69 | -- | -- |
| MW-46R | 465.76 | 464.45 | 463.96 | 465.04 | 464.42 | 464.16 | 463.17 | 458.03 | 463.62 |
| MW-50 | 463.11 | 459.55 | 457.87 | 460.51 | 455.14 | 460.66 | 456.46 | 458.53 | 456.78 |
| MW-55 | 465.50 | 464.71 | 464.19 | 465.46 | 463.44 | 464.30 | 463.34 | 461.91 | 462.16 |
| MW-56 | 463.22 | 462.24 | 463.01 | 463.06 | 460.86 | -- | 461.86 | 459.24 | 459.52 |
| MW-57 | 462.90 | 460.27 | 461.22 | 460.98 | 461.79 | -- | 461.30 | 458.49 | 460.69 |
| MW-58 | 462.71 | 462.71 | 462.95 | 462.44 | 462.67 | -- | -- | -- | -- |
| MW-60 | 460.85 | 456.20 | 455.15 | 457.73 | 456.45 | 458.26 | 454.13 | 456.12 | 454.51 |
| MW-61 | 459.61 | 452.22 | 451.74 | 453.15 | 453.60 | 453.15 | 451.28 | 451.44 | 451.96 |
| MW-62 | 464.33 | 461.38 | 460.40 | 461.70 | 461.23 | 461.06 | 459.65 | 459.09 | 458.40 |
| MW-63 | 463.87 | 461.69 | 460.43 | --- | 461.26 | 462.04 | 459.67 | 459.73 | 458.72 |
| MW-65 | 473.91 | 464.85 | 464.38 | --- | 464.75 | -- | 463.44 | 463.33 | 463.97 |
| MW-66 | 462.05 | 459.29 | 458.55 | 460.08 | 459.71 | 459.71 | 457.69 | 457.76 | 458.00 |
| MW-67 | 459.01 | 458.30 | 457.65 | 458.92 | 458.05 | 458.51 | 456.25 | 456.37 | 456.90 |
| SB-64 | | | 0.00 | #N/A | #N/A | #N/A | #N/A | | |
| MW-68 | 469.81 | -- | 464.33 | 465.47 | 464.66 | 464.53 | 463.48 | 463.14 | 464.01 |
| MW-70 | 471.53 | -- | 464.40 | 465.44 | 464.69 | 464.60 | 463.44 | 463.26 | 463.97 |
| MW-71 | 471.35 | -- | 464.41 | 465.46 | 464.81 | 464.62 | 463.46 | 463.25 | 465.00 |
| RW-69 | 471.25 | -- | 464.42 | 465.45 | 464.80 | 464.62 | 463.44 | 463.24 | 463.97 |

NOTES:

ft = feet
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Co-ordinates provided by EDM Consultants, Inc.
Elevations are taken from Table 3-1, "Draft Report, Remedial Investigation, North Side Ground Water", Malcolm Pirnie, Inc., with the exceptions of ITMW-4 and MW-22 through MW-26 (EDM Consultants, Inc.) and MW-27 through MW-30 (Philip J. Leraris, P.E., L.S.).
* = Depth to water measurements for MW-24 through MW-26 were taken on 25 February 1999.
TOC for ITMW-2 estimated pending re-survey.

TABLE 2

Analytical and Geochemical Data - Fall 2011

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents Sample ID: | ITMW-1 | ITMW-10 | ITMW-11 | ITMW-12 | ITMW-13 DUP-102711 | ITMW-13 | ITMW-14 | ITMW-15 | ITMW-16 | ITMW-17 |
|---|---|---|---|---|---|---|---|---|---|---|
| ***VOCs by SW-846 8260B*** Sample Date: | 10/27/2011 | 10/25/2011 | 10/26/2011 | 10/26/2011 | 10/27/2011 | 10/27/2011 | 10/27/2011 | 10/26/2011 | 10/27/2011 | 10/26/2011 |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | 0.0019 J | ND (0.005) | 0.0032 J | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | 0.0045 J | 0.0081 | 0.0026 J | ND (0.005) | ND (0.005) | ND (0.005) | 0.0023 J | ND (0.005) | 0.008 |
| 1,2-Dichloroethene, Total | 0.0082 J | 0.039 | 0.31 | 0.23 | 0.04 | 0.041 | 0.011 | 0.074 | ND (0.01) | 0.098 |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroform | ND (0.005) | ND (0.005) | 0.0025 J | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.0012 J |
| cis-1,2-Dichloroethene | 0.0082 | 0.039 | 0.31 | 0.23 | 0.04 | 0.041 | 0.011 | 0.074 | ND (0.005) | 0.098 |
| Methylene Chloride | ND (0.01) | ND (0.01) | 0.004 J B | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| m-Xylene & p-Xylene | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| o-Xylene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | 0.009 | ND (0.005) | ND (0.005) | ND (0.005) | 0.028 | ND (0.005) | ND (0.005) | 0.0014 J |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.05) | ND (0.05) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.017 | 0.094 | 8.8 | 1.6 | 0.064 | 0.065 | 0.0063 | 1.1 | ND (0.005) | 4.5 |
| Vinyl chloride | ND (0.005) | 0.0025 J | 0.016 | 0.0018 J | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Xylenes, Total | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| **EPA Method 4500-C** | | | | | | | | | | |
| Chloride | 180 | 130 | 40 | 32 | NA | 30 | 20 | 40 | 60 | 350 |
| **EP Method 4500-No3B** | | | | | | | | | | |
| Nitrogen, Nitrate | 0.54 | 8.82 | 0.269 | 0.51 | NA | 0.796 | 0.57 | 0.113 | 1.915 | 1.128 |
| **EPA Method 3010A / 6010C** | | | | | | | | | | |
| Potassium | 1.5 | ND (1) | ND (1) | ND (1) | NA | ND (1) | ND (1) | 1.4 | 3.2 | 1.1 |
| **EPA Method 4500-E** | | | | | | | | | | |
| Sulfates | 22 | 40 | 18 | 17 | NA | 7.6 | 7.5 | 2.6 | 12 | 11 |
| **Hach DR820 Colorimeter** | | | | | | | | | | |
| Ferrous Iron | 0.01 | | 0.1 | 0.28 | NA | ND | 0.02 | 0.38 | | ND |
| **SM 3500-Fe B** | | | | | | | | | | |
| Ferrous Iron | | ND (0.007) | | | NA | | | | ND (0.007) | |

NOTES:

1. Sample results are reported in mg/L.
2. Reported results are those constituents detected at least once above the method detection limit.
3. NA = Not Analyzed
4. ND(0.0014) = Result is Not Detected at the associated method quantitation limit.
5. J = The analyte was detected and identified with an estimated concentration.

TABLE 2 (Cont'd)

Analytical and Geochemical Data - Fall 2011

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents Sample ID: | ITMW-18 | ITMW-19 | ITMW-2 | ITMW-20 DUP-102611 | ITMW-20 | ITMW-21 | ITMW-3 | ITMW-4 | ITMW-5 | ITMW-6 DUP-102511 |
|---|---|---|---|---|---|---|---|---|---|---|
| ***VOCs by SW-846 8260B*** Sample Date: | 10/26/2011 | 10/26/2011 | 10/26/2011 | 10/26/2011 | 10/26/2011 | 10/25/2011 | 10/27/2011 | 10/25/2011 | 10/25/2011 | 10/25/2011 |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.0028 J | 0.0043 J |
| 1,1-Dichloroethene | 0.035 | 0.026 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.0053 | ND (0.005) |
| 1,2-Dichloroethene, Total | 0.29 | 0.12 | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | 0.0051 J | 0.035 | 0.0027 J |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | 0.00072 J | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.0016 J | ND (0.005) | ND (0.005) |
| Chloroform | 0.0019 J | 0.0053 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,2-Dichloroethene | 0.29 | 0.12 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.0051 | 0.035 | 0.0027 J |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | 0.004 J | ND (0.01) | ND (0.01) |
| m-Xylene & p-Xylene | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| o-Xylene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | 0.0021 J | 0.0041 J | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.05) | 0.00095 J | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 8.5 | 17 | ND (0.005) | ND (0.005) | ND (0.005) | 0.011 | 0.0041 J | 0.0048 J | 0.15 | ND (0.005) |
| Vinyl chloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Xylenes, Total | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| **EPA Method 4500-C** | | | | | | | | | | |
| Chloride | 115 | 275 | 18 | NA | 100 | 580 | 20 | 100 | 144 | NA |
| **EP Method 4500-No3B** | | | | | | | | | | |
| Nitrogen, Nitrate | 2.586 | 2.159 | 1.091 | NA | 1.432 | 0.749 | 1.307 | 6.73 | 8.16 | NA |
| **EPA Method 3010A / 6010C** | | | | | | | | | | |
| Potassium | ND (1) | ND (1) | ND (1) | NA | ND (1) | ND (1) | ND (1) | ND (1) | ND (1) | NA |
| **EPA Method 4500-E** | | | | | | | | | | |
| Sulfates | 7.2 | 12 | 18 | NA | 43 | 6.9 | 25 | 2.1 | 25 | NA |
| **Hach DR820 Colorimeter** | | | | | | | | | | |
| Ferrous Iron | 0.38 | ND | 0.16 | NA | ND | | 0.03 | | | NA |
| **SM 3500-Fe B** | | | | | | | | | | |
| Ferrous Iron | | | | NA | | ND (0.007) | | ND (0.007) | ND (0.007) | NA |

NOTES:

1. Sample results are reported in mg/L.
2. Reported results are those constituents detected at least once above the method detection limit.
3. NA = Not Analyzed
4. ND(0.0014) = Result is Not Detected at the associated method quantitation limit.
5. J = The analyte was detected and identified with an estimated concentration.

TABLE 2 (Cont'd)

Analytical and Geochemical Data - Fall 2011

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents | Sample ID: | ITMW-6 | ITMW-7 | ITMW-9 | IW-72 | IW-73 | IW-74 | IW-75 | IW-76 | IW-77 | IW-78 | IW-79 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***VOCs by SW-846 8260B*** | Sample Date: | 10/25/2011 | 10/25/2011 | 10/25/2011 | 10/24/2011 | 10/25/2011 | 10/25/2011 | 10/25/2011 | 10/25/2011 | 10/25/2011 | 10/25/2011 | 10/25/2011 |
| 1,1,2-Trichloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | | 0.0046 J | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | | ND (0.005) | ND (0.005) | 0.0033 J | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.002 J | ND (0.005) | 0.0012 J |
| 1,2-Dichloroethene, Total | | 0.0024 J | 0.026 | 0.057 | ND (0.01) | 0.0049 J | 0.0031 J | ND (0.01) | 0.0022 J | 0.032 | 0.012 | 0.013 |
| Acetone | | ND (0.01) | ND (0.01) | ND (0.01) | 0.042 | 0.0073 J | 0.014 | 0.085 | 0.009 J | ND (0.01) | ND (0.01) | 0.011 |
| Benzene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.022 | ND (0.005) | ND (0.005) | 0.0098 | ND (0.005) |
| Chlorobenzene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroform | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,2-Dichloroethene | | 0.0024 J | 0.026 | 0.057 | ND (0.005) | 0.0049 J | 0.0031 J | ND (0.005) | 0.0022 J | 0.032 | 0.012 | 0.013 |
| Methylene Chloride | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| m-Xylene & p-Xylene | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| o-Xylene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | | ND (0.005) | 0.099 | 0.09 | ND (0.005) | 0.25 | 0.15 | ND (0.005) | 0.13 | 1.4 | 0.35 | 0.57 |
| Vinyl chloride | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Xylenes, Total | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| **EPA Method 4500-C** | | | | | | | | | | | | |
| Chloride | | 130 | 200 | 70 | NA | NA | 400 | NA | NA | 300 | 400 | NA |
| **EP Method 4500-No3B** | | | | | | | | | | | | |
| Nitrogen, Nitrate | | 17.29 | 2.3 | 16.53 | NA | NA | 1.123 | NA | NA | 5.3 | 0.906 | NA |
| **EPA Method 3010A / 6010C** | | | | | | | | | | | | |
| Potassium | | ND (1) | ND (1) | ND (1) | NA | NA | 5 | NA | NA | 2.6 | 3.4 | NA |
| **EPA Method 4500-E** | | | | | | | | | | | | |
| Sulfates | | 11 | 13 | 59 | NA | NA | 7.7 | NA | NA | 2.8 | 6.9 | NA |
| **Hach DR820 Colorimeter** | | | | | | | | | | | | |
| Ferrous Iron | | | 0 | | NA | 0.1 | | NA | NA | | 0.39 | NA |
| **SM 3500-Fe B** | | | | | | | | | | | | |
| Ferrous Iron | | ND (0.007) | | ND (0.007) | NA | | ND (0.007) | NA | NA | ND (0.007) | | NA |

NOTES:

1. Sample results are reported in mg/L.
2. Reported results are those constituents detected at least once above the method detection limit.
3. NA = Not Analyzed
4. ND(0.0014) = Result is Not Detected at the associated method quantitation limit.
5. J = The analyte was detected and identified with an estimated concentration.

TABLE 2 (Cont'd)

Analytical and Geochemical Data - Fall 2011

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents | Sample ID: | IW-80 | MW-22 | MW-23 | MW-24 DUP-01 | MW-24 | MW-25 | MW-26 | MW-27 | MW-28 | MW-29 | MW-30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***VOCs by SW-846 8260B*** | Sample Date: | 10/25/2011 | 10/27/2011 | 10/27/2011 | 10/27/2011 | 10/27/2011 | 10/26/2011 | 10/26/2011 | 10/27/2011 | 10/27/2011 | 10/25/2011 | 10/26/2011 |
| 1,1,2-Trichloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.25) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.25) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.21 J | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene, Total | | ND (0.01) | ND (0.01) | ND (0.01) | 0.0014 J | 0.0019 J | 2.1 | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | 0.016 |
| Acetone | | 0.01 | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.5) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.25) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.25) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.25) | ND (0.005) | ND (0.005) | ND (0.005) | 0.0037 J | ND (0.005) |
| Chloroform | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.25) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,2-Dichloroethene | | ND (0.005) | ND (0.005) | ND (0.005) | 0.0014 J | 0.0019 J | 2.1 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.016 |
| Methylene Chloride | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.5) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| m-Xylene & p-Xylene | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.5) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| o-Xylene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.25) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.25) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.25) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.25) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | | 0.0097 | 0.0021 J | 0.041 | 0.17 | 0.17 | 120 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.057 |
| Vinyl chloride | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.25) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Xylenes, Total | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.25) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| **EPA Method 4500-C** | | | | | | | | | | | | |
| Chloride | | NA | 72 | 380 | NA | 380 | 600 | 195 | 25 | 40 | 100 | 290 |
| **EP Method 4500-No3B** | | | | | | | | | | | | |
| Nitrogen, Nitrate | | NA | 0.571 | 1.102 | NA | 1.407 | 0.474 | 2.092 | 1.51 | 0.886 | 2.401 | 1.943 |
| **EPA Method 3010A / 6010C** | | | | | | | | | | | | |
| Potassium | | NA | ND (1) | ND (1) | NA | 3.7 | ND (1) | ND (1) | ND (1) | ND (1) | ND (1) | ND (1) |
| **EPA Method 4500-E** | | | | | | | | | | | | |
| Sulfates | | NA | 12 | 10 | NA | 8.6 | 5.6 | 13 | 7.7 | 40 | 26 | 8.6 |
| **Hach DR820 Colorimeter** | | | | | | | | | | | | |
| Ferrous Iron | | ND | 0.12 | | NA | | 0.29 | ND | | | | ND |
| **SM 3500-Fe B** | | | | | | | | | | | | |
| Ferrous Iron | | | | ND (0.007) | NA | ND (0.007) | | | ND (0.007) | ND (0.007) | ND (0.007) | |

NOTES:

1. Sample results are reported in mg/L.
2. Reported results are those constituents detected at least once above the method detection limit.
3. NA = Not Analyzed
4. ND(0.0014) = Result is Not Detected at the associated method quantitation limit.
5. J = The analyte was detected and identified with an estimated concentration.

TABLE 2 (Cont'd)

Analytical and Geochemical Data - Fall 2011

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Sample ID: | MW-31 | MW-32 | MW-33 | MW-34 | MW-35R | MW-36 | MW-37 | MW-38 | MW-39 | MW-40 | MW-41 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ***VOCs by SW-846 8260B*** Sample Date: | 10/26/2011 | 10/26/2011 | 10/26/2011 | 10/26/2011 | 10/25/2011 | 10/26/2011 | 10/26/2011 | 10/26/2011 | 10/26/2011 | 10/26/2011 | 10/25/2011 |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.0047 J | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.011 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.031 | 0.031 | ND (0.005) | ND (0.005) | 0.0028 J |
| 1,2-Dichloroethene, Total | ND (0.01) | ND (0.01) | 0.016 | ND (0.01) | 0.012 | ND (0.01) | 9.7 | 0.87 | ND (0.01) | ND (0.01) | 0.018 |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | 0.0068 J | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.021 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | 0.016 | ND (0.005) | 0.012 | ND (0.005) | 9.7 | 0.87 | ND (0.005) | ND (0.005) | 0.018 |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | 0.19 B | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| m-Xylene & p-Xylene | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | 0.0023 J | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| o-Xylene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.0019 J | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.024 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.032 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.5) | 0.0045 J | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | 0.073 | 1 | 0.056 | 0.28 | ND (0.005) | 57 | 0.58 | ND (0.005) | ND (0.005) | 0.42 |
| Vinyl chloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 2.5 | 1.1 | ND (0.005) | ND (0.005) | ND (0.005) |
| Xylenes, Total | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.0042 J | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| **EPA Method 4500-C** | | | | | | | | | | | |
| Chloride | 140 | 370 | 180 | 300 | 380 | 300 | 30 | 40 | 350 | 260 | 200 |
| **EP Method 4500-No3B** | | | | | | | | | | | |
| Nitrogen, Nitrate | 0.45 | 2.06 | 1.88 | 6.79 | 3.91 | 1.38 | 0.117 | 0.119 | 3.07 | 15.38 | 1.115 |
| **EPA Method 3010A / 6010C** | | | | | | | | | | | |
| Potassium | ND (1) | ND (1) | 5.4 | ND (1) | 1.1 | ND (1) | 2 | 37 | ND (1) | ND (1) | 5.8 |
| **EPA Method 4500-E** | | | | | | | | | | | |
| Sulfates | 37 | 7.3 | 5.4 | 4.8 | 6.4 | 7.5 | 18 | 12 | 1.7 | 3.7 | 3.5 |
| **Hach DR820 Colorimeter** | | | | | | | | | | | |
| Ferrous Iron | | ND | ND | | | NA | 1.29 | 3.3 | | | |
| **SM 3500-Fe B** | | | | | | | | | | | |
| Ferrous Iron | ND (0.007) | | | ND (0.007) | ND (0.007) | NA | | | ND (0.007) | ND (0.007) | ND (0.007) |

NOTES:

1. Sample results are reported in mg/L.
2. Reported results are those constituents detected at least once above the method detection limit.
3. NA = Not Analyzed
4. ND(0.0014) = Result is Not Detected at the associated method quantitation limit.
5. J = The analyte was detected and identified with an estimated concentration.

Analytical and Geochemical Data - Fall 2011

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents Sample ID: | MW-46 | MW-50 | MW-55 | MW-56 | MW-57 | MW-60 | MW-61 | MW-62 | MW-63 | MW-65 | MW-66 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ***VOCs by SW-846 8260B*** Sample Date: | 10/26/2011 | 10/25/2011 | 10/25/2011 | 10/25/2011 | 10/25/2011 | 10/25/2011 | 10/25/2011 | 10/25/2011 | 10/25/2011 | 10/25/2011 | 10/26/2011 |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene, Total | 0.01 | ND (0.01) | ND (0.01) | 0.011 | 0.002 J | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | 0.01 | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,2-Dichloroethene | 0.01 | ND (0.005) | ND (0.005) | 0.011 | 0.002 J | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.01 | ND (0.005) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| m-Xylene & p-Xylene | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| o-Xylene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.46 | ND (0.005) | 0.007 | 0.15 | 0.059 | ND (0.005) | ND (0.005) | 0.0019 J | 0.0098 | 0.31 | 0.0018 J |
| Vinyl chloride | ND (0.005) | ND (0.005) | ND (0.005) | 0.0019 J | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Xylenes, Total | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| **EPA Method 4500-C** | | | | | | | | | | | |
| Chloride | 290 | 250 | 350 | 220 | 190 | 100 | 65 | 200 | 200 | 400 | 330 |
| **EP Method 4500-No3B** | | | | | | | | | | | |
| Nitrogen, Nitrate | 18.53 | 0.246 | 0.339 | 0.527 | 0.525 | 0.244 | 0.733 | 0.894 | 0.553 | 0.778 | 4.3 |
| **EPA Method 3010A / 6010C** | | | | | | | | | | | |
| Potassium | ND (1) | ND (1) | 1.2 | ND (1) | ND (1) | ND (1) | 1.3 | ND (1) | ND (1) | ND (1) | ND (1) |
| **EPA Method 4500-E** | | | | | | | | | | | |
| Sulfates | 0.65 | 1.9 | 0.83 | 7.8 | 3.1 | 24 | 1.3 | 3.7 | 6.2 | 3.7 | 10 |
| **Hach DR820 Colorimeter** | | | | | | | | | | | |
| Ferrous Iron | | | | | | | | | | | |
| **SM 3500-Fe B** | | | | | | | | | | | |
| Ferrous Iron | ND (0.007) | ND (0.007) | ND (0.007) | ND (0.007) | ND (0.007) | ND (0.007) | ND (0.007) | ND (0.007) | ND (0.007) | ND (0.007) | ND (0.007) |

NOTES:

1. Sample results are reported in mg/L.
2. Reported results are those constituents detected at least once above the method detection limit.
3. NA = Not Analyzed
4. ND(0.0014) = Result is Not Detected at the associated method quantitation limit.
5. J = The analyte was detected and identified with an estimated concentration.

TABLE 2 (Cont'd)

Analytical and Geochemical Data - Fall 2011

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents | Sample ID: | MW-67 | MW-68 | MW-70 | MW-71 | RW-69 |
|---|---|---|---|---|---|---|
| ***VOCs by SW-846 8260B*** | Sample Date: | 10/26/2011 | 10/26/2011 | 10/26/2011 | 10/26/2011 | 10/26/2011 |
| 1,1,2-Trichloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene, Total | | ND (0.01) | ND (0.01) | 0.0077 J | 0.0027 J | 0.0057 J |
| Acetone | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroform | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,2-Dichloroethene | | ND (0.005) | ND (0.005) | 0.0077 | 0.0027 J | 0.0057 |
| Methylene Chloride | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| m-Xylene & p-Xylene | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| o-Xylene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | | ND (0.005) | ND (0.005) | 0.32 | 0.13 | 0.21 |
| Vinyl chloride | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Xylenes, Total | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| **EPA Method 4500-C** | | | | | | |
| Chloride | | 60 | 340 | 340 | 345 | 340 |
| **EP Method 4500-No3B** | | | | | | |
| Nitrogen, Nitrate | | 6.83 | 0.437 | 0.537 | 0.264 | 0.612 |
| **EPA Method 3010A / 6010C** | | | | | | |
| Potassium | | 2.3 | ND (1) | ND (1) | ND (1) | 1 |
| **EPA Method 4500-E** | | | | | | |
| Sulfates | | 20 | 1.6 | 1.5 | 6.4 | 4 |
| **Hach DR820 Colorimeter** | | | | | | |
| Ferrous Iron | | | ND | ND | 1.74 | ND |
| **SM 3500-Fe B** | | | | | | |
| Ferrous Iron | | ND (0.007) | | | | |

NOTES:

1. Sample results are reported in mg/L.
2. Reported results are those constituents detected at least once above the method detection limit.
3. NA = Not Analyzed
4. ND(0.0014) = Result is Not Detected at the associated method quantitation limit.
5. J = The analyte was detected and identified with an estimated concentration.

TABLE 3

Analytical and Geochemical Data - Spring 2012

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Sample ID: | ITMW-1 | ITMW-13 | ITMW-14 | ITMW-16 | ITMW-17 | ITMW-18 | ITMW-19 DUP-02 | ITMW-19 | ITMW-2 | ITMW-20 | ITMW-21 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ***VOCs by SW- 846 8260B*** Sample Date: | 4/18/2012 | 4/19/2012 | 4/19/2012 | 4/18/2012 | 4/19/2012 | 4/19/2012 | 4/19/2012 | 4/19/2012 | 4/17/2012 | 4/18/2012 | 4/17/2012 |
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.0012 J | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.0053 | 0.034 | 0.015 | 0.017 | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene, Total | 0.013 | 0.063 | 0.016 | ND (0.01) | 0.11 | 0.36 | 0.11 | 0.11 | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | 0.00066 J | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.0012 J | 0.0026 J | ND | ND | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,2-Dichloroethene | 0.013 | 0.063 | 0.016 | ND (0.005) | 0.11 | 0.36 | 0.11 | 0.11 | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| m-Xylene & p-Xylene | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| o-Xylene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | 0.029 | ND (0.005) | ND (0.005) | 0.003 J | 0.0033 J | 0.0031 J | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.05) | 0.0012 J | 0.00089 J | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.032 | 0.097 | 0.0076 | ND (0.005) | 4.7 | 9.8 | 15 | 18 | ND (0.005) | ND (0.005) | 0.03 |
| Vinyl chloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.0029 J | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Xylenes, Total | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| **EPA Method 4500-C** | | | | | | | | | | | |
| Chloride | 254 | 34 | 11 | 24 | 237 | 120 | NA | 300 | 140 | 100 | 550 |
| **EP Method 4500-No3B** | | | | | | | | | | | |
| Nitrogen, Nitrate | 4.24 | 4.69 | 0.681 | 1.12 | 0.662 | 3.35 | NA | 2.004 | 4.63 | 1.75 | 1.813 |
| **EPA Method 3111-B** | | | | | | | | | | | |
| Potassium | 5.4 | ND (1) | ND (1) | 3.8 | ND (1) | ND (1) | NA | 1.3 | ND (1) | 1.1 | ND (1) |
| **EPA Method 4500-E** | | | | | | | | | | | |
| Sulfates | 16 | 8.1 | 12 | 9.6 | 4 | 6.8 | NA | 6.3 | 18 | 21 | 3.8 |
| **Hach DR820 Colorimeter** | | | | | | | | | | | |
| Ferrous Iron | ND | 0.06 | 0.07 | 3.25 | ND | 0.05 | NA | 0.03 | ND | 0.01 | ND |

NOTES:

1. Sample results are reported in mg/L.
2. Reported results are those constituents detected at least once above the method detection limit.
3. NA = Not Analyzed
4. ND(0.0014) = Result is Not Detected at the associated method quantitation limit.
5. J = The analyte was detected and identified with an estimated concentration.

TABLE 3 (Cont'd)

Analytical and Geochemical Data - Spring 2012

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / ***VOCs by SW- 846 8260B*** | Sample ID: / Sample Date: | ITMW-3 4/17/2012 | ITMW-5 4/17/2012 | ITMW-6 4/17/2012 | ITMW-7 4/18/2012 | ITMW-9 4/17/2012 | IW-72 4/17/2012 | IW-73 4/17/2012 | IW-74 4/17/2012 | IW-75 4/17/2012 | IW-76 4/17/2012 | IW-77 DUP-01 4/17/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | | ND (0.005) | 0.0022 J | 0.0057 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | | ND (0.005) | 0.0057 | ND (0.005) | ND (0.005) | 0.011 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.0012 J |
| 1,2-Dichloroethene, Total | | ND (0.01) | 0.026 | 0.0029 J | 0.02 | 0.05 | ND (0.01) | 0.0058 J | 0.0024 J | ND (0.01) | 0.0089 J | 0.02 |
| Acetone | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | 0.032 | ND (0.01) | ND (0.01) | 0.083 | 0.0091 J | ND (0.01) |
| Benzene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.024 | ND (0.005) | ND (0.005) |
| Chlorobenzene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroform | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,2-Dichloroethene | | ND (0.005) | 0.026 | 0.0029 J | 0.02 | 0.05 | ND (0.005) | 0.0058 | 0.0024 J | ND (0.005) | 0.0089 | 0.02 |
| Ethylbenzene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methylene Chloride | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| m-Xylene & p-Xylene | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| o-Xylene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | | ND (0.005) | 0.29 | ND (0.005) | 0.1 | 0.15 | 0.0038 J | 0.18 | 0.13 | 0.0029 J | 0.4 | 0.52 |
| Vinyl chloride | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.0025 J | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Xylenes, Total | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| **EPA Method 4500-C** | | | | | | | | | | | | |
| Chloride | | 20 | 120 | 11.21 | 300 | 100 | NA | 140 | 166 | NA | NA | NA |
| **EP Method 4500-No3B** | | | | | | | | | | | | |
| Nitrogen, Nitrate | | 5.35 | 8.24 | 11.21 | 3.32 | 12.33 | NA | 0.735 | 0.618 | NA | NA | NA |
| **EPA Method 3111-B** | | | | | | | | | | | | |
| Potassium | | ND (1) | ND (1) | ND (1) | ND (1) | ND (1) | NA | 4.6 | 3.8 | NA | NA | NA |
| **EPA Method 4500-E** | | | | | | | | | | | | |
| Sulfates | | 24 | 28 | 97 | 13 | 32 | NA | 6.3 | 3.8 | NA | NA | NA |
| **Hach DR820 Colorimeter** | | | | | | | | | | | | |
| Ferrous Iron | | ND | 0.01 | 0.05 | 0.03 | 0.22 | NA | 3.33 | 0.16 | NA | NA | NA |

NOTES:

1. Sample results are reported in mg/L.
2. Reported results are those constituents detected at least once above the method detection limit.
3. NA = Not Analyzed
4. ND(0.0014) = Result is Not Detected at the associated method quantitation limit.
5. J = The analyte was detected and identified with an estimated concentration.

TABLE 3 (Cont'd)

Analytical and Geochemical Data - Spring 2012

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Sample ID: | IW-77 | IW-78 | IW-79 | IW-80 | MW-22 | MW-23 | MW-24 | MW-25 | MW-26 | MW-27 | MW-28 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ***VOCs by SW- 846 8260B*** Sample Date: | 4/17/2012 | 4/18/2012 | 4/17/2012 | 4/17/2012 | 4/18/2012 | 4/18/2012 | 4/18/2012 | 4/17/2012 | 4/18/2012 | 4/18/2012 | 4/19/2012 |
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.0096 | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | 0.0012 J | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.031 | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene, Total | 0.023 | 0.0023 J | 0.0021 J | 0.0022 J | ND (0.01) | ND (0.01) | 0.0029 J | 0.69 | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.00094 J | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,2-Dichloroethene | 0.023 | 0.0023 J | 0.0021 J | 0.0022 J | ND (0.005) | ND (0.005) | 0.0029 J | 0.69 | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| m-Xylene & p-Xylene | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| o-Xylene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.0067 | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.1) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.51 | 0.12 | 0.43 | 0.055 | ND (0.005) | 0.036 | 0.15 | 18 | ND (0.005) | 0.0026 J | ND (0.005) |
| Vinyl chloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.018 | ND (0.005) | ND (0.005) | ND (0.005) |
| Xylenes, Total | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| **EPA Method 4500-C** | | | | | | | | | | | |
| Chloride | 130 | 100 | 120 | 100 | 20 | 220 | 265 | 400 | NA | 20 | 35 |
| **EP Method 4500-No3B** | | | | | | | | | | | |
| Nitrogen, Nitrate | 2.82 | 0.645 | 2.12 | 2.76 | 0.078 | 1.074 | 5.63 | 4.92 | NA | 1.58 | 0.79 |
| **EPA Method 3111-B** | | | | | | | | | | | |
| Potassium | 1.3 | 7.9 | 3.4 | 1.3 | ND (1) | ND (1) | ND (1) | ND (1) | NA | 1.3 | ND (1) |
| **EPA Method 4500-E** | | | | | | | | | | | |
| Sulfates | 6.7 | 16 | 10 | 9.9 | 15 | 14 | 8.1 | 2.3 | NA | 11 | 39 |
| **Hach DR820 Colorimeter** | | | | | | | | | | | |
| Ferrous Iron | 0.11 | 0.26 | 0.13 | 0.07 | ND | 0.08 | 0.16 | 0.04 | ND | 0.23 | 1.37 |

NOTES:

1. Sample results are reported in mg/L.
2. Reported results are those constituents detected at least once above the method detection limit.
3. NA = Not Analyzed
4. ND(0.0014) = Result is Not Detected at the associated method quantitation limit.
5. J = The analyte was detected and identified with an estimated concentration.

TABLE 3 (Cont'd)

Analytical and Geochemical Data - Spring 2012

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents | Sample ID: | MW-29 | MW-30 | MW-37 | MW-40 | MW-46 | MW-70 | MW-71 | RW-69 |
|---|---|---|---|---|---|---|---|---|---|
| ***VOCs by SW- 846 8260B*** | Sample Date: | 4/18/2012 | 4/18/2012 | 4/18/2012 | 4/18/2012 | 4/18/2012 | 4/18/2012 | 4/18/2012 | 4/18/2012 |
| 1,1,1-Trichloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | | ND (0.005) | ND (0.005) | 0.0013 J | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | | ND (0.005) | ND (0.005) | 0.018 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | | ND (0.005) | ND (0.005) | 0.018 | ND (0.005) | 0.0015 J | ND (0.005) | 0.0015 J | ND (0.005) |
| 1,2-Dichloroethene, Total | | ND (0.01) | 0.032 | 5.3 | ND (0.01) | 0.014 | 0.011 | 0.0053 J | 0.0036 J |
| Acetone | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | | 0.0055 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroform | | ND (0.005) | ND (0.005) | 0.011 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,2-Dichloroethene | | ND (0.005) | 0.032 | 5.3 | ND (0.005) | 0.014 | 0.011 | 0.0053 | 0.0036 J |
| Ethylbenzene | | ND (0.005) | ND (0.005) | 0.0015 J | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methylene Chloride | | ND (0.01) | ND (0.01) | 0.19 | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| m-Xylene & p-Xylene | | ND (0.01) | ND (0.01) | 0.0015 J | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| o-Xylene | | ND (0.005) | ND (0.005) | 0.0012 J | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | | ND (0.005) | ND (0.005) | 0.015 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | | ND (0.005) | ND (0.005) | 0.038 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | | ND (0.005) | ND (0.005) | ND (0.25) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | | ND (0.005) | 0.15 | 29 | 0.0039 J | 0.68 | 0.33 | 0.16 | 0.15 |
| Vinyl chloride | | ND (0.005) | ND (0.005) | 2.1 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Xylenes, Total | | ND (0.005) | ND (0.005) | 0.0027 J | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| **EPA Method 4500-C** | | | | | | | | | |
| Chloride | | 147 | 270 | 15 | 260 | 240 | 320 | 250 | 300 |
| **EP Method 4500-No3B** | | | | | | | | | |
| Nitrogen, Nitrate | | 3.32 | 2.33 | 2.28 | 1.032 | 2.23 | 0.198 | 0.31 | 0.119 |
| **EPA Method 3111-B** | | | | | | | | | |
| Potassium | | ND (1) | ND (1) | 3.5 | ND (1) | ND (1) | 1.5 | ND (1) | 1.3 |
| **EPA Method 4500-E** | | | | | | | | | |
| Sulfates | | 60 | 5.1 | 13 | 2.5 | 0.68 | 1.3 | 4.3 | 6 |
| **Hach DR820 Colorimeter** | | | | | | | | | |
| Ferrous Iron | | 0.1 | 0.15 | 0.21 | 0.04 | 0.09 | ND | 0.46 | 0.49 |

NOTES:

1. Sample results are reported in mg/L.
2. Reported results are those constituents detected at least once above the method detection limit.
3. NA = Not Analyzed
4. ND(0.0014) = Result is Not Detected at the associated method quantitation limit.
5. J = The analyte was detected and identified with an estimated concentration.

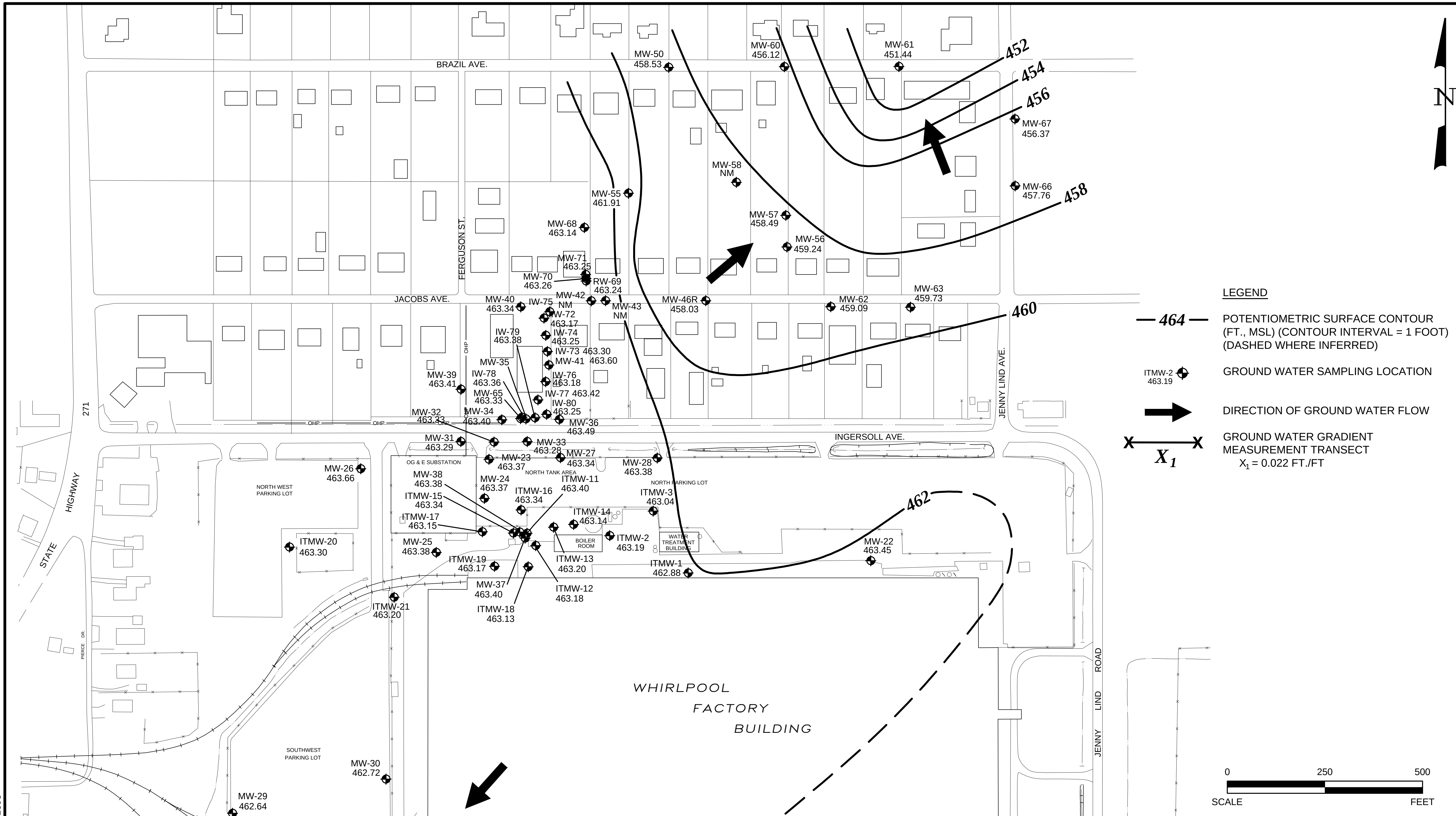
**Figures**

*Attachment 2*

*June 28, 2012*

*Project No. 0159348*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000




ERM-Southwest, Inc. TX PE Firm No. 2393

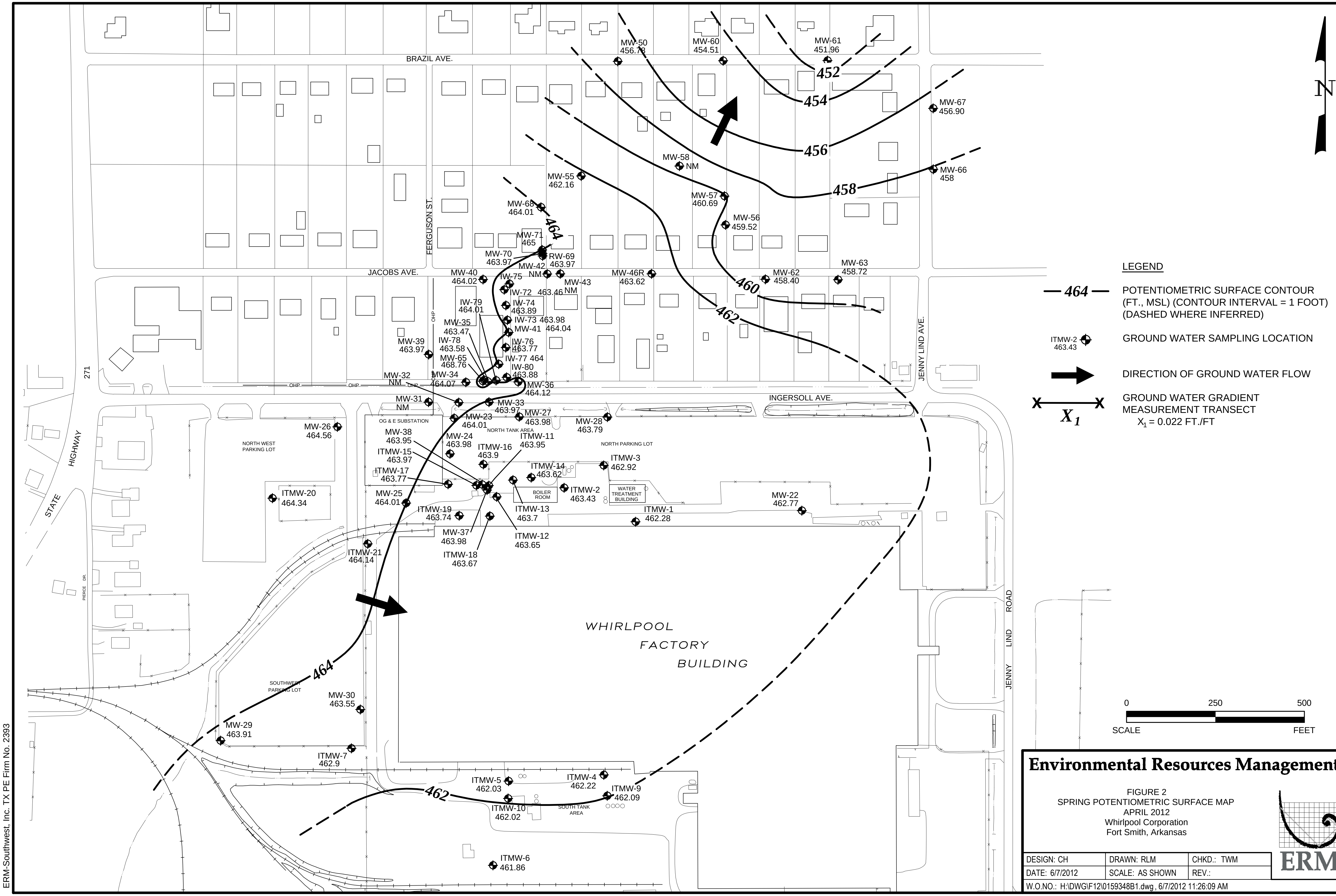
**Environmental Resources Management**

FIGURE 1
FALL POTENTIOMETRIC SURFACE MAP
OCTOBER 2011
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| | | |
|---|---|---|
| DESIGN: CH | DRAWN: RLM | CHKD.: TWM |
| DATE: 6/7/2012 | SCALE: AS SHOWN | REV.: |
| W.O.NO.: H:\DWG\F12\0159348b202.dwg , 6/7/2012 11:27:01 AM | | |

G:/2012/0159348/17766H (Att2).pdf

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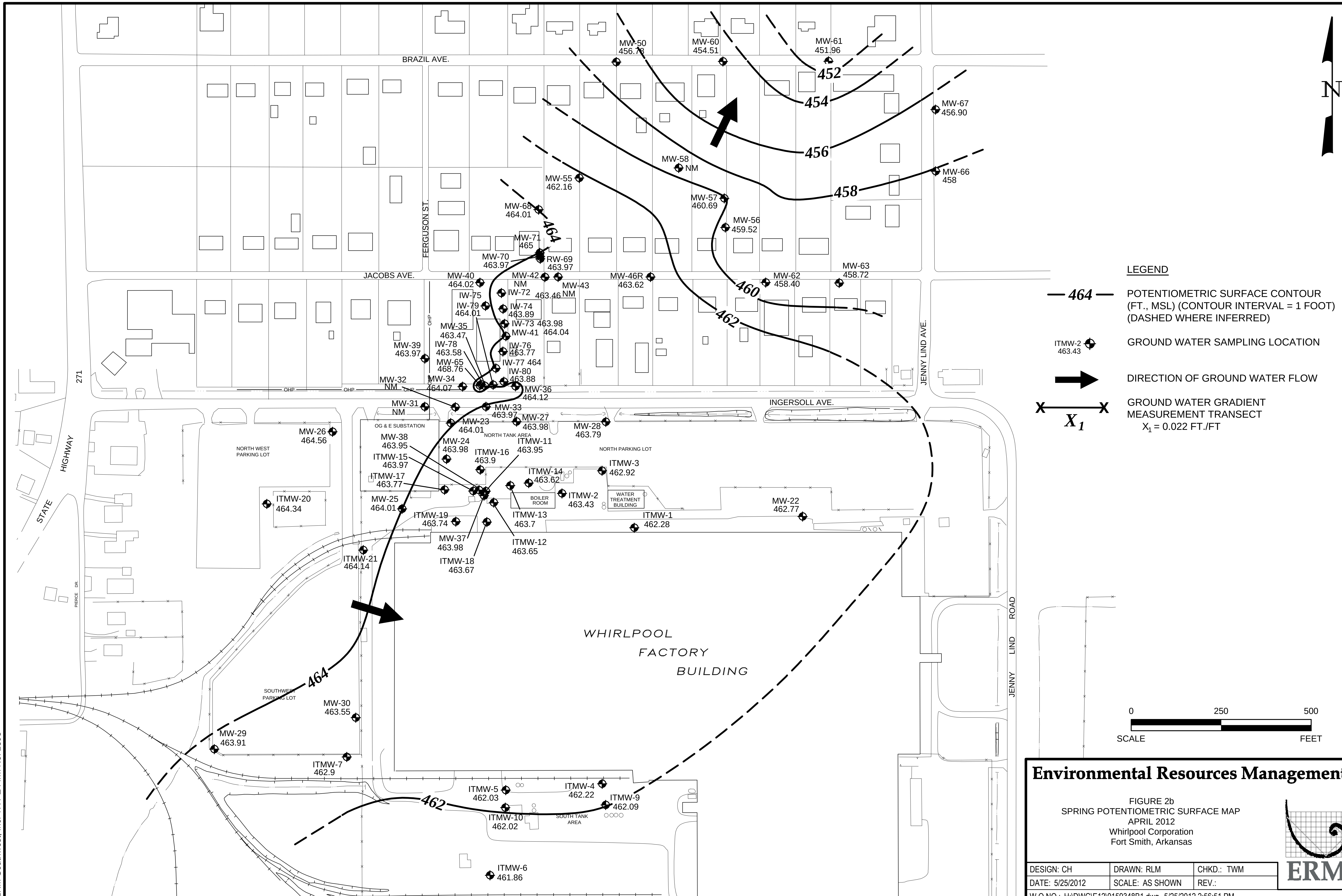
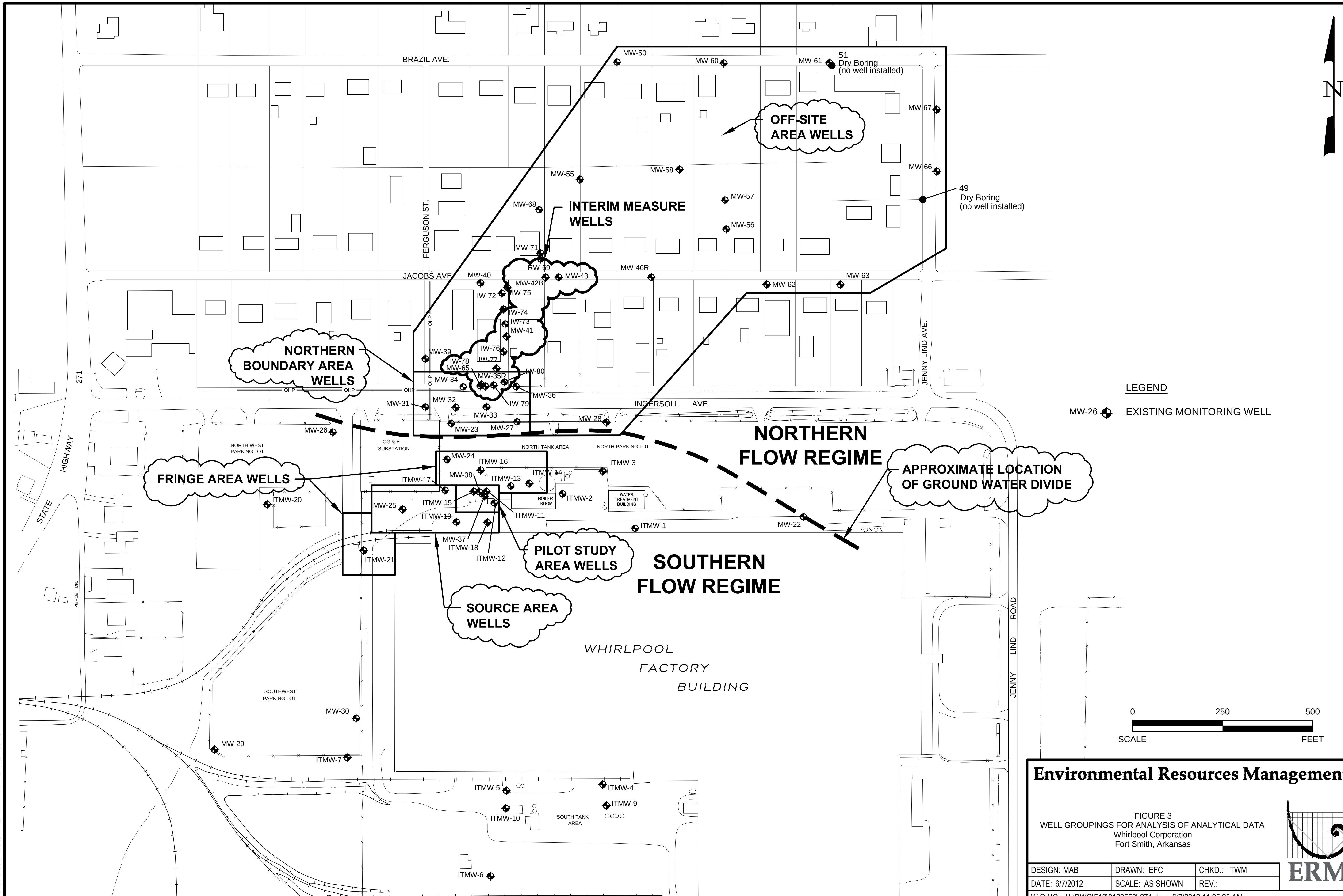



ERM-Southwest, Inc. TX PE Firm No. 2393

G:/2012/0159348/17766H (Att2).pdf




Environmental Resources Management

FIGURE 3
WELL GROUPINGS FOR ANALYSIS OF ANALYTICAL DATA
Whirlpool Corporation
Fort Smith, Arkansas

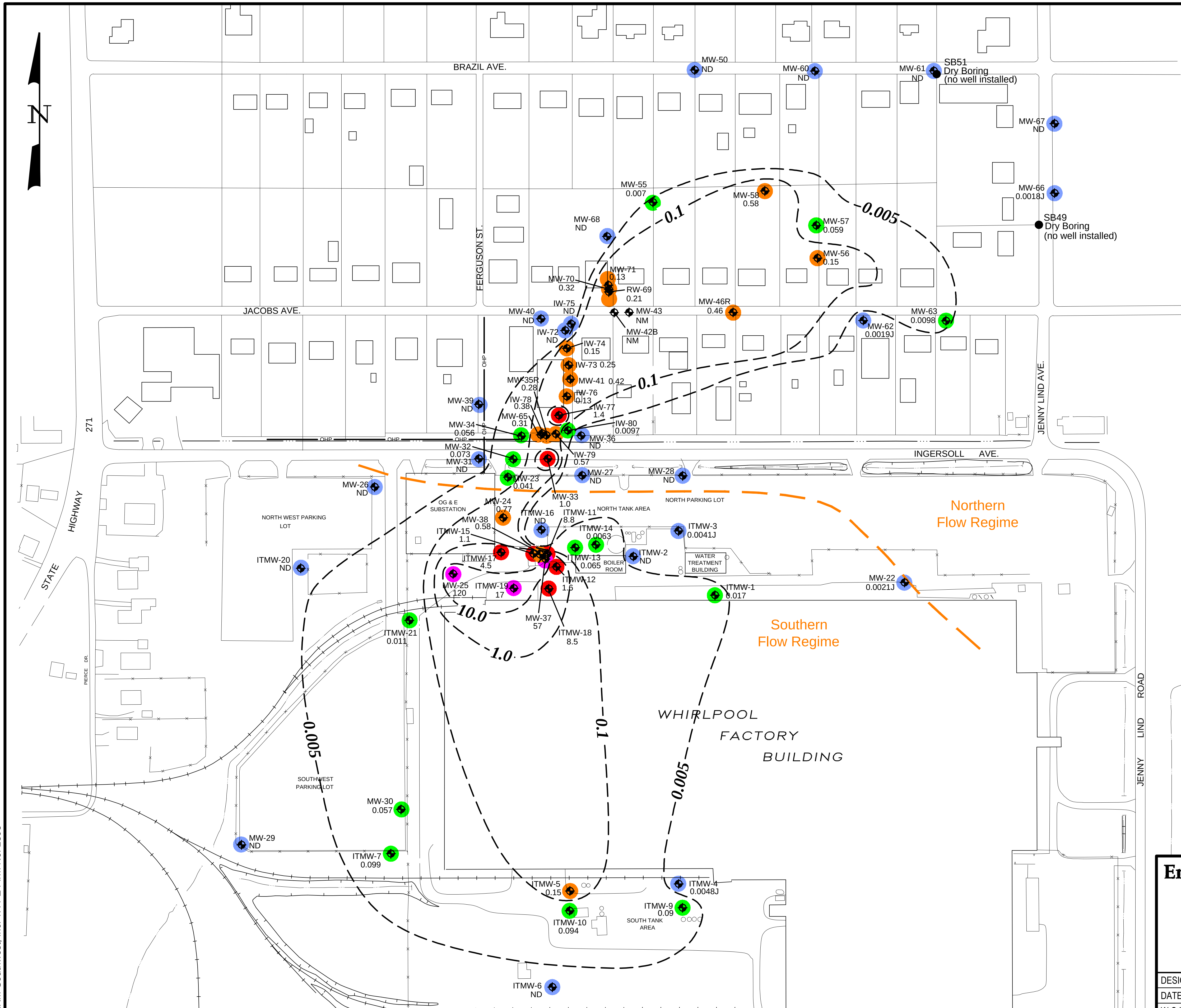
ERM

| DESIGN: MAB | DRAWN: EFC | CHKD.: TWM |
|---|---|---|
| DATE: 6/7/2012 | SCALE: AS SHOWN | REV.: |

W.O.NO.: H:\DWG\F12\0129550b274.dwg , 6/7/2012 11:25:25 AM

ERM-Southwest, Inc. TX PE Firm No. 2393

G:/2012/0159348/17766H (Att2).pdf




LEGEND

MW-58 0.58 — EXISTING MONITORING WELL WITH TCE CONCENTRATION IN mg/L

ND — RESULT IS NOT DETECTED ABOVE THE REPORTING LIMIT

J — RESULT IS LESS THAN THE REPORTING LIMIT BUT GREATER THAN OR EQUAL TO THE MINIMUM DETECTION LIMIT AND THE CONCENTRATION IS AN APPROXIMATE VALUE

NM — NOT MEASURED

- - 1.0 - - — TCE ISOCONCENTRATION CONTOUR LINE (mg/L) (DASHED WHERE INFERRED)

TCE CONCENTRATION (mg/L)

- < 0.005
- 0.005 to 0.10
- 0.10 to 1.00
- 1.00 to 10.0
- ≥ 10.0

0 250 500

SCALE FEET

**Environmental Resources Management**

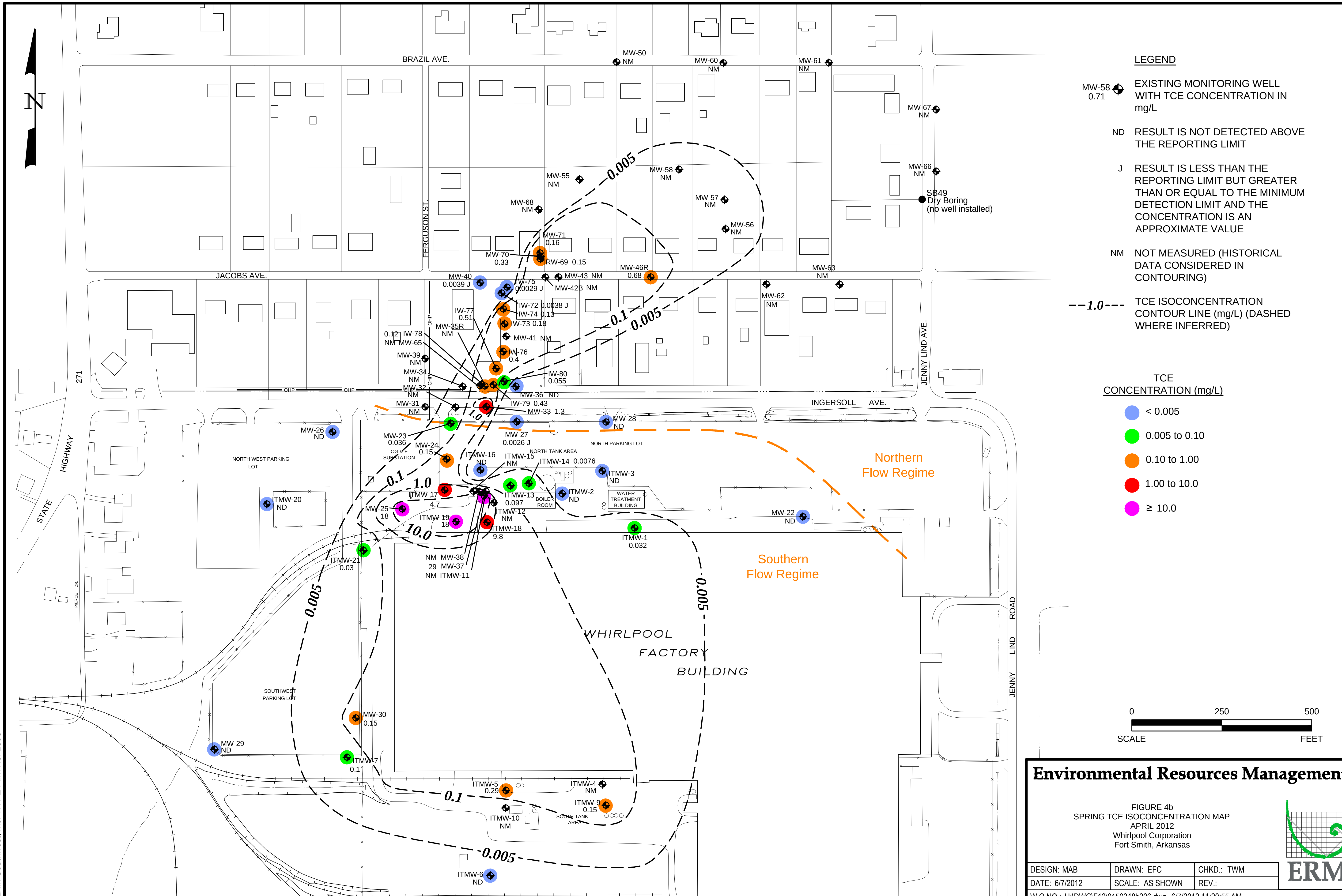
FIGURE 4a
FALL TCE ISOCONCENTRATION MAP
OCTOBER 2011
Whirlpool Corporation
Fort Smith, Arkansas

| DESIGN: MAB | DRAWN: EFC | CHKD.: TWM |
|---|---|---|
| DATE: 6/7/2012 | SCALE: AS SHOWN | REV.: |
| W.O.NO.: H:\DWG\F12\0159348b203.dwg, 6/7/2012 11:23:53 AM | | |

ERM

ERM-Southwest, Inc. TX PE Firm No. 2393

G:/2012/0159348/17766H (Att2).pdf




**Environmental Resources Management**

FIGURE 4b
SPRING TCE ISOCONCENTRATION MAP
APRIL 2012
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| DESIGN: MAB | DRAWN: EFC | CHKD.: TWM |
|---|---|---|
| DATE: 6/7/2012 | SCALE: AS SHOWN | REV.: |

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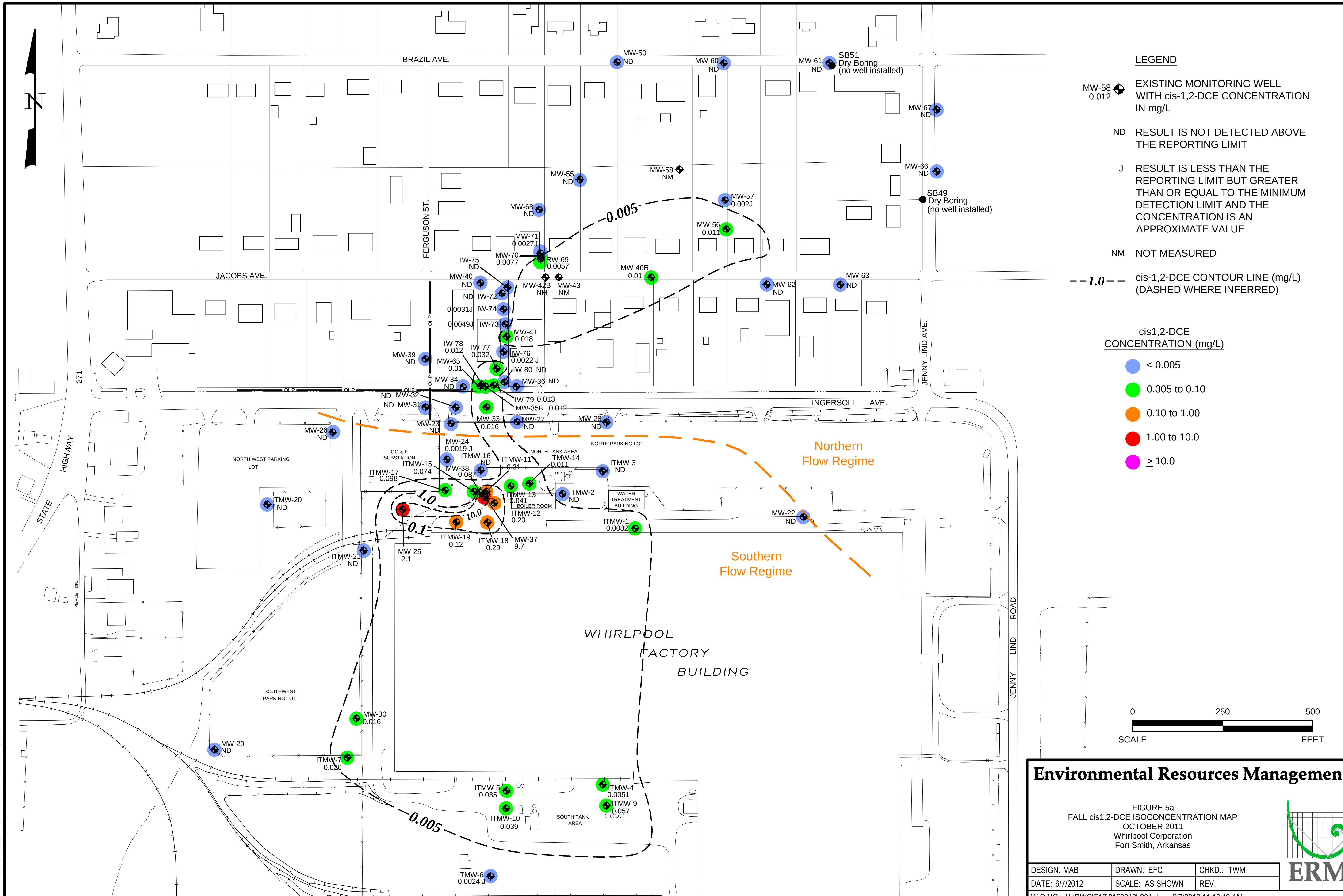
ERM-Southwest, Inc. TX PE Firm No. 2393




ERM-Southwest, Inc. TX PE Firm No. 2393

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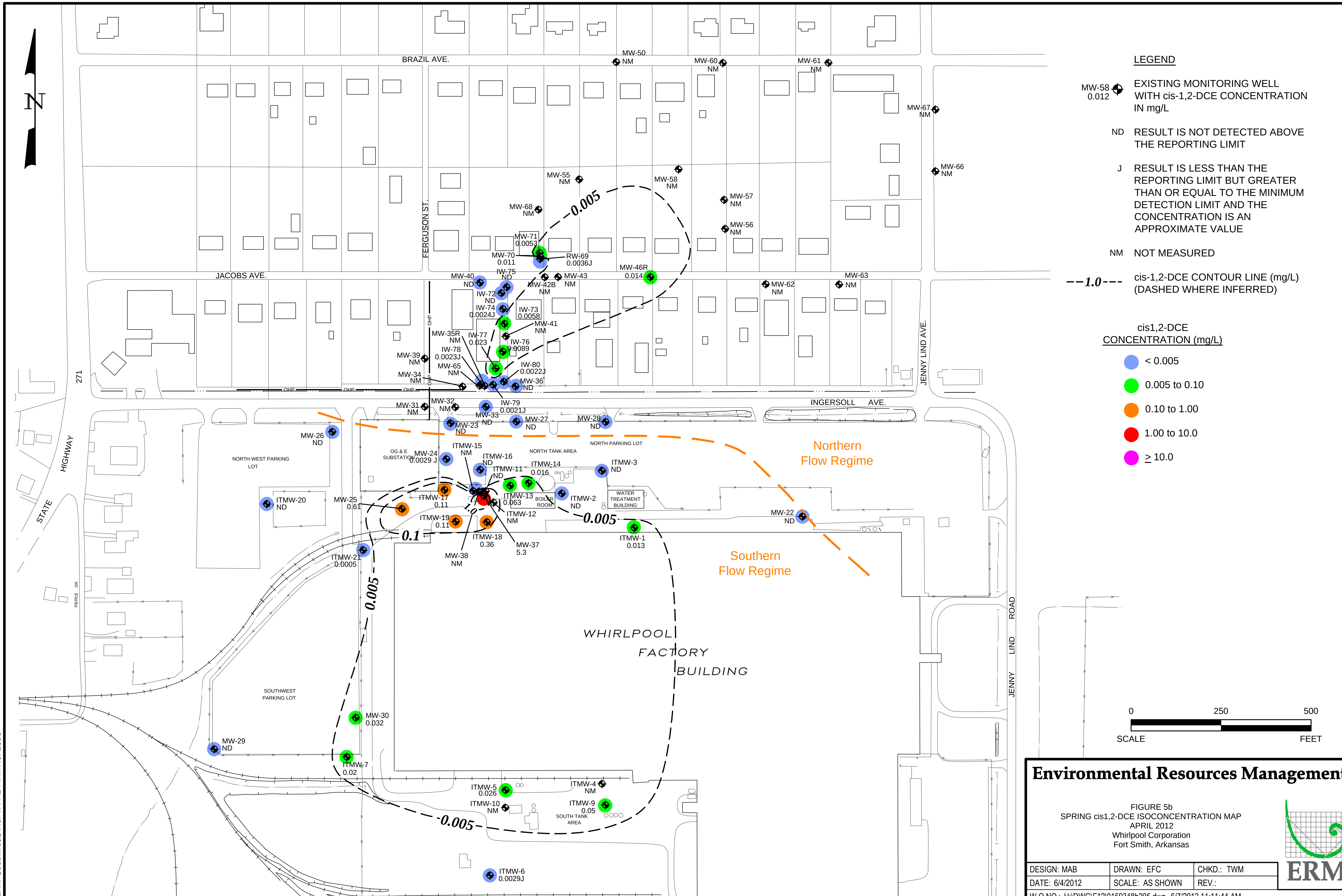


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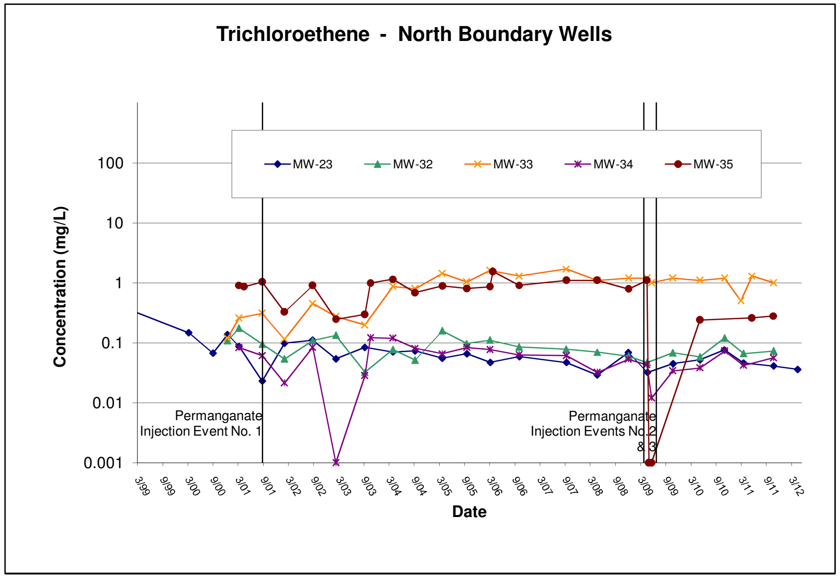
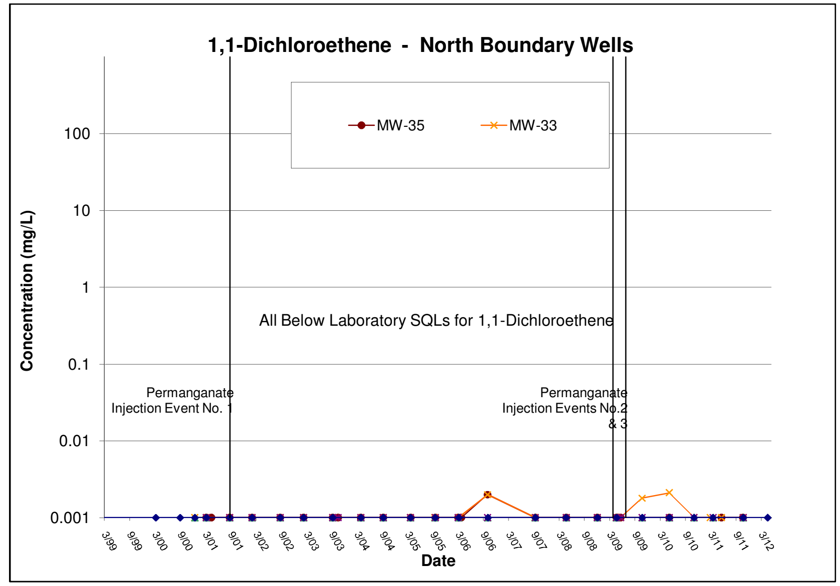
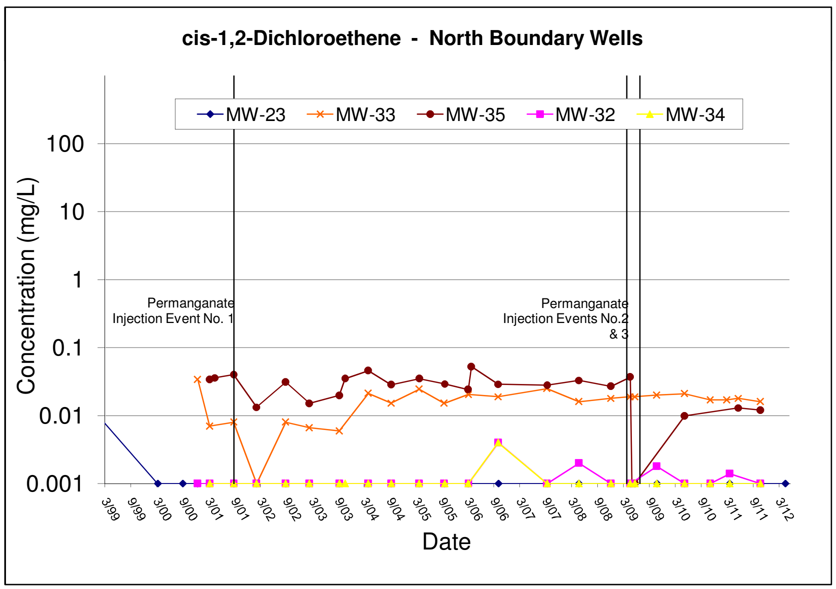
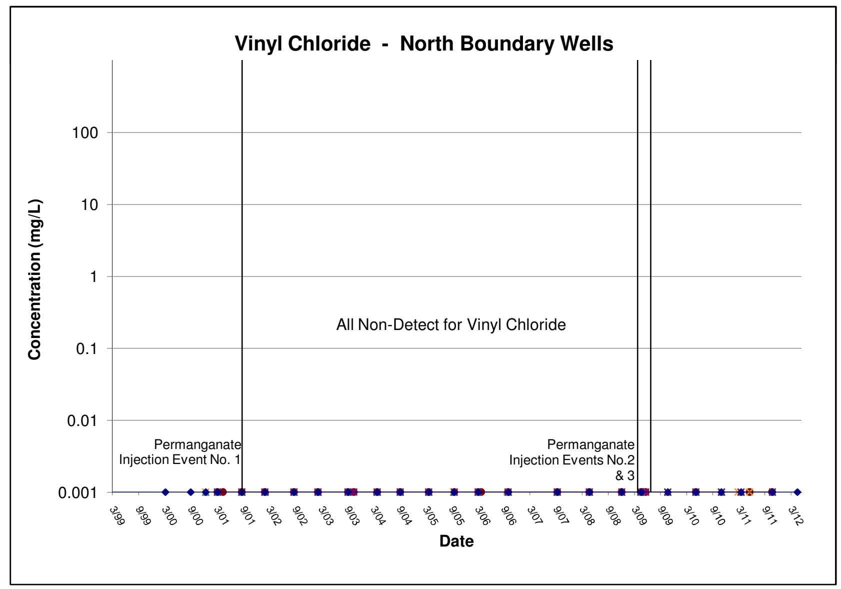



ERM-Southwest, Inc.

HOUSTON-NEW ORLEANS-AUSTIN-DALLAS-BEAUMONT-BATON ROUGE

FIGURE 6
North Boundary Wells Concentration Trends

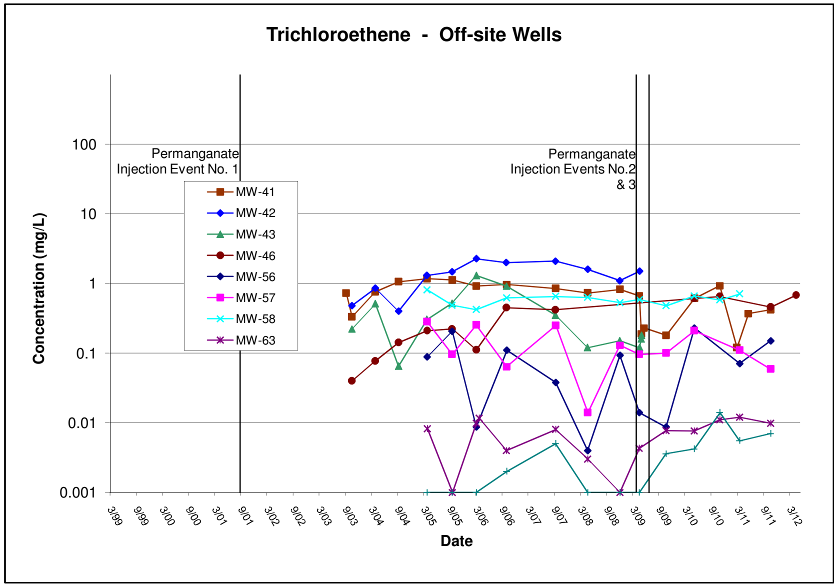
Whirlpool Corporation
Fort Smith, Arkansas

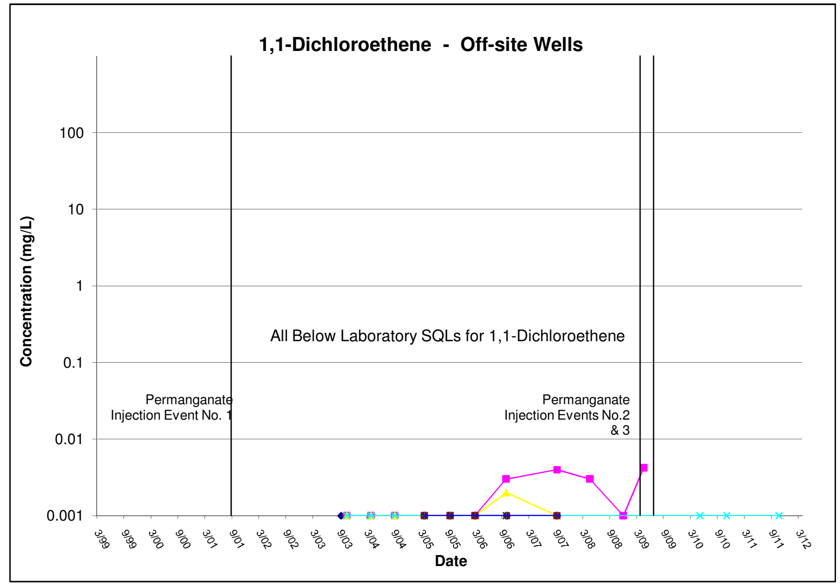
| DESIGN: TWM | CHKD: | 6/13/2012 | REV: |
|---|---|---|---|
| DRAWN: ESB | SCALE: AS SHOWN | W.O.NO: 0129550 | |

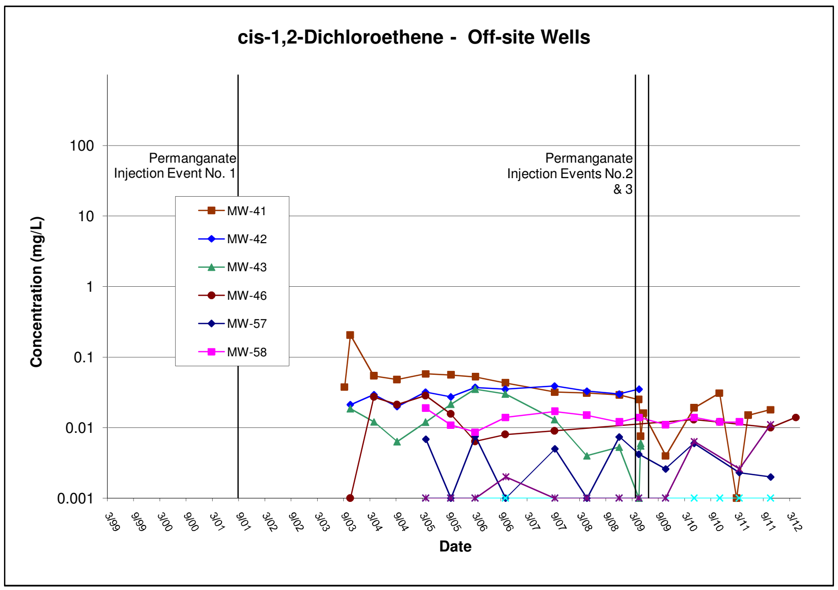
ERM

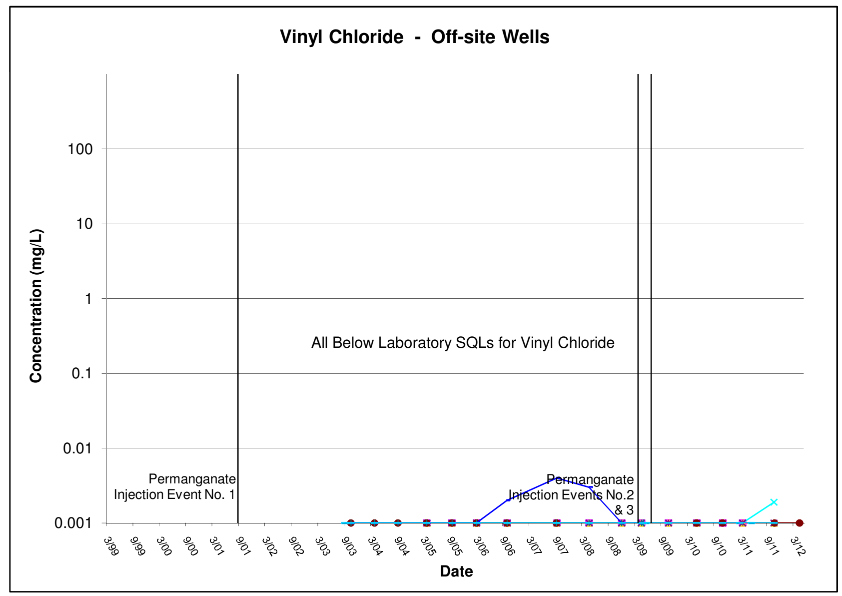


G:\2012\0159348\17766H (Att2b).xlsx




ERM-Southwest, Inc.

HOUSTON-NEW ORLEANS-AUSTIN-DALLAS-BEAUMONT-BATON ROUGE

FIGURE 7
Off-Site Wells Concentration Trends

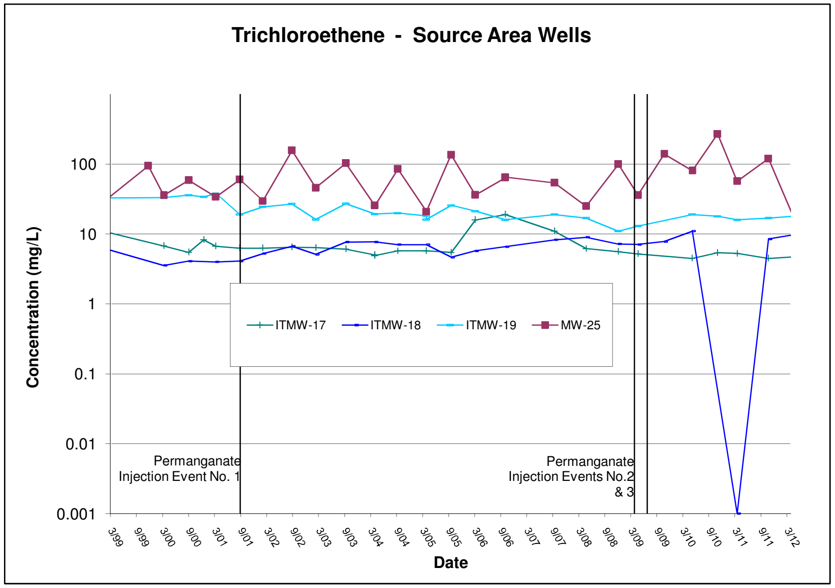
Whirlpool Corporation
Fort Smith, Arkansas

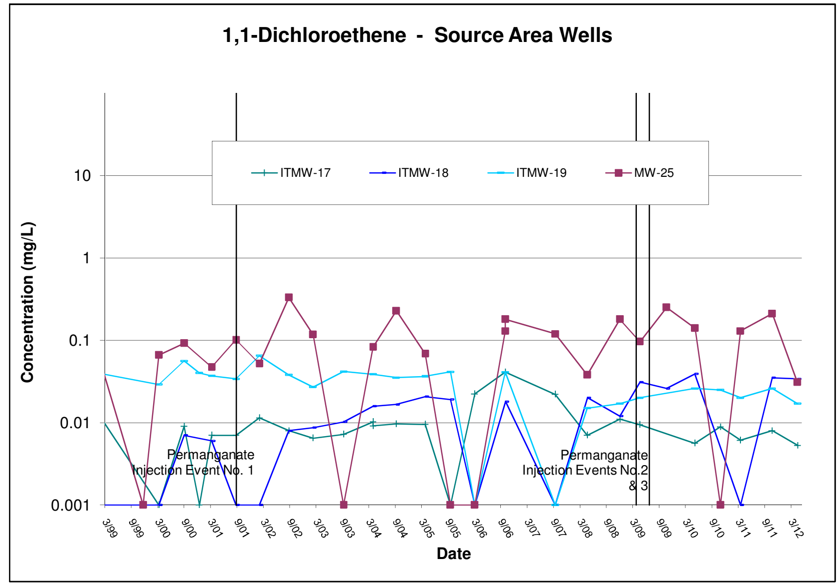
| | | | |
|---|---|---|---|
| DESIGN: TWM | CHKD: | 6/13/2012 | REV: |
| DRAWN: ESB | SCALE: AS SHOWN | W.O.NO: 0129550 | |

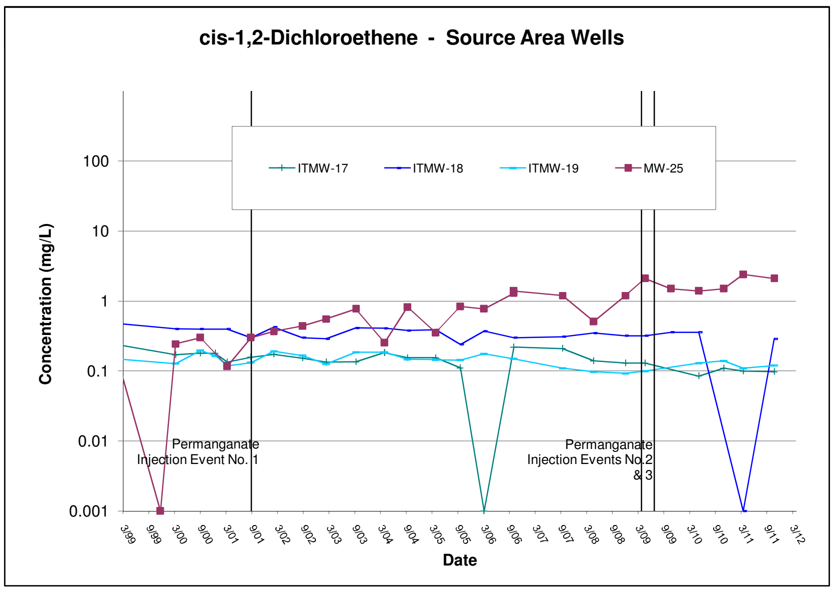
ERM

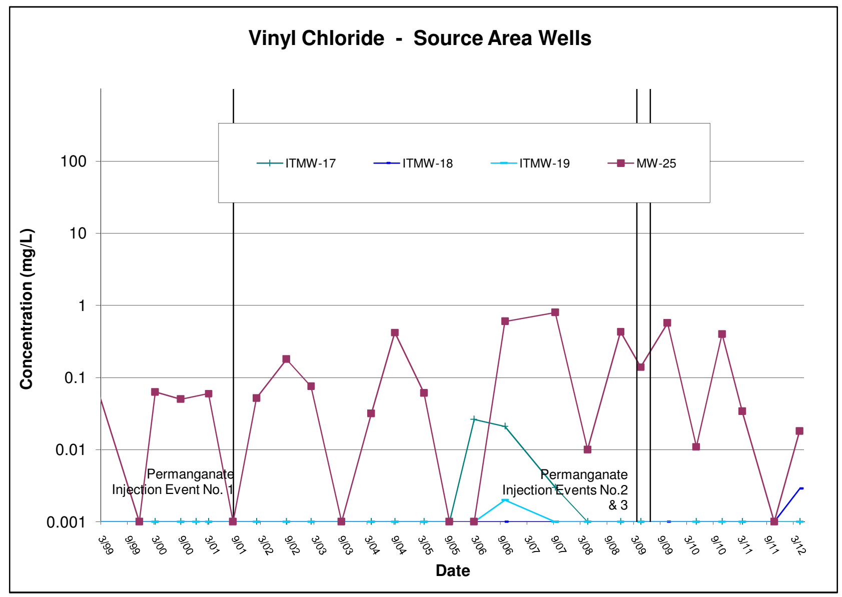


G:\2012\0159348\17766H (Att2b).xlsx




ERM-Southwest, Inc.

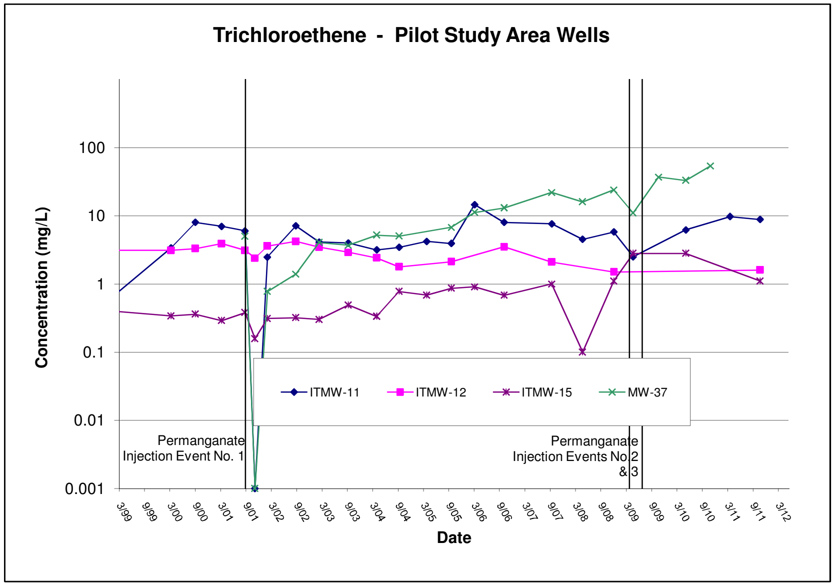
HOUSTON-NEW ORLEANS-AUSTIN-DALLAS-BEAUMONT-BATON ROUGE

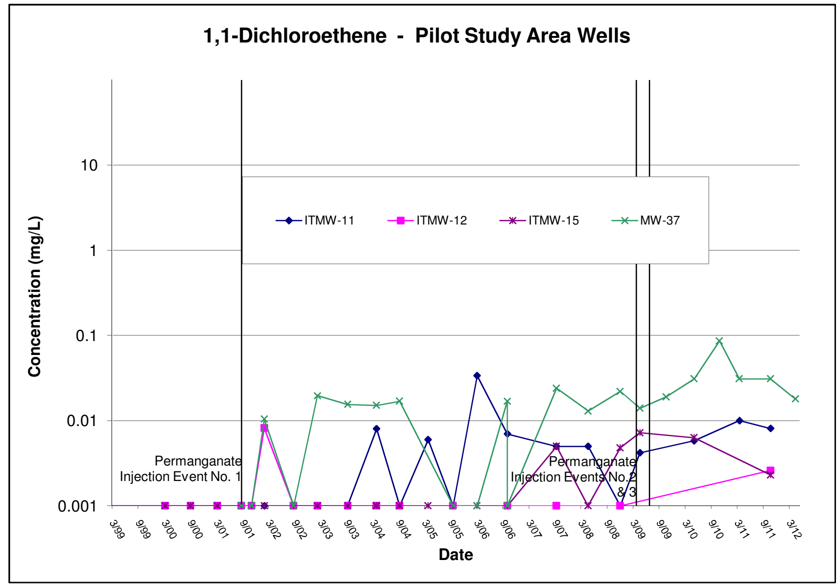
FIGURE 8
Source Area Wells Concentration Trends

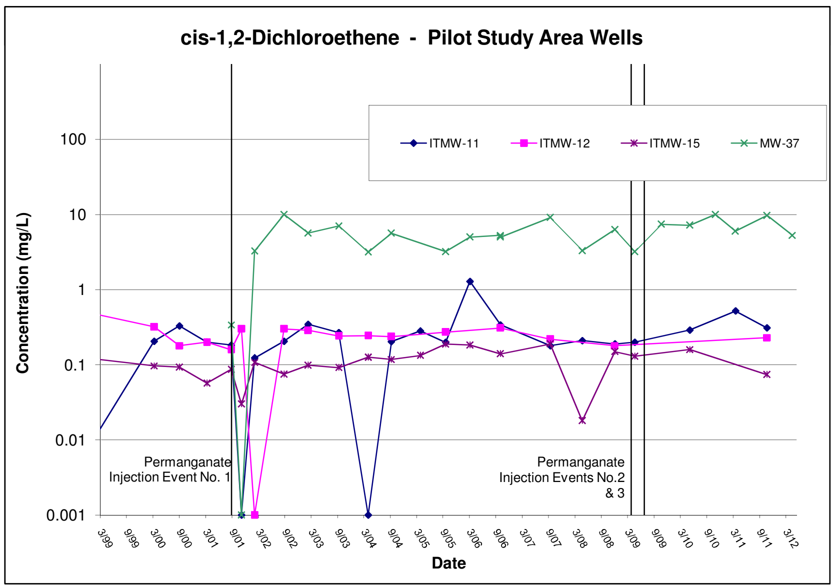
Whirlpool Corporation
Fort Smith, Arkansas

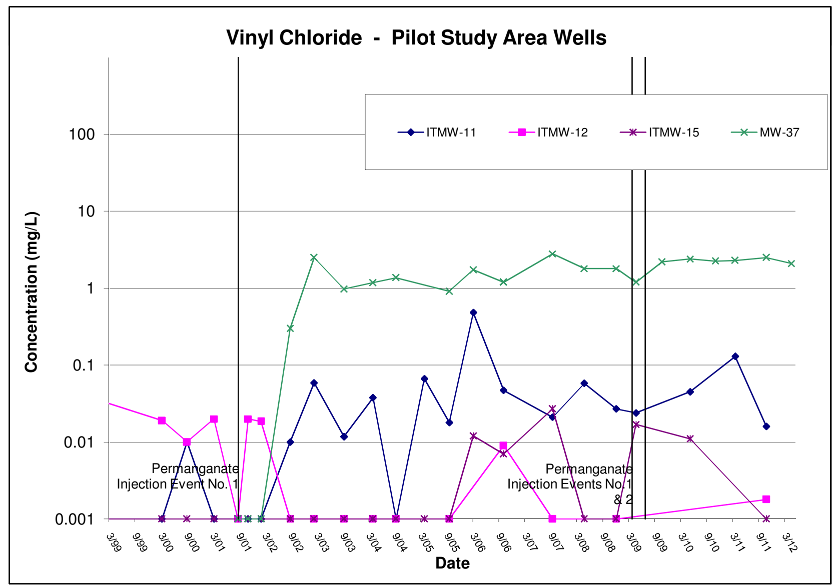
| | | | |
|---|---|---|---|
| DESIGN: TWM | CHKD: | 6/13/2012 | REV: |
| DRAWN: ESB | SCALE: AS SHOWN | W.O.NO: 0129550 | |

ERM




**ERM-Southwest, Inc.**

HOUSTON-NEW ORLEANS-AUSTIN-DALLAS-BEAUMONT-BATON ROUGE

FIGURE 9
Pilot Study Area Concentration Trends

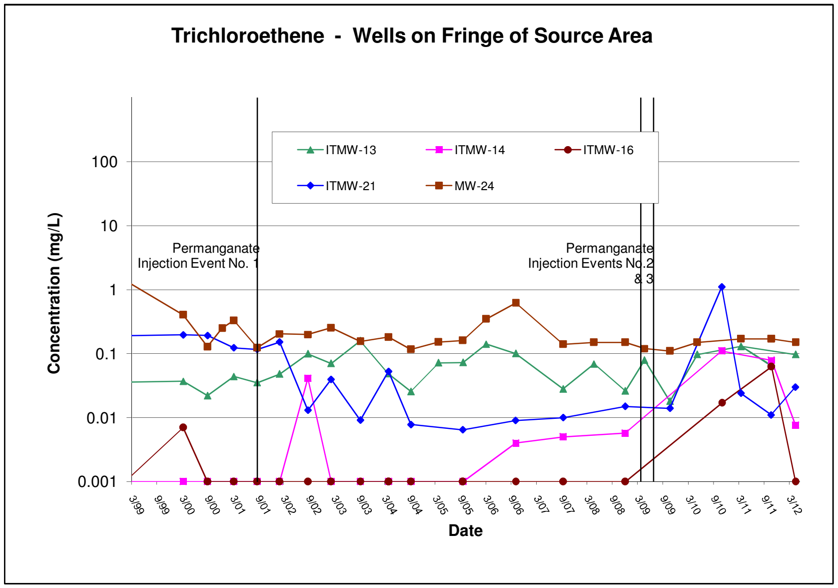
Whirlpool Corporation
Fort Smith, Arkansas

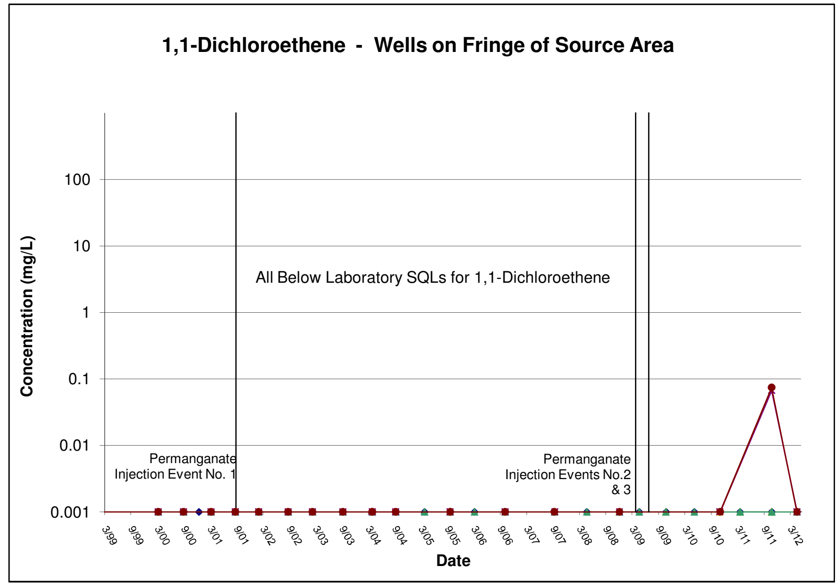
| DESIGN: TWM | CHKD: | 6/13/2012 | REV: |
|---|---|---|---|
| DRAWN: ESB | SCALE: AS SHOWN | W.O.NO: 0129550 | |

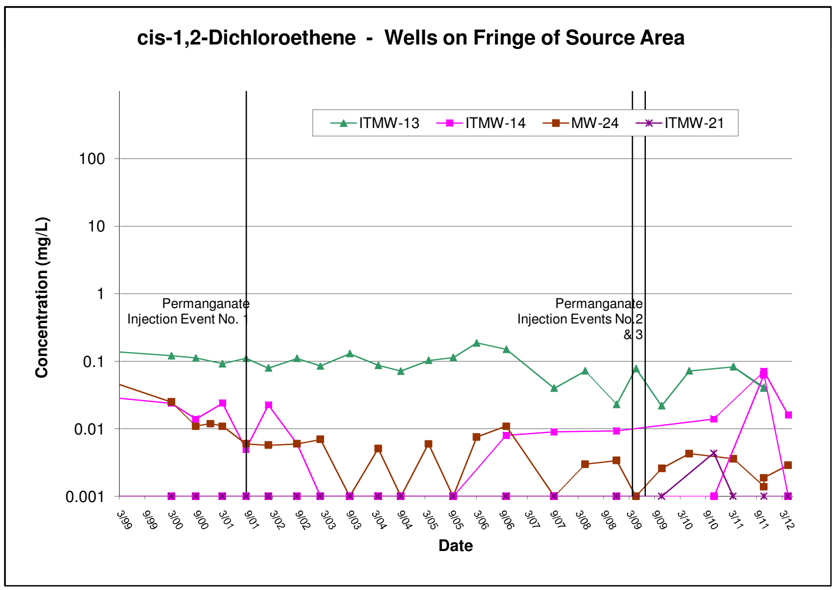
ERM

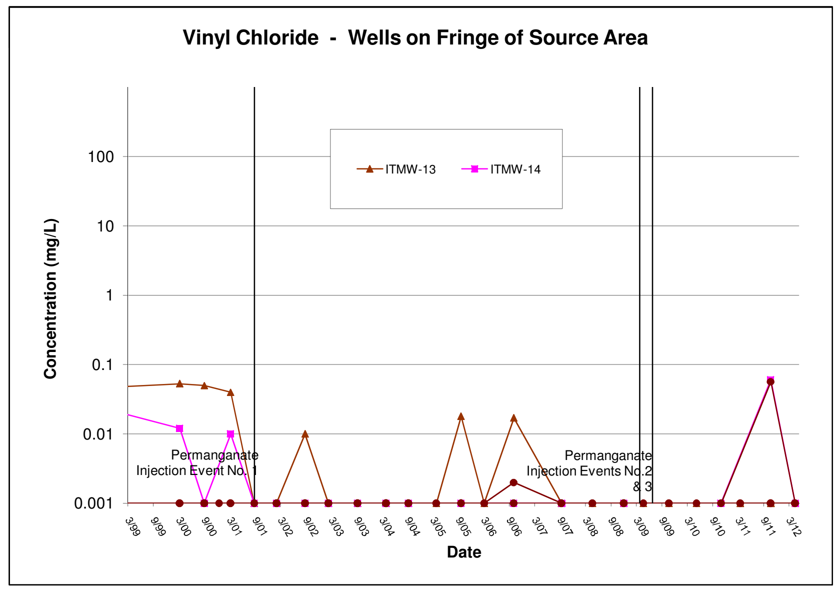


G:\2012\0159348\17766H (Att2b).xlsx




ERM-Southwest, Inc.

HOUSTON-NEW ORLEANS-AUSTIN-DALLAS-BEAUMONT-BATON ROUGE

FIGURE 10
Concentration Trends from Wells
on Fringe of Source Area
Whirlpool Corporation
Fort Smith, Arkansas

| DESIGN: TWM | CHKD: | 6/13/2012 | REV: |
|---|---|---|---|
| DRAWN: ESB | SCALE: AS SHOWN | W.O.NO: 0129550 | |

ERM



G:\2012\0159348\17766H (Att2b).xlsx

# Data Validation Report

*Attachment 3*

*June 28, 2012*

*Project No. 0159348*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

**Data Validation Report**
*Attachment 3*

Whirlpool Corporation
Fort Smith, Arkansas

## Introduction

Environmental Resources Management (ERM) reviewed the following laboratory sample delivery groups (SDG) from TestAmerica Laboratories, Inc. of Houston, Texas for ground water samples collected at the Whirlpool Corporation facility in Fort Smith, Arkansas:

- 600-45228-1 – October 24 - 27, 2011, and
- 600-53847-1 – April 17 – 19, 2012

Analysis requested was limited to SW-846 8260B – Volatile Organic Compounds (VOCs) by Gas Chromatography/Mass Spectrometry (GC/MS).

Data were reviewed and validated in accordance with the United States Environmental Protection Agency's (EPA's) *National Functional Guidelines for Organic Data Review* (EPA540/R-99/008, October 1999). The following laboratory submittals were evaluated:

- Sample Preservation and Holding Times,
- GC/MS Instrument Performance Check,
- Initial Calibration,
- Continuing Calibration,
- Blanks,
- System Monitoring Compounds,
- Internal Standards,
- Laboratory Control Samples,
- Matrix Spike/Matrix Spike Duplicates,
- Field Precision, and
- Overall Assessment of Data.

## Data Review / Validation Results

### Analytical Results

One hundred and five (105) ground water samples, six blind ground water field duplicates, five field blanks, and four trip blanks were submitted to the laboratory and analyzed for VOCs. In addition, ground water samples were collected at six locations (MW-25, ITMW-17, ITMW-16, ITMW-10, MW-26, and ITMW-14) and submitted to the laboratory for the matrix spike/matrix spike duplicate (MS/MSD) analysis. The following table lists the sample identifications by SDG.

| SDG | Sample ID |
|---|---|
| 600-53847-1 | DUP-01, DUP-02, FB-01, FB-02, ITMW-1, ITMW-13, ITMW-14, ITMW-16, ITMW-17, ITMW-18, ITMW-19, ITMW-2, ITMW-20, ITMW-21, ITMW-3, ITMW-5, ITMW-6, ITMW-7, ITMW-9, IW-72, IW-73, IW-74, IW-75, IW-76, IW-77, IW-78, IW-79, IW-80, MW-22, MW-23, MW-24, MW-25, MW-26, MW-27, MW-28, MW-29, MW-30, MW-37, MW-40, MW-46, MW-70, MW-71, RW-69, and TRIP BLANK |
| 600-45228-1 | DUP-01, DUP-102511, DUP-102611, DUP-102711, FB-102511, FB-102611, FB-102711, ITMW-1, ITMW-10, ITMW-11, ITMW-12, ITMW-13, ITMW-14, ITMW-15, ITMW-16, ITMW-17, ITMW-18, ITMW-19, ITMW-2, ITMW-20, ITMW-21, ITMW-3, ITMW-4, ITMW-5, ITMW-6, ITMW-7, ITMW-9, IW-72, IW-73, IW-74, IW-75, IW-76, IW-77, IW-78, IW-79, IW-80, MW-22, MW-23, MW-24, MW-25, MW-26, MW-27, MW-28, MW-29, and MW-30. |

Ground water analytical results are reported in ug/L. Not Detected results are reported as less than the value of the practical quantitation limit (PQL).

**Preservation and Holding Times**

The samples were evaluated for agreement with the chain-of-custody. The samples were received by the laboratory in the appropriate containers and in good condition. Sample receipt temperatures of 4.9, 4.3, 1.1, and 1.3 degrees Celsius were within the acceptance criteria of 4 ± 2 degrees Celsius for SDGs 600-53847-1 and 600-45228-1, respectively. Samples IW-75 (600-53847-1 and 600-45228-1), IW-79, IW-74, IW-73, IW-76 (600-53847-1 and 600-45228-1), and IW-80 were preserved with 5 grams of lab-grade ascorbic acid for residual permanganate quenching methods; however, they were not preserved in the field with HCl to bring the pH below 2. Because the samples were received within the temperature acceptance criteria and were analyzed within 7 days, results were not qualified.

The remaining samples were preserved in the field as specified by the method and were prepared and analyzed within holding times.

**GC/MS Instrument Performance Check**

GC/MS instrument performance checks are performed to ensure mass resolution, identification, and sensitivity. The appropriate compound, bromofluorobenzene (BFB) for volatile analysis, was used for instrument tuning. GC/MS tunes were performed at the appropriate frequency (once every 12 hours). BFB ion abundance met criteria specified by the method.

No analytical data were qualified based on the results of the GC/MS instrument performance check.

**Initial Calibration**

Initial calibration demonstrates that the instrument is capable of acceptable performance at the start of an analytical run and producing a linear calibration curve. Six standards (5, 10, 20, 50, 100, and 200) were used for the initial calibration. The initial calibration relative response factors (RRFs) were greater than 0.05 for all VOCs and system monitoring compounds. The percent relative standard deviation (%RSD) was less than 30% for all relative VOCs and system monitoring compounds.

No analytical data were qualified based on the results of the initial calibration.

**Continuing Calibration**

Continuing calibration establishes the 12-hour relative response factors on which quantitations are based and checks satisfactory instrument performance on a day-to-day basis. The continuing calibration RRFs were greater than 0.05 for all VOCs and system monitoring compounds. The percent difference (%D) between the initial calibration and continuing calibration RRFs were less than 30% for all VOCs and system monitoring compounds, except as detailed below. Constituent results associated with the CCV exceedance were qualified as estimated (J or UJ).

| *SDG* | *Constituent* | *Associated Samples (Qualification)* |
|---|---|---|
| 600-45228-1 | Chloroethane | IW-80, IW-73, MW-37, ITMW-11, ITMW-12, ITMW-13, DUP-102711, ITMW-3, ITMW-1, MW-22, MW-56, MW-41, IW-77, MW-35, MW-65, IW-78, ITMW-4, ITMW-9, ITMW-5, ITMW-6, DUP-102511, ITMW-7, ITMW-21, MW-29, MW-38, MW-37, ITMW-11<br><br>All qualified as "UJ" |
| 600-45228-1 | Carbon tetrachloride<br>1,2-Dichloroethane | ITMW-19, ITMW-18, ITMW-18, ITMW-15<br><br>All qualified as "UJ" |
| 600-53847-1 | Carbon Tetrachloride | MW-30, ITMW-7, IW-78, MW-40, MW-46, MW-24, MW-27, MW-25, ITMW-3, IW-75, MW-37, MW-37, ITMW-18, ITMW-2, ITMW-9, ITMW-6, ITMW-21, IW-72, IW-73, IW-77, DUP-01, IW-79, MW-22, ITMW-1, MW-26, ITMW-17, IW-73, IW-79, MW-71, MW-70<br><br>All qualified as "UJ" |

**Blanks**

Laboratory and field blanks indicate the presence and magnitude of contamination resulting from laboratory or field activities. The following table summarizes the contamination reported in the laboratory and field blanks. The discussion following the table details the data qualification, if any.

| *SDG* | *Blank ID* | *Constituents* | *Concentration (ug/L)* | *Associated Samples* |
|---|---|---|---|---|
| 600-53847-1 | MB 600-77727/4 | No detections | --- | --- |
| 600-53847-1 | MB 600-77728/5 | No detections | --- | --- |
| 600-53847-1 | MB 600-77729/4 | No detections | --- | --- |
| 600-53847-1 | MB 600-77767/4 | No detections | --- | --- |
| 600-53847-1 | MB 600-77880/5 | No detections | --- | --- |
| 600-53847-1 | MB 600-78168/5 | No detections | --- | --- |
| 600-53847-1 | MB 600-78240/12 | No detections | --- | --- |
| 600-53847-1 | MB 600-78101/4 | No detections | --- | --- |

| SDG | Blank ID | Constituents | Concentration (ug/L) | Associated Samples |
|---|---|---|---|---|
| 600-53847-1 | MB 600-78101/4 and TRIP Blank (600-53847-45) | Methylene Chloride | 1.4 | MW-70, RW-69, ITMW-16, MW-23, ITMW-14, ITMW-13 (U) |
| 600-45228-1 | MB 600-65363/7 | No detections | --- | --- |
| 600-45228-1 | MB 600-65401/6 | No detections | --- | --- |
| 600-45228-1 | MB 600-65486/8 | No detections | --- | --- |
| 600-45228-1 | MB 600-65530/9 | Methylene Chloride | 1.9 | MW-68, MW-71, MW-70, MW-69, MW-36, MW-33, MW-32, MW-66, MW-67, ITMW-16 (U) |
| 600-45228-1 | MB 600-65578/7 | Methylene Chloride | 1.4 | ITMW-12, ITMW-13, DUP-102711, ITMW-3, FB-102711, ITMW-1, MW-22 (U)<br><br>ITMW-11 (J)<br>MW-37 (190 ug/L) |
| 600-45228-1 | MB 600-65618/4 | Methylene Chloride | 1.4 | MW-70, MW-69, MW-33, MW-46, MW-46, MW-40, MW-39, MW-34, MW-31, ITMW-10 (U) |
| 600-45228-1 | MB 600-65729/4 | No detections | --- | --- |
| 600-45228-1 | MB 600-65900/4 | No detections | --- | --- |
| 600-45228-1 | MB 600-65942/4 | No detections | --- | --- |
| 600-45228-1 | MB 600-66005/4 | No detections | --- | --- |
| 600-45228-1 | MB 600-66039/4 | No detections | --- | --- |

The methylene chloride concentration in SDG 600-53847-1 sample MW-37 was reported as detected above the reporting limit and was not within ten times the Trip Blank concentration and therefore was not qualified. Other samples associated with method blank 600-78101-4 were reported as Not Detected; therefore, no data were qualified based on method blank detections for SDG 600-53847-1.

Methylene chloride was reported as detected and estimated (J) in SDG 600-45228-1 sample ITMW-11, which is associated with MB 600-65578/7. Because it was qualified as estimated (J), no additional qualifiers were applied based on the detection in the method blank.

The methylene chloride concentration in SDG 600-45228-1 sample MW-37 was reported as detected above the reporting limit and was not within ten times the Trip Blank concentration and therefore was not qualified. Other samples associated with method blanks were reported as Not Detected and no additional qualifiers were applied.

**System Monitoring Compounds**

System monitoring compounds are added to all samples prior to purging to evaluate the laboratory performance on individual samples. Four volatile surrogates (dibromofluoromethane, 1,2-dichloroethane-d4, toluene-d8, and bromofluorobenzene) were added to each sample. Percent recoveries (%R) for all volatile surrogates in all samples were within the method acceptance limits of 70%-130%.

No analytical data were qualified based on the results of the system monitoring compounds.

**Internal Standards**

Internal standards indicate whether GC/MS sensitivity and response were stable during each analysis. Four internal standards (pentafluorobenzene, 1,4-difluorobenzene, chlorobenzene-d5, and 1,4-dichlorobenzene-d4) were added to each sample prior to volatile analysis. All internal standard area counts were within the method-required QC limits of -50% to +100% of the internal standard area counts for the associated 12-hour calibration standard. The retention times for all internal standards did not vary more than the method-specified QC limit of ±30 seconds from the retention time of the associated 12-hour calibration standard.

No analytical data were qualified based on the results of the internal standards.

**Laboratory Control Samples**

The laboratory control sample (LCS) provides information on the accuracy of the analytical method and on the laboratory performance. The following table summarizes the LCS results that were outside the acceptance limits of 60% to 140% and any associated qualifications.

| *SDG* | *LCS ID* | *%R Outcome* | *Associated Samples (Qualification)* |
|---|---|---|---|
| 600-45228-1 | LCS 600-65578/4 | Vinyl Chloride (56%) | DUP-102711, FB-102711, ITMW-1, ITMW-13, ITMW-3, MW-22 (R) |
| 600-45228-1 | LCS 600-65578/4 | Chloromethane (47%) | DUP-102711, FB-102711, ITMW-1, ITMW-13, ITMW-3, MW-22 (R) |
| 600-45228-1 | LCS 600-65486/5 | Vinyl Chloride (58%) | IW-79 (R) |
| 600-45228-1 | LCS 600-65486/5 | Acetone (59%) | No associated samples () |
| NOTES:<br>( ) = No qualification. | | | |

LCS recoveries for vinyl chloride and chloromethane were below acceptance limits for batches 65578 and 65486. Associated samples that were reported as "Not Detected" for these analytes were qualified as rejected (R). LCS recoveries for vinyl chloride and acetone were below acceptance limits for batch 65486. Associated sample IW-79 was reported as "Not Detected" for vinyl chloride and was therefore qualified as rejected (R). IW-79 was not analyzed for acetone.

**Matrix Spike/Matrix Spike Duplicates**

MS/MSD data are used to assess long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery at the time of sample analysis. The table below summarizes MS/MSD analyses that were performed in association with samples from the SDGs of interest, in addition to constituents with recoveries and/or relative percent differences (RPD outside the acceptance limits of %60 to 140% or 40% of less, respectively:

| *SDG* | *Lab Sample ID (Well ID)* | *Constituent* | *MS %R* | *MSD %R* | *RPD* | *Associated Batch* |
|---|---|---|---|---|---|---|
| 600-53847-1 | 600-53847-14 (MW-25) | Bromomethane,<br>Chloroethane,<br>Cis-1,2-dichloroethane | 156<br>152<br>23 | 134<br>131<br>155 | 15<br>15<br>8 | 600-77727 |
| 600-45228-1 | 600-45228-16 (ITMW-16) | 1,2-Dichloroethane,<br>Bromomethane,<br>Chloroethane, | 148<br>75<br>86 | 146<br>105<br>116 | 2<br>31<br>33 | 600-65530 |
| 600-45228-1 | 600-45228-43 (ITMW-10) | 1,1-Dichloroethane<br>1,1-Dichloroethene | 122<br>166 | 128<br>179 | 5<br>7 | 600-65618 |
| 600-45228-1 | 600-45228-54 (MW-26) | 1,1-Dichloroethene<br>Ethylbenzene<br>Tetrachloroethene<br>Toluene<br>Trichloroethene | 158<br>122<br>138<br>122<br>126 | 158<br>134<br>146<br>131<br>133 | 0<br>9<br>6<br>6<br>6 | 600-65729 |
| 600-45228-1 | 600-45228-60 DL (ITMW-15) | Carbon Tetrachloride | 149 | 150 | 1 | 600-66039 |
| 600-45228-1 | 600-45228-66 (ITMW-14) | Carbon Tetrachloride<br>Chloroform<br>1,1-Dichloroethane<br>1,2-Dichloroethane<br>Ethylbenzene<br>Tetrachloroethane<br>1,1,1-Trichloroethane<br>Trichloroethene | 176<br>135<br>125<br>157<br>131<br>149<br>167<br>134 | 147<br>134<br>136<br>166<br>126<br>134<br>173<br>144 | 4<br>0<br>9<br>5<br>4<br>7<br>4<br>7 | 600-66005 |
| 600-45228-1 | No MS/MSD | | | | | 600-65363 |
| 600-45228-1 | No MS/MSD | | | | | 600-65401 |
| 600-45228-1 | No MS/MSD | | | | | 600-65486 |
| 600-45228-1 | No MS/MSD | | | | | 600-65578 |

<u>SDG 600-53847-1</u>

The matrix spike / matrix spike duplicate (MS/MSD) recoveries associated with batch 77727 for bromomethane, chloroethane, and cis-1,2-dichloroethane were outside control limits for MW-25 (600-53847-14 MS) and MW-25 (600-53847-14 MSD). Matrix interference is suspected. LCS recoveries for these samples were within acceptance limits and no data were qualified based on the MS/MSD results.

<u>SDG 600-45228-1</u>

The MS/MSD recoveries in samples ITMW-16 (600-45228-16 MS/MSD) were above acceptance limits for 1,1-dichloroethane, bromomethane, and chloroethane, Matrix interference is suspected. Also relative percent differences (RPD) between ITMW-16 (600-45228-16 MS and MSD) were above acceptance limits. LCS recoveries for these samples were within acceptance limits and no data were qualified based on the MS/MSD results.

The chloroethane recovery in sample (600-45228-30 DL MSD) and the %RPD between samples (600-45228-30 DL MS and MSD) were above acceptance limits. Matrix interference is suspected. LCS recoveries for these samples were within acceptance limits and no data were qualified based on the MS/MSD results.

The 1,1-dichloroethene recovery in sample ITMW-10 (600-45228-43 MS) and the 1,1-dichloroethane and 1,1-dichloroethene recoveries in sample ITMW-10 (600-45228-43 MSD) were above acceptance limits. Matrix interference is suspected. LCS recoveries for these samples were within acceptance limits and no data were qualified based on the MS/MSD results.

The 1,1-dichloroethene recovery in sample MW-26 (600-45228-54 MS) and the 1,1-dichloroethene, ethylbenzene, tetrachloroethene, toluene and trichloroethene recoveries in sample MW-26 (600-45228-54 MSD) were above acceptance limits. Matrix interference is suspected. LCS recoveries for these samples were within acceptance limits and no data were qualified based on the MS/MSD results.

The Carbon tetrachloride recoveries in samples 600-45228-60 DL MS and MSD were above acceptance limits. Matrix interference is suspected. LCS recoveries for these samples were within acceptance limits and no data were qualified based on the MS/MSD results.

Recoveries for carbon tetrachloride, chloroform, 1,2-dichloroethane, ethylbenzene, tetrachloroethene, 1,1,1-trichloroethene, and trichloroethene were above acceptance limits in sample ITMW-14 (600-45228-66 MS). Also, recoveries for carbon tetrachloride, chloroform, 1,1-dichloroethane, 1,2-dichloroethane, 1,1,1-trichloroethene, and trichloroethene in sample ITMW-14 (600-45228-66 MSD) were above acceptance limits. Matrix interference is suspected. LCS recoveries for these samples were within acceptance limits and no data were qualified based on the MS/MSD results.

**Field Precision**

Two field duplicate sample pairs (Dup-1/IW-77, Dup-2/ITMW-19) were collected with SDG 600-53847 and four duplicate sample pairs (Dup-1/MW-24, DUP-102511/ITMW-6, DUP-102711, ITMW-13, DUP-102611/ITMW-20) were collected with SDG 600-45228-1. Seven constituents were detected in the original sample and/or duplicate sample. All RPDs were less than the acceptance limit of 40% therefore no qualification was assigned based on the field duplicate data.

| *SDG* | *Field ID* | *DUP ID* | *Constituent* | *Sample Result* | *Duplicate Result* | *RPD* |
|---|---|---|---|---|---|---|
| 600-53847-1 | IW-77 | DUP-01 | 1,1-Dichloroethene | 1.2 | 1.2 | 0% |
| | | | cis-1,2-Dichloroethene | 23 | 20 | 14% |
| | | | 1,2-Dichloroethene, Total | 23 | 20 | 14% |
| | | | Trichloroethene | 510 | 520 | 2% |
| 600-53847-1 | ITMW-19 | DUP-02 | 1,1-Dichloroethene | 17 | 15 | 13% |
| | | | Chloroform | 5 | 5 | 0% |
| | | | cis-1,2-Dichloroethene | 110 | 110 | 0% |
| | | | Tetrachloroethene | 3.1 | 3.3 | 6% |

| *SDG* | *Field ID* | *DUP ID* | *Constituent* | *Sample Result* | *Duplicate Result* | *RPD* |
|---|---|---|---|---|---|---|
| | | | trans-1,2-Dichloroethene | 0.89 | 1.2 | 30% |
| | | | 1,2-Dichloroethene, Total | 110 | 110 | 0% |
| | | | Trichloroethene | 18000 | 15000 | 18% |
| 600-45228-1 | MW-24 | DUP-01 | cis-1,2-Dichloroethene | 1.9 | 1.4 | 30% |
| | | | Trichloroethene | 170 | 170 | 0% |
| | | | 1,2-Dichloroethene, Total | 1.9 | 1.4 | 30% |
| 600-45228-1 | ITMW-6 | DUP-102511 | 1,1-Dichloroethane | 4.6 | 4.3 | 7% |
| | | | cis-1,2-Dichloroethene | 2.4 | 2.7 | 12% |
| | | | 1,2-Dichloroethene, Total | 2.4 | 2.7 | 12% |
| 600-45228-1 | ITMW-13 | DUP-102711 | cis-1,2-Dichloroethene | 41 | 40 | 2% |
| | | | Trichloroethene | 65 | 64 | 2% |
| | | | 1,2-Dichloroethene, Total | 41 | 40 | 2% |
| 600-45228-1 | ITMW-20 | DUP-102611 | No Detections | --- | --- | --- |

**Overall Assessment of Data**

The data are usable for its intended purpose based on an evaluation of the QC parameters discussed in this report. Results for seven samples were rejected during this validation due to inability to meet acceptable laboratory control sample recoveries for vinyl chloride and chloromethane. Some data are qualified as Not Detected or estimated due to the inability to meet all QC criteria. The table below summarizes the final qualifications for the analytical data.

| *QC Failure Reason* | CCV | | CCV | | CCV | | CCV | | LCS %R | | LCS %R | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***SDG*** | 600-45228-1 | | 600-45228-1 | | 600-45228-1 | | 600-53847-1 | | 600-45228-1 | | 600-45228-1 | |
| ***Constituent*** | Chloroethane | | Carbon tetrachloride | | 1,2-Dichloroethane | | Carbon tetrachloride | | Vinyl Chloride | | Chloromethane | |
| ***Sample ID*** | IW-80 | UJ | ITMW-19 | UJ | ITMW-19 | UJ | MW-30 | UJ | DUP-102711 | R | DUP-102711 | R |
| | IW-73 | UJ | ITMW-18 | UJ | ITMW-18 | UJ | ITMW-7 | UJ | FB-102711 | R | FB-102711 | R |
| | MW-37 | UJ | ITMW-15 | UJ | ITMW-15 | UJ | IW-78 | UJ | ITMW-1 | R | ITMW-1 | R |
| | ITMW-11 | UJ | | | | | MW-40 | UJ | ITMW-13 | R | ITMW-13 | R |
| | ITMW-12 | UJ | | | | | MW-46 | UJ | ITMW-3 | R | ITMW-3 | R |
| | ITMW-13 | UJ | | | | | MW-24 | UJ | MW-22 | R | MW-22 | R |
| | DUP-102711 | UJ | | | | | MW-27 | UJ | DUP-102711 | R | DUP-102711 | R |
| | ITMW-3 | UJ | | | | | MW-25 | UJ | FB-102711 | R | FB-102711 | R |
| | ITMW-1 | UJ | | | | | ITMW-3 | UJ | IW-79 | R | | |
| | MW-22 | UJ | | | | | IW-75 | UJ | | | | |
| | MW-56 | UJ | | | | | MW-37 | UJ | | | | |
| | MW-41 | UJ | | | | | MW-37 | UJ | | | | |
| | IW-77 | UJ | | | | | ITMW-18 | UJ | | | | |
| | MW-35 | UJ | | | | | ITMW-2 | UJ | | | | |
| | MW-65 | UJ | | | | | ITMW-9 | UJ | | | | |
| | IW-78 | UJ | | | | | ITMW-6 | UJ | | | | |
| | ITMW-4 | UJ | | | | | ITMW-21 | UJ | | | | |
| | ITMW-9 | UJ | | | | | IW-72 | UJ | | | | |
| | ITMW-5 | UJ | | | | | IW-73 | UJ | | | | |
| | ITMW-6 | UJ | | | | | IW-77 | UJ | | | | |
| | DUP-102511 | UJ | | | | | DUP-01 | UJ | | | | |
| | ITMW-7 | UJ | | | | | IW-79 | UJ | | | | |
| | ITMW-21 | UJ | | | | | MW-22 | UJ | | | | |
| | MW-29 | UJ | | | | | ITMW-1 | UJ | | | | |
| | MW-38 | UJ | | | | | MW-26 | UJ | | | | |
| | MW-37 | UJ | | | | | ITMW-17 | UJ | | | | |
| | ITMW-11 | UJ | | | | | IW-73 | UJ | | | | |
| | | | | | | | IW-79 | UJ | | | | |
| | | | | | | | MW-71 | UJ | | | | |
| | | | | | | | MW-70 | UJ | | | | |

# Fall 2011

DATA TESTING INC.

3434 Country Club Avenue
P.O. Box 1507
Fort Smith, AR 72902
(479) 649-8378

ERM SOUTHWEST
15810 PARK TEN PLACE, SUITE 300
HOUSTON, TX 77084

Invoice number 36522
Date 12/02/2011

Project **ERM SOUTHWEST**

Analysis of Eleven (11) Water Samples received on October 26, 2011, for ERM Southwest, Houston, Texas (MW-41,56,57,55,62,61,60,50,63,65 & IW-78)

| | Units | Rate | Billed Amount |
|---|---|---|---|
| Nitrate Nitrogens | 11.00 | 20.00 | 220.00 |
| Chloride Tests | 11.00 | 10.00 | 110.00 |
| Potassium Tests | 11.00 | 23.00 | 253.00 |
| Sulfate Tests | 11.00 | 20.00 | 220.00 |
| ferrous iron | 11.00 | 50.00 | 550.00 |
| | | Invoice total | **1,353.00** |

DATA TESTING INC

November 29, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-57

Date Sample Collected: October 25, 2011
Time Sample Collected: 11:15am
Sample Collected By: ERM Southwest

Date Sample Received: October 26, 2011
Time Sample Received: 12:03pm
Sample Received By: C Peterson

Sample #: 20117319

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/8/2011 | 2:00pm | AIP | 3.1 | 0.2 | 97.2 | 1.81 |
| Chloride | 4500-CL | 10/28/2011 | 2:42pm | CAP | 190 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/27/2011 | 3:30pm | CAP | 0.525 | 0.3 | 97.2 | 3.7 |
| Potassium * | EPA 3010A 6010C | 11/3/2011 | 2:00pm | AIP | <1 | 1 | 104.0 | 1.51 |
| Ferrous Iron * | SM 3500-Fe B | 11/8/2011 | 3:30pm | AIP | <0.007 | 0.007 | 98.9 | 3.09 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC

November 29, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-56

Date Sample Collected: October 25, 2011
Time Sample Collected: 10:55am
Sample Collected By: ERM Southwest

Date Sample Received: October 26, 2011
Time Sample Received: 12:03pm
Sample Received By: C Peterson

Sample #: 20117318

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/8/2011 | 1:34pm | AIP | 7.8 | 0.2 | 92.2 | 1.81 |
| Chloride | 4500-CL | 10/28/2011 | 2:44pm | CAP | 220 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/27/2011 | 4:00pm | CAP | 0.527 | 0.3 | 97.2 | 3.7 |
| Potassium * | EPA 3010A 6010C | 11/3/2011 | 6:17pm | AIP | <1 | 1 | 104.0 | 1.51 |
| Ferrous Iron * | SM 3500-Fe B | 11/8/2011 | 3:30pm | AIP | <0.007 | 0.007 | 98.9 | 3.09 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC.

November 29, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-63

Date Sample Collected: October 25, 2011
Time Sample Collected: 10:35am
Sample Collected By: ERM Southwest

Date Sample Received: October 26, 2011
Time Sample Received: 12:03pm
Sample Received By: C Peterson

Sample #: 2017317

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/7/2011 | 11:51pm | AIP | 6.2 | 0.2 | 97.2 | 1.81 |
| Chloride | 4500-CL | 10/28/2011 | 2:46pm | CAP | 200 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/27/2011 | 4:00pm | CAP | 0.553 | 0.3 | 9.2 | 3.7 |
| Potassium * | EPA 3010A 6010C | 11/3/2011 | 6:15pm | AIP | <1 | 1 | 104.0 | 1.51 |
| Ferrous Iron * | SM 3500-Fe B | 11/8/2011 | 3:30pm | AIP | <0.007 | 0.007 | 98.9 | 3.09 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

November 29, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-50

Date Sample Collected: October 25, 2011
Time Sample Collected: 10:15am
Sample Collected By: ERM Southwest

Date Sample Received: October 26, 2011
Time Sample Received: 12:03pm
Sample Received By: C Peterson

Sample #: 20117316

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/7/2011 | 11:25pm | AIP | 1.9 | 0.2 | 97.2 | 1.81 |
| Chloride | 4500-CL | 10/28/2011 | 2:48pm | CAP | 250 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/27/2011 | 4:00pm | CAP | 0.246 | 0.3 | 97.2 | 3.7 |
| Potassium * | EPA 3010A 6010C | 11/3/2011 | 6:13pm | AIP | <1 | 1 | 104.0 | 1.51 |
| Ferrous Iron * | SM 3500-Fe B | 11/8/2011 | 3:30pm | AIP | <0.007 | 0.007 | 98.9 | 3.09 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

November 29, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-60

Date Sample Collected: October 25, 2011
Time Sample Collected: 9:55am
Sample Collected By: ERM Southwest

Date Sample Received: October 26, 2011
Time Sample Received: 12:03pm
Sample Received By: C Peterson

Sample #: 20117315

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/7/2011 | 10:59pm | AIP | 24 | 0.2 | 97.2 | 1.81 |
| Chloride | 4500-CL | 10/28/2011 | 2:50pm | CAP | 100 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/27/2011 | 4:00pm | CAP | 0.244 | 0.3 | 97.2 | 3.7 |
| Potassium * | EPA 3010A 6010C | 11/3/2011 | 6:11pm | AIP | <1 | 1 | 104.0 | 1.51 |
| Ferrous Iron * | SM 3500-Fe B | 11/8/2011 | 3:30pm | AIP | <0.007 | 0.007 | 98.9 | 3.09 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC

November 29, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-61

Date Sample Collected: October 25, 2011
Time Sample Collected: 9:30am
Sample Collected By: ERM Southwest

Date Sample Received: October 26, 2011
Time Sample Received: 12:03pm
Sample Received By: C Peterson

Sample #: 20117314

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/7/2011 | 10:34pm | AIP | 1.3 | 0.2 | 97.2 | 1.81 |
| Chloride | 4500-CL | 10/28/2011 | 2:52pm | CAP | 65 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/27/2011 | 4:30pm | CAP | 0.733 | 0.3 | 97.2 | 3.7 |
| Potassium * | EPA 3010A 6010C | 11/3/2011 | 6:09pm | AIP | 1.3 | 1 | 104.0 | 1.51 |
| Ferrous Iron * | SM 3500-Fe B | 11/8/2011 | 3:30pm | AIP | <0.007 | 0.007 | 98.9 | 3.09 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

November 29, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: IW-78

Date Sample Collected: October 25, 2011
Time Sample Collected: 5:06pm
Sample Collected By: ERM Southwest

Date Sample Received: October 26, 2011
Time Sample Received: 12:03pm
Sample Received By: C Peterson

Sample #: 20117313

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/7/2011 | 10:08pm | AIP | 6.9 | 0.2 | 97.2 | 1.81 |
| Chloride | 4500-CL | 10/28/2011 | 2:54pm | CAP | 400 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/27/2011 | 4:30pm | CAP | 0.906 | 0.3 | 97.2 | 3.7 |
| Potassium * | EPA 3010A 6010C | 11/3/2011 | 6:07pm | AIP | 3.4 | 1 | 104.0 | 1.51 |
| Ferrous Iron * | SM 3500-Fe B | 11/8/2011 | 3:30pm | AIP | <0.007 | 0.007 | 98.9 | 3.09 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

November 29, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-65

Date Sample Collected: October 25, 2011
Time Sample Collected: 4:30pm
Sample Collected By: ERM Southwest

Date Sample Received: October 26, 2011
Time Sample Received: 12:03pm
Sample Received By: C Peterson

Sample #: 20117312

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/7/2011 | 9:42pm | AIP | 3.7 | 0.2 | 97.2 | 1.81 |
| Chloride | 4500-CL | 10/28/2011 | 2:56pm | CAP | 400 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/27/2011 | 4:30pm | CAP | 0.778 | 0.3 | 97.0 | 3.7 |
| Potassium * | EPA 3010A 6010C | 11/3/2011 | 6:06pm | AIP | <1 | 1 | 104.0 | 1.51 |
| Ferrous Iron * | SM 3500-Fe B | 11/8/2011 | 3:30pm | AIP | <0.007 | 0.007 | 98.9 | 3.09 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

November 29, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-55

Date Sample Collected: October 25, 2011
Time Sample Collected: 11:30am
Sample Collected By: ERM Southwest

Date Sample Received: October 26, 2011
Time Sample Received: 12:03pm
Sample Received By: C Peterson

Sample #: 20117311

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/7/2011 | 9:16pm | AIP | 0.83 | 0.2 | 97.2 | 1.81 |
| Chloride | 4500-CL | 10/28/2011 | 2:58pm | CAP | 350 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/27/2011 | 5:15pm | CAP | 0.339 | 0.3 | 97.7 | 3.7 |
| Potassium * | EPA 3010A 6010C | 11/3/2011 | 6:04pm | AIP | 1.2 | 1 | 104.0 | 1.51 |
| Ferrous Iron * | SM 3500-Fe B | 11/8/2011 | 3:30pm | AIP | <0.007 | 0.007 | 98.9 | 3.09 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

November 29, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-62

Date Sample Collected: October 25, 2011
Time Sample Collected: 11:00am
Sample Collected By: ERM Southwest

Date Sample Received: October 26, 2011
Time Sample Received: 12:03pm
Sample Received By: C Peterson

Sample #: 20117310

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/7/2011 | 8:50pm | AIP | 3.7 | 0.2 | 97.2 | 1.81 |
| Chloride | 4500-CL | 10/28/2011 | 3:00pm | CAP | 200 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/27/2011 | 5:15pm | CAP | 0.894 | 0.3 | 97.2 | 3.7 |
| Potassium * | EPA 3010A 6010C | 11/3/2011 | 6:02pm | AIP | <1 | 1 | 104.0 | 1.51 |
| Ferrous Iron * | SM 3500-Fe B | 11/8/2011 | 3:30pm | AIP | <0.007 | 0.007 | 98.9 | 3.09 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC.

November 29, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-41

| | | | |
|---|---|---|---|
| Date Sample Collected: | October 25, 2011 | Date Sample Received: | October 26, 2011 |
| Time Sample Collected: | 2:35pm | Time Sample Received: | 12:03pm |
| Sample Collected By: | ERM Southwest | Sample Received By: | C Peterson |
| Sample #: | 20117320 | Received Temperature: | |

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/8/2011 | 3:29pm | AIP | 3.5 | 0.2 | 97.2 | 1.81 |
| Chloride | 4500-CL | 10/28/2011 | 2:40pm | CAP | 200 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/27/2011 | 3:30pm | CAP | 1.115 | 0.3 | 97.2 | 3.7 |
| Potassium * | EPA 3010A 6010C | 11/3/2011 | 2:04pm | AIP | 5.8 | 1 | 104.0 | 1.51 |
| Ferrous Iron * | SM 3500-Fe B | 11/8/2011 | 3:30pm | AIP | <0.007 | 0.007 | 98.9 | 3.09 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC.

November 28, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-14

Date Sample Collected: October 27, 2011
Time Sample Collected: 10:10am
Sample Collected By: ERM Southwest

Date Sample Received: October 28, 2011
Time Sample Received: 11:47am
Sample Received By: C Peterson

Sample #: 20117411

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/14/2011 | 4:33pm | AIP | 7.5 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 12:48pm | CAP | 20 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 4:30pm | CAP | 0.57 | 0.3 | 93.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 1:30pm | AIP | <1 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC.

November 28, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-13

Date Sample Collected: October 27, 2011
Time Sample Collected: 10:50am
Sample Collected By: ERM Southwest

Date Sample Received: October 28, 2011
Time Sample Received: 11:47am
Sample Received By: C Peterson

Sample #: 20117412

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/12/2011 | 8:41am | AIP | 7.6 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 12:46pm | CAP | 30 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 4:30pm | CAP | 0.796 | 0.3 | 93.9 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 1:28pm | AIP | <1 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater". EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

November 28, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-3

Date Sample Collected: October 27, 2011
Time Sample Collected: 10:25am
Sample Collected By: ERM Southwest

Date Sample Received: October 28, 2011
Time Sample Received: 11:47am
Sample Received By: C Peterson

Sample #: 20117413

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/12/2011 | 8:15am | AIP | 25 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 12:44pm | CAP | 20 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 4:30pm | CAP | 1.307 | 0.3 | 93.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 1:26pm | AIP | <1 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

November 28, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-1

Date Sample Collected: October 27, 2011
Time Sample Collected: 12:10pm
Sample Collected By: ERM Southwest

Date Sample Received: October 28, 2011
Time Sample Received: 11:47am
Sample Received By: C Peterson

Sample #: 20117414

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/11/2011 | 11:49apm | AIP | 22 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 12:42pm | CAP | 180 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 4:30pm | CAP | 0.540 | 0.3 | 93.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 1:20pm | AIP | 1.5 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC.

November 28, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-22

Date Sample Collected: October 27, 2011
Time Sample Collected: 12:50pm
Sample Collected By: ERM Southwest

Date Sample Received: October 28, 2011
Time Sample Received: 11:47am
Sample Received By: C Peterson

Sample #: 20117415

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/11/2011 | 11:23pm | AIP | 12 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 12:40pm | CAP | 72 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 4:30pm | CAP | 0.571 | 0.3 | 93.9 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 12:32pm | AIP | <1 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC.

3434 Country Club Avenue
P.O. Box 1507
Fort Smith, AR 72902
(479) 649-8378

ERM SOUTHWEST
15810 PARK TEN PLACE, SUITE 300
HOUSTON, TX 77084

Invoice number 36520
Date 12/02/2011

Project **ERM SOUTHWEST**

Analysis of Five (5) Water Samples received on October 28, 2011, for ERM Southwest, Houston, Texas (MW-23,24,27,28 & ITMW-16)

| | Units | Rate | Billed Amount |
|---|---|---|---|
| Nitrate Nitrogens | 5.00 | 20.00 | 100.00 |
| Chloride Tests | 5.00 | 10.00 | 50.00 |
| Potassium Tests | 5.00 | 23.00 | 115.00 |
| Sulfate Tests | 5.00 | 20.00 | 100.00 |
| ferrous iron | 5.00 | 50.00 | 250.00 |
| | | Invoice total | **615.00** |

DATA TESTING INC

November 28, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-24

Date Sample Collected: October 27, 2011
Time Sample Collected: 11:41am
Sample Collected By: ERM Southwest

Date Sample Received: October 28, 2011
Time Sample Received: 11:51am
Sample Received By: C Peterson

Sample #: 20117420

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/11/2011 | 9:40pm | AIP | 8.6 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 12:28pm | CAP | 380 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 3:00pm | CAP | 1.407 | 0.3 | 93.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 1:10pm | AIP | 3.7 | 1 | 104.0 | 6.90 |
| Ferrous Iron * | SM 3500-Fe B | 11/16/2011 | 9:00am | AIP | <0.007 | 0.007 | 99.9 | 4.19 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC.

November 28, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-23

Date Sample Collected: October 27, 2011
Time Sample Collected: 10:25am
Sample Collected By: ERM Southwest

Date Sample Received: October 28, 2011
Time Sample Received: 11:57am
Sample Received By: C Peterson

Sample #: 20117416

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/11/2011 | 10:57pm | AIP | 10 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 12:36pm | CAP | 380 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 4:00pm | CAP | 1.102 | 0.3 | 93.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 1:18pm | AIP | <1 | 1 | 104.0 | 6.90 |
| Ferrous Iron * | SM 3500-Fe B | 11/16/2011 | 9:00am | AIP | <0.007 | 0.007 | 99.9 | 4.19 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

November 28, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-16

Date Sample Collected: October 27, 2011
Time Sample Collected: 12:00pm
Sample Collected By: ERM Southwest

Date Sample Received: October 28, 2011
Time Sample Received: 11:47am
Sample Received By: C Peterson

Sample #: 20117417

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/11/2011 | 10:31pm | AIP | 12 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 12:34pm | CAP | 60 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 4:00pm | CAP | 1.915 | 0.3 | 93.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 1:16pm | AIP | 3.2 | 1 | 104.0 | 6.90 |
| Ferrous Iron * | SM 3500-Fe B | 11/16/2011 | 9:00am | AIP | <0.007 | 0.007 | 99.9 | 4.19 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC

November 28, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-28

Date Sample Collected: October 27, 2011
Time Sample Collected: 10:06am
Sample Collected By: ERM Southwest

Date Sample Received: October 28, 2011
Time Sample Received: 11:47am
Sample Received By: C Peterson

Sample #: 20117418

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/11/2011 | 10:06am | AIP | 40 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 12:32pm | CAP | 40 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 4:00pm | CAP | 0.886 | 0.3 | 93.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 1:14pm | AIP | <1 | 1 | 104.0 | 6.90 |
| Ferrous Iron * | SM 3500-Fe B | 11/16/2011 | 9:00am | AIP | <0.007 | 0.007 | 99.9 | 4.19 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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November 28, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-27

Date Sample Collected: October 27, 2011
Time Sample Collected: 10:56am
Sample Collected By: ERM Southwest

Date Sample Received: October 28, 2011
Time Sample Received: 11:51am
Sample Received By: C Peterson

Sample #: 20117419

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/11/2011 | 10:06pm | AIP | 7.7 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 12:30pm | CAP | 25 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 4:00pm | CAP | 1.510 | 0.3 | 93.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 1:14pm | AIP | <1 | 1 | 104.0 | 6.90 |
| Ferrous Iron * | SM 3500-Fe B | 11/16/2011 | 9:00am | AIP | <0.007 | 0.007 | 99.9 | 4.19 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-70

Date Sample Collected: October 26, 2011
Time Sample Collected: 11:50am
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117371

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/19/2011 | 3:00pm | AIP | 1.5 | 0.2 | 102.0 | 1.57 |
| Chloride | 4500-CL | 11/2/2011 | 11:56am | CAP | 340 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 2:00pm | CAP | 0.537 | 0.3 | 95.1 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 1:36pm | AIP | <1 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC.

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-68

Date Sample Collected: October 26, 2011
Time Sample Collected: 10:15am
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117369

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/14/2011 | 5:50pm | AIP | 1.6 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 11:59am | CAP | 340 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 2:00pm | CAP | 0.437 | 0.3 | 93.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 1:40pm | AIP | <1 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC.

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-71

Date Sample Collected: October 26, 2011
Time Sample Collected: 10:54am
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117370

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/14/2011 | 5:24pm | AIP | 6.4 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 11:57am | CAP | 345 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 2:00pm | CAP | 0.264 | 0.3 | 95.1 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 1:38pm | AIP | <1 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC.

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: RW-69

Date Sample Collected: October 26, 2011
Time Sample Collected: 1:11pm
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117372

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/14/2011 | 4:59pm | AIP | 4 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 11:54am | CAP | 340 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 2:00pm | CAP | 0.612 | 0.3 | 95.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 1:34pm | AIP | 1.0 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC.

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-36

Date Sample Collected: October 26, 2011
Time Sample Collected: 2:59pm
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117373

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/14/2011 | 4:33pm | AIP | 7.5 | 0.2 | 97.2 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 11:53am | CAP | 300 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 1:30pm | CAP | 1.38 | 0.3 | 95.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 1:32pm | AIP | <1 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-33

Date Sample Collected: October 26, 2011
Time Sample Collected: 3:56pm
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117374

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/14/2011 | 5:03pm | AIP | 5.4 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 11:51am | CAP | 180 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 1:30pm | CAP | 1.88 | 0.3 | 95.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 1:08pm | AIP | 5.4 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-32

Date Sample Collected: October 26, 2011
Time Sample Collected: 4:41pm
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117375

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/11/2011 | 9:24pm | AIP | 7.3 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 11:49am | CAP | 370 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 1:30pm | CAP | 2.06 | 0.3 | 95.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 1:06pm | AIP | <1 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC.

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-7

Date Sample Collected: October 25, 2011
Time Sample Collected: 4:20pm
Sample Collected By: ERM Southwest

Date Sample Received: October 26, 2011
Time Sample Received: 12:03pm
Sample Received By: C Peterson

Sample #: 20117328

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/5/2011 | 3:28am | AIP | 13 | 0.2 | 97.2 | 1.81 |
| Chloride | 4500-CL | 10/28/2011 | 3:43pm | CAP | 200 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/27/2011 | 2:30pm | CAP | 2.300 | 0.3 | 97.2 | 3.7 |
| Potassium * | EPA 3010A 6010C | 11/3/2011 | 5:49pm | AIP | <1 | 1 | 104.0 | 1.51 |
| Ferrous Iron * | SM 3500-Fe B | 11/8/2011 | 3:30pm | AIP | <0.007 | 0.007 | 98.9 | 3.09 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC.

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-6

Date Sample Collected: October 25, 2011
Time Sample Collected: 3:35pm
Sample Collected By: ERM Southwest

Date Sample Received: October 26, 2011
Time Sample Received: 12:03pm
Sample Received By: C Peterson

Sample #: 20117327

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/7/2011 | 8:24pm | AIP | 110 | 0.2 | 97.2 | 1.81 |
| Chloride | 4500-CL | 10/28/2011 | 3:45pm | CAP | 130 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/27/2011 | 2:30pm | CAP | 17.29 | 0.3 | 97.2 | 3.7 |
| Potassium * | EPA 3010A 6010C | 11/3/2011 | 5:47pm | AIP | <1 | 1 | 104.0 | 1.51 |
| Ferrous Iron * | SM 3500-Fe B | 11/8/2011 | 3:30pm | AIP | <0.007 | 0.007 | 98.9 | 3.09 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-5

Date Sample Collected: October 25, 2011
Time Sample Collected: 2:55pm
Sample Collected By: ERM Southwest

Date Sample Received: October 26, 2011
Time Sample Received: 12:03pm
Sample Received By: C Peterson

Sample #: 20117326

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/5/2011 | 2:35am | AIP | 25 | 0.2 | 97.2 | 1.81 |
| Chloride | 4500-CL | 10/28/2011 | 3:47pm | CAP | 144 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/27/2011 | 3:00pm | CAP | 8.16 | 0.3 | 97.2 | 3.7 |
| Potassium * | EPA 3010A 6010C | 11/3/2011 | 5:45pm | AIP | <1 | 1 | 104.0 | 1.51 |
| Ferrous Iron * | SM 3500-Fe B | 11/8/2011 | 3:30pm | AIP | <0.007 | 0.007 | 98.9 | 3.09 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-10

Date Sample Collected: October 25, 2011
Time Sample Collected: 2:00pm
Sample Collected By: ERM Southwest

Date Sample Received: October 26, 2011
Time Sample Received: 12:03pm
Sample Received By: C Peterson

Sample #: 20117325

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/5/2011 | 2:10am | AIP | 40 | 0.2 | 97.2 | 1.81 |
| Chloride | 4500-CL | 10/28/2011 | 3:49pm | CAP | 130 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/27/2011 | 3:00pm | CAP | 8.82 | 0.3 | 9.2 | 3.7 |
| Potassium * | EPA 3010A 6010C | 11/3/2011 | 5:43pm | AIP | <1 | 1 | 104.0 | 1.51 |
| Ferrous Iron * | SM 3500-Fe B | 11/8/2011 | 3:30pm | AIP | <0.007 | 0.007 | 98.9 | 3.09 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-9

Date Sample Collected: October 25, 2011
Time Sample Collected: 1:25pm
Sample Collected By: ERM Southwest

Date Sample Received: October 26, 2011
Time Sample Received: 12:03pm
Sample Received By: C Peterson

Sample #: 20117324

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/7/2011 | 7:59pm | AIP | 59 | 2 | 97.2 | 1.81 |
| Chloride | 4500-CL | 10/28/2011 | 3:51pm | CAP | 70 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/27/2011 | 3:00pm | CAP | 16.53 | 0.3 | 97.2 | 3.7 |
| Potassium * | EPA 3010A 6010C | 11/3/2011 | 5:41pm | AIP | <1 | 1 | 104.0 | 1.51 |
| Ferrous Iron * | SM 3500-Fe B | 11/8/2011 | 3:30pm | AIP | <0.007 | 0.007 | 98.9 | 3.09 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-4

Date Sample Collected: October 25, 2011
Time Sample Collected: 12:30pm
Sample Collected By: ERM Southwest

Date Sample Received: October 26, 2011
Time Sample Received: 12:03pm
Sample Received By: C Peterson

Sample #: 20117323

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/5/2011 | 1:19am | AIP | 2.1 | 0.2 | 97.2 | 1.81 |
| Chloride | 4500-CL | 10/28/2011 | 3:53pm | CAP | 100 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/27/2011 | 3:00pm | CAP | 6.73 | 0.3 | 97.2 | 3.7 |
| Potassium * | EPA 3010A 6010C | 11/3/2011 | 5:39pm | AIP | <1 | 1 | 104.0 | 1.51 |
| Ferrous Iron * | SM 3500-Fe B | 11/8/2011 | 3:30pm | AIP | <0.007 | 0.007 | 98.9 | 3.09 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-35R

Date Sample Collected: October 25, 2011
Time Sample Collected: 4:30pm
Sample Collected By: ERM Southwest

Date Sample Received: October 26, 2011
Time Sample Received: 12:03pm
Sample Received By: C Peterson

Sample #: 20117322

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/5/2011 | 8:53am | AIP | 6.4 | 0.2 | 97.2 | 1.81 |
| Chloride | 4500-CL | 10/28/2011 | 3:56pm | CAP | 380 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/27/2011 | 3:00pm | CAP | 3.91 | 0.3 | 97.2 | 3.7 |
| Potassium * | EPA 3010A 6010C | 11/3/2011 | 5:37pm | AIP | 1.1 | 1 | 104.0 | 1.51 |
| Ferrous Iron * | SM 3500-Fe B | 11/8/2011 | 3:30pm | AIP | <0.007 | 0.007 | 98.9 | 3.09 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: IW-77

Date Sample Collected: October 25, 2011
Time Sample Collected: 3:25pm
Sample Collected By: ERM Southwest

Date Sample Received: October 26, 2011
Time Sample Received: 12:03pm
Sample Received By: C Peterson

Sample #: 20117321

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/5/2011 | 8:27am | AIP | 2.8 | 0.2 | 97.2 | 1.81 |
| Chloride | 4500-CL | 10/28/2011 | 3:57pm | CAP | 300 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/27/2011 | 3:30pm | CAP | 5.30 | 0.3 | 97.2 | 3.7 |
| Potassium * | EPA 3010A 6010C | 11/3/2011 | 5:31pm | AIP | 2.6 | 1 | 104.0 | 1.51 |
| Ferrous Iron * | SM 3500-Fe B | 11/8/2011 | 3:30pm | AIP | <0.007 | 0.007 | 98.9 | 3.09 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: IW-74

Date Sample Collected: October 25, 2011
Time Sample Collected: 12:50pm
Sample Collected By: ERM Southwest

Date Sample Received: October 26, 2011
Time Sample Received: 12:03pm
Sample Received By: C Peterson

Sample #: 20117331

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/7/2011 | 11:33am | AIP | 7.7 | 0.2 | 97.2 | 1.81 |
| Chloride | 4500-CL | 10/28/2011 | 3:02pm | CAP | 400 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/27/2011 | 5:15pm | CAP | 1.123 | 0.3 | 97.7 | 3.7 |
| Potassium * | EPA 3010A 6010C | 11/3/2011 | 5:56pm | AIP | 5 | 1 | 104.0 | 1.51 |
| Ferrous Iron * | SM 3500-Fe B | 11/8/2011 | 3:30pm | AIP | <0.007 | 0.007 | 96.9 | 3.09 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-29

Date Sample Collected: October 25, 2011
Time Sample Collected: 5:35pm
Sample Collected By: ERM Southwest

Date Sample Received: October 26, 2011
Time Sample Received: 12:03pm
Sample Received By: C Peterson

Sample #: 20117330

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/7/2011 | 10:41am | AIP | 26 | 0.2 | 97.2 | 1.81 |
| Chloride | 4500-CL | 10/28/2011 | 3:40pm | CAP | 100 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/27/2011 | 2:30pm | CAP | 2.401 | 0.3 | 97.2 | 3.7 |
| Potassium * | EPA 3010A 6010C | 11/3/2011 | 5:54pm | AIP | <1 | 1 | 104.0 | 1.51 |
| Ferrous Iron * | SM 3500-Fe B | 11/8/2011 | 3:30pm | AIP | <0.007 | 0.007 | 96.9 | 3.09 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-21

Date Sample Collected: October 25, 2011
Time Sample Collected: 4:55pm
Sample Collected By: ERM Southwest

Date Sample Received: October 26, 2011
Time Sample Received: 12:03pm
Sample Received By: C Peterson

Sample #: 20117329

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/7/2011 | 10:16am | AIP | 6.9 | 0.2 | 97.2 | 1.81 |
| Chloride | 4500-CL | 10/28/2011 | 3:42pm | CAP | 580 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/27/2011 | 2:30pm | CAP | 0.749 | 0.3 | 97.2 | 3.7 |
| Potassium * | EPA 3010A 6010C | 11/3/2011 | 5:52pm | AIP | <1 | 1 | 104.0 | 1.51 |
| Ferrous Iron * | SM 3500-Fe B | 11/8/2011 | 3:30pm | AIP | <0.007 | 0.007 | 98.9 | 3.09 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

November 28, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-30

Date Sample Collected: October 26, 2011
Time Sample Collected: 9:55am
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117362

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/14/2011 | 11:49am | AIP | 8.6 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 12:12pm | CAP | 290 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 3:00pm | CAP | 1.943 | 0.3 | 93.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 1:58pm | AIP | <1 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater". EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC

November 28, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-20

Date Sample Collected: October 26, 2011
Time Sample Collected: 10:35am
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117363

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/14/2011 | 11:52pm | AIP | 43 | 2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 12:11pm | CAP | 100 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 3:00pm | CAP | 1.423 | 0.3 | 93.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 1:56pm | AIP | <1 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC.

November 28, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-26

Date Sample Collected: October 26, 2011
Time Sample Collected: 11:20am
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117364

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/14/2011 | 11:23am | AIP | 13 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 12:09pm | CAP | 195 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 2:30pm | CAP | 2.092 | 0.3 | 93.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 1:54pm | AIP | <1 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

November 28, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-25

Date Sample Collected: October 26, 2011
Time Sample Collected: 12:10pm
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117365

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/14/2011 | 10:57am | AIP | 5.6 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 12:07pm | CAP | 600 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 2:30pm | CAP | 0.474 | 0.3 | 93.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 1:52pm | AIP | <1 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

November 28, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-19

Date Sample Collected: October 26, 2011
Time Sample Collected: 1:25pm
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117367

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/14/2011 | 6:42pm | AIP | 12 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 12:03pm | CAP | 275 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 2:30pm | CAP | 2.159 | 0.3 | 93.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 1:44pm | AIP | <1 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC

November 28, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-18

Date Sample Collected: October 26, 2011
Time Sample Collected: 2:00pm
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117368

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/14/2011 | 6:16pm | AIP | 7.2 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 12:01pm | CAP | 115 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 2:30pm | CAP | 2.586 | 0.3 | 93.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 6:42pm | AIP | <1 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

November 28, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-17

Date Sample Collected: October 26, 2011
Time Sample Collected: 12:40pm
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117366

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/14/2011 | 10:31am | AIP | 11 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 12:05pm | CAP | 350 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 2:30pm | CAP | 1.128 | 0.3 | 93.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 1:50pm | AIP | 1.1 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater". EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-2

Date Sample Collected: October 26, 2011
Time Sample Collected: 5:20pm
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117388

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/10/2011 | 10:48pm | AIP | 18 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 11:20am | CAP | 18 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 12:00pm | CAP | 1.091 | 0.3 | 95.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 12:22pm | AIP | <1 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-11

Date Sample Collected: October 26, 2011
Time Sample Collected: 4:15pm
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117386

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/10/2011 | 11:14pm | AIP | 18 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 11:23am | CAP | 40 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 12:00pm | CAP | 0.269 | 0.3 | 95.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 11:40pm | AIP | <1 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-12

Date Sample Collected: October 26, 2011
Time Sample Collected: 4:50pm
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117387

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/10/2011 | 11:14pm | AIP | 17 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 11:21am | CAP | 32 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 12:00pm | CAP | 0.510 | 0.3 | 95.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 12:38pm | AIP | <1 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC.

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-37

| | | | |
|---|---|---|---|
| Date Sample Collected: | October 26, 2011 | Date Sample Received: | October 27, 2011 |
| Time Sample Collected: | 3:45pm | Time Sample Received: | 11:00am |
| Sample Collected By: | ERM Southwest | Sample Received By: | C Peterson |
| Sample #: | 20117385 | Received Temperature: | |

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/11/2011 | 8:06am | AIP | 18 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 11:24am | CAP | 30 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 12:00pm | CAP | 0.117 | 0.3 | 95.1 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 12:42pm | AIP | 2 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-38

Date Sample Collected: October 26, 2011
Time Sample Collected: 3:10pm
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117384

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/11/2011 | 1:49pm | AIP | 12 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 11:25am | CAP | 40 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 12:00pm | CAP | 0.119 | 0.3 | 93.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 12:44pm | AIP | 37 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC.

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-15

Date Sample Collected: October 26, 2011
Time Sample Collected: 2:35pm
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117383

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/11/2011 | 2:15am | AIP | 2.6 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 11:26am | CAP | 40 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 12:30pm | CAP | 0.113 | 0.3 | 95.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 12:46pm | AIP | 1.4 | 1 | 104.0 | 6.90 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-66

Date Sample Collected: October 26, 2011
Time Sample Collected: 9:55am
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117376

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/11/2011 | 8:58pm | AIP | 10 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 11:47am | CAP | 330 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 1:30pm | CAP | 4.3 | 0.3 | 93.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 1:04pm | AIP | <1 | 1 | 104.0 | 6.90 |
| Ferrous Iron * | SM 3500-Fe B | 11/16/2011 | 9:00am | AIP | <0.007 | 0.007 | 95.8 | 4.19 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-67

Date Sample Collected: October 26, 2011
Time Sample Collected: 11:15am
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117377

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/11/2011 | 7:15pm | AIP | 20 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 11:45pm | CAP | 60 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 1:00pm | CAP | 6.83 | 0.3 | 95.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 1:02pm | AIP | 2.3 | 1 | 104.0 | 6.90 |
| Ferrous Iron * | SM 3500-Fe B | 11/16/2011 | 9:00am | AIP | <0.007 | 0.007 | 95.8 | 4.19 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC.

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-46

Date Sample Collected: October 26, 2011
Time Sample Collected: 12:00pm
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117378

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/11/2011 | 6:49pm | AIP | 0.65 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 11:43am | CAP | 290 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 1:00pm | CAP | 18.53 | 0.3 | 95.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 12:56pm | AIP | <1 | 1 | 104.0 | 6.90 |
| Ferrous Iron * | SM 3500-Fe B | 11/16/2011 | 9:00am | AIP | <0.007 | 0.007 | 98.5 | 4.19 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-40

Date Sample Collected: October 26, 2011
Time Sample Collected: 1:05pm
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117379

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/11/2011 | 6:23pm | AIP | 3.7 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 11:41am | CAP | 260 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 1:00pm | CAP | 15.38 | 0.3 | 95.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 12:54pm | AIP | <1 | 1 | 104.0 | 6.90 |
| Ferrous Iron * | SM 3500-Fe B | 11/16/2011 | 9:00am | AIP | <0.007 | 0.007 | 98.5 | 4.19 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-39

Date Sample Collected: October 26, 2011
Time Sample Collected: 2:05pm
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117380

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/11/2011 | 5:57pm | AIP | 1.7 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 11:40am | CAP | 350 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 12:30pm | CAP | 3.07 | 0.3 | 95.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 12:52pm | AIP | <1 | 1 | 104.0 | 6.90 |
| Ferrous Iron * | SM 3500-Fe B | 11/16/2011 | 9:00am | AIP | <0.007 | 0.007 | 95.8 | 4.19 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC.

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-34

Date Sample Collected: October 26, 2011
Time Sample Collected: 3:25pm
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117381

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/11/2011 | 3:06am | AIP | 4.8 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 11:29am | CAP | 300 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 12:30pm | CAP | 6.79 | 0.3 | 95.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 12:50pm | AIP | <1 | 1 | 104.0 | 6.90 |
| Ferrous Iron * | SM 3500-Fe B | 11/16/2011 | 9:00am | AIP | <0.007 | 0.007 | 95.8 | 4.19 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC

November 30, 2011

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-31

Date Sample Collected: October 26, 2011
Time Sample Collected: 4:55pm
Sample Collected By: ERM Southwest

Date Sample Received: October 27, 2011
Time Sample Received: 11:00am
Sample Received By: C Peterson

Sample #: 20117382

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 11/11/2011 | 2:40am | AIP | 37 | 0.2 | 97.5 | 0.328 |
| Chloride | 4500-CL | 11/2/2011 | 11:27am | CAP | 140 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 10/31/2011 | 12:30pm | CAP | 0.450 | 0.3 | 95.0 | 2.8 |
| Potassium * | EPA 3010A 6010C | 11/11/2011 | 12:48pm | AIP | <1 | 1 | 104.0 | 6.90 |
| Ferrous Iron * | SM 3500-Fe B | 11/16/2011 | 9:00am | AIP | <0.007 | 0.007 | 95.8 | 4.19 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

**Spring 2012**

**DATA TESTING** INC.

3434 Country Club Avenue
P.O. Box 1507
Fort Smith, AR 72902
(479) 649-8378

ERM SOUTHWEST
15810 PARK TEN PLACE, SUITE 300
HOUSTON, TX 77084

Invoice number 37569
Date 05/22/2012

Project **ERM SOUTHWEST**

Analysis of Six (6) Water Samples received on April 20, 2012, for ERM Southwest, Houston, Texas (MW-28, TMW-9, ITMW-18, ITMW-14, ITMW-13, ITMW-17)

| | Units | Rate | Billed Amount |
|---|---|---|---|
| Nitrate Nitrogens | 6.00 | 20.00 | 120.00 |
| Chloride Tests | 6.00 | 15.00 | 90.00 |
| Potassium Tests | 6.00 | 23.00 | 138.00 |
| Sulfate Tests | 6.00 | 20.00 | 120.00 |
| | | Invoice total | **468.00** |

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-17

Date Sample Collected: April 19, 2012
Time Sample Collected: 10:40am
Sample Collected By: ERM Southwest

Date Sample Received: April 20, 2012
Time Sample Received: 1:43pm
Sample Received By: C Peterson

Sample #: 20121989

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 5/1/2012 | 7:55am | AIP | 4 | 0.2 | 94.9 | 2.80 |
| Chloride | 4500-CL | 4/25/2012 | 2:16pm | CAP | 237 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 4/20/2012 | 3:40pm | CAP | 0.662 | 0.3 | | 11.4 |
| Potassium * | EPA 3010A 6010C | 5/2/2012 | 8:46pm | AIP | <1 | 1 | 96.8 | 2.88 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-13

Date Sample Collected: April 19, 2012
Time Sample Collected: 9:50am
Sample Collected By: ERM Southwest

Date Sample Received: April 19, 2012
Time Sample Received: 11:35am
Sample Received By: C Peterson

Sample #: 20121988

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 5/1/2012 | 10:12am | AIP | 8.1 | 0.2 | 94.9 | 2.80 |
| Chloride | 4500-CL | 4/25/2012 | 2:17pm | CAP | 34 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 4/20/2012 | 3:30pm | CAP | 4.69 | 0.3 | | 11.4 |
| Potassium * | EPA 3010A 6010C | 5/2/2012 | 9:05pm | AIP | <1 | 1 | 96.8 | 2.88 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-14

Date Sample Collected: April 19, 2012
Time Sample Collected: 9:15am
Sample Collected By: ERM Southwest

Date Sample Received: April 19, 2012
Time Sample Received: 11:35am
Sample Received By: C Peterson

Sample #: 20121987

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 5/1/2012 | 1:03pm | AIP | 12 | 0.2 | 94.9 | 2.80 |
| Chloride | 4500-CL | 4/25/2012 | 2:18pm | CAP | 11 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 4/20/2012 | 3:25pm | CAP | 0.681 | 0.3 | | 11.4 |
| Potassium * | EPA 3010A 6010C | 5/2/2012 | 8:59pm | AIP | <1 | 1 | 96.8 | 2.88 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-18

Date Sample Collected: April 19, 2012
Time Sample Collected: 10:40am
Sample Collected By: ERM Southwest

Date Sample Received: April 20, 2012
Time Sample Received: 1:43pm
Sample Received By: C Peterson

Sample #: 20121986

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 5/1/2012 | 7:55pm | AIP | 6.8 | 0.2 | 94.9 | 2.80 |
| Chloride | 4500-CL | 4/25/2012 | 2:19pm | CAP | 120 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 4/20/2012 | 3:15pm | CAP | 3.35 | 0.3 | | 11.4 |
| Potassium * | EPA 3010A 6010C | 5/2/2012 | 8:57pm | AIP | <1 | 1 | 96.8 | 2.88 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

**3434 COUNTRY CLUB • FORT SMITH, AR 72903 • (479) 649-8378**

DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-19

Date Sample Collected: April 19, 2012
Time Sample Collected: 9:45am
Sample Collected By: ERM Southwest

Date Sample Received: April 20, 2012
Time Sample Received: 1:43pm
Sample Received By: C Peterson

Sample #: 20121985

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 5/1/2012 | 6:47pm | AIP | 6.3 | 0.2 | 94.9 | 2.80 |
| Chloride | 4500-CL | 4/25/2012 | 2:20pm | CAP | 300 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 4/20/2012 | 3:05pm | CAP | 2.004 | 0.3 | | 11.4 |
| Potassium * | EPA 3010A 6010C | 5/2/2012 | 9:08pm | AIP | 1.3 | 1 | 96.8 | 2.80 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-28

| | | | |
|---|---|---|---|
| Date Sample Collected: | April 19, 2012 | Date Sample Received: | April 20, 2012 |
| Time Sample Collected: | 8:45am | Time Sample Received: | 1:43pm |
| Sample Collected By: | ERM Southwest | Sample Received By: | C Peterson |
| Sample #: | 20121984 | Received Temperature: | |

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 5/1/2012 | 9:37pm | AIP | 39 | 0.2 | 94.9 | 2.80 |
| Chloride | 4500-CL | 4/25/2012 | 2:21pm | CAP | 35 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 4/20/2012 | 3:00pm | CAP | 0.790 | 0.3 | | 11.4 |
| Potassium * | EPA 3010A 6010C | 5/2/2012 | 9:02pm | AIP | <1 | 1 | 96.8 | 0.896 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
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**DATA TESTING INC.**

Data Testing, Inc.
3434 Country Club
P. O. Box 1507
Fort Smith, Arkansas 72902
79) 649-8378 Fax (479) 649-8486

Company Name: ERM

Phone #: 281-600-1000

Address: 15810 Park Ten Place, Suite 300
Houston, TX 77084

Fax #: 281-600-1001

Project Name or Number: Whirlpool

Purchase Order #: 0159348

Sampling Personnel Signature(s): [signature] Kaleigh Kimsey

Printed: Sara Tomashitis
Kaleigh Kimsey

| Sample I.D. | Date | Time | Comp. | Grab | Cont. Type: Plast. | Cont. Type: Glass | # of Containers | Method Preserved: H2SO4 | HNO3 | NAOH | HCL | Ice | None | Sample Matrix: Water | Soil | Air | Sludge | Other | Requested Analysis: Natural Attenuation | Metals | | | | | | | Laboratory Control Number | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-28 | 4/19/12 | 0845 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | | | | | | | |
| ITMW-9 | 4/19/12 | 0945 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | | | | | | | |
| ITMW-18 | 4/19/12 | 1040 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | | | | | | | |
| ITMW-14 | 4/19/12 | 0915 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | | | | | | | |
| ITMW-13 | 4/19/12 | 0950 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | | | | | | | |
| ITMW-17 | 4/19/12 | 1040 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | | | | | | | |

| Relinquished by: | Date: | Time: | Relinquished by: | Date: | Time: |
|---|---|---|---|---|---|
| [signature] Sara Tomashitis | 4/19/12 | 11:35 | | | |
| Received by: | Date: | Time: | Received by: | Date: | Time: |
| Relinquished by: | Date: | Time: | Received by Laboratory: [signature] | 4-19-12 | 1:43 |

Comments:



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DATA TESTING INC.

3434 Country Club Avenue
P.O. Box 1507
Fort Smith, AR 72902
(479) 649-8378

ERM SOUTHWEST
15810 PARK TEN PLACE, SUITE 300
HOUSTON, TX 77084

Invoice number 37575
Date 05/23/2012

Project **ERM SOUTHWEST**

Analysis of Seven (7) Water Samples received on April 19, 2012, for ERM Southwest, Houston, Texas (MW-37, ITMW-20, MW-30, ITMW-7, IW-78, MW-40, MW-46)

| | Units | Rate | Billed Amount |
|---|---|---|---|
| Nitrate Nitrogens | 7.00 | 20.00 | 140.00 |
| Chloride Tests | 7.00 | 15.00 | 105.00 |
| Potassium Tests | 7.00 | 23.00 | 161.00 |
| Sulfate Tests | 7.00 | 20.00 | 140.00 |
| | | Invoice total | **546.00** |

DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-46

Date Sample Collected: April 18, 2012
Time Sample Collected: 5:05pm
Sample Collected By: ERM Southwest

Date Sample Received: April 19, 2012
Time Sample Received: 11:35am
Sample Received By: C Peterson

Sample #: '20121962

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 5/3/2012 | 2:08pm | AIP | 0.68 | 0.2 | 101.0 | 0.760 |
| Chloride | 4500-CL | 4/25/2012 | 2:34pm | CAP | 240 | 3 | | 6.9 |
| Nitrogen, Nitrate | 4500-E | 4/19/2012 | 2:45pm | CAP | 2.23 | 0.3 | | 6.6 |
| Potassium * | EPA 3010A 6010C | 5/2/2012 | 9:16pm | AIP | <1 | 1 | 101.0 | 2.92 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-40

Date Sample Collected: April 18, 2012
Time Sample Collected: 4:10pm
Sample Collected By: ERM Southwest

Date Sample Received: April 19, 2012
Time Sample Received: 11:35am
Sample Received By: C Peterson

Sample #: 20121961

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 5/3/2012 | 1:42pm | AIP | 2.5 | 0.2 | 101.0 | 0.760 |
| Chloride | 4500-CL | 4/25/2012 | 2:36pm | CAP | 260 | 3 | | 6.9 |
| Nitrogen, Nitrate | 4500-E | 4/19/2012 | 3:00pm | CAP | 1.032 | 0.3 | | 6.6 |
| Potassium * | EPA 3010A 6010C | 5/2/2012 | 9:13pm | AIP | <1 | 1 | 101.0 | 2.92 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: IW-78

Date Sample Collected: April 18, 2012
Time Sample Collected: 3:05pm
Sample Collected By: ERM Southwest

Date Sample Received: April 19, 2012
Time Sample Received: 11:35am
Sample Received By: C Peterson

Sample #: 20121960

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 5/3/2012 | 1:16pm | AIP | 16 | 0.2 | 101.0 | 0.760 |
| Chloride | 4500-CL | 4/25/2012 | 2:37pm | CAP | 100 | 3 | | 6.9 |
| Nitrogen, Nitrate | 4500-E | 4/19/2012 | 2:05pm | CAP | 0.645 | 0.3 | | 6.6 |
| Potassium * | EPA 3010A 6010C | 5/2/2012 | 2:11am | AIP | 7.9 | 1 | 101.0 | 2.92 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-7

Date Sample Collected: April 18, 2012
Time Sample Collected: 12:15pm
Sample Collected By: ERM Southwest

Date Sample Received: April 19, 2012
Time Sample Received: 11:35am
Sample Received By: C Peterson

Sample #: 20121959

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 5/2/2012 | 4:17pm | AIP | 13 | 0.2 | 101.0 | 0.760 |
| Chloride | 4500-CL | 4/25/2012 | 2:38pm | CAP | 300 | 3 | | 6.9 |
| Nitrogen, Nitrate | 4500-E | 4/19/2012 | 2:30pm | CAP | 3.32 | 0.3 | | 6.6 |
| Potassium * | EPA 3010A 6010C | 5/2/2012 | 9:35am | AIP | <1 | 1 | 101.0 | 2.92 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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# DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-30

Date Sample Collected: April 18, 2012
Time Sample Collected: 11:15am
Sample Collected By: ERM Southwest

Date Sample Received: April 19, 2012
Time Sample Received: 11:35am
Sample Received By: C Peterson

Sample #: 20121958

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 5/3/2012 | 1:45am | AIP | 5.1 | 0.2 | 101.0 | 0.760 |
| Chloride | 4500-CL | 4/25/2012 | 2:39pm | CAP | 270 | 3 | | 6.9 |
| Nitrogen, Nitrate | 4500-E | 4/19/2012 | 1:50pm | CAP | 2.33 | 0.3 | | 6.6 |
| Potassium * | EPA 3010A 6010C | 5/3/2012 | 9:46pm | AIP | <1 | 1 | 101.0 | 2.92 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-37

Date Sample Collected: April 18, 2012
Time Sample Collected: 9:30am
Sample Collected By: ERM Southwest

Date Sample Received: April 19, 2012
Time Sample Received: 11:35am
Sample Received By: C Peterson

Sample #: 20121956

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 5/2/2012 | 6:00pm | AIP | 13 | 0.2 | 101.0 | 0.760 |
| Chloride | 4500-CL | 4/25/2012 | 3:00pm | CAP | 15 | 3 | | 6.9 |
| | | | Duplicate | | 14 | | | |
| Nitrogen, Nitrate | 4500-E | 4/19/2012 | 1:15pm | CAP | 2.28 | 0.3 | | 6.6 |
| Potassium * | EPA 3010A 6010C | 5/2/2012 | 9:37pm | AIP | 3.5 | 1 | 101.0 | 2.92 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC.

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITWM-20

Date Sample Collected: April 18, 2012
Time Sample Collected: 10:20am
Sample Collected By: ERM Southwest

Date Sample Received: April 19, 2012
Time Sample Received: 11:35am
Sample Received By: C Peterson

Sample #: 20121957

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 5/2/2012 | 2:59pm | AIP | 21 | 0.2 | 101.0 | 0.760 |
| Chloride | 4500-CL | 4/25/2012 | 2:41pm | CAP | 100 | 3 | | 6.9 |
| Nitrogen, Nitrate | 4500-E | 4/19/2012 | 1:20pm | CAP | 1.75 | 0.3 | | 6.6 |
| Potassium * | EPA 3010A 6010C | 5/2/2012 | 9:21pm | AIP | 1.1 | 1 | 101.0 | 2.92 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
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**DATA TESTING** INC.

Data Testing, Inc.
3434 Country Club
P. O. Box 1507
Fort Smith, Arkansas 72902
79) 649-8378 Fax (479) 649-8486

Company Name: ERM
Phone #: 281-600-1000
Address: 15810 Park Ten Place Suite 300, Houston, Tx 77084
Fax #:
Project Name or Number: Whirlpool
Purchase Order #: 0159348
Sampling Personnel Signature(s): Kaleigh Kimsey, Sara Tomashitis
Printed: Kaleigh Kimsey, Sara Tomashitis

| Sample I.D. | Date | Time | Comp. | Grab | Cont. Type: Plast. | Cont. Type: Glass | # of Containers | Method Preserved: H2SO4 | HNO3 | NAOH | HCL | Ice | None | Sample Matrix: Water | Soil | Air | Sludge | Other | Requested Analysis: Natural Attenuation | Metals | Laboratory Control Number | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-37 | 4/18/12 | 0930 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |
| ITMW-20 | | 1020 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |
| MW-30 | | 1115 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |
| ITMW-7 | | 1215 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |
| IW-78 | | 1505 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |
| MW-40 | | 1610 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |
| MW-46 | ↓ | 1705 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |

| | | | | | |
|---|---|---|---|---|---|
| Relinquished by: Kaleigh Kimsey | Date: 4/18/12 | Time: 19:33 | Relinquished by: | Date: | Time: |
| Received by: | Date: | Time: | Received by: | Date: | Time: |
| Relinquished by: | Date: | Time: | Received by Laboratory: Cindy Peterson | Date: 4-19-12 | Time: 11:50 |

Comments:

DATA TESTING INC.

3434 Country Club Avenue
P.O. Box 1507
Fort Smith, AR 72902
(479) 649-8378

ERM SOUTHWEST
15810 PARK TEN PLACE, SUITE 300
HOUSTON, TX 77084

Invoice number 37576
Date 05/23/2012

Project **ERM SOUTHWEST**

Analysis of Seven (7) Water Samples for ERM Southwest, Houston, Texas, received on April 18, 2012 (ITMW-3, ITMW-5, MW-25, IW-74, IW-80, ITMW-2, ITMW-9)

| | Units | Rate | Billed Amount |
|---|---|---|---|
| Nitrate Nitrogens | 7.00 | 20.00 | 140.00 |
| Chloride Tests | 7.00 | 15.00 | 105.00 |
| Potassium Tests | 7.00 | 23.00 | 161.00 |
| Sulfate Tests | 7.00 | 20.00 | 140.00 |
| | | Invoice total | **546.00** |

DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-3

Date Sample Collected: April 17, 2012
Time Sample Collected: 9:55am
Sample Collected By: ERM Southwest

Date Sample Received: April 18, 2012
Time Sample Received: 11:30am
Sample Received By: C Peterson

Sample #: 20121899

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 4/26/2012 | 10:08am | AIP | 24 | 0.2 | 96.8 | 0.896 |
| Chloride | 4500-CL | 4/25/2012 | 2:33pm | CAP | 20 | 3 | | 0.0 |
| | | Duplicate | | | 20 | | | |
| Nitrogen, Nitrate | 4500-E | 4/18/2012 | 2:00pm | CAP | 5.35 | 0.3 | | 0.0 |
| Potassium * | EPA 3010A 6010C | 5/1/2012 | 9:04pm | AIP | <1 | 1 | 94.9 | 2.80 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-5

Date Sample Collected: April 17, 2012
Time Sample Collected: 11:10am
Sample Collected By: ERM Southwest

Date Sample Received: April 18, 2012
Time Sample Received: 11:30am
Sample Received By: C Peterson

Sample #: 20121900

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 4/26/2012 | 10:34am | AIP | 28 | 0.2 | 96.8 | 0.896 |
| Chloride | 4500-CL | 4/25/2012 | 2:32pm | CAP | 120 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 4/18/2012 | 4:15pm | CAP | 8.24 | 0.3 | | 0.0 |
| Potassium * | EPA 3010A 6010C | 5/1/2012 | 9:07pm | AIP | <1 | 1 | 94.4 | 2.80 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-25

Date Sample Collected: April 17, 2012
Time Sample Collected: 12:20pm
Sample Collected By: ERM Southwest

Date Sample Received: April 18, 2012
Time Sample Received: 11:30am
Sample Received By: C Peterson

Sample #: 20121901

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 4/26/2012 | 7:59am | AIP | 2.3 | 0.2 | 96.8 | 0.896 |
| Chloride | 4500-CL | 4/25/2012 | 2:31pm | CAP | 400 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 4/18/2012 | 4:00pm | CAP | 4.92 | 0.3 | | 11.4 |
| Potassium * | EPA 3010A 6010C | 5/1/2012 | 7:0pm | AIP | <1 | 1 | 94.9 | 2.80 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: IW-80

| | | | |
|---|---|---|---|
| Date Sample Collected: | April 17, 2012 | Date Sample Received: | April 18, 2012 |
| Time Sample Collected: | 6:05pm | Time Sample Received: | 11:30am |
| Sample Collected By: | ERM Southwest | Sample Received By: | C Peterson |
| Sample #: | 20121903 | Received Temperature: | |

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 4/26/2012 | 4:32pm | AIP | 9.9 | 0.2 | 96.8 | 0.896 |
| Chloride | 4500-CL | 4/25/2012 | 2:29pm | CAP | 100 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 4/18/2012 | 2:50pm | CAP | 2.76 | 0.3 | | 11.4 |
| Potassium * | EPA 3010A 6010C | 5/1/2012 | 5:32am | AIP | 1.3 | 1 | 94.9 | 2.80 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITWM-2

Date Sample Collected: April 17, 2012
Time Sample Collected: 9:50am
Sample Collected By: ERM Southwest

Date Sample Received: April 18, 2012
Time Sample Received: 11:30am
Sample Received By: C Peterson

Sample #: 20121904

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 4/26/2012 | 7:59am | AIP | 18 | 0.2 | 96.8 | 0.896 |
| Chloride | 4500-CL | 4/25/2012 | 2:28pm | CAP | 140 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 4/18/2012 | 2:40pm | CAP | 4.63 | 0.3 | | 11.4 |
| Potassium * | EPA 3010A 6010C | 5/1/2012 | 8:58am | AIP | <1 | 1 | 94.9 | 2.80 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-9

Date Sample Collected: April 17, 2012
Time Sample Collected: 10:57am
Sample Collected By: ERM Southwest

Date Sample Received: April 18, 2012
Time Sample Received: 11:30am
Sample Received By: C Peterson

Sample #: 20121905

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 4/26/2012 | 7:33am | AIP | 32 | 0.2 | 96.8 | 0.896 |
| Chloride | 4500-CL | 4/25/2012 | 2:27pm | CAP | 100 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 4/18/2012 | 2:30pm | CAP | 12.33 | 0.3 | | 11.4 |
| Potassium * | EPA 3010A 6010C | 5/1/2012 | 8:55pm | AIP | <1 | 1 | 94.9 | 2.80 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: IW-74

Date Sample Collected: April 17, 2012
Time Sample Collected: 4:10pm
Sample Collected By: ERM Southwest

Date Sample Received: April 18, 2012
Time Sample Received: 11:30am
Sample Received By: C Peterson

Sample #: 20121902

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 4/26/2012 | 6:16pm | AIP | 3.8 | 0.2 | 96.8 | 0.896 |
| Chloride | 4500-CL | 4/25/2012 | 2:30pm | CAP | 166 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 4/18/2012 | 3:25pm | CAP | 0.618 | 0.3 | | 11.4 |
| Potassium * | EPA 3010A 6010C | 5/1/2012 | 5:32pm | AIP | 3.8 | 1 | 94.4 | 2.80 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

Data Testing, Inc.
3434 Country Club
P. O. Box 1507
Fort Smith, Arkansas 72902
79) 649-8378 Fax (479) 649-8486

**DATA TESTING** INC.

Company Name: Whirlpool c/o ERM
Phone #: 281-600-1000

Address: 15810 Park Ten Place, Suite 300
Houston, TX 77084
Fax #: 281-600-1001

Project Name or Number: Whirlpool Spring 2012 Sampling
Purchase Order #: 0159348

Sampling Personnel Signature(s): Kaleigh Kimsey
Printed: Sara Tomashitis
Kaleigh Kimsey

| Sample I.D. | Date | Time | Comp. | Grab | Cont. Type: Plast. | Cont. Type: Glass | # of Containers | Method Preserved: H2SO4 | HNO3 | NAOH | HCL | Ice | None | Sample Matrix: Water | Soil | Air | Sludge | Other | Requested Analysis: Natural Attenuation | Metals | Laboratory Control Number | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ITMW-3 | 4/17/12 | 0955 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |
| ITMW-5 | 4/17/12 | 1110 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |
| MW-25 | 4/17/12 | 1220 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |
| IW-74 | 4/17/12 | 1610 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |
| IW-80 | 4/17/12 | 1805 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |
| ITMW-2 | 4/17/12 | 0950 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |
| ITMW-9 | 4/17/12 | 1057 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |

| | | | | | |
|---|---|---|---|---|---|
| Relinquished by: Sara Tomashitis | Date: 4/17/12 | Time: 19:25 | Relinquished by: | Date: | Time: |
| Received by: | Date: | Time: | Received by: | Date: | Time: |
| Relinquished by: | Date: | Time: | Received by Laboratory: Cindy Peterson | Date: 4-12-12 | Time: 11:30 |

Comments:

DATA TESTING INC.

3434 Country Club Avenue
P.O. Box 1507
Fort Smith, AR 72902
(479) 649-8378

ERM SOUTHWEST
15810 PARK TEN PLACE, SUITE 300
HOUSTON, TX 77084

Invoice number 37577
Date 05/23/2012

Project **ERM SOUTHWEST**

Analysis of Five (5) Water Samples received on April 18, 2012, for ERM Southwest, Houston, Texas (ITMW-6, ITMW-21, IW-73, IW-77, IW-79)

| | Units | Rate | Billed Amount |
|---|---|---|---|
| Nitrate Nitrogens | 5.00 | 20.00 | 100.00 |
| Chloride Tests | 5.00 | 15.00 | 75.00 |
| Potassium Tests | 5.00 | 23.00 | 115.00 |
| Sulfate Tests | 5.00 | 20.00 | 100.00 |
| | | Invoice total | **390.00** |

DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-6

Date Sample Collected: April 17, 2012
Time Sample Collected: 11:50am
Sample Collected By: ERM Southwest

Date Sample Received: April 18, 2012
Time Sample Received: 11:30am
Sample Received By: C Peterson

Sample #: 20121906

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 4/26/2012 | 4:55pm | AIP | 97 | 0.2 | 96.8 | 0.896 |
| Chloride | 4500-CL | 4/25/2012 | 2:26pm | CAP | 150 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 4/18/2012 | 4:00pm | CAP | 11.21 | 0.3 | | 11.4 |
| Potassium * | EPA 3010A 6010C | 5/1/2012 | 5:29pm | AIP | <1 | 1 | 94.4 | 2.80 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: IW-77

Date Sample Collected: April 17, 2012
Time Sample Collected: 5:33pm
Sample Collected By: ERM Southwest

Date Sample Received: April 18, 2012
Time Sample Received: 11:30am
Sample Received By: C Peterson

Sample #: 20121909

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 4/26/2012 | 7:07am | AIP | 6.7 | 0.2 | 96.8 | 0.896 |
| Chloride | 4500-CL | 4/25/2012 | 2:23pm | CAP | 130 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 4/18/2012 | 2:10pm | CAP | 2.82 | 0.3 | | 11.4 |
| Potassium * | EPA 3010A 6010C | 5/1/2012 | 5:38pm | AIP | 1.3 | 1 | 94.9 | 2.80 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC.

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: IW-73

Date Sample Collected: April 17, 2012
Time Sample Collected: 4:30pm
Sample Collected By: ERM Southwest

Date Sample Received: April 18, 2012
Time Sample Received: 11:30am
Sample Received By: C Peterson

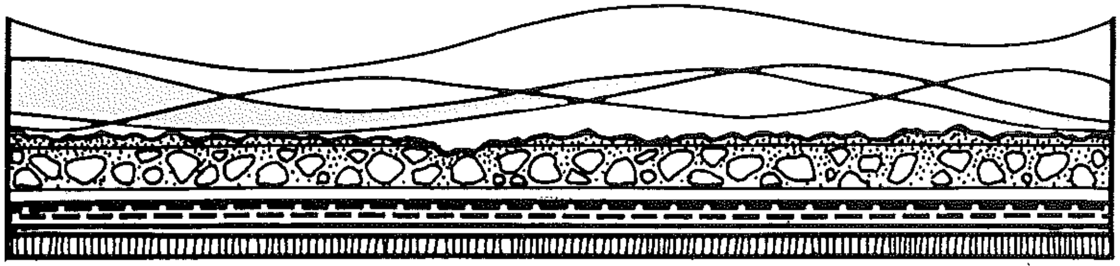
Sample #: 20121908

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 4/26/2012 | 4:58pm | AIP | 6.3 | 0.2 | 96.8 | 0.896 |
| Chloride | 4500-CL | 4/25/2012 | 2:24pm | CAP | 140 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 4/18/2012 | 3:00pm | CAP | 0.735 | 0.3 | | 11.4 |
| Potassium * | EPA 3010A 6010C | 5/1/2012 | 5:22pm | AIP | 4.6 | 1 | 94.9 | 2.80 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC.



May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-21

Date Sample Collected: April 17, 2012
Time Sample Collected: 12:45pm
Sample Collected By: ERM Southwest

Date Sample Received: April 18, 2012
Time Sample Received: 11:30am
Sample Received By: C Peterson

Sample #: 20121907

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 4/26/2012 | 6:42am | AIP | 3.8 | 0.2 | 96.8 | 0.896 |
| Chloride | 4500-CL | 4/25/2012 | 2:25pm | CAP | 550 | 3 | | 0.0 |
| Nitrogen, Nitrate | 4500-E | 4/18/2012 | 4:30pm | CAP | 1.813 | 0.3 | | 11.4 |
| Potassium * | EPA 3010A 6010C | 5/1/2012 | 5:35pm | AIP | <1 | 1 | 94.9 | 2.80 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

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DATA TESTING INC.

Data Testing, Inc.
3434 Country Club
P. O. Box 1507
Fort Smith, Arkansas 72902
79) 649-8378 Fax (479) 649-8486

Company Name: Whirlpool c/o ERM

Phone #: 281-600-1000

Address: 15810 Parke Ten Place, Suite 300

Fax #: 281-600-1001

Project Name or Number: Whirlpool Spring 2012 Sampling

Purchase Order #: 0159348

Sampling Personnel Signature(s): Kaleigh Kimsey

Printed: Sara Tomashitis, Kaleigh Kimsey

| Sample I.D. | Date | Time | Comp. | Grab | Cont. Type: Plast. | Cont. Type: Glass | # of Containers | Method Preserved: H2SO4 | HNO3 | NAOH | HCL | Ice | None | Sample Matrix: Water | Soil | Air | Sludge | Other | Requested Analysis: Natural Attenuation | Metals | | | | | | | Laboratory Control Number | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ITMW-6 | 4/17/12 | 1150 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | | | | | | | |
| ITMW-21 | 4/17/12 | 1245 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | | | | | | | |
| IW-73 | 4/17/12 | 1630 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | | | | | | | |
| IW-77 | 4/17/12 | 1733 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | | | | | | | |
| IW-79 | 4/17/12 | 1845 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | | | | | | | |

| Relinquished by: | Date: | Time: | Relinquished by: | Date: | Time: |
|---|---|---|---|---|---|
| Sara Tomashitis | 4/17/12 | 19:25 | | | |
| Received by: | Date: | Time: | Received by: | Date: | Time: |
| Relinquished by: | Date: | Time: | Received by Laboratory: [illegible] | Date: 4-18-12 | Time: 11:50 |

Comments:

DATA TESTING INC.

3434 Country Club Avenue
P.O. Box 1507
Fort Smith, AR 72902
(479) 649-8378

ERM SOUTHWEST
15810 PARK TEN PLACE, SUITE 300
HOUSTON, TX 77084

Invoice number 37570
Date 05/22/2012

Project **ERM SOUTHWEST**

Analysis of Four (4) Water Samples received on April 19, 2012, for ERM Southwest, Houston, Texas (MW-70, RW-69, ITMW-16, MW-23)

| | Units | Rate | Billed Amount |
|---|---|---|---|
| Nitrate Nitrogens | 4.00 | 20.00 | 80.00 |
| Chloride Tests | 4.00 | 15.00 | 60.00 |
| Potassium Tests | 4.00 | 23.00 | 92.00 |
| Sulfate Tests | 4.00 | 20.00 | 80.00 |
| | | Invoice total | **312.00** |

DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-23

| | | | |
|---|---|---|---|
| Date Sample Collected: | April 18, 2012 | Date Sample Received: | April 19, 2012 |
| Time Sample Collected: | 6:45pm | Time Sample Received: | 11:35am |
| Sample Collected By: | ERM Southwest | Sample Received By: | C Peterson |
| Sample #: | 20121948 | Received Temperature: | |

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 5/3/2012 | 2:37pm | AIP | 14 | 0.2 | 101.0 | 0.760 |
| Chloride | 4500-CL | 4/25/2012 | 2:53pm | CAP | 220 | 3 | | 6.9 |
| Nitrogen, Nitrate | 4500-E | 4/19/2012 | 2:00pm | CAP | 1.074 | 0.3 | | 6.6 |
| Potassium * | EPA 3010A 6010C | 5/2/2012 | 9:51pm | AIP | <1 | 1 | 101.0 | 2.92 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-16

Date Sample Collected: April 18, 2012
Time Sample Collected: 5:50pm
Sample Collected By: ERM Southwest

Date Sample Received: April 19, 2012
Time Sample Received: 11:35am
Sample Received By: C Peterson

Sample #: 20121947

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 5/3/2012 | 2:11pm | AIP | 9.6 | 0.2 | 101.0 | 0.760 |
| Chloride | 4500-CL | 4/25/2012 | 2:54pm | CAP | 24 | 3 | | 6.9 |
| Nitrogen, Nitrate | 4500-E | 4/19/2012 | 1:25pm | CAP | 1.12 | 0.3 | | 6.6 |
| Potassium * | EPA 3010A 6010C | 5/2/2012 | 9:48pm | AIP | 3.8 | 1 | 101.0 | 2.92 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: RW-69

Date Sample Collected: April 18, 2012
Time Sample Collected: 4:40pm
Sample Collected By: ERM Southwest

Date Sample Received: April 19, 2012
Time Sample Received: 11:35am
Sample Received By: C Peterson

Sample #: 20121946

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 5/3/2012 | 3:28am | AIP | 6 | 0.2 | 101.0 | 0.760 |
| Chloride | 4500-CL | 4/25/2012 | 2:56pm | CAP | 300 | 3 | | 6.9 |
| Nitrogen, Nitrate | 4500-E | 4/19/2012 | 1:35pm | CAP | 0.119 | 0.3 | | 6.6 |
| Potassium * | EPA 3010A 6010C | 5/2/2012 | 2:11am | AIP | 1.3 | 1 | 101.0 | 2.92 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC.

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-70

Date Sample Collected: April 18, 2012
Time Sample Collected: 3:35pm
Sample Collected By: ERM Southwest

Date Sample Received: April 19, 2012
Time Sample Received: 11:35am
Sample Received By: C Peterson

Sample #: 20121945

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 5/3/2012 | 1:19pm | AIP | 1.3 | 0.2 | 101.0 | 0.760 |
| Chloride | 4500-CL | 4/25/2012 | 2:57pm | CAP | 320 | 3 | | 6.9 |
| Nitrogen, Nitrate | 4500-E | 4/19/2012 | 1:45pm | CAP | 0.198 | 0.3 | | 6.6 |
| Potassium * | EPA 3010A 6010C | 5/2/2012 | 9:43pm | AIP | 1.5 | 1 | 101.0 | 2.92 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

**DATA TESTING INC.**

Data Testing, Inc.
3434 Country Club
P. O. Box 1507
Fort Smith, Arkansas 72902
79) 649-8378 Fax (479) 649-8486

| | | | |
|---|---|---|---|
| Company Name: ERM | Phone #: 281-600-1000 | | |
| Address: 15810 Park Ten Place Suite 300, Houston, TX 77084 | Fax #: | | |
| Project Name or Number: Whirlpool | Purchase Order #: 0159348 | | |
| Sampling Personnel Signature(s): Kaleigh Kimsey, Sara Tomashitis | Printed: Kaleigh Kimsey, Sara Tomashitis | | |

| Sample I.D. | Date | Time | Comp. | Grab | Cont. Type: Plast. | Cont. Type: Glass | # of Containers | Method Preserved: H2SO4 | HNO3 | NAOH | HCL | Ice | None | Sample Matrix: Water | Soil | Air | Sludge | Other | Requested Analysis: Natural Attenuation | Metals | Laboratory Control Number | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-70 | 4/18/12 | 1535 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |
| RW-69 | ↓ | 1040 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |
| ITMW-16 | ↓ | 1750 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |
| MW-23 | ↓ | 1845 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |

| | | | | | |
|---|---|---|---|---|---|
| Relinquished by: Kaleigh Kimsey | Date: 4/18/12 | Time: 19:33 | Relinquished by: | Date: | Time: |
| Received by: | Date: | Time: | Received by: | Date: | Time: |
| Relinquished by: | Date: | Time: | Received by Laboratory: Cindy Peterson | Date: 4-19-12 | Time: 11:30 |

Comments:

DATA TESTING INC.

3434 Country Club Avenue
P.O. Box 1507
Fort Smith, AR 72902
(479) 649-8378

ERM SOUTHWEST
15810 PARK TEN PLACE, SUITE 300
HOUSTON, TX 77084

Invoice number 37571
Date 05/22/2012

Project **ERM SOUTHWEST**

Analysis of Seven (7) Water Samples received on April 19, 2012, for ERM Southwest, Houston, Texas (MW-24,MW-27, MW-22,ITMW-1, MW-26, MW-29, MW-71)

| | Units | Rate | Billed Amount |
|---|---|---|---|
| Nitrate Nitrogens | 7.00 | 20.00 | 140.00 |
| Chloride Tests | 7.00 | 15.00 | 105.00 |
| Potassium Tests | 7.00 | 23.00 | 161.00 |
| Sulfate Tests | 7.00 | 20.00 | 140.00 |
| | | Invoice total | **546.00** |

DATA TESTING INC.

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-71

Date Sample Collected: April 18, 2012
Time Sample Collected: 2:50pm
Sample Collected By: ERM Southwest

Date Sample Received: April 19, 2012
Time Sample Received: 11:35am
Sample Received By: C Peterson

Sample #: 20121955

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 5/3/2012 | 6:03am | AIP | 4.3 | 0.2 | 101.0 | 0.760 |
| Chloride | 4500-CL | 4/25/2012 | 2:43pm | CAP | 250 | 3 | | 6.9 |
| Nitrogen, Nitrate | 4500-E | 4/19/2012 | 1:30pm | CAP | 0.310 | 0.3 | | 6.6 |
| Potassium * | EPA 3010A 6010C | 5/3/2012 | 2:14pm | AIP | <1 | 1 | 101.0 | 2.92 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-29

| | | | |
|---|---|---|---|
| Date Sample Collected: | April 18, 2012 | Date Sample Received: | April 19, 2012 |
| Time Sample Collected: | 12:50pm | Time Sample Received: | 11:35am |
| Sample Collected By: | ERM Southwest | Sample Received By: | C Peterson |
| Sample #: | 20121954 | Received Temperature: | |

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 5/3/2012 | 8:28am | AIP | 60 | 2 | 101.0 | 0.760 |
| Chloride | 4500-CL | 4/25/2012 | 2:44pm | CAP | 147 | 3 | | 6.9 |
| Nitrogen, Nitrate | 4500-E | 4/19/2012 | 2:10pm | CAP | 3.32 | 0.3 | | 6.6 |
| Potassium * | EPA 3010A 6010C | 5/2/2012 | 9:18pm | AIP | <1 | 1 | 101.0 | 2.92 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

**3434 COUNTRY CLUB • FORT SMITH, AR 72903 • (479) 649-8378**

DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-26

Date Sample Collected: April 18, 2012
Time Sample Collected: 11:22am
Sample Collected By: ERM Southwest

Date Sample Received: April 19, 2012
Time Sample Received: 11:35am
Sample Received By: C Peterson

Sample #: 20121953

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 5/2/2012 | 3:25pm | AIP | 8.8 | 0.2 | 101.0 | 0.760 |
| Chloride | 4500-CL | 4/25/2012 | 2:46pm | CAP | 380 | 3 | | 6.9 |
| Nitrogen, Nitrate | 4500-E | 4/19/2012 | 1:10pm | CAP | 4.73 | 0.3 | | 6.6 |
| Potassium * | EPA 3010A 6010C | 5/2/2012 | 9:29pm | AIP | <1 | 1 | 101.0 | 2.92 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

**3434 COUNTRY CLUB • FORT SMITH, AR 72903 • (479) 649-8378**

DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: ITMW-1

Date Sample Collected: April 18, 2012
Time Sample Collected: 10:15am
Sample Collected By: ERM Southwest

Date Sample Received: April 19, 2012
Time Sample Received: 11:35am
Sample Received By: C Peterson

Sample #: 20121952

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 5/3/2012 | 3:03pm | AIP | 16 | 0.2 | 101.0 | 0.760 |
| Chloride | 4500-CL | 4/25/2012 | 2:47pm | CAP | 254 | 3 | | 6.9 |
| Nitrogen, Nitrate | 4500-E | 4/19/2012 | 1:05pm | CAP | 4.24 | 0.3 | | 6.6 |
| Potassium * | EPA 3010A 6010C | 5/3/2012 | 2:08pm | AIP | 5.4 | 1 | 101.0 | 2.92 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-22

Date Sample Collected: April 18, 2012
Time Sample Collected: 9:07am
Sample Collected By: ERM Southwest

Date Sample Received: April 19, 2012
Time Sample Received: 11:35am
Sample Received By: C Peterson

Sample #: 20121951

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 5/2/2012 | 12:24pm | AIP | 15 | 0.2 | 101.0 | 0.760 |
| Chloride | 4500-CL | 4/25/2012 | 2:50pm | CAP | 20 | 3 | | 6.9 |
| Nitrogen, Nitrate | 4500-E | 4/19/2012 | 1:40pm | CAP | 0.078 | 0.3 | | 6.6 |
| Potassium * | EPA 3010A 6010C | 5/2/2012 | 9:40pm | AIP | <1 | 1 | 101.0 | 2.92 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC.

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-27

Date Sample Collected: April 18, 2012
Time Sample Collected: 6:50pm
Sample Collected By: ERM Southwest

Date Sample Received: April 19, 2012
Time Sample Received: 11:35am
Sample Received By: C Peterson

Sample #: 20121950

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 5/2/2012 | 9:32pm | AIP | 11 | 0.2 | 101.0 | 0.760 |
| Chloride | 4500-CL | 4/25/2012 | 2:52pm | CAP | 20 | 3 | | 6.9 |
| Nitrogen, Nitrate | 4500-E | 4/19/2012 | 1:55pm | CAP | 1.58 | 0.3 | | 6.6 |
| Potassium * | EPA 3010A 6010C | 5/2/2012 | 1:55am | AIP | 1.3 | 1 | 101.0 | 2.92 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

DATA TESTING INC

May 21, 2012

FOR: ERM Southwest
15810 Park Ten Place, Suite 300
Houston, Texas 77084

Sample Identification: MW-24

Date Sample Collected: April 18, 2012
Time Sample Collected: 5:50pm
Sample Collected By: ERM Southwest

Date Sample Received: April 19, 2012
Time Sample Received: 11:35am
Sample Received By: C Peterson

Sample #: 210121949

Received Temperature:

| Parameter | Method Number | Date & Time Analyzed | | By | Reported* Value | MDL mg/l | % Recovery | % RDP |
|---|---|---|---|---|---|---|---|---|
| Sulfates * | EPA 9056A | 5/3/2012 | 6:29am | AIP | 8.1 | 0.2 | 101.0 | 0.760 |
| Chloride | 4500-CL | 4/25/2012 | 2:58pm | CAP | 265 | 3 | | 6.9 |
| Nitrogen, Nitrate | 4500-E | 4/19/2012 | 1:00pm | CAP | 5.63 | 0.3 | | 6.6 |
| Potassium * | EPA 3010A 6010C | 5/3/2012 | 2:17am | AIP | <1 | 1 | 101.0 | 2.92 |

* Analyzed by American Interplex
*All results reported in mg/l unless otherwise indicated.
Method: 19th & 20th Edition of "Standard Methods for the Examination of Water & Wastewater".
EPA Regulations, 40 CFR, Part 136
Quality control measures such as blanks, spikes & duplicates are performed daily on at least 10% of all sample. Equipment maintenance & calibration is also performed daily under the guidelines of the USEPA."

# DATA TESTING INC.

Data Testing, Inc.
3434 Country Club
P. O. Box 1507
Fort Smith, Arkansas 72902
79) 649-8378 Fax (479) 649-8486

| Company Name: ERM | Phone #: 281-1000-1000 |
|---|---|
| Address: 15810 Park Ten Place, Houston, TX | Fax #: 77084 |
| Project Name or Number: Whirlpool | Purchase Order #: 0159348 |
| Sampling Personnel Signature(s): Kaleigh Kimsey, Sara Tamashita | Printed: Kaleigh Kimsey, Sara Tomashitis |

| Sample I.D. | Date | Time | Comp. | Grab | Cont. Type: Plast. | Cont. Type: Glass | # of Containers | Method Preserved: H2SO4 | HNO3 | NAOH | HCL | Ice | None | Sample Matrix: Water | Soil | Air | Sludge | Other | Requested Analysis: Natural Attenuation | Metals | Laboratory Control Number | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-24 | 4/18/12 | 1750 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |
| MW-27 | ↓ | 1850 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |
| MW-22 | ↓ | 0907 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |
| ITMW-1 | ↓ | 1015 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |
| MW-26 | ↓ | 1122 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |
| MW-29 | ↓ | 1250 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |
| MW-71 | ↓ | 1450 | | ✓ | ✓ | | 3 | ✓ | ✓ | | | ✓ | | ✓ | | | | | X | X | | |

| Relinquished by: | Date: | Time: | Relinquished by: | Date: | Time: |
|---|---|---|---|---|---|
| Kaleigh Kimsey | 4/18/12 | 19:33 | | | |
| Received by: | Date: | Time: | Received by: | Date: | Time: |
| | | | | | |
| Relinquished by: | Date: | Time: | Received by Laboratory: | Date: | Time: |
| | | | C. Peterson | 4-19-12 | 11:30 |

Comments:

Environmental
Resources
Management

15810 Park Ten Place
Suite 300
Houston, Texas 77084
(281) 600-1000
(281) 600-1001 (fax)

July 9, 2010

Mr. Mostafa Mehran
Arkansas Department of Environmental Quality
Hazardous Waste Division
8001 National Drive
Little Rock, AR 72219-8913

Project No. 0097932

Subject: Interim Measure Status Report for January to June 2010; Whirlpool Corporation, Fort Smith, Arkansas

Dear Mr. Mehran:

On behalf of Whirlpool Corporation, Environmental Resources Management Southwest, Inc. (ERM) is pleased to provide this status report on the interim measure (IM) activities as conducted in accordance with the approved Interim Measure Work Plan dated March 17, 2008.

*Introduction*

Whirlpool Corporation (Whirlpool) has been working with The Arkansas Department of Environmental Quality (ADEQ) to address potential risks to human health and the environment associated with a historical release of trichloroethylene (TCE) at the Whirlpool Fort Smith facility (the Site) located at 6400 Jenny Lind Avenue, Fort Smith, Arkansas (Figure 1). Based on site investigations conducted between 1999 and 2006, TCE and associated degradation products (primarily cis-1,2-dichloroethene) are present in shallow ground water at the site and have migrated off-site into a residential area north of the facility.

Whirlpool's Risk Evaluation Report (RER) for the Site, submitted June 13, 2007, characterized the approximate extent of the off-site ground water plume as having two general components: the "core" and the "fringe" (Figure 2). The RER concluded that there were two exposure pathways that could pose potential risk to human health and the environment near the "core" of the off-site plume: 1) ground water ingestion via use of a hypothetical future well, and 2) inhalation of vapors via volatilization of affected ground water. Based on current conditions, neither of these pathways appears to be complete.

*Objectives*

Although the ground water ingestion pathway is not currently complete, and the potential for risk via ground water-to-indoor air pathway has not been quantified, Whirlpool's goal is to reduce any potential risk to human health. Therefore, Whirlpool in April 2009 initiated the ADEQ approved Interim Measures (IM) as an early response to target the "core" of the off-site plume.

*Interim Measures Tasks Completed to Date*

As discussed in the initial IM Status Report, dated January 12, 2010, the IM is being conducted as a two-phased program. The initial phase included two ISCO treatment events (conducted in April 2009 and July 2009) along with a ground water pumping test. The purpose of the initial phase was to evaluate 1) the effectiveness of ISCO at treating the core of the off-site plume and 2) the feasibility of ground water pumping to induce gradients and subsequent flow through the aquifer. The second phase (tentatively scheduled for 3Q 2010) will involve ground water pumping from at least one well to induce gradients and pull permanganate through the plume to effect treatment of the entire core of the plume.

The January 2010 IM Status Report concluded that ISCO treatments are very effective at the site where treatment is applied. The area over which the treatment is effective, however, appears to be highly dependent on local lithology and static ground water flow gradients. Based on the evaluation of ISCO performance data, permanganate had not migrated a measurable distance away from treatment wells over the then three-month evaluation period. Evaluation of aquifer test data indicated that ground water pumping at the well RW-69 could be a viable option for inducing a gradient at the site to help move ISCO reagents through the formation to reach untreated portions of the aquifer.

Tasks completed since the January 2010 IM Status Report include the following:

- ISCO Performance Monitoring was conducted in combination with the May 2010 semi-annual sampling event and included water level gauging, sampling of monitor wells for volatile organic compounds, and field screening for water quality parameters.
- Installation of support equipment at an offsite location for the purpose of ground water pumping using well RW-69 as part of the second phase of the IM.

*ISCO Performance Evaluation*

Following each ISCO treatment, performance monitoring was conducted in accordance with the Work Plan including:

- Periodic water level gauging of selected wells to assess potential changes in ground water flow resulting from injection activities;
- Periodic sampling of selected monitor wells to assess the changes in TCE concentration from the ISCO injections; and
- Periodic field screening of selected wells for water quality parameters (e.g., oxidation-reduction potential (ORP), dissolved oxygen (DO), temperature, pH, specific conductivity (SC) and chloride (Cl)) to assess the level of impact on the ground water chemistry from the ISCO treatment.

Continuing ISCO performance monitoring was conducted on May 10 through May 13, 2010 in conjunction with the semi-annual sampling event. Wells with visible permanganate in the ground water (IW-72, IW-73, IW-74, IW-75, IW-76, IW-78, IW-79, IW-80, MW-35R and MW-65) were not sampled during sampling event. With two exceptions, all of the treatment area wells with no visible permanganate in the ground water were sampled and analyzed during the May 2010 sampling event.

Two wells located along Jacobs street immediately downgradient of the treatment area (MW-42B and MW-43) were damaged between the April and October, 2009 sampling events. To prevent further damage and potential unauthorized access, each well was temporarily capped and sealed. The wells could not be sampled during performance monitoring activities or during the May 2010 sampling event.

*Ground Water Sampling Results*

Figures 3 and 4 illustrate TCE concentrations in ground water from the October 2009 and the May 2010 sampling events. Wells with unreacted permanganate were not sampled, since the presence of unreacted permanganate generally implies complete destruction of the TCE. Additionally, purging those wells would remove a small volume of the treatment solution.

In the previous status report, a slight decrease in TCE concentrations was observed in monitoring points adjacent to the ISCO treatment wells (i.e., wells MW-32, MW-33, MW-41, MW-46R, and IW-77). Based on May 2010 data, TCE concentrations were stable or continued to decline in wells IW-77 and MW-71 (Table 1). TCE concentrations appeared to have increased in wells MW-41 and RW-69.

ORP performance monitoring between the treatments in 2009, suggests the radius of influence for ISCO treatment ranges from 5 to 45 feet. The variation is generally consistent with lithological characterizations of the aquifer: wells in gravel-rich areas have larger radius of influence than wells in clay-rich areas.

Based on ORP measurements and qualitative field observations in May 2010, unreacted permanganate remains within 40 to 50 feet of ISCO treatment wells; even ten months after treatment. Additionally, it appears that the influence of the ISCO treatments evidenced by increasing ORP values or changes in TCE concentrations have been observed at distances of up to 400 feet from the ISCO treatment wells. ORP values have increased in wells IW-77, MW-28, MW-36, MW-39, and MW-68. In addition, there also appear to be some areas where permanganate has begun to be depleted or its influence has decreased. For example, ORP values have dropped in wells MW-71, MW-34, MW-41, MW-65, and RW-69 (although the ground water in well MW-65 is still pink from the permanganate). ORP values from the October 2009 and May 2010 sampling events are presented in Figures 3 and 4. The changes in ORP concentration in wells adjacent to ISCO treatment wells are shown in Table 2. The inferred area of unreacted permanganate is indicated on Figure 4.

The analytical data suggest permanganate treatment continues to be very effective within the radius of influence of the injection well. The fact that permanganate has not migrated further away from the treatment wells supports conclusions from earlier site data that the aquifer is characterized by highly permeable soils within the gravel-rich zone but given the limited amount of saturated thickness, has low transmissivity. Therefore, ground water in the areas where treatment was applied is fairly stagnant. It is expected that migration of unreacted permanganate into the plume will be slow due to the very low gradients in the area between Ingersoll and Jacobs.

The exception to this conclusion (potentially evidenced by data from MW-46R from October 2009 and wells MW-28, MW-39, and MW-68 in May 2010) may be the presence of some flow along interconnected gravel rich zones or channels[1]. While such interconnectedness has not been observed directly, it may be responsible for the current configuration of the plume and the fact that impact of ISCO was apparent at MW-46R.

*Phase II IM Activities Completed January to June 2010*

During April and May 2010 support equipment has been installed near well RW-69 for the purpose of initiating ground water pumping. The purpose of the ground water pumping portion of the IM is to induce a gradient at RW-69 and pull permanganate through the plume to effect treatment of the entire core of the plume. During May 2010 the following equipment and infrastructure was installed at an offsite property owned by Whirlpool located at 1501 Jacob Avenue:

- Concrete and gravel driveway and culvert to provide access to the property;
- Small shed (5 by 7 feet) to house a low noise compressor to power the ground water pump in well RW-69;
- 8-foot wooded privacy fence around the shed;
- Underground piping from well RW-69 to the shed; and
- Electrical power box.

In addition to the construction activities listed above, a 120-day temporary use permit application was filed with the City of Fort Smith to operate the ground water pumping system. Ground water pumping will start following final approval of the temporary use permit and approval of an amendment to the Whirlpool industrial user water discharge permit by the City. It is currently anticipated that ground water pumping will start in July 2010. IM performance monitoring will continue during Phase II of the IM activities to assess the effectiveness of ground water pumping to pull permanganate through the plume to effect treatment of the entire core of the plume.

*Conclusion and Path Forward*

ORP data, visual observations, and analytical data collected during Phase 1 of the IM suggest that ISCO treatments are very effective at the site where treatment is applied. The area over which the treatment is effective, however, appears to be highly dependent on local lithology and static ground water flow gradients. Based on the evaluation of ISCO performance data,

---

[1] While the concentration of TCE in well MW-46R decreased and the ORP concentration increased in October 2009 as compared to April 2009; both the TCE concentration and the ORP value increased in May 2010 as compared to October 2009.

permanganate has not migrated a measurable distance away from treatment wells over the ten-month evaluation period.

IM performance monitoring is ongoing. The aquifer has remained stagnant and permanganate has not moved adequately through the core of the plume; therefore, the second phase of the IM will be initiated. The January 2010 IM Status Report indicated that ground water pumping at the well RW-69 could be a viable option for inducing a gradient at the site to help move ISCO reagents through the formation to reach untreated portions of the aquifer. A schedule for further IM implementation is included in Table 3.

Should you have any questions, please contact us.

Sincerely,

Environmental Resources Management Southwest, Inc.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL GEOLOGIST
No. 1931
REED EVAN MINER
REM 7/9/10

Reed Evan Miner

Reed Miner, P.G. (Arkansas)

Troy W. Meinen

TWM/skd

Attachments

cc: Robert J. Karwowski, Whirlpool Corporation
Jerry Scott Horton, Whirlpool Corporation
H. Reiffert Hedgcoxe, Environmental Resources Management Southwest, Inc.

# Tables

*July 9, 2010*
*Project No. 0097932*

**Environmental Resources Management Southwest, Inc.**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

TABLE 1

Trichloroethene (TCE) Concentrations in the Vicinity of Treatment Wells
Pre- and Post- ISCO

Fort Smith Interim Measure
Whirlpool

| Well ID | Pre-ISCO April 2009 | Post ISCO October 2009 | Post ISCO May 2010 |
|---|---|---|---|
| IW-77 | 0.570 | 0.380 | 0.260 |
| MW-32 | 0.047 | 0.068 | 0.058 |
| MW-33 | 1.20 | 1.20 | 1.10 |
| MW-41 | 0.660 | 0.180 | 0.610 |
| MW-46R | 0.460 | 0.390 | 0.610 |
| RW-69 | 0.062 | 0.200 (12/09) | 0.170 |
| MW-71 | --- | 0.190 | 0.160 |

NOTES:

1. TCE concentrations reported in mg/L.
2. NS - Not Sampled due to presence of unreacted permanganate.

TABLE 2

ORP Concentrations in the Vicinity of Treatment Wells
Pre- and Post- ISCO

Fort Smith Interim Measure
Whirlpool

| | Pre-Treatment | Post Treatment | |
|---|---|---|---|
| **Well** | **April 2009** | **October 2009** | **May 2010** |
| MW-23 | -77 | 334 | 377 |
| MW-24 | -109 | 313 | 349 |
| MW-28 | -- | 104 | 246 |
| MW-32 | -248 | 321 | 347 |
| MW-33 | -173 | 333 | 366 |
| MW-34 | -257 | 613 | 416 |
| MW-35R | -98 | 743 | 697.3 |
| MW-36 | -308 | 183 | 392 |
| MW-39 | -329 | 274 | 404 |
| MW-40 | -313 | 269 | 396 |
| MW-41 | -339 | 144 | -127.6 |
| MW-43 | -104 | 35 (5/8/09) | Damaged |
| MW-46R | -115 | 274 | 411 |
| MW-65 | -320 | 773 | 21.4 |
| MW-68 | -318 | -33 | 260 |
| RW-69 | -90 | 184 (8/26/09) | -65.2 |
| MW-71 | -- | 79 | -129.2 |
| IW-72 | -73 | 796 | 714 |
| IW-74 | -283 | 795 | 697 |
| IW-76 | -301 | 774 | 774 |
| IW-77 | -192 | 238 | 461.3 |
| IW-78 | -- | 767 | 649.9 |
| IW-80 | -205 | 784 | 707 |

Concentrations in mV

TABLE 3

IM Phase 2 Implementation Schedule

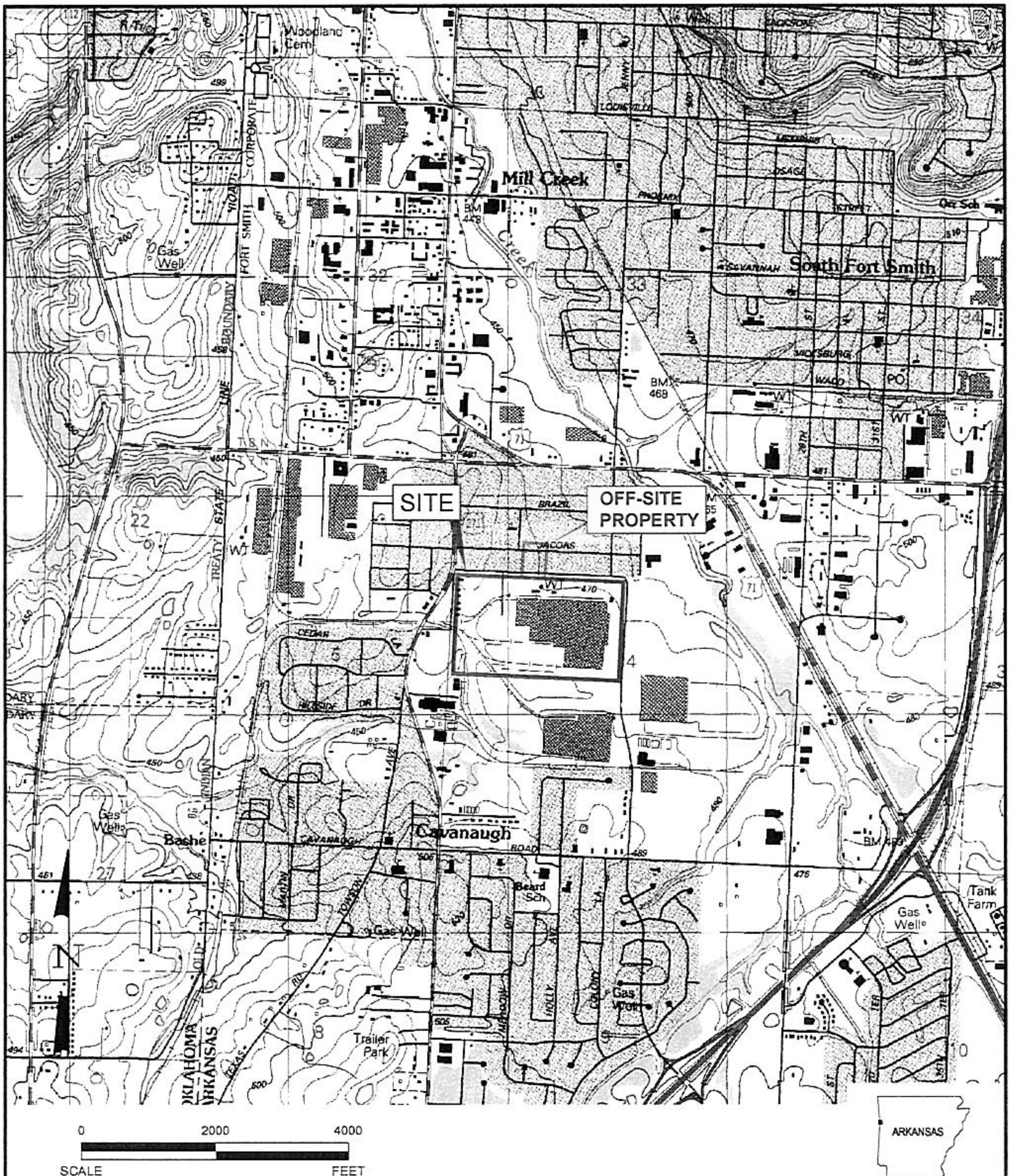
Fort Smith Interim Measure
Whirlpool

| Activity | Time Period |
|---|---|
| IM Pumping Well Design | Done |
| IM Pumping Well Installation | Done |
| IM Ground Water Recovery | Third Quarter 2010/Fourth Quarter 2010 |
| IM Evaluation | First Quarter 2011 |

# Figures

*July 9, 2010*
*Project No. 0097932*

**Environmental Resources Management Southwest, Inc.**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000



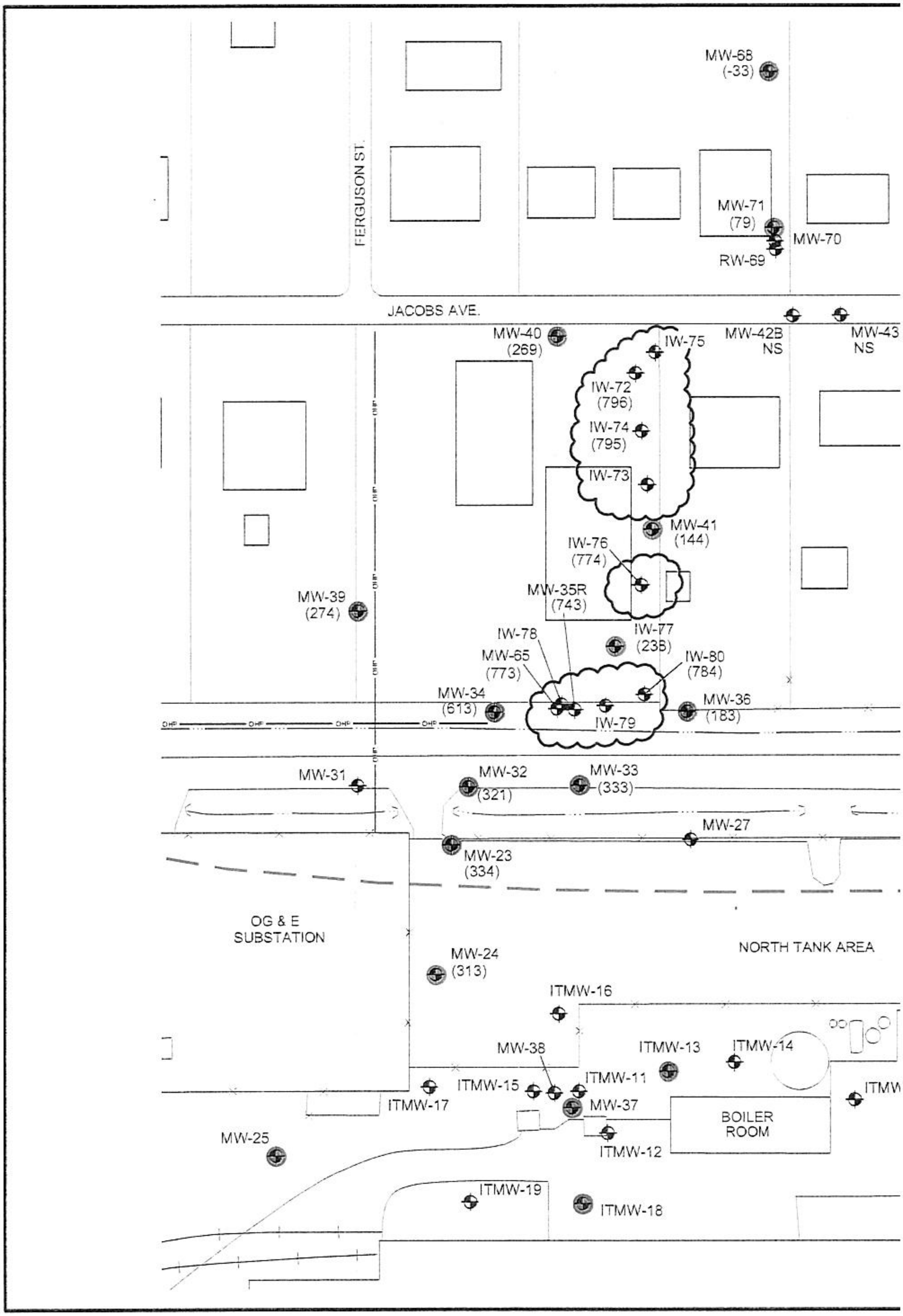

SOURCE: U.S.G.S. 7.5' QUADRANGLE, SOUTH FORT SMITH, ARK.-OKLA., (o35094C4) 1987.

**Environmental Resources Management**

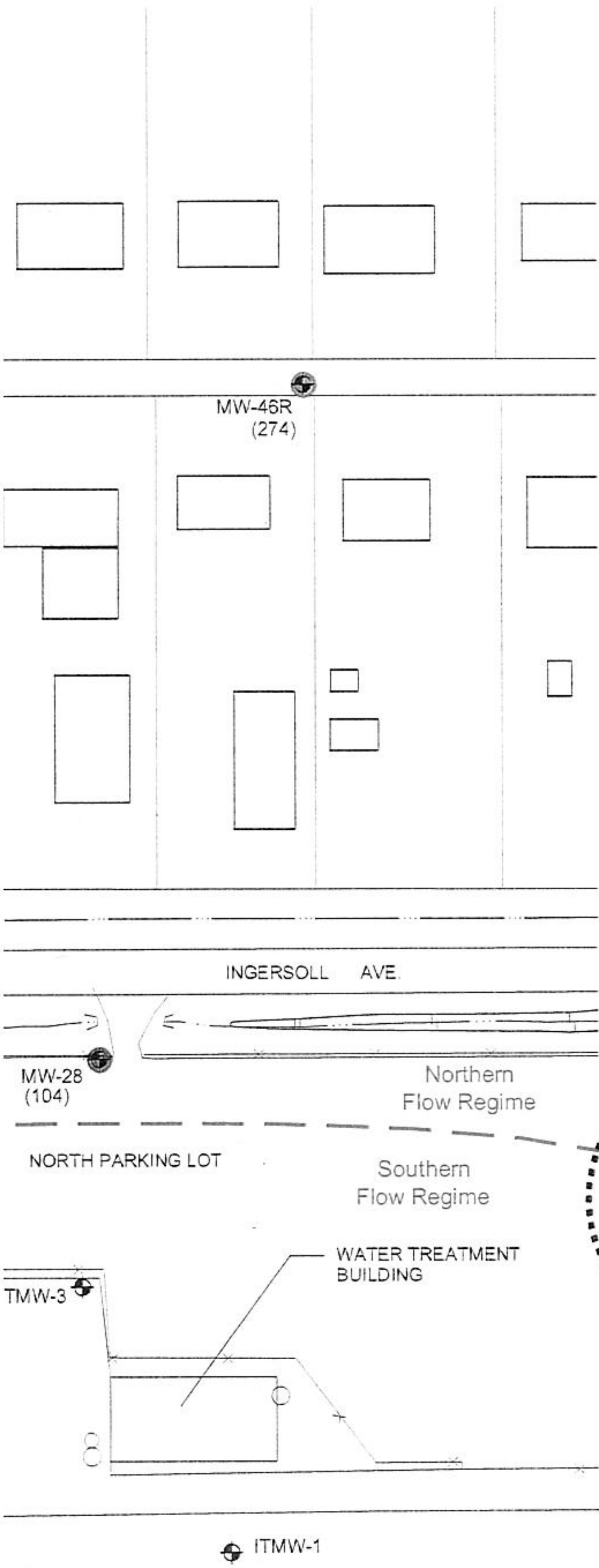
| DESIGN: HTV | DRAWN: EFC | CHKD.: TWM |
|---|---|---|
| DATE: 11/23/2009 | SCALE: AS SHOWN | REV.: |
| PROJ. NO.: H:\DWG\K09\0097933A2.dwg , 12/11/2009 2:35:31 PM | | |

FIGURE 1
SITE LOCATION MAP
Whirlpool Corporation
Fort Smith, Arkansas

ERM



MW-68
(-33)
FERGUSON ST.
MW-71
(79)
MW-70
RW-69
JACOBS AVE.
MW-40
(269)
IW-75
MW-42B
NS
MW-43
NS
IW-72
(796)
IW-74
(795)
IW-73
MW-41
(144)
IW-76
(774)
MW-35R
(743)
MW-39
(274)
IW-77
(238)
IW-78
MW-65
(773)
IW-80
(784)
MW-34
(613)
MW-36
(183)
IW-79
MW-31
MW-32
(321)
MW-33
(333)
MW-27
MW-23
(334)
OG & E
SUBSTATION
NORTH TANK AREA
MW-24
(313)
ITMW-16
MW-38
ITMW-13
ITMW-14
ITMW-15
ITMW-11
ITMW-17
MW-37
BOILER
ROOM
ITMW-12
MW-25
ITMW-19
ITMW-18




N

LEGEND

EXISTING MONITORING WELL

NS NOT SAMPLED

(743) ORP READING (mV)

TCE CONCENTRATION (mg/l)
OCTOBER 2009

- < 0.005
- 0.005 to 0.10
- 0.10 to 1.00
- 1.00 to 10.0
- ≥ 10.0

PERMANGANATE PRESENT IN WELL

STATE OF ARKANSAS
REGISTERED PROFESSIONAL GEOLOGIST
No. 1931
REED EVAN MINER

Reed Evan Miner
7/9/2010

NOTE:

WELLS WITHOUT ANY COLOR WERE NOT SAMPLED DURING THE OCTOBER SAMPLING EVENT.

0 100 200
SCALE FEET

**Environmental Resources Management**

FIGURE 3
FALL TCE ISOCONCENTRATION MAP
OCTOBER 2009
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| | | |
|---|---|---|
| DESIGN: TWM | DRAWN: JMH | CHKD.: TWM |
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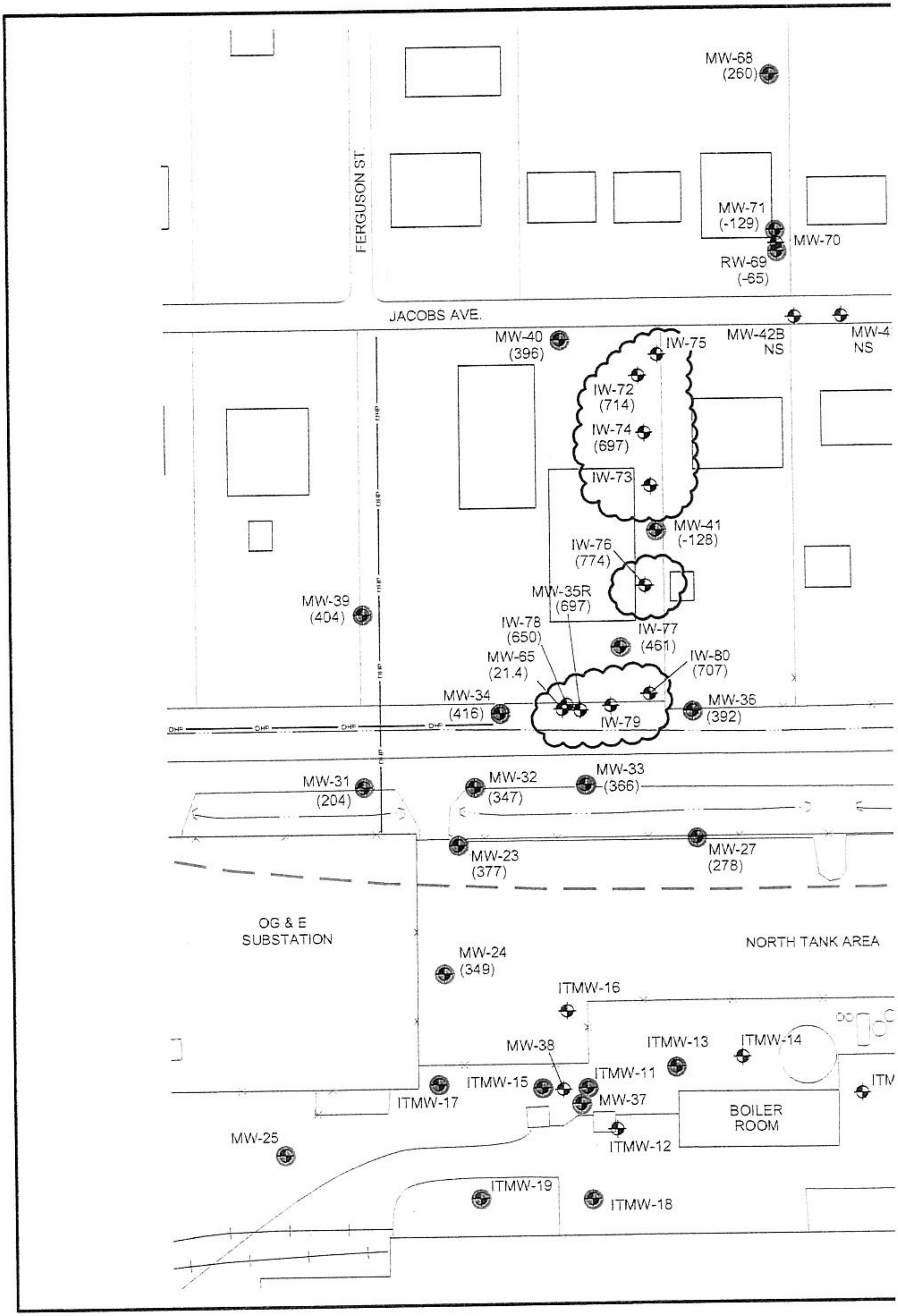
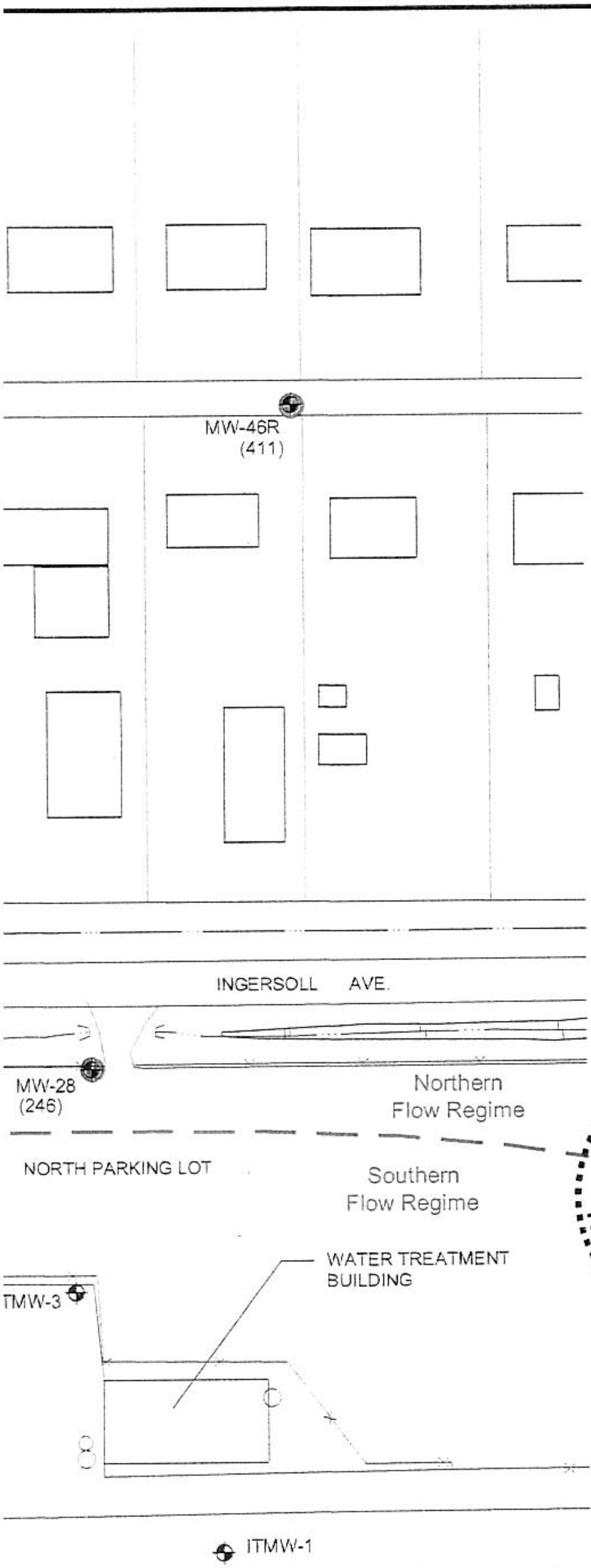


MW-68
(260)
FERGUSON ST.
MW-71
(-129)
MW-70
RW-69
(-65)
JACOBS AVE.
MW-40
(396)
IW-75
MW-42B
NS
NS
IW-72
(714)
IW-74
(697)
IW-73
MW-41
(-128)
IW-76
(774)
MW-35R
(697)
MW-39
(404)
IW-78
(650)
IW-77
(461)
MW-65
(21.4)
IW-80
(707)
MW-34
(416)
MW-36
(392)
IW-79
MW-31
(204)
MW-32
(347)
MW-33
(366)
MW-23
(377)
MW-27
(278)
OG & E
SUBSTATION
NORTH TANK AREA
MW-24
(349)
ITMW-16
ITMW-13
ITMW-14
MW-38
ITMW-11
ITMW-15
ITMW-17
MW-37
BOILER
ROOM
MW-25
ITMW-12
ITMW-19
ITMW-18




LEGEND

EXISTING MONITORING WELL

NS NOT SAMPLED

(743) ORP READING (mV)

TCE CONCENTRATION (mg/l)
OCTOBER 2009

< 0.005

0.005 to 0.10

0.10 to 1.00

1.00 to 10.0

≥ 10.0

PERMANGANATE PRESENT IN WELL

STATE OF ARKANSAS
REGISTERED PROFESSIONAL GEOLOGIST
No. 1931
REED EVAN MINER

Reed Evan Miner
7/9/2010

NOTE:

WELLS WITHOUT ANY COLOR WERE NOT SAMPLED DURING THE OCTOBER SAMPLING EVENT.

0 100 200
SCALE FEET

**Environmental Resources Management**

FIGURE 4
TCE ISOCONCENTRATION MAP
MAY 2010
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| | | |
|---|---|---|
| DESIGN: TWM | DRAWN: JMH | CHKD.: TWM |
| DATE: 6/14/2010 | SCALE: AS SHOWN | REV.: |

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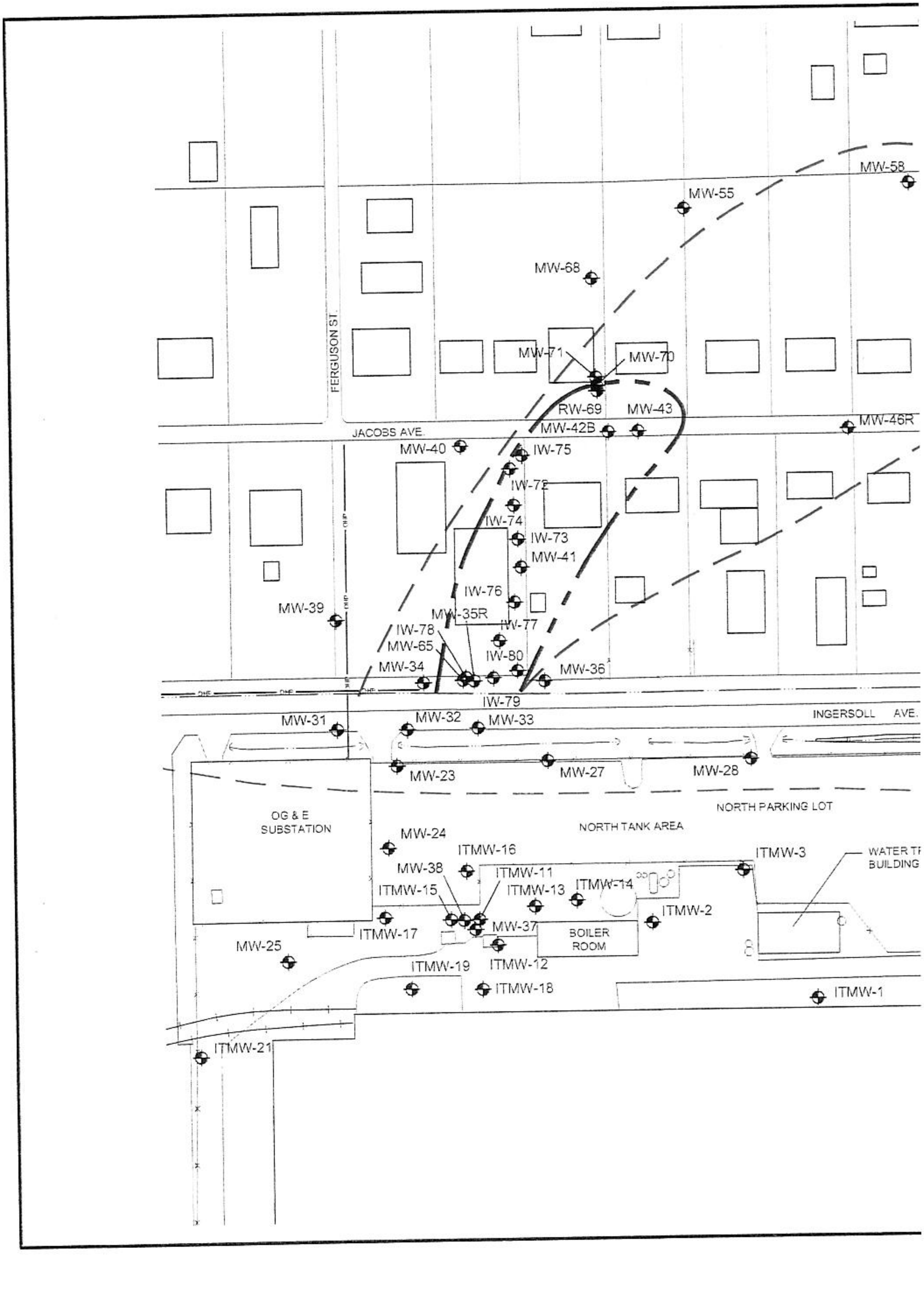

MW-58
MW-55
MW-68
FERGUSON ST.
MW-71
MW-70
RW-69
MW-43
MW-42B
MW-46R
JACOBS AVE.
MW-40
IW-75
IW-72
IW-74
IW-73
MW-41
IW-76
MW-39
MW-35R
IW-77
IW-78
MW-65
IW-80
MW-34
MW-36
IW-79
INGERSOLL AVE.
MW-31
MW-32
MW-33
MW-23
MW-27
MW-28
NORTH PARKING LOT
OG & E
SUBSTATION
NORTH TANK AREA
MW-24
ITMW-16
ITMW-3
WATER TI
BUILDING
MW-38
ITMW-11
ITMW-15
ITMW-13
ITMW-14
ITMW-2
ITMW-17
MW-37
BOILER
ROOM
MW-25
ITMW-19
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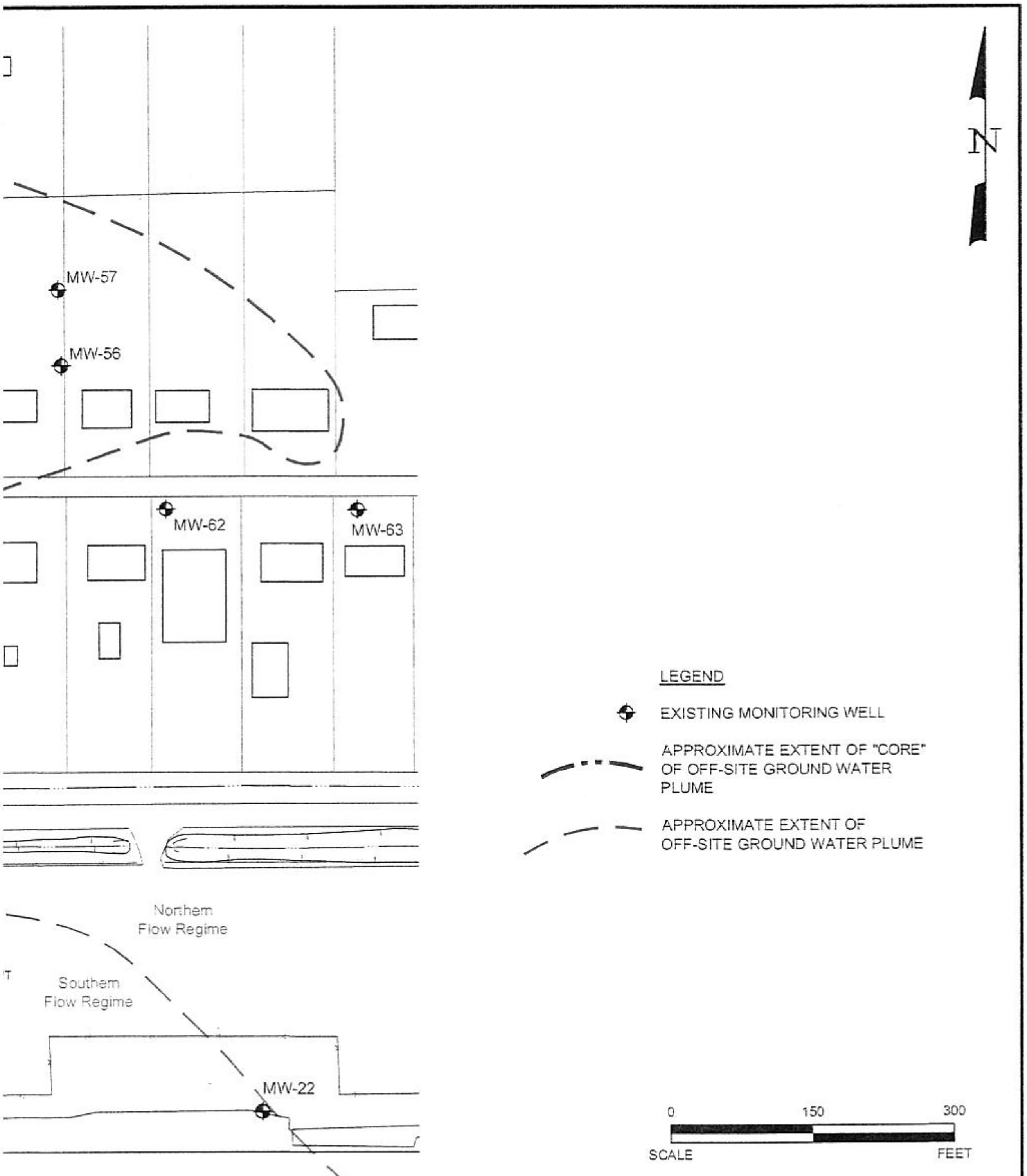
ITMW-1
ITMW-21




**Environmental Resources Management**

FIGURE 2
IM WELL LOCATIONS

Whirlpool Corporation
Fort Smith, Arkansas

ERM

| | | |
|---|---|---|
| DESIGN: TWM | DRAWN: JMH | CHKD.: TWM |
| DATE: 12/7/2009 | SCALE: AS SHOWN | REV.: |

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Environmental
Resources
Management

15810 Park Ten Place
Suite 300
Houston, Texas 77084-5140
(281) 600-1000
(281) 600-1001 (fax)

January 12, 2010

Mr. Mostafa Mehran
Arkansas Department of Environmental Quality
Hazardous Waste Division
8001 National Drive
Little Rock, AR 72219-8913 Project No. 0097932

Subject: Interim Measure Status Report;
Whirlpool Corporation, Fort Smith, Arkansas

Dear Mr. Mehran:

On behalf of Whirlpool Corporation, Environmental Resources Management Southwest, Inc. (ERM) is pleased to provide this status report on the interim measure (IM) activities as conducted in accordance with the approved Interim Measure Work Plan dated March 17, 2008.

*Introduction*

Whirlpool Corporation (Whirlpool) has been working with The Arkansas Department of Environmental Quality (ADEQ) to address potential risks to human health and the environment associated with a historical release of trichloroethylene (TCE) at the Whirlpool Fort Smith facility (the site) located at 6400 Jenny Lind Avenue, Fort Smith, Arkansas (Figure 1). Based on site investigations conducted between 1999 and 2006, TCE and associated degradation products (primarily cis-1,2-dichloroethene) are present in shallow ground water at the site and have migrated off-site into a residential area north of the facility.

Whirlpool's Risk Evaluation Report (RER) for the site, submitted June 13, 2007, summarized area land use, site geology and hydrogeology, and evaluated exposure scenarios and assessed potential risks to human health. The RER characterized the approximate extent of the off-site ground water plume as having two general components: the "core" and the "fringe" (Figure 2). The "core" is roughly identified as the area where TCE concentrations exceed approximately 0.8 mg/L. The "fringe" is identified as the remainder of the off-site plume where TCE concentrations are below 0.8 mg/L and above the EPA Maximum Concentration Level (MCL) of 0.005 mg/L.

The RER concluded that there were two exposure pathways that could pose potential risk to human health and the environment near the "core" of the off-site plume: 1) ground water ingestion via use of a hypothetical future well, and 2) inhalation of vapors via volatilization of affected ground water. Based on current conditions, neither of these pathways is expected to be complete. The ground water ingestion pathway is not complete since there are no private or public water supply wells within the footprint of the plume and the homes in the area are on municipal water service. Additionally, potential exposure by vapor intrusion into homes is also not likely. Observations from boring logs indicate clayey soils are present at the surface to depths of approximately 10 to 15 feet. The clays serve as a significant barrier to vapor transport to the ground surface. Additionally, all but two of the residences near the plume's "core" are pier and beam-type homes, having crawl spaces that would vent vapors to ambient air and interrupt the intrusion pathway.

***Objectives***

The IM is being conducted as a two-phased program. The initial phase (started in April 2009) included two in-situ chemical oxidation (ISCO) treatment events along with a ground water pumping test. The purpose of the initial phase was to evaluate 1) the effectiveness of ISCO at treating the core of the off-site plume and 2) the feasibility of ground water pumping to induce gradients and subsequent flow through the aquifer. Based on preliminary data presented herein, the second phase (tentatively scheduled for 1Q 2010) will involve ground water pumping from at least one well to induce gradients and pull permanganate through the plume to effect treatment of the entire core of the plume.

***Interim Measures Technical Approach – In-situ Chemical Oxidation (ISCO)***

*Methods*

Prior to conducting ISCO treatments, 13 wells (one ground water recovery well, three monitor wells and nine ISCO injection wells) were installed in January 2009 throughout the "core" of the off-site plume as shown in Figure 2. The actual location of the ISCO wells varied slightly from the proposed arrangement in the Work Plan due to underground utilities, trees and property access.

Wells were installed using a combination Geoprobe/hollow-stem auger drilling rig to depths ranging from approximately 24 to 30 feet below ground surface (bgs). Wells were constructed in general accordance with ADEQ guidance. The well locations are shown in Figure 2. Well completion details for all new wells are provided on Table 1.

Descriptions of each soil core, including the lithology, color, moisture content and other features such as texture and plasticity were recorded in the field. Only six of the 13 wells were logged, due to the close proximity of the wells. Soil cores were field-screened for the potential presence of volatile organic compounds utilizing an Organic Vapor Meter (OVM). Boring logs are provided in Attachment 1.

Upon reaching total depth, well materials consisting of 10 feet of 2-inch ID Schedule 40 PVC 0.010-inch machine slotted well screen with sufficient 2-inch OD PVC riser to reach the surface were installed in the each boring. A fine (e.g., 20/40 sieve) silica sand filter pack was placed in the annular space between the well string and the borehole to a minimum of two feet above the top of the well screen. A well seal consisting of bentonite pellets was installed on top of the sand pack and allowed to hydrate. The remainder of the annulus was filled to the surface with a bentonite/Portland cement grout mixture. The wells were completed at grade with 4-foot by 4-foot concrete pads, steel manway and a manhole cover (Figure 3).

Following well installation, each well was developed using a surge block and bailer. A surge block was used to flush water in and out of the well screen, and then the suspended sediment was removed using a 2-inch PVC bailer. Soil cuttings and purge water generated from the drilling and well development activities were stored in 55-gallon steel drums on-site for management and disposal by Whirlpool.

Following well installation, ISCO treatment was conducted in general accordance with the approved IM Work Plan and UIC authorization. A sodium permanganate solution was applied to eight of the injection well locations during two separate ISCO treatment events (April 2009 and July 2009) of the initial phase of the IM. A total volume of approximately 1,105 gallons was used during the two treatment events and while injection pressure varied throughout, it was generally less than 5 pounds per square inch (psi). Injection volumes and pressure for individual wells during each event are summarized on Table 2.

*ISCO Performance Evaluation*

Following each ISCO treatment, performance monitoring was conducted in accordance with the Work Plan including:

- Periodic water level gauging of selected wells to assess potential changes in ground water flow resulting from injection activities;
- Periodic sampling of selected monitor wells to assess the changes in TCE concentration from the ISCO injections; and
- Periodic field screening of selected wells for water quality parameters (e.g., oxidation-reduction potential (ORP), dissolved oxygen (DO), temperature, pH, specific conductivity (SC) and chloride (Cl)) to assess the level of impact on the ground water chemistry from the ISCO treatment.

Wells with visible permanganate in the ground water (IW-72, IW-73, IW-74, IW-75, IW-76, IW-78, IW-79, IW-80, MW-35R and MW-65) were not sampled during performance monitoring events or the October 2009 semiannual sampling event. With two exceptions, all of the treatment area wells with no visible permanganate in the ground water were sampled and analyzed after each ISCO treatment and during the October 2009 sampling event.

Two wells located along Jacobs street immediately downgradient of the treatment area (MW-42B and MW-43) were damaged between the April and October sampling events. To prevent further damage and potential unauthorized access, each well was temporarily capped and sealed. The wells could not be sampled during performance monitoring activities or during the October sampling event.

*ISCO Treatment Results*

ORP performance monitoring between the treatments, suggests the radius of influence for ISCO treatment ranges from 5 to 45 feet. It appears the variation is generally consistent with lithological characterizations of the aquifer: wells in gravel-rich areas have larger radius of influence than wells in clay-rich areas.

Based on ORP measurements and qualitative field observations, unreacted permanganate remains within 40 to 50 feet of ISCO treatment wells; even three months after treatment. ORP values from the April and October 2009 sampling events are presented in Figures 5 and 6. The inferred area of unreacted permanganate is indicated on Figure 6.

Figures 4 and 5 also illustrate TCE concentrations in ground water from the April and October 2009 sampling events. Wells with unreacted permanganate were not sampled, since the presence of unreacted permanganate generally implies complete destruction of the TCE. Additionally, purging those wells would effectively remove the treatment solution.

Data from monitoring points adjacent to ISCO treatment wells appear to exhibit a slight decrease in concentration after treatments. The changes in concentration in wells adjacent to ISCO treatment wells are shown in Table 3. Of note is that monitoring well 46R (located approximately 400 feet downgradient of the treatment area) exhibited elevated ORP and a slight concentration decrease.

The analytical data suggest permanganate treatment is very effective within the radius of influence of the injection well. The fact that permanganate has not migrated further away from the treatment wells supports conclusions from earlier site data that the aquifer is characterized by highly permeable soils within the gravel-rich zone but given the limited amount of saturated thickness, has low transmissivity. Therefore, ground water in the areas where treatment was applied is fairly stagnant. It is expected that migration of unreacted permanganate into the plume will be slow due to the very low gradients in the area between Ingersoll and Jacobs. The exception to this conclusion (potentially evidenced by data from 46R) may be the presence of some flow along interconnected gravel rich zones or channels. While such interconnectedness has not been observed directly, it may be responsible for the current configuration of the plume and the fact that impact of ISCO is apparent at 46R.

***Interim Measures Technical Approach – Ground Water Pumping Evaluation***

*Methods*

During installation of injection and observation wells, a 4-inch diameter well (RW-69) was installed north of Jacobs at the southeast corner of Whirlpool property. The well was installed and developed in the same manner as injection wells described earlier in this report.

Aquifer testing was conducted during May 4 and 5, 2009. Initially, a series of three step tests was conducted over approximately 12 hours to assess the maximum flow rate which the aquifer could sustain while pumping over an extended period of time. Results from the step testing indicated that pumping rates of approximately 0.5 gal/min enabled a stable drawdown and sustainable rate of ground water extraction over a longer period of time. These results are shown in Figure 6. A significant rain event occurred during the aquifer test, which led to a substantial amount of uncertainty in the water level data.

Following step testing, an aquifer pumping test was performed using well RW-69. Two nearby monitor wells (MW-70 and MW-71) were used as primary observation wells. Field personnel used a combination of electronic dataloggers with transducers and manual water level indicators to record depth-to-ground water levels over a 38.5-hour monitoring period. Data from the pumping well and two observation wells approximately 10 and 15-feet north of RW-69 were evaluated to assess aquifer characteristics.

*Performance Evaluation*

Performance monitoring during the pumping test was conducted in accordance with the Work Plan including:

- Periodic water level gauging of selected wells to assess the change in ground water flow resulting from the extraction of ground water;

***Ground Water Pumping Results***

Evaluation of the ground water level data from observation wells over the limited duration of the pumping test suggest that the approximate area of influence related to pumping may be as much as 45 feet (Figure 7). A more quantitative evaluation of distant drawdown relationships was not possible due to the significant noise in the data caused by heavy rainfall and barometric changes during the test. Pumping test and recovery test data were input into Aqtesolv software to assess aquifer parameters such as hydraulic conductivity and specificity. Output from the Aqtesolv analyses are presented in Attachment 2. The hydraulic conductivity of the aquifer is estimated from $5.3 \times 10^{-3}$ cm/second to $8.1 \times 10^{-3}$ cm/second generally similar to results from a test conducted at well MW-35R in 2006.

***Conclusion and Path Forward***

ORP data, visual observations, and analytical data collected during Phase 1 of the IM suggest that ISCO treatments are very effective at the site where treatment is applied. The area over which the treatment is effective, however, appears to be highly dependent on local lithology and static ground water flow gradients. Based on the evaluation of ISCO performance data, permanganate has not migrated a measurable distance away from treatment wells over the three-month evaluation period.

Evaluation of aquifer test data indicated hydraulic conductivity ranges from $5.3 \times 10^{-3}$ cm/second to $8.1 \times 10^{-3}$ cm/second and the potential radius of influence of the recovery well is approximately 45 feet. These data indicate that ground water pumping at the well RW-69 could be a viable option for inducing a gradient at the site to help move ISCO reagents through the formation to reach untreated portions of the aquifer.

IM performance monitoring is ongoing. If the aquifer remains stagnant and permanganate does not move adequately through the core of the plume, the second phase of the IM will be initiated. As indicated in the IM Work Plan, the second phase may involve ground water pumping to induce gradients in the aquifer and effect movement of the permanganate into untreated portions of the plume. A schedule for further IM implementation is included in Table 4.

Should you have any questions, please contact us.

Sincerely,

Environmental Resources Management Southwest, Inc.

Troy W. Meinen

Ronald T. Grimes, P.E.

TWM/skd

Attachments

cc: Robert J. Karwowski, Whirlpool Corporation
Jerry Scott Horton, Whirlpool Corporation
H. Reiffert Hedgcoxe, Environmental Resources Management Southwest, Inc.

# Tables

*January 12, 2010*
*Project No. 0097932*

**Environmental Resources Management Southwest, Inc.**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

TABLE 1

Well Construction Details
Interim Measure Field Activities
Fort Smith, Arkansas

| Well Identification | Well Location Coordinates (WGS84) X (E) | Y (N) | Surface Elevation (ft) | Top of PVC Casing Elevation (ft) | Total Well Depth (ft) | Total Borehole Depth (ft) | Elevation Bottom of Hole (ft asl) (1) | Well Screen Length Interval (ft) | Top of Well Screen Elevation (2) (ft asl) |
|---|---|---|---|---|---|---|---|---|---|
| **IW-72** | 35.3240 | -94.4180 | 472.2 | 471.65 | 25.00 | 27.50 | 447.200 | 15.0-25.0 | 468.700 |
| **IW-73 *** | 7899.91 | 9575.14 | 472.1 | 471.48 | 25.00 | 27.50 | 447.100 | 15.0-25.0 | 468.600 |
| **IW-74** | 35.3240 | -94.4180 | 472.3 | 472.06 | 25.50 | 28.00 | 446.800 | 15.0-25.0 | 468.800 |
| **IW-75 *** | 7905.94 | 9676.85 | 472.8 | 472.17 | 25.00 | 27.50 | 447.800 | 15.0-25.0 | 469.300 |
| **IW-76 *** | 7895.32 | 9498.35 | 473.2 | 472.26 | 27.00 | 29.50 | 446.200 | 17.0-27.0 | 469.700 |
| **IW-77** | 35.3230 | -94.4180 | 473.8 | 473.01 | 27.50 | 30.00 | 446.300 | 17.5-27.5 | 470.300 |
| **IW-78 *** | 7834.62 | 9406.82 | 474.2 | 473.49 | 27.50 | 30.00 | 446.700 | 17.5-27.5 | 470.700 |
| **IW-79 *** | 7868.25 | 9405.70 | 474.1 | 473.84 | 27.50 | 30.00 | 446.600 | 17.5-27.5 | 470.600 |
| **IW-80** | 35.3240 | -94.4180 | 473.7 | 473.30 | 27.50 | 30.00 | 446.200 | 17.5-27.5 | 470.200 |
| **MW-68** | 35.3250 | -94.4170 | 470.0 | 469.81 | 24.00 | 24.00 | 446.000 | 14.0-24.0 | 466.500 |
| **MW-70 *** | 7998.72 | 9761.84 | 471.7 | 471.53 | 25.00 | 27.50 | 446.700 | 15.0-25.0 | 468.200 |
| **MW-71 *** | 7997.73 | 9772.17 | 471.5 | 471.35 | 25.00 | 27.50 | 446.500 | 15.0-25.0 | 468.000 |
| **RW-69** | 35.3250 | -94.4180 | 471.5 | 471.25 | 25.00 | 26.00 | 446.500 | 15.0-25.0 | 468.000 |

NOTES:

Well screen slot size for all listed wells is 0.01 inches.
* - Coordinates were calculated from the northwest corner of the facility in a site-specific coordinate system.
(1) Surface Elevation minus Total Well Depth.
(2) Surface Elevation minus depth to Top of the Well Screen.

TABLE 2

Phase 1 - ISCO Treatment

Fort Smith Interim Measure
Whirlpool

**April 2009 ISCO Treatment (Event #1)**

| Well ID | Date | Start Time | End Time | Pressure (PSI) | Volume Injected (gal) |
|---|---|---|---|---|---|
| *Off-Site Areas* | | | | | |
| MW-72 | Well not used for injected during April Event | | | | |
| MW-73 | 4/30/2009 | 9:55 | 10:07 | <5.0 | 90 |
| MW-74 | 5/1/2009 | 9:10 | 13:00 | <5.0 | 55 |
| MW-75 | 4/29/2009 | 12:35 | | <5.0 | 90 |
| MW-76 | Well not used for injected during April Event | | | | |
| MW-78 | 4/30/2009 | 12:51 | 13:09 | 4.0 | 90 |
| MW-79 | 4/30/2009 | 12:43 | 17:25 | 0.0 | 120 |
| MW-80 | Well not used for injected during April Event | | | | |

**July 2009 ISCO Treatment (Event #1)**

| Well ID | Date | Start Time | End Time | Pressure (PSI) | Volume Injected (gal) |
|---|---|---|---|---|---|
| *Off-Site Areas* | | | | | |
| MW-72 | 7/30/2009 | 1500 | 1729 | ~5 | 90 |
| MW-73 | 7/29/2009 | 1550 | 1605 | ~4 | 90 |
| MW-74 | 7/30/2009 | 1136 | 1225 | ~5 | 90 |
| MW-75 | 7/29/2009 | 1050 | 1650 | Gravity | 90 |
| MW-76 | 7/29/2009 | 1610 | 1625 | ~4 | 30 |
| MW-78 | 7/28/2009 | 1625 | 1636 | ~4.5 | 90 |
| MW-79 | 7/28/2009 | 1639 | 1641 | 0 | 90 |
| MW-80 | 7/30/2009 | 1106 | 1125 | ~5 | 90 |

TABLE 3

Trichloroethene (TCE) Concentrations in the Vicinity of Treatment Wells
Pre- and Post- ISCO

Fort Smith Interim Measure
Whirlpool

| Well ID | Pre-ISCO April 2009 | Post ISCO October 2009 |
|---|---|---|
| IW-77 | 0.57 | 0.380 |
| MW-32 | 0.047 | 0.068 |
| MW-33 | 1.2 | 1.2 |
| MW-41 | 0.66 | 0.18 |
| MW-46R | 0.46 | 0.39 |

NOTES:

1. TCE concentrations reported in mg/L.
2. NS - Not Sampled due to presence of unreacted permanganate.

# TABLE 4

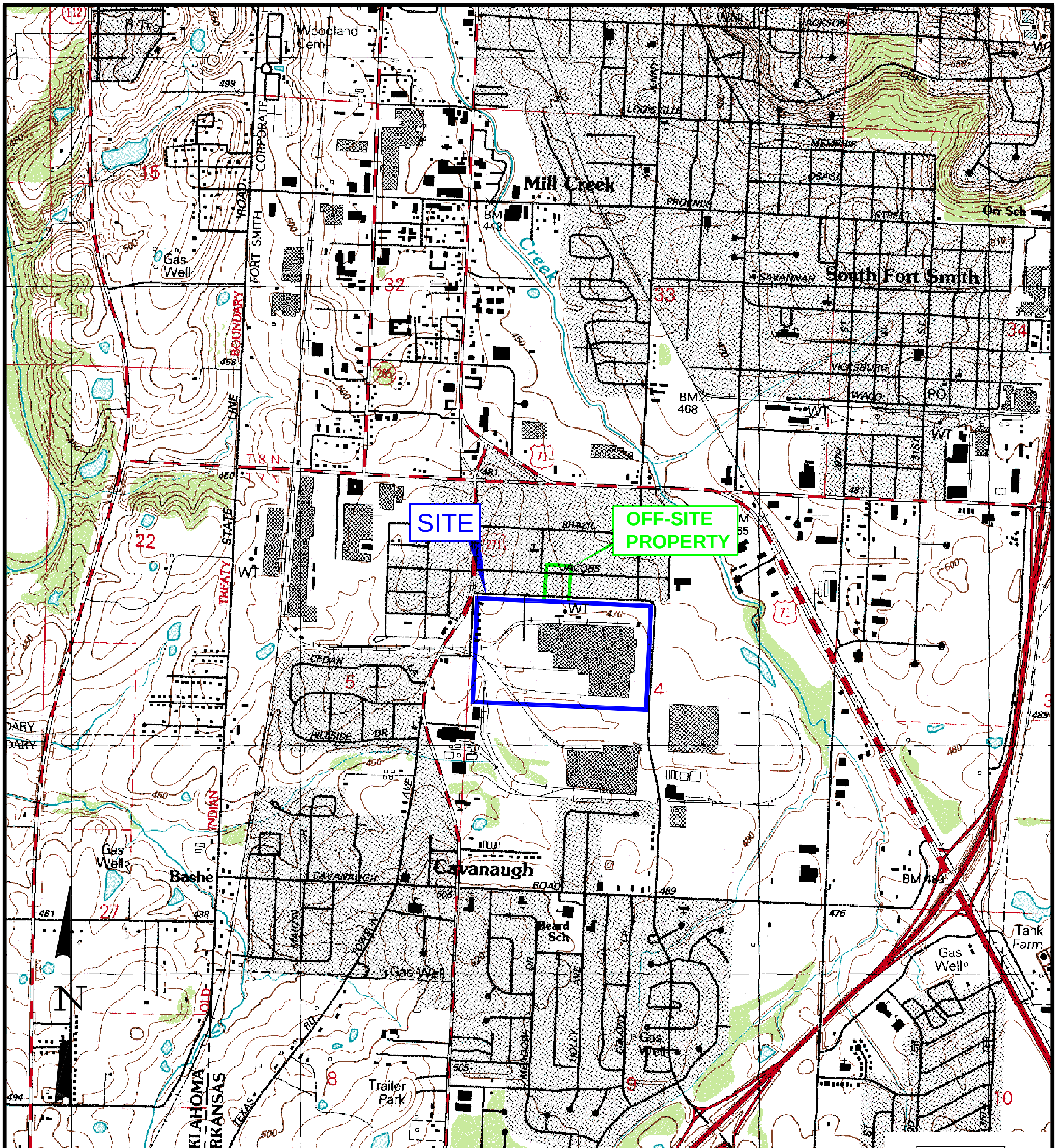
## IM Phase 2 Implementation Schedule

| Activity | Time Period |
|---|---|
| IM Pumping Well Design | First Quarter 2010 |
| IM Pumping Well Installation | Second Quarter 2010 |
| ISCO Treatments (if needed) | Second Quarter 2010/Third Quarter 2010 |
| IM Evaluation | First Quarter 2011 |

# Figures

*January 12, 2010*
*Project No. 0097932*

**Environmental Resources Management Southwest, Inc.**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000




0 2000 4000

SCALE FEET


QUADRANGLE LOCATION

SOURCE: U.S.G.S. 7.5' QUADRANGLE, SOUTH FORT SMITH, ARK.-OKLA., (o35094C4) 1987.

**Environmental Resources Management**

| | | |
|---|---|---|
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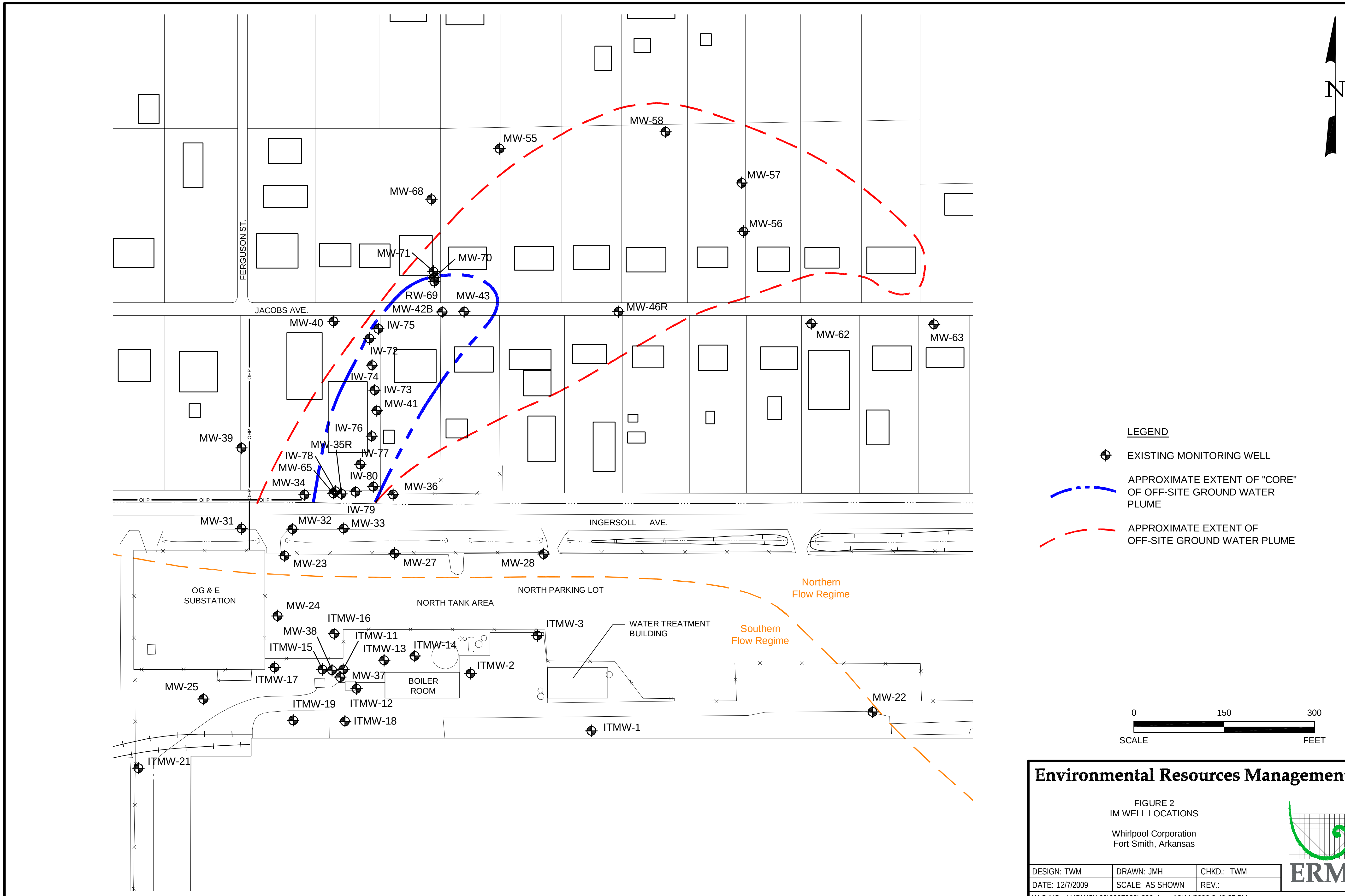
| PROJ. NO.: H:\DWG\K09\0097933A2.dwg , 12/11/2009 2:35:31 PM | | |

FIGURE 1
SITE LOCATION MAP
Whirlpool Corporation
Fort Smith, Arkansas

ERM




**Environmental Resources Management**

FIGURE 2
IM WELL LOCATIONS

Whirlpool Corporation
Fort Smith, Arkansas

ERM

| DESIGN: TWM | DRAWN: JMH | CHKD.: TWM |
|---|---|---|
| DATE: 12/7/2009 | SCALE: AS SHOWN | REV.: |

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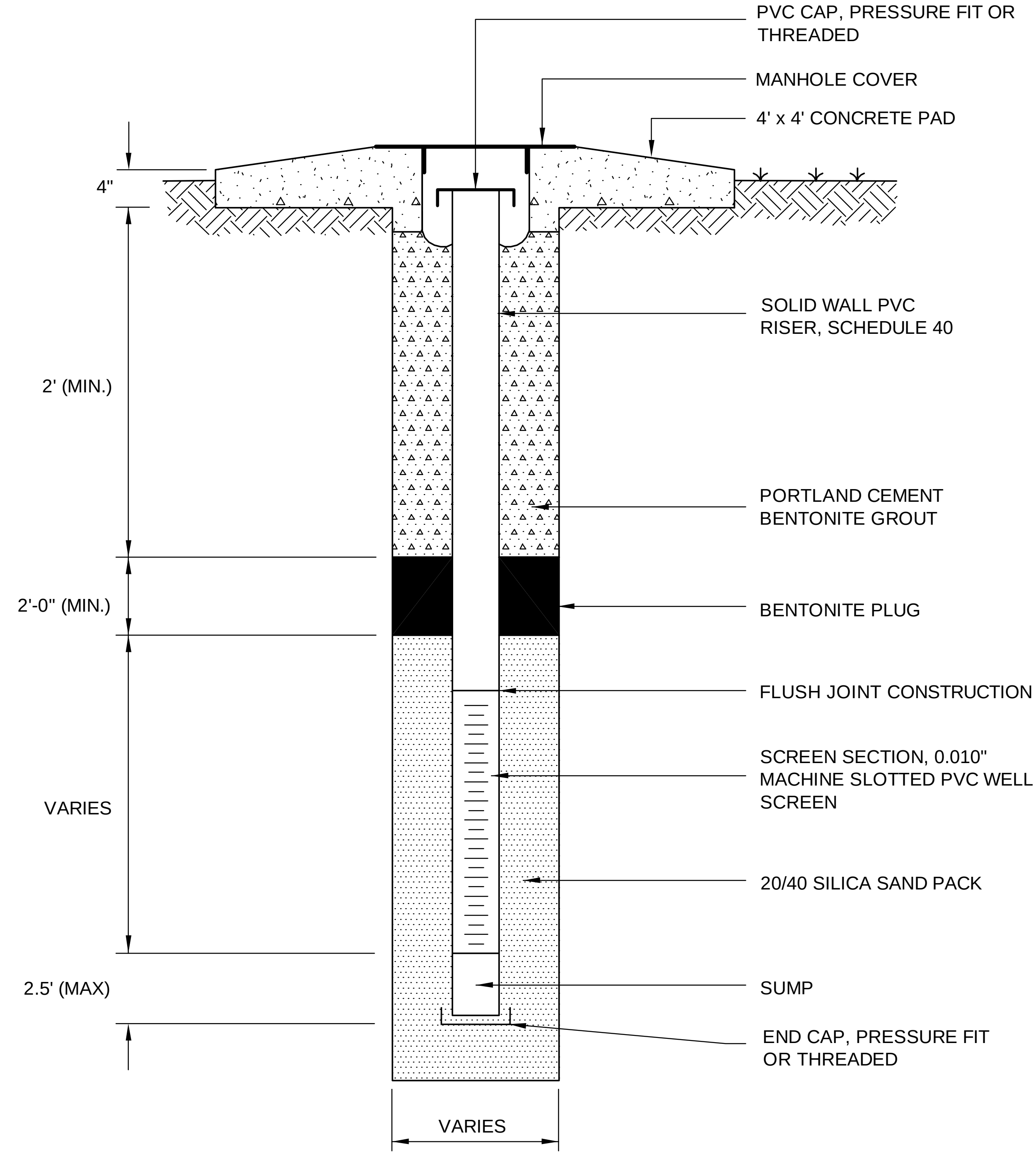


NOT TO SCALE

| Environmental Resources Management | | | FIGURE 3<br>TYPICAL CONSTRUCTION WELL<br>COMPLETED BELOW GRADE<br>Whirlpool Corporation<br>Fort Smith, Arkansas | ERM |
|---|---|---|---|---|
| DESIGN: | DRAWN: | CHKD.: | | |
| DATE: 11/23/2009 | SCALE: AS SHOWN | REV.: | | |
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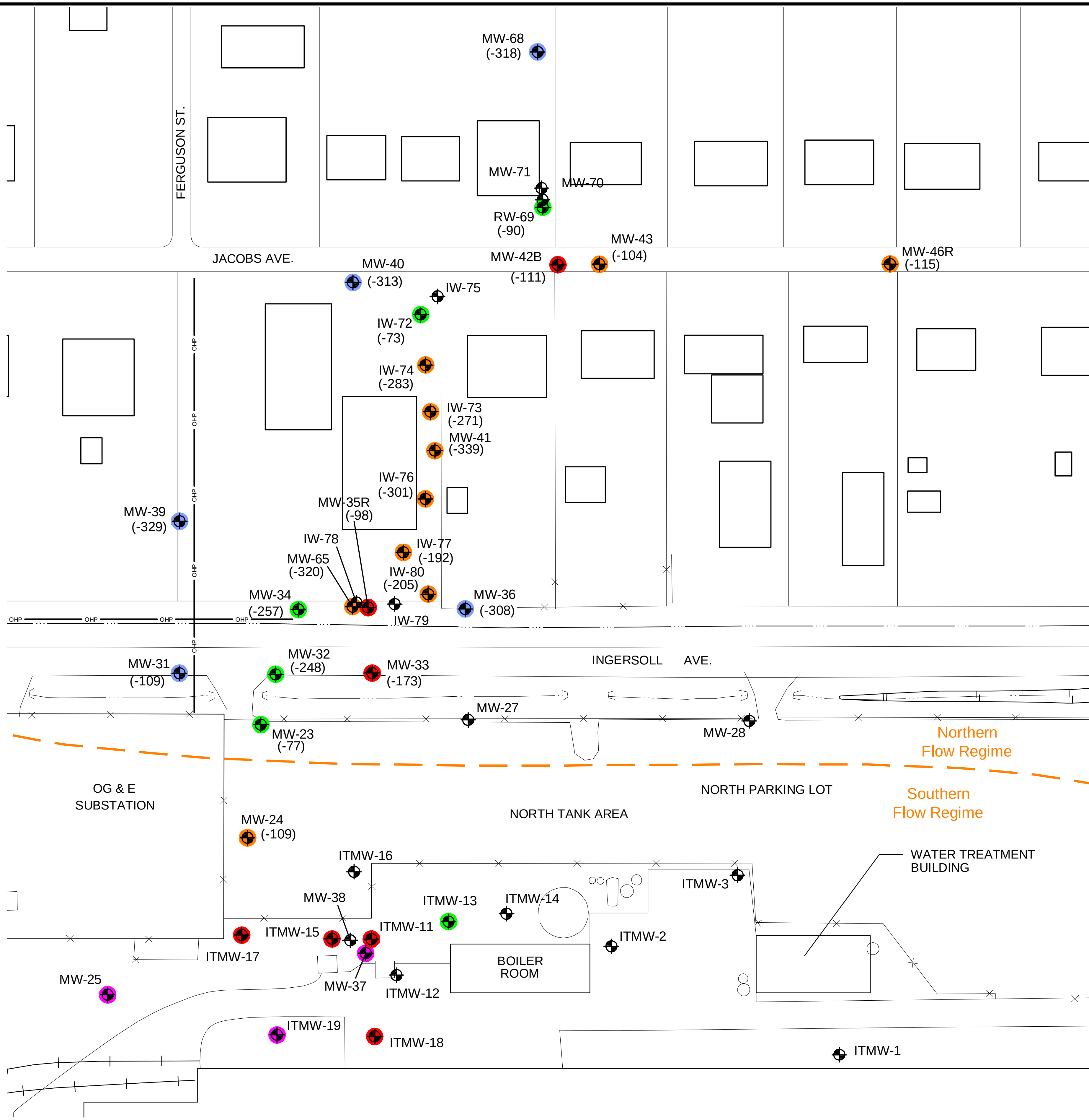


LEGEND

EXISTING MONITORING WELL

(-73) ORP READING (mV)

TCE CONCENTRATION (mg/l)
APRIL 2009

- < 0.005
- 0.005 to 0.10
- 0.10 to 1.00
- 1.00 to 10.0
- > 10.0

NOTE:

WELLS WITHOUT ANY COLOR WERE NOT SAMPLED DURING THE APRIL SAMPLING EVENT.

0 100 200
SCALE FEET

**Environmental Resources Management**

FIGURE 4
SPRING TCE ISOCONCENTRATION MAP
APRIL 2009
Whirlpool Corporation
Fort Smith, Arkansas

| DESIGN: TWM | DRAWN: JMH/RLM | CHKD.: TWM |
|---|---|---|
| DATE: 12/11/2009 | SCALE: AS SHOWN | REV.: |

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ERM

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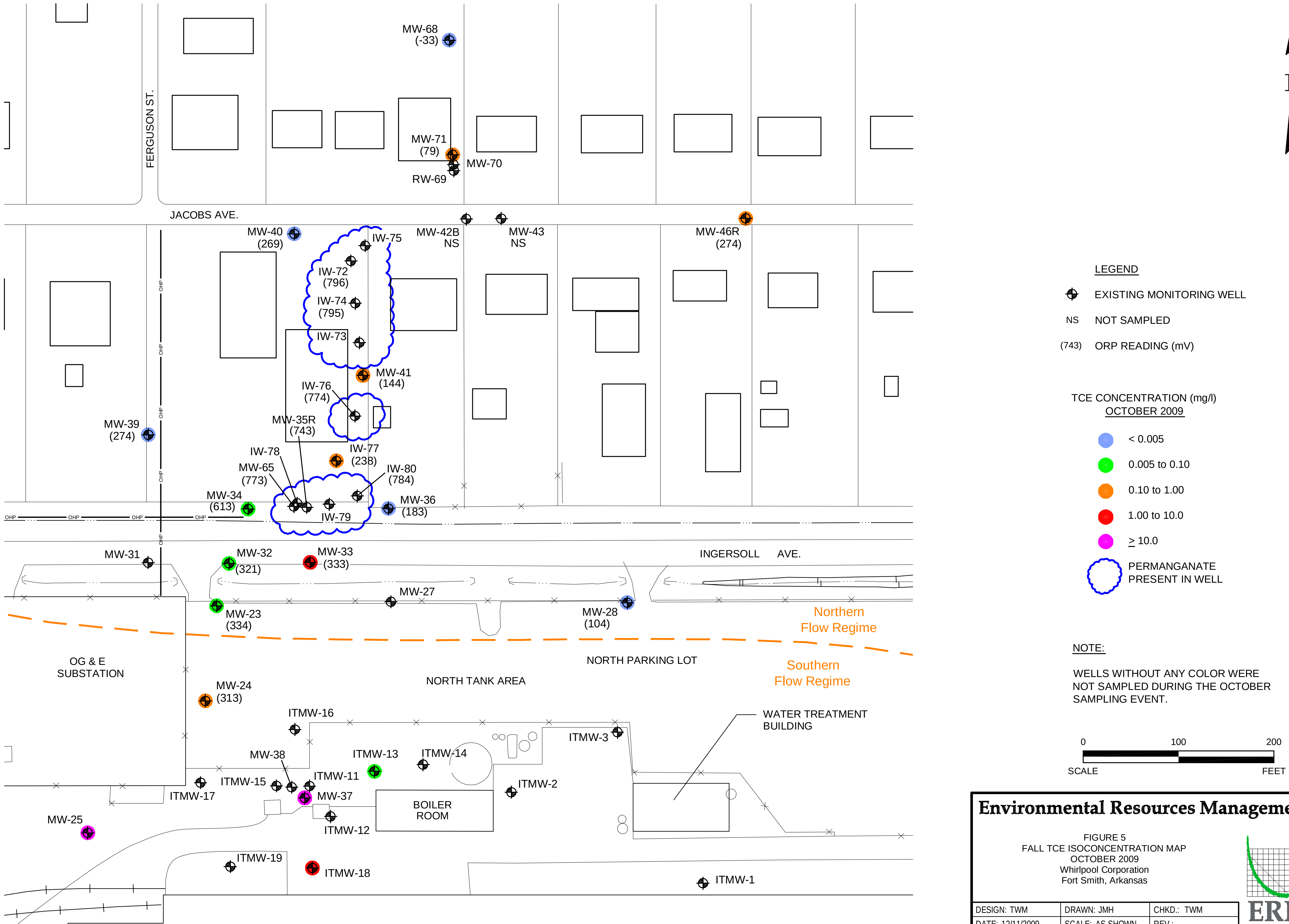



LEGEND

EXISTING MONITORING WELL

NS NOT SAMPLED

(743) ORP READING (mV)

TCE CONCENTRATION (mg/l)
OCTOBER 2009

< 0.005

0.005 to 0.10

0.10 to 1.00

1.00 to 10.0

$\geq$ 10.0

PERMANGANATE PRESENT IN WELL

NOTE:

WELLS WITHOUT ANY COLOR WERE NOT SAMPLED DURING THE OCTOBER SAMPLING EVENT.

0 100 200

SCALE FEET

**Environmental Resources Management**

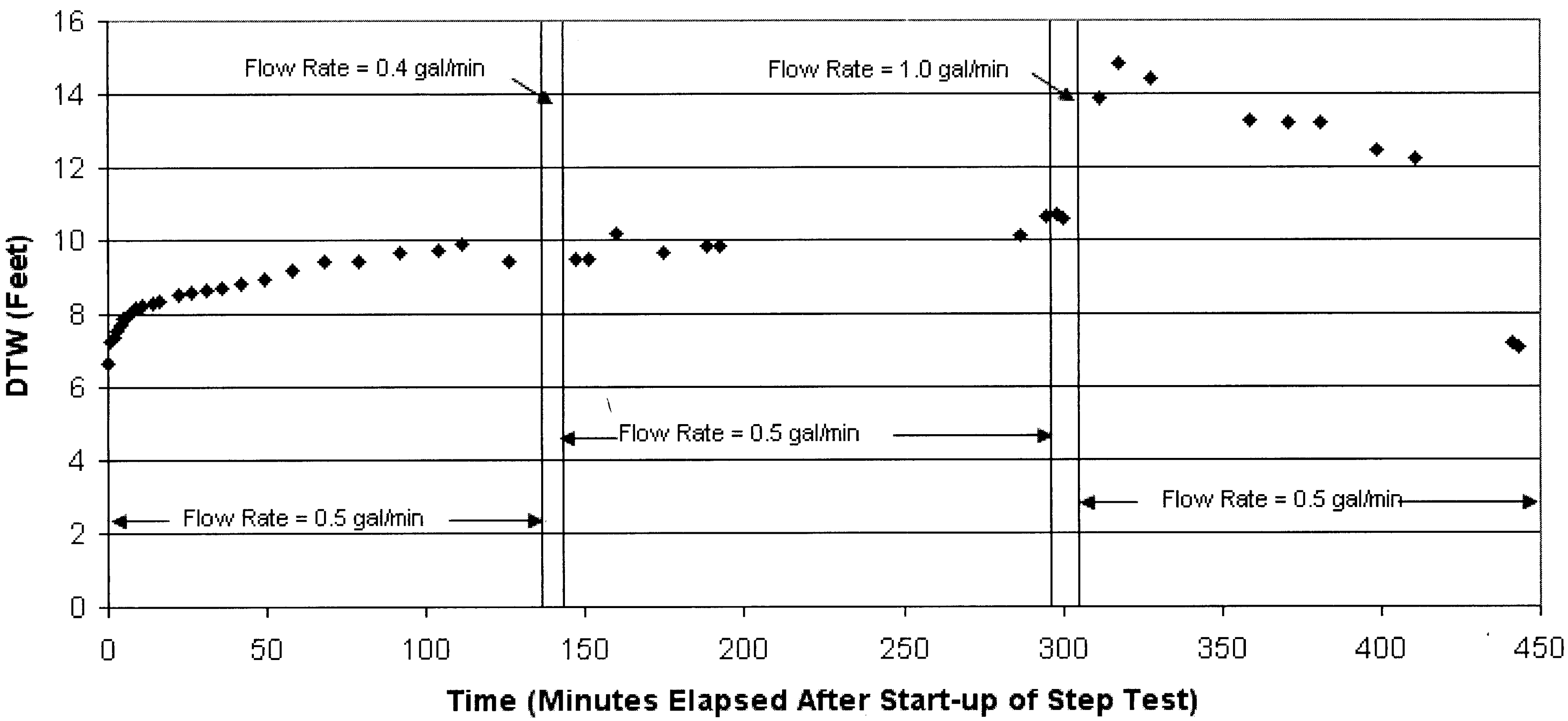
FIGURE 5
FALL TCE ISOCONCENTRATION MAP
OCTOBER 2009
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| | | |
|---|---|---|
| DESIGN: TWM | DRAWN: JMH | CHKD.: TWM |
| DATE: 12/11/2009 | SCALE: AS SHOWN | REV.: |

W.O.NO.: H:\DWG\L09\0097933b205.dwg, 12/11/2009 2:40:18 PM

g:\2010\0097932\14249H(figs).pdf




ERM-Southwest, Inc. TX PE Firm No. 2393

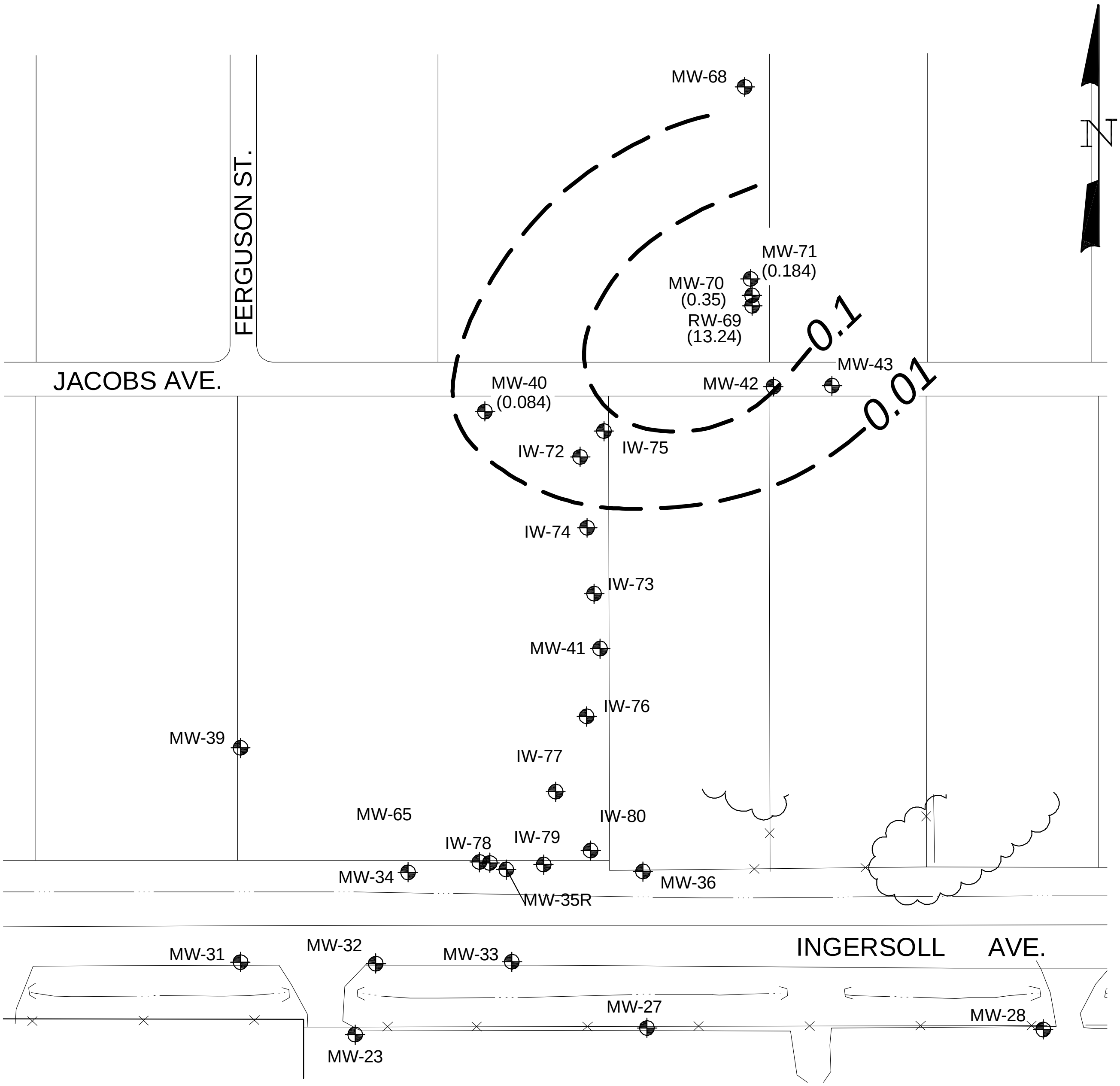
**Environmental Resources Management**

| DESIGN: CH | DRAWN: RLM | CHKD.: CH |
|---|---|---|
| DATE: 12/10/2009 | SCALE: AS SHOWN | REV.: |
| W.O. NO.: H:\DWG\L09\0097933A1.dwg, 12/10/2009 3:20:42 PM | | |

FIGURE 6
RW-69 STEP TEST
MAY 2009

Whirlpool Corporation
Fort Smith, Arkansas

ERM




NOTE: DRAWDOWN CORRECTED FOR CHANGES IN ATMOSPHERIC PRESSURE

0 100 200

SCALE FEET

**LEGEND**

MONITOR WELLS

(0.35) MAXIMUM OBSERVED CORRECTED DRAWDOWN

ERM-Southwest, Inc. TX PE Firm No. 2393

**Environmental Resources Management**

| | | |
|---|---|---|
| DESIGN: TWM | DRAWN: RLM | CHKD.: |
| DATE: 12/11/2009 | SCALE: AS SHOWN | REV.: |
| W.O. NO.: H:\DWG\L09\0097933A001.dwg, 12/11/2009 2:40:01 PM | | |

FIGURE 7
OBSERVED DRAWDOWN: RW-69 PUMPING TEST
Whirlpool Corporation
Fort Smith, Arkansas

ERM

# Boring Logs

*Attachment 1*

*January 12, 2010*
*Project No. 0097932*

**Environmental Resources Management Southwest, Inc.**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

ERM Environmental Resources Management

# IW-72
# DRILLING LOG

Proj. No. 0079781 Boring/Well ID IW-72 Date Drilled 1/8/2009

Project Whirlpool Injection Wells Owner Scott Horton

Location Fort Smith, Arkansas Boring T.D. 27.5 ' Boring Diam. 6.6 "

N. Coord. 35.324 ' E. Coord. -94.418 Surface Elevation 466 ' ft. MSL Datum

Screen: Type Schedule 40 PVC Diam. 2 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 2 " Length 16 ' Sump Length 2.5 '

Top of Casing Elevation 466 ' Stickup 0 '

Depth to Water: 1. Ft. 8.09 ( ) 2. Ft. 0 ( )

Drilling Company Lewis Drilling Driller Zane Ruffen

Drilling Method Hollow Stem Auger Log By Betsy Zunk

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 466 | 0 | | | | | 0-6 | 0-6 | NOT SAMPLED |
| 464 | 2 | | | | | | | |
| 462 | 4 | | | | | | | |
| 460 | 6 | | | | 0.0 | 6-8 | 6-8 | SILTY CLAY: Light gray with yellowish red mottling, moist, slightly plastic to slightly crumbly, minor sand content, abundant roots. |
| 458 | 8 | | | | 0.0 | 8-10 | 8-10 | SILTY CLAY: Light gray to yellowish red, moist, slightly plastic to slightly crumbly, occasional quarter inch gravel. At 9 feet - Black mottling. |
| 456 | 10 | | | | | | | |

ERM Environmental Resources Management

# IW-72
# DRILLING LOG

Proj. No. 0079781 Boring/Well ID IW-72 Date Drilled 1/8/2009

Project Whirlpool Injection Wells Owner Scott Horton

Location Fort Smith, Arkansas Boring T.D. 27.5 ' Boring Diam. 6.6 "

N. Coord. 35.324 ' E. Coord. -94.418 Surface Elevation 466 ' ft. MSL Datum

Screen: Type Schedule 40 PVC Diam. 2 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 2 " Length 16 ' Sump Length 2.5 '

Top of Casing Elevation 466 ' Stickup 0 '

Depth to Water: 1. Ft. 8.09 ( ) 2. Ft. 0 ( )

Drilling Company Lewis Drilling Driller Zane Ruffen

Drilling Method Hollow Stem Auger Log By Betsy Zunk

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 456 | 10 | | | | 0.0 | 10-12 | 10-12 | SILTY CLAY: Yellowish red, moist, slightly plastic to slightly crumbly with light gray sand pockets. |
| 454 | 12 | | | | 0.0 | 12-14 | 12-15 | CLAYEY SAND: Yellowish red, moist, slightly crumbly, black mottling along root traces with gray sand pockets. |
| 452 | 14 | | | | 0.0 | 14-16 | | |
| | | | | | | | 15-20 | SANDY SILTY CLAY: Light gray with yellowish red mottling, moist, slightly plastic. |
| 450 | 16 | | | | 0.0 | 16-18 | | At 16-17 feet - Black mottling along root traces. |
| 448 | 18 | | | | 0.0 | 18-20 | | |
| 446 | 20 | | | | | | | |

ERM Environmental Resources Management

# IW-72
# DRILLING LOG

Proj. No. 0079781 Boring/Well ID IW-72 Date Drilled 1/8/2009

Project Whirlpool Injection Wells Owner Scott Horton

Location Fort Smith, Arkansas Boring T.D. 27.5 ' Boring Diam. 6.6 "

N. Coord. 35.324 ' E. Coord. -94.418 Surface Elevation 466 ' ft. MSL Datum

Screen: Type Schedule 40 PVC Diam. 2 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 2 " Length 16 ' Sump Length 2.5 '

Top of Casing Elevation 466 ' Stickup 0 '

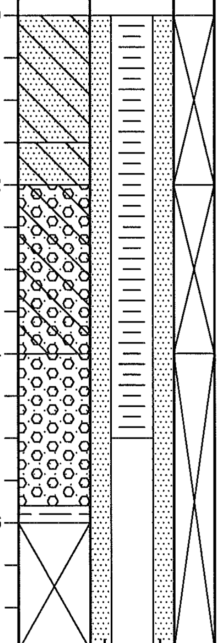
Depth to Water: 1. Ft. 8.09 ( ) 2. Ft. 0 ( )

Drilling Company Lewis Drilling Driller Zane Ruffen

Drilling Method Hollow Stem Auger Log By Betsy Zunk

SKETCH MAP

NOTES



| Elevation (Feet) | Depth (Feet) | OVM (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| 446 | 20 | 0.0 | 20-22 | 20-21.5 | SANDY CLAY: Light gray with black and yellowish red mottling, moist, slightly crumbly. |
| | | | | 21.5-22 | SANDY CLAY: Yellowish red, moist, slightly crumbly with occasional quarter inch gravel. |
| 444 | 22 | 0.0 | 22-24 | 22-24 | CLAYEY GRAVELLY SAND: Strong brown some red and light gray mottling, wet, crumbly, dense, clayey matrix. |
| 442 | 24 | 0.0 | 24-26 | 24-25.8 | GRAVELLY SAND: Strong brown, wet, slightly plastic to slightly crumbly, with occasional one inch diameter gravel. |
| | | | | 25.8-26 | CLAY-SHALE: Dark brown, weathered, fissil, wet, dense. |
| 440 | 26 | 0.0 | | | |
| | | | | | T.D. = 27.5 ' |
| 438 | 28 | | | | |
| 436 | 30 | | | | |

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ERM Environmental Resources Management

# IW-74
# DRILLING LOG

Proj. No. 0079781 Boring/Well ID IW-74 Date Drilled 1/9/2009

Project Whirlpool Injection Wells Owner Scott Horton

Location Fort Smith, Arkansas Boring T.D. 27.5 ' Boring Diam. 6.6 "

N. Coord. 35.324 ' E. Coord. -94.418 Surface Elevation 466 ' ft. MSL Datum

Screen: Type Schedule 40 PVC Diam. 4 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 4 " Length 16 ' Sump Length 2.5 '

Top of Casing Elevation 466 ' Stickup 0 '

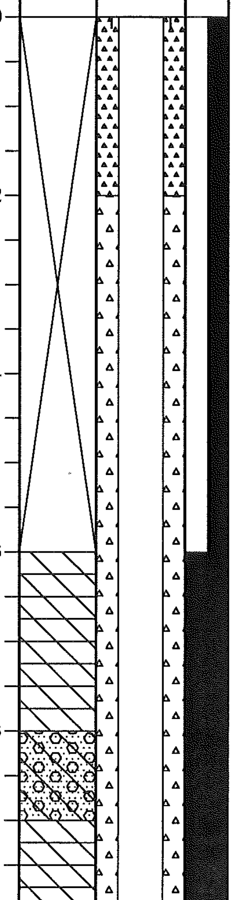
Depth to Water: 1. Ft. 8.11 ( ) 2. Ft. 0 ( )

Drilling Company Lewis Drilling Driller Rick Jones

Drilling Method Hollow Stem Auger Log By Betsy Zunk

SKETCH MAP

NOTES



| Elevation (Feet) | Depth (Feet) | OVM (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| 466 | 0 | | 0-6 | 0-6 | NOT SAMPLED |
| 464 | 2 | 0.0 | | | |
| 462 | 4 | 0.0 | | | |
| 460 | 6 | 0.0 | 6-8 | 6-8 | SILTY CLAY: Yellowish red with light gray and red mottling, moist, plastic, abundant roots. |
| 458 | 8 | 0.0 | 8-10 | 8-9 | GRAVELLY SANDY CLAY: Yellowish red, moist, slightly crumbly to slighty plastic with minor sand content, abundant roots and occasional red mottling. |
| | | | | 9-10 | SILTY CLAY: Yellowish red with light gray mottling with black mottling along root traces, moist, plastic, sandy clay pockets. |
| 456 | 10 | | | | |

ERM Environmental Resources Management

# IW-74
# DRILLING LOG

Proj. No. 0079781 Boring/Well ID IW-74 Date Drilled 1/9/2009

Project Whirlpool Injection Wells Owner Scott Horton

Location Fort Smith, Arkansas Boring T.D. 27.5 ' Boring Diam. 6.6 "

N. Coord. 35.324 ' E. Coord. -94.418 Surface Elevation 466 ' ft. MSL Datum

Screen: Type Schedule 40 PVC Diam. 4 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 4 " Length 16 ' Sump Length 2.5 '

Top of Casing Elevation 466 ' Stickup 0 '

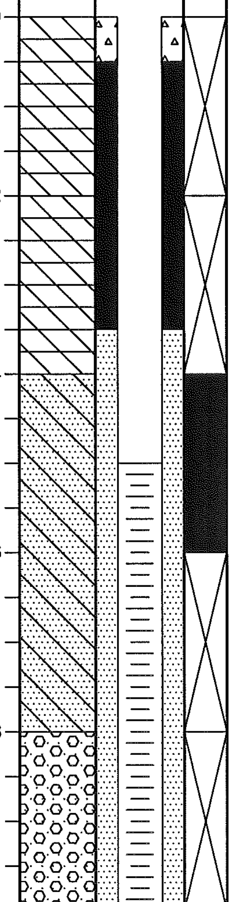
Depth to Water: 1. Ft. 8.11 ( ) 2. Ft. 0 ( )

Drilling Company Lewis Drilling Driller Rick Jones

Drilling Method Hollow Stem Auger Log By Betsy Zunk

SKETCH MAP

NOTES



| Elevation (Feet) | Depth (Feet) | OVM (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| 456 | 10 | 0.0 | 10-12 | 10-12 | SILTY CLAY: Strong brown with light gray to reddish yellow mottling, occasional black mottling along root traces, moist to saturated, dense, with gravel, sandy clay pockets. |
| 454 | 12 | 0.0 | 12-14 | 12-14 | SILTY CLAY: Light gray, moist, plastic, occasional quarter inch diameter gravel with minor sand content. |
| 452 | 14 | 0.0 | 14-16 | 14-18 | SANDY CLAY: Light gray with gray mottling, moist, slightly plastic. |
| 450 | 16 | 0.0 | 16-18 | | |
| 448 | 18 | 0.0 | 18-20 | 18-22 | GRAVELLY SAND: Strong brown, saturated, loose. |
| | | | | | At 19 to 19.5 feet - Light gray silty clay, saturated, plastic. |
| 446 | 20 | | | | |

ERM Environmental Resources Management

# IW-74
# DRILLING LOG

Proj. No. 0079781 Boring/Well ID IW-74 Date Drilled 1/9/2009

Project Whirlpool Injection Wells Owner Scott Horton

Location Fort Smith, Arkansas Boring T.D. 27.5 ' Boring Diam. 6.6 "

N. Coord. 35.324 ' E. Coord. -94.418 Surface Elevation 466 ' ft. MSL Datum

Screen: Type Schedule 40 PVC Diam. 4 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 4 " Length 16 ' Sump Length 2.5 '

Top of Casing Elevation 466 ' Stickup 0 '

Depth to Water: 1. Ft. 8.11 ( ) 2. Ft. 0 ( )

Drilling Company Lewis Drilling Driller Rick Jones

Drilling Method Hollow Stem Auger Log By Betsy Zunk

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 446 | 20 | | | | 0.0 | 20-22 | | |
| 444 | 22 | | | | 0.2 | 22-24 | 22-24 | SANDY GRAVEL: Strong brown, saturated, loose, darker gravel with depth, generally quarter inch diameter gravel with occasional one inch diameter gravel. |
| 442 | 24 | | | | 0.0 | 24-26 | 24-26 | GRAVELLY SAND: Strong brown, with abundant quarter inch diameter gravel and occasional 2 inch gravel, saturated, loose. |
| 440 | 26 | | | | 0.00 | 26-27 | 26-27 | SHALE: Strong brown to dark brown, weathered, fissil. |
| | | | | | | | | T.D. = 27.5 ' |
| 438 | 28 | | | | | | | |
| 436 | 30 | | | | | | | |

ERM Environmental Resources Management

# IW-77
# DRILLING LOG

| | | | | | |
|---|---|---|---|---|---|
| Proj. No. | 0079781 | Boring/Well ID | IW-77 | Date Drilled | 1/12/2009 |
| Project | Whirlpool Injection Wells | Owner | Scott Horton | | |
| Location | Fort Smith, Arkansas | Boring T.D. | 30 ' | Boring Diam. | 6.6 " |
| N. Coord. | 35.323 ' | E. Coord. | -94.418 | Surface Elevation | 466 ' ft. MSL Datum |

| | Type | Diam. | Length | | |
|---|---|---|---|---|---|
| Screen: | Schedule 40 PVC | 4 " | 10 ' | Slot Size | 0.01 " |
| Casing: | Schedule 40 PVC | 4 " | 19 ' | Sump Length | 2.5 ' |

Top of Casing Elevation 466 ' Stickup 0 '

Depth to Water: 1. Ft. 19.4 ( ) 2. Ft. 0 ( )

Drilling Company Lewis Drilling Driller Rick Jones

Drilling Method Hollow Stem Auger Log By Betsy Zunk

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 466 | 0 | | | | | 0-3 | 0-3 | NOT SAMPLED |
| 464 | 2 | | | | | | | |
| | | | | | 0.0 | 3-5 | 3-7 | SILTY CLAY: Light gray mottled with yellowish red and red mottling, moist, plastic with abundant roots, red mottling decreasing with depth. |
| 462 | 4 | | | | | | | |
| | | | | | 0.0 | 5-7 | | |
| 460 | 6 | | | | | | | At 6 feet - Light gray to gray. |
| | | | | | 0.0 | 7-9 | 7-9 | SILTY CLAY: Strong brown with small quartzite gravel, occasional black and light gray mottling, moist, plastic. |
| 458 | 8 | | | | | | | |
| | | | | | 0.0 | 9-11 | 9-11 | SILTY CLAY: Light reddish brown to strong brown mottled, with minimal sand content, occasional quarter inch quartzite gravel, moist, plastic to slightly crumbly. |
| 456 | 10 | | | | | | | |

ERM Environmental Resources Management

# IW-77
# DRILLING LOG

Proj. No. 0079781 Boring/Well ID IW-77 Date Drilled 1/12/2009

Project Whirlpool Injection Wells Owner Scott Horton

Location Fort Smith, Arkansas Boring T.D. 30 ' Boring Diam. 6.6 "

N. Coord. 35.323 ' E. Coord. -94.418 Surface Elevation 466 ' ft. MSL Datum

Screen: Type Schedule 40 PVC Diam. 4 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 4 " Length 19 ' Sump Length 2.5 '

Top of Casing Elevation 466 ' Stickup 0 '

Depth to Water: 1. Ft. 19.4 ( ) 2. Ft. 0 ( )

Drilling Company Lewis Drilling Driller Rick Jones

Drilling Method Hollow Stem Auger Log By Betsy Zunk

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 456 | 10 | | | | | | | |
| | | | | | 0.0 | 11-13 | 11-13 | SANDY CLAY: Strong brown with light reddish brown mottling, moist, slightly plastic, with black mottling along root traces. |
| 454 | 12 | | | | | | | |
| | | | | | 0.0 | 13-15 | 13-15 | SANDY CLAY: Reddish yellow, moist, slighty plastic to slightly crumbly, light gray silty clay pockets and black, mottling along root traces. |
| 452 | 14 | | | | | | | |
| | | | | | 0.0 | 15-17 | 15-19 | CLAYEY SAND TO SANDY CLAY: Light gray with strong brown mottling, moist, crumbly, with occasional roots. |
| 450 | 16 | | | | | | | |
| | | | | | 0.0 | 17-19 | | |
| 448 | 18 | | | | | | | |
| | | | | | 0.0 | 19-21 | 19-21 | GRAVELLY SAND: Strong brown, saturated, loose, occasional half inch diameter quartzite gravel, light gray silty clay pockets. |
| 446 | 20 | | | | | | | |

ERM Environmental Resources Management

# IW-77
# DRILLING LOG

Proj. No. 0079781 Boring/Well ID IW-77 Date Drilled 1/12/2009

Project Whirlpool Injection Wells Owner Scott Horton

Location Fort Smith, Arkansas Boring T.D. 30 ' Boring Diam. 6.6 "

N. Coord. 35.323 ' E. Coord. -94.418 Surface Elevation 466 ' ft. MSL Datum

Screen: Type Schedule 40 PVC Diam. 4 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 4 " Length 19 ' Sump Length 2.5 '

Top of Casing Elevation 466 ' Stickup 0 '

Depth to Water: 1. Ft. 19.4 ( ) 2. Ft. 0 ( )

Drilling Company Lewis Drilling Driller Rick Jones

Drilling Method Hollow Stem Auger Log By Betsy Zunk

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 446 | 20 | | | | | | | |
| | | | | | 0.0 | 21-23 | 21-28 | SANDY GRAVEL: Strong brown, occasional dark brown two inch diameter quartzite gravel, wet, dense. |
| 444 | 22 | | | | | | | |
| | | | | | 0.0 | 23-25 | | |
| 442 | 24 | | | | | | | |
| | | | | | 0.0 | 25-27 | | |
| 440 | 26 | | | | | | | |
| | | | | | 0.0 | 27-28.5 | | |
| 438 | 28 | | | | | | 28-28.5 | CLAY: Strong brown, weathered, moist, crumbly. |
| | | | | | 0.0 | | 28.5-29 | SHALE: Very dark brown, fissil, weathered. |
| | | | | | | | | T.D. = 30 ' |
| 436 | 30 | | | | | | | |

ERM Environmental Resources Management

# IW-80
# DRILLING LOG

Proj. No. 0079781 Boring/Well ID IW-80 Date Drilled 1/13/2009

Project Whirlpool Injection Wells Owner Scott Horton

Location Fort Smith, Arkansas Boring T.D. 30 ' Boring Diam. 6.6 "

N. Coord. 35.324 ' E. Coord. -94.418 Surface Elevation 466 ' ft. MSL Datum

Screen: Type Schedule 40 PVC Diam. 4 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 4 " Length 18 ' Sump Length 2.5 '

Top of Casing Elevation 466 ' Stickup 0 '

Depth to Water: 1. Ft. 0 ( ) 2. Ft. 0 ( )

Drilling Company Lewis Drilling Driller Rick Jones

Drilling Method Hollow Stem Auger Log By Betsy Zunk

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 466 | 0 | | | | | 0-15 | 0-15 | NOT SAMPLED |
| 464 | 2 | | | | | | | |
| 462 | 4 | | | | | | | |
| 460 | 6 | | | | | | | |
| 458 | 8 | | | | | | | |
| 456 | 10 | | | | | | | |

ERM Environmental Resources Management

# IW-80
# DRILLING LOG

Proj. No. 0079781 Boring/Well ID IW-80 Date Drilled 1/13/2009

Project Whirlpool Injection Wells Owner Scott Horton

Location Fort Smith, Arkansas Boring T.D. 30 ' Boring Diam. 6.6 "

N. Coord. 35.324 ' E. Coord. -94.418 Surface Elevation 466 ' ft. MSL Datum

Screen: Type Schedule 40 PVC Diam. 4 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 4 " Length 18 ' Sump Length 2.5 '

Top of Casing Elevation 466 ' Stickup 0 '

Depth to Water: 1. Ft. 0 ( ) 2. Ft. 0 ( )

Drilling Company Lewis Drilling Driller Rick Jones

Drilling Method Hollow Stem Auger Log By Betsy Zunk

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | OVM (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| 456 | 10 | | | | |
| 454 | 12 | | | | |
| 452 | 14 | | | | |
| | | 0.0 | 15-17 | 15-19 | SANDY SILTY CLAY: Light gray mottled with strong brown sandy clay pockets, moist, slightly plastic to slightly crumbly, with occasional roots. |
| 450 | 16 | 0.0 | | | |
| | | 0.1 | 17-19 | | At 17 feet - Wet and crumbly. |
| 448 | 18 | 0.0 | | | |
| | | 0.1 | 19-21 | 19-23 | GRAVELLY SAND: Strong brown, water saturated, loose, with occasional roots and occasional pinkish red quarter inch diameter quartzite gravel. |
| 446 | 20 | | | | |

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ERM Environmental Resources Management

# IW-80
# DRILLING LOG

Proj. No. 0079781 Boring/Well ID IW-80 Date Drilled 1/13/2009

Project Whirlpool Injection Wells Owner Scott Horton

Location Fort Smith, Arkansas Boring T.D. 30 ' Boring Diam. 6.6 "

N. Coord. 35.324 ' E. Coord. -94.418 Surface Elevation 466 ' ft. MSL Datum

Screen: Type Schedule 40 PVC Diam. 4 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 4 " Length 18 ' Sump Length 2.5 '

Top of Casing Elevation 466 ' Stickup 0 '

Depth to Water: 1. Ft. 0 ( ) 2. Ft. 0 ( )

Drilling Company Lewis Drilling Driller Rick Jones

Drilling Method Hollow Stem Auger Log By Betsy Zunk

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 446 | 20 | | | | | | | |
| | | | | | 0.0 | 21-23 | | |
| 444 | 22 | | | | 0.0 | | | |
| | | | | | 0.1 | 23-25 | 23-27 | GRAVELLY SAND: Strong brown, wet, loose. |
| 442 | 24 | | | | 0.0 | | | |
| | | | | | 0.1 | 25-27 | | At 25 feet - dense. |
| 440 | 26 | | | | 0.0 | | | |
| | | | | | 0.3 | 27-28 | 27-28 | CLAY: Strong brown, moist, plastic. |
| 438 | 28 | | | | 0.0 | | 28-28.2 | SHALE: Very dark gray, fissil. |
| 436 | 30 | | | | | | | T.D. = 30 ' |

ERM Environmental Resources Management

# MW-68
# DRILLING LOG

Proj. No. 0079781 Boring/Well ID MW-68 Date Drilled 1/6/2009

Project Whirlpool Injection Wells Owner Scott Horton

Location Fort Smith, Arkansas Boring T.D. 24 ' Boring Diam. 6.6 "

N. Coord. 35.325 ' E. Coord. -94.417 Surface Elevation 465.5 ' ft. MSL Datum

Screen: Type Schedule 40 PVC Diam. 2 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 2 " Length 14 ' Sump Length 0 '

Top of Casing Elevation 465.5 ' Stickup 0 '

Depth to Water: 1. Ft. 6.1 ( ) 2. Ft. 0 ( )

Drilling Company Lewis Drilling Driller Zane Ruffen

Drilling Method Hollow Stem Auger Log By Betsy Zunk

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 465.5 | 0 | | | | | 0-2 | 0-2.2 | SILTY CLAY: Reddish brown, damp to wet, soft slightly plastic, with abundant rootlets. |
| 464 | | | | | | | | |
| | 2 | | | | 2.6 | 2-4 | 2.2-4 | SILTY CLAY: Yellowish red with reddish brown mottling, occasional black mottling along root traces, moist, slightly plastic to slightly crumbly, and occasional quarter inch diameter quartzite gravel increasing with depth. |
| 462 | | | | | | | | |
| | 4 | | | | 2.1 | 4-6 | 4-6 | GRAVELLY CLAY: Yellowish red, moist, slightly crumbly with abundant half inch diameter quartzite gravel. |
| 460 | | | | | | | | |
| | 6 | | | | 0.6 | 6-8 | 6-12 | SILTY CLAY: Red brown, yellowish brown and black mottled, moist, slightly plastic to slightly crumbly with occasional root traces. |
| 458 | | | | | | | | |
| | 8 | | | | 1.7 | 8-10 | | At 9 to 10.5 feet - One inch sand pocket. |
| 456 | | | | | | | | |
| | 10 | | | | | | | |

ERM Environmental Resources Management

# MW-68 DRILLING LOG

| | | | | | |
|---|---|---|---|---|---|
| Proj. No. | 0079781 | Boring/Well ID | MW-68 | Date Drilled | 1/6/2009 |
| Project | Whirlpool Injection Wells | Owner | Scott Horton | | |
| Location | Fort Smith, Arkansas | Boring T.D. | 24 ' | Boring Diam. | 6.6 " |
| N. Coord. | 35.325 ' | E. Coord. | -94.417 | Surface Elevation | 465.5 ' ft. MSL Datum |

Screen: Type Schedule 40 PVC Diam. 2 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 2 " Length 14 ' Sump Length 0 '

Top of Casing Elevation 465.5 ' Stickup 0 '

Depth to Water: 1. Ft. 6.1 ( ) 2. Ft. 0 ( )

Drilling Company Lewis Drilling Driller Zane Ruffen

Drilling Method Hollow Stem Auger Log By Betsy Zunk

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| | 10 | | | | 1.6 | 10-12 | | |
| 454 | | | | | | | | |
| | 12 | | | | 2.7 | 12-14 | 12-16 | SANDY CLAY: Yellowish red to reddish brown mottled, moist, slightly plastic to slightly crumbly some black mottling, black root traces decreasing with depth. |
| 452 | | | | | | | | |
| | 14 | | | | 2.2 | 14-16 | | |
| | | | | | | | | At 16 feet - half inch silty sand pocket. |
| 450 | | | | | | | | |
| | 16 | | | | 4.6 | 16-18 | 16-20 | SILTY SANDY CLAY: Yellowish red silty sandy clay, slightly plasitc to slightly crumbly, pockets of moist light gray silty sandy clay with higher sand content. |
| 448 | | | | | | | | |
| | 18 | | | | 2.3 | 18-20 | | |
| 446 | | | | | | | | |
| | 20 | | | | | | | |

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ERM Environmental Resources Management

# MW-68 DRILLING LOG

| | | | |
|---|---|---|---|
| Proj. No. 0079781 | Boring/Well ID MW-68 | Date Drilled 1/6/2009 | |
| Project Whirlpool Injection Wells | Owner Scott Horton | | |
| Location Fort Smith, Arkansas | Boring T.D. 24 ' | Boring Diam. 6.6 " | |
| N. Coord. 35.325 ' | E. Coord. -94.417 | Surface Elevation 465.5 ' | ft. MSL Datum |
| Screen: Type Schedule 40 PVC | Diam. 2 " | Length 10 ' | Slot Size 0.01 " |
| Casing: Type Schedule 40 PVC | Diam. 2 " | Length 14 ' | Sump Length 0 ' |
| Top of Casing Elevation 465.5 ' | | Stickup 0 ' | |
| Depth to Water: 1. Ft. 6.1 ( ) | 2. Ft. 0 ( ) | | |
| Drilling Company Lewis Drilling | Driller Zane Ruffen | | |
| Drilling Method Hollow Stem Auger | Log By Betsy Zunk | | |

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| | 20 | | | | 3.8 | 20-22 | 20-22 | NO RECOVERY |
| 444 | 22 | | | | 0 | 22-24 | 22-23.5 | GRAVELLY SAND: Yellowish brown quarter inch diameter quartzite gravel, water saturated, and loose. |
| 442 | | | | | | | 23.5-24 | SHALE: Very dark brown weathered shale, hard, fissil. T.D. = 24 ' |
| | 24 | | | | | | | |
| 440 | 26 | | | | | | | |
| 438 | 28 | | | | | | | |
| 436 | 30 | | | | | | | |

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ERM Environmental Resources Management

# RW-69
# DRILLING LOG

Proj. No. 0079781 Boring/Well ID RW-69 Date Drilled 1/7/2009

Project Whirlpool Injection Wells Owner Scott Horton

Location Fort Smith, Arkansas Boring T.D. 26 ' Boring Diam. 8.6 "

N. Coord. 35.325 ' E. Coord. -94.418 Surface Elevation 466 ' ft. MSL Datum

Screen: Type Schedule 40 PVC Diam. 4 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 4 " Length 16 ' Sump Length 2.5 '

Top of Casing Elevation 466 ' Stickup 0 '

Depth to Water: 1. Ft. 7.04 ( ) 2. Ft. 0 ( )

Drilling Company Lewis Drilling Driller Zane Ruffen

Drilling Method Hollow Stem Auger Log By Betsy Zunk

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 466 | 0 | | | | | 0-2 | 0-4 | SILTY CLAY: Dark reddish brown, moist, plastic, with abundant roots. |
| 464 | 2 | | | | 0.0 | 2-4 | | |
| 462 | 4 | | | | 0.0 | 4-6 | 4-6 | SILTY CLAY: Yellowish red to reddish brown mottled, moist, slightly plastic to slightly crumbly, occasional quarter inch diameter quartzite gravel with abundant roots at 4 feet. |
| 460 | 6 | | | | 0.0 | 6-8 | 6-10 | SILTY CLAY: Yellowish red with light gray mottling, moist, slightly crumbly to slightly plastic. |
| 458 | 8 | | | | 0.0 | 8-10 | | |
| 456 | 10 | | | | | | | |

**ERM** Environmental Resources Management

# RW-69
# DRILLING LOG

Proj. No. 0079781 Boring/Well ID RW-69 Date Drilled 1/7/2009

Project Whirlpool Injection Wells Owner Scott Horton

Location Fort Smith, Arkansas Boring T.D. 26 ' Boring Diam. 8.6 "

N. Coord. 35.325 ' E. Coord. -94.418 Surface Elevation 466 ' ft. MSL Datum

Screen: Type Schedule 40 PVC Diam. 4 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 4 " Length 16 ' Sump Length 2.5 '

Top of Casing Elevation 466 ' Stickup 0 '

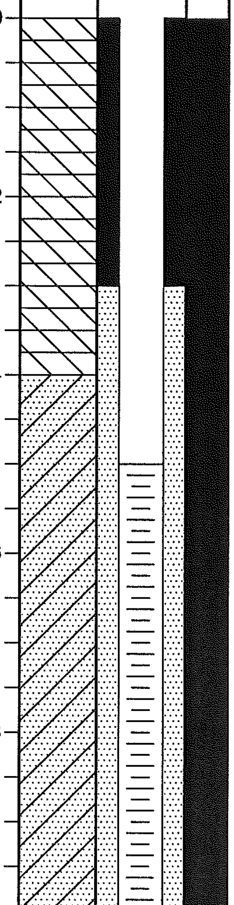
Depth to Water: 1. Ft. 7.04 ( ) 2. Ft. 0 ( )

Drilling Company Lewis Drilling Driller Zane Ruffen

Drilling Method Hollow Stem Auger Log By Betsy Zunk

SKETCH MAP

NOTES



| Elevation (Feet) | Depth (Feet) | OVM (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| 456 | 10 | 0.0 | 10-12 | 10-14 | SILTY CLAY: Reddish yellow, moist, slightly plastic with pockets of light gray, with higher sand concentrations increasing with depth. |
| 454 | 12 | 0.0 | 12-14 | | |
| 452 | 14 | 0.0 | 14-16 | 14-20 | CLAYEY SAND: Light gray, moist, slightly plastic to slightly crumbly with pockets of yellowish red silty clay. |
| 450 | 16 | 0.0 | 16-18 | | |
| 448 | 18 | 0.0 | 18-20 | | At 18 feet - Black mottling along root traces. |
| 446 | 20 | | | | |

ERM Environmental Resources Management

# RW-69
# DRILLING LOG

Proj. No. 0079781 Boring/Well ID RW-69 Date Drilled 1/7/2009

Project Whirlpool Injection Wells Owner Scott Horton

Location Fort Smith, Arkansas Boring T.D. 26 ' Boring Diam. 8.6 "

N. Coord. 35.325 ' E. Coord. -94.418 Surface Elevation 466 ' ft. MSL Datum

Screen: Type Schedule 40 PVC Diam. 4 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 4 " Length 16 ' Sump Length 2.5 '

Top of Casing Elevation 466 ' Stickup 0 '

Depth to Water: 1. Ft. 7.04 ( ) 2. Ft. 0 ( )

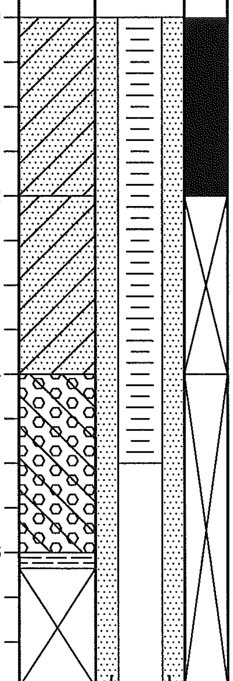
Drilling Company Lewis Drilling Driller Zane Ruffen

Drilling Method Hollow Stem Auger Log By Betsy Zunk

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 446 | 20 | | | | 0.0 | 20-22 | 20-22 | CLAYEY SAND: Light gray with yellowish red mottling, moist, slightly plastic increasing to slightly crumbly with depth. |
| 444 | 22 | | | | 0.0 | 22-24 | 22-24 | CLAYEY SAND: Pinkish gray, occasional quarter inch quartzite gravel, saturated, loose, mottled with yellowish red silty clay. |
| 442 | 24 | | | | 0.0 | 24-26 | 24-26 | GRAVELLY CLAY: Yellowish red, water saturated, loose to slightly crumbly with depth. |
| 440 | 26 | | | | 0.0 | 26-26.2 | 26-26.2 | SHALE: Very dark brown, weathered and fissil. |
| | | | | | | | | T.D. = 27.5 ' |
| 438 | 28 | | | | | | | |
| 436 | 30 | | | | | | | |



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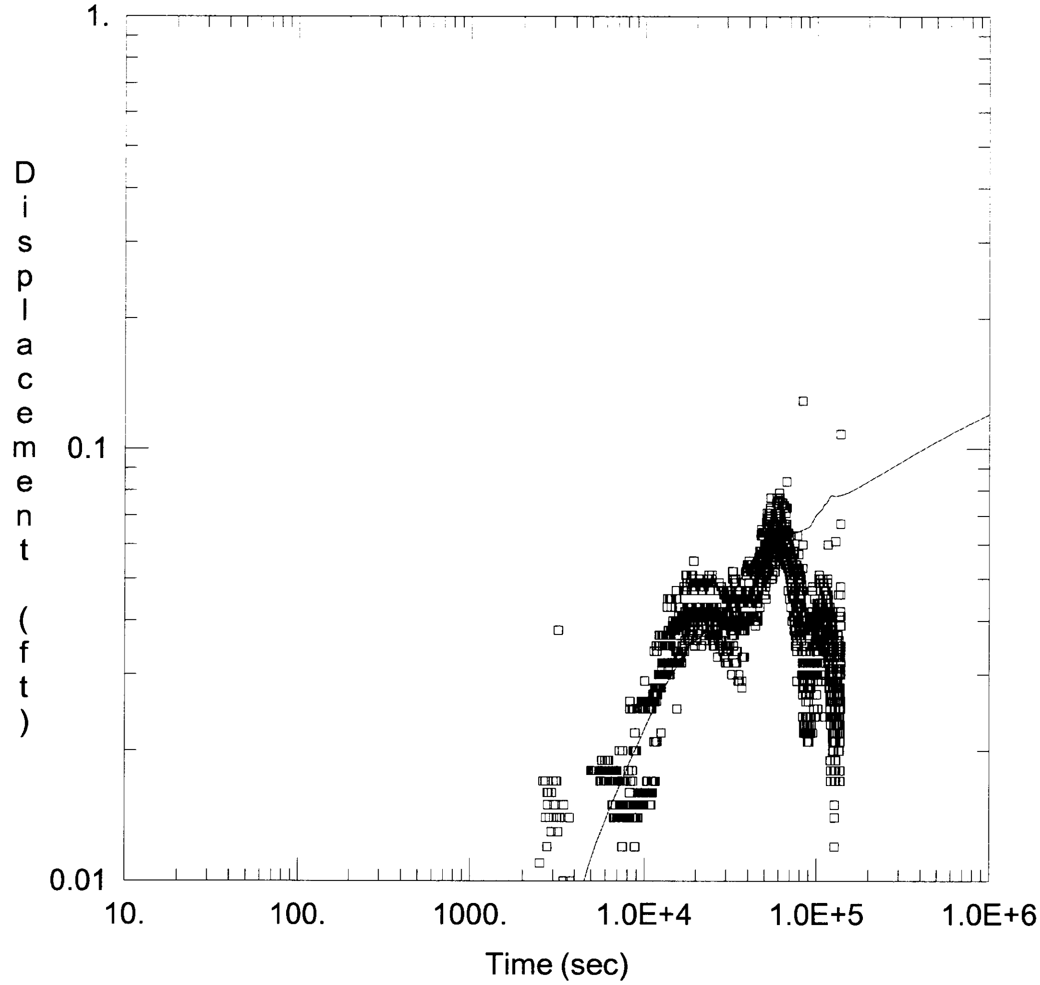
# Aqtesolv Output

*Attachment 2*

*January 12, 2010*
*Project No. 0097932*

**Environmental Resources Management Southwest, Inc.**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000




## CORRECTED DRAWDOWN

Data Set: C:\...\MW69 PT MW-40 obs corr.aqt
Date: 11/23/09 Time: 10:59:17

## PROJECT INFORMATION

Company: ERM
Client: Whirlpool
Project: 97933
Location: For smith
Test Well: RW-69
Test Date: 5/6/09

## WELL DATA

Pumping Wells

| Well Name | X (ft) | Y (ft) |
|---|---|---|
| RW-69 | 0 | 0 |

Observation Wells

| Well Name | X (ft) | Y (ft) |
|---|---|---|
| □ MW-40 | 0 | 185 |

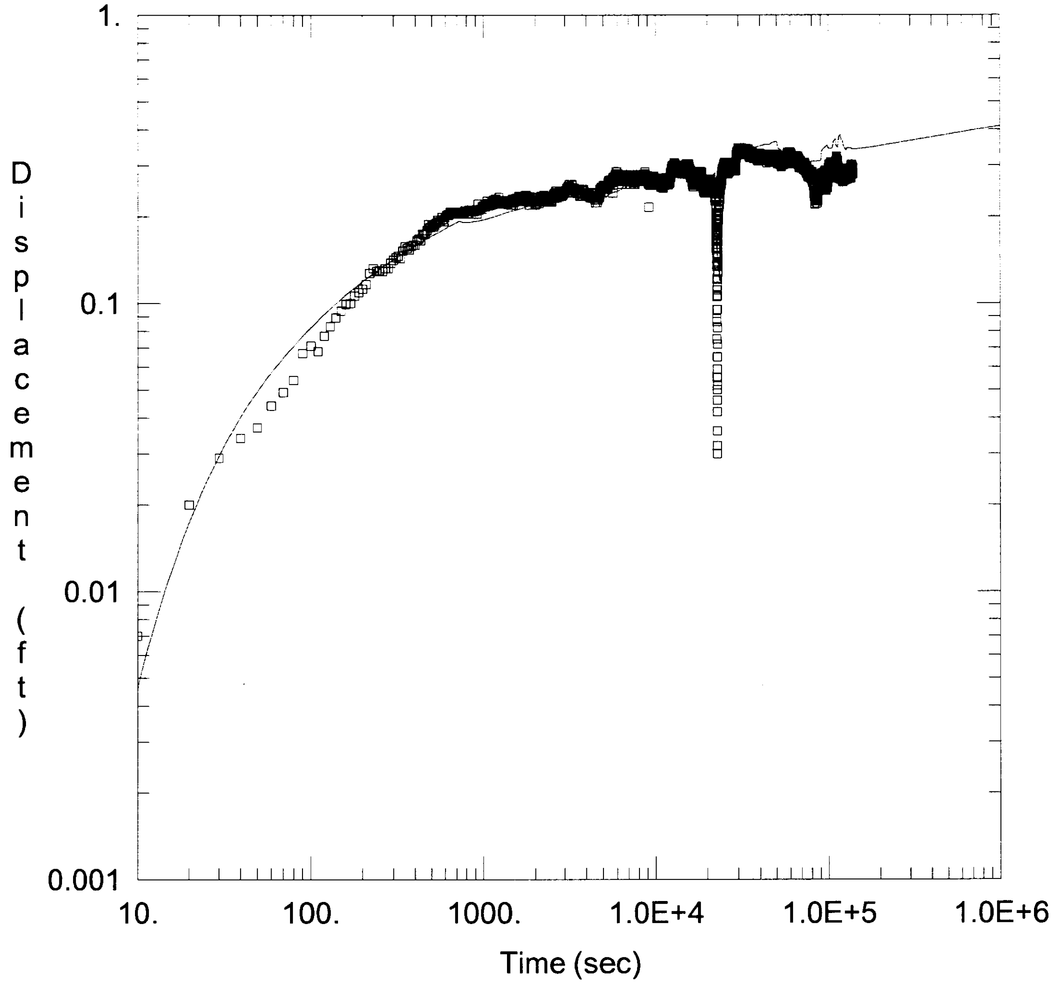
## SOLUTION

Aquifer Model: Confined

Solution Method: Theis

T = 0.003444 $ft^2/sec$
Kz/Kr = 1.

S = 0.001446
b = 12. ft




## CORRECTED DRAWDOWN

Data Set: C:\...\MW69 PT MW-70 obs corr.aqt
Date: 11/23/09 Time: 11:00:41

## PROJECT INFORMATION

Company: ERM
Client: Whirlpool
Project: 97933
Location: Fort Smith
Test Well: RW-69
Test Date: 5/6/09

## WELL DATA

Pumping Wells

| Well Name | X (ft) | Y (ft) |
|---|---|---|
| MW-69 | 0 | 0 |

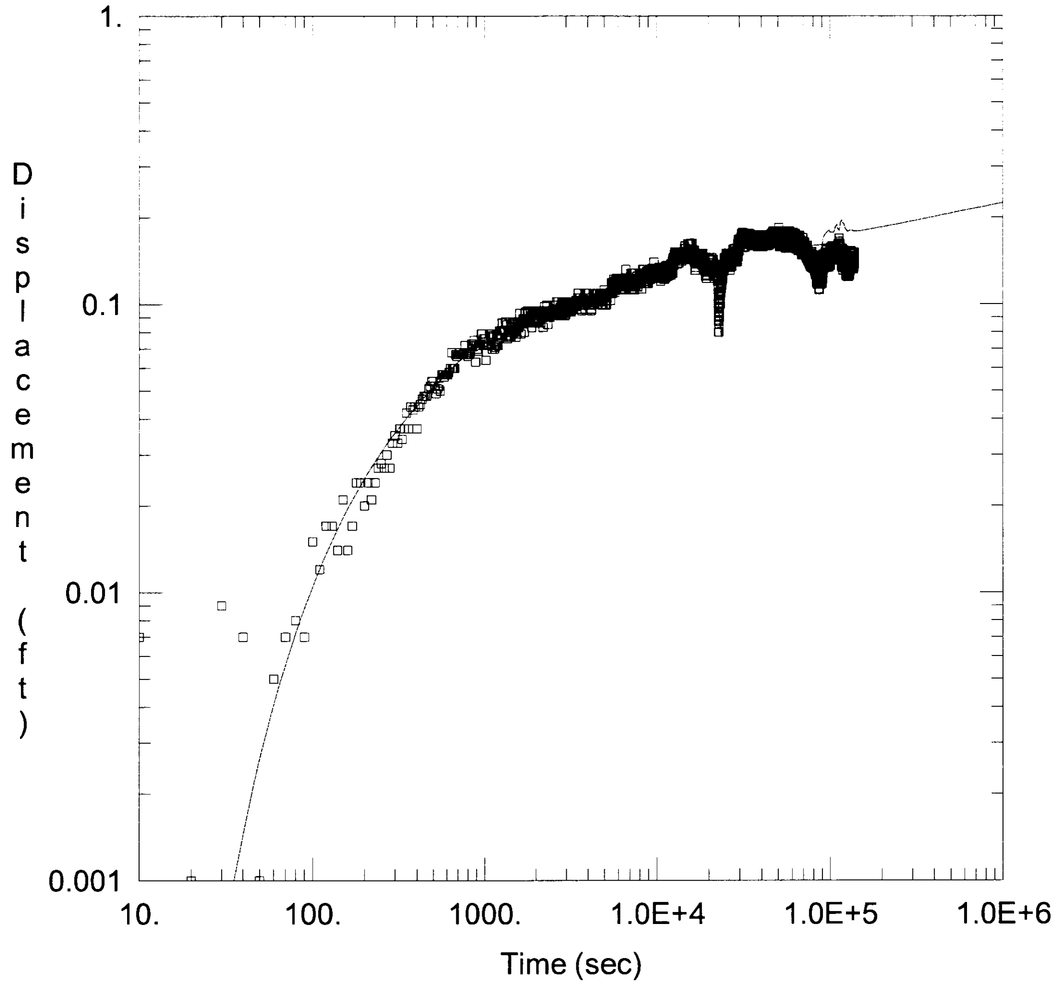
Observation Wells

| Well Name | X (ft) | Y (ft) |
|---|---|---|
| □ MW-70 | 0.14 | 6.36 |

## SOLUTION

Aquifer Model: Confined
Solution Method: Theis

$T = 0.002067$ ft$^2$/sec
$S = 0.003431$
$Kz/Kr = 1.$
$b = 12.$ ft




## CORRECTED DRAWDOWN

Data Set: C:\...\MW69 PT MW-71 obs corr.aqt
Date: 11/23/09 Time: 11:04:42

## PROJECT INFORMATION

Company: ERM
Client: Whirlpool
Project: 97933
Location: Fort Smith
Test Well: RW-69
Test Date: 5/6/09

## WELL DATA

Pumping Wells

| Well Name | X (ft) | Y (ft) |
|---|---|---|
| RW-69 | 0 | 0 |

Observation Wells

| Well Name | X (ft) | Y (ft) |
|---|---|---|
| □ MW-71 | 1.13 | 16.71 |

## SOLUTION

Aquifer Model: Confined

Solution Method: Theis

T = 0.003194 $ft^2/sec$

Kz/Kr = 1.

S = 0.004013

b = 12. ft

Environmental
Resources
Management

15810 Park Ten Place
Suite 300
Houston, Texas 77084
(281) 600-1000
(281) 600-1001 (fax)

ERM®

March 26, 2008

Mr. Mostafa Mehran
Arkansas Department of Environmental Quality
Hazardous Waste Division
8001 National Drive
Little Rock, Arkansas 72219-8913 Project No. 0079781

Subject: Risk Management Plan
Whirlpool Corporation, Fort Smith, Arkansas

Dear Mr. Mehran:

On behalf of Whirlpool, Environmental Resources Management (ERM) is pleased to submit this Risk Management Plan (RMP) for the Fort Smith Facility. This submittal has been prepared in accordance with Section I.E of the Letter of Agreement (LOA) between the Arkansas Department of Environmental Quality and Whirlpool Corporation.

In accordance with the reporting requirements in Section J of the LOA, four hard copies of the RMP are enclosed.

If you have any questions, please contact Mr. Scott Horton of Whirlpool at (479) 648-2698.

Sincerely,

Environmental Resources Management

Troy W. Meinen

TWM/skd
Enclosures

cc: Mr. Scott Horton, Whirlpool Corporation
Mr. Bob Karwowski, Whirlpool Corporation (letter only)
Mr. Doug Wilson, Whirlpool Corporation (letter only)
Mr. Paul Schultz, Whirlpool Corporation (letter only)
Mr. Robert LaForest, Whirlpool Corporation (letter only)
Mr. Andy Huggins, Environmental Resources Management (Exton) (letter only)
Mr. Reif Hedgcoxe, Environmental Resources Management (Houston) (letter only)

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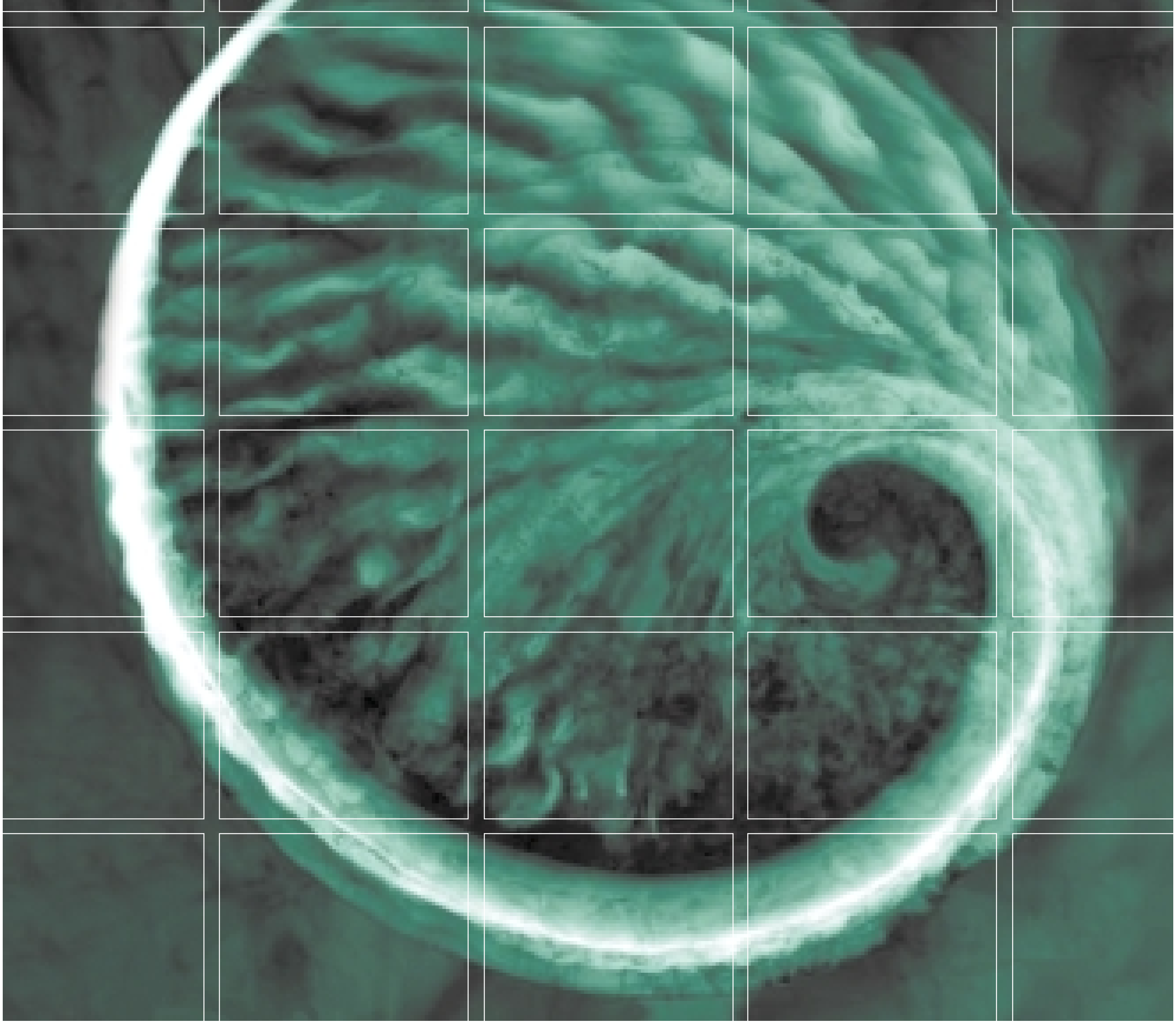

# Risk Management Plan

**Fort Smith, Arkansas**
**Whirlpool Corporation, Inc.**

March 27, 2008

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ERM

Whirlpool Corporation

# Risk Management Plan

March 27, 2008

Project No. 0048030
Fort Smith, Arkansas


H. Reiffert Hedgcoxe
*Partner-in-Charge*

Troy W. Meinen
*Project Manager*

Robert G. Perry
*Project Consultant*

Thomas M. Whitehurst, P.G.
*Project Consultant*

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24 MAR 08

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## *1.0 INTRODUCTION*

### *1.1 BACKGROUND AND OBJECTIVES*

#### *1.1.1 General Site Description*

The Whirlpool Fort Smith facility is located at 6400 Jenny Lind Road on the south side of Fort Smith, Arkansas (Figure 1-1). The facility manufactures side-by-side household refrigerators and trash compactors. The facility has been operated by Whirlpool for over 40 years.

The facility is approximately 153 acres and includes the main manufacturing building (approximately 1.3 million square feet), adjoining warehouse and administrative offices, and approximately 21 acres of undeveloped land (Figure 1-2). Additional buildings located on the north side of the property include a water treatment plant and boiler house. The majority of the property surrounding the buildings is covered with concrete or asphalt for parking. Some gravel parking areas are also present. An outdoor waste storage area is located on the south side of the manufacturing facility. This paved area is enclosed with a chain-link fence topped with razor wire.

#### *1.1.2 Facility Operations*

The manufacturing processes at the Whirlpool-Fort Smith facility involve metal fabrication, plastic thermoforming and assembly operations. All storage of hazardous wastes is limited to 90 days or less in containers, no hazardous waste treatment activities are conducted on site. It is believed that constituents in the soils and ground water identified in the facility investigation are the result of historical practices prior to 1980.

Dating back to approximately 1967, equipment degreasing operations utilizing trichloroethylene (TCE) were performed in the former degreaser building located near the northwestern corner of the main manufacturing building, west of the boiler house. Based on verbal reports from former workers, the degreasing equipment consisted of a tank and a parts rack. The degreasing operations involved placing parts into the parts rack positioned over the tank. The TCE tank was then heated creating a TCE vapor in the area where the parts were placed. Following degreasing activities, the vapor was condensed and returned to the tank below the parts rack.

The use of TCE was discontinued in 1981 and the degreaser building is not currently used for any cleaning operations. There are no historical records that document any specific spills or other release incidents from the degreaser building. However, it is possible that historical leaks from the tank or surface spills in the vicinity of the degreaser building may have occurred, resulting in releases to the soil and ground water.

A series of soil and ground water studies were initiated at the site as part of a project to remove an underground fuel storage tank (UST). Although there was no evidence of releases of petroleum hydrocarbons from the UST, the analytical data showed the presence of TCE and other solvents in the shallow ground water. Subsequent investigations, including soil sampling to assess the potential source area have been conducted to delineate affected soil and ground water.

Based on historical process knowledge, and recent analytical data, the major constituent of concern (COC) is TCE. Tetrachloroethylene (PCE), and TCE daughter products (including cis-1,2-dichloroethylene (cis-1,2-DCE) and trans-1,2-dichloroethylene (trans-1,2-DCE), 1,1-dichloroethylene (1,1-DCE), and vinyl chloride) resulting from degradation have also been periodically detected in site monitoring wells.

### *1.1.3 Summary of Previous Site Assessments and Risk Evaluations*

To address the impacts from the historical releases, Whirlpool entered into a letter of agreement (LOA) with the Arkansas Department of Environmental Quality (ADEQ), dated July 19, 2002. Under the LOA, Whirlpool is following the US EPA's Corrective Action Strategy (CAS) that includes the development of a site conceptual model and other documents describing environmental conditions at the site. Results of the various studies are included in a series of reports listed below:

- Supplemental Site Investigation, December 2000;
- Conceptual Site Model, August 2002;
- CAS Work Plan, June 2003;
- Interim Status Report and Revised CAS Work Plan, June 2004;
- Interim Status Report for Off-Site Investigations, March 2005;
- Interim Status Report for Off-Site Investigations, June 2005; and
- CAS Work Plan Addendum, August 2006.

In addition to the above reports, a series of Annual Ground Water Monitoring Reports have been produced since March 2000 documenting the results of semi-annual ground water sampling events. The last semi-annual ground water monitoring event was conducted during September 2007.

Data from the assessments described above were evaluated and summarized in the Risk Evaluation Report (RER), dated June 2007. The results of the RER indicate that two exposure pathways, soil leaching to ground water and direct contact with ground water, exceed acceptable risk standards. Corrective action will be required to address these pathways. Additional pathways, defined in the RER as Undetermined Exposure Pathways, may also be a concern. It is expected that the corrective action(s) to address the ground water exposure pathways will also control potential risks posed by the Undetermined Exposure Pathways.

### 1.2 *OBJECTIVES AND TECHNICAL APPROACH*

The next step in the CAS process is to prepare a Risk Management Plan (RMP) that identifies and selects a site remedy and to develop a plan for managing the risk at the site. As required by the LOA, the remedy selection process was conducted "*in general accordance with the remedy evaluation standards and general decision factors contained in Chapter IV of the EPA guidance document entitled RCRA Corrective Action Plan (Final), May 1994…*" (the CAP Guidance).

The objective of this RMP is to present the selected remedy and schedule for implementation, establish performance monitoring criteria, describe contingency plans for additional corrective measures, and describe the approach and schedule for performance reviews. The Conceptual Site Model (CSM) was finalized and presented in the RER. The only data that have been obtained since the submittal of the RER are the September 2007 ground water data which are generally consistent with historic data; therefore the CSM has not been modified.

The remedy selection process generally followed the approach specified in Section II (Corrective Measures Study Report), subsections A, B, C, and D in Chapter IV of the CAP Guidance. Based on the nature of the site conditions, Section I of Chapter IV (Corrective Measures Study Work Plan) is not needed.

Additionally, the RMP was prepared in accordance with the LOA and following Section II (Corrective Measures Study Report), subsections E, F, and G, and Sections III and IV in Chapter IV of the CAP Guidance.

## 2.0 REMEDY SELECTION

### 2.1 INTRODUCTION AND PURPOSE

The purpose of the remedy selection process is to identify and screen remedial technologies for potential use at the site and to select the final remedy. As described in the CSM (Section 2 of the RER), affected soil and ground water are present within the fenced boundary of the Whirlpool Facility (on site) and affected ground water is present beneath a residential area north of the Facility (off site). Given the nature of the affected media and differences in land use on site versus off site, there are differences in potentially complete exposure pathways for on-site versus off-site areas. Thus, this Whirlpool RMP presents the results of the identification and screening of potential remedial technologies separately for on-site versus off-site areas.

### 2.2 DESCRIPTION OF CURRENT CONDITIONS

The CSM characterizes the site conditions and provides the basis for the exposure scenario evaluation. Key components of the CSM include a facility profile, a land use and exposure profile, a physical profile, a release profile, an ecological profile, and a risk management profile. A brief summary of the current site conditions is provided below. The current site conditions and the CSM are summarized more fully in Section 2.0 of the RER. No new information has been discovered since the site conditions were summarized in the RER.

*On-Site Current Conditions*

On-site land use is characterized by industrial activities involving the manufacture of refrigerators and trash compactors. The facility has been operated by Whirlpool for over 40 years.

The known area of affected on-site soils is wholly contained within the confines of the facility security fencing (Figure 2-1). The main area of impacts, the "source area," is a fairly localized area of elevated TCE concentrations in soil and ground water near and immediately to the west of the former degreaser building. The general area of impacted soils is limited to a 50 by 250-foot area west of the former degreaser building (Figure 2-1). The on-site ground water plume extends about 1,000 feet to the south and southwest from the source area (Figure 2-2).

Based on the available information concerning on-site land use, the following potential exposure populations were identified:

- Site workers (potentially long-term exposure) that are involved in manufacturing activities and facility maintenance administration; and
- Site construction workers (potentially short-term exposure) that may be involved in limited duration activities, e.g., construction, utility, or other related activities.

Considering the source, potential exposure points, potential exposure routes, and EPA's guidelines for a potentially complete pathway, the RER identified two potentially complete, on-site Determined Exposure Pathways:

- Direct contact with soil 0-2 ft bgs (i.e., combined ingestion, dermal, and inhalation exposures) for current and future site workers; and
- Direct contact with soil 0-5 ft bgs (i.e., combined ingestion, dermal, and inhalation exposures) for future construction workers.

Two additional on-site Determined Exposure Pathways that are not currently complete, but without institutional controls could become potentially complete, were identified:

- Direct contact with on-site ground water (i.e., combined ingestion, dermal, and inhalation exposures) for site workers if a water supply well was installed in the uppermost aquifer in the future; and
- Direct contact with on-site ground water via leaching and infiltration of soil constituents to on-site ground water if a water supply well was installed in the uppermost aquifer in the future.

*Off-Site Current Conditions*

Off-site land use is generally residential. Residential properties to the north include single-family homes and two multi-family units. A recreational facility that includes three buildings, two basketball courts, and three baseball fields is located northeast of the site, adjacent to the residential area. The recreational facility lies beyond the area of the off-site ground water plume. No agricultural properties are located in the vicinity of the site. There are no sensitive areas, such as schools, hospitals, or day care centers located within 0.5 miles from the facility.

As indicated in the CSM, affected ground water extends to an area north of the Facility. At the facility boundary, current data indicate that the off-site ground water plume is relatively narrow (less than about 200 feet wide near well MW-23). North of Ingersol Avenue, the plume becomes broader and extends to the north and then northeast for a distance of about 1,000 feet (Figure 2-2). The higher TCE ground water concentrations (e.g. greater than 1 mg/L) are mostly constrained to the limits of a gravel-rich portion of the shallow aquifer (Figure 2-3). Lower TCE and cis-1,2-DCE concentrations extend beyond the known limits of the gravel-rich zone for approximately 200 feet. The gravel-rich zone is about 6 to 7 feet thick near the source area (on site) and is composed mostly of gravel and sandy gravel. Off site, the gravel-rich zone thins and increases in clay content such that north of Jacobs Avenue, it is composed mostly of clayey gravel to gravely clay.

Based on the available information concerning off site land use, the following potential exposure population was identified:

- Off-site residents (potentially long-term exposure) that live in the area north of the site where the plume has migrated.

Considering the source, potential exposure points, potential exposure routes, and EPA's guidelines for a potentially complete pathway, no Determined Exposure Pathways were identified to be potentially complete off-site currently. One off-site Determined Exposure Pathway that is not currently complete, but without institutional controls could become potentially complete, was identified:

- Direct contact with off-site ground water (i.e., combined ingestion, dermal, and inhalation exposures) for residents if a domestic water supply well was installed in the uppermost aquifer in the future.

In addition, one Undetermined Exposure Pathway that will be evaluated, and, if necessary, addressed during the Risk Management Corrective Action, was identified:

- Inhalation of vapors in indoor air due to volatilization from affected ground water.

## *2.3 CORRECTIVE ACTION OBJECTIVES/MEDIA CLEANUP STANDARDS*

Based on the identified exposure pathways that require risk management, the corrective action objectives for the Site are summarized below:

- Reduce the risk of potential exposure to on-site workers from impacted surface or subsurface soils;
- Reduce, where technically feasible, the potential for the subsurface soils to act as a continuing source of chemicals to the on-site ground water;
- Control further migration and reduce concentrations within the off-site ground water plume, and reduce the potential for direct contact with the impacted ground water; and
- Reduce the potential for inhalation exposure to vapors from ground water in off-site areas.

### *2.3.1 Remedial Action Criteria*

*Ground Water*

Drinking water standards, EPA Maximum Contaminant Levels, or MCLs will be used as the remedial action criteria for off-site ground water. Constituents present at the site include a number of chemicals for which MCLs exist or are proposed. Specifically, the RER identified TCE and cis-1,2-DCE as the COCs in off-site ground water. Each of these constituents have MCLs, as summarized in Table 2-1.

It is noted that MCLs are developed as standards for drinking water. As discussed in Section 3, Whirlpool intends to apply institutional controls on property it owns and will enforce its restriction that no on-site ground water will be used as a drinking water source. Accordingly, MCLs would only be applicable beyond the Whirlpool property boundary, unless similar institutional controls to restrict the use of ground water for drinking water supplies are applied to off-site property. Therefore, the primary remedial action criterion for on-site ground water will be to assure no further migration of COCs from the Whirlpool site at concentrations that exceed MCLs. . The RER identified TCE, cis-1,2-DCE, chloroform, PCE and vinyl chloride as the COCs in on-site ground water. Each of these constituents have MCLs, as summarized in Table 2-1.

While MCLs will be the primary criteria for off-site ground water, a secondary consideration will be potential exposure to vapors from affected ground water. As discussed in the RER, a screening-level assessment of the potential risks associated with vapor intrusion from ground water to indoor air as a pathway was initiated. Following EPA's and ADEQ's common practice, that initial assessment utilized the Johnson and Ettinger model for vapor intrusion (the J&E Model). The results of the screening suggest that the vapor intrusion pathway exceeded the acceptable risk level.

It was recognized, however, that the J&E Model incorporates a number of assumptions that tend to overestimate risk. Also, many of the model assumptions are not consistent with the actual conditions at the Ft. Smith site. Therefore, the model results do not provide an accurate estimate of the potential risk associated with the vapor pathway. For those reasons, the RER concluded that vapor intrusion was an "indeterminate" pathway that would be evaluated further as part of a performance monitoring program for the remediation program that would be presented in the RMP.

*Soils*

The ADEQ has not established default clean up standards for soils. Therefore, the RER utilized the EPA Region VI Medium-Specific Screening Levels (MSSLs) to define the soil COCs. MSSLs are typically used for comparison to preliminary investigation data to provide an initial evaluation for the relative environmental concern for a site or set of environmental data. MSSLs are not cleanup standards, but are intended to be used as a tool to identify areas for further evaluation.

The RER concluded that no reported soil COC concentrations exceed direct-contact MSSLs for soils. For the ground water protection pathway (soil leaching to ground water), the only soil COC identified in the RER that exceeds MSSLs is TCE. The RER then developed a site-specific ground water protection value for TCE in soil of 0.129 mg/kg that would be protective of ground water at the MCL. The ground water protection value of 0.129 mg/kg for TCE will be used as the remedial action criteria for soils.

## 2.4 IDENTIFICATION AND SCREENING OF CORRECTIVE MEASURES

As a first step in developing a plan to address the impacted soil and ground water, several candidate corrective measures were identified for the Whirlpool site. Each corrective measure was evaluated on a screening-level basis to assess whether the measure should be retained for more detailed consideration.

In general, the potential response measures can be grouped into five categories:

- No Action;
- Containment;
- Removal;
- Treatment; and
- Institutional Controls.

A description of each of the categories and the specific technologies within the categories are presented below along with the discussion of how the corrective measures were screened in or out. Based on the nature of the exposure pathways to be addressed, the screening process gives a preference to proven, presumptive measures rather than new or highly innovative measures. This approach was taken to facilitate the timely implementation of the ground water remedy in order to more quickly address off-site areas where there may be potential for risks associated with the Undetermined Exposure Pathways (e.g., vapor intrusion into buildings for residents from affected shallow ground water). Measures eliminated from further consideration are noted, along with the reasons for their elimination. In general, alternatives which:

- are not currently available commercially;
- have not been demonstrated on similar wastes; or
- are less effective than other technologies that could achieve the same results, were eliminated from further consideration.

It should be noted that some technologies must be combined with others to fully address the site conditions. Table 2-2 summarizes the technologies considered for each of the above general response measures.

### *2.4.1 No Action*

The No Action alternative represents a base line approach against which other alternatives can be compared. This alternative would entail continuation of the current semi-annual ground water monitoring program but with no active remedial activities to address affected soils or ground water, either on site or off site.

The No Action alternative is screened out from further consideration because it will not address the potential risks associated with affected ground water if a drinking water well were to be installed, either on site or off site. As a separate remedial action, No Action will not reduce concentrations, control mobility, or reduce the extent of impacted media. However, semi-annual ground water monitoring will be retained as a technology for consideration to be combined with other active remedial measures.

### 2.4.2 *Containment*

Containment is the second corrective measure that is potentially applicable to the Whirlpool site. Containment involves the placement of a physical barrier that impedes movement of constituents, thereby providing a means to significantly reduce or eliminate an exposure pathway. Containment technologies can effectively isolate soils and/or ground water, and are generally separated into the following groups:

- Horizontal barriers; and
- Vertical barriers.

Horizontal barriers can be constructed using several technologies including:

- Topsoil/clay and vegetative covers;
- Cement-stabilized soil covers;
- Asphalt covers;
- Concrete covers; and
- Soil cover with synthetic/geotextile composite liner.

Horizontal barriers can prevent contact between affected surface soils and surface water runoff, thereby reducing the potential for constituent migration via infiltration into the ground water. In addition, installation of a cover can also be engineered to prevent human exposure to affected soils, and to limit air emissions.

Much of the on-site area where affected soils are present is already covered by asphalt or concrete which serves as a horizontal barrier. Regular maintenance of the existing cover will act to reduce the potential for future leaching of constituents from the affected soils to ground water. The limited areas where affected on-site soils are not currently paved (in the northwestern portion of the facility) could also be paved to increase the effectiveness of the cover.

There are no documented affected off-site soils; therefore, applying a horizontal barrier as a corrective measure in the off-site areas would provide little if any benefit. In addition, considering the residential nature of the off-site ground water plume area, implementation of capping is not practicable.

Vertical barriers are typically used to limit or redirect the lateral flow of ground water from or around an affected area, to isolate affected soils, or to contain an affected ground water plume. Such barriers are usually keyed into an existing confining clay layer. Vertical barriers can include:

- Slurry wall;
- Cement-bentonite cutoff wall;
- Grout curtain;

- Sheet pile wall; and
- Interceptor trenches and recovery well systems.

Construction of these types of barriers require a significant working area, typically at least a 50-ft wide, area along the entire length of the barrier. A material mixing area would also be needed.

For the Whirlpool site, vertical barriers would be keyed into the lower McAllester Shale at a depth of about 35 ft. Prior to final design, a series of geotechnical soil borings would need to be drilled on 20 to 50-ft intervals along the proposed trench centerline to obtain detailed stratigraphic information and other design data. Depth to water, depth to the "key" layer, soil types, and the potential presence of gravels or flowing sands are important data items for barrier design. Compatibility testing may be required to evaluate the impact of COCs on the permeability of the barrier material.

*Screening of the Containment Alternative*

A containment-based response action would not remove the chemicals from the site but would provide protection of human health and the environment by reducing migration of or exposure to constituents in soils and/or ground water. Containment technologies are highly proven, commercially available, and readily implemented. Due to the highly intrusive nature of the construction method, residential areas with homes and underground utilities are generally not good candidates for these types of controls. Therefore, containment could be applied on-site and used to control both on-site exposure and the off-site migration of constituents.

Accordingly, capping of affected on-site soils was retained as a viable alternative to be used in conjunction with other technologies. With respect to a vertical barrier, considering the nature of the current ground water flow patterns, a barrier wall may not be necessary to control the off-site migration of affected ground water away from the on-site source area. However, a vertical barrier would be effective if, in the future, ground water flow conditions were to change; therefore, the option of a vertical barrier was retained for further analysis.

### *2.4.3 Removal*

Removal is the third remedial alternative that is potentially applicable to the Whirlpool site. Removal of affected soils or ground water involves excavation or collection of the media for treatment or disposal. Removal technologies must be combined with a treatment or disposal technology to form a complete response action. Treatment technologies will be addressed as part of the design specification and will not be discussed as part of this report.

Two common removal technologies were considered as potentially applicable for the Whirlpool site:

*Excavation – Soils*

Excavation is a proven technology for direct mass removal and, for small to moderate soil volumes, technically feasible. Excavation achieves a very direct means of reducing the amount of constituent mass in the environment that could pose a risk to human health. Where high concentrations are present in relatively small areas (i.e., hot spots), excavation can be cost effective as long as the cost for off-site transportation and disposal is acceptable.

*Ground Water Extraction*

Ground water extraction is a removal technology that is also applied as a hydraulic barrier/control technology. The process entails removing ground water to prevent down gradient migration, which results in removal of dissolved and residual mass from the affected transmissive zone. It is rarely effective in fully restoring ground water concentrations to cleanup standards, but can provide adequate protection from potential exposure pathways as an independent remedial measure or when coupled with other remedial options.

Ground water can be extracted using either extraction trenches or extraction wells.

An extraction trench is an open trench that is designed to collect and convey liquid discharges by gravity flow in a manner similar to a French drain. The trench could be installed in any of three basic configurations:

1. To intercept a plume downgradient of the leading edge;
2. In conjunction with a ground water cutoff barrier to prevent buildup of ground water upgradient of the barrier; or
3. As a more active withdrawal system where the drain(s) are installed within the ground water plume perpendicular to the direction of ground water flow.

Similar to vertical barriers, extraction trenches are commonly "keyed" into a confining clay layer. Extraction trenches are more effective than a line of wells when used to contain and/or recover affected liquids in low transmissivity hydrogeological environments. Extraction trenches are considered a feasible technology except where access is a problem.

Affected ground water can also be extracted from the ground by a system of recovery wells that is designed to both control ground water flow in a specific area and to remove dissolved and residual mass from the affected transmissive zone. In addition, recovery wells may be used in conjunction with a physical vertical barrier to prevent hydraulic mounding behind the barrier.

Ground water extraction can reduce the dissolved phase concentrations in ground water. While the rate of mass removal is typically small compared to the residual mass of constituents in soil, ground water extraction can lower the dissolved phase concentrations to a level where the ground water to vapor phase pathway is eliminated.

The pumping test conducted at well MW-35R indicated that the radius of influence of a recovery well and its ability to remove constituent mass in areas outside of the more transmissive, gravel portions aquifer would likely be low. Thus, long term pumping may be required, or additional technologies may be needed to be effective.

*Screening of the Removal Alternative*

The removal alternative for both soil and ground water is a highly proven remedial approach and readily implemented at other similar sites. With respect to soils, there is only one documented exceedance of the soil remedial action criteria in on-site soils (boring ERM-8 at 14 feet) and none off-site. However, excavation to 14 feet is not likely to be technically practicable. Accordingly, this option is not retained as a remedial alternative for on-site soils as a means to reduce the potential leaching via soil-to-ground water pathway.

Ground water pumping and treatment is the EPA's presumptive remedy for VOC affected ground water. Furthermore, removal has the technical ability to reduce COC concentrations within the more transmissive portions of the gravel aquifer, providing near term protection to off-site residents. However, off-site access in the residential area may limit the ability to install a trench and may also limit the number of recovery wells that could be installed. In addition, the presence of buried utility lines in the residential area may make installation of a trench unfeasible. Therefore, only the use of ground water extraction by recovery wells is retained for further evaluation and use in the development of the final on-site and off-site remedial alternatives.

### *2.4.4 In Situ Treatment*

In situ treatment technologies rely on the application of treatment methods in the subsurface to reduce constituent mass and concentrations without removing the affected media. The technologies and options considered for this alternative include:

- Biological
  - Natural Attenuation
  - Enhanced Aerobic/Anaerobic Biodegradation
- Physical/Chemical
  - Vapor Extraction or Sparging
  - Permeable Treatment Beds
  - Chemical Oxidation

The technologies are described in the following paragraphs.

2.4.4.1 *Biological*

*Natural Attenuation*

The term "natural attenuation" refers to the reliance on natural attenuation processes to control or prevent migration and/or over time achieve site-specific remediation objectives (EPA, 1989). Natural attenuation processes include a variety of physical, chemical, and biological processes that, under favorable conditions, reduce the mass, toxicity, mobility, volume, or constituent concentrations in soil and/or ground water.

The primary constituents in the off-site plume are TCE and cis-1,2-DCE, and the constituents of concern in on-site plume are TCE, cis-1,2-DCE, PCE, vinyl chloride, and chloroform. These chemicals can be degraded both anaerobically (via reductive dechlorination) or aerobically. However, reductive dechlorination of cis-1,2-DCE risks the formation of vinyl chloride. Currently, little to no reductive dechlorination of TCE or cis-1,2-DCE appears to be occurring in the off-site plume given the generally stable concentrations and the lack of vinyl chloride in the off-site plume. However, some reductive dechlorination appears to be occurring in the source area of the on-site plume.

While both the on-site and off-site ground water plumes appear to be stable, ground water concentrations are not dropping significantly with time. The rate of natural attenuation does not appear to be sufficient to meet the remedial objectives in a timely fashion.

*Enhanced Aerobic/Anaerobic Biodegradation*

In situ biological treatment includes the addition of nutrients, oxygen and/or acclimated microbes to enhance the natural degradation processes. Biodegradation in the saturated zone can be used for the remediation of both affected soils and ground water. To implement biodegradation in the saturated zone, a series of wells or trenches is used to inject water containing nutrients, microbes and/or oxygen. The treatment occurs as the water flows with the natural or induced gradient and is collected in downgradient wells or trenches. Additional nutrients, microbes, or oxygen are added to the water and it is recirculated through the soils. Use of this technology may be limited in areas with clayey soils due to the limited flow and reduced contact.

2.4.4.2 *Physical/Chemical Treatment*

*Vapor Extraction or* Sparging

Vapor extraction includes application of a vacuum on the subsurface soils to induce volatilization of organic constituents. This is accomplished by pulling a vacuum on a series of vertical or horizontal wells screened in the unsaturated soil zone. Sparging (stripping) of VOCs in ground water via wells can also be performed to remove vapors. A low permeability cover may be installed above the treatment area to reduce air bypass. This technology works most efficiently in highly permeable, granular soils.

*Permeable Treatment Beds*

Implementation of permeable treatment beds would include construction of a downgradient trench filled with a material which would either adsorb or chemically react with constituents in the ground water. As ground water passes through the bed, the COCs would be treated or removed. Treatment beds can include granular zero valent iron to treat dissolved chlorinated hydrocarbons (chlorinated solvents) to nontoxic end products. This abiotic process involves corrosion (oxidation) of zero valent iron (ZVI) and reduction of dissolved chlorinated hydrocarbons. This technology could potentially be used alone or together with other technologies to control the migration of affected ground water.

*Chemical Oxidation*

In situ chemical oxidation (ISCO) involves the decomposition and in situ destruction using chemical oxidation technologies. In contrast to other remedial technologies, reduction in constituent concentrations can be seen in short time frames (e.g., weeks or months). Chemical oxidation technologies are predominantly used to address in situ ground water and soil in the source area saturated zone and capillary fringe.

Understanding the site hydrogeologic conditions is important when considering the use of chemical oxidation or reduction technologies because these conditions often determine the extent to which the chemical oxidants or reducing agents may come into contact with the COCs. Soil reactivity with chemical oxidants or reducing agents is also important when considering the costs of chemical oxidation. Excessive loss of a chemical oxidant or reducing agent that is reacting with organics in soil, instead of reacting with the COCs, may preclude the use of the technology as an economically viable approach to site remediation. Consequently, if chemical oxidation is to be considered, it is recommended that treatability studies be completed prior to field implementation.

Potassium permanganate has demonstrated success in applications involving the destruction of chlorinated organics and was evaluated in an on-site field scale test in 2002 near well MW-11. This test was conducted in an area where the shallow aquifer is predominately gravel. The results indicated that ISCO was effective in treating the COCs within the treatment zone and over 20 feet outside the treatment zone. However, given the limited area of the test, COC concentrations eventually rebounded to pre-test levels – likely due to flow of affected ground water back into the treated zone.

Additional field scale testing would be needed to further evaluate the effectiveness and design parameters for application of ISCO in the off-site plume in areas where the shallow aquifer has higher clay content.

In general, the advantages of using chemical oxidation or reduction as an in situ treatment option for both ground water and soils are:

- COC mass can be destroyed in situ;
- Produces no significant wastes;
- Reduced operation and monitoring costs;
- Compatible with post treatment natural attenuation if limited to the most affected areas; and
- Causes only minimal disturbance to nearby human activities.

#### 2.4.4.3 *Screening of the In Situ Treatment Alternative*

In situ treatment technologies are proven remediation methods, readily implemented, and have been used at other similar sites. Furthermore, in situ treatment has the technical ability to rapidly reduce ground water concentrations, providing near term protection to off-site residents. In situ Treatment is retained as a remedial alternative for further consideration. In particular, the following in situ treatment technologies were considered further in identifying remedial alternatives and are discussed further in subsequent sections:

- Enhanced Aerobic/Anaerobic Biodegradation;
- Permeable Treatment Beds; and
- In situ Chemical Oxidation.

The following-in situ treatment technologies were screened out from further consideration:

- Natural Attenuation was screened out as an independent remedial measure because it does not appear to be currently effective in reducing the mass of COCs in the on-site and off-site ground water plume in a timely fashion. Enhanced Biodegradation was also screened out as a remedial measure because it is less effective in clayey or silty soils like those found in offsite areas. However, natural attenuation or enhanced biodegradation may be used in combination with other remedial measures and as a contingent remedial measure.
- Vapor extraction and sparging were screened out because they are generally less effective in clayey or silty soil types.

### 2.4.5 *Institutional Controls*

Applying institutional controls as a remedial measure entails the implementation of legally enforceable restrictions on land use in order to prevent exposure to affected media. Institutional controls would not directly remediate the site (reduce concentrations and/or limit migration). However, by preventing exposure (ingestion, direct contact, etc.), institutional controls can effectively protect human health on a long-term basis. Institutional controls can be applied to both soil and ground water, depending on the nature of the impacted media.

Institutional controls are usually deed recorded wherein a metes and bounds description of impacted media, a description of the impacts (e.g., constituent concentrations and distribution), and all land-use restrictions are entered into the deed for the affected property. Institutional controls can be applied via property acquisition, easement or through the use of a legal covenant.

Other institutional controls include measures such as Municipal Setting Designations (MSDs) where a city or other municipal entity establishes a prohibition on the use of ground water in an area that is impacted. MSDs are often instituted in areas that are fully serviced by municipal water supplies and private water wells are not needed or used.

*Screening of Institutional Control Alternative*

The use of institutional controls have been approved by ADEQ as an element of remedial measures on other sites and can readily be applied to impacted areas within the limits of Whirlpool's property. Applying institutional controls such as MSDs and/or deed recordation in the off-site area would require the cooperation and approval of residents, property owners, and the City of Fort Smith.

As a separate remedial action, institutional controls will not reduce concentrations, control mobility, or reduce the extent of impacted media. Additionally, application of institutional controls in off-site areas necessarily involves other property owners. For these reasons, the Institutional Control alternative is eliminated as a primary option and is not acceptable for use as an independent corrective measure. However, it is retained as a secondary or contingency action that may be applied in combination with one or more other corrective measures.

## *2.5 SUMMARY OF REMEDIAL MEASURES RETAINED FOR FURTHER ANALYSIS*

Four of the five general remedial measures discussed above were retained, in whole or in part, for potential inclusion in the Whirlpool Risk Management Plan. No Action was completely screened out as a candidate approach. In some cases, a given remedial measure should not be implemented as a "stand alone" remedy or could be applied on a contingency basis (e.g., institutional controls), while others could be applied on a broader basis (e.g., removal by ground water extraction).

To help focus the selection of final corrective measures (presented in Section 3), the retained remedial measures were subjected to a second screening and a "short list" of surviving approaches was identified as summarized in the table below.

| *Remedial Measures Retained For Further Analysis* | | | |
|---|---|---|---|
| General Remedial Measure | Media | Exposure Pathway Applicability | Retained for Potential Inclusion in the RMP? |
| Containment - Horizontal Barrier | On-Site Soil | Interrupt the soil-to-ground water pathway by incorporating with existing asphalt and concrete to reduce infiltration and limit potential leaching from affected on-site soils. | Yes |
| Containment – Vertical Barrier | Ground Water | Interrupt the residential ground water exposure pathway by limiting migration from on-site "source area". | No, may be considered as a contingency action if performance monitoring indicates a need for secondary measures to protect off-site ground water. |
| Removal – Excavation | On-Site Soil | Interrupt the soil-to-ground water exposure pathway by removing constituents from soil. | No, current data indicates higher soil concentrations within the ground water zone and are below practical excavation depths.<br><br>May be considered as a contingency action if performance monitoring indicates a need for secondary measures to protect off-site ground water. |
| Removal – Extraction | Ground Water | Interrupt the ground water exposure pathway by removing constituents from ground water.<br><br>Interrupt potential vapor intrusion to indoor air exposure pathway by decreasing concentrations to levels below concern for volatilization. | Yes, for on-site and off-site plume.<br><br>May also be considered as a contingency action if performance monitoring indicates a need for secondary measures to protect off-site ground water. |
| In Situ Treatment | Ground Water | Interrupt the ground water exposure pathway by removing constituents from ground water.<br><br>Interrupt potential vapor intrusion to indoor air by decreasing concentrations to levels below concern for volatilization. | Yes, for on-site and off-site plume. May need to combine with other measures to adequately cover plume area.<br><br>May also be considered as a contingency action if performance monitoring indicates a need for secondary measures to protect off-site ground water. |

| | | | |
|---|---|---|---|
| *Remedial Measures Retained For Further Analysis* | | | |
| Institutional Controls | On-Site Soil | Interrupt potential for worker direct contact to subsurface soil by restricting access. | Yes, if combined with other measures. |
| Institutional Controls | Ground Water | Eliminate ground water exposure pathway by restricting access. | Yes, for on-site if combined with other measures.<br><br>Not currently available for off-site. May be applied if allowed in future. |

Based on the second level of screening, the remedial measures retained for potential inclusion in the RMP are:

- On-Site Soils – Containment via a horizontal barrier and institutional controls;
- On-Site Ground Water – In situ treatment (ISCO) or ground water extraction, and institutional controls; with vertical containment as a contingency measure; and
- Off-Site Ground Water – In situ treatment (ISCO) or ground water extraction; with institutional controls if allowed in the future.

This analysis indicates that combining remedial measures can provide an effective means of addressing the exposure pathways for the Whirlpool site. It also suggests that using in situ treatment or ground water extraction are equally acceptable methods for addressing the ground water pathway. Therefore, the next step in developing the Risk Management Plan was to combine two or more remedial measures to create corrective measure alternatives recommended for the Whirlpool site. That approach is described in Section 3, below.

## 3.0 RISK MANAGEMENT PLAN

Grouping different remedial measures into an alternative allows the remedial plan to focus on the specific exposure pathways that pose an unacceptable risk, or potential risk. Based on the environmental setting at the Whirlpool site, two corrective measure alternatives were identified as having a high potential to address the exposure pathways of concern:

*Alternative 1 –*

- *On-Site: Soil Containment, In Situ Ground Water Treatment and Institutional Controls; and*
- *Off-Site: In Situ Ground Water Treatment*

*Alternative 2 –*

*On-Site: Soil Containment, Ground Water Extraction and Institutional Controls; and*

*Off-Site: Ground Water Extraction*

For both of these alternatives, the soil leaching to ground water pathway would be addressed by adding additional cover to the existing asphalt and concrete in the area where affected soils are present on site. Further protection is provided with the first alternative by reducing ground water concentrations using in situ treatment (ISCO). Decreasing ground water concentrations reduces the potential for future off-site migration. Additionally, applying institutional controls limits on-site access to the affected soil and ground water.

The second alternative is essentially equivalent to Alternative 1, except that ground water concentrations (both on and off-site) are reduced via removal (recovery wells) rather than by in situ treatment. Ground water extraction has the added benefit of providing hydraulic control of the plume migration. However, compared to in situ treatment, contaminant mass removal by ground water recovery is a slower process. Conversely, in situ treatment may not cover the entire plume.

### 3.1 EVALUATION OF FINAL CORRECTIVE MEASURE ALTERNATIVES

As specified in the CAP guidance, and in accordance with the LOA, the components of the two corrective measures alternatives described above were evaluated against the following performance criteria:

- Protection of Human Health and the Environment;
- Attainment of remedial action criteria;
- Control of the source of releases;
- Compliance with applicable standards for management of waste;
- Short and long-term reliability and effectiveness;
- Reduction in toxicity, mobility, or volume of impacted media;

- Implementability; and
- Costs.

The results of the evaluation are summarized as follows:

**On-Site Soil Containment -**

| | |
|---|---|
| Protection of Human Health and the Environment | Containment effectively reduces or eliminates the potential for exposure to affected soils and limits potential for infiltration through affected soils and into ground water |
| Attainment of remedial action criteria | Containment will not modify concentrations in soil or ground water |
| Control of the source of releases | Containment creates a physical barrier to isolate the source from the environment |
| Compliance with applicable standards for management of waste | Containment is not applicable to this criteria since the remediation does not involve management of wastes |
| Short and long-term reliability and effectiveness | Containment can be applied in a reasonably short time frame and can be designed to provided long-term effectiveness |
| Reduction in toxicity, mobility, or volume of impacted media | Containment will help reduce mobility, but will not affect reductions in toxicity or volume |
| Implementability | Containment is readily implemented |
| Cost | Containment is cost effective as compared to other soil corrective measures |

**In Situ Ground Water Treatment -**

| | |
|---|---|
| Protection of Human Health and the Environment | Treatment effectively reduces or eliminates the potential for exposure to affected ground water by reducing concentrations |
| Attainment of remedial action criteria | Treatment can potentially attain MCLs if applied over a sufficient area |
| Control of the source of releases | Treatment effectively controls the source of releases by reducing constituent mass |
| Compliance with applicable standards for management of waste | Treatment can be conducted in a manner consistent with applicable standards |
| Short and long-term reliability and effectiveness | Treatment can be applied in a reasonably short time frame and can be designed to provided long-term effectiveness |
| Reduction in toxicity, mobility, or volume of impacted media | Treatment will reduce toxicity, mobility, and volume by reducing constituent mass |
| Implementability | Treatment is readily implemented but may be limited by off-site access issues |
| Cost | Treatment has higher initial cost and low long term cost, but is cost effective as compared to other ground water corrective measures |

**Ground Water Extraction -**

| | |
|---|---|
| Protection of Human Health and the Environment | Extraction effectively reduces or eliminates the potential for exposure to affected ground water by reducing concentrations |
| Attainment of remedial action criteria | Extraction can potentially attain MCLs if implemented over a sufficient area and operated long-term |
| Control of the source of releases | Extraction effectively controls the source of releases by reducing concentrations and isolating the source using hydraulic control |
| Compliance with applicable standards for management of waste | Extraction can be conducted in a manner consistent with applicable standards |
| Short and long-term reliability and effectiveness | Extraction can be applied in a reasonably short time frame and can be designed to provided long-term effectiveness |
| Reduction in toxicity, mobility, or volume of impacted media | Extraction will help reduce toxicity and volume by direct removal and will reduce mobility by hydraulic control |
| Implementability | Extraction is readily implemented but may be limited by off-site access issues |
| Cost | Extraction has low initial and moderate to high long term cost, but can be cost effective as compared to other ground water corrective measures in the short term |

**Institutional Controls-**

| | |
|---|---|
| Protection of Human Health and the Environment | Institutional Controls effectively reduce or eliminate the potential for exposure to affected soils and ground water |
| Attainment of remedial action criteria | Institutional Controls will not modify concentrations in soil or ground water |
| Control of the source of releases | Institutional Controls will not physically isolate the source of releases from the environment |
| Compliance with applicable standards for management of waste | Institutional Controls are not applicable to this criteria since it does not involve management of wastes |
| Short and long-term reliability and effectiveness | Institutional Controls can be applied in a reasonably short time frame and can be designed to provided long-term effectiveness |
| Reduction in toxicity, mobility, or volume of impacted media | Institutional Controls will not help reduce toxicity, mobility, or volume of impacted media |
| Implementability | Institutional Controls are readily implemented on-site but would require the cooperation of multiple parties to be implemented off-site |
| Cost | Institutional Controls are cost effective as compared to other soil and ground water corrective measures |

### 3.2 *PROPOSED INTERIM MEASURES*

As discussed above, the evaluation of alternatives indicates that both ground water recovery and in situ treatment using ISCO are potentially viable alternatives for off-site ground water corrective measures. In order to provide a basis for selecting a final corrective measure, it is often necessary to conduct one or more design studies and/or pilot tests. Pilot testing also provides operational data that are needed for a full-scale design of a remediation system.

In the case of the off-site portion of the Whirlpool ground water plume, it would be beneficial to conduct a design study/pilot test program to support the final selection of a corrective measure for the off-site area. Unfortunately, the time required to plan, implement, and evaluate data from pilot testing and related design studies may take a year or more to complete. Although the off-site ground water ingestion pathway is not currently complete, and the potential for residential risk via ground water-to-indoor air pathway has not been quantified, Whirlpool believes it is prudent to move forward with an "early response" in the residential area. Whirlpool's goal is to reduce any potential risk to human health.

On that basis, Whirlpool has proposed to conduct an Interim Measure (IM) focusing on the off-site plume as an early response. The IM Work Plan was submitted to ADEQ for review on March 17, 2008.

In addition to serving as an early response, the IM will serve as a pilot test to assess whether ground water recovery or ISCO (either separately or in combination) are more appropriate for expanded implementation. This IM will provide data for use in designing an expaned system. In order to address the area with the greatest concentration of COC mass off site and the area that may be a concern for potential vapor intrusion, the IM will target the "core" of the off-site plume (Figure 3-1).

If performance monitoring of the IM indicates that the initial system is effective in reducing concentrations of TCE and daughter compounds in ground water and controlling the potential for exposure in the off-site area, it is envisioned the IM will be incorporated into the RMP as Phase 1 of the remediation plan for the site. A Process Flowchart illustrating the projected IM pilot program activities and relationship to the RMP is provided as Figure 3-2.

### 3.3 *RECOMMENDATION OF FINAL CORRECTIVE MEASURE*

In order to take maximum advantage of the information that will be obtained during the IM, Whirlpool has developed a recommended plan for final corrective measures that will be implemented in phases.

***Phase 1 – Interim Measure***

The IM will serve as a first phase of remediation. As illustrated in Figure 3-1, the IM will consist of two components: 1) in situ treatment using a series of injection wells installed in the core of the plume that will be used to deliver an oxidizing agent in the ground water, and 2) a ground water recovery well installed downgradient of the ISCO injection wells. Additional details of the IM design and implementation are provided in the IM Work Plan. It is anticipated that the IM will be operated over a 6-month period, with performance monitoring being performed throughout the operation.

Operational data from the IM will be used in the detail design of an expanded system for the off-site and on-site ground water plumes in Phase 2. Specifically, the IM data will help assess whether ISCO treatment, ground water recovery, or both should be implemented as the Expanded Remedy for off-site and on-site ground water. In addition, the IM will guide refinement of the system to more effectively treat the more clay-rich portions of the shallow aquifer off site. If the IM has not been implemented by the time this RMP has been approved and public notice given, the IM will be implemented as Phase 1, and Phase 2 will not start until sufficient operational data has been collected for design purposes.

***Phase 2 – Expanded Remedy***

As discussed above, the IM will provide operational data that are needed for assessing whether treatment or removal, or both, are appropriate for expanded application for on-site and/or off-site ground water.

*Off-Site Ground Water*

Following evaluation of the data collected during the IM, it is expected that either the ISCO treatment system or the ground water recovery system, or both, will be modified and/or expanded to more fully address the off-site plume.

*On-Site Ground Water*

The Expanded Remedy for on-site ground water will include establishing Institutional Controls to preclude use of shallow ground water. Data from the IM will be used to design the on-site ground water remedial system using either ISCO treatment, ground water recovery, or both to reduce ground water concentrations and control potential for off-site migration.

*On-Site Soil*

The Expanded Remedy for on-site soils will include establishing Institutional Controls to preclude access to affected shallow soils. Also, the existing asphalt/concrete cover in the source area will be upgraded and/or maintained to serve as a physical barrier (containment) to infiltration through the affected soils. Additional cover may be added to provide a more extensive cover system. The detail design for the soil containment system will proceed during Phase 1 activities.

The Expanded Remedy will also include semi-annual ground water monitoring of both on-site and off-site areas, as discussed below, to monitor remedy effectiveness and to provide the data necessary to assess the need for contingency measures, if any.

*Phase 3 - Contingency Measures*

If ground water monitoring results indicate remedial action criteria may not be met within three years, Whirlpool will, in consultation with the ADEQ, evaluate the need for modification of the existing remedial measures or the application of other measures that may be required to improve the performance of the selected remedies at the Fort Smith site. Such contingent measures may include one or more of the following technologies:

- Additional ground water extraction to control migration and remove mass;
- Soil excavation to remove residual constituents in the source area;
- The injection of nutrients to enhance natural attenuation;
- Additional ISCO treatment to reduce constituent mass;
- Installation of a permeable treatment bed;
- Installation of a vertical barrier or other containment structures; or
- Filing of deed recordation, restricting off-site ground water use.

### *3.4 PUBLIC INVOLVEMENT PLAN*

As specified in the LOA, Whirlpool will work with the ADEQ to seek public comment on the Administrative Record (AR) and the proposed corrective measures for the remedial actions to be implemented for the Fort Smith facility. The public involvement plan will consist of three parts:

- Establishing a local repository for project documents;
- Compiling a copy of the AR for public access at the repository; and
- Providing public notice of the availability of the AR and a request for comments on the AR and the proposed corrective measures.

Whirlpool will establish a local document repository where the public will have access to the AR (i.e., the collection of documents forming the basis for the final corrective measure). The location of the document repository, typically a local library, will be determined in cooperation with the ADEQ.

Whirlpool will provide a copy of relevant site documents to the repository that will provide the public the basis to understand the selection of the final corrective measure. Whirlpool will then work with the ADEQ to place a pubic notice in a local newspaper advertising the availability of the AR and asking for public comments on the selection of the final corrective measure. The public will be directed to provide comments to the ADEQ. The public comment period will be for a minimum of 30 calendar days. Following receipt of comments and direction from ADEQ, Whirlpool will update the AR, as necessary. Once the AR is complete and fully approved, the RMP will be implemented.

## 3.5 PROGRESS REPORTS

*Performance Monitoring*

Starting with the initiation of the IM activities, Whirlpool proposes to implement a program of semiannual ground water monitoring for at least a three-year period to evaluate the effectiveness of the remedies. The monitoring will involve analysis of the key constituents of concern: PCE, TCE, cis-1,2-DCE, vinyl chloride and chloroform. Specific wells to be incorporated into the monitoring system will be specified in the final design.

If analytical results indicate that remediation activities are not making reasonable progress toward reducing the constituent concentrations in the off-site area to MCLs within three years, or that concentrations are rebounding above their respective MCLs, then Whirlpool will notify the ADEQ and discuss the need to implement one or more contingent remedial measures (triggering Phase 3 of the remedial plan as indicated in Figure 3-2). Similarly, if analytical results show changes in concentrations that would indicate an increase in off-site migration during the remedy implementation, Whirlpool will notify the ADEQ and discuss the need to implement one or more contingent remedial measures (again triggering Phase 3).

The condition of the existing asphalt/concrete cover in the source area and any additional cover will be monitored semiannually for general wear and the existence of significant cracks. Cover will be repaired as necessary to maintain effectiveness.

*Performance Reviews*

Whirlpool will prepare quarterly Remedial Action and Operation and Maintenance Status Reports as required in the LOA and annual ground water monitoring reports that summarize the results of the semiannual ground water monitoring and any performance data from continuing corrective actions.

The quarterly status reports will contain the following:

- Summaries of findings in the reporting period, including the result of any pilot studies;
- Summaries of any changes made in the RMP during the reporting period;
- Summaries of problems encountered during the reporting period; and
- Actions taken to address problems.

The annual monitoring report will contain the following:

- Summaries of the semiannual ground water monitoring results with comparisons to remedial action criteria;
- Summaries of ground water level elevation data; and
- Copies of the laboratory analytical reports.

Consistent with the 2005 Arkansas Ground Water Remediation Level Interim Policy, five years after initiating the Expanded Remedy (Phase 2) Whirlpool will prepare a five-year technical review of the status of the Fort Smith facility corrective actions and assess the need for implementation of contingency response actions (Phase 3). In the event that the three-year monitoring program indicates that the performance criteria have been met, Whirlpool will propose that performance monitoring cease.

### *3.6 PROPOSED SCHEDULE AND COMPLETION OF CAS PROGRAM*

The RMP implementation schedule is presented in Figure 3-3 and represents Whirlpools current estimate of the timing for completion of each of the outlined tasks. The schedule has been developed to provide for the expeditious implementation of corrective measures following notification to proceed from the ADEQ. It should be noted that the schedule includes assumptions for duration of tasks outside of Whirlpool's control (e.g., ADEQ review of IM Work Plan).

Since off-site corrective action is being initiated as an IM, the implementation schedule for the on-site and off-site corrective measures will follow separate but parallel schedules (Figure 3-3). As illustrated in the flowchart in Figure 3-2, the IM will be initiated while the review and approval process (including the public review/comment period) for the RMP proceeds. The on-site remedy will begin following approval of this RMP, likely after the start of the IM.

The schedule will be revisited on an annual basis and updates provided to the ADEQ, as warranted based on current conditions and remedial progress.

# Tables

*March 27, 2008*
*Project No. 0048030*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas  77084-5140
(281) 600-1000

## TABLE 2-1

### Summary of Remedial Action Criteria

### Whirlpool Corporation
### Fort Smith, Arkansas

**On-Site Soil - Soil to Ground Water Pathway**

| | RAC | Units | RAC Source |
|---|---|---|---|
| TCE | 0.129 | mg/kg | Table 4-9 RER |

**On-Site Ground Water - No Migration Off-Site Above MCLs**

| | RAC | Units | RAC Source |
|---|---|---|---|
| Trichloroethene (TCE) | 0.005 | mg/l | MCL |
| cis-1,2-DCE | 0.070 | mg/l | MCL |
| Chloroform | 0.080 | mg/l | MCL[1] |
| Tetrachlorethene (PCE) | 0.005 | mg/l | MCL |
| Vinyl Chloride | 0.002 | mg/l | MCL |

**Off-Site Ground Water - Direct Contact and Vapor Intrusion Pathways**

| | RAC | Units | RAC Source |
|---|---|---|---|
| Trichloroethene (TCE) | 0.005 | mg/l | MCL |

NOTES:

1) MCL for Total Trihalomethanes, which includes chloroform.
RAC - Remedial Action Criteria
RER - Risk Evaluation Report

**TABLE 2-2**

**Corrective Action Measures Summaries**

**Whirlpool Corporation**
**Fort Smith, Arkansas**

| General Corrective Action | Remedial Technology | Process Option | Description |
|---|---|---|---|
| NO ACTION | None | No Action | No action, represents base line conditions. Includes semi-annual ground water monitoring. |
| CONTAINMENT | Horizontal Barriers | Topsoil/Clay and Vegetation | Placement of topsoil/clay and seeding to vegetate |
| | | Cement Stabilized Soil | Mixing of soil with cement and compacting |
| | | Asphalt | Placement of asphalt over affected soil |
| | | Concrete | Mixing and placement of concrete over affected soil |
| | | Soil Cover w/Synthetic Liner | Construction of combination soil cover and synthetic liner |
| | Vertical Barriers | Slurry Wall | Installation of trench filled with soil/bentonite slurry |
| | | Cement-Bentonite Wall | Installation of trench filled with cement/bentonite slurry |
| | | Grout Curtain | Injection of clay-cement grout into voids where piles were driven and extracted |
| | | Sheet Pile Wall | Construct of containment wall by driving sheet piling |
| | | Interceptor Trenches | Installation of gravel filled trench used to isolate affected area |
| REMOVAL | Soil Excavation | Excavation | Excavation - Removing media for treatment or disposal by backhoe |
| | Ground Water Extraction | Extraction Trenches | Trench, either open or backfilled with porous media, to allow seepage and collection of ground water and oils |
| | | Extraction Wells | Series of wells to extract affected ground water |
| TREATMENT - In situ | Biological | Enhanced Aerobic/Anaerobic Biodegradation | Addition of bacteria, oxygen and nutrients to promote biodegradation of chemicals |
| | | Natural Attenuation | Long-term monitoring physical, chemical and biological processes that reduce chemicals of concern naturally |
| | Physical/Chemical | Vapor Extraction | Application of a vacuum on the soil |
| | | Permeable Treatment Beds | Affected ground water is intercepted in a downgradient trench filled with materials to treat or absorb the chemicals |
| | | Chemical Oxidation | Saturated soils and ground water are oxidized by injection of oxidants such as sodium persulfate |
| INSTITUTIONAL ACTIONS | Access Restrictions | Deed Recordation | Surveying and filing of deed recordation, restricting ground water use |

# Figures

*March 27, 2008*
*Project No. 0048030*

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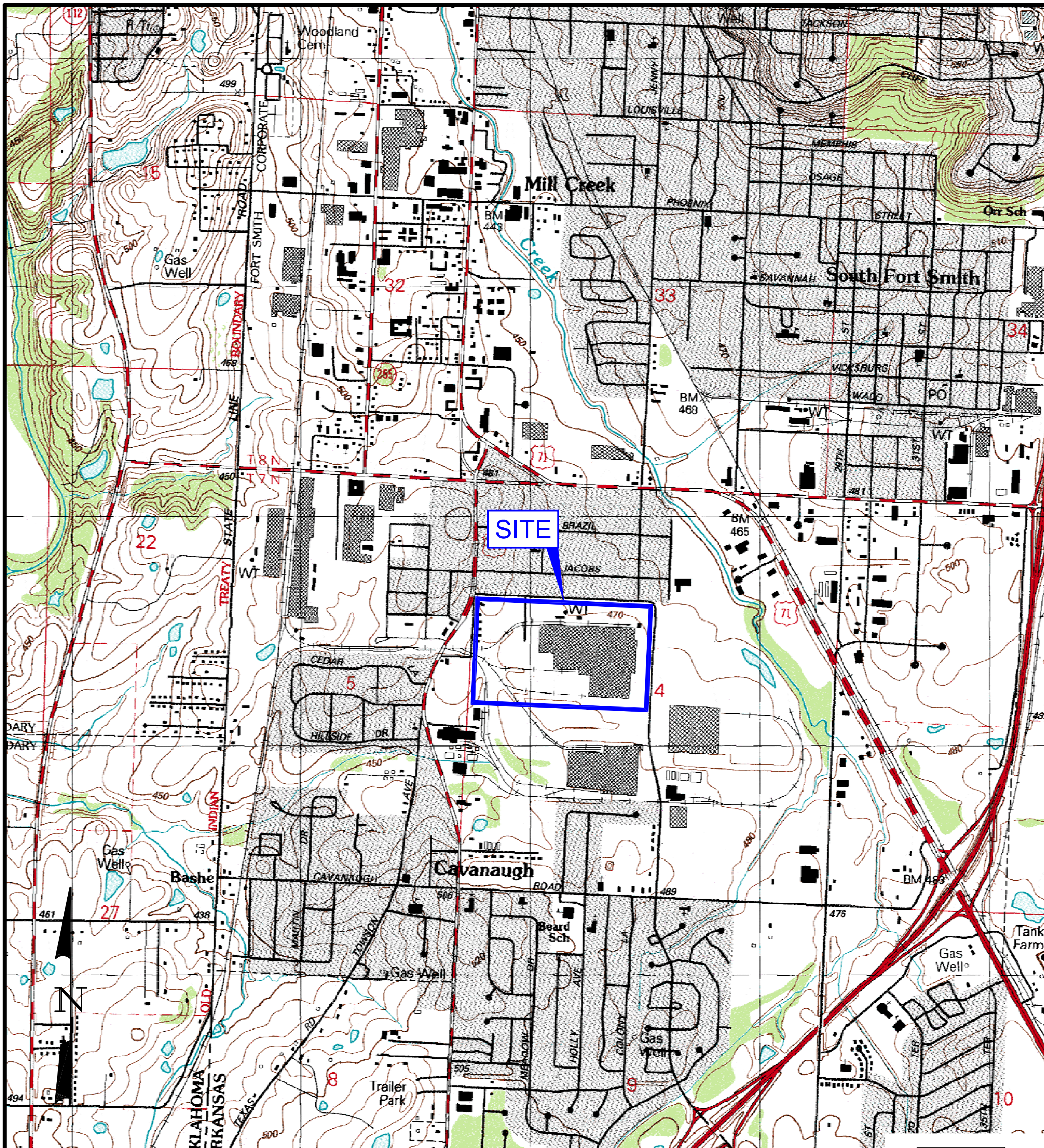
(281) 600-1000




0 2000 4000

SCALE FEET


QUADRANGLE LOCATION

SOURCE: U.S.G.S. 7.5' QUADRANGLE, SOUTH FORT SMITH, ARK.-OKLA., (o35094C4) 1987.

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FIGURE 1-1
SITE LOCATION MAP
Whirlpool Corporation
Fort Smith, Arkansas

ERM

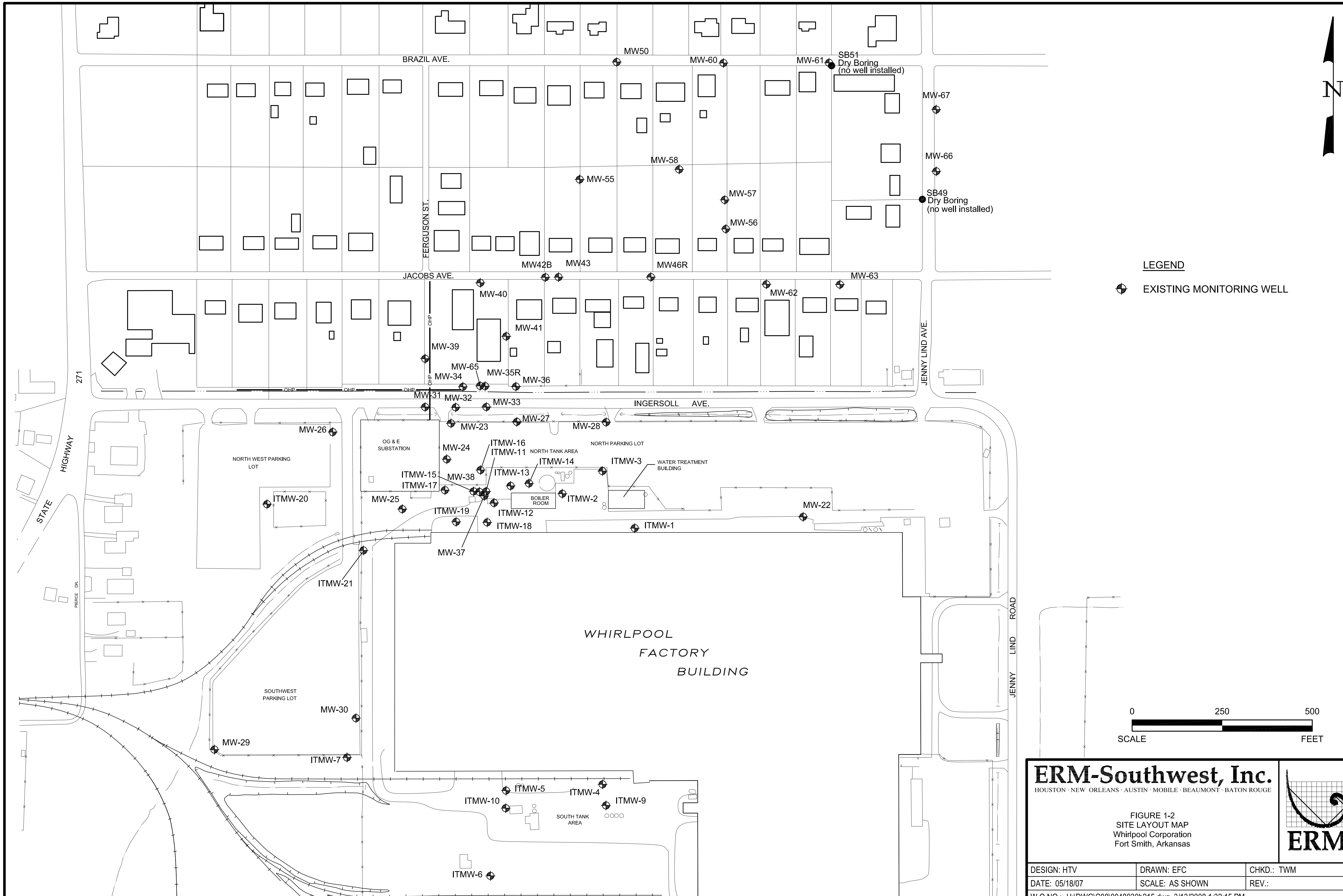


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FIGURE 1-2
SITE LAYOUT MAP
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| | | |
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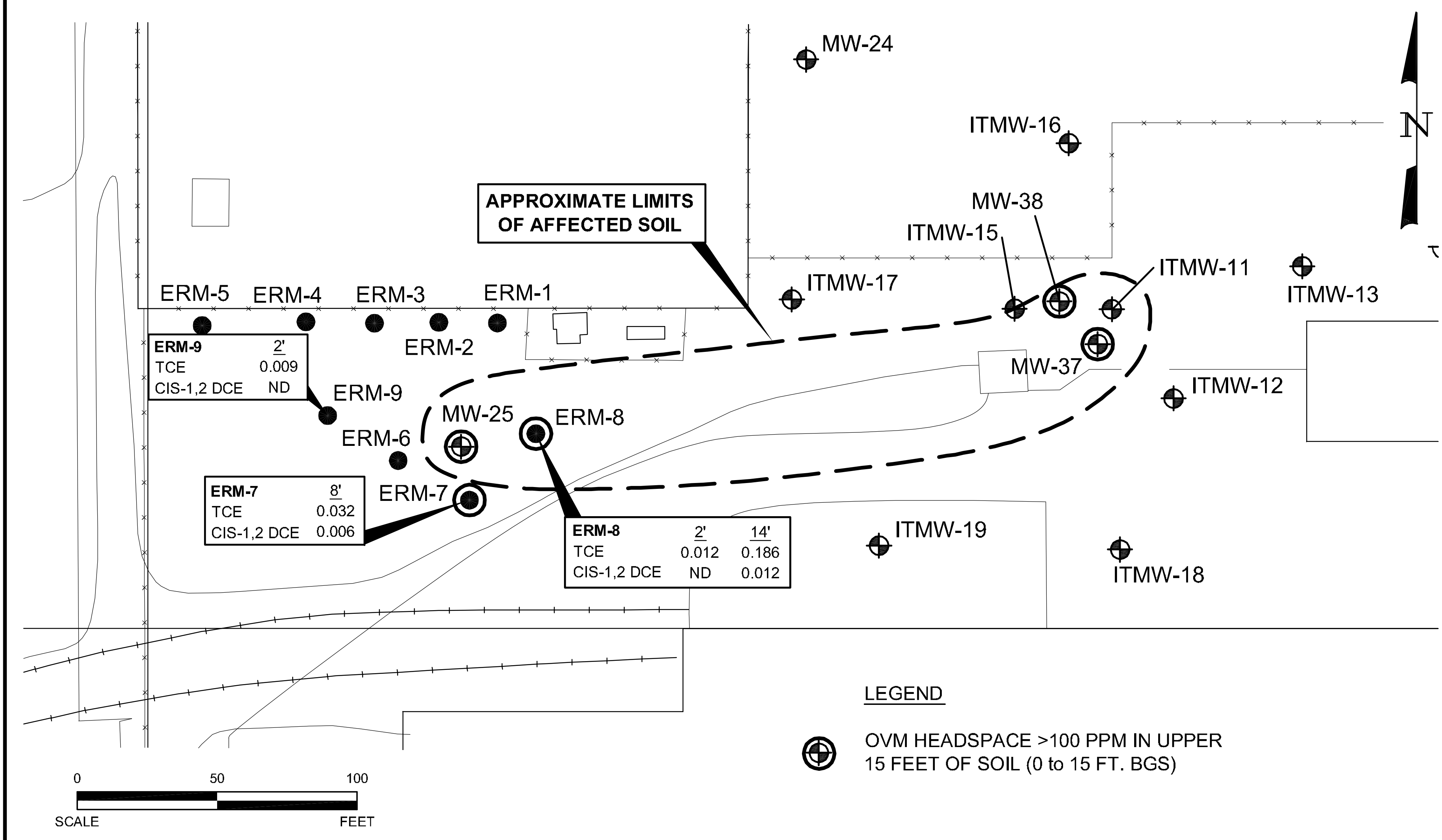


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FIGURE 2-1
APPROXIMATE EXTENT OF AFFECTED SOIL
Whirlpool Corporation
Fort Smith, Arkansas

ERM

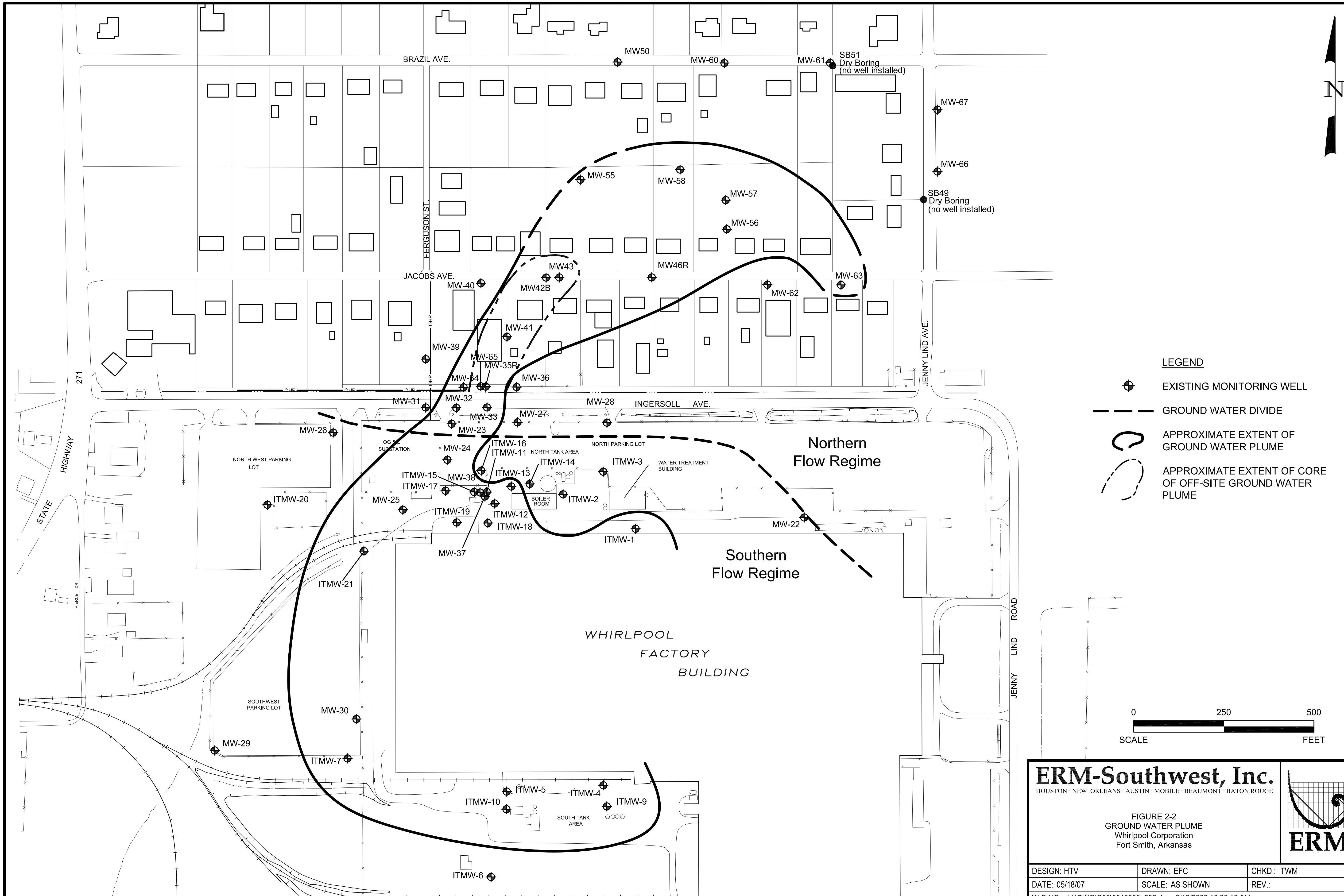


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FIGURE 2-2
GROUND WATER PLUME
Whirlpool Corporation
Fort Smith, Arkansas

ERM

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LEGEND

EXISTING MONITORING WELL

APPROXIMATE AREA OF GRAVEL ZONE
(MINIMUM THICKNESS OF 1 FOOT)

0 150 300
SCALE FEET

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FIGURE 2-3
DISTRIBUTION OF GRAVEL ZONE
Whirlpool Corporation
Fort Smith, Arkansas

| | | |
|---|---|---|
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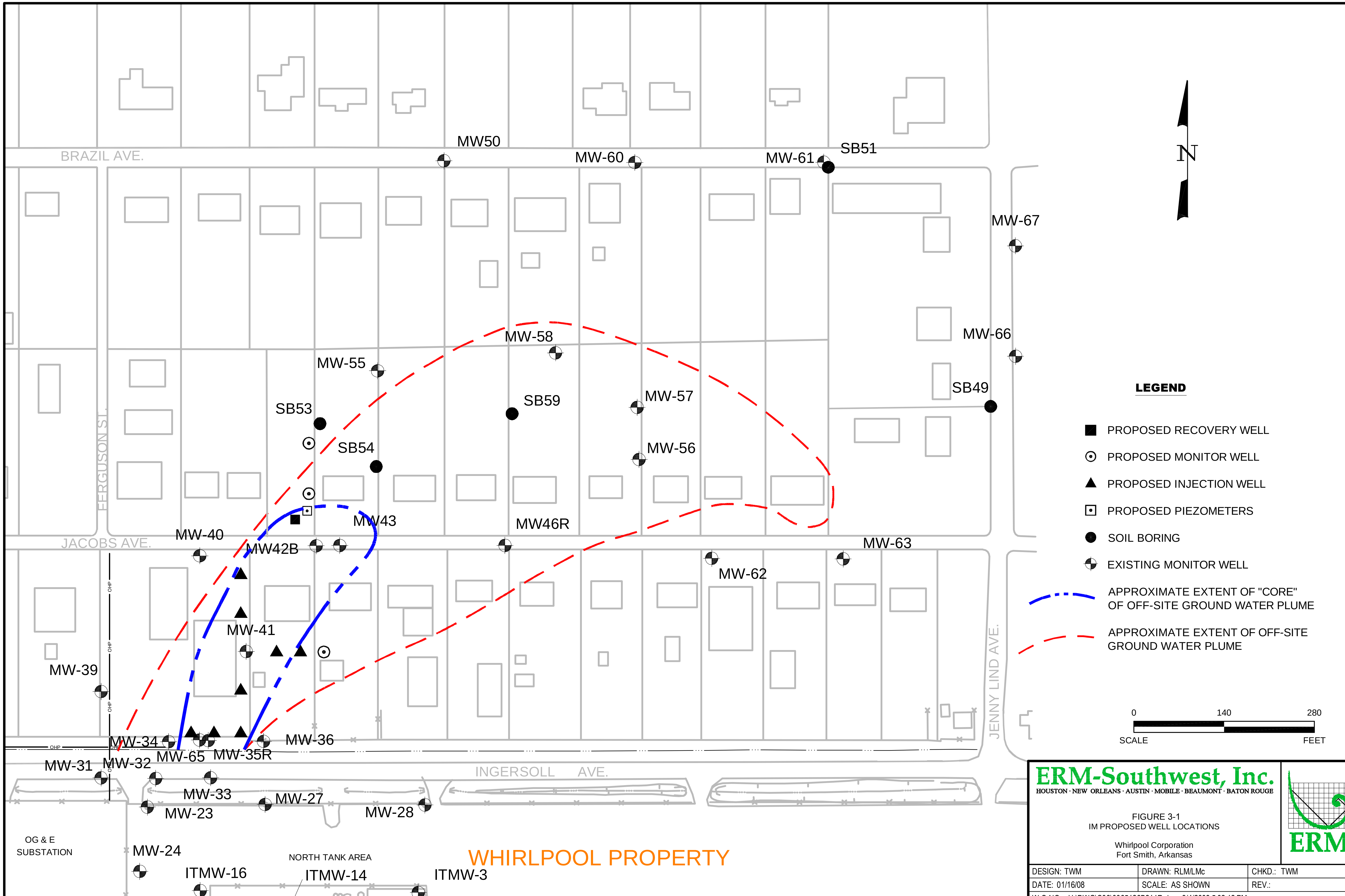


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FIGURE 3-1
IM PROPOSED WELL LOCATIONS

Whirlpool Corporation
Fort Smith, Arkansas

ERM

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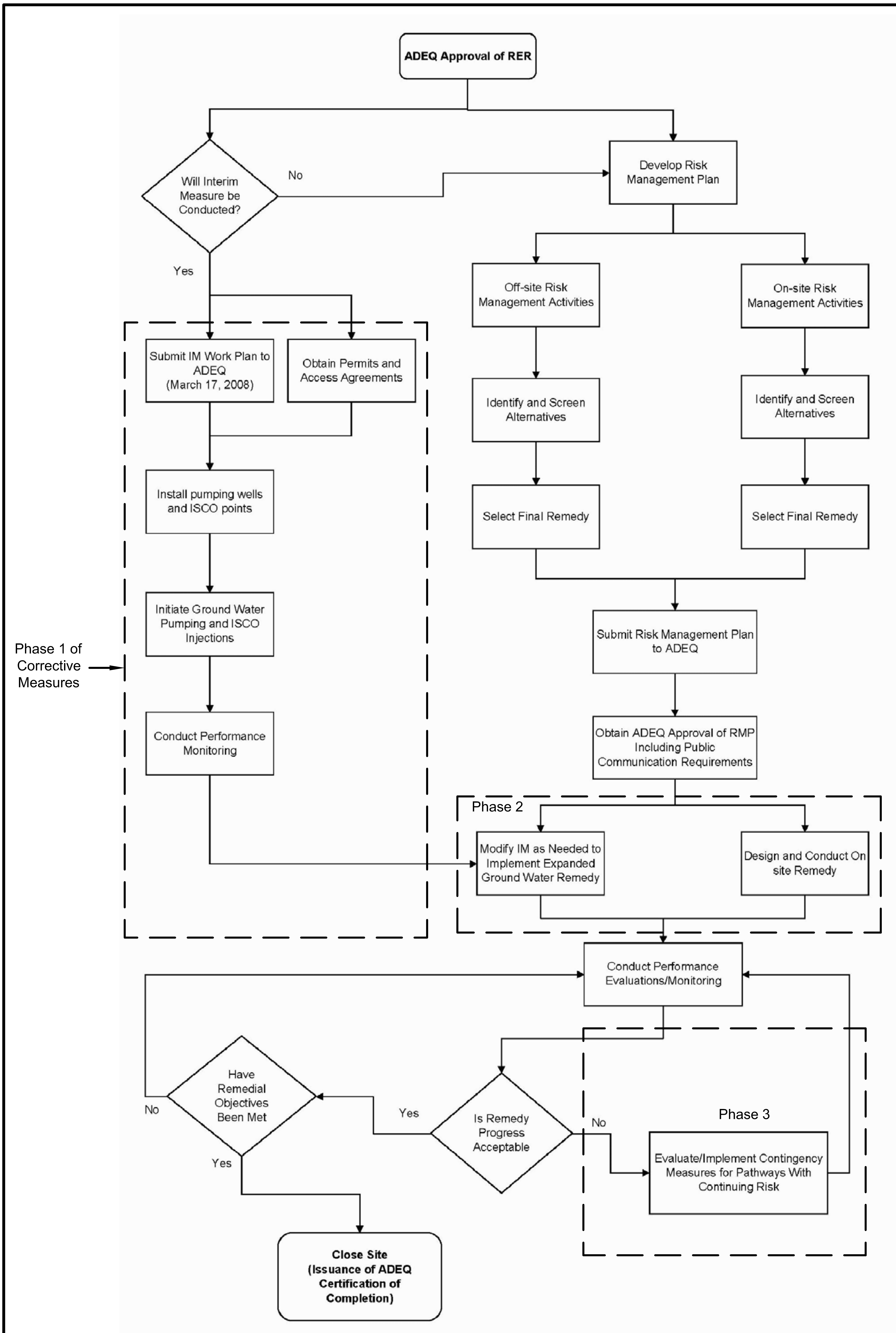


**Environmental Resources Management**

FIGURE 3-2

IM AND RMP PROCESS FLOW CHART
Whirlpool Corporation
Fort Smith, Arkansas

| | | |
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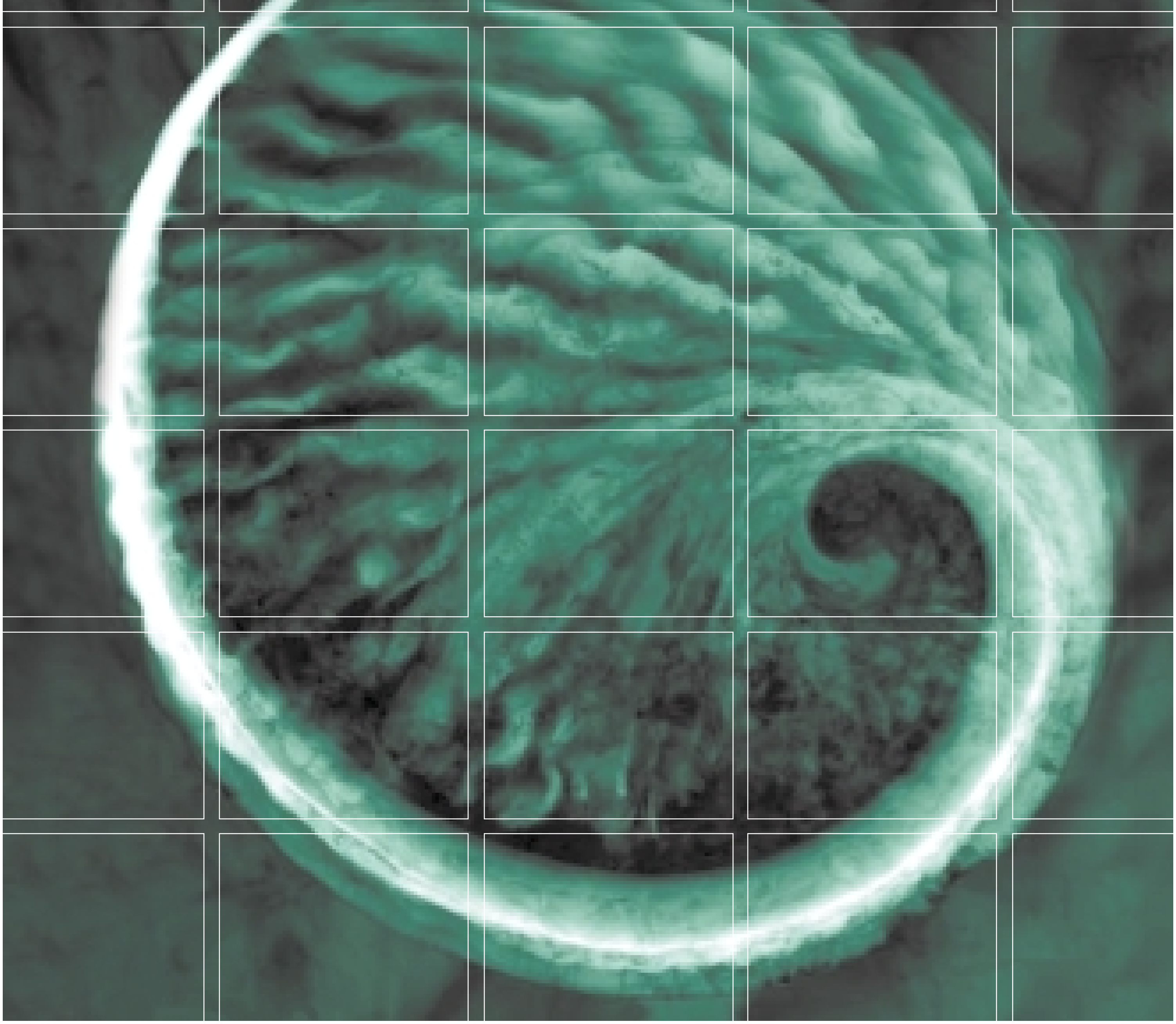
**FIGURE 3-3**

**Schedule of Tasks**
**For RMP Implementation**

**Whirlpool Corporation**
**Fort Smith, Arkansas**

| Task/Activity | Timeframe | Expected Duration |
|---|---|---|
| **Phase 1 – Interim Measure for Off-Site Ground Water** | | |
| Submit IM Work Plan | March 17, 2008 | Completed |
| ADEQ IM Work Plan review and approval | | 30 days |
| Implement IM and conduct Performance Monitoring | Final planning and mobilization within two weeks of ADEQ approval | 180 days |
| Evaluate IM data and initiate Phase 2 design activities | Results of IM evaluation to be included in a final quarterly status report<br><br>IM operation may continue pending results of evaluation | 90 days |
| | | |
| ADEQ RMP review and approval | Concurrent with Phase 1 activities | |
| Establish Public Repository for Administrative Record (AR) | Begin upon approval of RMP | 10 days |
| Issue Public Notice on availability of AR and begin 30-day comment period | | 30 days |
| ADEQ review of public comments | | 30 days |
| Revise / finalize RMP based on public and ADEQ comments | Level of effort to be determined based on nature and extent of comments | 30 to 60 days |
| ADEQ issue Final Remedial Action Decision Document | | 30 days |
| | | |
| **Phase 2 – Expanded Remedy** | | |
| Design modified/expanded off-site ground water remedy | May be combined with on-site design activity and may parallel IM evaluation activity | 60 days |
| Design on-site ground water remedy | May be combined with off-site design activity and may parallel IM evaluation activity | 60 days |
| Design on-site soil containment | May parallel Phase 1 activities | 60 days |
| ADEQ review of design document(s) | Expanded designs may be combined into one document | 30 to 60 days |
| Revise / finalize designs based on ADEQ comments | Level of effort to be determined based on nature and extent of comments | 30 to 60 days |
| Conduct on-site and off-site remedies | On-site and off-site implementation may begin independently based on timing of ADEQ approval of remedy designs | Duration of construction and system startup dependent upon final design |
| Begin performance monitoring and system operational evaluation | Following system startup and trouble shooting. | Milestone |
| Submit Quarterly Remedial Action and Operation and Maintenance Status Reports | | Milestone |
| Conduct semiannual ground water monitoring | Following system startup and trouble shooting | |
| Submit annual ground water monitoring report | | Milestone |
| Conduct 5-Year Technical Review | | Milestone |
| | | |
| **Phase 3 – Contingency Measures** | | |
| Tasks and schedule to be determined | | |



# Interim Measures Work Plan – Fort Smith, Arkansas Facility

**Whirlpool Corporation**
**Fort Smith, Arkansas**

March 17, 2008

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# Interim Measures Work Plan:
## *Fort Smith Arkansas Facility*

March 17, 2008

Project No. 0079781
Fort Smith, Arkansas


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## *1.0 INTRODUCTION*

### *1.1 BACKGROUND*

Whirlpool Corporation (Whirlpool) has been working with The Arkansas Department of Environmental Quality (ADEQ) to address potential risks to human health and the environment associated with a historical release of trichloroethylene (TCE) at the Whirlpool Fort Smith facility located at 6400 Jenny Lind Ave., Fort Smith, Arkansas (Figure 1-1). Based on site investigations conducted between 1999 and 2006, TCE and associated degradation products (primarily cis-1,2-dichloroethene) are present in shallow ground water at the site and have migrated off-site into a residential area north of the facility.

Whirlpool's Risk Evaluation Report (RER) for the Fort Smith Site, submitted June 13, 2007, summarized area land use, site geology and hydrogeology, and evaluated exposure scenarios and assessed potential risks to human health. The RER characterized the approximate extent of the off-site ground water plume. The plume has two general components; the "core" and the "fringe" (Figure 1-2). The "core" is roughly identified as the area where TCE concentrations exceed 0.8 mg/L.

The RER concluded that there were two exposure pathways that, depending on site conditions could pose potential risk to human health and the environment near the "core" of the off-site plume: 1) ground water ingestion via use of a hypothetical future well, and 2) inhalation of vapors via volatilization of affected ground water. Based on current conditions, neither of these pathways is expected to be complete. The ground water ingestion pathway is not complete since shallow wells are not present within the footprint of the plume and the homes in the area are on municipal water service. Additionally, potential exposure by vapor intrusion into homes is also not likely. For example, the clayey soils that are present at the surface would serve as a significant barrier to vapor transport to the ground surface and all but two of the residences near the core are raised, pier and beam-type homes having crawl spaces that would vent vapors to ambient air and interrupt the intrusion pathway.

### *1.2 INTERIM MEASURES OBJECTIVES AND GOALS*

Although the ground water ingestion pathway is not currently complete, and the potential for risk via ground water-to-indoor air pathway has not been quantified, Whirlpool's goal is to reduce any potential risk to human health. Therefore, Whirlpool is proposing to conduct an Interim Measure (IM) as an early response.

In addition to serving as an early response targeting the "core" of the off-site plume, the IM will serve as a pilot test to assess if these technologies (either separately or in combination) are appropriate for full scale implementation and provide data for use in designing a full scale system. In order to address the area with the greatest concentration of COC mass offsite and the area that may be a concern for potential vapor intrusion, the IM will target the core of the off-site plume (Figure 1-2). Technologies that are considered most likely to provide a cost effective and shorter term reduction in constituent concentrations are ground water pump-and-treat and in-situ chemical oxidation (ISCO).

If performance monitoring of the IM indicates that the initial system is effective in reducing concentrations of TCE and daughter compounds in ground water and controlling the potential for exposure in the off-site area, it is envisioned the IM will be incorporated into the final remediation plan for the site. A Process Flowchart illustrating the projected IM pilot program activities and relationship to the Risk Management Plan (RMP) is provided as Figure 1-3.

## 2.0 INTERIM MEASURES TECHNICAL APPROACH

This section describes the technical approach for the IM which will consist of: 1) ground water recovery to extract TCE from the subsurface and induce hydraulic capture of the plume to limit potential for additional plume migration, and 2) a series of ISCO injection points using sodium permanganate to aggressively oxidize the TCE and related constituents in the core of the plume.

### 2.1 GROUND WATER RECOVERY AND TREATMENT

The ground water recovery component of the IM will be comprised of up to two 2-inch diameter recovery wells with pneumatic pumps with a bottom inlet. The pump(s) will periodically discharge to a ground water treatment system each time the pump float senses the pump is full.

Granular Activated Carbon (GAC) will be used to treat recovered ground water. GAC is a proven technology in removal of TCE from water and its low operator labor requirements, low operations and maintenance (O&M) costs, and relatively low capital costs compared with other technologies make it a preferred treatment method for this application.

Two GAC vessels will be placed in series with a sampling port after the first unit to collect monthly samples of treated water to determine when that unit has reached its chemical loading capacity. Any TCE that passes through the first vessel after its capacity has been reached will be adsorbed by the second vessel. The first vessel will then be changed out and the vessel configuration changed so that the second (backup) becomes the primary treatment unit. A preliminary conceptual schematic process and instrumentation diagram (PID) of a similar recovery and treatment system is provided in Figure 2-1.

The treatment system equipment and ancillary instrumentation will be housed in an enclosed temporary building located on an off-site property. The building style will be consistent with the residential structures and will be designed with internal secondary containment of fluids.

Treated water management approaches that may be employed include discharge to the local storm sewers, re-injection into the shallow transmissive zone, or discharge via the Whirlpool facility's waste water treatment system. Final disposition of the treated water will be determined based on results of permitting activities and evaluation of actual quantities produced.

### 2.2 IN-SITU CHEMICAL OXIDATION

The ISCO component of the IM will be comprised of up to eight injection wells located through the core of the off-site plume as shown in Figure 1-2. It is anticipated that two 70-gallon (approximate volume) injections of a 12% sodium permanganate solution will occur at each of eight injection well locations for a total injected volume of approximately 1100 gallons. Injection pressure will be no greater than 12 psi. Based on pilot studies, ISCO injections are anticipated to treat the core of the plume to a radial distance of 30 feet from the injection wells.

Sodium permanganate (RemOx® L ISCO Reagent – Carus Chemicals), (Appendix A – Sodium Permanganate Fact Sheet) has been selected for the in-situ chemical treatments, because of its low toxicity and quick degradation of TCE. The reagent is specifically designed for environmental remediation applications.

Injection of the sodium permanganate into the subsurface requires registration in the ADEQ Underground Injection Control (UIC) Section Class V well program. The UIC is regulated under Regulation 17 (Arkansas Underground Injection Control Code) and the Code of Federal Regulations (CFR) Title 40, Parts 144, 145, 146, and 124. The ISCO injection wells will be registered with the State of Arkansas after installation. Information required by the UIC Section for authorization of injection wells will be submitted prior to initiating injection activities.

Upon completion of ISCO activities, the injection wells will either be converted for use as monitor wells or plugged and abandoned in accordance with abandonment procedures {40 CFR 144.28 and 146.10(c)}.

### *2.3 WELL INSTALLATION*

Twelve wells and one piezometer will initially be installed for the IM -- one ground water recovery well, three monitor wells and eight ISCO injection wells. The proposed arrangement of the wells is shown in Figure 1-2. The recovery well will be installed in the vicinity of monitor well MW-42B. As a contingency, depending on access and permitting, an additional recovery well may be installed near MW-46 but is not currently planned for this phase of the IM. The ISCO injection wells will be installed up-gradient of the recovery well. Two monitor wells will be installed north of the recovery well and one installed east of the easternmost injection wells. The piezometer will be installed approximately 5 feet from the recovery well to facilitate measuring water levels without recovery well pump interference.

Wells will be installed to a depth of approximately 30 feet below ground surface (bgs) and constructed of 2-inch diameter PVC casing with 0.01-inch slotted screen. The surface completions for the injection and monitor wells are anticipated to be 4-foot by 4-foot concrete pads with a steel manway and a manhole cover. Figure 2-2 shows the typical well construction. The surface completion for the recovery well will be a below-grade concrete vault. The piezometer will be a 1-inch diameter "pre-pack" design. Wells will be developed upon completion and all purge water contained for proper disposal. Well installation will be in accordance with prevailing well construction standards for the State of Arkansas.

## *3.0 PERFORMANCE MONITORING*

Performance monitoring will be conducted to assess:

- the rate of TCE concentration reduction in ground water;
- the mass removed by the ground water recovery system; and
- the rate of oxidation and effectiveness of ISCO injections in oxidizing TCE in ground water.

## *3.1 PERFORMANCE MONITORING*

The performance monitoring program for the IM will consist of the following activities:

For the ground water recovery component:

- Periodic water level gauging of selected wells to assess the change in ground water flow resulting from the extraction of ground water; and
- Periodic sampling of selected monitor wells to assess the changes in TCE concentrations resulting from the recovery operation.

For the ISCO treatment component:

- Periodic water level gauging of selected wells to assess potential changes in ground water flow resulting from injection activities;
- Periodic sampling of selected monitor wells to assess the changes in TCE concentration from the ISCO injections; and
- Periodic field screening of selected wells for water quality parameters (e.g., ORP, DO, temp, pH, SC and Cl) to assess the level of impact on the ground water chemistry from the ISCO treatment.

Ground water gauging and monitoring will be conducted in accordance with the approved CAS Work Plan utilizing wells shown in Figure 1-2.

The anticipated frequencies of the monitoring activities are summarized below:

| **Performance Monitoring Activity** | | |
|---|---|---|
| ***Water Level Gauging (1)*** | ***Sampling for TCE*** | ***Water Quality Parameters (2)*** |
| **Ground Water Recovery** | | |
| Baseline prior to system startup;<br>daily for first 5 days;<br>weekly through first month; and<br>monthly thru month 6 | Baseline prior to system startup;<br>day 10;<br>end month 1, and;<br>end month 3.<br><br>(May include additional interim sampling pending review of initial data.) | |

| Performance Monitoring Activity | | |
|---|---|---|
| ***Water Level Gauging (1)*** | ***Sampling for TCE*** | ***Water Quality Parameters (2)*** |
| **ISCO Injection** | | |
| Baseline prior to ISCO injection;<br>end of weeks 1 & 2;<br>monthly thru month 6. | Baseline prior to injections;<br>day 10;<br>end month 1, and;<br>end month 3.<br><br>(May include additional interim sampling pending review of initial data.) | Baseline prior to injection;<br>weekly thru month 1. |
| (1) Additional water level gauging may be recorded in the event of significant rainfall events to assess transient impacts on local flow conditions.<br>(2) Water quality parameters include ORP, DO, temp, pH, SC and Cl. | | |

## 4.0 *OPERATIONS AND MAINTENANCE*

Operations and maintenance of the ground water recovery system and ground water treatment system will consist of the following activities:

For the ground water recovery system component:

- Periodic check of air supply and pressure to recovery well pump(s);
- Periodic check of power supply to air compressor;
- Period readings of recovery well pump cycle counter; and
- Periodic check for leakage of hoses and fittings.

For the ground water treatment system component:

- Periodic check of power supply to system;
- Periodic check for leakage of hoses and fittings;
- Periodic collection of water sample for TCE analysis from sampling port between GAC vessel 1 and GAC vessel 2 to check for break-through;
- Periodic collection of water sample for TCE analysis from discharge line sampling port; and
- Periodic check of discharge rate.

The anticipated frequency of O&M activities is summarized below:

| **Operations and Maintenance Activities** | | | |
|---|---|---|---|
| ***Hoses & Fittings*** | ***Air & Power Supply*** | ***Cycle Counter / Discharge Gauging*** | ***TCE Analysis*** |
| **Ground Water Recovery System** | | | |
| Check for leakage prior to system startup;<br>daily week 1, and;<br>weekly thereafter. | Check daily first week, and;<br>weekly thereafter. | Discharge manually gauged from pump discharge at startup;<br>Discharge manually gauged from pump quarterly, and;<br>weekly cycle counter readings. | Pump discharge sampled at system startup, and;<br>monthly thru month 6, |
| **Ground Water Treatment System** | | | |
| Check for leakage at system startup;<br>daily week 1, and;<br>weekly thereafter. | Check weekly. | Discharge manually gauged at startup;<br>weekly month 1;<br>quarterly thereafter, and;<br>weekly flow meter readings. | GAC vessel-to-vessel sampling port and discharge sampling port at system startup, and;<br>monthly thereafter. |

## 5.0 IM REPORTING AND IMPLEMENTATION SCHEDULE

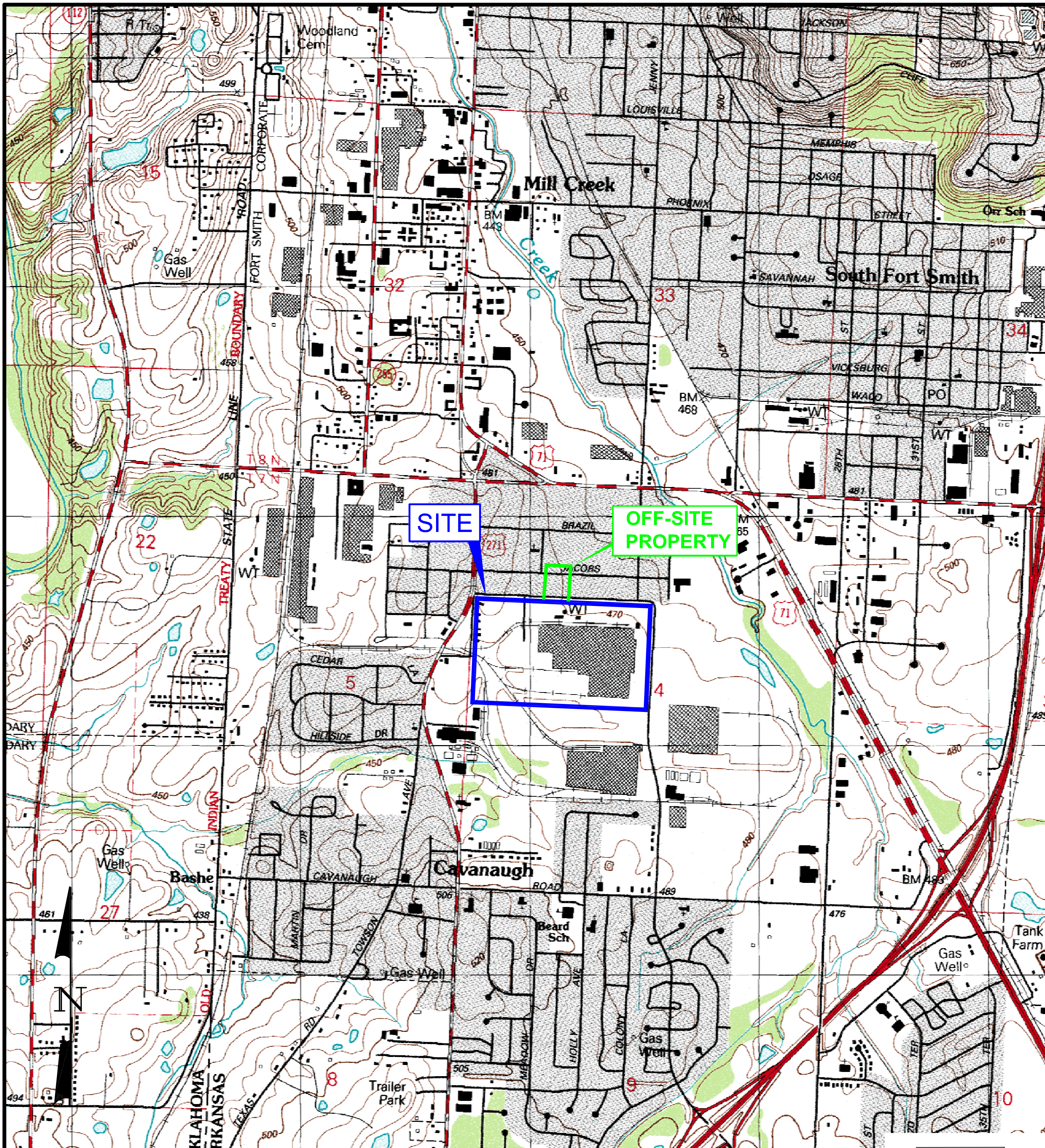
Status reports documenting IM operations will be submitted at least quarterly to the ADEQ. The IM implementation schedule is described below. Implementation of ISCO injections and installation and startup of the pump and treat system may not occur concurrently due to access and permitting requirements. Construction of a building to house the GAC treatment system is dependent on closure of a pending real estate transaction to purchase the property and subsequent review and approval by the City of Fort Smith Planning and Zoning Board to allow the construction of the GAC pump and treat system on the property. Utilization of injection wells is subject to authorization by the UIC Section. A general timeline of activities to prepare and implement the IM is shown below.

| *Task* | *Timeline* | *Duration* |
|---|---|---|
| Submit Work Plan to ADEQ | March 12, 2008 | |
| Obtain applicable permits and access agreements. | Concurrent with Work Plan preparation. | Undetermined |
| Submit ADEQ Notice of Field Activities. | Within 4 weeks of ADEQ approval of Work Plan and receipt of signed access agreements. | |
| Conduct well installation and development. | Within 2 weeks of ADEQ Notice of Field Activities submittal. | 2 to 3 weeks. |
| Conduct baseline sampling/monitoring | Upon completion of well installation. | 1 to 2 weeks. |
| Conduct ISCO injection. | Within two weeks of receipt of baseline analytical data (assuming authorization by ADEQ UIC Section). | 1 week. |
| Construct ground water treatment facilities. | Within 4 weeks of approval of city Conditional Use Permit. | 2 to 3 weeks. |
| Conduct ground water recovery system operational testing. | Upon completion of treatment system construction. | 1 week. |
| Commence ground water system operation. | Upon completion of system testing. | |

# Figures

*March 17, 2008*
*Project No. 0079781*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

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SCALE FEET

SOURCE: U.S.G.S. 7.5' QUADRANGLE, SOUTH FORT SMITH, ARK.-OKLA., (o35094C4) 1987.


QUADRANGLE LOCATION

**Environmental Resources Management**

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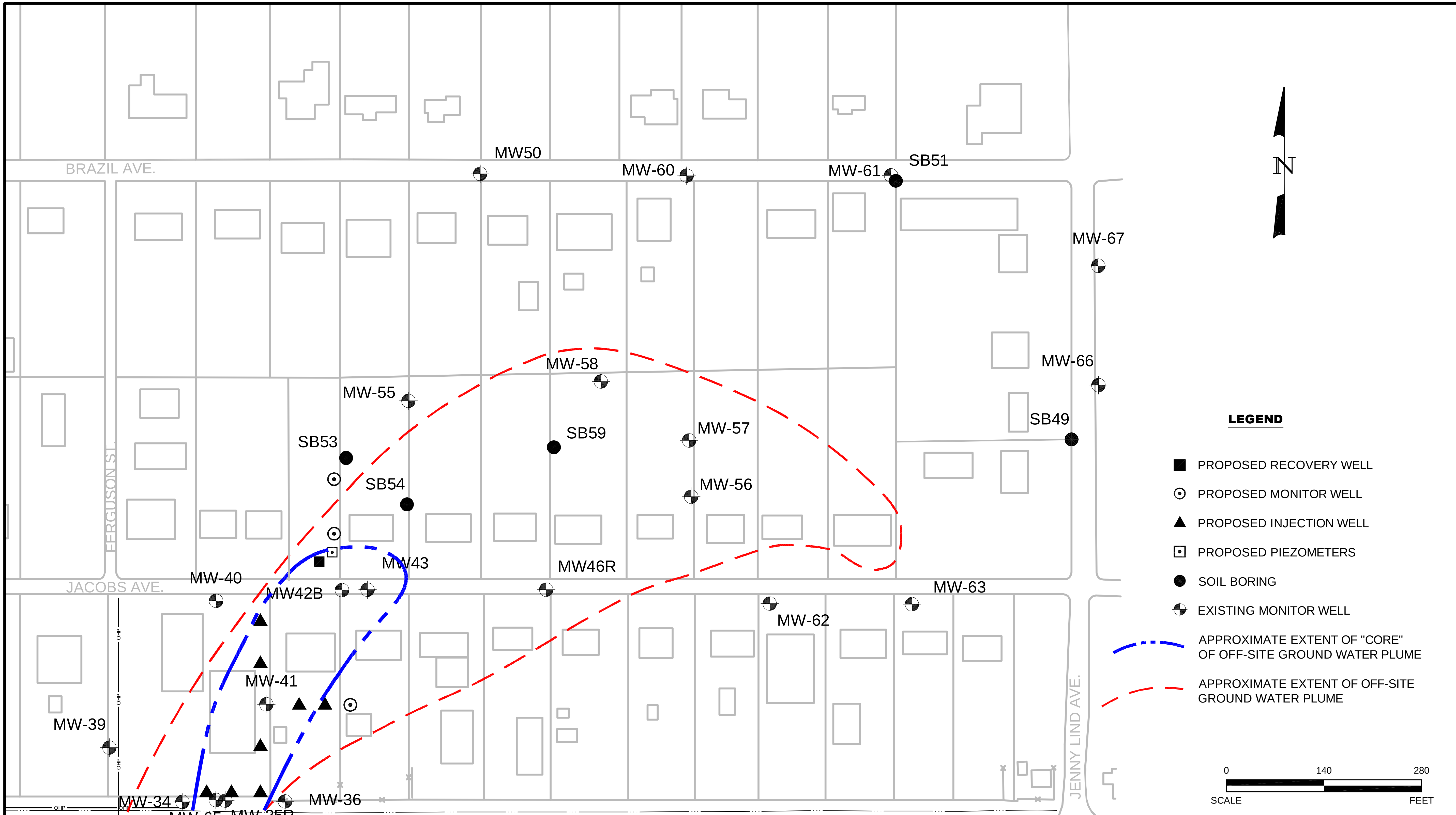
FIGURE 1-1
SITE LOCATION MAP
Whirlpool Corporation
Fort Smith, Arkansas

ERM




ERM-Southwest, Inc.
HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE

FIGURE 1-2
IM PROPOSED WELL LOCATIONS

Whirlpool Corporation
Fort Smith, Arkansas

| | | |
|---|---|---|
| DESIGN: TWM | DRAWN: RLM/LMc | CHKD.: TWM |
| DATE: 01/16/08 | SCALE: AS SHOWN | REV.: |
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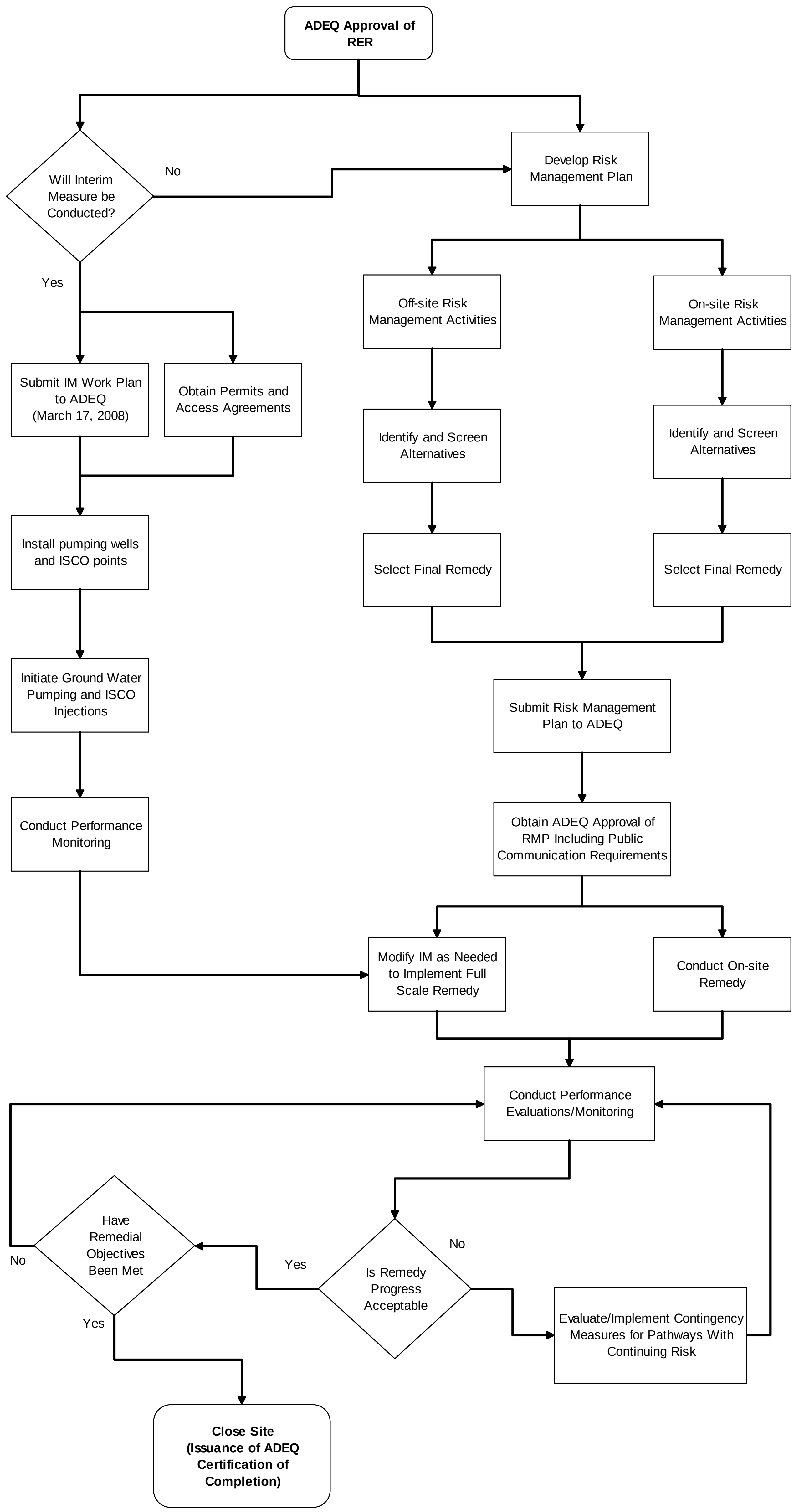


**Environmental Resources Management**

FIGURE 1-3
IM AND RMP PROCESS FLOW CHART
Whirlpool Corporation
Fort Smith, Arkansas

| | | |
|---|---|---|
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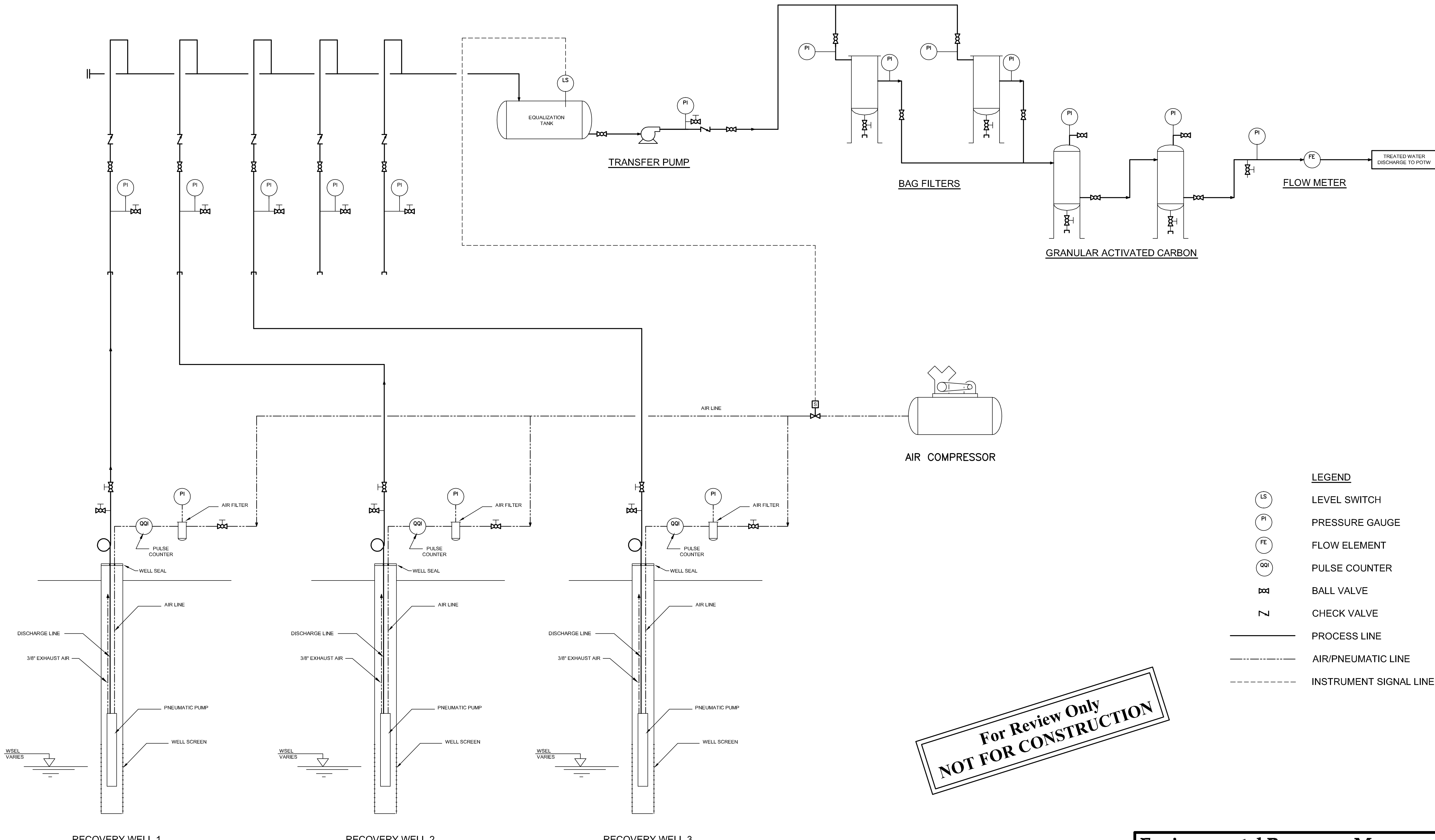


**Environmental Resources Management**

FIGURE 2-1
GROUND WATER TREATMENT SYSTEM
PRELIMINARY CONCEPTUAL
PIPING AND INSTRUMENTATION DIAGRAM
WHIRLPOOL CORPORATION
FORT SMITH, ARKANSAS

ERM

| | | | |
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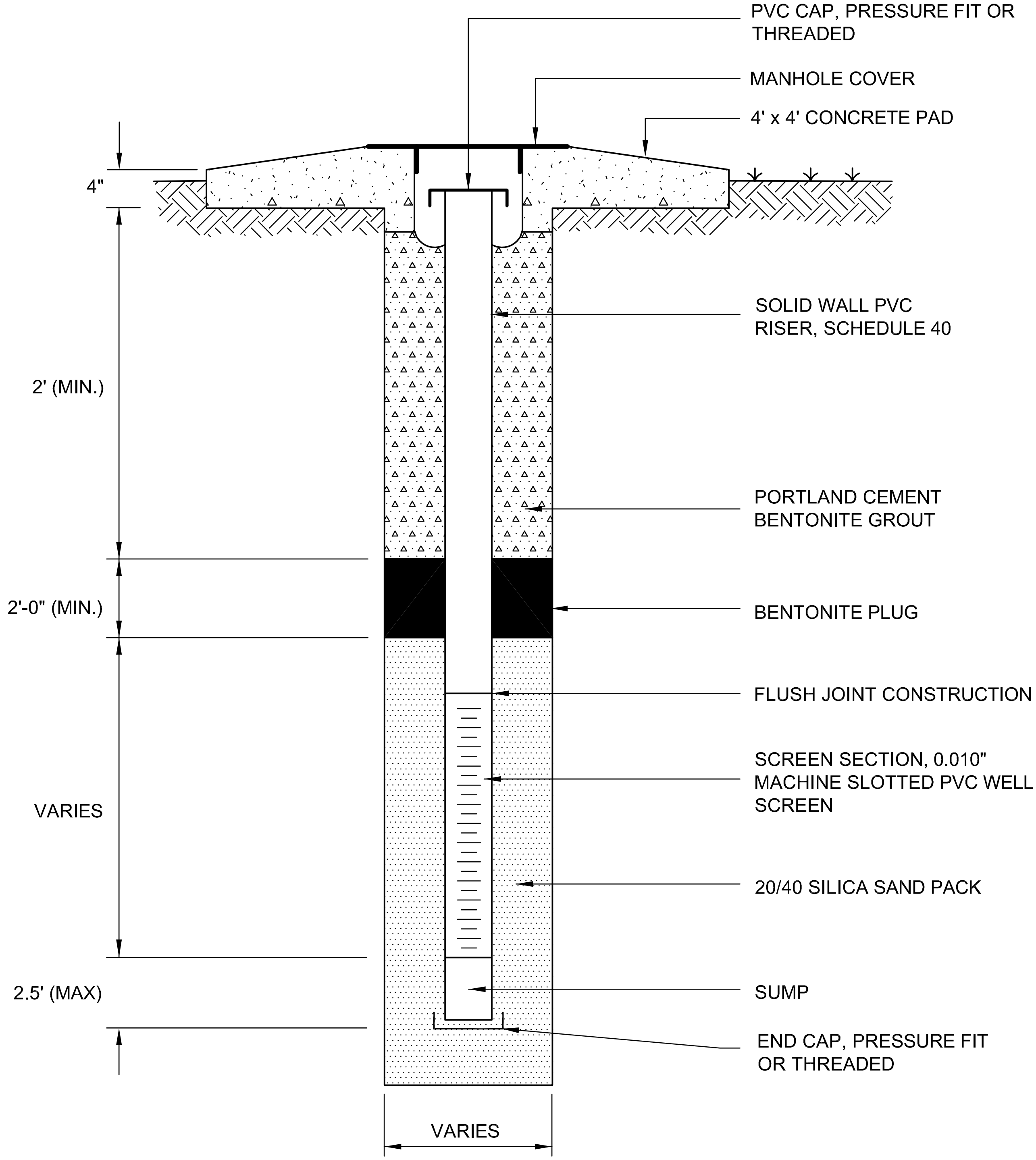


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**Environmental Resources Management**

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FIGURE 2-2
TYPICAL CONSTRUCTION WELL
COMPLETED BELOW GRADE
Whirlpool Corporation
Fort Smith, Arkansas

ERM

# Sodium Permanganate Fact Sheet

*Appendix A*

*March 17, 2008*
*Project No. 0079781*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

# RemOx® L
# ISCO Reagent

CAS Registry No. 10101-50-5
EINECS No. 233-251-1

## Fact Sheet

RemOx® L ISCO Reagent has been specifically manufactured for environmental applications such as remediation of soils and associated groundwater. This product can be used to degrade a variety of contaminants such as chlorinated solvents, polyaromatic hydrocarbons, phenolics, organo-pesticides and substituted aromatics. RemOx® L ISCO Reagent is shipped with a Certificate of Analysis (COA).

### Product Specifications

| | |
|---|---|
| Assay, % | 39.5 - 41.0 as $NaMnO_4$ |
| pH | 5.0 - 8.0 |
| Trace Metals | (See Table 1) |

### Chemical/Physical Data

| | |
|---|---|
| Formula | $NaMnO_4$ |
| Appearance | Dark Purple Solution |
| Specific Gravity | 1.365-1.385 |
| Shelf Life | 18 months |
| Freezing Point | 4° F |
| Solubility in Water | Miscible with water in all proportions. |

Material will pass through a 10 micron filter

### Applications

RemOx® L ISCO Reagent is used for soil and groundwater remediation by in-situ or ex-situ chemical oxidation and as active agent in subsurface reactive barriers for treatment of:

- Chlorinated Ethenes -PCE, TCE, Vinyl Chloride, etc.
- Phenolics-PCP, p-Cresol, 2,3 Dichlorophenol, etc.
- Polyaromatic Hydrocarbons-Naphthalene, Phenanthrene, Benzo(a)Pyrene, etc.
- TNT, RDX, HMX, etc.
- Various Pesticides

### Benefits

- Concentrated liquid form
- More precise dosing of chemical
- Feed equipment is simplified
- Consistent concentration
- High stability

### Shipping Containers

<u>5-gallon (20-L) HDPE Jerrican</u>
(UN Specification: UN3H1/Y1.8/100) Made of high-density polyethylene (HDPE). Weighs 3.5 lb (1.6 kg). The net weight is 57 lbs (25.7 kg). The jerrican stands approximately 13.4 in. tall, 9.4 in. wide, and 13.0 in. deep (33.9 cm high, 23.8 cm wide, and 33.0 cm deep).

<u>55-gallon (208.2L) HDPE TightHead Drum</u>
(UN Specification: UN1H1/Y1.9/150) Made of high-density polyethylene (HDPE). Weighs 22 lbs (10 kg). The net weight is 550 lbs (249.5 kg). The drum stands approximately 34.5 in. tall, has an outside diameter of 23.4 in. (89.1 cm tall, OD 59.4 cm).

<u>275-gallon (1041L) IBC (Intermediate Bulk Container)</u>
(UN Specification: UN31HA1/Y1.9/100) They are also marked "MX" for multi-trip IBC Weighs 139 lbs (65 kg). The net weight is 3000 lb (1161 kg). The IBC contains 263 gallons or 995 liters of product. The IBC dimensions are 45.4 in. high, 48 in. long, and 40 in. wide. The IBC has a 2" butterfly valve with NPT threads in bottom sump. (Domestic)

<u>Bulk Shipping</u> - Quantities up to 4000 gallons are available.

### Handling and Storage

Like any strong oxidant RemOx® L ISCO Reagent should be handled with care. Protective equipment during handling should include face shields and/or goggles, rubber or plastic loves, and rubber or plastic apron. If clothing becomes spotted, wash off immediately; spontaneous ignition can occur with cloth or paper. In cases where significant exposure exists use the appropriate NIOSH-MSHA dust or mist respirator is recommended.

Store in accordance with NFPA (National Fire Protection Association) Code 430 requirements for Class II Oxidizers. The product should be stored in a cool, dry area in closed containers. Concrete floors are preferred. Avoid wooden decks. Spillage should be collected and disposed of properly. Contain and dilute spillage to approximately 6% with water, and then reduce with sodium thiosulfate, a bisulfite, or ferrous salt solution. The bisulfite or ferrous salt may require some dilute sulfuric acid (10% w/w) to promote reduction. Neutralize with sodium carbonate to neutral pH, if acid was used. Deposit sludge in an approved landfill or, where permitted, drain into sewer with large quantities of water.

As an oxidant, the product itself is non-combustible, but will accelerate the burning of combustible materials. Therefore, contact with all combustible materials and/or chemicals must be avoided. These include but are not limited to: wood, cloth, organic chemicals, and charcoal. <u>Fires may be controlled and extinguished by using large quantities of water. Refer to the *MSDS* for more information</u>. Avoid contact with acids, peroxides, sulfites, oxalates, and all other oxidizable inorganic chemicals. During contact with hydrochloric acid, chlorine is liberated.

**CARUS CHEMICAL COMPANY**

## Shipping

RemOx® L ISCO Reagent is classified as an oxidizer for both domestic and international transportation. Liquid permanganate is shipped domestically as Freight Class 70.

Harmonized Code for export: 2841.69.0010

Proper Shipping Name: Permanganates, inorganic, aqueous solution n.o.s (contains permanganate).
Hazard Class: 5.1
Identification Number: UN 3214
Packaging Group: II
Label Requirements: Oxidizer, 5.1

Packaging Requirements: 49 CFR Parts 171 to 180
Sections: 173.152, 173.202, 173.242.

Quantity Limitations: 1 liter net for passenger aircraft or railcar;
5 liters net for cargo aircraft.

Vessel Stowage: D-material must be stowed "on-deck" on a cargo vessel, but is prohibited on a passenger vessel. Other provisions: stow separately from ammonium compounds, hydrogen peroxide, peroxides, super-oxides, cyanide compounds and powdered metal.

## Compatibility Information

RemOx® L ISCO Reagent is compatible with many metals and synthetic materials. Natural rubbers and fibers are often incompatible. Solution pH and temperature are also important factors. The material selected for use with liquid permanganate must also be compatible with any kind of acid or alkali being used.

In neutral and alkaline solutions, sodium permanganate is not corrosive to carbon steel and 316 stainless steel. However, chloride corrosion of metals may be accelerated when an oxidant such as liquid permanganate is present in solution. Plastics such as Teflon, polypropylene, HDPE and EPDM are also compatible with liquid permanganate.

Aluminum, zinc, copper, lead, and alloys containing these metals maybe be slightly affected by sodium permanganate. Actual corrosion or compatibility studies should be made under the conditions in which RemOx® L ISCO Reagent will be used prior to use.

Table 1: Trace Metal Content and Specifications

| | Typical Analysis (mg/kg) | Specification (mg/kg) | DL* (mg/kg) | Element | Typical Analysis (mg/kg) | Specification (mg/kg) | DL* (mg/kg) |
|---|---|---|---|---|---|---|---|
| Ag | 0.036 | 0.15 | 0.034 | Fe | BDL | 2.00 | 0.053 |
| Al | 0.33 | 2.00 | 0.24 | Hg | BDL | 0.03 | 0.003 |
| As | 0.005 | 4.00 | 0.006 | Ni | BDL | 0.10 | 0.030 |
| Ba | 2.26 | 5.00 | 0.016 | Pb | BDL | 0.70 | 0.16 |
| Be | BDL | 0.50 | 0.08 | Sb | BDL | 0.70 | 0.16 |
| Cd | BDL | 0.10 | 0.016 | Se | 0.0066 | 0.50 | 0.0003 |
| Cr | 1.99 | 5.00 | 0.031 | Tl | BDL | 3.50 | 0.8 |
| Cu | 0.024 | 0.10 | 0.022 | Zn | 0.024 | 0.40 | 0.011 |

*DL=Detection Limit

### Carus Chemical Company

During its 90-year history, Carus' ongoing emphasis on research and development, technical support, and customer service has enabled the company to become the world leader in permanganate, manganese, oxidation, and base-metal catalyst technologies.

Carus Chemical Company
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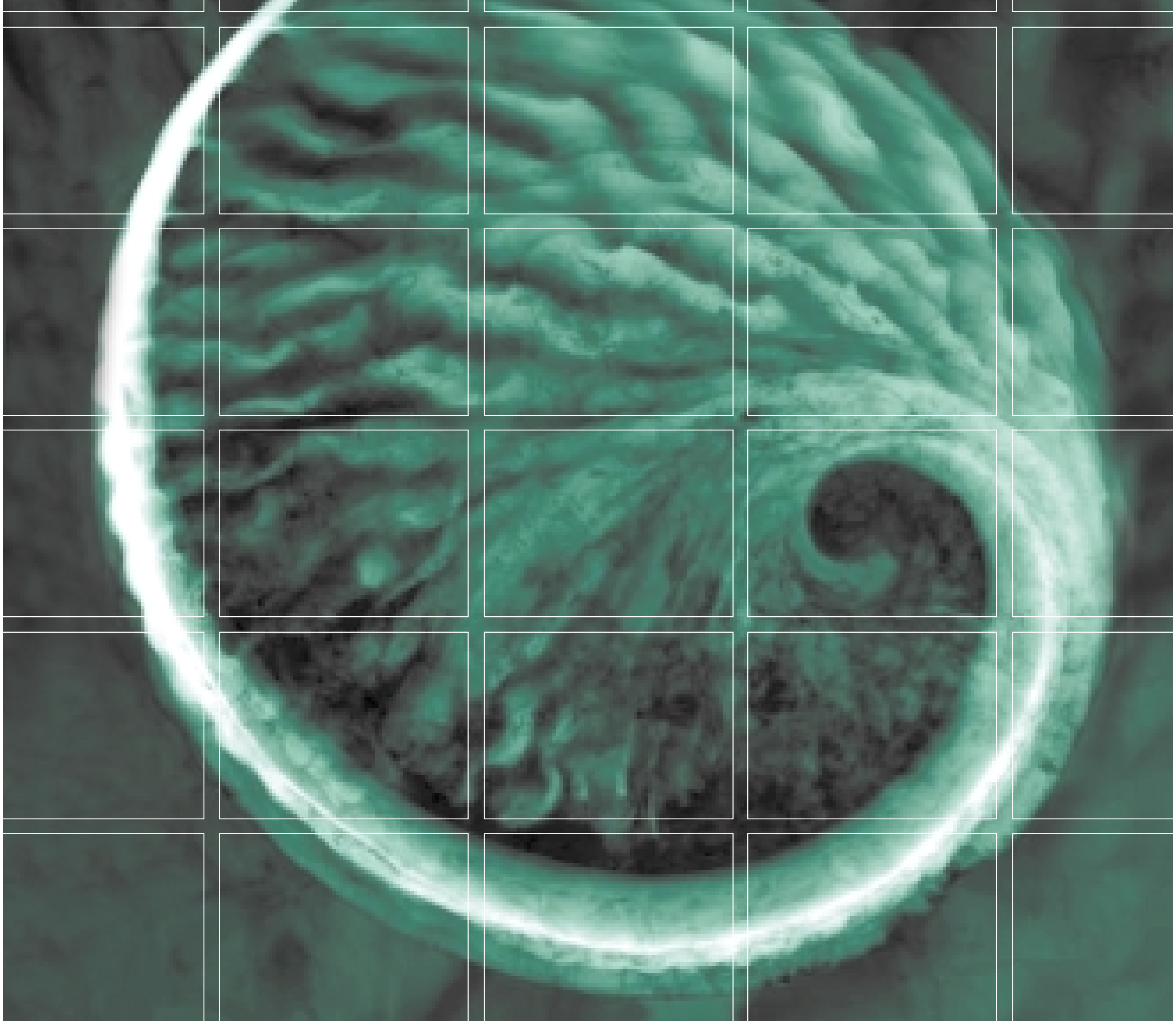
Peru, IL
Tel. (815) 223-1500
Fax (815) 224-6663
Web: www.caruschem.com
E-Mail: remediation@caruschem.com



# Risk Evaluation Report – Fort Smith, Arkansas Facility

**Whirlpool Corporation**
**Fort Smith, Arkansas**

June 14, 2007

www.erm.com

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*Delivering sustainable solutions in a more competitive world*

Whirlpool Corporation

# Risk Evaluation Report:
## *Fort Smith Arkansas Facility*

June 14, 2007

Project No. 0048030
Fort Smith, Arkansas


**H. Reiffert Hedgcoxe**
*Partner-in-Charge*

**Troy W. Meinen**
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*Glossary of Acronyms*

| | |
|---|---|
| ADEQ | Arkansas Department of Environmental Quality |
| ASTM | American Standard for Testing and Materials |
| CAS | Corrective Action Strategy |
| COPC | Constituent of Potential Concern |
| CSM | Conceptual Site Model |
| DAF | Dilution and Attenuation Factor |
| EPA | Environmental Protection Agency |
| GWP | Ground Water Protection |
| HQ | Hazard Quotient |
| J&E | Johnson and Ettinger |
| LOA | Letter of Agreement |
| MSSL | Medium-Specific Screening Level |
| NOD | Notice of Deficiency |
| QAPP | Quality Assurance Project Plan |
| RAGS | Risk Assessment Guidance for Superfund |
| RER | Risk Evaluation Report |
| RMR | Risk Management Report |
| SSL | Soil Screening Levels |
| USGS | United States Geological Survey |
| UST | Underground Fuel Storage Tank |
| VF | Volatilization Factor |
| VOCs | Volatile Organic Constituents |

## *1.0 INTRODUCTION*

This Risk Evaluation Report (RER) has been prepared pursuant to the requirements specified in Section II.F of the Letter of Agreement (LOA) between the Arkansas Department of Environmental Quality (ADEQ) and Whirlpool Corporation, dated July 19, 2002. The RER captures four elements necessary in guiding risk management decisions at the site: 1) the site characterization activities and results for the Whirlpool Corporation, Fort Smith Facility (hereafter referred to as the site), 2) the exposure scenario evaluation, 3) highlights of the revised conceptual site model (CSM), and 4) the findings of the risk assessment.

Initial information for the first three of the four elements listed above was previously provided in the Conceptual Site Model (CSM) report, dated August 2, 2002, and in the Corrective Action Strategy Work Plan Addendum (Work Plan), dated August 30, 2006. These elements have been updated as necessary and are provided in the RER.

Consistent with the path forward outlined in Work Plan, a risk assessment (the fourth element of the RER) was completed for the site. The technical approach used for the risk assessment generally followed the principles and guidelines described in EPA Region 6 Corrective Action Strategy (CAS) (EPA, 2000).

As an initial step in the risk assessment, High Priority Bright Line Screening Levels provided in the CAS were used as a priority screen. The results indicated that several constituents significantly exceeded the High Priority Bright Line Screening Levels. It was apparent from the results of the priority screen that it would be more effective to initiate remediation directly after conducting the priority screen, rather than perform a detailed site-specific risk assessment. Constituents of potential concern (COPCs) that required remediation were identified in a subsequent risk-based screening step.

### *1.1 REGULATORY BACKGROUND*

Whirlpool entered into a LOA with ADEQ on July 19, 2002 to investigate and remediate affected ground water at the northern position of the site in accordance with the CAS. A chronology of significant events related to the site is presented below.

| | |
|---|---|
| August 2001 | Notice of Intent |
| June 2002 | Letter of Agreement |
| August 2002 | Conceptual Site Model |

| | |
|---|---|
| August 2002 | Scoping Meeting – ADEQ indicated that Whirlpool should proceed with off-site delineation under CAS Work Plan Outline. |
| August 2002 | CSM Addendum |
| June 2003 | CAS Work Plan |
| July 2003 | Off-site Delineation Phase A – included installation and sampling of three off-site wells |
| November 2003 | Off-site Delineation Phase B – included ten Geoprobe borings and field screening using a membrane interface probe, and the installation and sampling of four off-site wells |
| June 2004 | Interim Status Report and Revised CAS Work Plan |
| October 2004 | E-mail from Linda Hanson, ADEQ – directed Whirlpool to continue with off-site delineation under the Revised CAS Work Plan and address specified deficiencies upon completion of delineation |
| November 2004 | Off-site Delineation Phase C – included installation of seven Geoprobe borings and the installation and sampling of four off-site wells |
| March 2005 | Interim Status Report for Off-Site Investigation |
| April 2005 | Off-Site Delineation Phase D – included installation of five Geoprobe borings and the installation and sampling of four off-site wells |
| June 2005 | Interim Status Report for Off-Site Investigation |
| June 2005 | Notice of Deficiency (NOD) letter from ADEQ – identified several items to be addressed, requested a revised CAS Work Plan |
| July 2005 | Response to June 2005 ADEQ NOD letter |
| April 2006 | Off-site Delineation Phase E - including installation and sampling of two off-site monitoring wells |
| June 2006 | NOD letter from ADEQ |
| June 2006 | Meeting with ADEQ to review off-site delineation status and clarify path forward |

| | |
|---|---|
| August 2006 | CAS Work Plan Addendum (approved by ADEQ January, 2007) |

## 1.2 *OBJECTIVES*

As presented in the CAS Guidelines, the objectives of the RER include:

- Summarize the site characterization activities and results of those studies;
- Evaluate exposure scenarios that apply to the site;
- Assess the potential risk to human health considering site-specific conditions; and
- Identify aspects of the site that may warrant remediation or further risk evaluation.

## 1.3 *REPORT ORGANIZATION*

This report is organized into the following sections to present the information in a clear and concise framework.

- *Section 1* (Introduction) presents the site background and description, and outlines the scope and objectives of the report.
- *Section 2* (Conceptual Site Model) describes the site conditions based on the comprehensive site investigation activities, presents a discussion of the extent of affected media, exposure scenarios, results of the Ecological Exclusion Criteria Worksheet, and identifies areas that require evaluation in the risk assessment.
- *Section 3* (Risk-Based Priority Screening) presents a summary of the methods and results for prioritizing the site.
- *Section 4* (Identification of COPCs) describes the risk-based methods used to identify COPCs for remediation and the list of COPCs.
- *Section 5* (Summary of Risk-Screening Process and Conclusions) summarizes the significant findings of the risk assessment.
- *Section 6* (References) provides a listing of the references used in the report.

## 2.0 CONCEPTUAL SITE MODEL

The CSM characterizes the site conditions and provides the basis for the exposure scenario evaluation. Key components of the CSM are discussed below organized by facility profile, land use and exposure profile, physical profile, release profile, ecological profile, and risk management profile.

## 2.1 FACILITY PROFILE

### 2.1.1 Site Features

The Whirlpool Fort Smith facility is located at 6400 Jenny Lind Avenue on the south side of Fort Smith in Sebastian County, Arkansas (Figure 2-1).
The facility is approximately 153 acres and includes the main manufacturing building (approximately 1.3 million square feet), adjoining warehouse and administrative offices, and approximately 21 acres of undeveloped land (Figure 2-2). Additional buildings located on the north side of the property include a water treatment plant and boiler house. The majority of the property surrounding the buildings is covered with concrete or asphalt for parking. Some gravel parking areas are also present. An outdoor waste storage area is located on the south side of the manufacturing facility. This paved area is enclosed with a chain-link fence topped with razor wire. Historical records indicate that a small building located west of the boiler house was formerly used for degreasing operations. The former degreaser building has not been used since the mid 1980s.

### 2.1.2 Facility Operations

The facility manufactures side-by-side household refrigerators, trash compactors and icemakers, and has been operated by Whirlpool for over 30 years. Manufacturing processes include polyurethane foaming, metal fabrication, plastic thermoforming, and assembly operations. All storage of hazardous wastes is limited to 90 days or less in containers. No hazardous waste disposal activities are conducted on site.

## 2.2 LAND USE AND EXPOSURE PROFILE

### 2.2.1 Land Use

The facility property is developed for industrial use (i.e., manufacturing and warehousing). No other specific land use categories are present on the property. Land uses adjacent to the site include residential areas to the north and industrial/commercial areas to the south, west and east. A tract of undeveloped land is also present east of the site. Residential properties to the north include single-family homes and two multi-family units. A recreational facility that includes three buildings, two basketball courts, and three baseball fields is located northeast of the site, adjacent to the residential area. No agricultural properties are located in the vicinity of the site. There are no sensitive areas, such as schools, hospitals, or day care centers located within 0.5 miles from the facility. Figure 2-3 illustrates the land uses immediately surrounding the facility.

### 2.2.2 *Resource Use*

Drinking water and sanitary sewer services for both commercial/industrial and residential properties in the vicinity of the site are supplied by the City of Fort Smith. Drinking water supplies include Lake Fort Smith, Lake Shepherd Springs and the Lee Creek Reservoir. None of these reservoirs are located near the facility.

Based on the EPA ground water classification guidelines, ground water in the vicinity of the site is classified as Class IIB ground water (a potential drinking water source). However, available literature indicates that the majority of shallow wells in the Fort Smith area are completed in the McAlester Shale. The thin alluvial deposits in the Fort Smith area (specifically those not associated with the Arkansas River) yield insufficient quantities of water to justify shallow wells. Most wells completed in the McAlester Shale are completed to depths up to 475 feet and produce poor quality water with yields of 25 to 75 gallons per minute. These potential drinking water resources are significantly separated from thin alluvial sands and gravels that immediately underlie the site.

A water well search was initially conducted for the facility in February 2001. In May 2006, a new water well search was performed and covered a one-mile radius around the site (Figure 2-4). No federal, state or public water supply wells were identified within the search radius. Based on the water well search reports and area reconnaissance, no water supply wells are present on the residential properties adjacent to the facility to the north. The database search also indicated the presence of 20 shallow (<30 ft bgs) environmental monitor wells within a one-mile radius of the site. All 20 of those wells are situated at least 2,000 feet away from the site, and none are impacted by site activities.

Future impacts to domestic or public water supply wells are unlikely based on the current location of the ground water plumes, inferred ground water flow directions, and the lack of drinking water use in the vicinity of the site.

The closest surface water body is approximately 1200 feet east of the site and is named Mill Creek. Mill Creek is a perennial freshwater stream that is classified as state segment 11110105002991 and has designated uses for contact recreation, fishery, and domestic, industrial, and agricultural water supply. Based on site reconnaissance and data from lithologic logs from borings along Jenny Lind Avenue, the transmissive zone containing site constituents is not hydraulically connected to and does not discharge to the creek.

Other than the features described above, there are no beneficial resources that are in the vicinity of the site that would be potentially impacted by the historical release from the site (described in more detail in Section 2.4, Release Profile).

### 2.2.3 *Exposure Profile*

The exposure profile integrates the information on land uses, receptors, resources, and releases to identify applicable exposure pathways. As defined by EPA, a pathway is potentially complete if all of the following conditions exist: (1) a source or chemical release from a source, (2) an exposure point where contact can occur, and (3) an exposure route by which contact can occur (EPA, 1989). The following subsections discuss each of the conditions stated above as necessary for identification of a potentially complete pathway.

#### *2.2.3.1 Source*

Additional aspects of the source component of the exposure profile are described in more detail in Section 2.4 (Release Profile). In summary, chlorinated solvents (reportedly tricholorethylene, or TCE) likely entered the environment from historical site activities that were potentially related to former degreasing operations at or near the former degreaser building. The known area of affected soils is wholly contained within the confines of the facility security fencing. Those historical releases appear to have traveled through surface soil, migrating vertically to ground water within alluvial sands and gravels constituting the uppermost aquifer underlying the site. Over time, the constituents were transported laterally within the uppermost aquifer to the south and to the north from the general vicinity of the former degreaser building, located outside the northeastern corner of the manufacturing building.

At this time, both soil and ground water may be considered as a source for the purposes of this exposure pathway analysis. Constituents present in deep soil above the water table may potentially act as a source for transfer to ground water. Similarly, the affected ground water may potentially serve as a source as constituents migrate to soils, soil vapor and then to air.

#### *2.2.3.2 Exposure Point*

The concept of an exposure point primarily refers to an exposure medium. However, another important component of the exposure pathway analysis is the exposure population. Both of these components, an exposure medium and an exposure population are discussed below.

*Exposure Medium*

The exposure media by which receptors may potentially come in contact with constituents from the site were considered to be soil (for the direct contact to soil pathway), ground water (for the direct contact to ground water pathway) and air (for the ground water to ambient air and ground water to indoor air pathways).

*Exposure Population*

Based on the available information concerning land uses both on and off site, the following potential exposure populations were identified:

- Site workers (potentially long-term exposure) that are involved in manufacturing activities, facility maintenance administration over many years;
- Site construction workers (potentially short-term exposure) that may be involved in limited duration activities construction, utility, or other related activities; and
- Off-site residents (potentially long-term exposure) that live in the area north of the site where the plume has migrated.

In this risk assessment, these exposure populations are represented by a *receptor*.

*2.2.3.3 Exposure Routes and Pathways*

Constituents may potentially enter the human body through ingestion, dermal contact, and inhalation. These modes of entry constitute exposure routes.

Based on the nature and distribution of the affected soil and ground water, the on- and off-site receptors may potentially be exposed to site constituents through several pathways. For purposes of discussion, the exposure pathways that were carried into the risk assessment are referred to as *Determined Exposure Pathways* while others that were generally considered, but not used in the risk assessment are referred to as *Undetermined Exposure Pathways*.

*Determined Exposure Pathways*

Considering the source, potential exposure points, potential exposure routes, and EPA's guidelines for a potentially complete pathway, two Determined Exposure Pathways were identified to be potentially complete at the site:

- Direct contact with soil 0-2 ft bgs (i.e., combined ingestion, dermal, and inhalation exposures) for current and future site workers; and
- Direct contact with soil 0-2 ft bgs (i.e., combined ingestion, dermal, and inhalation exposures) for future construction workers.

Additionally, three Determined Exposure Pathways that are not currently complete, but without institutional controls could become potentially complete, were identified:

- Direct contact with on-site ground water (i.e., combined ingestion, dermal, and inhalation exposures) for site workers if a water supply well was installed in the uppermost aquifer in the future;

- Direct contact with off-site ground water (i.e., combined ingestion, dermal, and inhalation exposures) for residents if a domestic water supply well was installed in the uppermost aquifer in the future; and
- Direct contact with on-site ground water via leaching and infiltration of soil constituents to on-site ground water if a water supply well was installed in the uppermost aquifer in the future.

*Undetermined Exposure Pathways*

Several additional pathways were assessed, but not demonstrated to be complete based on analytical data in the exposure medium. Rather, they are acknowledged as theoretically possible based on site conditions (e.g., source concentrations, lack of engineering controls, potential receptors, etc). For the most part, these Undetermined Exposure Pathways rely on an indirect connection between the source and the potential receptor. For example, exposure via inhalation of vapors in outdoor air over an area of the plume requires transport from ground water to soil and through soil vapor, and then into ambient air where vapors might accumulate. Then, exposure would be required by a receptor to the accumulated vapors in the outdoor air space.

The lack of analytical data and accurate models for such indirect pathways make quantitative analysis less reliable, and therefore less useful for these pathways. The Undetermined Exposure Pathways considered for the site are listed below:

- Inhalation of volatile emissions in outdoor air from constituents in shallow ground water for current and future site workers, construction workers, and residents;
- Vapor intrusion into buildings from constituents in shallow ground water for current and future site workers, and residents;
- Incidental contact with off-site surface soils for the resident; and
- Incidental contact with ground water in off-site soils for the resident (short-term exposure).

The exposure pathways, both Determined and Undetermined, are summarized in the exposure pathway analysis diagram in Figure 2-5. A pictorial illustrating the conceptual exposure model is provided in Figure 2-6. Exposure scenarios were developed for both Determined and Undetermined Pathways (See Section 3.3). However, quantitative risk assessment was only performed for the Determined Pathways. Potential risk from the Undetermined Exposure Pathways will be managed as part of the overall remediation strategy.

#### 2.2.3.4 *Description of On-Site Receptor Exposure Scenarios*

***Ground Water Receptor Scenario***

*Current and Future Site Worker*: Shallow ground water beneath the site is currently not used and it is anticipated that it will not be used in the future. No water supply wells are located on site. The site and immediate surrounding area are provided with municipally supplied water, which is expected to continue in the future. Therefore, there is no risk to the current site worker from direct contact with on-site ground water as the pathway is incomplete.

There is no current restriction on ground water use at the facility. In the unlikely event that a drinking water well is installed in the future, a *hypothetical* scenario was evaluated for the future site worker. Direct contact with shallow ground water on site was hypothetically assumed for the future site worker only. In this hypothetical scenario, a future site worker may be exposed to ground water via a *hypothetical* water supply well completed in the shallow affected ground water zone on site. In this hypothetical scenario, the exposure route could occur via ingestion, dermal contact while showering, and inhalation of volatiles while showering.

Volatile COPCs are present in on-site ground water. Based on headspace analysis of site soils using an organic vapor meter, there is no indication that vapors from ground water have actually reached the surface and, if so, at what concentration. The ground water to ambient air pathway was not quantified for the current and future site worker in the absence of reported ambient air data. Quantification of this pathway would require use of screening level models that use a "box" assumption which limits the degree of circulation and exchange of air. Such models do not represent site conditions.

For the current and future site worker (indoor), the vapor intrusion into buildings pathway was not quantified. While volatile COPCs are detected in on-site ground water, the lack of analytical data in the exposure medium (air) and inaccuracies of screening quality models present a high level of uncertainty regarding the completeness of the pathway.

*Current and Future Construction Worker:* Construction/utility projects at the site do not typically involve work to a depth below five feet or more. Contact with shallow ground water at the site is not a likely scenario due to the depth to ground water (more than 10 to 15 feet below ground surface) and because dewatering would be required should water enter an excavation during construction activities. Accordingly, this pathway was considered incomplete and not evaluated.

It is unknown whether the ground water to ambient air pathway is complete for the construction worker. Screening-level models to assess ambient air typically use a "box" assumption which limits the degree of circulation and exchange of air. Such models are overly simplistic and do not represent site conditions. Accordingly, this pathway was not quantitatively evaluated for the construction worker.

### 2.2.3.5 *Description of Off-Site Receptor Exposure Scenarios*

***Soil Receptor Scenarios***

*Residential Receptor (Short-Term Exposure) Scenario:* Under current and future conditions, some residents may come into contact with saturated surface soil in their yards. Ground water elevation measurements in several off-site wells, suggest the ground water potentiometric surface is proximate to the ground surface in an area roughly demarcated by wells MW-50, MW-58, MW-56, and MW-62. The aquifer is confined in this area such that there is no direct discharge of ground water to the ground surface. In that limited area, a residential receptor involved in digging or related activities could experience short-term direct contact with saturated soils via incidental ingestion, dermal contact, and inhalation of volatiles and particulates. However, this pathway was not quantitatively evaluated since it has not been established that this pathway is, in fact, complete.

***Ground Water Receptor Scenarios***

*Current and Future Resident:* There are no domestic water supply wells located within limits of the plume in the residential area adjacent to the facility. Therefore, there is no current risk to a residential receptor from direct contact with ground water.

There are no current institutional or other controls restricting the use of ground water off site. For this risk assessment, a *hypothetical* scenario was evaluated for the future resident assuming access to ground water via a *hypothetical* supply well completed in the shallow aquifer. It was assumed that a water supply well is completed in the uppermost aquifer within the limits of the off-site plume and water was used for potable and non-potable uses. Based on these assumptions, exposure could occur via ingestion, dermal contact while showering, and inhalation of volatiles while showering.

For the current and future resident, it is unknown whether the vapor intrusion into buildings pathway is complete for ground water. Volatile COPCs were detected in off-site ground water samples and there are currently two slab-on-grade residential buildings overlying the off-site ground water plume. Quantitative evaluation of this pathway would require the use of screening-quality models using site ground water data. However, such models do not accurately represent the actual site conditions, and therefore would yield results with a high level of uncertainty. This pathway was not quantitatively evaluated. Note that most homes in the residential neighborhood are constructed with raised crawl spaces, which allow for venting to the ambient air and are not significantly affected by subsurface vapor intrusion.

Migration of volatiles from ground water to ambient air is an undetermined pathway off site. This pathway has not been quantified due to potential inaccuracies in screening level models and the lack of ambient air data.

Screening-level models to assess ambient air typically use a "box" assumption which limits the degree of circulation and exchange of air. Such models are overly simplistic and do not represent site conditions. Accordingly, this pathway was not quantitatively evaluated for the current and future resident.

*Current and Future Resident (Short-Term Exposure) Scenario:* Under current and future conditions, residents involved in digging activities could potentially be exposed to shallow ground water in some limited areas northwest of MW-50, MW-58, MW-56, and MW-62 where the ground water potentiometric surface is proximate to the ground surface. The aquifer is confined in this area such that there is no direct discharge of ground water to the ground surface. Such exposure would be short-term, and given the uncertainty associated with the pathway, it was not quantitatively evaluated.

## *2.3 PHYSICAL PROFILE*

### *2.3.1 Topography*

The site is situated near the crest of a low hill such that the topography gently slopes to the east-northeast along the northern portion of the site, and to the south-southeast along the southern portion of the site. The location of the site is identified on the USGS 7.5 min. topographic quadrangle for Fort Smith, Arkansas in Figure 2-1. The site is located outside the 100-year and 500-year floodplains.

The residential area north of the facility generally slopes to the northeast towards Mill Creek. The overall slope is gradual, but punctuated by minor slope breaks at what appear to be former terraces that are generally coincident with the mapped topographic contours (Figure 2-1). These topographic breaks are also evident on cross sections presented in Figure 2-7 (MW-23 and MW-55 areas).

Drainage ditches are located along Ingersoll Avenue on the north side of the facility and along Jenny Lind Road on the east side of the facility. Surface water along the eastern half of the facility generally flows toward the northeast corner of the facility to the facility outfall where it enters the city storm sewer system under Jenny Lind Road and flows toward Mill Creek. Surface water from the western part of the facility flows to ditches located adjacent to the railroad tracks where it drains to an unnamed tributary of the Poteau River approximately one mile to the west.

### *2.3.2 Geology*

The geology of the Fort Smith area of Western Arkansas is generally characterized by Pennsylvanian age sediments. The site, situated on the Northwestern flank of the Massard Prairie Anticline, overlies Quaternary Alluvium and gently dipping Pennsylvanian McAlester Shale.

Quaternary Alluvium is present from ground surface to depths ranging from 29 to 37 feet at the site. Site boring logs and previous site literature indicate that the alluvium is generally composed of a shallow fine-grained unit, and a coarse-textured basal unit. Cross-sections of the site are provided as Figures 2-7 and 2-8.

The Upper Fine-Grained unit exhibits significant variations in lithologic texture throughout the site and with depth, generally varies from fine-grained silt to sandy clay. In general, the central portion of this unit (from 4 to 15 feet below ground surface consists of silty to sandy clay. In off-site areas, especially north of Jacobs and east of monitor well MW-46, this unit becomes characterized by thinly bedded silty clays and silts.

The lower unit of the alluvium at the site, referred to as the Basal Transmissive Zone, consists of sands and gravels. The upper portion of the Basal Transmissive Zone is typically composed of a fine-grained silty sand to sandy silt. This sandy silt grades to a sandy gravel with depth. Where present (generally observed on site), the silty sand portion of the unit is from 5 to 10 feet thick and forms a gradational transition between the Upper Fine-Grained unit and the Basal Transmissive Zone.

The sandy gravel at the base of the Basal Transmissive Zone is commonly 3 to 6 feet thick on site and has variable amounts of clay and silt. This sand and gravel layer is present in the majority of the borings on site and it rests unconformably on either weathered shale or clay associated with the weathered shale. North and northeast of the site this unit thins and pinches out. Additional detail on this gravel-rich portion of the transmissive zone is provided below.

The alluvial units are underlain by the McAlester Shale. This formation ranges up to 1000 feet thick in the Fort Smith region. In the vicinity of the Whirlpool facility the upper portion has been eroded leaving a thickness of 100 to 500 feet. The full thickness of the McAlester Shale immediately beneath the Whirlpool facility has not been determined.

Based on the site boring logs, the top of the shale is present at depths from 26 to 35 feet (Figure 2-9). The upper portion of the shale is typically silty, black to dark-gray, fissile, micaceous shale. Commonly, there is a thin veneer of friable red-orange to gray-brown clay between the base of the gravel zone and the weathered shale. This clay typically grades to the black or dark gray shale of the McAlester Formation.

Soil boring logs, cone penetrometer test logs and monitor well completion details were provided in the Work Plan.

*Characteristics of the Gravel-Rich Portion of the Basal Transmissive Zone*

As discussed above, the lower portion of the Basal Transmissive Zone within the limits of the facility is gravel-rich. This gravel-rich portion of the transmissive zone thins and pinches out to the north and northeast (Figures 2-7 and 2-8). The gravel-rich portion of the Basal Transmissive Zone is of interest because it appears to have a strong influence on the distribution of the plume north of the site.

As shown in Figure 2-10, the gravel-rich basal zone forms a hook-shaped area that extends north from Ingersoll across Jacobs and pinches out south of Brazil and west of Jenny Lind. North and northeast of this area, pockets of gravel are present but they have clay-rich matrices and appear to be discontinuous.

Additionally, as part of the field studies, an initial reconnaissance of Mill Creek was conducted. Gravel deposits observed in the side banks of Mill Creek also are in a clay-rich, low permeability matrix that is different from the gravel zone that extends from the plant. The different character indicates that the gravels in the far eastern part of the study area are in a different terrace formation and likely not hydraulically connected to the more transmissive gravel zone located west of Jenny Lind.

### *2.3.3 Hydrogeology*

Evaluation of potentiometric surface maps from the past five years indicates that there are two distinct ground water flow regimes at the site (Figures 2-11 and 2-12). These flow regimes are separated by a ground water divide that is consistently present along a general line from MW-26 through MW-24, ITMW-3, and MW-22. The Northern Flow Regime extends from the ground water divide across Ingersoll to the north and northeast. The Southern Flow Regime extends south and southwestward from the ground water divide and covers the majority of the Whirlpool Facility.

In the Northern Flow Regime, ground water flows consistently toward the northeast without significant seasonal variations. The gradient is relatively flat near the ground water divide and in the immediate area north of Ingersoll Avenue, and then increases north of Jacobs Avenue. The gradient appears to experience minor seasonal fluctuations in magnitude. Ground water elevation measurements in several off-site wells, suggest the ground water potentiometric surface is proximate to the ground surface in an area roughly outlined by wells MW-50, MW-58, MW-56, and MW-62. This area corresponds to a minor topographic slope break. The aquifer is confined in this area such that there is no direct discharge of ground water to the ground surface.

In contrast, ground water flow in the Southern Flow Regime has a fairly uniform gradient throughout the year, but exhibits seasonal shifts in ground water flow direction of up to 90 degrees. Ground water appears to flow to the southeast during spring and to the south, southwest during fall.

Aquifer tests conducted in wells immediately to the north of Ingersoll Avenue in MW-35 indicate that the hydraulic conductivity of the gravel-rich portion of the Basal Transmissive Zone is quite variable. A review of the data collected at the pumping well and the observation well indicates the following:

| | Transmissivity (T) | Hydraulic Conductivity (K) | Storativity (S) |
|---|---|---|---|
| Pumping | 4.56e00 to 7.17e00 $ft^2$/day | 5.00e-01 to 7.88e-01 ft/day | 9.83e-02 |
| Well MW-35R | 4.24e03 to 6.66e03 $cm^2$/day | 1.52e01 to 2.40e01 cm/day | |
| Observation | 4.95e02 to 8.40e02 $ft^2$/day | 5.44e01 to 9.23e01 ft/day | 7.17e-03 to |
| Well MW-65 | 4.60e05 to 7.8e05 $cm^2$/day | 1.66e03 to 2.81e03 cm/day | 9.76e-03 |

A drawdown map illustrating the maximum observed drawdown in the wells after 24 hours of pumping in MW-35R is presented in Figure 2-11. The tightness and strong oval shape of the cone of depression indicate that the Basal Transmissive Zone is anisotropic and heterogeneous in nature. The anisotropic character is also evidenced by the variations in the aquifer characteristics calculated for MW-35R and MW-65. The main axis of the cone of depression generally follows the trend of the axis of the ground water plume within the zone.

Ground water flow velocity for the northern portion of the facility has been calculated at 24 feet per year. As is indicated by the stagnant nature of constituent concentrations, off-site ground water flow is likely much slower due to the pinch-out of the Basal Transmissive Zone. Ground water flow in the off-site area will be further characterized during corrective measure studies as part of risk management planning.

## 2.4 *RELEASE PROFILE*

From 1967 to mid-1980s, the former degreaser building housed equipment degreasing operations that utilized TCE as a cleaning solvent. The use of TCE was discontinued in the early 1980s. Based on verbal reports from former workers, the degreasing equipment consisted of a tank and a parts rack. The degreasing operations involved placing parts into the parts rack positioned over the tank. The TCE tank was then heated, creating a vapor in the area where the parts were placed. Following degreasing activities, the vapor was condensed and returned to the tank below the parts rack.

There are no historical records that document any specific spills or other release incidents from the degreaser building. However, it is possible that historical leaks from the tank or surface spills in the vicinity of the degreaser building may have occurred, resulting in releases to the soil and ground water.

Based on historical process knowledge, and recent analytical data, the major constituent is TCE. Tetrachloroethylene, and TCE daughter products (including cis-1,2-dichloroethylene and trans-1,2-dichloroethylene, 1,1-dichloroethylene, and vinyl chloride) resulting from degradation have also been periodically detected in site monitoring wells.

In the late 1980s, a series of soil and ground water studies were initiated at the site as part of a project to remove an underground fuel storage tank (UST) that was located near the northwest corner of the site. The initial work indicated the presence of TCE and other solvents not related to the UST in the shallow ground water. Subsequent soil and ground water investigations were performed to characterize, assess, and delineate the potential source area and ground water plumes.

The following sections summarize the findings from the five phases of site investigation activities (Phases A through E). Phases A and B were described in Revised CAS Work Plan, dated June 2004. Phases C through E were presented in the CAS Work Plan Addendum, dated August 30, 2006.

*Soil*

Soil borings were advanced in 10 locations in a developed area near the former degreaser building and MW-25 northwest of the current factory building. Fifteen soil samples and one field duplicate were collected at depths ranging from 2 feet to 26 feet bgs. TCE and cis-1,2-dichloroethylene were reported at three on-site locations, with higher concentrations generally reported at deeper sample intervals (around 8 to 14 feet bgs). This increase in concentration with depth suggests that the release was historical with residual TCE remaining near the surface while most of the material migrated to depth. Low concentrations of methylene chloride were also reported in some soil samples, but were considered to be a laboratory artifact associated with laboratory procedures and not a site release.

Five of the borings were completed along the northern perimeter near the facility security fence. All constituents were reported Not Detected, indicating that the impacted soil does not extend off site. Figure 2-13 illustrates the extent of affected soil. Free phase TCE, which is a dense non-aqueous phase liquid (DNAPL), has not been observed at the site in shallow soils or in wells completed to screen across the base of the transmissive zone.

*Ground Water*

Thirty-four wells were installed within the facility property. Twenty-one wells have been installed in the residential area north of the facility. Ground water data have been collected at least on a semi-annual basis from 1989 to 2006.

Nineteen constituents have been detected in ground water associated with the Southern Flow Regime. Of these 19 constituents, 10 were detected sporadically (less than 5%) and are not thought to be associated with any potential site release. The remaining nine constituents are associated with chlorinated solvents. No constituents have been consistently reported in areas where TCE or cis-1,2-dichloroethylene are not also present. The highest historical TCE concentration of 157 mg/L was reported in MW-25 on September 2002. For 2006, the highest TCE concentration was 65 mg/L from the same well, MW-25, on October 12, 2006.

Wells in the Southern Flow Regime appear to have generally decreasing or stable trends, indicating that the ground water plume is stable or shrinking. Trend graphs for wells in the Southern Flow Regime are provided as Appendix A. Concentrations of cis-1,2-dichloroethylene and TCE are generally stable but exhibit some seasonal variation.

A total of seven constituents plus TCE have been reported in ground water associated with the Northern Flow Regime. The highest historical TCE concentration of 2.4 mg/L was reported in MW-23 on May 1, 1997. The highest cis-1,2-dichloroethylene concentration of 0.205 mg/L was reported in MW-41 on November 14, 2003. For 2006, the highest trichloroethylene concentration was 2.0 mg/L from MW-42 on October 10, 2006 and the highest cis-1,2-dichloroethylene concentration was 0.0525 mg/L from MW-35R on April 6, 2006 and MW-41 on March 17, 2006.

The other constituents reported in off-site monitoring wells are generally reported at concentrations at a frequency of five percent or less. The exception to this is cis-1,2-dichloroethane which has been reported at a frequency of about 25 percent.

In general, wells in the Northern Flow Regime appear to have decreasing or stable constituent concentration trends indicating that the ground water plume is not migrating. Graphs of ground water concentration trends for the Northern Flow Regime are provided in Appendix A. Concentrations appear to fluctuate seasonally and have been generally stable or decreasing. Constituent concentrations in 2006 are lower than those recorded in the past; with the exception of MW-46R (replacement for damaged MW-46), which exhibited higher levels of TCE than in the past.

The Southern Flow Regime ground water plume is bounded to the south by ITMW-6, to the west by MW-29, and to the east by MW-22 and does not extend beyond the Whirlpool property. The Northern Flow Regime ground water plume extends from the Whirlpool facility to Brazil Avenue to the north, Ferguson Street to the west, Jenny Lind Avenue to the east. The northern and northeastern distribution of the plume appears to coincide with the area where a gravel-rich alluvial deposit is present.

Ground water samples from wells installed outside of the gravel-rich zone have been consistently reported as non-detect for TCE and cis-1,2-dichloroethylene. The only exception is that the samples from well MW-63, which is outside the area of the gravel zone, and is hydraulically upgradient or cross gradient from other portions of the plume, have reported very low, sporadic concentrations of TCE. Figure 2-14 illustrates the extent of the ground water plumes.

## *2.5 ECOLOGICAL PROFILE*

As indicated previously, the majority of the 153-acre Whirlpool facility, is developed and consists of a warehouse, manufacturing facility, boiler house and water treatment plant. Concrete driveways and concrete and asphalt parking areas surround the structures. Approximately 21 acres of the site are undeveloped and consist of open grassy areas in the southwestern portion of the property. Affected soil is limited to a small area in the northwestern portion of the facility, which is developed and subject to industrial activities. Residential areas are located to the north and south of the property, and commercial industrial properties are located to the east and west.

City of Fort Smith stormwater drainage ditches are located along the northern and eastern boundaries of the property along Ingersoll Avenue and Jenny Lind Road, respectively. An intermittent drainage channel is also located on the west side of the property and appears to drain to an unnamed tributary of the Poteau River approximately 1.0 mile to the west.

In accordance with the requirements of the CAS, an assessment to identify potential endangered and threatened species habitat in the vicinity of the facility has been requested from the U.S Fish and Wildlife Service.

There are no wetlands or gaining streams within the limits of the plume. Therefore, off-site migration of affected ground water to the north of the facility does not appear to impact any surface water features. Data collected during limited off-site investigation activities indicate that only off-site ground water is affected. Field observations from boring logs indicate there are no off-site soils that are impacted by the historical site releases.

The nearest major surface water body is Mill Creek, which is located approximately 1500 to 2000 feet east of the property, outside of the limits of affected ground water. The results of the delineation activities show that the downgradient limit of the plume is at least 1000 feet from Mill Creek and the gravel-rich zone where the core of the plume is observed is not connected to the creek. Based on this profile, it appears that there are no complete exposure pathways from the affected ground water to any ecological receptors in the vicinity of the facility.

The USEPA Region 6 *Ecological Exclusion Criteria Worksheet* was completed and provided in Appendix E of the Work Plan. The results of the worksheet indicate that the site meets the ecological exclusion criteria based on Subpart A (for surface water/sediment pathways), and Subpart C (for soil pathways). The affected soil is wholly contained within the developed portion of the facility which is characterized by pavement, buildings, landscaped areas, roadways, equipment storage area, manufacturing or process area, or other surface cover or structure, or otherwise disturbed ground.

Based on absence of complete exposure pathways, no further ecological evaluations are warranted at the site.

### *2.6 RISK MANAGEMENT PROFILE*

As presented in more detail in Section 4, the screening of constituents of concern established TCE, chloroform, cis-1,2-dichloroethylene, tetrachloroethylene, and vinyl chloride as the ground water COPCs that may require remediation. For off-site areas north of the facility, TCE is the only COPC. The risk assessment identified direct contact with on- and off-site ground water (the Determined Exposure Pathways) are a potential risk concern for the site. Although currently incomplete pathways, there is potential for excess risk if a water supply well were to be installed within the plume in the uppermost aquifer. Leaching of TCE from soil to on-site ground water was also identified as a potential risk concern for the site.

The primary risk management approach for the Whirlpool site will be to address the Determined Exposure Pathways. This strategy will focus on eliminating or reducing the exposure pathways so that remaining risks are below acceptable levels based on current and future land use. Potential remedial options may include source reduction or isolation for the ground water plumes and physical controls to minimize leaching potential. Institutional controls to prohibit future use of ground water within the uppermost aquifer will also be implemented as part of the remedial strategy.

Additionally, the effort to address the Determined Exposure Pathways will also take into account the Undetermined Exposure Pathways. For example, preference will be given to remedial actions that will both remove or reduce ground water concentrations to levels that are acceptable for direct contact, as well as reduce concentrations so that exposure via indirect means (such as TCE volatilization from ground water through soil, and soil vapor to outdoor air) will be below acceptable risk levels.

Final cleanup goals for the Determined Exposure Pathways will be based on current and future potential land use. Uncertainties associated with the Undetermined Exposure Pathways will be managed by developing an appropriate program for performance monitoring during and after implementation of the remedy. The proposed remedies and cleanup goals for ground water and on-site soil (leaching pathway) will be presented in the Risk Management Plan (RMP) following the ADEQ's approval of this Risk Evaluation Report. The RMP will also detail the performance standards and monitoring activities suggested for the site.

## 3.0 RISK-BASED PRIORITY SCREEN

A risk-based priority screen was performed for the site to identify and prioritize impacted areas which may pose a potential risk concern. This would allow the efforts and resources for corrective action to be focused on activities that would yield maximum risk reduction benefits in a time-efficient manner.

There are two stages to the risk-based priority screen:

1) Comparison with CAS High Priority Bright Line Screening Values; and
2) Comparison with CAS Low Priority Bright Line Screening Values, which correspond to EPA Region 6 Medium-Specific Screening Levels (MSSLs).

Constituent concentrations in an impacted area are first compared to the CAS High Priority Bright Line Screening Values, which are based on a target cancer risk level of 1.0E-04 and a hazard quotient of 1.0. Constituent exceedances of these screening values indicate that the impacted area is high priority and requires a site-specific risk assessment and/or remedial action.

If an impacted area has no constituents that exceed the CAS High Priority Bright Line Screening Values, then further evaluation is performed using the CAS Low Priority Bright Line Screening Values (i.e., EPA Region 6 MSSLs), which are based on a target cancer risk level of 1.0E-06 and a hazard quotient of 1.0. If a site has multiple constituents exceeding the Low, but not High Priority Bright Line Screening Values, further evaluation of cumulative risk may be warranted.

Two pathways were evaluated using this priority screen:

1) direct contact with soil for the site worker; and
2) direct contact with ground water for the site worker and resident.

For this priority screen, reported maximum historical concentrations for detected constituents were compared to the High Priority Bright Line Screening Values. Tables 3-1 and 3-2 present the comparisons for on-site and off-site ground water, respectively. The results of the comparisons indicate that TCE, 1,1-dichloroethylene, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, 1,2-dichloroethylene (total), chloroform, and vinyl chloride in on-site ground water and TCE in off-site ground water exceeded their High Priority Bright Line Screening Values. Thus, according to the CAS guidance, the site may be classified as high priority, requiring a site-specific risk assessment and/or remedial action.

TCE was the only constituent reported detected in on-site soils at depths from surface to two feet. The maximum reported concentration of 0.012 mg/kg did not exceed the High Priority Bright Line Screening Value of 760 mg/kg for an industrial outdoor worker. The reported maximum concentration of 0.012 mg/kg was further compared to the CAS Low Priority Bright Line Screening Value of 7.6 mg/kg for the industrial outdoor worker, and did not exceed the screening criteria.

## *4.0 IDENTIFICATION OF CONSTITUENTS OF POTENTIAL CONCERN*

### *4.1 DATA EVALUATION AND SCREENING PROCESS*

A data screening process was used to identify constituents that should be retained for quantitative risk assessment and/or remediation and those that may be excluded from further risk evaluation. This process is very similar to the site priority screen, but does not replicate it. The main point of difference is that the site priority screen is intended to provide a basis for a ranking a site (e.g., high priority), whereas the constituent screening process is used to identify COPCs that will be evaluated in site-specific exposure pathways.

The data screening process consisted of comparisons of soil and ground water concentrations with EPA Region 6 Medium-Specific Screening Levels (MSSLs), updated February 2007. This was a step-wise process that involved initial comparisons with historical maximum concentrations and where appropriate, a second comparison with recent maximum concentrations reported for 2006. All available data were included in this screening evaluation. The results of the data-screening step were used to identify COPCs for each medium of concern. A constituent was retained as a COPC if the reported 2006 maximum detected concentration exceeded the MSSL. Constituents that were reported as *Not Detected* at appropriate reporting limits that were above MSSLs (applicable to ground water only) were not identified as exceedances because the reporting limits were obtained using widely-accepted, standard analytical techniques, i.e., EPA Solid Waste 846 Method 8260B.

### *4.2 RISK-BASED SCREENING RESULTS*

#### *4.2.1 Soil*

Residential risk-based screening levels were used to identify which of the constituents detected in the on-site soils required detailed evaluation under more site-appropriate exposure scenarios. The EPA Region 6 MSSLs for residential direct contact were used as the screening values for soils in the surficial (0 to 2-foot) and shallow subsurface (0 to 5-foot) depth intervals. The intent was to identify constituents for which risk calculations would be required for direct contact exposures (e.g., site worker and construction worker). The surficial soil interval is consistent with EPA guidance for evaluating soil exposure in site workers (EPA, 2002). A standard EPA default for soil depth for the construction worker was not available. The shallow subsurface interval was deemed to be appropriate for a construction worker receptor based on site-specific knowledge that the predominance of site construction or utility work at the facility is generally not greater than five feet.

This data-screening step only identifies COPCs for the direct contact exposure pathways for media of concern. Data screening results are provided in Tables 4-1 and 4-2 for the surficial and shallow subsurface soil intervals, respectively. No constituents were retained for further evaluation of direct contact with soils 0-2 ft bgs (site worker) and 0-5 ft bgs (construction worker).

Since the direct contact MSSLs do not address migration of constituents from soil to ground water, all soil constituents reported for all depths were evaluated in the soil protection of ground water (GWP) evaluation. The results of the GWP evaluation are discussed following the ground water screening.

### *4.2.2 Ground Water*

For ground water, a similar approach was used to identify COPCs. The ground water data were segregated into the Northern Flow Regime and Southern Flow Regime, roughly corresponding to off site and on site, respectively, and compared to the EPA Region 6 MSSLs for tap water. The tap water MSSLs are conservatively derived and assume a residential scenario. Tables 4-3 and 4-4 present the data screening results for on-site ground water. For the Southern Flow Regime (on-site ground water), seven constituents exceeded the screening criteria based on reported maximum historical concentrations:

- chloroform;
- cis-1,2-dichlorothylene;
- trans-1,2-dichloroethylene;
- 1,2-dichloroethylene (total);
- tetrachloroethylene;
- trichloroethylene; and
- vinyl chloride.

These seven constituents were further screened using reported maximum concentrations for 2006. Of the seven, only current concentrations of trans-1,2-dichloroethylene were less than the screening value.

Tables 4-5 and 4-6 present the data screening results for off-site ground water. For the Northern Flow Regime (off-site ground water), two constituents exceeded the screening criteria:

- cis-1,2-dichloroethylene; and
- trichloroethylene.

An additional evaluation was performed using current maximum ground water concentrations reported for 2006. Current maximum concentrations of trichloroethylene still exceeded the screening value. However, the maximum cis-1,2-dichloroethylene concentration for 2006 was less than the screening value.

### 4.2.3 *Ground Water Protection Demonstration*

Demonstrating ground water protection is a concept that involves assessing reported concentrations in soil to determine if constituents in soil have the potential to leach (as a result of precipitation) at concentrations that would cause an exceedance of acceptable levels in ground water. For this assessment, GWP was evaluated based on a comparison of the maximum reported concentration or limit for all soil depths to EPA Region 6 MSSLs for GWP. Table 4-7 presents the GWP data screening evaluation. For the screening evaluation, additional residential GWP screening levels were derived for constituents that were not listed in the EPA Region 6 MSSL table. The screening values were derived using the EPA's GWP model provided in the EPA's 1996 Soil Screening Guidance assuming a default dilution and attenuation factor (DAF) of 1 (Table 4-8).

Fourteen constituents exceeded the default GWP screening levels. Only one constituent, TCE, was detected. The remaining 13 Not Detected constituents had reporting limits that exceeded the GWP screening levels. Constituents that exceeded the default GWP screening levels were evaluated further using a site-specific DAF of 43. Derivation of the site-specific DAF is provided in Table 4-9. The screening results are provided as Table 4-7. The reporting limits for the 13 Not Detected constituents were less than the site-specific DAF screening levels. The one detected constituent, TCE, still had a reported maximum soil concentration that exceeded the site-specific DAF screening level. The results of the GWP screening suggest that TCE may leach from soil to the underlying ground water at concentrations above the acceptable ground water use limit.

### 4.2.4 *Identification of COPCs*

Based on the risk-based screening process described above, a list of site COPCs was identified for the site (Table 4-10). No COPCs were identified for direct contact soil exposure pathways. The primary COPCs for ground water on and off site are cis-1,2-dichloroethylene and TCE. Additional COPCs identified for on-site ground water include chloroform, tetrachloroethylene, and vinyl chloride. For the GWP pathway, the only soil COPC is trichloroethylene.

## 5.0 *SUMMARY OF RISK SCREENING PROCESS AND CONCLUSIONS*

This RER complies with Section II.F of the LOA between the ADEQ and Whirlpool Corporation, dated July 19, 2002. The results of the RER indicate that, soil leaching to ground water and, in the event that a water supply well were to be installed within the limits of the plume, direct contact with ground water are potential risk concerns. The areas where soil leaching to ground water is a concern (affected soil) is shown in Figure 2-13. The area where direct contact with ground water would be a concern (ground water plume) is shown in Figure 2-14.

The RER also identified some Undetermined Exposure Pathways that may be a concern. However, there is a high degree of uncertainty associated with the analysis of these Undetermined Exposure Pathways. Unacceptable current risk to human health has not been demonstrated for any of the identified receptors associated with the Undetermined Exposure Pathways. To determine if there are, in fact, risks associated with those pathways and to better understand uncertainties associated with the pathways, Whirlpool proposes to collect additional data during corrective measure studies as part of risk management planning. Alternately, the data may be obtained during performance monitoring that would be implemented as part of corrective action.

The results of the risk assessment, including the priority screen, indicate that it would be more effective to initiate remediation of the ground water plume now, rather than perform a detailed site-specific risk assessment. It is anticipated that the corrective actions that are being considered for the site will effectively manage both Determined and Undetermined Exposure Pathways. Therefore, rather than spend time collecting additional information now and delay the submittal of the RER, Whirlpool recommends that the appropriate data be collected in the process of corrective action/risk management.

The technical approach used for the risk assessment generally followed the principles and guidelines described in EPA Region 6 Corrective Action Strategy (CAS) (EPA, 2000). The technical work related to the risk evaluation portion of this report was conducted by Ms Hong Vu whose professional profile is included as Appendix B.

## 6.0 REFERENCES

American Standard for Testing and Materials, 2002. Standard guide for risk-based corrective action applied at petroleum release sites.

EPA, 1989. Risk Assessment Guidance for Superfund, Volume 1: Human Health Evaluation Manual (Part A). Interim Final. Office of Emergency and Remedial Response. Washington, DC. EPA/540/1-89/002.

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EPA, 2007. EPA Region 6 Medium-Specific Screening Levels, updated February 2007.

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# Tables

*June 14, 2007*
*Project No. 0048030*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

TABLE 3-1

Comparison of Ground Water Data to High Priority Bright Line Screening Levels
Southern Flow Regime (On-Site)

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents [(a)] | Maximum Result [(b)] (mg/L) | High Priority Bright Line Screening Levels for Tap Water [(c)] (mg/L) | | Maximum Result Greater Than Screening Value? Yes/No |
|---|---|---|---|---|
| 1,1,1-Trichloroethane | 9.70E-02 | 7.90E+00 | | No |
| 1,1,2-Trichloroethane | 3.00E-03 | 2.00E-02 | | No |
| 1,1-Dichloroethane | 7.40E-02 | 8.10E+00 | | No |
| 1,1-Dichloroethylene | 3.30E-01 | 4.60E-03 | | **Yes** |
| 1,2-Dichloroethylene (total) | 5.30E+00 | 6.10E-01 | (d) | **Yes** |
| 1,2-Dichloropropane | 7.00E-03 | 1.60E-02 | | No |
| 2-Hexanone | 1.44E-02 | NA | | --- |
| Acetone | 2.85E-01 | 6.10E+00 | | No |
| Chlorobenzene | 5.74E-03 | 1.10E+00 | | No |
| Chloroform | 1.10E-02 | 6.20E-03 | | **Yes** |
| cis-1,2-Dichloroethylene | 5.30E+00 | 6.10E-01 | | **Yes** |
| Ethylbenzene | 1.00E-03 | 1.30E+01 | | No |
| Methylene Chloride | 6.77E-02 | 4.30E-01 | | No |
| Tetrachloroethylene | 3.60E-02 | 1.10E-01 | | No |
| Toluene | 1.83E-02 | 7.20E+00 | | No |
| trans-1,2-Dichloroethylene | 3.60E+00 | 1.20E+00 | | **Yes** |
| Trichloroethylene | 1.57E+02 | 1.60E-01 | | **Yes** |
| Vinyl Chloride | 2.15E+00 | 4.30E-03 | | **Yes** |
| Xylenes (total) | 5.50E-02 | 1.40E+01 | (e) | No |

NOTES:

NA - No EPA Region 6 CAS High Priority Bright Line Screening Level was provided for 2-Hexanone.
(a) Only detected constituents are presented.
(b) Maximum results for all available on-site ground water data.
(c) Tap Water Screening Levels from EPA Region 6 CAS High Priority Bright Line Screening Levels Table with a Cancer Risk of $10^{-4}$ and Hazard Quotient of 10 (August 2000).
(d) A screening value for 1,2-Dichloroethylene (total) was not available. The conservative value for cis 1,2-Dichloroethylene was used as the screening value.
(e) A screening value for xylenes (total) was not available. The most conservative value for the various isomers (m-xylene) was used as the screening value.

TABLE 3-2

Comparison of Ground Water Data to High Priority Bright Line Screening Levels
Northern Flow Regime (Off-Site)

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents [a] | Maximum Result [b] (mg/L) | High Priority Bright Line Screening Levels for Tap Water [c] (mg/L) | | Maximum Result Greater Than Screening Value? Yes/No |
|---|---|---|---|---|
| 1,1-Dichloroethylene | 3.00E-03 | 4.60E-03 | | No |
| 1,2-Dichloroethylene (total) | 5.80E-02 | 6.10E-01 | (d) | No |
| Acetone | 3.92E-02 | 6.10E+00 | | No |
| Carbon Disulfide | 1.15E-01 | 1.00E+01 | | No |
| cis-1,2-Dichloroethylene | 2.05E-01 | 6.10E-01 | | No |
| Tetrachloroethylene | 1.00E-03 | 1.10E-01 | | No |
| Trichloroethylene | 2.40E+00 | 1.60E-01 | | **Yes** |
| Vinyl Chloride | 2.00E-03 | 4.30E-03 | | No |

NOTES:

(a) Only detected constituents are presented.
(b) Maximum results for all available off-site ground water data.
(c) Tap Water Screening Levels from EPA Region 6 CAS High Priority Bright Line Screening Levels Table with a Cancer Risk of $10^{-4}$ and Hazard Quotient of 10 (August 2000).
(d) A screening value for 1,2-Dichloroethylene (total) was not available. The conservative value for cis 1,2-Dichloroethylene was used as the screening value.

TABLE 4-1

Soil Data Evaluation and Screening Results for Current and Future On-Site Industrial Worker (0-2 ft)

Whirlpool Corporation
Fort Smith, Arkansas

| DATA SUMMARY | | | | | | | | SCREENING RESULTS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Constituents | Number of Analyses | Number of Detections | Frequency of Detection | Minimum Result (mg/kg) | Maximum Result (mg/kg) | Location of Max. Result | Maximum Reporting Limit (mg/kg) | EPA Region 6 Residential[a] Soil Screening Levels (mg/kg) | | Screened out? Yes/No | Screening Rationale |
| Acetone | 2 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 1.42E+04 | | Yes | (e) |
| Benzene | 2 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 6.56E-01 | | Yes | (e) |
| Bromodichloromethane | 2 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 1.03E+00 | | Yes | (e) |
| Bromoform | 2 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 6.16E+01 | | Yes | (e) |
| Bromomethane (Methyl bromide) | 2 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 3.90E+00 | | Yes | (e) |
| Carbon disulfide | 2 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 7.21E+02 | | Yes | (e) |
| Carbon tetrachloride | 2 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 2.40E-01 | | Yes | (e) |
| Chlorobenzene | 2 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 2.73E+02 | | Yes | (e) |
| Dichlorobromomethane | 2 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 1.01E+00 | | Yes | (e) |
| Chloroethane (Ethyl chloride) | 2 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 3.03E+00 | | Yes | (e) |
| Chloroform | 2 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 2.45E-01 | | Yes | (e) |
| Chloromethane (Methyl chloride) | 2 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 1.26E+00 | | Yes | (e) |
| 1,1-Dichloroethane | 2 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 8.46E+02 | | Yes | (e) |
| 1,2-Dichloroethane | 2 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 3.47E-01 | | Yes | (e) |
| 1,1-Dichloroethene | 2 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 2.85E+02 | | Yes | (e) |
| 1,2-Dichloroethylene (total) | 2 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 4.30E+01 | (b) | Yes | (e) |
| cis-1,2-Dichloroethylene | 2 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 4.30E+01 | | Yes | (e) |
| trans-1,2-Dichloroethylene | 2 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 1.22E+02 | | Yes | (e) |
| 1,2-Dichloropropane | 2 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 3.51E-01 | | Yes | (e) |
| cis-1,3-Dichloropropene | 2 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 6.97E-01 | (c) | Yes | (e) |
| trans-1,3-Dichloropropene | 2 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 6.97E-01 | (c) | Yes | (e) |
| Ethylbenzene | 2 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 2.34E+02 | | Yes | (e) |
| 2-Hexanone | 2 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 1.10E+02 | (d) | Yes | (e) |
| Methylene Chloride | 2 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 8.90E+00 | | Yes | (e) |
| Methyl Ethyl Ketone (2-Butanone) | 2 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 3.21E+04 | | Yes | (e) |
| 4-Methyl-2-pentanone (MIBK) | 2 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 5.80E+03 | | Yes | (e) |
| Styrene | 2 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 1.73E+03 | | Yes | (e) |
| 1,1,1,2-Tetrachloroethane | 2 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 3.01E+00 | | Yes | (e) |
| Tetrachloroethylene | 2 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 5.54E-01 | | Yes | (e) |
| Toluene | 2 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 5.21E+02 | | Yes | (e) |
| 1,1,1-Trichloroethane | 2 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 1.39E+03 | | Yes | (e) |
| 1,1,2-Trichloroethane | 2 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 8.44E-01 | | Yes | (e) |
| Trichloroethylene | 2 | 2 | 100.0% | 9.00E-03 | 1.20E-02 | ERM-8 (2') | 5.00E-03 | 4.26E-02 | | Yes | (e) |
| Vinyl chloride | 2 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 4.30E-02 | | Yes | (e) |
| Xylene (total) | 2 | 0 | 0.0% | --- | --- | --- | 2.00E-02 | 2.14E+02 | | Yes | (e) |

NOTES:

(a) Residential Soil Screening Levels from EPA Region 6 Human Health Medium-Specific Screening Levels Table (February 2007).
(b) There was no value listed in the EPA Region 6 Screening Levels for 1,2-Dichloroethylene (total). The conservative value for cis-1,2-Dichloroethylene was used as the screening value.
(c) There was no value listed in the EPA Region 6 Screening Levels for cis-1,3-Dichloropropene and trans-1,3-Dichloropropene. The value for 1,3-Dichloropropene (total) was used as the screening value.
(d) No EPA Region 6 Screening Level was provided for 2-hexanone. The residential direct contact soil value ($^{Tot}Soil_{Comb}$ Protective Concentration Level (PCL) for 0.5 acre source) from Texas Risk Reductic
(TRRP) was used. The TRRP PCL was taken from Table 1, updated March 30, 2007.
(e) Maximum detected result and the maximum reporting limit are below EPA Region 6 Screening Levels.

TABLE 4-2

Soil Data Evaluation and Screening Results for Current and Future On-Site Construction Worker (0-5 ft)

Whirlpool Corporation
Fort Smith, Arkansas

| DATA SUMMARY | | | | | | | | SCREENING RESULTS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Constituents | Number of Analyses | Number of Detections | Frequency of Detection | Minimum Result (mg/kg) | Maximum Result (mg/kg) | Location of Max. Result | Maximum Reporting Limit (mg/kg) | EPA Region 6 Residential[a] Soil Screening Levels (mg/kg) | | Screened out? Yes/No | Screening Rationale |
| Acetone | 3 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 1.42E+04 | | Yes | (e) |
| Benzene | 3 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 6.56E-01 | | Yes | (e) |
| Bromodichloromethane | 3 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 1.03E+00 | | Yes | (e) |
| Bromoform | 3 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 6.16E+01 | | Yes | (e) |
| Bromomethane (Methyl bromide) | 3 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 3.90E+00 | | Yes | (e) |
| Carbon disulfide | 3 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 7.21E+02 | | Yes | (e) |
| Carbon tetrachloride | 3 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 2.40E-01 | | Yes | (e) |
| Chlorobenzene | 3 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 2.73E+02 | | Yes | (e) |
| Dichlorobromomethane | 3 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 1.01E+00 | | Yes | (e) |
| Chloroethane (Ethyl chloride) | 3 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 3.03E+00 | | Yes | (e) |
| Chloroform | 3 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 2.45E-01 | | Yes | (e) |
| Chloromethane (Methyl chloride) | 3 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 1.26E+00 | | Yes | (e) |
| 1,1-Dichloroethane | 3 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 8.46E+02 | | Yes | (e) |
| 1,2-Dichloroethane | 3 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 3.47E-01 | | Yes | (e) |
| 1,1-Dichloroethene | 3 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 2.85E+02 | | Yes | (e) |
| 1,2-Dichloroethylene (total) | 3 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 4.30E+01 | (b) | Yes | (e) |
| cis-1,2-Dichloroethylene | 3 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 4.30E+01 | | Yes | (e) |
| trans-1,2-Dichloroethylene | 3 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 1.22E+02 | | Yes | (e) |
| 1,2-Dichloropropane | 3 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 3.51E-01 | | Yes | (e) |
| cis-1,3-Dichloropropene | 3 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 6.97E-01 | (c) | Yes | (e) |
| trans-1,3-Dichloropropene | 3 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 6.97E-01 | (c) | Yes | (e) |
| Ethylbenzene | 3 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 2.34E+02 | | Yes | (e) |
| 2-Hexanone | 3 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 1.10E+02 | (d) | Yes | (e) |
| Methylene Chloride | 3 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 8.90E+00 | | Yes | (e) |
| Methyl Ethyl Ketone (2-Butanone) | 3 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 3.21E+04 | | Yes | (e) |
| 4-Methyl-2-pentanone (MIBK) | 3 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 5.80E+03 | | Yes | (e) |
| Styrene | 3 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 1.73E+03 | | Yes | (e) |
| 1,1,1,2-Tetrachloroethane | 3 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 3.01E+00 | | Yes | (e) |
| Tetrachloroethylene | 3 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 5.54E-01 | | Yes | (e) |
| Toluene | 3 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 5.21E+02 | | Yes | (e) |
| 1,1,1-Trichloroethane | 3 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 1.39E+03 | | Yes | (e) |
| 1,1,2-Trichloroethane | 3 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 8.44E-01 | | Yes | (e) |
| Trichloroethylene | 3 | 2 | 66.7% | 9.00E-03 | 1.20E-02 | ERM-8 (2') | 5.00E-03 | 4.26E-02 | | Yes | (e) |
| Vinyl chloride | 3 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 4.30E-02 | | Yes | (e) |
| Xylene (total) | 3 | 0 | 0.0% | --- | --- | --- | 2.00E-02 | 2.14E+02 | | Yes | (e) |

NOTES:

(a) Residential Soil Screening Levels from EPA Region 6 Human Health Medium-Specific Screening Levels Table (February 2007).
(b) There was no value listed in the EPA Region 6 Screening Levels for 1,2-Dichloroethylene (total). The conservative value for cis-1,2-Dichloroethylene was used as the screening value.
(c) There was no value listed in the EPA Region 6 Screening Levels for cis-1,3-Dichloropropene and trans-1,3-Dichloropropene. The value for 1,3-Dichloropropene (total) was used as the screening value.
(d) No EPA Region 6 Screening Level was provided for 2-hexanone. The residential direct contact soil value ($^{Tot}Soil_{Comb}$ Protective Concentration Level (PCL) for 0.5 acre source) from Texas Risk Reduction Rule Program (TRRP) was used. The TRRP PCL was taken from Table 1, updated March 30, 2007.
(e) Maximum detected result and the maximum reporting limit are below EPA Region 6 Screening Levels.

TABLE 4-3

Ground Water Data Evaluation and Screening Results
Southern Flow Regime (On-Site)

Whirlpool Corporation
Fort Smith, Arkansas

| DATA SUMMARY | | | | | | | | SCREEN RESULTS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Constituents | Number of Analyses | Number of Detections | Frequency of Detection | Minimum Result (mg/L) | Maximum Result (mg/L) | Location of Max. Result | Maximum Reporting Limit (mg/L) | EPA Region 6 Screening Levels for Tap Water [(a)] (mg/L) | | Screened out? Yes/No | Screening Rationale |
| 1,1,1-Trichloroethane | 619 | 12 | 1.94% | 7.00E-03 | 9.70E-02 | MW-25 | 1.00E-01 | 8.40E-01 | | Yes | (e) |
| 1,1,2,2-Tetrachloroethane | 327 | 0 | 0.00% | --- | --- | --- | 1.00E-01 | 3.30E-04 | | Yes | (f) |
| 1,1,2-Trichloroethane | 327 | 2 | 0.61% | 3.00E-03 | 3.00E-03 | ITMW-17, ITMW-19 | 1.00E-01 | 1.20E-03 | | Yes | (k) |
| 1,1-Dichloroethane | 615 | 39 | 6.34% | 1.60E-03 | 7.40E-02 | MW-25 | 1.00E-01 | 1.20E+00 | | Yes | (e) |
| 1,1-Dichloroethylene | 327 | 69 | 21.10% | 3.00E-03 | 3.30E-01 | MW-25 | 2.00E-01 | 3.40E-01 | | Yes | (e) |
| 1,2-Dichloroethane | 327 | 0 | 0.00% | --- | --- | --- | 1.00E-01 | 7.30E-04 | | Yes | (f) |
| 1,2-Dichloroethylene (total) | 150 | 102 | 68.00% | 4.00E-03 | 5.30E+00 | MW-37 | 1.00E+00 | 6.10E-02 | (b) | **No** | (g) |
| 1,2-Dichloropropane | 327 | 1 | 0.31% | 7.00E-03 | 7.00E-03 | ITMW-11 | 1.00E-01 | 9.70E-04 | | Yes | (l) |
| 2-Hexanone | 327 | 2 | 0.61% | 1.00E-02 | 1.44E-02 | MW-25 | 2.00E-01 | 1.50E+00 | (c) | Yes | (e) |
| 4-Methyl-2-pentanone (MIBK) | 327 | 0 | 0.00% | --- | --- | --- | 2.00E-01 | 2.00E+00 | | Yes | (e) |
| Acetone | 327 | 9 | 2.75% | 6.00E-03 | 2.85E-01 | MW-38 | 2.50E-01 | 5.50E+00 | | Yes | (e) |
| Benzene | 327 | 0 | 0.00% | --- | --- | --- | 1.00E-01 | 1.20E-03 | | Yes | (f) |
| Bromodichloromethane | 327 | 0 | 0.00% | --- | --- | --- | 1.00E-01 | 1.10E-03 | | Yes | (f) |
| Bromoform | 327 | 0 | 0.00% | --- | --- | --- | 1.00E-01 | 8.50E-03 | | Yes | (f) |
| Bromomethane | 327 | 0 | 0.00% | --- | --- | --- | 2.00E-01 | 8.70E-03 | | Yes | (f) |
| Carbon Disulfide | 327 | 0 | 0.00% | --- | --- | --- | 1.00E-01 | 1.00E+00 | | Yes | (e) |
| Carbon Tetrachloride | 327 | 0 | 0.00% | --- | --- | --- | 1.00E-01 | 5.10E-04 | | Yes | (f) |
| Chlorobenzene | 327 | 2 | 0.61% | 2.00E-03 | 5.74E-03 | ITMW-4 | 1.00E-01 | 9.10E-02 | | Yes | (h) |
| Chloroethane | 327 | 0 | 0.00% | --- | --- | --- | 2.00E-01 | 2.30E-02 | | Yes | (f) |
| Chloroform | 327 | 20 | 6.12% | 3.00E-03 | 1.10E-02 | MW-25 | 1.00E-01 | 1.70E-04 | | **No** | (g) |
| Chloromethane (Methyl Chloride) | 327 | 0 | 0.00% | --- | --- | --- | 2.00E-01 | 2.10E-03 | | Yes | (f) |
| cis-1,2-Dichloroethylene | 463 | 300 | 64.79% | 4.00E-03 | 5.30E+00 | MW-37 | 5.00E-01 | 6.10E-02 | | **No** | (g) |
| cis-1,3-Dichloropropene | 327 | 0 | 0.00% | --- | --- | --- | 1.00E-01 | 6.70E-04 | (d) | Yes | (f) |
| Dibromochloromethane | 327 | 0 | 0.00% | --- | --- | --- | 1.00E-01 | 7.90E-04 | | Yes | (f) |
| Ethylbenzene | 327 | 1 | 0.31% | 1.00E-03 | 1.00E-03 | MW-37 | 1.00E-01 | 1.30E+00 | | Yes | (e) |
| Methyl Ethyl Ketone (2-Butanone) | 327 | 0 | 0.00% | --- | --- | --- | 2.00E-01 | 7.10E+00 | | Yes | (e) |
| Methylene Chloride | 327 | 11 | 3.36% | 2.00E-03 | 6.77E-02 | ITMW-4 | 2.00E-01 | 8.90E-03 | | Yes | (i) |
| Styrene | 327 | 0 | 0.00% | --- | --- | --- | 1.00E-01 | 1.60E+00 | | Yes | (e) |
| Tetrachloroethylene | 619 | 51 | 8.24% | 1.00E-03 | 3.60E-02 | MW-25 | 1.00E-01 | 1.20E-04 | | **No** | (g) |
| Toluene | 619 | 8 | 1.29% | 2.00E-03 | 1.83E-02 | ITMW-11 | 1.00E-01 | 2.30E+00 | | Yes | (e) |
| trans-1,2-Dichloroethylene | 613 | 52 | 8.48% | 1.00E-03 | 3.60E+00 | ITMW-11 | 1.00E-01 | 1.10E-01 | | **No** | (g) |
| trans-1,3-Dichloropropene | 327 | 0 | 0.00% | --- | --- | --- | 1.00E-01 | 6.70E-04 | (d) | Yes | (f) |
| Trichloroethylene | 617 | 423 | 68.56% | 1.70E-03 | 1.57E+02 | MW-25 | 1.00E+01 | 1.70E-04 | | **No** | (g) |
| Vinyl Chloride | 619 | 104 | 16.80% | 1.00E-03 | 2.15E+00 | MW-38 | 1.00E+00 | 1.50E-05 | | **No** | (g) |
| Xylenes (total) | 327 | 2 | 0.61% | 6.00E-03 | 5.50E-02 | MW-37 | 3.00E-01 | 2.00E-01 | | Yes | (j) |

NOTES:

(a) Screening Levels for Tap Water From EPA Region 6 Human Health Medium-Specific Screening Levels Table (February 2007).
(b) A screening value for 1,2-Dichloroethylene (total) was not available. The conservative value for cis 1,2-Dichloroethylene was used as the screening value.
(c) No EPA Region 6 Screening Level was provided for 2-hexanone. The Tier 1 Residential Ground Water value ($^{GW}GW_{Ing}$ PCL) from the Texas Risk Reduction Rule Program (TRRP) was utilized for screening purposes. The TRRP PCL value was taken from Table 3, updated March 30, 2007.
(d) There was no value listed in the EPA Region 6 Screening Levels for cis-1,3-Dichloropropene and trans-1,3-Dichloropropene. The value for 1,3-Dichloropropene (total) was used as the screening value.
(e) Maximum detected result and the maximum reporting limit are below the EPA Region 6 Screening Level.
(f) The maximum reporting limit exceeded the screening level. However, no detections were reported. The constituent was screened from further quantitative evaluation, and discussed in the uncertainty analysis.
(g) Maximum detected result exceeded the EPA Region 6 Screening Level.
(h) The maximum reporting limit (0.1 mg/l) was above the EPA Region 6 Screening Level in only two samples (3/15/06 and 10/13/06) at separate locations (MW-25 and MW-27). All other reporting limits as well as reported detections were below screening levels.
(i) Methylene chloride is a common laboratory artifact. It was detected in only 11 samples out of 327 (3% frequency), and detected at various sample locations not indicative of the source area.
(j) The maximum reporting limit (0.3 mg/l) was above EPA Region 6 Screening Levels one time (10/13/06) for a duplicate at sample location MW-37. All other reporting limits and reported detections were below screening levels.
(k) Detections were determined to be anomalous. 1,1,2-Trichloroethane was detected once at an estimated concentration at two different well locations (ITMW-17 and ITMW-19) in samples collected on 10/12/06 for a 0.6% detection frequency.
(l) Detection was determined to be anomalous. 1,2-Dichloropropane was detected only once (4/13/04) at one well location (ITMW-11), for a detection frequency of 0.3%. Since 2004, the constituent has been Not Detected for approximately 6 consecutive sampling events from 2005 to 2006.

TABLE 4-4

Ground Water Screening Results: 2006 Concentrations
Southern Flow Regime (On-Site)

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents | 2006 Maximum Concentration (mg/L) | EPA Region 6 Screening Levels for Tap Water [(a)] (mg/L) | | Site Concentration Less Than Screening Value? Yes/No |
|---|---|---|---|---|
| 1,2-Dichloroethylene (total) | 5.30E+00 | 6.10E-02 | (b) | **No** |
| Chloroform | 7.00E-03 | 1.70E-04 | | **No** |
| cis-1,2-Dichloroethylene | 5.30E+00 | 6.10E-02 | | **No** |
| Tetrachloroethylene | 2.10E-02 | 1.20E-04 | | **No** |
| trans-1,2-Dichloroethylene | 9.00E-03 | 1.10E-01 | | Yes |
| Trichloroethylene | 6.50E+01 | 1.70E-04 | | **No** |
| Vinyl Chloride | 2.00E+00 | 1.50E-05 | | **No** |

NOTES:

(a) Screening Levels for Tap Water From EPA Region 6 Human Health Medium-Specific Screening Levels Table (February 2007).
(b) A screening value for 1,2-Dichloroethylene (total) was not available. The conservative value for cis 1,2-Dichloroethylene was used as the screening value.

TABLE 4-5

Ground Water Data Evaluation and Screening Results
Northern Flow Regime (Off-Site)

Whirlpool Corporation
Fort Smith, Arkansas

| DATA SUMMARY | | | | | | | | SCREEN RESULTS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Constituents | Number of Analyses | Number of Detections | Frequency of Detection | Minimum Result (mg/L) | Maximum Result (mg/L) | Location of Max. Result | Maximum Reporting Limit (mg/L) | EPA Region 6 Screening Levels for Tap water[a] (mg/L) | | Screened out? Yes/No | Screening Rationale |
| 1,1,1-Trichloroethane | 218 | 0 | 0.00% | --- | --- | --- | 5.00E-03 | 8.40E-01 | | Yes | (e) |
| 1,1,2,2-Tetrachloroethane | 200 | 0 | 0.00% | --- | --- | --- | 5.00E-03 | 3.30E-04 | | Yes | (f) |
| 1,1,2-Trichloroethane | 200 | 0 | 0.00% | --- | --- | --- | 5.00E-03 | 1.20E-03 | | Yes | (f) |
| 1,1-Dichloroethane | 218 | 0 | 0.00% | --- | --- | --- | 5.00E-03 | 1.20E+00 | | Yes | (e) |
| 1,1-Dichloroethylene | 200 | 6 | 3.00% | 1.00E-03 | 3.00E-03 | MW-42 | 5.00E-03 | 3.40E-01 | | Yes | (e) |
| 1,2-Dichloroethane | 200 | 0 | 0.00% | --- | --- | --- | 5.00E-03 | 7.30E-04 | | Yes | (f) |
| 1,2-Dichloroethylene (total) | 117 | 25 | 21.37% | 4.00E-03 | 5.80E-02 | MW-41 | 1.00E-02 | 6.10E-02 | (b) | Yes | (e) |
| 1,2-Dichloropropane | 200 | 0 | 0.00% | --- | --- | --- | 5.00E-03 | 9.70E-04 | | Yes | (f) |
| 2-Hexanone | 200 | 0 | 0.00% | --- | --- | --- | 1.00E-02 | 1.50E+00 | (c) | Yes | (e) |
| 4-Methyl-2-pentanone (MIBK) | 200 | 0 | 0.00% | --- | --- | --- | 1.00E-02 | 2.00E+00 | | Yes | (e) |
| Acetone | 200 | 8 | 4.00% | 1.14E-02 | 3.92E-02 | MW-39 | 2.00E-02 | 5.50E+00 | | Yes | (e) |
| Benzene | 200 | 0 | 0.00% | --- | --- | --- | 5.00E-03 | 1.20E-03 | | Yes | (f) |
| Bromodichloromethane | 200 | 0 | 0.00% | --- | --- | --- | 5.00E-03 | 1.10E-03 | | Yes | (f) |
| Bromoform | 200 | 0 | 0.00% | --- | --- | --- | 5.00E-03 | 8.50E-03 | | Yes | (e) |
| Bromomethane | 200 | 0 | 0.00% | --- | --- | --- | 1.00E-02 | 8.70E-03 | | Yes | (f) |
| Carbon Disulfide | 200 | 6 | 3.00% | 8.00E-02 | 1.15E-01 | MW-33 | 5.00E-03 | 1.00E+00 | | Yes | (e) |
| Carbon Tetrachloride | 201 | 0 | 0.00% | --- | --- | --- | 5.00E-03 | 5.10E-04 | | Yes | (f) |
| Chlorobenzene | 200 | 0 | 0.00% | --- | --- | --- | 5.00E-03 | 9.10E-02 | | Yes | (e) |
| Chloroethane | 200 | 0 | 0.00% | --- | --- | --- | 1.00E-02 | 2.30E-02 | | Yes | (e) |
| Chloroform | 200 | 0 | 0.00% | --- | --- | --- | 5.00E-03 | 1.70E-04 | | Yes | (f) |
| Chloromethane (Methyl Chloride) | 200 | 0 | 0.00% | --- | --- | --- | 1.00E-02 | 2.10E-03 | | Yes | (f) |
| cis-1,2-Dichloroethylene | 214 | 54 | 25.23% | 2.00E-03 | 2.05E-01 | MW-41 | 5.00E-02 | 6.10E-02 | | **No** | (g) |
| cis-1,3-Dichloropropene | 200 | 0 | 0.00% | --- | --- | --- | 5.00E-03 | 6.70E-04 | (d) | Yes | (f) |
| Dibromochloromethane | 200 | 0 | 0.00% | --- | --- | --- | 5.00E-03 | 7.90E-04 | | Yes | (f) |
| Ethylbenzene | 200 | 0 | 0.00% | --- | --- | --- | 5.00E-03 | 1.30E+00 | | Yes | (e) |
| Methyl Ethyl Ketone (2-Butanone) | 200 | 0 | 0.00% | --- | --- | --- | 1.00E-02 | 7.10E+00 | | Yes | (e) |
| Methylene Chloride | 200 | 0 | 0.00% | --- | --- | --- | 1.00E-02 | 8.90E-03 | | Yes | (f) |
| Styrene | 200 | 0 | 0.00% | --- | --- | --- | 5.00E-03 | 1.60E+00 | | Yes | (e) |
| Tetrachloroethylene | 218 | 1 | 0.46% | 1.00E-03 | 1.00E-03 | MW-43 | 5.00E-03 | 1.20E-04 | | Yes | (h) |
| Toluene | 218 | 0 | 0.00% | --- | --- | --- | 5.00E-03 | 2.30E+00 | | Yes | (e) |
| trans-1,2-Dichloroethylene | 218 | 0 | 0.00% | --- | --- | --- | 5.00E-03 | 1.10E-01 | | Yes | (e) |
| trans-1,3-Dichloropropene | 200 | 0 | 0.00% | --- | --- | --- | 5.00E-03 | 6.70E-04 | (d) | Yes | (f) |
| Trichloroethylene | 218 | 115 | 52.75% | 1.00E-03 | 2.40E+00 | MW-23 | 2.50E-01 | 1.70E-04 | | **No** | (g) |
| Vinyl Chloride | 218 | 1 | 0.46% | 2.00E-03 | 2.00E-03 | MW-42 | 1.00E-02 | 1.50E-05 | | Yes | (h) |
| Xylenes (total) | 200 | 0 | 0.00% | --- | --- | --- | 2.00E-02 | 2.00E-01 | | Yes | (e) |

NOTES:

(a) Screening Levels for Tap Water From EPA Region 6 Human Health Medium-Specific Screening Levels Table (February 2007).
(b) A screening value for 1,2-Dichloroethylene (total) was not available. The conservative value for cis 1,2-Dichloroethylene was used as the screening value.
(c) No EPA Region 6 Screening Level was provided for 2-hexanone. The Tier 1 Residential Ground Water value ($^{GW}GW_{Ing}$ PCL) from the Texas Risk Reduction Rule Program (TRRP) was utilized for screening purposes. The TRRP PCL value was taken from Table 3, updated March 30, 2007.
(d) There was no value listed in the EPA Region 6 Screening Levels for cis-1,3-Dichloropropene and trans-1,3-Dichloropropene. The value for 1,3-Dichloropropene (total) was used as the screening value.
(e) Maximum detected result and the maximum reporting limit are below the EPA Region 6 Screening Level.
(f) The maximum reporting limit exceeded the screening level. However, no detections were reported. The constituent was screened from further quantitative evaluation, and discussed in the uncertainty analysis.
(g) Maximum detected result exceeded the EPA Region 6 Screening Level.
(h) Detection was determined to be anomalous. Vinyl chloride was detected only once (10/10/2006) at one well location (MW-42), for a detection frequency of 0.46%.

TABLE 4-6

Ground Water Screening Results: 2006 Maximum Concentrations
Northern Flow Regime (Off-Site)

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents | 2006 Maximum Concentration (mg/L) | EPA Region 6 Screening Levels for Tap Water [(a)] (mg/L) | Site Concentration Less Than Screening Value? Yes/No |
|---|---|---|---|
| cis-1,2-Dichloroethylene | 5.25E-02 | 6.10E-02 | Yes |
| Trichloroethylene | 2.00E+00 | 1.70E-04 | **No** |

NOTES:

(a) Screening Levels for Tap Water From EPA Region 6 Human Health Medium-Specific Screening Levels Table (February 2007).
(b) A screening value for 1,2-Dichloroethylene (total) was not available. The conservative value for cis 1,2-Dichloroethylene was used as the screening value.

TABLE 4-7

Soil Data Evaluation and Screening Results for Ground Water Protection: Southern Flow Regime (On-Site)

Whirlpool Corporation
Fort Smith, Arkansas

| DATA SUMMARY | | | | | | | | SCREENING RESULTS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Constituent | Number of Analyses | Number of Detections | Frequency of Detection | Minimum Result (mg/kg) | Maximum Result (mg/kg) | Location of Max. Result | Maximum Reporting Limit (mg/kg) | EPA Region 6 DAF 1 [a] Screening Levels (mg/kg) | Screened out? Yes/No | Screening Rationale | Site-Specific DAF [i] Screening Level (mg/kg) | Screened out? Yes/No | Screening Rationale |
| Acetone | 16 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 8.00E-01 | Yes | (h) | --- | --- | --- |
| Benzene | 16 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 2.00E-03 | No | (g) | 8.60E-02 | Yes | (j) |
| Bromodichloromethane | 16 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 3.00E-02 | Yes | (h) | --- | --- | --- |
| Bromoform | 16 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 4.00E-02 | Yes | (h) | --- | --- | --- |
| Bromomethane (Methyl bromide) | 16 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 1.00E-02 | Yes | (h) | --- | --- | --- |
| Carbon disulfide | 16 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 2.00E+00 | Yes | (h) | --- | --- | --- |
| Carbon tetrachloride | 16 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 3.00E-03 | No | (g) | 1.29E-01 | Yes | (j) |
| Chlorobenzene | 16 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 7.00E-02 | Yes | (h) | --- | --- | --- |
| Dichlorobromomethane | 16 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 2.00E-02 | Yes | (h) | --- | --- | --- |
| Chloroethane (Ethyl chloride) | 16 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 6.20E-03 (d) | No | (g) | 2.67E-01 | Yes | (j) |
| Chloroform | 16 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 3.00E-02 | Yes | (h) | --- | --- | --- |
| Chloromethane (Methyl chloride) | 16 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 4.29E-04 (d) | No | (g) | 1.85E-02 | Yes | (j) |
| 1,1-Dichloroethane | 16 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 1.00E+00 | Yes | (h) | --- | --- | --- |
| 1,2-Dichloroethane | 16 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 1.00E-03 | No | (g) | 4.30E-02 | Yes | (j) |
| 1,1-Dichloroethylene | 16 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 3.00E-03 | No | (g) | 1.29E-01 | Yes | (j) |
| 1,2-Dichloroethylene (total) | 16 | 1 | 6.3% | 1.20E-02 | 1.20E-02 | ERM-8 (14') | 1.00E-02 | 2.00E-02 (b) | Yes | (h) | --- | --- | --- |
| cis-1,2-Dichloroethylene | 16 | 2 | 12.5% | 6.00E-03 | 1.20E-02 | ERM-8 (14') | 5.00E-03 | 2.00E-02 | Yes | (h) | --- | --- | --- |
| trans-1,2-Dichloroethylene | 16 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 3.00E-02 | Yes | (h) | --- | --- | --- |
| 1,2-Dichloropropane | 16 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 1.00E-03 | No | (g) | 4.30E-02 | Yes | (j) |
| cis-1,3-Dichloropropene | 16 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 2.00E-04 (c) | No | (g) | 8.60E-03 | Yes | (j) |
| trans-1,3-Dichloropropene | 16 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 2.00E-04 (c) | No | (g) | 8.60E-03 | Yes | (j) |
| Ethylbenzene | 16 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 7.00E-01 | Yes | (h) | --- | --- | --- |
| 2-Hexanone | 16 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 3.54E-01 (d) | Yes | (h) | --- | --- | --- |
| Methylene Chloride | 16 | 4 | 25.0% | 5.00E-03 | 7.00E-03 | ERM-5 (9') | 5.00E-03 | 1.00E-03 | Yes | (e) | --- | --- | --- |
| Methyl Ethyl Ketone (2-Butanone) | 16 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 1.48E+00 (d) | Yes | (h) | --- | --- | --- |
| 4-Methyl-2-pentanone (MIBK) | 16 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 9.37E-01 (d) | Yes | (h) | --- | --- | --- |
| Styrene | 16 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 2.00E-01 | Yes | (h) | --- | --- | --- |
| 1,1,1,2-Tetrachloroethane | 16 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 8.98E-04 (d) | No | (g) | 3.86E-02 | Yes | (j) |
| Tetrachloroethylene | 16 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 3.00E-03 | No | (g) | 1.29E-01 | Yes | (j) |
| Toluene | 16 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 6.00E-01 | Yes | (h) | --- | --- | --- |
| 1,1,1-Trichloroethane | 16 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 1.00E-01 | Yes | (h) | --- | --- | --- |
| 1,1,2-Trichloroethane | 16 | 0 | 0.0% | --- | --- | --- | 5.00E-03 | 9.00E-04 | No | (g) | 3.87E-02 | Yes | (j) |
| Trichloroethylene | 16 | 4 | 25.0% | 9.00E-03 | 1.86E-01 | ERM-8 (14') | 5.00E-03 | 3.00E-03 | No | (f) | 1.29E-01 | No | (k) |
| Vinyl chloride | 16 | 0 | 0.0% | --- | --- | --- | 1.00E-02 | 7.00E-04 | No | (g) | 3.01E-02 | Yes | (j) |
| Xylene (total) | 16 | 0 | 0.0% | --- | --- | --- | 2.00E-02 | 1.00E+01 | Yes | (h) | --- | --- | --- |

NOTES:

(a) Ground Water Protection (GWP) Screening Levels assuming a DAF 1 from EPA Region 6 Human Health Medium-Specific Screening Levels Table (February 2007).
(b) There was no value listed in the EPA Region 6 Screening Levels for 1,2-Dichloroethylene (total). The conservative value for cis-1,2-Dichloroethylene was used as the screening value.
(c) There was no value listed in the EPA Region 6 Screening Levels for cis-1,3-Dichloropropene and trans-1,3-Dichloropropene.The value for 1,3-Dichloropropene (total) was used as the screening value.
(d) A screening value was not provided on the EPA Region 6 Human Health Medium-Specific Screening Levels Table. A Soil Screening Value was calculated using Equation 4-10 of the EPA Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (December 2002). See Table 4-8.
(e) Methylene chloride is a common laboratory artifact and is not anticipated to be associated with site operations. The constituent was screened out.
(f) The maximum detected result exceeded the EPA Region 6 Screening Level.
(g) The maximum reporting limit exceeded the EPA Region 6 Screening Level. However, there were no reported detections. The constituent was evaluated further using a screening level based on a site-specific DAF.
(h) The maximum detected result is less than the EPA Region 6 Screening Level.
(i) The calculated site-specific DAF was 43. Calculations for the DAF are presented in Table 4-9. MSSL (assuming DAF 1) was multiplied by the calculated DAF of 43 to obtain the site-specific screening levels.
(j) The maximum reporting limit is below the calculated site-specific DAF screening level.
(k) The maximum detected result exceeds the calculated site-specific DAF screening level.

TABLE 4-8

Calculation of Soil Ground Water Protection Screening Values

Whirlpool Corporation
Fort Smith, Arkansas

| Parameter | Definition | Value | Units | Notes |
|---|---|---|---|---|
| $C_w$ | Concentration in ground water | chemical-specific | mg/L | |
| Kd | Soil-water partition coefficient | chemical-specific | L/kg | |
| $K_{OC}$ | Soil organic carbon/water partition coefficient | chemical-specific | L/kg | |
| $f_{oc}$ | Fraction organic carbon in soil | 0.002 | g/g | |
| $\theta_w$ | Water-filled soil porosity | 0.3 | $L_{water}/L_{soil}$ | |
| $\theta_a$ | Air-filled soil porosity | 0.134 | $L_{air}/L_{soil}$ | $\theta_a = n - \theta_w$ |
| n | Soil porosity | 0.43 | $L_{pore}/L_{soil}$ | $n = 1 - (\rho_b/\rho_s)$ |
| $\rho_b$ | Dry soil bulk density | 1.5 | kg/L | |
| $\rho_s$ | Soil particle density | 2.65 | kg/L | |
| H' | Dimensionless Henry's law constant | chemical-specific | unitless | |
| SSL | Screening level in soil | chemical-specific | mg/kg | |

| Constituent | | $C_w$ (a) mg/L | H' (b) unitless | $K_{oc}$ (b) L/kg | $K_d$ (c) L/kg | SSL (d) mg/kg |
|---|---|---|---|---|---|---|
| Methyl Ethyl Ketone (2-Butanone) | | 7.10E+00 | 1.12E-03 | 4.50E+00 | 9.00E-03 | 1.48E+00 |
| Chloroethane (Ethyl chloride) | | 2.30E-02 | 4.51E-01 | 1.47E+01 | 2.94E-02 | 6.20E-03 |
| Chloromethane (Methyl chloride) | | 1.20E-03 | 9.84E-01 | 3.50E+01 | 7.00E-02 | 4.29E-04 |
| 2-Hexanone | (c) | 1.50E+00 | 3.38E-03 | 1.78E+01 | 3.56E-02 | 3.54E-01 |
| 4-Methyl-2-pentanone (MIBK) | | 2.00E+00 | 5.74E-03 | 1.34E+02 | 2.68E-01 | 9.37E-01 |
| 1,1,1,2-Tetrachloroethane | | 2.50E-03 | 1.41E-02 | 7.90E+01 | 1.58E-01 | 8.98E-04 |

NOTES:

(a) EPA's Region 6 Human Health Medium-Specific Screening Levels for Tap Water (February 2007).
(b) Values from EPA's Region 6 Human Health Medium-Specific Screening Levels Table (February 2007).
(c) $K_d = K_{oc} \times f_{oc}$
(d) $SSL = C_w \times (K_d + ((\theta_w + \theta_a \times H')/\rho b))$
(e) No EPA Region 6 Screening Level for Tap Water was provided for 2-Hexanone. The Tier 1 Residential Ground Water value from the Texas Risk Reduction Rule Program (TRRP) was utilized for $C_w$. The TRRP PCL value is from Table 3, updated March 30, 2007. TRRP values were also utilized for H' and Koc for 2-Hexanone from TRRP chemical and physical properties table, updated March 30, 2007.
Equations from Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (EPA, 2002).

TABLE 4-9

Site Specific DAF and Soil Ground Water Protection Calculation

Whirlpool Corporation
Fort Smith, Arkansas

| Parameter | Definition | Value | Units | Comments |
|---|---|---|---|---|
| K | Hydraulic conductivity | 8.70E+02 | m/yr | |
| i | Hydraulic gradient | 2.70E-03 | unitless | |
| P | Annual precipitation | 1.05E+00 | m/yr | (a) |
| I | Infiltration | 1.99E-04 | m/yr | (b) |
| d | Mixing zone depth | 1.36E+00 | m | (c), (d) |
| L | Source length parallel to ground water flow | 3.79E+02 | m | |
| $d_a$ | Aquifer thickness | 1.36E+00 | m | |
| DAF | Dilution Attenuation Factor | 4.33E+01 | unitless | (e) |

| Constituent | EPA Region 6 MSSL (f) (mg/kg) | Site-Specific MSSL (g) (mg/kg) |
|---|---|---|
| Benzene | 2.00E-03 | 8.60E-02 |
| Carbon tetrachloride | 3.00E-03 | 1.29E-01 |
| Chloroethane (Ethyl chloride) | 6.20E-03 | 2.67E-01 |
| Chloromethane (Methyl chloride) | 4.29E-04 | 1.85E-02 |
| 1,2-Dichloroethane | 1.00E-03 | 4.30E-02 |
| 1,1-Dichloroethylene | 3.00E-03 | 1.29E-01 |
| 1,2-Dichloropropane | 1.00E-03 | 4.30E-02 |
| cis-1,3-Dichloropropene | 2.00E-04 | 8.60E-03 |
| trans-1,3-Dichloropropene | 2.00E-04 | 8.60E-03 |
| 1,1,1,2-Tetrachloroethane | 8.98E-04 | 3.86E-02 |
| Tetrachloroethylene | 3.00E-03 | 1.29E-01 |
| 1,1,2-Trichloroethane | 9.00E-04 | 3.87E-02 |
| Trichloroethylene | 3.00E-03 | 1.29E-01 |
| Vinyl chloride | 7.00E-04 | 3.01E-02 |

NOTES:

(a) Annual precipitation from worldclimate.com
(b) $I = 0.00018 \times (P^2)$. Infiltration calculation from Texas Risk Reduction Rule Program, 1999.
(c) $d = (0.0112(L^2))^{0.5} + da(1 - \exp((-L \times I)/(K \times i \times da)))$. Mixing zone depth calculated using Equation 4-12 from the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (December 2002).
(d) The calculated mixing zone depth of 40.1 m was greater than the aquifer thickness of 1.36 m. The mixing zone depth was set equal to the aquifer thickness.
(e) $DAF = 1 + ((K \times i \times d)/(I \times L))$. DAF calculated using Equation 4-11 from the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (December 2002).
(f) Values taken from EPA Region 6 Human Health Medium-Specific Screening Levels (MSSL) Table for DAF 1 (February 2007).
(g) Site-specific MSSL = DAF 1 MSSL x Site-specific DAF (43.3).

TABLE 4-10

Constituents of Potential Concern

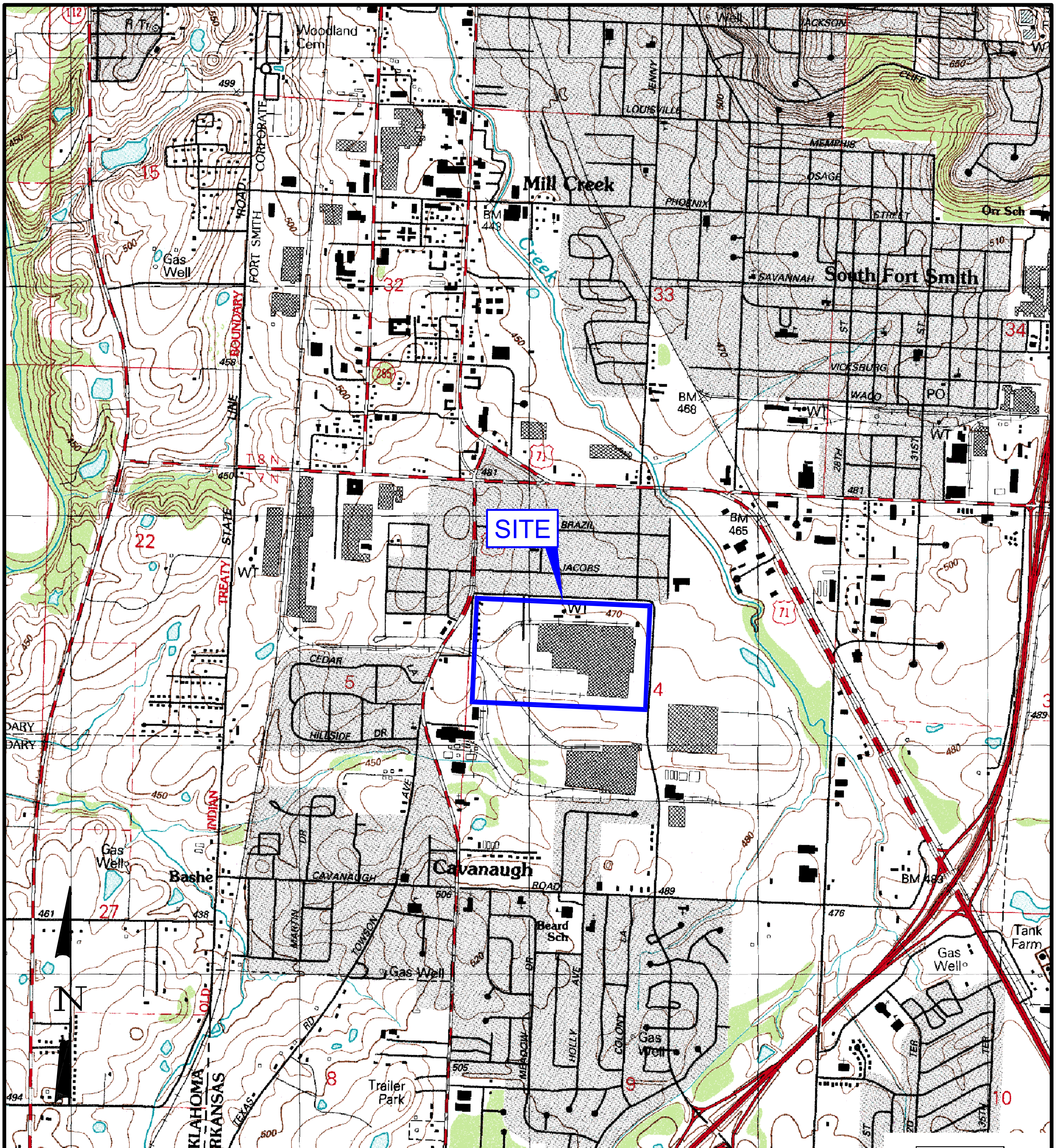
Whirlpool Corporation
Fort Smith, Arkansas

| Constituent | On Site | Off Site |
|---|---|---|
| ***Soil*** | | |
| Trichloroethylene | X | |
| | | |
| ***Ground Water*** | | |
| Chloroform | X | |
| cis-1,2-Dichloroethylene | X | |
| Tetrachloroethylene | X | |
| Trichloroethylene | X | X |
| Vinyl Chloride | X | |

# Figures

*June 14, 2007*
*Project No. 0048030*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000




0 2000 4000

SCALE FEET

SOURCE: U.S.G.S. 7.5' QUADRANGLE, SOUTH FORT SMITH, ARK.-OKLA., (o35094C4) 1987.


QUADRANGLE LOCATION

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HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE

| DESIGN: HTV | DRAWN: EFC | CHKD.: TWM |
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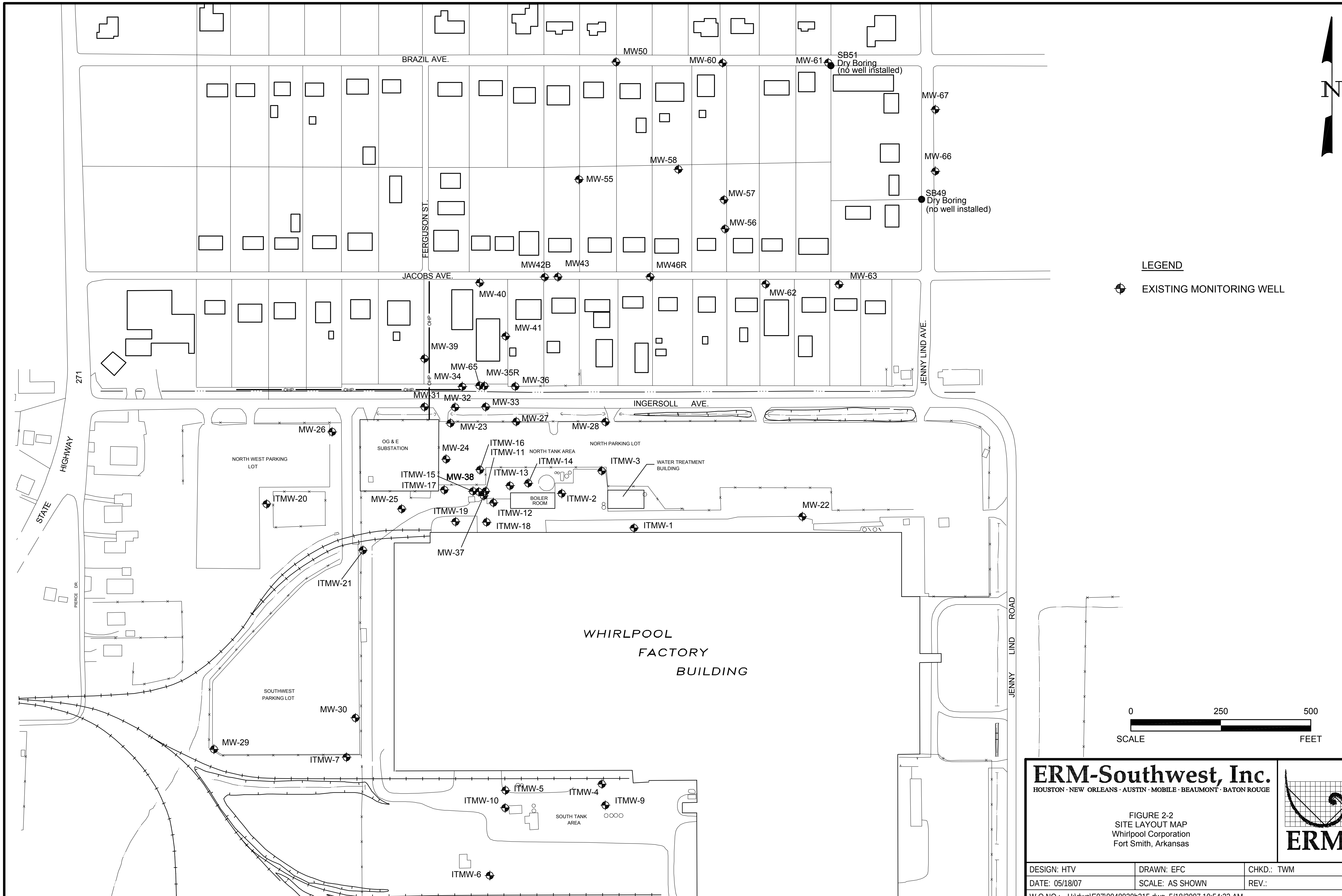
| DATE: 05/18/07 | SCALE: AS SHOWN | REV.: |
| W.O.NO.: H:\dwg\E07\0048030_Site_Loc.dwg, 5/18/2007 10:55:56 AM | | |

FIGURE 2-1
SITE LOCATION MAP
Whirlpool Corporation
Fort Smith, Arkansas

ERM®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JACOBS AVE.
INGERSOLL AVE.
FERGUSON ST.
JENNY LIND AVE.
JENNY LIND ROAD
STATE HIGHWAY 271
PIERCE DR.
OHP
MW50
MW-60
MW-61
SB51
Dry Boring
(no well installed)
MW-67
MW-66
MW-58
MW-55
MW-57
SB49
Dry Boring
(no well installed)
MW-56
MW42B
MW43
MW46R
MW-63
MW-62
MW-40
MW-41
MW-39
MW-65
MW-34
MW-35R
MW-36
MW-31
MW-32
MW-33
MW-27
MW-28
MW-23
MW-26
MW-24
OG & E SUBSTATION
NORTH WEST PARKING LOT
NORTH TANK AREA
NORTH PARKING LOT
WATER TREATMENT BUILDING
BOILER ROOM
ITMW-16
ITMW-11
ITMW-14
ITMW-3
ITMW-15
ITMW-17
MW-38
ITMW-13
ITMW-2
MW-25
ITMW-20
ITMW-19
ITMW-12
ITMW-18
ITMW-1
MW-22
MW-37
ITMW-21
WHIRLPOOL FACTORY BUILDING
SOUTHWEST PARKING LOT
MW-30
MW-29
ITMW-7
ITMW-5
ITMW-4
ITMW-9
ITMW-10
SOUTH TANK AREA
ITMW-6
N
LEGEND
EXISTING MONITORING WELL
0
250
500
SCALE
FEET
ERM-Southwest, Inc.
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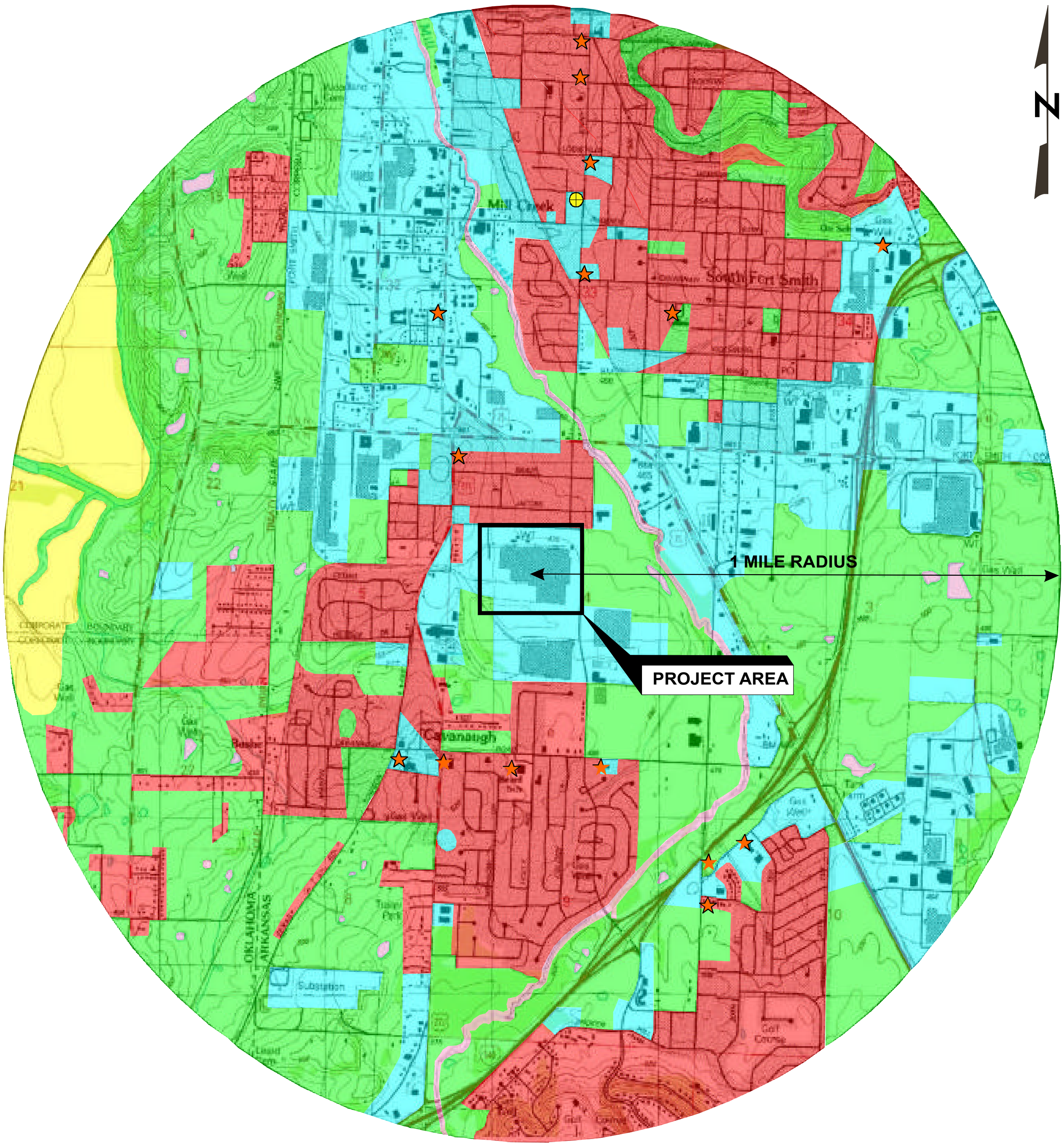
FIGURE 2-2
SITE LAYOUT MAP
Whirlpool Corporation
Fort Smith, Arkansas
ERM
DESIGN: HTV
DRAWN: EFC
CHKD.: TWM
DATE: 05/18/07
SCALE: AS SHOWN
REV.:
W.O.NO.: H:\dwg\E07\0048030b215.dwg, 5/18/2007 10:54:23 AM




SOURCE: U.S.G.S. 7.5' QUADRANGLE, SOUTH FORT SMITH, ARK.-OKLA., (o35094C4) 1987.

LEGEND:

- RESIDENTIAL
- UNDERDEVELOPED
- AGRICULTURAL
- COMMERCIAL / INDUSTRIAL
- SURFACE WATER
- HOSPITAL
- SCHOOL / DAYCARE

0 1500 3000

SCALE FEET

**ERM-Southwest, Inc.**

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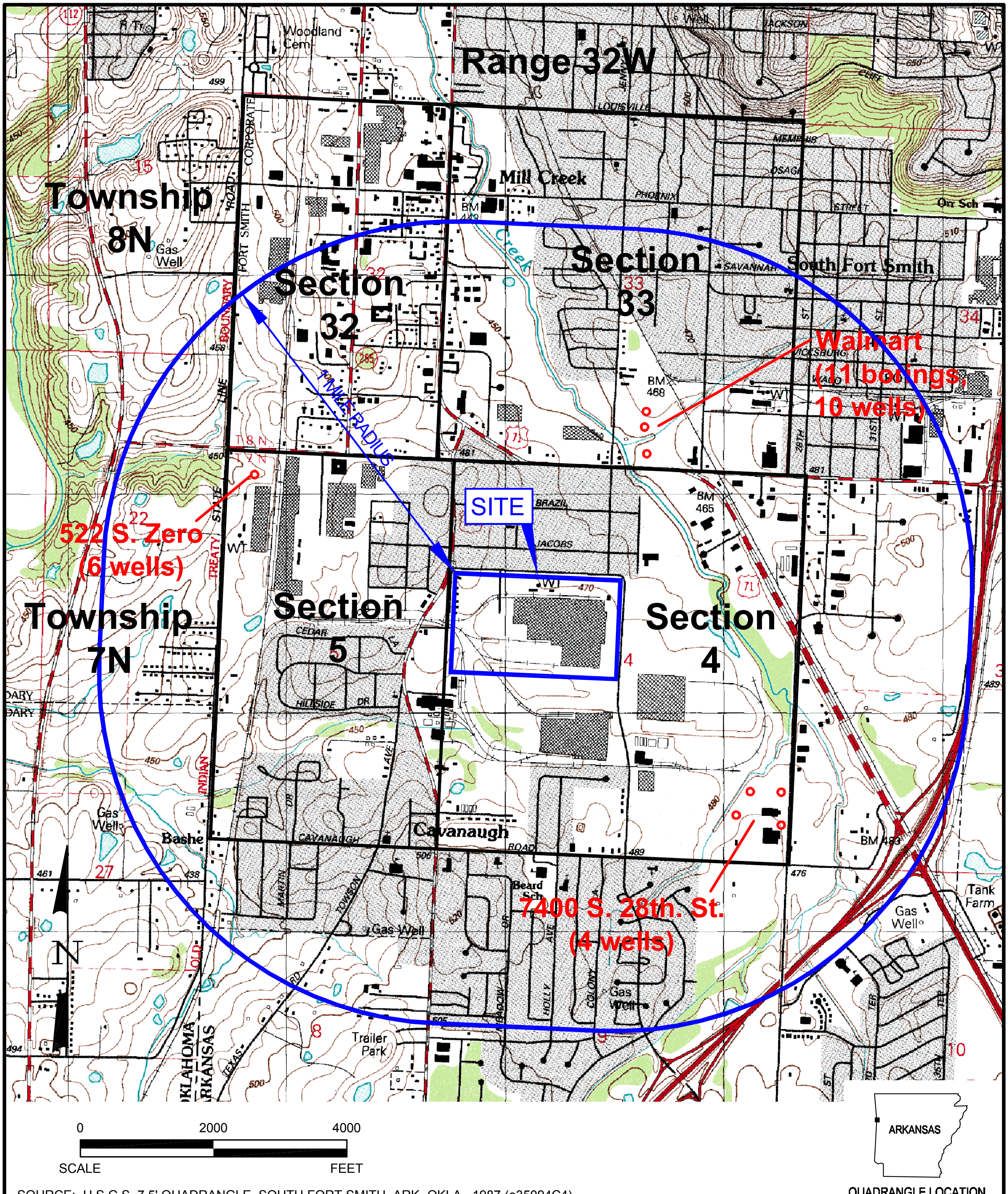
| | | | |
|---|---|---|---|
| DESIGN: HTV | CHKD.: TWM | DATE: 05/18/07 | REV.: 0 |
| DRAWN: EFC | SCALE: AS SHOWN | W.O.NO.: \E07\581007a208.cdr | |

FIGURE 2-3
LAND USE MAP
Whirlpool Corporation
Fort Smith, Arkansas

ERM®




SOURCE: U.S.G.S. 7.5' QUADRANGLE, SOUTH FORT SMITH, ARK.-OKLA., 1987 (o35094C4).

**ERM-Southwest, Inc.**
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FIGURE 2-4
WELL SURVEY SUMMARY MAP
Whirlpool Corporation
Fort Smith, Arkansas

| | | |
|---|---|---|
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| DATE: 05/18/07 | SCALE: AS SHOWN | REV.: |

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ERM

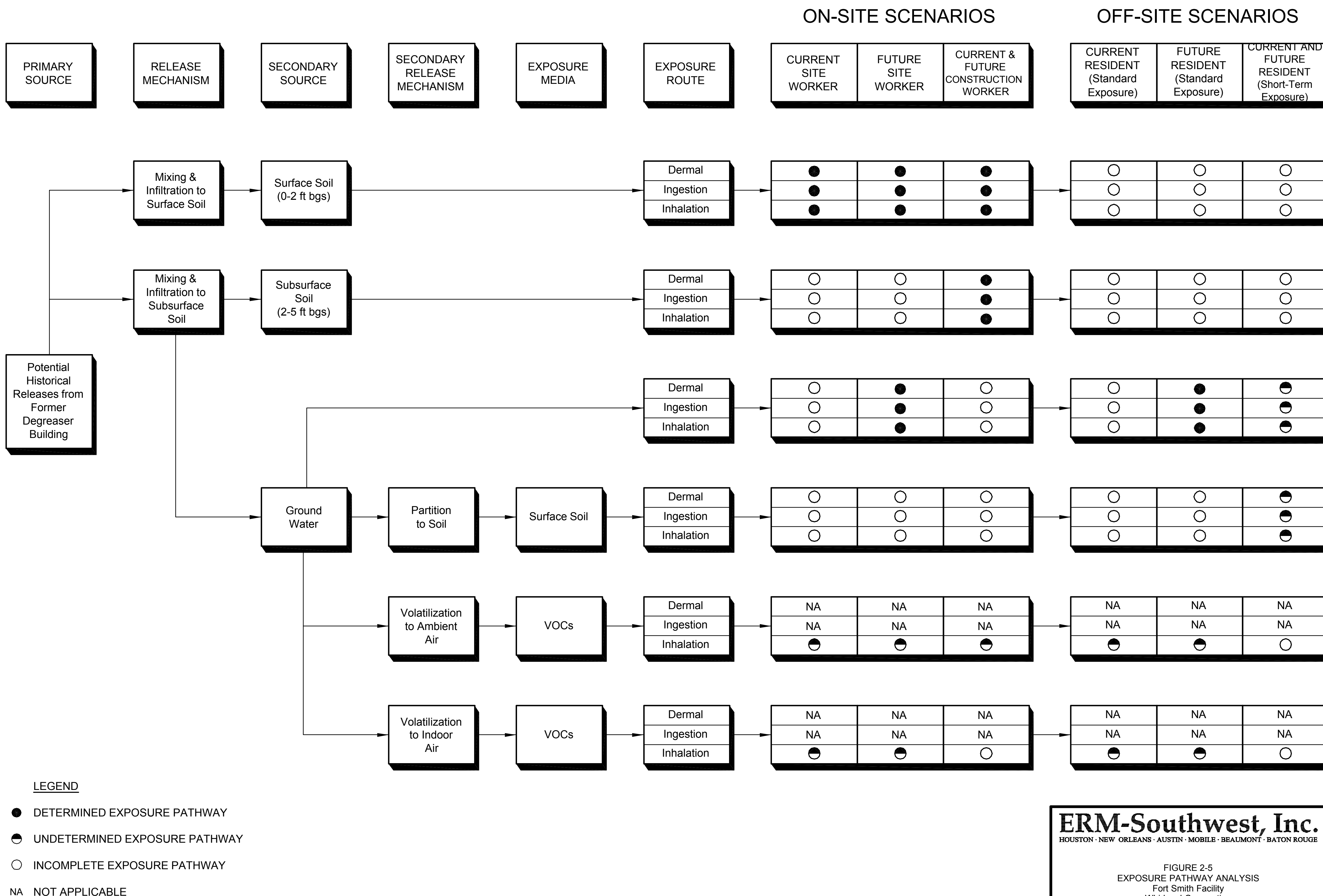


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FIGURE 2-5
EXPOSURE PATHWAY ANALYSIS
Fort Smith Facility
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| | | |
|---|---|---|
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| DATE: 06/13/07 | SCALE: AS SHOWN | REV.: |
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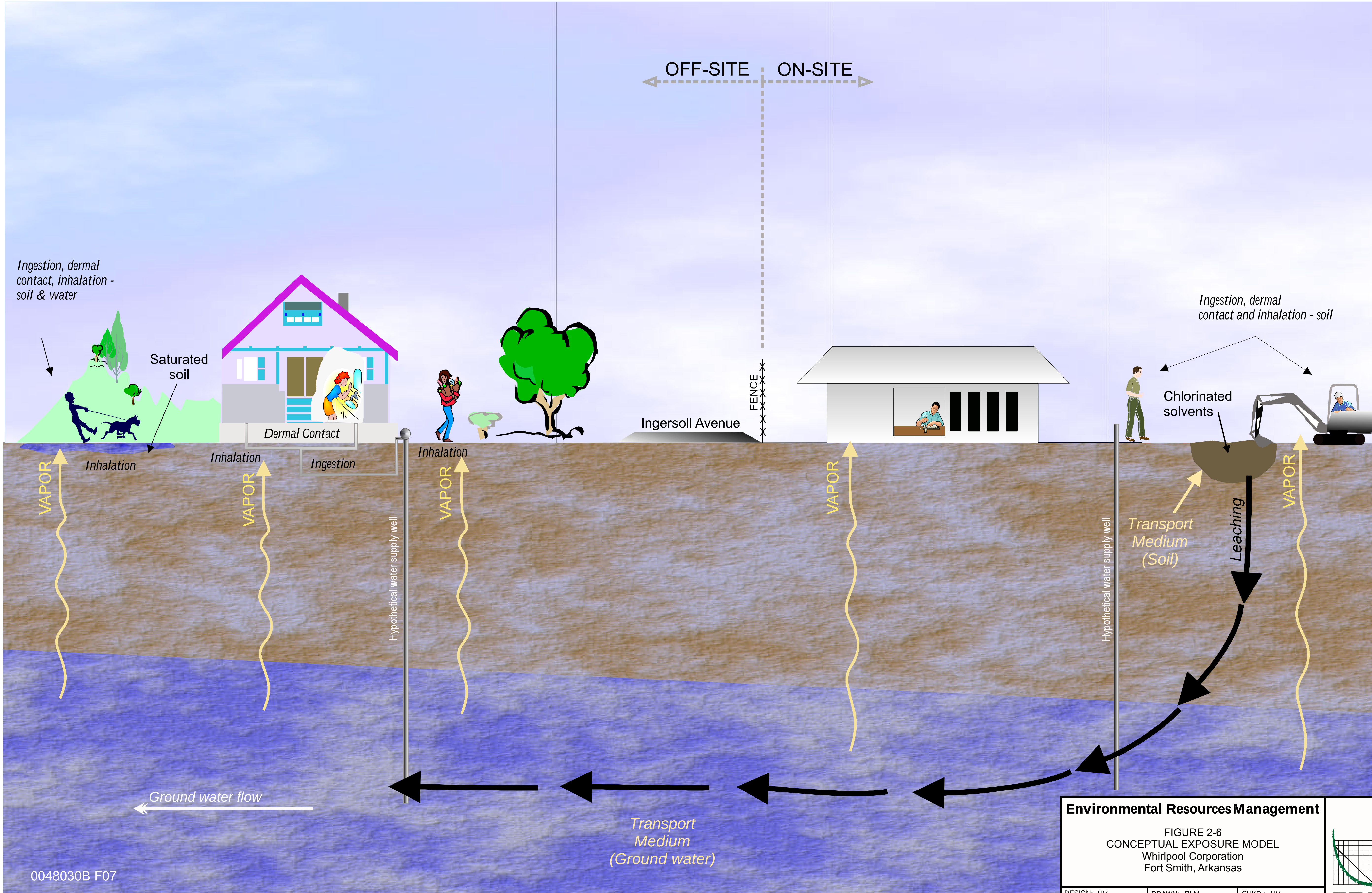
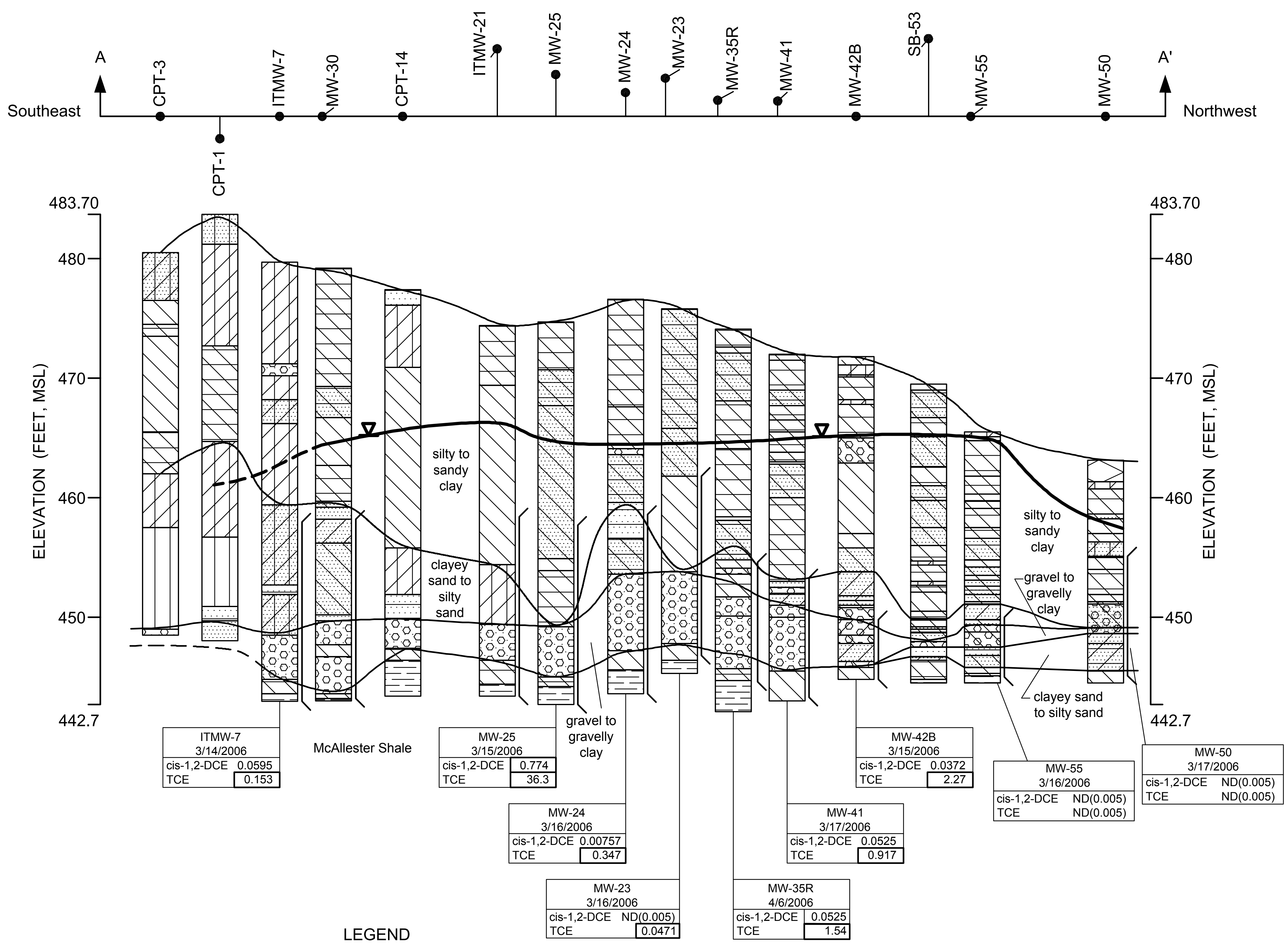


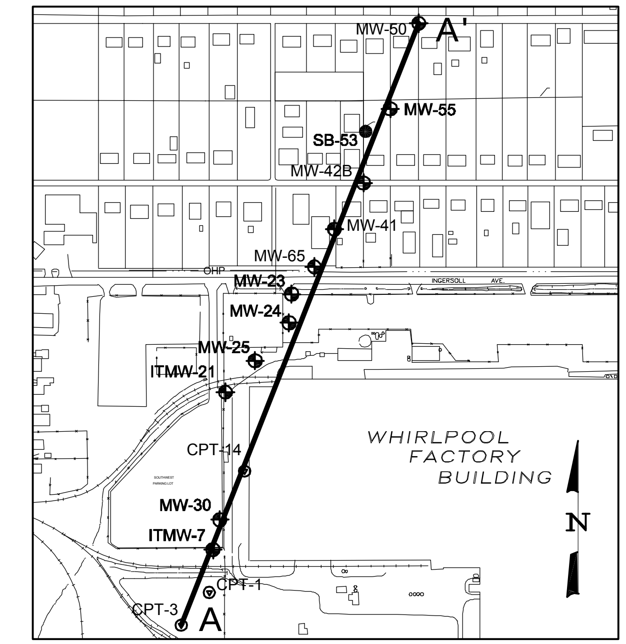

**Environmental Resources Management**

FIGURE 2-6
CONCEPTUAL EXPOSURE MODEL
Whirlpool Corporation
Fort Smith, Arkansas

| | | |
|---|---|---|
| DESIGN: HV | DRAWN: RLM | CHKD.: HV |
| DATE: 06/07/07 | SCALE: N.T.S. | REV.: |
| W.O.NO.: 0048030B201 F07 | | |

ERM




CROSS-SECTION LOCATION MAP
SCALE: 1" = 700'

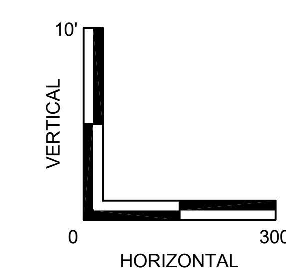
NOTES:

ALL DATA ARE mg/L IN MARCH/APRIL 2006

cis-1,2-DCE = cis-1,2-DICHLOROETHENE

TCE = TRICHLOROETHENE

EXCEEDS EPA REGION 6 HUMAN HEALTH MEDIUM SPECIFIC SCREEN LEVEL FOR TAPWATER




LEGEND

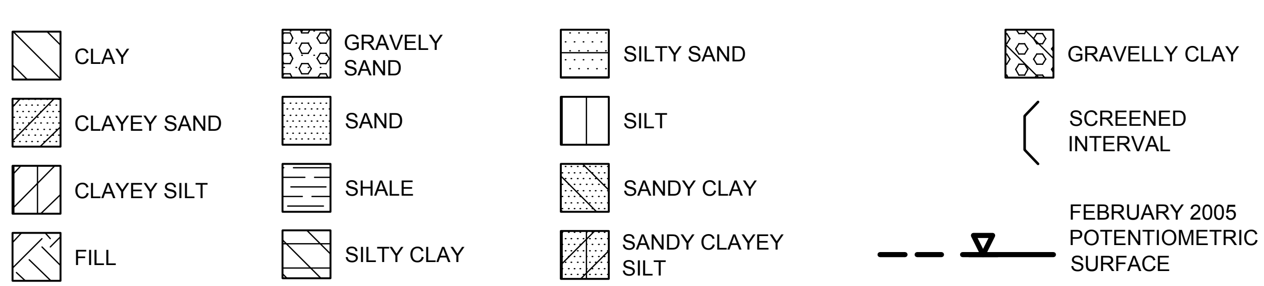



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FIGURE 2-7
CROSS-SECTION A-A'
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| | | |
|---|---|---|
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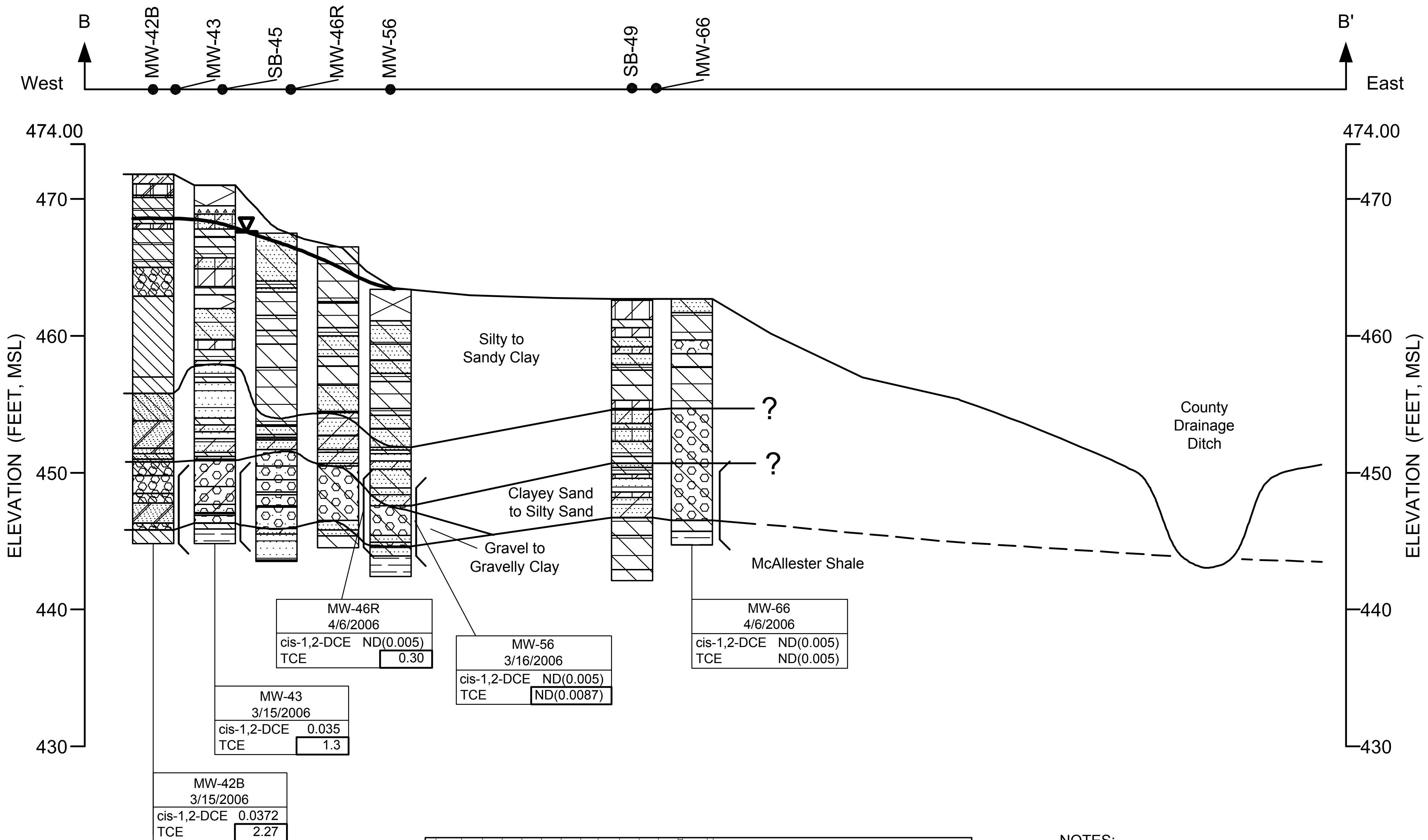


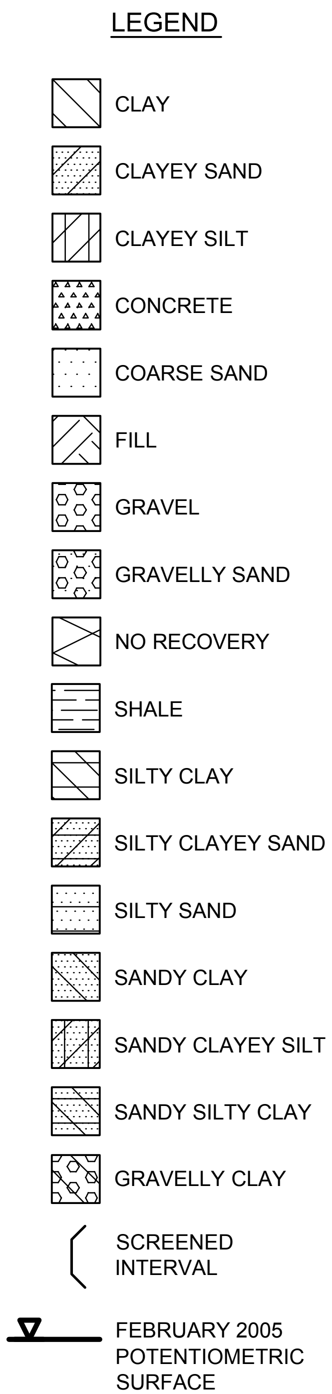


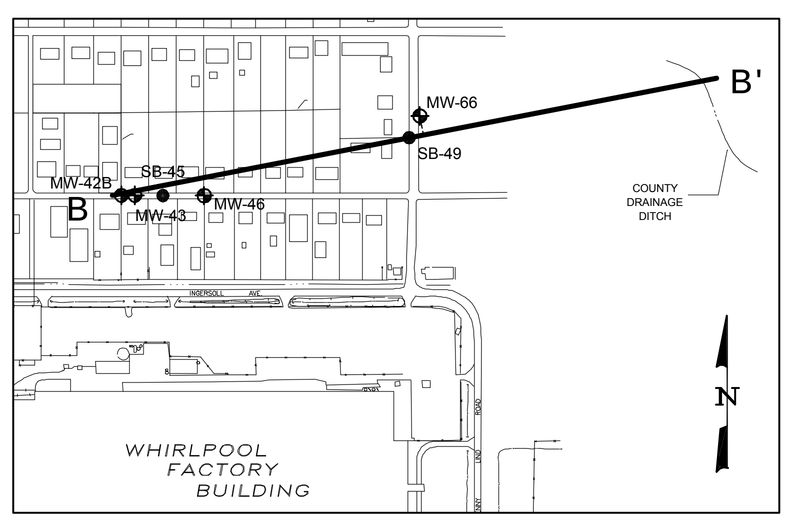


CROSS-SECTION LOCATION MAP
SCALE: 1" = 700'

NOTES:

ALL DATA ARE mg/L IN MARCH/APRIL 2006.

cis-1,2-DCE = cis-1,2-DICHLOROETHENE

TCE = TRICHLOROETHENE

▭ EXCEEDS EPA REGION 6 HUMAN HEALTH MEDIUM SPECIFIC SCREEN LEVEL FOR TAPWATER

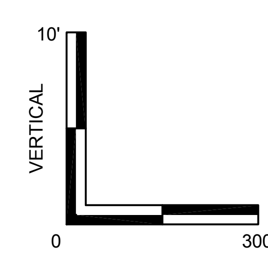


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FIGURE 2-8
CROSS-SECTION B-B'
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| | | |
|---|---|---|
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| DATE: 05/18/07 | SCALE: AS SHOWN | REV.: |
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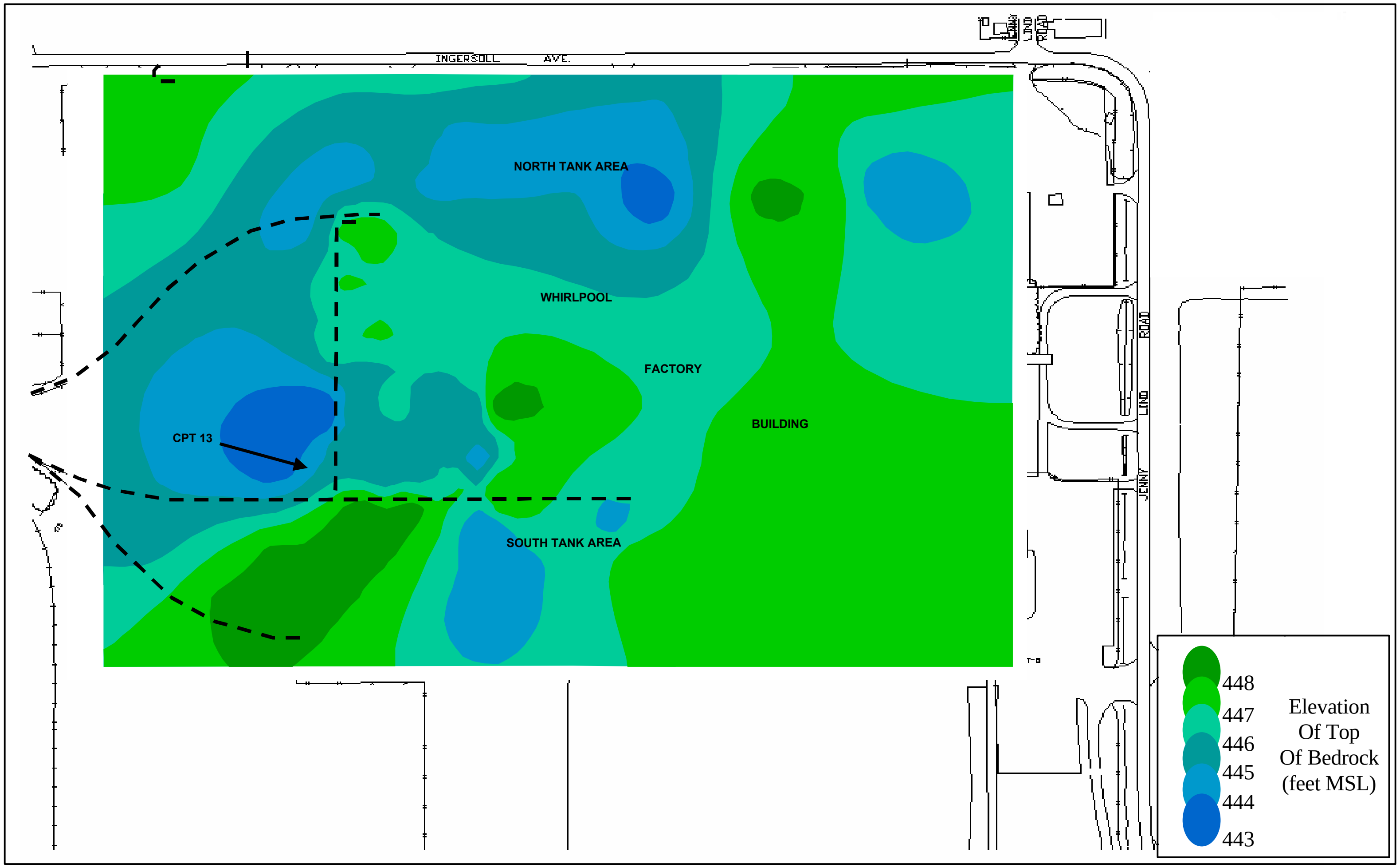


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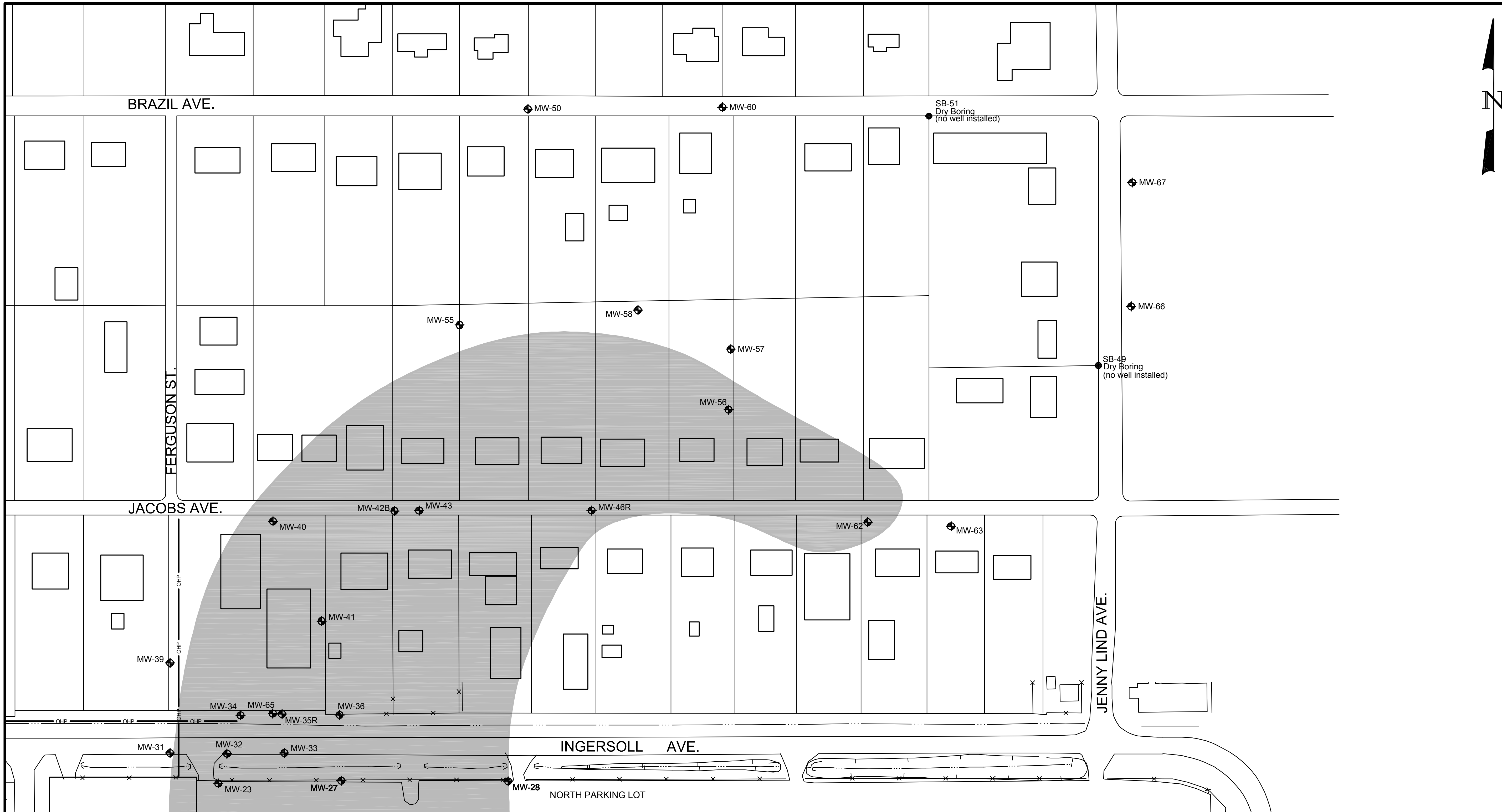
| | | | |
|---|---|---|---|
| DESIGN: | CHKD.: | DATE: 07/31/02 | REV.: |
| DRAWN: | SCALE: AS SHOWN | W.O.NO.: \F07\581007a210.ppt | |

FIGURE 2-9
CONTOUR MAP OF McALESTER SHALE SURFACE
Whirlpool corporation
Fort Smith, Arkansas

ERM




LEGEND

EXISTING MONITORING WELL

APPROXIMATE AREA OF GRAVEL ZONE
(MINIMUM THICKNESS OF 1 FOOT)

0 150 300

SCALE FEET

**ERM-Southwest, Inc.**

HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE · CORPUS CHRISTI

FIGURE 2-10
DISTRIBUTION OF GRAVEL ZONE
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| | | |
|---|---|---|
| DESIGN: TWM | DRAWN: JMH | CHKD.: TWM |
| DATE: 08/25/06 | SCALE: AS SHOWN | REV.: |
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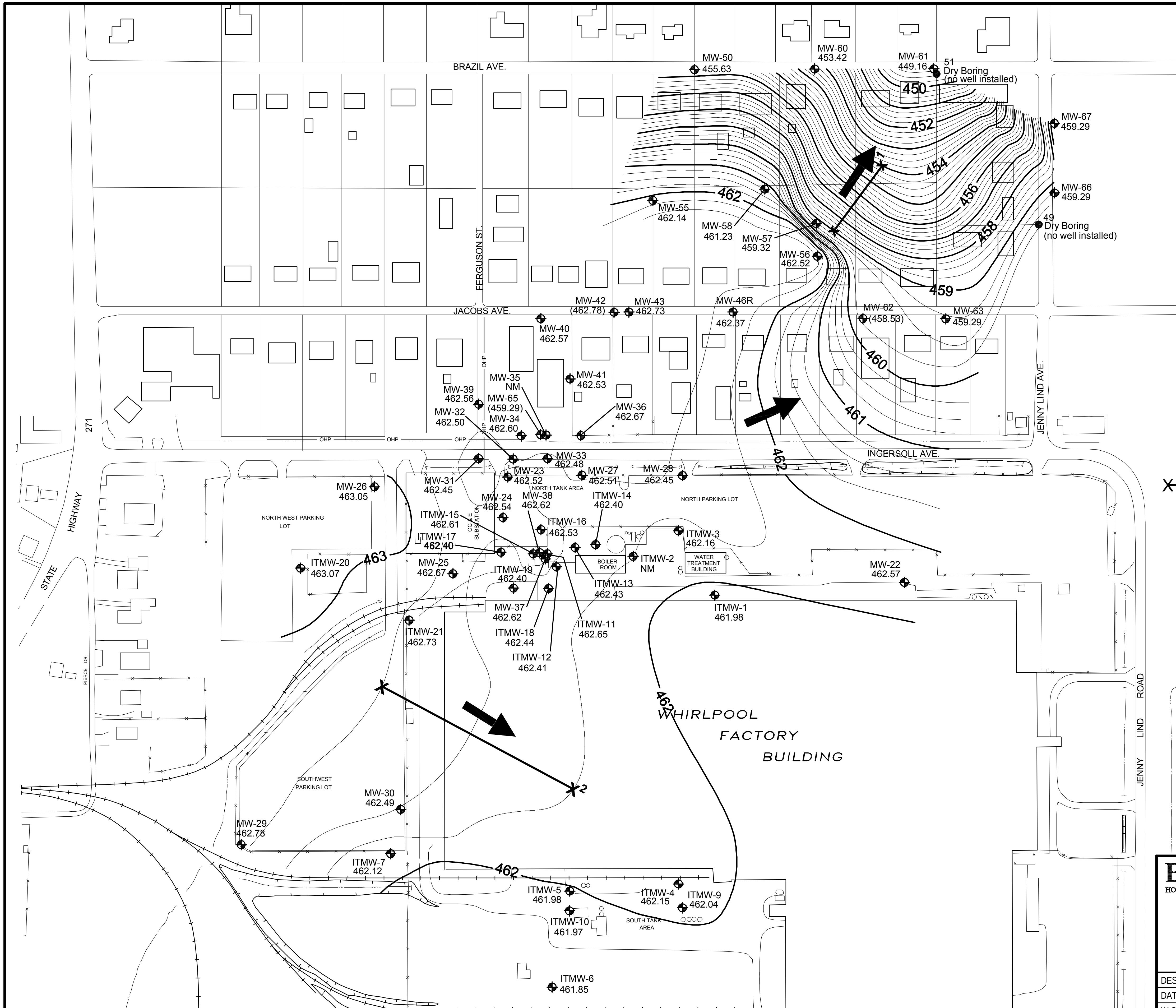
g:\2007\0048030\10264H(figs).pdf




LEGEND

—464.5— POTENTIOMETRIC SURFACE CONTOUR (FT., MSL) (CONTOUR INTERVAL = 0.25 FT.) (DASHED WHERE INFERRED)

ITMW-2 GROUND WATER SAMPLING LOCATION

DIRECTION OF GROUND WATER FLOW

$X_1$ GROUND WATER GRADIENT MEASUREMENT TRANSECT
$X_1$ = 0.0250 FT./FT
$X_2$ = 0.0009 FT./FT

NOTE:

DUE TO ANOMALOUS READINGS, MW-42, MW-62, AND MW-65 WERE NOT USED TO CONTOUR THIS MAP.

0 250 500
SCALE FEET

**ERM-Southwest, Inc.**
HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE

FIGURE 2-11
SPRING POTENTIOMETRIC SURFACE MAP
MARCH 2006
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| DESIGN: HTV | DRAWN: EFC | CHKD.: TWM |
|---|---|---|
| DATE: 05/18/07 | SCALE: AS SHOWN | REV.: |

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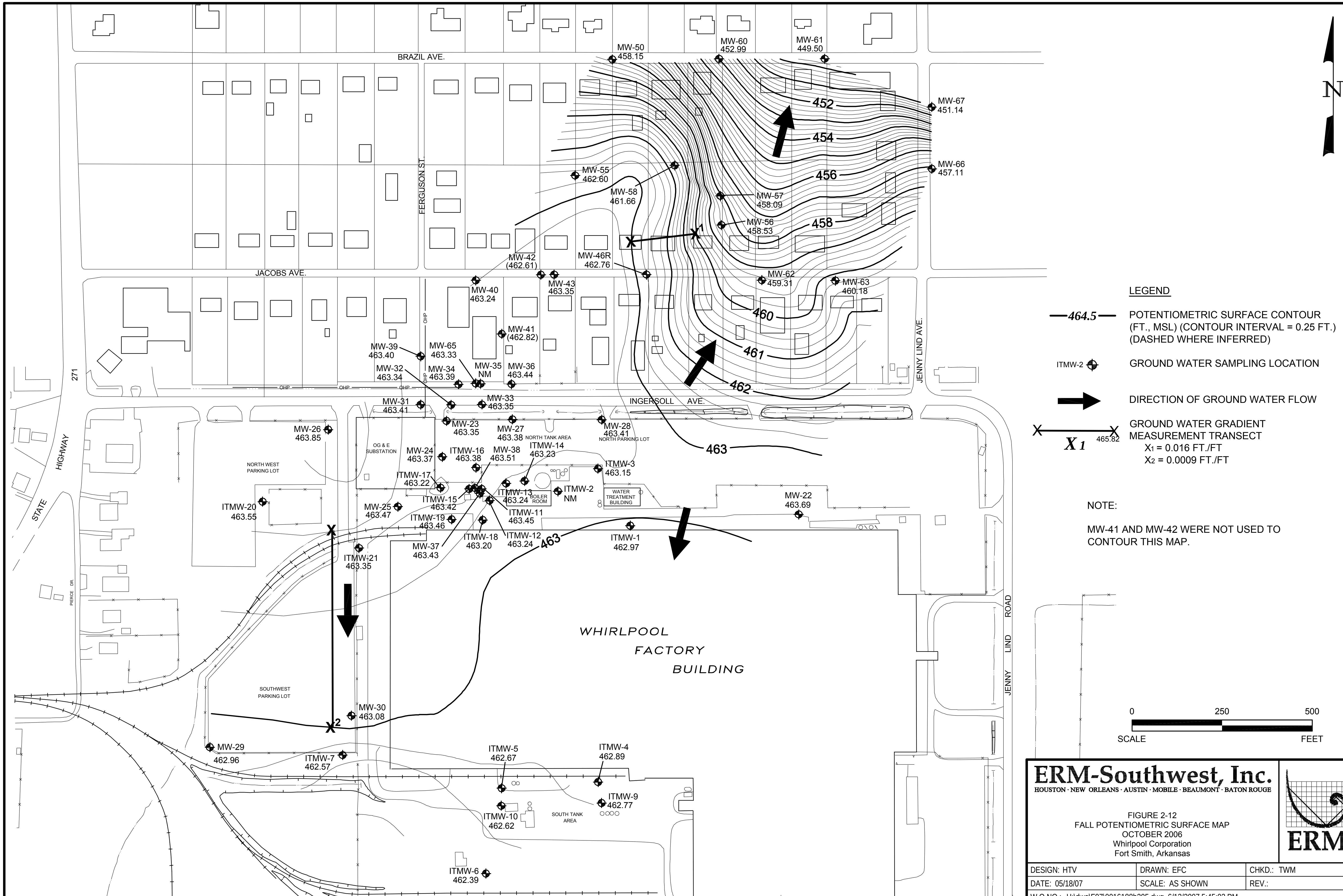
BRAZIL AVE.
JACOBS AVE.
INGERSOLL AVE.
FERGUSON ST.
JENNY LIND AVE.
JENNY LIND ROAD
STATE HIGHWAY 271
PIERCE DR.
N
MW-50 458.15
MW-60 452.99
MW-61 449.50
MW-67 451.14
MW-66 457.11
MW-55 462.60
MW-58 461.66
MW-57 458.09
MW-56 458.53
MW-42 (462.61)
MW-46R 462.76
MW-62 459.31
MW-63 460.18
MW-40 463.24
MW-43 463.35
MW-41 (462.82)
MW-39 463.40
MW-65 463.33
MW-32 463.34
MW-34 463.39
MW-35 NM
MW-36 463.44
MW-31 463.41
MW-33 463.35
MW-23 463.35
MW-27 463.38
MW-28 463.41
MW-26 463.85
MW-24 463.37
ITMW-16 463.38
MW-38 463.51
ITMW-14 463.23
ITMW-3 463.15
ITMW-17 463.22
ITMW-15 463.42
ITMW-13 463.24
ITMW-2 NM
ITMW-11 463.45
ITMW-20 463.55
MW-25 463.47
ITMW-19 463.46
ITMW-18 463.20
ITMW-12 463.24
MW-37 463.43
MW-22 463.69
ITMW-1 462.97
ITMW-21 463.35
MW-30 463.08
MW-29 462.96
ITMW-7 462.57
ITMW-5 462.67
ITMW-4 462.89
ITMW-9 462.77
ITMW-10 462.62
ITMW-6 462.39
452
454
456
458
460
461
462
463
X1
X2
OG & E SUBSTATION
NORTH WEST PARKING LOT
NORTH TANK AREA
NORTH PARKING LOT
BOILER ROOM
WATER TREATMENT BUILDING
SOUTHWEST PARKING LOT
SOUTH TANK AREA
OHP
WHIRLPOOL FACTORY BUILDING
LEGEND
464.5 POTENTIOMETRIC SURFACE CONTOUR (FT., MSL) (CONTOUR INTERVAL = 0.25 FT.) (DASHED WHERE INFERRED)
ITMW-2 GROUND WATER SAMPLING LOCATION
DIRECTION OF GROUND WATER FLOW
X1 465.82 GROUND WATER GRADIENT MEASUREMENT TRANSECT
X1 = 0.016 FT./FT
X2 = 0.0009 FT./FT
NOTE:
MW-41 AND MW-42 WERE NOT USED TO CONTOUR THIS MAP.
0 250 500
SCALE FEET
ERM-Southwest, Inc.
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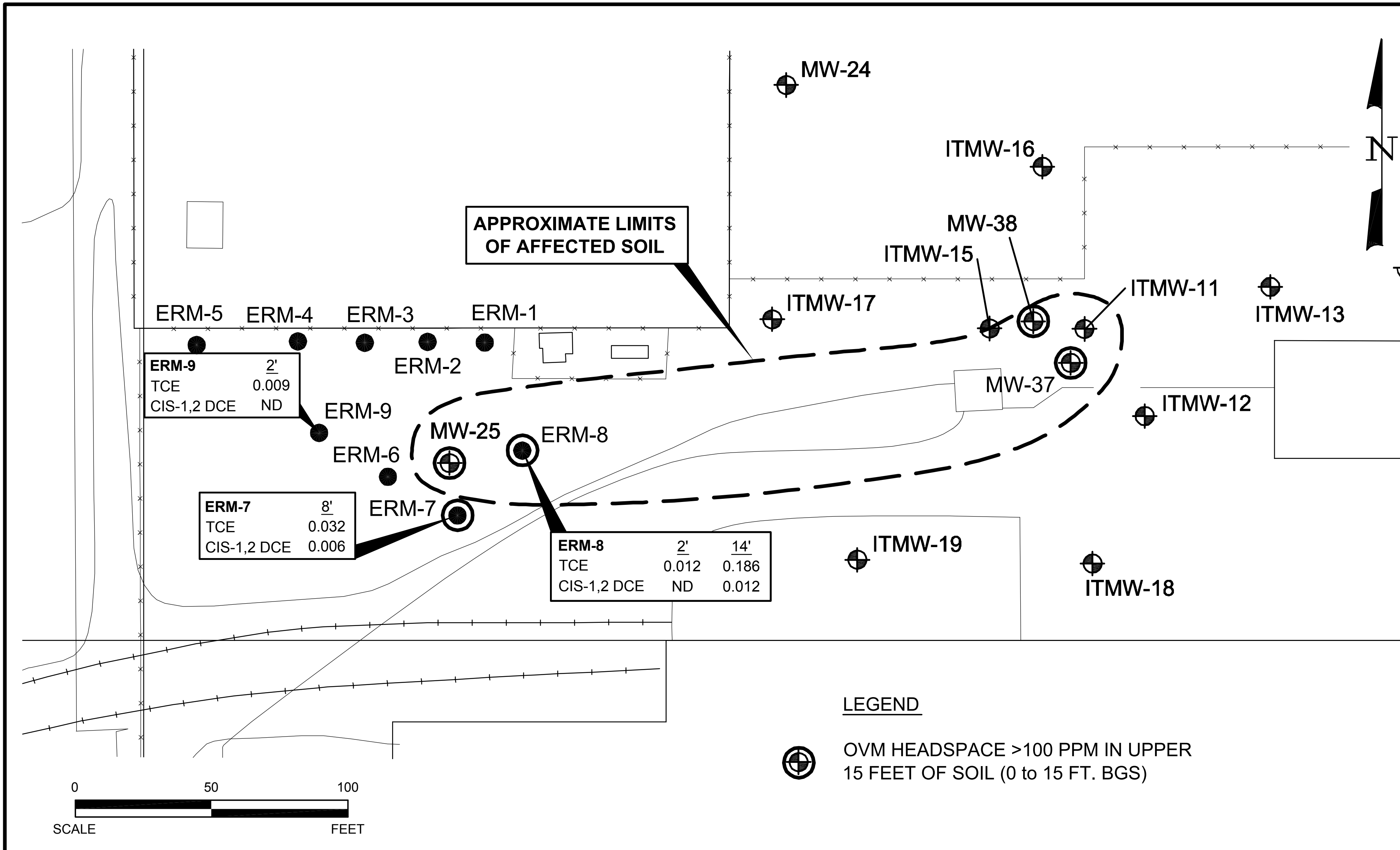
ERM
FIGURE 2-12
FALL POTENTIOMETRIC SURFACE MAP
OCTOBER 2006
Whirlpool Corporation
Fort Smith, Arkansas
DESIGN: HTV
DRAWN: EFC
CHKD.: TWM
DATE: 05/18/07
SCALE: AS SHOWN
REV.:
W.O.NO.: H:\dwg\F07\0016188b205.dwg, 6/12/2007 5:45:03 PM




**ERM-Southwest, Inc.**
HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE

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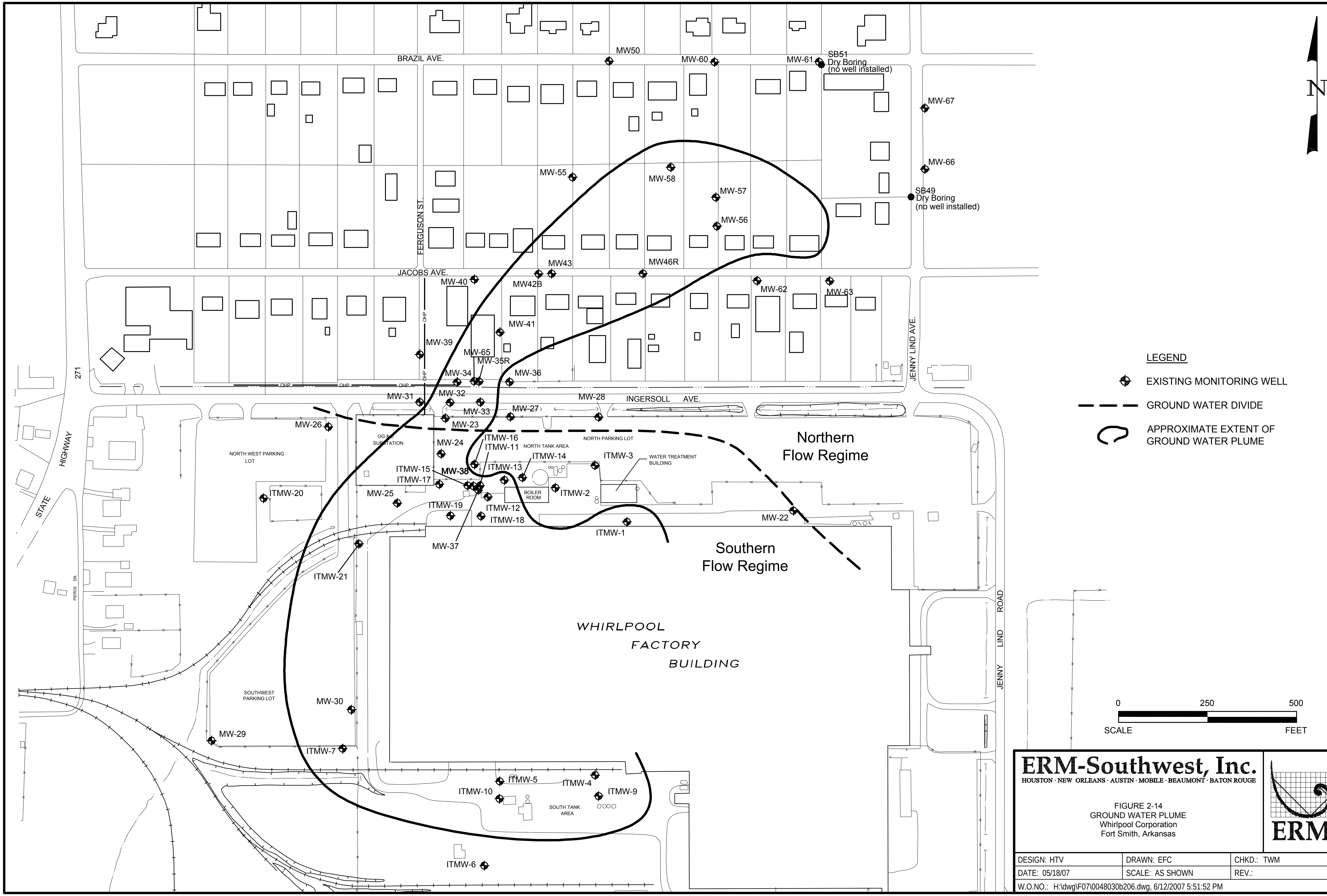
FIGURE 2-13
APPROXIMATE EXTENT OF AFFECTED SOIL
Whirlpool Corporation
Fort Smith, Arkansas

ERM®

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# Ground Water Concentration Trend Charts

*Appendix A*

*June 14, 2007*
*Project No. 0048030*

**Environmental Resources Management**
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Houston, Texas 77084-5140
(281) 600-1000

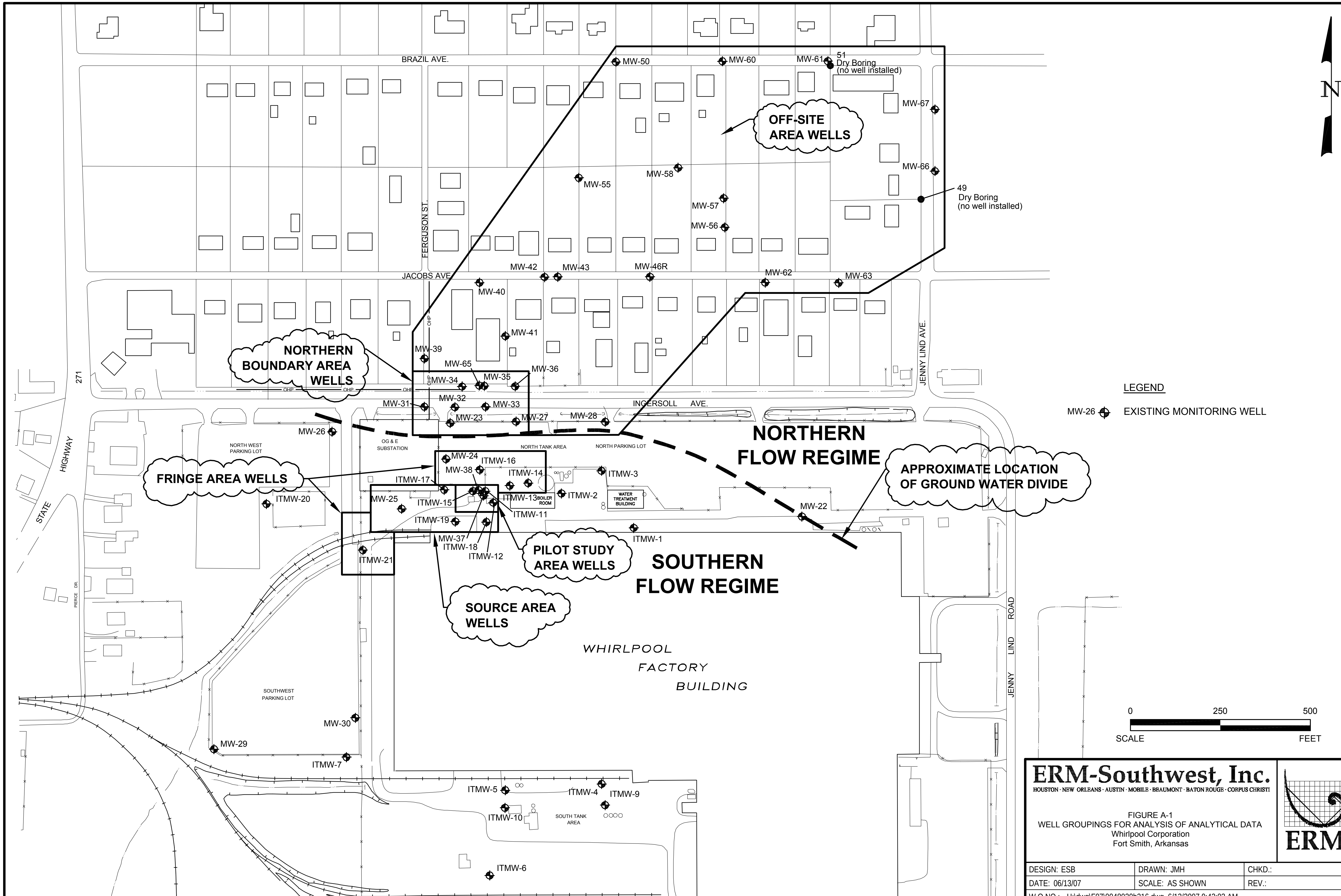


FIGURE A-1
WELL GROUPINGS FOR ANALYSIS OF ANALYTICAL DATA
Whirlpool Corporation
Fort Smith, Arkansas

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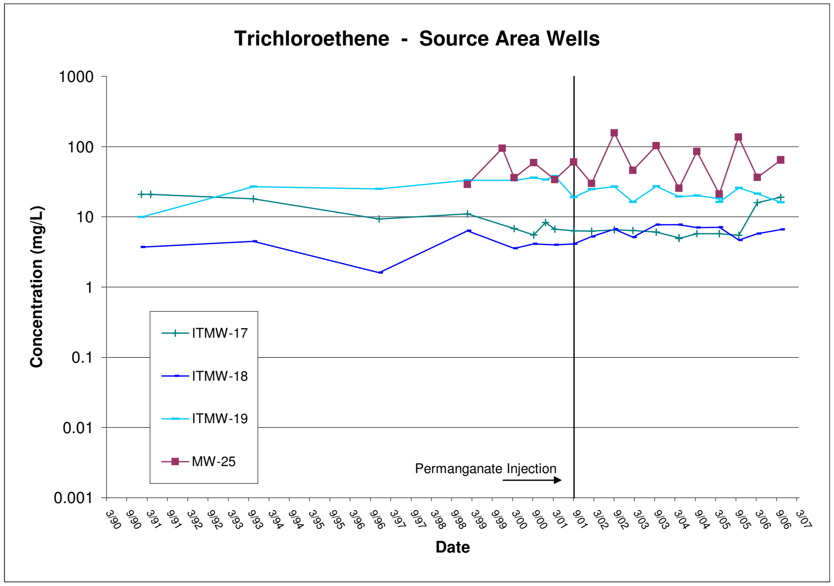


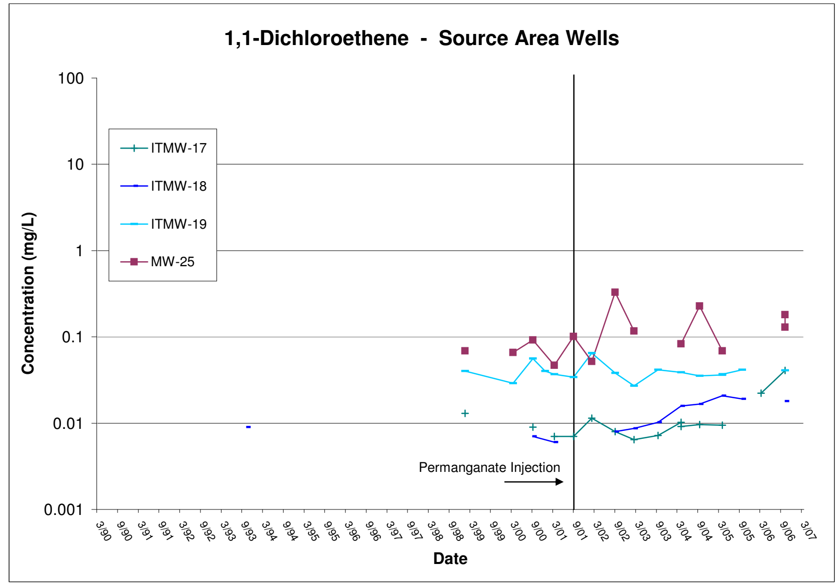


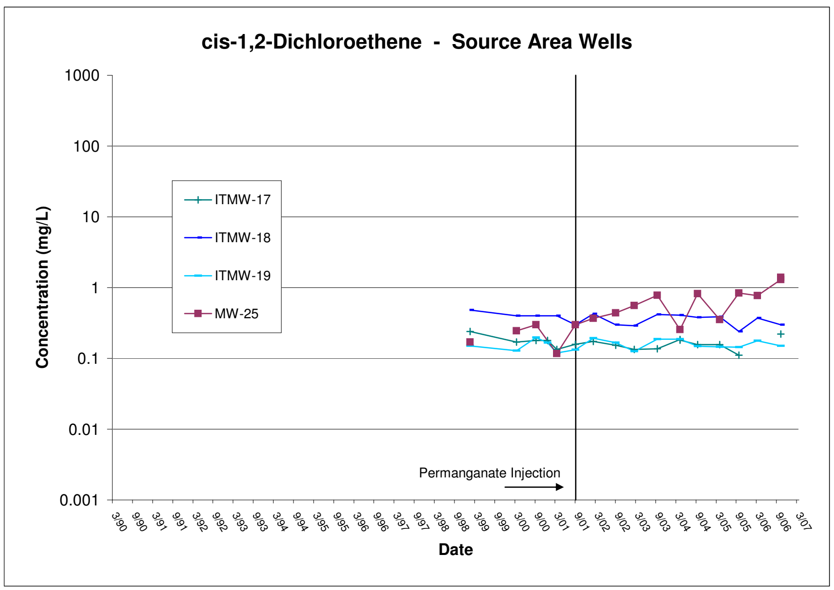


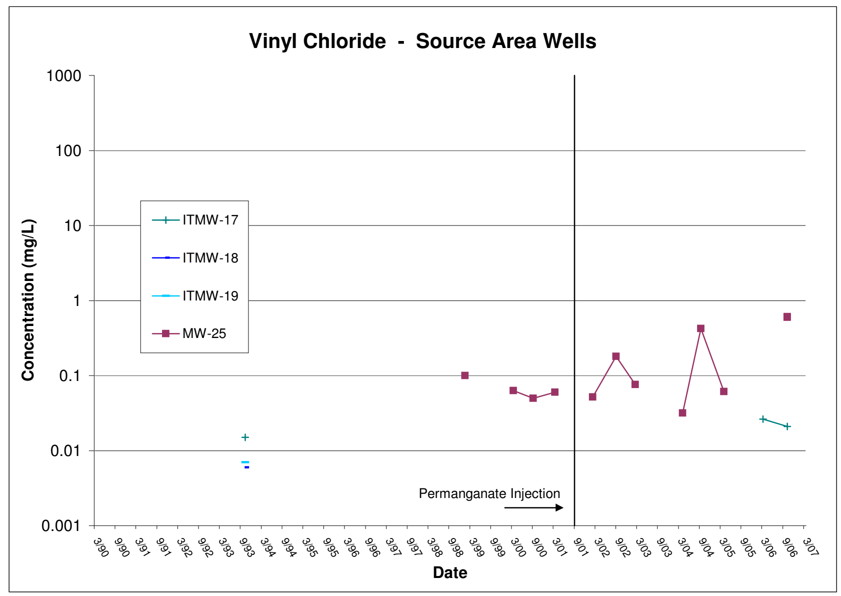


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HOUSTON-NEW ORLEANS-AUSTIN-DALLAS-BEAUMONT-BATON ROUGE

FIGURE A-2
Source Area Wells Concentration Trends

Whirlpool Corporation
Fort Smith, Arkansas

| DESIGN: TWM | CHKD: | DATE: 1/2/07 | REV: |
|---|---|---|---|
| DRAWN: ESB | SCALE: AS SHOWN | W.O.NO: 0046495 | |

ERM

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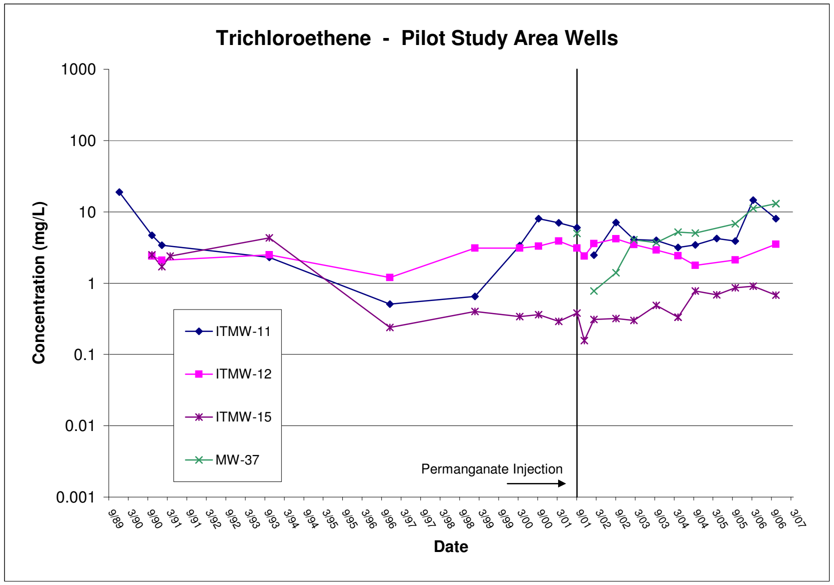


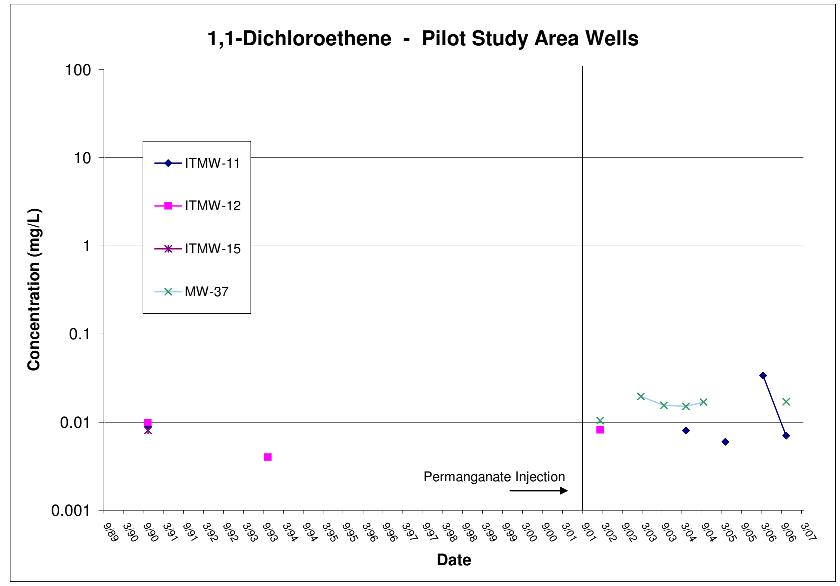


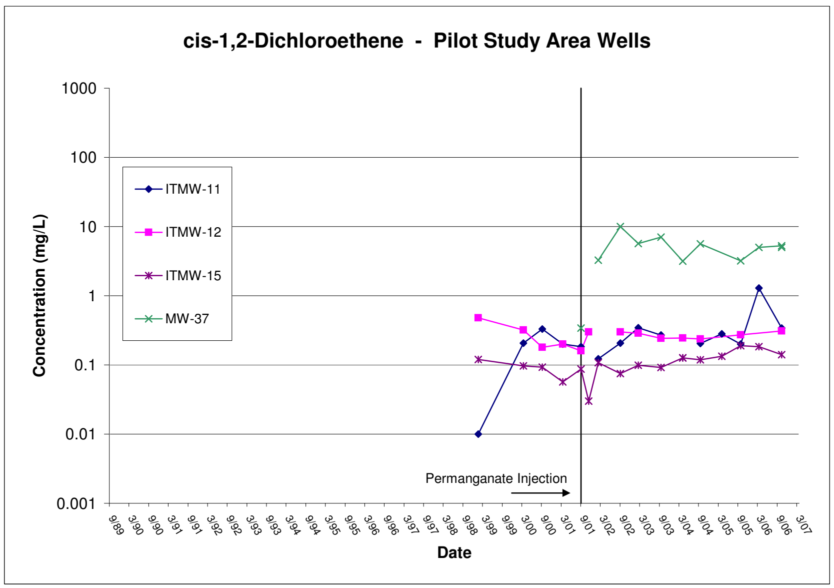


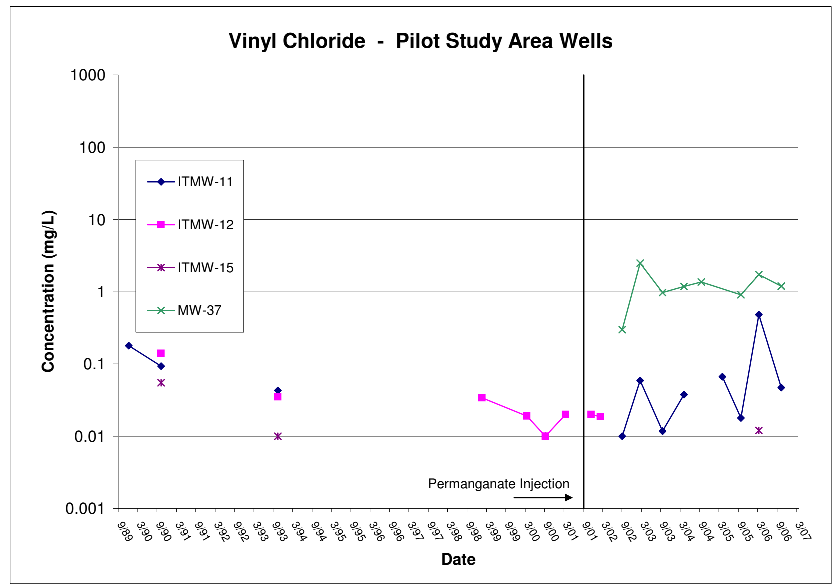


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HOUSTON-NEW ORLEANS-AUSTIN-DALLAS-BEAUMONT-BATON ROUGE

FIGURE A-3

Pilot Study Area Concentration Trends

Whirlpool Corporation

Fort Smith, Arkansas

| DESIGN: TWM | CHKD: | DATE: 1/2/07 | REV: |
|---|---|---|---|
| DRAWN: ESB | SCALE: AS SHOWN | W.O.NO: 0046495 | |

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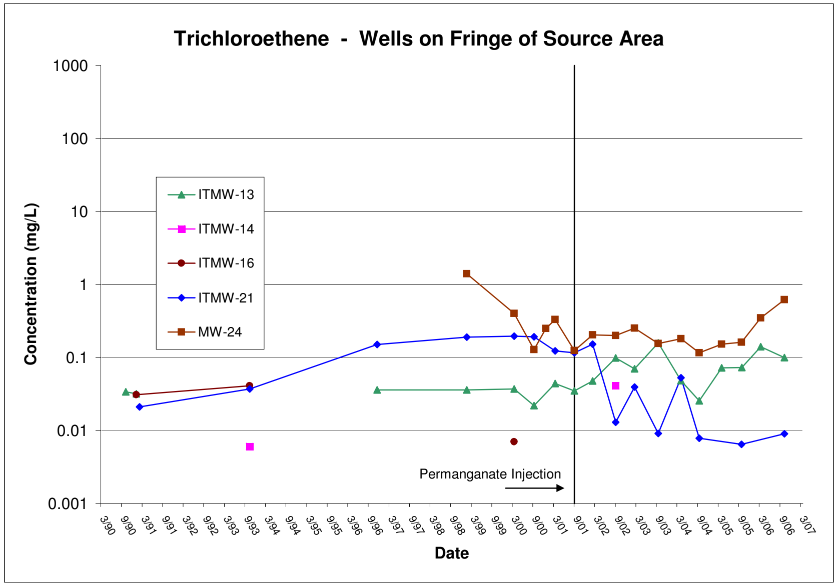


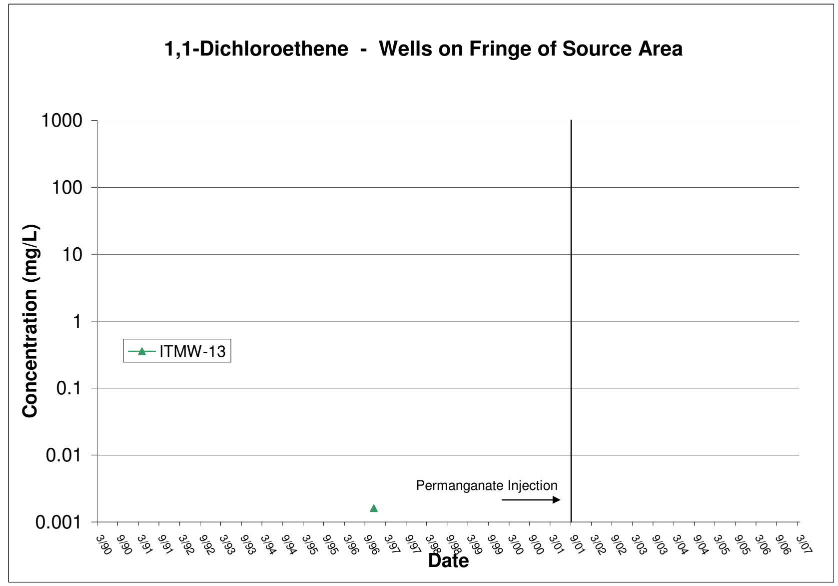


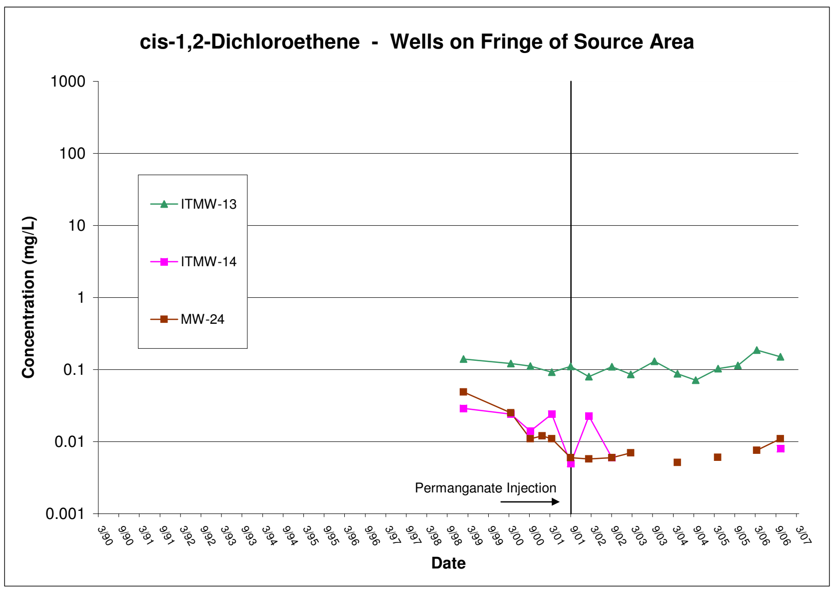


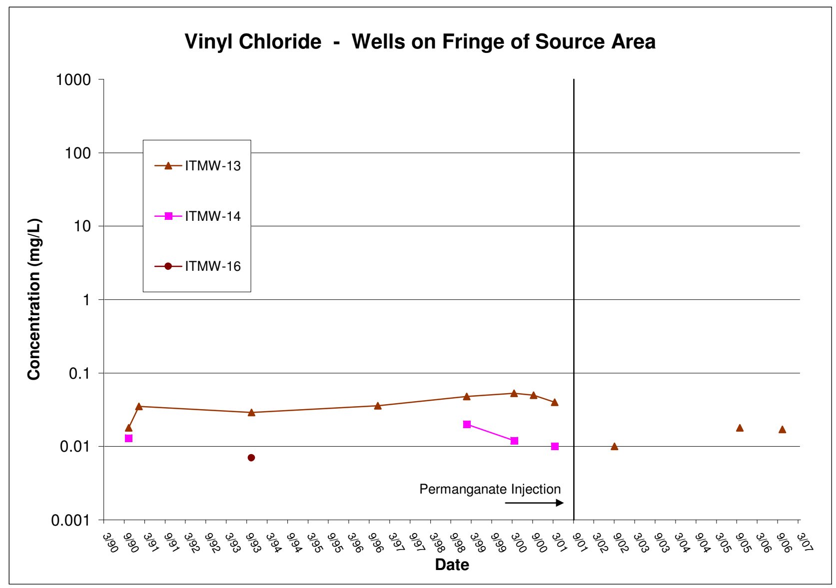


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HOUSTON-NEW ORLEANS-AUSTIN-DALLAS-BEAUMONT-BATON ROUGE

FIGURE A-4
Concentration Trends from Wells on Fringe of Source Area
Whirlpool Corporation
Fort Smith, Arkansas

| DESIGN: TWM | CHKD: | DATE: 1/2/07 | REV: |
|---|---|---|---|
| DRAWN: ESB | SCALE: AS SHOWN | W.O.NO: 0046495 | |

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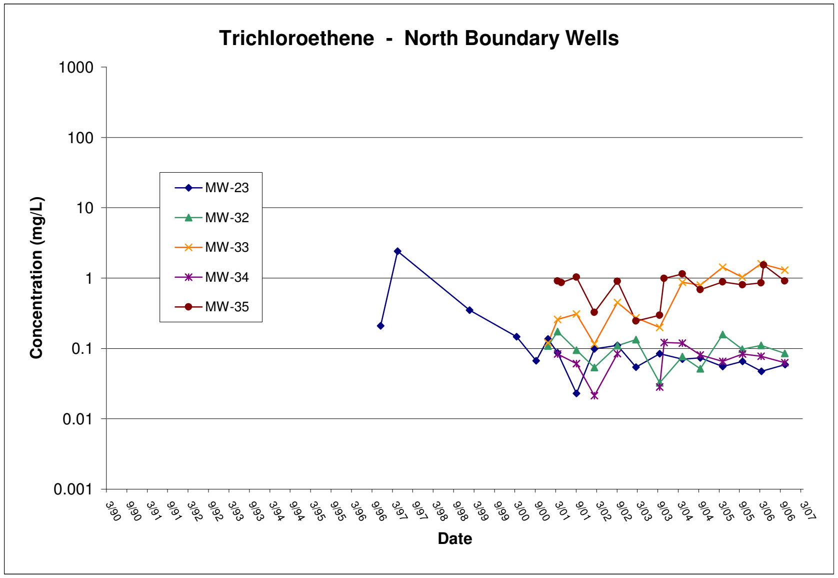


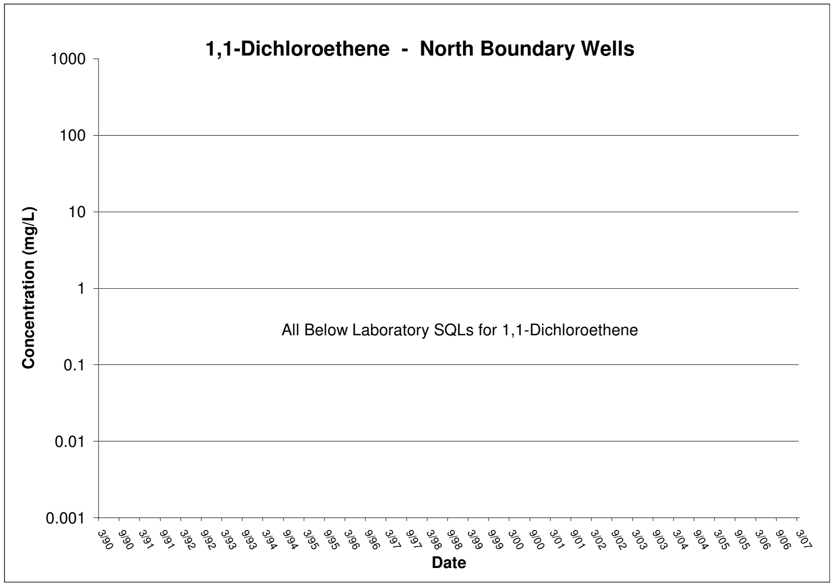


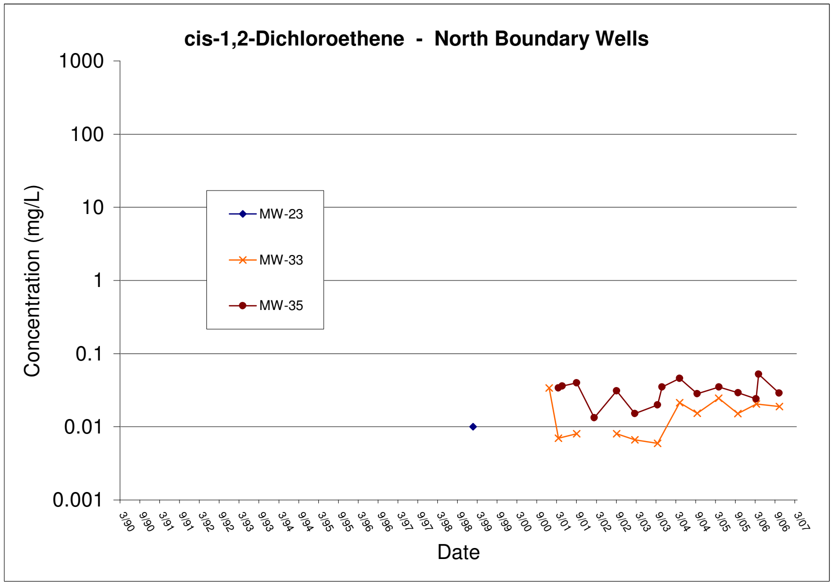


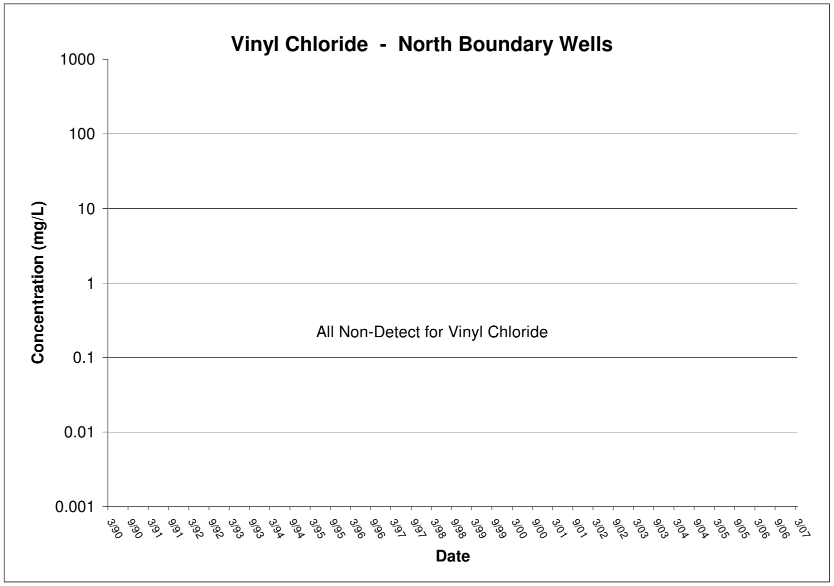


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HOUSTON-NEW ORLEANS-AUSTIN-DALLAS-BEAUMONT-BATON ROUGE

FIGURE A-5
North Boundary Wells Concentration Trends

Whirlpool Corporation
Fort Smith, Arkansas

| DESIGN: TWM | CHKD: | DATE: 1/2/07 | REV: |
|---|---|---|---|
| DRAWN: ESB | SCALE: AS SHOWN | W.O.NO: 0046495 | |

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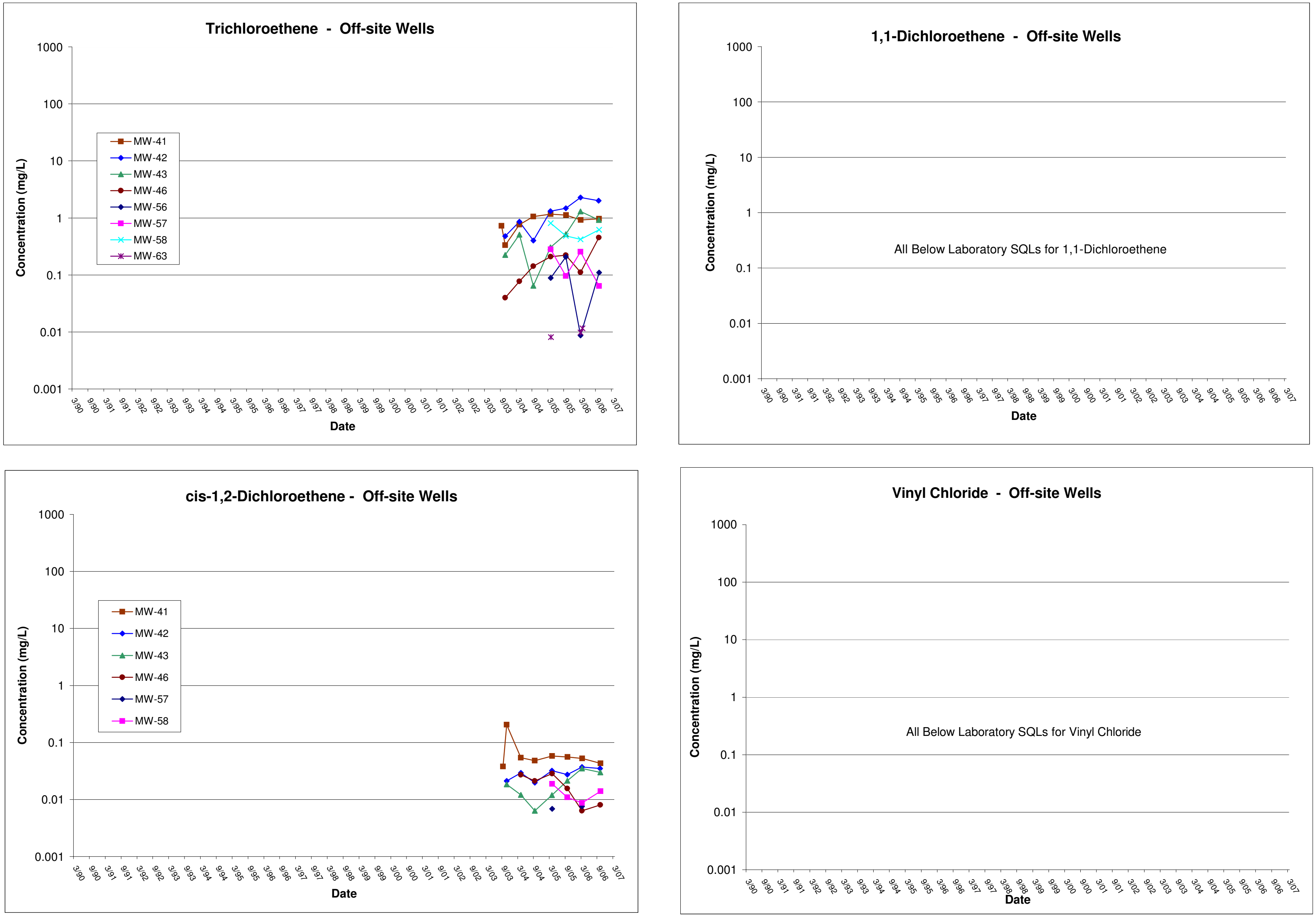


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HOUSTON-NEW ORLEANS-AUSTIN-DALLAS-BEAUMONT-BATON ROUGE

FIGURE A-6

Off-Site Wells Concentration Trends

Whirlpool Corporation

Fort Smith, Arkansas

| DESIGN: TWM | CHKD: | DATE: 1/2/07 | REV: |
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| DRAWN: ESB | SCALE: AS SHOWN | W.O.NO: 0046495 | |

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# Professional Profile

*Appendix B*

*June 14, 2007*
*Project No. 0048030*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

# Hong Thi Vu

Experience in human health and ecological risk assessment, litigation support, and epidemiological/public health research. Four years experience as an environmental consultant working on human health and ecological risk assessment, fate and transport mechanism, data quality assessment/data validation (QA/QC), and litigation support. Knowledge of federal and various state risk guidelines. Experience in risk assessment with U.S. and Mexico sites. Over four years experience with designing and analyzing epidemiological studies, including cross-sectional, case-control, prospective cohort and intervention clinical trial studies. Expertise in statistical programming and analysis, particularly with SAS, Stata and SPSS software. Statistical methods include chi-square, analysis of variance, analysis of covariance, t-tests and various non-parametric tests for small samples. More sophisticated methods include multivariate regressions (linear, logistic, proportional odds), generalized linear models and generalized estimating equations. Projects have included research in depression, psychiatric disorders, substance use, health services and sudden infant death syndrome. Extensive experience in survey data management. Some experience in cancer epidemiology and conducting field surveys.

### Fields of Competence

- Risk Assessment (Human Health and Ecological)
- Data Quality Assessment/Data Validation (QA/QC)
- Fate and Transport Mechanisms
- Litigation Support
- Epidemiology
- Statistics

### Education

- Master of Health Science, Epidemiology, Johns Hopkins University (1998)
- Certificate, Health Finance and Management, Johns Hopkins University (1998)
- Bachelor of Arts, Biology, Women's Studies, Wesleyan University (1996)

### Honors and Awards

- Ronald E. McNair Scholar, Wesleyan University (1993-1994)
- Ronald E. McNair Fellow, Wesleyan University (1995-1996)
- Departmental Honors in Women's Studies, Wesleyan University (1996)

## Key Projects

- Performed numerous risk assessments (including human health and ecological evaluations) for a wide variety of chemicals including total petroleum hydrocarbons, volatile organic compounds, semivolatile organics, polycyclic aromatic hydrocarbons, polychlorinated biphenyls, and inorganic compounds.
- Performed baseline risk assessments for an acrylics manufacturing facility in Mexico in support of developing a remedial strategy for chlorinated solvents at the site.
- Calculated risk-based cleanup value for a zinc-contaminated site in Mexico to reduce cleanup costs associated with a property transaction.
- Achieved risk-based closure for two separate sites for a utility company in Texas, United States.
- Performed risk-based closure for a coal combustion byproduct facility in Texas, United States which included human health and ecological risk evaluations. Site closure was approved by governing state agency.
- Prepared baseline risk assessments for Superfund site in Texas, United States. Assessments were reviewed and approved by governing state agency.
- Prepared and provided technical support for human health and ecological risk assessments for a multi-national oil supply company with sites in Texas, United States.
- Prepared a ground water risk-based assessment of a Louisiana, United States site for a transportation company.
- Prepared human health and ecological risk assessments for a refinery facility in Montana, United States.
- Prepared a risk-based evaluation for a chemical company in Mississippi.
- Conducted numerous data quality assessment/data validation assessments of laboratory analytical data for various clients, including Spanish-language laboratory reports for an industrial facility in Mexico.
- Created databases of analytical results for a manufacturing facility in Mexico.
- Calculated alternate risk-based values using fate and transport models for several risk assessment projects.
- Provided litigation support for toxic tort case involving wood preserving waste facility.
- Written critique of an epidemiological study used in a litigation case.
- Evaluated comparative health risks from indoor air exposure to LNAPL and DNAPL plumes.
- Summarized epidemiological findings on the relationship between mercury and neurological disorders in support of an expert witness testimony for toxic tort case involving an electric generator.
- Compiled/reviewed toxicity data and occupational standards for a toxic tort case involving a manufacturing facility.
- Performed data validation (QA/QC) for a litigation case. Chemicals of concern included polycyclic aromatic hydrocarbons, volatile organic compounds, pesticides, polychlorinated biphenyls, dioxins, and metals.
- Researched methods for fingerprinting chlorinated solvents in a property liability case.
- Performed statistics for site assessments and litigation cases.
- Collaborated on design and report writing for multiple epidemiological and health services research studies.
- Statistical data programming and analysis for numerous epidemiological and health services research projects.
- Database management for a variety of health research projects, including studies for head and neck cancer, treatment of major depression, physician-patient communication, health services, and sudden infant death syndrome.
- Performed power and sample size analyses for health research study proposals.

## Publications

Cooper-Patrick, L., Gallo, J.J., Gonzales, J.J., Vu, H.T., Powe, N.R., Nelson, C. and Ford, D.E. (1999). "Race, Gender, and Partnership in the Patient-Physician Relationship." JAMA 282(6), 583-589.

Cooper, L.A., Brown, C., Vu, H.T., Palenchar, D.R., Gonzales, J.J., Ford, D.E. and Powe, N.R. (2000). "Primary Care Patients' Opinions Regarding the Importance of Various Aspects of Care for Depression." General Hospital Psychiatry 22(3), 163-173.

Primm, A.B., Gomez, M.B., Tzolova-Iontchev, I., Perry, W., Vu, H.T. and Crum, R.M. (2000). "Severely Mentally Ill Patients with and without Substance Use Disorders: Characteristics Associated with Treatment Attrition." Community Mental Health Journal 36(3), 235-246.

Gomez, M.B., Primm, A.B., Tzolova-Iontchev, I., Perry, W., Vu, H.T. and Crum, R.M. (2000). "A Description of Precipitants of Drug Use among Dually Diagnosed Patients with Chronic Mental Illness." Community Mental Health Journal 36(4), 351-362.

Primm, A.B., Gomez, M.B., Tzolova-Iontchev, I., Perry, W., Vu, H.T. and Crum, R.M. (2000). "Mental Health Versus Substance Abuse Treatment Programs for Dually Diagnosed Patients." Journal of Substance Abuse Treatment 19(3), 285-290.

Houston, T.K., Cooper, L.A., Vu, H.T., Kahn, J., Toser, J. and Ford, D.E. (2001). "Screening the Public for Depression through the Internet." Psychiatric Services 52(3), 362-367.

Cooper, L.A., Brown, C., Vu, H.T., Ford, D.E. and Powe, N.R. (2001). "How Important Is Intrinsic Spirituality in Depression Care? A Comparison of the Views of White and African-American Primary Care Patients." Journal of General Internal Medicine 16(9), 634-638.

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Primm, A.B., Cabot, D., Pettis, J., Vu, H.T., and Cooper, L.A. (2002). "The acceptability of a culturally-tailored depression education videotape to African Americans." Journal of the National Medical Association 94(11), 1007-1016.

Li, D.K., Petitti, D.B., Willinger, M., McMahon, R., Odouli, R., Vu, H., and Hoffman, H.J. (2003). "Infant Sleeping Position and the Risk of Sudden Infant Death Syndrome in California, 1997-2000. American Journal of Epidemiology, 157(5), 446-455.

**Abstracts**

Ford, D., Rost, K., Meredith, L., Duan, N., Rubenstein, L., Sherbourne, C., Smith, J., Vu, H., Nutting, P., and Wells, K. "Variation in the Quality of Primary Care Treatment Provided for Major Depression." National Institute of Mental Health. Thirteenth International Conference on Mental Health Problems in the General Health Care Sector. Washington, DC. July 12-13, 1999.

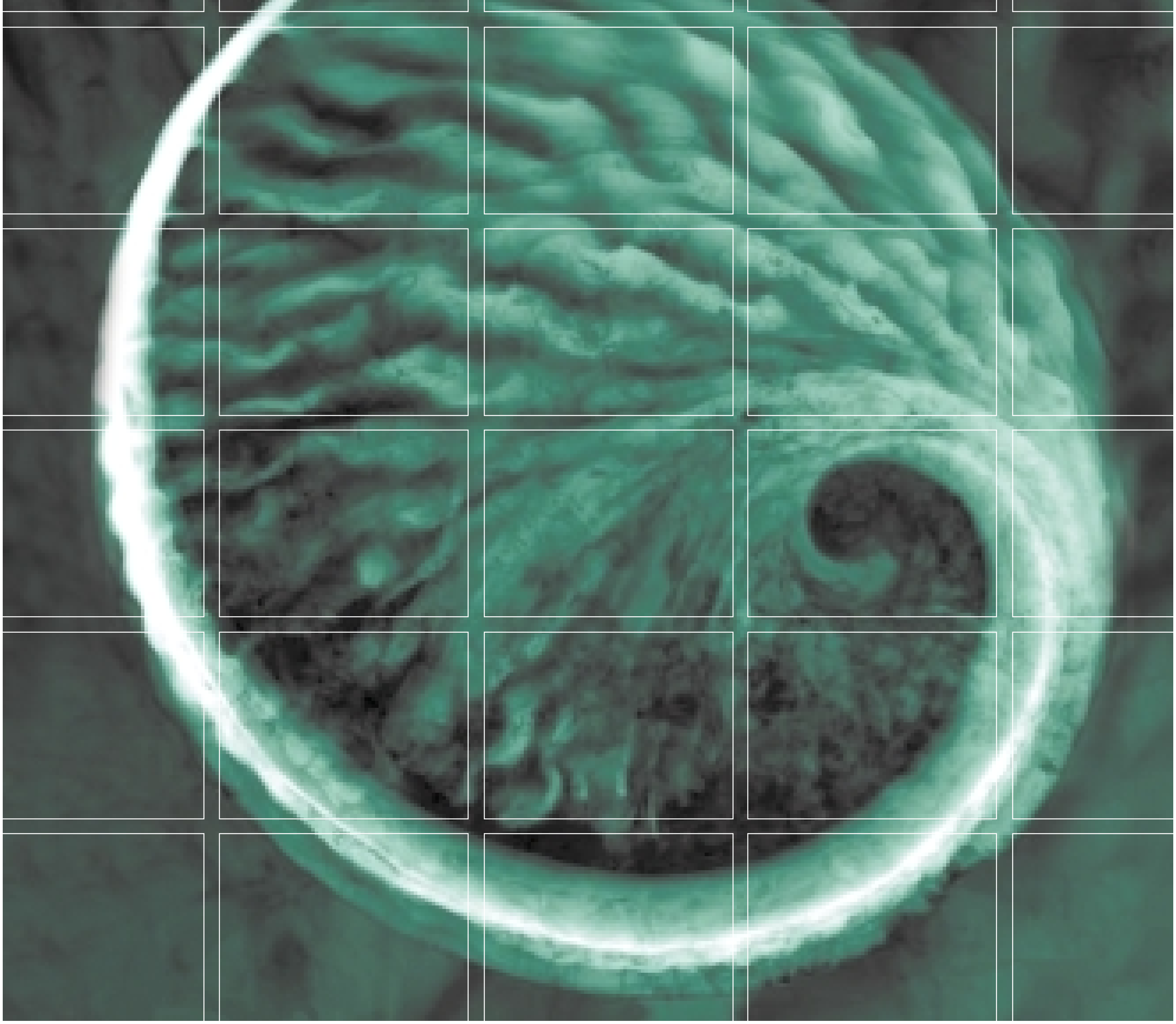
Alberg, A.J., Landrigan, J.A., Vu, H., Helzlsouer, K.J., and Ford, D.E. "A case-control study of *NAT2*, *GSTM1*, and *GSTT1* genotypes in relation to head and neck cancer." Society for Epidemiologic Research. 2000.

Crum, R.M., and Vu, H.T. "Risk of Problem Drinking Among Adolescents: The Role of Educational Aspirations and Other Characteristics." 23rd Annual Research Society on Alcoholism Scientific Meeting. 2000.

**Theses**

Vu, H.T. "HIV/AIDS and Women of Color in the United States." Senior honors thesis. Wesleyan University. 1996.

Vu, H.T. "Lifetime Depression and All-Cause Mortality: A 13-Year Follow-Up of the Baltimore ECA Study." Master's thesis. Johns Hopkins University. 1998.



# Corrective Action Strategy (CAS) Work Plan Addendum

**Whirlpool Corporation**
**Fort Smith, Arkansas**

August 30, 2006

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Whirlpool Corporation

# Corrective Action Strategy (CAS) Work Plan Addendum

August 30, 2006

Project No. 0014507
Fort Smith, Arkansas

H. Reiffert Hedgcoxe
*Partner-in-Charge*

Troy W. Meinen
*Project Manager*

Thomas M. Whitehurst, P.G.
*Project Consultant*

30 Aug 06

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
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F: 281-600-1001

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## *1.0 INTRODUCTION*

Whirlpool has prepared this Addendum to the Corrective Action Strategy (CAS) Work Plan for the Fort Smith Facility in accordance with the agreement drawn during the June 2006 project review meeting with the Arkansas Department of Environmental Quality (ADEQ). This document addresses the remaining Notice of Deficiency (NOD) comments from the ADEQ and outlines Whirlpool's plan for managing the potential risks to human health and the environment associated with a historical release at the Fort Smith site.

Prior to entering the CAS program, Whirlpool developed a flow chart to illustrate the process logic for the overall management of ground water issues at Fort Smith. The flow chart, provided in Figure 1-1, has been updated to incorporate the CAS Addendum. Once approved, it is understood that the Addendum will fulfill all administrative requirements for the CAS Work Plan.

### *1.1 SITE BACKGROUND*

The Whirlpool Fort Smith facility is located at 6400 Jenny Lind Avenue on the south side of Fort Smith, Arkansas (Figure 1-2). The facility manufactures side-by-side household refrigerators, trash compactors and icemakers, and has been operated by Whirlpool for over 30 years.

In the late 1980's, a series of soil and ground water studies were initiated at the site as part of a project to remove an underground fuel storage tank (UST) that was located near the northwest corner of the site. The initial work indicated that there was no evidence of releases of petroleum hydrocarbons from the UST. However, the analytical data showed the presence of trichloroethylene (TCE) and other solvents not related to the UST in the shallow ground water. Subsequent investigations, including a soil investigation to assess the potential source area, have been conducted to characterize and delineate the affected area.

In 2001, the investigation indicated that the TCE plume extended off-site north of the facility. At that point, Whirlpool initiated discussions with the ADEQ to enter a letter of agreement (LOA) to implement a CAS at the Whirlpool Facility. As specified in the LOA, Whirlpool has submitted a Conceptual Site Model, hosted a Scoping Meeting and submitted an initial CAS Work Plan. As summarized in the chronology below, Whirlpool has continued site investigation activities at the facility to assess the extent of affected soil and ground water and assess the potential need for interim corrective measures to protect human health and the environment.

### *1.2 CHRONOLOGY OF CAS ACTIVITIES/MILESTONES*

| | |
|---|---|
| August 2001 | Notice of Intent (NOI) |
| June 2002 | Letter of Agreement (LOA) |

| | |
|---|---|
| August 2002 | Conceptual Site Model (CSM) |
| August 2002 | Scoping Meeting - ADEQ indicated that Whirlpool should proceed with off-site delineation under CAS Work Plan Outline. |
| August 2002 | CSM Addendum |
| June 2003 | CAS Work Plan |
| July 2003 | Off-site Delineation Phase A – included installation and sampling of three off-site wells |
| November 2003 | Off-site Delineation Phase B – included ten Geoprobe borings and field screening using a membrane interface probe, and the installation and sampling of four off-site wells |
| June 2004 | Interim Status Report and Revised CAS Work Plan |
| October 2004 | E-mail from Linda Hanson, ADEQ – directed Whirlpool to continue with off-site delineation under the Revised CAS Work Plan and address specified deficiencies upon completion of delineation |
| November 2004 | Off-site Delineation Phase C – included installation of seven Geoprobe borings and the installation and sampling of four off-site wells |
| March 2005 | Interim Status Report for Off-Site Investigation |
| April 2005 | Off-Site Delineation Phase D – included installation of five Geoprobe borings and the installation and sampling of four off-site wells |
| June 2005 | Interim Status Report for Off-Site Investigation |
| June 2005 | Notice of Deficiency (NOD) letter from ADEQ – identified several items to be addressed, requested a revised CAS Work Plan |
| July 2005 | Response to June 2005 ADEQ NOD letter |
| April 2006 | Off-site Delineation Phase E– including installation and sampling of two off-site monitoring wells |
| June 2006 | NOD letter from ADEQ |

| | |
|---|---|
| June 2006 | Meeting with ADEQ to review off-site delineation status and clarify path forward |

## *1.3 OBJECTIVES FOR THIS ADDENDUM*

The primary objective of this CAS Work Plan Addendum is to address comments in the ADEQ NOD letters dated June 16, 2005, June 20, 2006, and June 22, 2006. Table 1-1 lists the ADEQ NOD comments that have not been addressed in previous submittals. Also included in the table are summaries of the activities Whirlpool has completed to address the comments and the location where the details are provided in this submittal.

A secondary objective of this CAS Work Plan Addendum is to identify remaining activities to complete the requirements of the CAS process.

## 2.0 RESPONSE TO REMAINING NODS

### 2.1 DELINEATION ACTIVITIES

This section of the Addendum partially addresses item 1e in Table 1-1.

The delineation activities have focused on characterizing the subsurface conditions and extent of the affected ground water plume in the area north of Ingersoll Avenue. Five phases of delineation have been completed to date. Boring logs and well completion data for the initial two phases of delineation were included in Appendix C of the CAS Work Plan Revision submitted to the ADEQ in June 2004. Boring logs and well completion data from the most recent three phases of delineation are included in Appendix A of this submittal.

Whirlpool completed the fifth phase of plume delineation in April 2006 which included the installation of two additional monitor wells (MW-66 and MW-67) along the east side of Jenny Lind between Brazil Avenue and Jacobs Avenue (Figure 2-1). These monitor wells were installed, developed, and sampled following the procedures outlined in the 2004 CAS Work Plan Revision. The boring logs and well completion details for these wells are included in Appendix A.

Evaluation of potentiometric surface maps from the past five years indicates that there are two distinct ground water flow regimes at the site (Figure 2-2). These flow regimes are separated by a ground water divide that is consistently present along a general line from MW-26 through MW-24, ITMW-3, and MW-22. The Northern Flow Regime extends from the ground water divide across Ingersoll to the north and northeast. The Southern Flow Regime extends south and southwestward from the ground water divide and covers the majority of the Whirlpool Facility.

In the Northern Flow Regime, ground water flow is consistently toward the northeast without significant seasonal variations. The gradient is relatively flat near the ground water divide and in the immediate area north of Ingersoll Avenue, and then increases north of Jacobs Avenue. The gradient appears to experience minor seasonal fluctuations in magnitude.

In contrast, ground water flow in the Southern Flow Regime has a fairly uniform gradient throughout the year, but exhibits seasonal shifts in ground water flow direction of up to 90 degrees. Ground water appears to flow to the southeast during spring and to the south to southwest during fall.

Analytical results from the delineation activities are discussed in more detail in Section 2.2. In general, the plume in the Northern Flow Regime is composed of only TCE and cis-1,2 DCE, and does not extend north of Brazil or east of Jenny Lind. Similarly, TCE and cis-1,2 DCE are the primary constituents in the Southern Flow Regime plume, although there are occurrences of other compounds in the area north and northwest of the Whirlpool manufacturing building (the immediate vicinity of the former degreaser building). None of the other constituents have been consistently reported in areas where TCE or cis-1,2 DCE are not also present.

## 2.2 *SOIL AND GROUND WATER DATA*

This section of the Addendum addresses items 1b, 1e, 1f, 4b, and 4c in Table 1-1. (As discussed in a brief conference call with ADEQ on August 23, 2006, the response to item 1f will include only TCE and cis-1,2 DCE. The rationale for using TCE and cis-1,2 DCE as the key site constituents is provided below.)

Over the past several years, a significant amount of analytical data has been collected as part of Whirlpool's investigations at the Fort Smith site. A complete summary of the data are provided in both tabular and electronic format in Appendix H.

### 2.2.1 *Distribution of Affected Ground Water and Soil*

Results from the regular monitoring activities combined with the recently completed delineation activities have been incorporated into the summary data table and database include in Appendix H.

A detailed review of the data indicates that the ground water plume in the Northern Flow Regime is composed of only TCE and cis-1,2 DCE. Maps showing the distribution of those key constituents are provided in Figures 2-3 and Figure 2-4, respectively. The northern portion of the plume is restricted to an area generally south of Brazil and west of Jenny Lind. The limit of the plume appears to coincide with the area where a gravel-rich alluvial deposit is present (see Section 2.3 for additional discussion). Ground water samples from wells installed outside of the gravel-rich zone have been consistently reported as non-detect for TCE and cis-1,2 DCE. The only exception is that the samples from well MW-63, which is outside the area of the gravel zone, and is hydraulically upgradient or cross gradient from other portions of the plume, have reported very low concentrations of TCE.

The delineation indicates the plume does not appear to affect any surface water. This conclusion is drawn based on data from the wells along Jenny Lind which show no reported constituents. The nearest surface water body is Mill Creek which is approximately 1000 feet east of the intersection of Jenny Lind and Brazil. Because the TCE / cis-1,2 DCE plume does not reach Jenny Lind, there is no pathway for affected groundwater to impact Mill Creek. Consequently, there is no plan to sample the surface water in Mill Creek.

In the Southern Flow Regime, the ground water plume also consists mainly of TCE and cis-1,2 DCE. As illustrated in Figures 2-3 and 2-4, the plume extends to the south and terminates less than 100 feet from the south edge of the Whirlpool manufacturing building.

A review of the data provided in Appendix H shows that 16 other compounds, including some of the daughter products from TCE degradation, which are not present in the Northern Flow Regime plume have been reported in some locations within the Southern Flow Regime plume. Typically, the other compounds are found near the area of the former degreaser building.

However, the 1) frequency of detections, 2) concentration levels, and 3) number of different locations where the other constituents are present is much less than the occurrences of TCE and cis-1,2 DCE. Stated another way, none of the other constituents have been consistently reported in areas where TCE or cis-1,2 DCE are not also present. Additionally, the concentrations of the other constituents are generally lower than the levels of TCE and cis-1,2 DCE. Therefore, using TCE and cis-1,2 DCE as the key constituents gives the most conservative representation of the plume. For that reason (and as agreed to with ADEQ), concentration maps for all constituents have not been prepared because they would not provide a different picture of the extent or nature of the ground water plume.

Affected soil at the Whirlpool facility was evaluated in a focused soil sampling program in 2001. The samples were collected in an area adjacent to the former degreaser building in the northwest part of the facility. The data from that sampling are provided in the summary table and database included in Appendix H. Additionally, the extent of affected soils has been evaluated using headspace data collected from soil cores from the vadose zone during drilling activities. As indicated in the data, the only constituents reported in soils near the former degreaser building are TCE, cis-1,2 DCE, and low-level (<10 ppb) detections of dichloromethane (which appear to be artifacts of laboratory contamination). Based on the sampling results and PID field screening, the extent of affected soil and detections of COCs in soil are illustrated in Figure 2-5.

### 2.2.2 *Laboratory Reporting and Data QA/QC*

As discussed during the June 2006 project status meeting with ADEQ, the analytical program that has been followed through the end of Phase E delineation activities was intended to yield data that supports the general objective of characterizing the nature and extent of the affected media. Additionally, the semi annual ground water monitoring has focused on establishing concentration trends over time. To this point, none of the data have been used to demonstrate that a specific clean up level or other compliance standard has been achieved. Accordingly, the data quality objectives (DQOs) for the plume chasing and semi annual monitoring were such that the laboratory data have been reported to meet Level II quality assurance (QA) requirements. (The large volume of paper associated with the historical laboratory reports is not included with this CAS Addendum, but is available for review upon request.)

Based on the findings from the Phase E delineation effort, Whirlpool believes that the ground water plume has been adequately defined. As a result, the analytical program for the semi annual monitoring conducted during the fall time frame will now include Level IV QA reporting from the laboratory. Whirlpool has selected the fall time frame because a review of the historical data indicates that ground water concentrations vary due to seasonal conditions, and the higher concentrations are consistently observed during the fall period.

The Level IV data packages will be used to support data validation in accordance with the CAS Quality Assurance Project Plan (QAPP). The validated data will be used to confirm that the limits of the plume are adequately defined. Similarly, additional samples that are used as confirmation that an affected area is fully delineated or that remediation has met a final clean up standard will also be reported under the Level IV QA format. However, the DQOs for future sampling that may be conducted to assist in evaluating remedial options or for screening-level data to generally characterize the nature of ground water or soils can be done using Level II or lower QA reporting.

## *2.3 GEOLOGY INCLUDING THE DISTRIBUTION OF THE GRAVEL-RICH ZONE*

This section of the Addendum addresses items 1b, 1f, 1g, and 5c in Table 1-1. (As discussed in a brief conference call with ADEQ on August 23, 2006, the response to item 1f will include only TCE and cis-1,2 DCE. The rationale for using TCE and cis-1,2 DCE as the key site constituents is provided in Section 2.2).

The continued investigation activities north of Ingersoll (Phase D and E) provided additional information regarding the geology of the site. The additional information supplements and generally compliments the picture of the site geology as previously depicted in the August 2002 CSM Addendum. In particular, the additional wells helped to define the distribution of the gravel-rich zone. The gravel-rich zone is of interest because it appears to have a strong influence on the distribution of the plume in the Northern Flow Regime.

Data from the earlier investigations indicate that the Whirlpool facility is generally underlain by 25 to 30 feet of alluvium composed of fine-grained clays and silts from the surface that grade to a coarse-textured basal interval. This alluvium immediately overlies the McAlester Shale. Based on the borings completed for the delineation activities, the lithology of the alluvium north of Ingersoll is similar to that observed on-site (for additional information, see Section 4.2 of the CSM). However, the alluvial deposits thin to only 10 to 15 feet toward the north and east.

As illustrated in cross sections (Figures 2-6 and 2-7), the uppermost aquifer is identified as the lower 3 to 5 feet of silty clayey sands and a gravely basal zone. As shown in Figure 2-8, the gravel-rich basal zone forms a hook-shaped area that extends north from Ingersoll across Jacobs and pinches out south of Brazil and west of Jenny Lind.

As part of the field studies, an initial reconnaissance of Mill Creek was conducted. Gravel deposits were observed in the side banks of Mill Creek that are in a clay-rich low permeability matrix that is different from the gravel zone that extends from the plant. The different character indicates that the gravels in the far eastern part of the study area are in a different terrace formation and likely not hydraulically connected to the more transmissive gravel zone located west of Jenny Lind. Finally, as mentioned in Section 2.1 and 2.2, sampling of wells along Jenny Lind show no detectable levels of TCE, cis-1,2 DCE or any other constituents. All of these factors support the conclusion that the affected groundwater does not impact Mill Creek.

## *2.4 AQUIFER TESTING AND DATA EVALUATION*

This section of the Addendum addresses item 2b in Table 1-1.

As part of the recent field investigation activities, an aquifer test was conducted to provide data on the transmissivity, hydraulic conductivity, and storativity of the uppermost aquifer at the site. The test was performed on April 4-5, 2006 at a location just north of Ingersoll Avenue (Figure 2-9). The location was selected based on accessibility and proximity to the apparent axis of the ground water plume.

### *2.4.1 Testing Procedures*

For the purpose of conducting the aquifer test, one 4-inch diameter pumping well (MW-35R) and one 2-inch diameter observation well (MW-65) were installed at the site. MW-65 was installed approximately 15 feet from the pumping well. Both wells extend to a depth of about 32 feet and have 10-foot well screens that span the basal gravel zone. The wells were installed and developed following procedures outlined in the CAS Work Plan Revision, and boring logs and well completion details are included in Appendix A.

The aquifer test procedures were as follows:

- A submersible pump was fitted with disposable tubing and lowered to the approximate middle of the screen in MW-35R;
- Several trial runs were conducted to determine a sustainable production rate. After the well was allowed to fully recover, the test was initiated at a constant pumping rate of approximately 1.7 gallons/minute and continued for 24-hours; and
- Water levels were measured in the pumping well (MW-35R) and in observation wells MW-28, MW-33, MW-34, MW-36, MW-41, and MW-65 using automatic data loggers. Water levels were also measured at MW-16, MW-23, MW-24, and MW-27 periodically using an electronic tape.

### 2.4.2 *Data Analysis*

The data was analyzed using Theis' non-leaky solution using the software *Infinite Extent, v. 4.0,* by Starpoint Software, Inc., as well as manually using distance-drawdown and time-drawdown calculations. Summary plots and backup for the aquifer test are provided in Appendix B.

Aquifer test results indicate that the hydraulic conductivity of the gravel-rich basal is quite variable. A review of the data collected at the pumping well and the observation well indicates the following:

| | *Transmissivity (T)* | *Hydraulic Conductivity (K)* | *Storativity (S)* |
|---|---|---|---|
| Pumping Well MW-35R | 4.56e00 to 7.17e00 $ft^2$/day<br>4.24e03 to 6.66e03 $cm^2$/day | 5.00e-01 to 7.88e-01 ft/day<br>1.52e01 to 2.40e01 cm/day | 9.83e-02 |
| Observation Well MW-65 | 4.95e02 to 8.40e02 $ft^2$/day<br>4.60e05 to 7.8e05 $cm^2$/day | 5.44e01 to 9.23e01 ft/day<br>1.66e03 to 2.81e03 cm/day | 7.17e-03 to 9.76e-03 |

A drawdown map illustrating the maximum observed drawdown in the wells after 24 hours of pumping in MW-35R is presented in Figure 2-9. The tightness and strong oval shape of the cone of depression emphasizes the anisotropic and heterogeneous nature of the aquifer indicated by the variations in the aquifer characteristics calculated for MW-35R and MW-65; the main axis of the cone of depression generally follows the trend of the axis of the ground water plume within the gravelly basal zone.

To date, separate tests to determine the permeability of soils at the site have not been conducted. To the extent that such data are needed to support the selection and/or design of a remedial action, soil permeability testing will be conducted as part Corrective Action planning activities.

## 2.5 *UPDATE TO THE WATER WELL SEARCH*

This section of the Addendum addresses item 2c in Table 1-1.

A water well search was initially conducted for the facility in February 2001. In May 2006, a new water well search was performed and covered a one-mile radius area around the Whirlpool facility. No federal, state, or public water supply wells were identified within the search distance. The results of the database search are provided in Appendix C.

In addition, during the update of the water well search, the Arkansas USGS office files were manually searched for water well information near the Whirlpool facility. No federal, state or public water supply wells were identified, however, several shallow (<30 ft deep) environmental monitoring wells were identified (Figure 2-10, Appendix D). These environmental monitoring wells are located at least 2,000 feet away from the site, are not affected by the plume, and are not used for drinking water; therefore, they are not a concern for Whirlpool's CAS activities.

## 2.6 *ECOLOGICAL EXCLUSION WORKSHEET*

This section of the Addendum addresses item 4c in Table 1-1.

As part of Whirlpools' program to assess the site conditions, the USEPA Region VI *Ecological Exclusion Criteria Worksheet* has been completed and is provided in Appendix E. The results of the worksheet indicate that the site meets the exclusion criteria based on Subpart A (for surface water pathways), and Subpart C (for soil pathways).

Reported TCE concentrations in near-surface soil (0.009 to 0.012 ppm) are an order of magnitude below the residential media specific screening value (2.8 ppm) and are beneath concrete and/or road-base gravel. In addition, the affected soil is wholly contained within the facility which is characterized by: pavement, buildings, landscaped area, functioning cap, roadways, equipment storage area, manufacturing or process area, or other surface cover or structure, or otherwise disturbed ground.

Affected ground water in the Northern Flow Regime extends into a residential area north of the site; however, the residential area is characterized by homes and landscaped yards that are not typically attractive as valuable ecological habitat. As discussed in Section 2.2 above, the surface water body that is closest to the Whirlpool facility is Mill Creek, which is about 1500 to 2000 feet from the site. The results of the delineation activities show that the downgradient limit of the plume is at least 1000 feet from Mill Creek and the gravelly basal zone where the core of the plume is observed is not connected to the creek.

Based on absence of exposure pathways, no further ecological evaluations are warranted at the site.

## 2.7 *CORRESPONDENCE WITH LOCAL GOVERNMENT AND THE COMMUNITY*

All correspondence with local government agencies requested in the ADEQ June 22, 2006 e-mail are included in Appendix F. The community question and answer sheet and the letter to residents requested from the afore-mentioned email are attached as Appendix G.

## 3.0 PATH FORWARD

### 3.1 SUMMARY OF ADDITIONAL TASKS

This section addresses items 1 through 4 in ADEQ's June 2006 NOD letter as listed in Table 1-1.

Following approval of the CAS Work Plan as modified by this Addendum, Whirlpool intends to proceed with risk evaluation and risk management planning activities as described in the LOA and illustrated on Figure 1-2. Whirlpool also intends to continue ground water sampling and water level monitoring activities. The fall sampling event will include the use of Level IV QA laboratory reporting packages to support data validation and confirmation of the plume extent on an annual basis. Based on the completed delineation activities, Whirlpool has addressed all known data gaps. Should additional data be needed to complete risk assessment activities and feasibility studies, these data will be collected in accordance with the Revised CAS Work Plan and this Addendum.

In general, Whirlpool's overall management plan for the Fort Smith site is to address the environmental conditions using a risk-based and "holistic" site-wide remediation approach.

Accordingly, Whirlpool is committed to controlling potential exposures that could present unacceptable risks to human health and the environment.

As Whirlpool proceeds with the next steps of the CAS program (the risk evaluation and risk management planning), the need for remediation of the source area and the ground water plume (both in the Northern Flow Regime and Southern Flow Regime) will be assessed. If the technical evaluation of exposure pathways and risks indicates that corrective measures are required for both Northern and Southern Flow Regimes, both will be addressed in the risk management plan.

In future submittals subject to the LOA, as in this submittal, references to on- and off-site data and systems will be limited. The boundary between the Northern and Southern Flow Regime plumes is not coincident with the property boundary.

### 3.2 REVISED SCHEDULE

The revised schedule for upcoming CAS milestones is included as Table 3-1.

# Tables

*August 30, 2006*
*Project No. 0014507*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

TABLE 1-1

ADEQ NODs and Comments to Whirlpool

Whirlpool Corporation
Fort Smith, Arkansas

| | ADEQ NOD or Comment Request | Whirlpool Activities | Additional Information |
|---|---|---|---|
| | | | |
| | **ADEQ's June 22, 2006 E-mail** | | |
| | | | |
| 1. | Provide all correspondence with local government agencies | | All correspondence with local government agencies are in Appendix F. |
| 2. | Provide communication plan including community Q&A sheet and letter to residents | | Community Q&A Sheet and letter to residents are in Appendix G. |
| | | | |
| | **ADEQ's June 20, 2006 NOD Letter** | | |
| | | | |
| 1. | Provide reference to statement in LOA that specifies on-site and off-site "systems". | | Discussions regarding on-site and off-site plans and applicability of the LOA are included in Section 3.1. |
| 2. | Provide reply to request to remediate on-site and off-site. | | |
| 3. | Change wording - "Approved CAS Work Plan" in 6/1/05 letter from Troy Meinen. | | |
| 4. | Address remaining items in ADEQ's June 2005 letter. | | |
| | | | |
| | **Remaining Items in ADEQ's June 16, 2005 NOD Letter** | | |
| | | | |
| 1b. | Evaluation of possible surface water impact - ie. sampling of Mill Creek. | Completed delineation activities. Verified plume does not cross Jenny Lind. | Plume delineation status is described in Section 2.1 and Section 2.2. |
| 1e. | Offsite delineation of COCs north of site. | Completed delineation activities. | Plume delineation status is described in Section 2.1 and Section 2.2. |
| 1f. | Update of site maps and x-sections showing extent of COCs in soil and ground water. | Updated maps and cross-sections depicting extent of contamination in soil and ground water. | Plume delineation status is described in Section 2.2. Cross-sections are presented in Section 2.3. |
| 1g. | Updated evaluation of the extent of the gravel unit. | Installed additional borings and prepared gravel extent map. | Revised gravel extent map. Included in Section 2.3. |

TABLE 1-1 (Cont'd)

ADEQ NODs and Comments to Whirlpool

Whirlpool Corporation
Fort Smith, Arkansas

| | ADEQ NOD or Comment Request | Whirlpool Activities | Additional Information |
|---|---|---|---|
| 2b. | Aquifer and soil permeability testing. | Completed aquifer test (April 06). | Preliminary results of aquifer test and aquifer test evaluation plan. Soil permeability testing will be conducted as part of Corrective Action planning. Included in Section 2.4 and in Appendix B. |
| 2c. | Update of water well search | Completed update of water well search | Included in Section 2.5 and in Appendix C and Appendix D. |
| 4b. | Revise data table to include constituents analyzed in soil and ground water. | Revised data table to include constituents analyzed in soil and ground water. | Included in Section 2.2 and in Appendix H. |
| 4c. | All historic lab results and/or lab verification data. | Discuss with ADEQ. | Data tables and access database showing all site data are included in Section 2.2 and Appendix H. |
| 5c. | Revise cross-sections to include potentiometric surface. | Revised cross-sections to include potentiometric surface. | See 1f. |
| 6a. | Ecological Exclusion Worksheet and, if necessary, Ecological Assessment Worksheet. | Completed Ecological Exclusion Worksheet. | Included in Section 2.6 and in Appendix E. |

TABLE 3-1

Corrective Action Strategy (CAS) Schedule

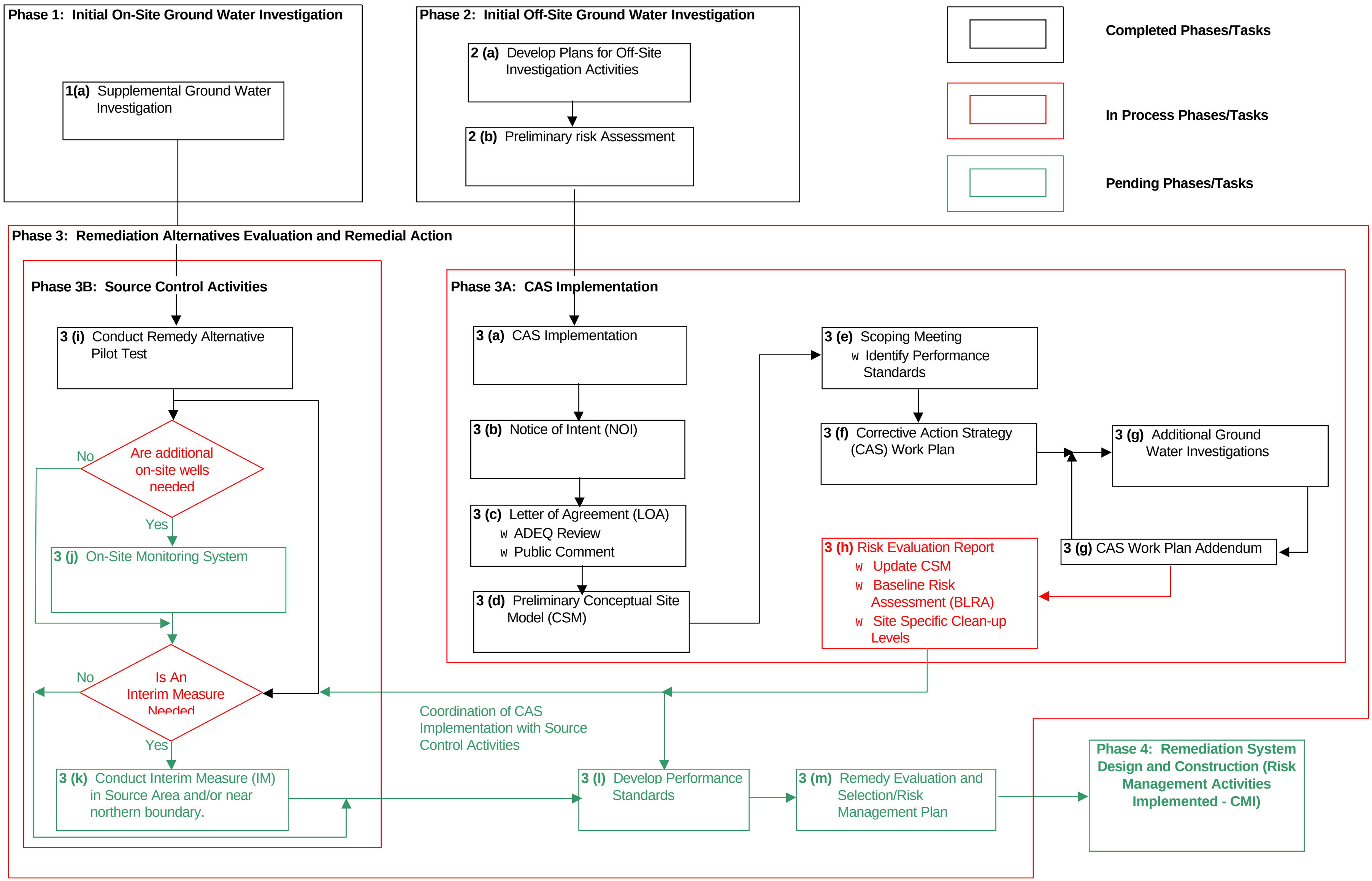
Whirlpool Corporation
Fort Smith, Arkansas

| Action Item Description | Forecasted Completion Date | Actual Completion Date | Status |
|---|---|---|---|
| **Corrective Action Strategy Process** | | | |
| Submit NOI | | August 2001 | Completed |
| Letter of Agreement | | June 2002 | Completed |
| Conceptual Site Model | | June 2002 | Completed |
| Scoping Meeting | | August 2002 | Completed |
| Off-site Delineation Activities (Wells between Ingersoll and Jacobs) | | July 2003 - April 2006 | Completed |
| Submit Revised CAS Work Plan Addendum | | August 2006 | Completed |
| Submit Risk Evaluation Report | 4th QTR 2006 | | |
| Prepare Draft of Risk Management Plan for ADEQ Review | 2nd QTR 2007 | | |
| Conference Call with ADEQ to Review Risk Management Plan | 2nd QTR 2007 | | |
| Submit Final Risk Management Plan to ADEQ | 4th QTR 2007 | | |

# Figures

*August 30, 2006*
*Project No. 0014507*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000




# Ground Water Management Program

Whirlpool Corporation, Fort Smith Arkansas

ERM-Southwest, Inc.

HOUSTON-NEW ORLEANS-AUSTIN-DALLAS-BEAUMONT-BATON ROUGE

FIGURE 1-1

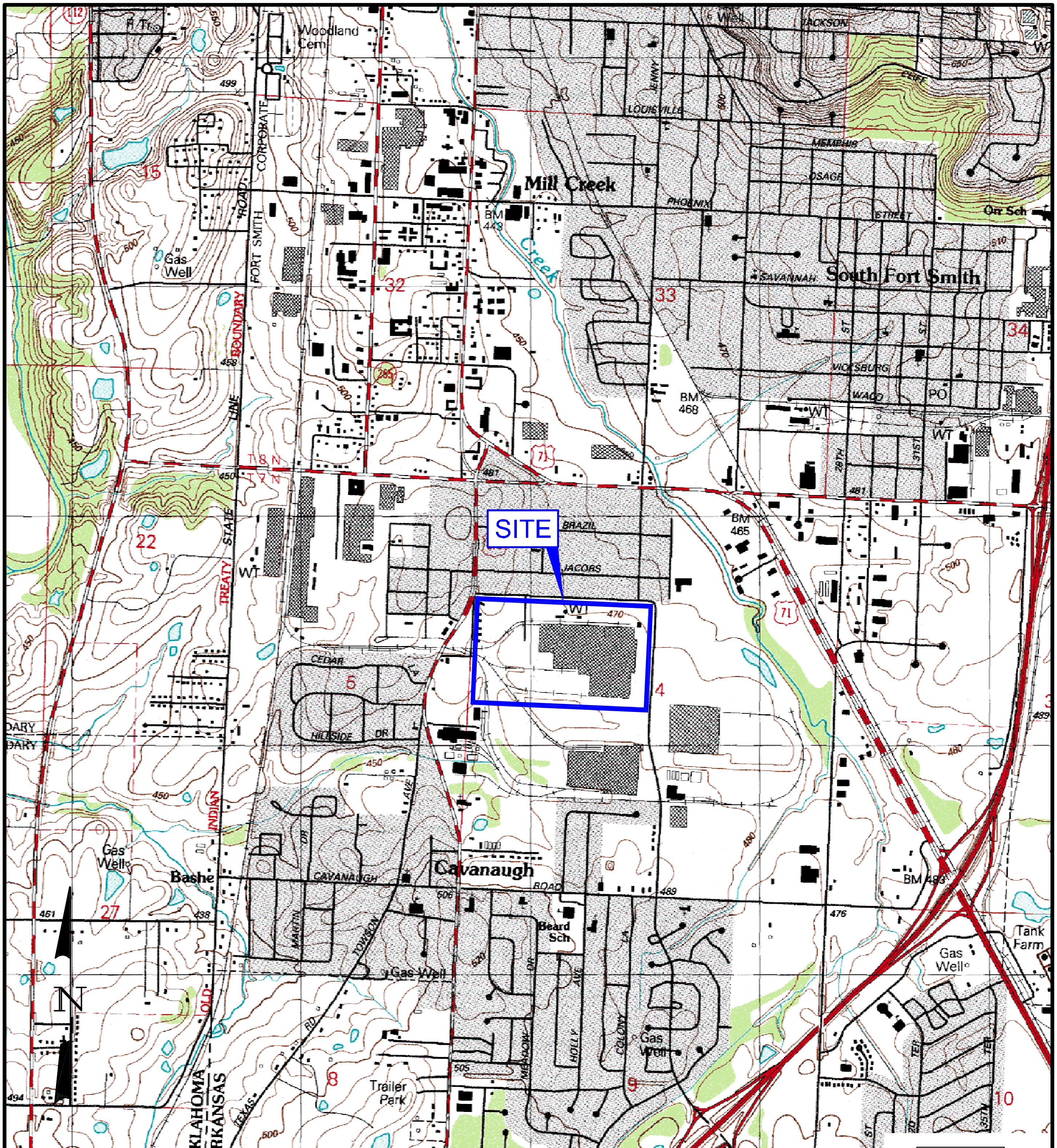
Ground Water Management Program Flow Chart

Whirlpool Corporation

Fort Smith, Arkansas

| | | | |
|---|---|---|---|
| DESIGN: TWM | CHKD: | DATE: 10/31/03 | REV: |
| DRAWN: TWM | SCALE: AS SHOWN | W.O.NO: 0048030 | |

ERM




0 2000 4000

SCALE FEET

SOURCE: U.S.G.S. 7.5' QUADRANGLE, SOUTH FORT SMITH, ARK.-OKLA., (o35094C4) 1987.


QUADRANGLE LOCATION

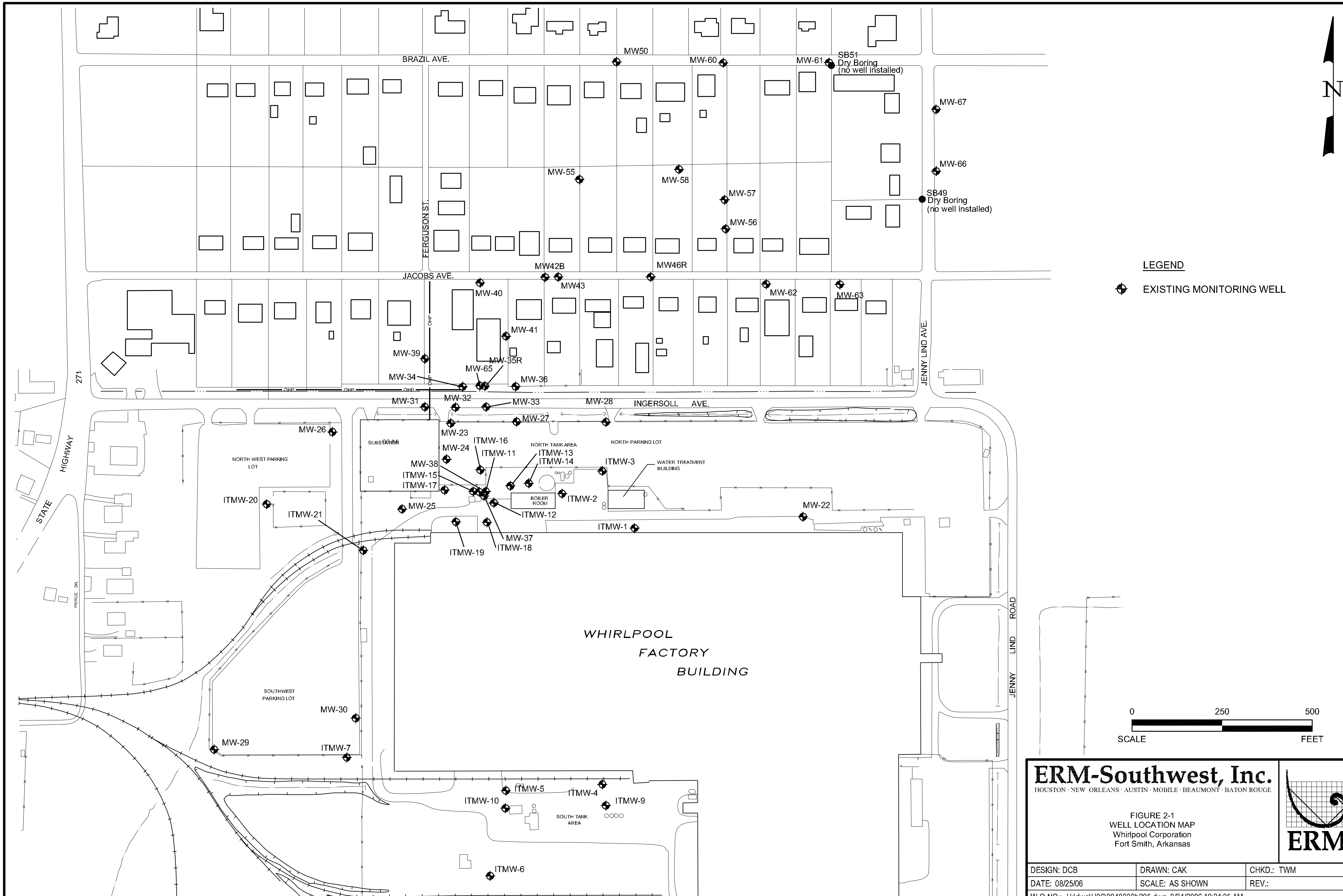
**ERM-Southwest, Inc.**

HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE · CORPUS CHRISTI

| | | |
|---|---|---|
| DESIGN: DCB | DRAWN: EFC | CHKD.: TWM |
| DATE: 08/07/06 | SCALE: AS SHOWN | REV.: |
| W.O.NO.: H:\dwg\H06\0048030_Site_Loc.dwg, 8/25/2006 11:09:10 AM | | |

FIGURE 1-2
SITE LOCATION MAP
Whirlpool Corporation
Fort Smith, Arkansas

ERM®




**ERM-Southwest, Inc.**

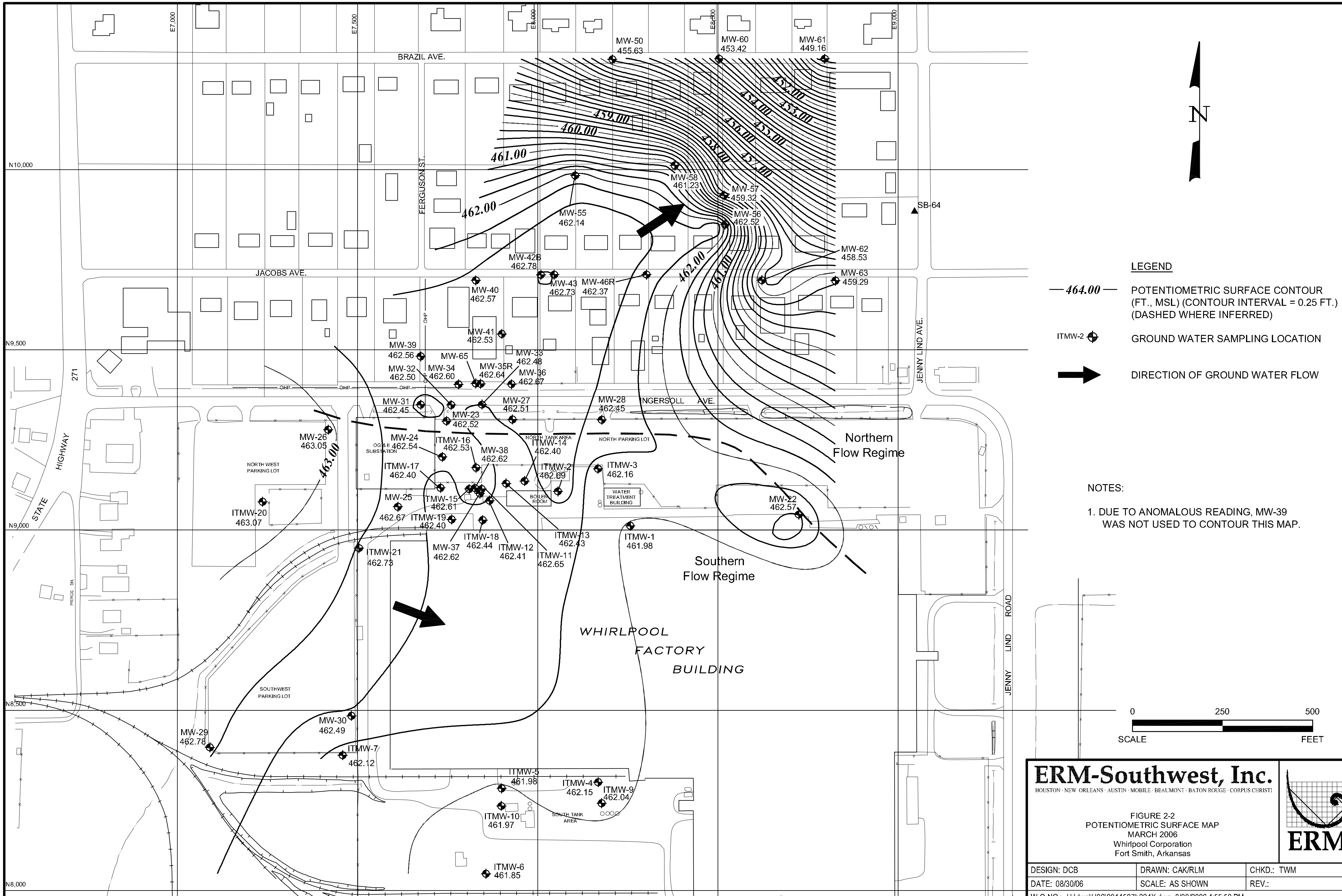
HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE

ERM

FIGURE 2-1
WELL LOCATION MAP
Whirlpool Corporation
Fort Smith, Arkansas

| DESIGN: DCB | DRAWN: CAK | CHKD.: TWM |
|---|---|---|
| DATE: 08/25/06 | SCALE: AS SHOWN | REV.: |

W.O.NO.: H:\dwg\H06\0048030b205.dwg, 8/31/2006 10:24:35 AM




**ERM-Southwest, Inc.**

HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE · CORPUS CHRISTI

FIGURE 2-2
POTENTIOMETRIC SURFACE MAP
MARCH 2006
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| DESIGN: DCB | DRAWN: CAK/RLM | CHKD.: TWM |
|---|---|---|
| DATE: 08/30/06 | SCALE: AS SHOWN | REV.: |

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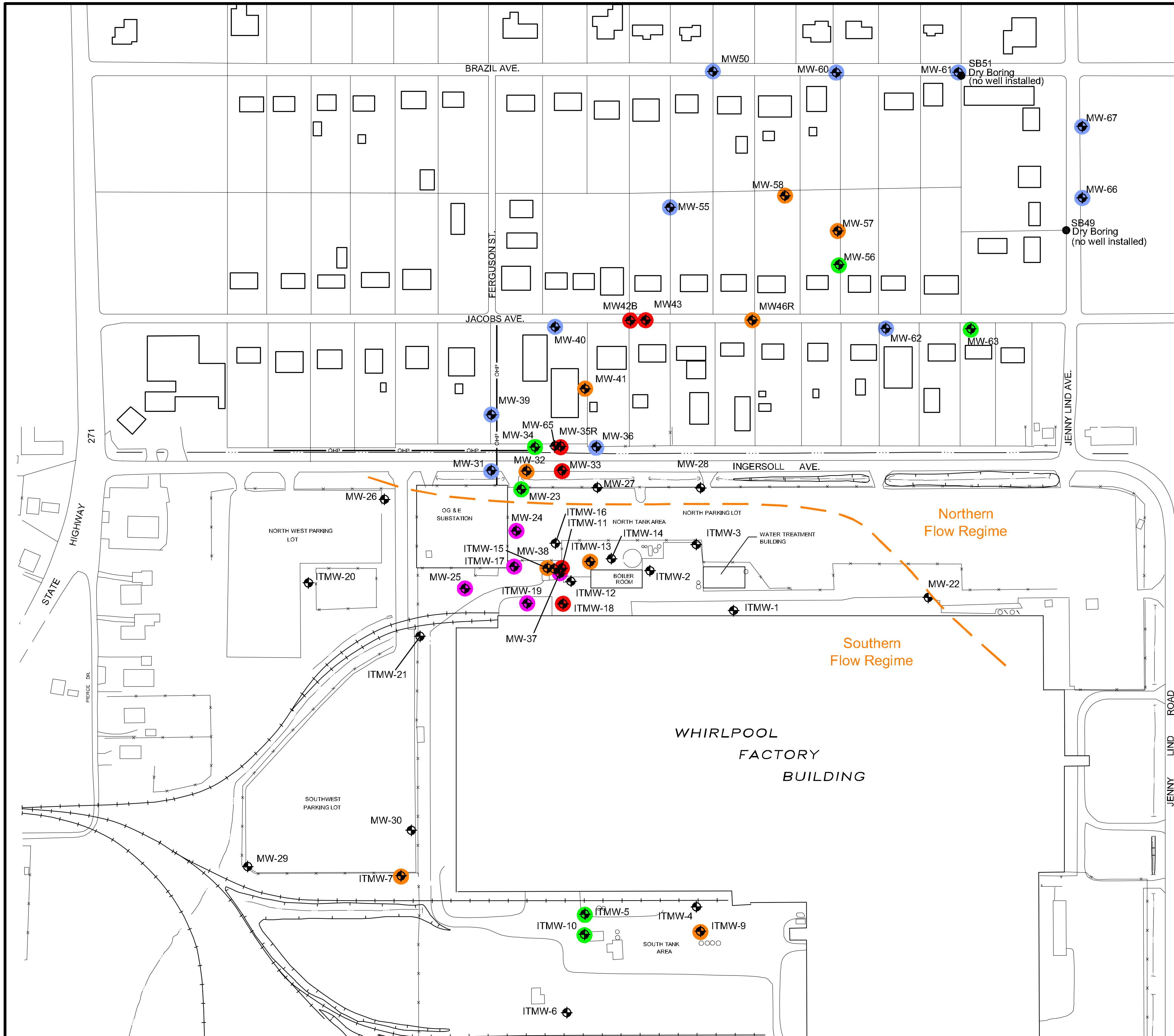


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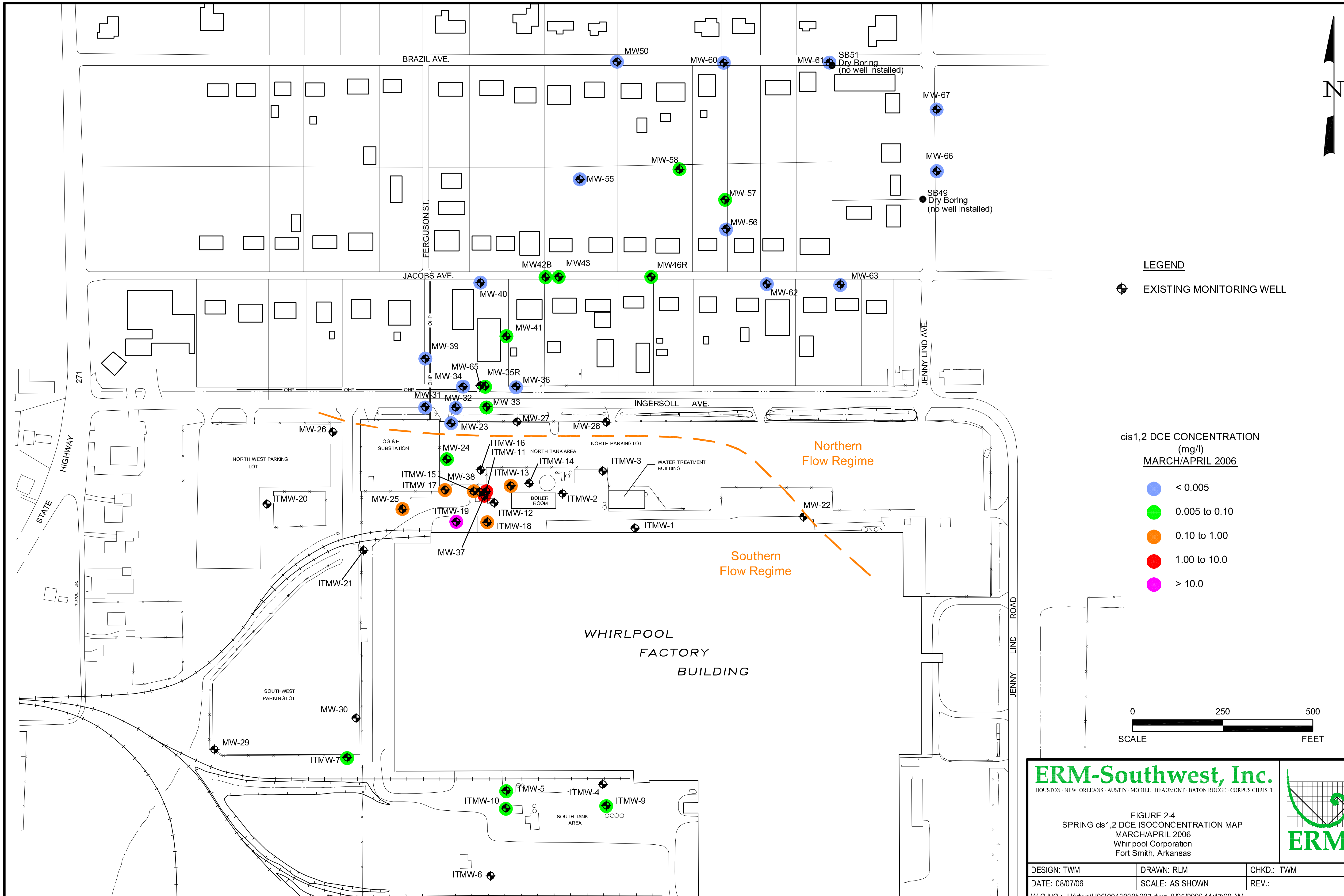
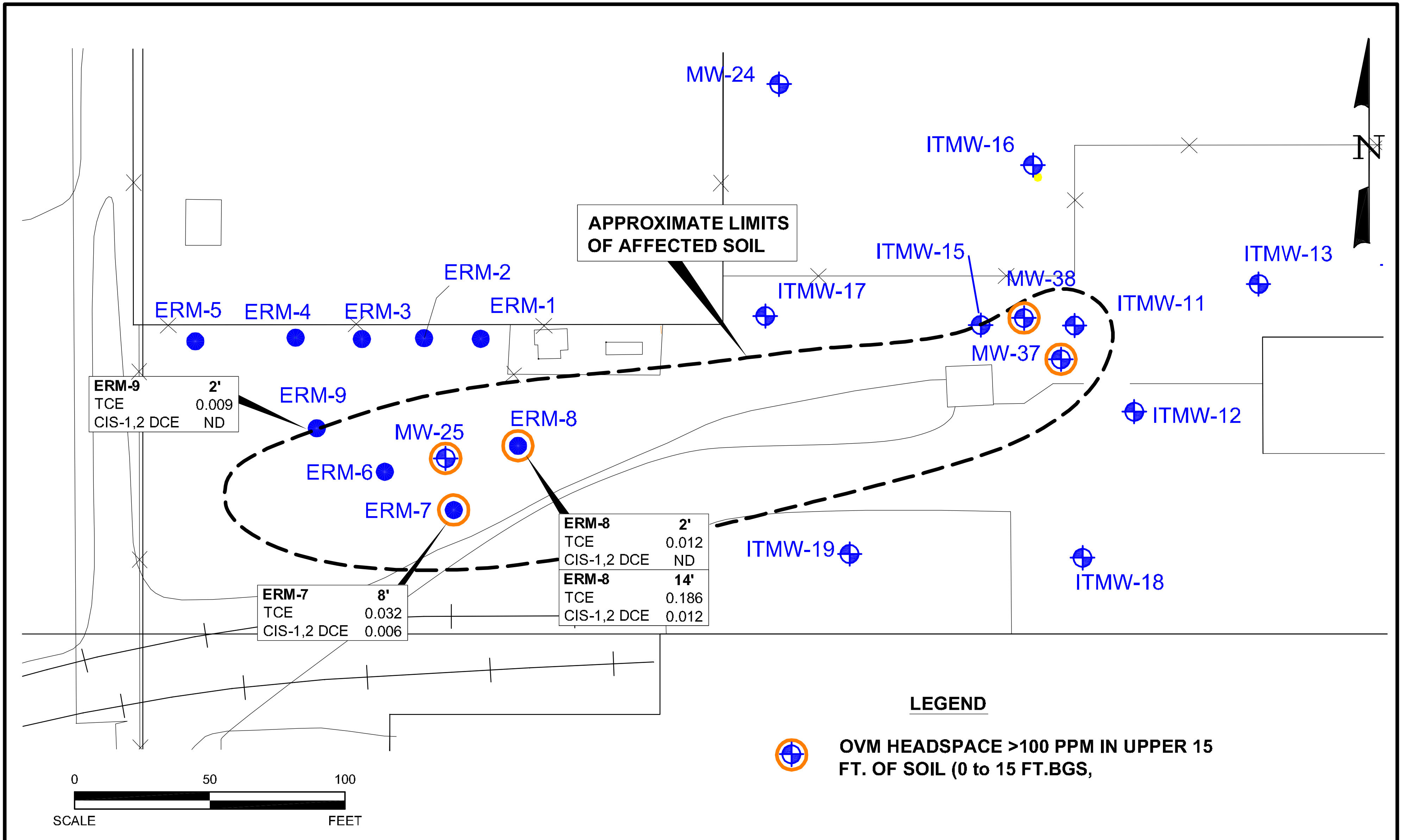
FIGURE 2-3
SPRING TCE ISOCONCENTRATION MAP
MARCH/APRIL 2006
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| | | |
|---|---|---|
| DESIGN: TWM | DRAWN: RLM | CHKD.: TWM |
| DATE: 08/07/06 | SCALE: AS SHOWN | REV.: |

W.O.NO.: H:\dwg\H06\0048030b206.dwg, 8/25/2006 11:16:27 AM


BRAZIL AVE.
JACOBS AVE.
INGERSOLL AVE.
FERGUSON ST.
JENNY LIND AVE.
JENNY LIND ROAD
STATE HIGHWAY 271
MW50
MW-60
MW-61
SB51
Dry Boring
(no well installed)
MW-67
MW-66
SB49
Dry Boring
(no well installed)
MW-58
MW-55
MW-57
MW-56
MW42B
MW43
MW46R
MW-40
MW-62
MW-63
MW-41
MW-39
MW-65
MW-34
MW-35R
MW-36
MW-31
MW-32
MW-33
MW-27
MW-28
MW-26
MW-23
MW-24
OG & E SUBSTATION
NORTH WEST PARKING LOT
NORTH TANK AREA
NORTH PARKING LOT
WATER TREATMENT BUILDING
BOILER ROOM
ITMW-16
ITMW-11
ITMW-14
ITMW-3
ITMW-15
ITMW-17
MW-38
ITMW-13
ITMW-2
ITMW-20
MW-25
ITMW-19
ITMW-12
ITMW-18
ITMW-1
MW-22
MW-37
ITMW-21
Northern
Flow Regime
Southern
Flow Regime
WHIRLPOOL
FACTORY
BUILDING
SOUTHWEST PARKING LOT
MW-30
MW-29
ITMW-7
ITMW-5
ITMW-4
ITMW-10
ITMW-9
SOUTH TANK AREA
ITMW-6
N
LEGEND
EXISTING MONITORING WELL
cis1,2 DCE CONCENTRATION
(mg/l)
MARCH/APRIL 2006
< 0.005
0.005 to 0.10
0.10 to 1.00
1.00 to 10.0
> 10.0
0 250 500
SCALE FEET
ERM-Southwest, Inc.
HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE · CORPUS CHRISTI
FIGURE 2-4
SPRING cis1,2 DCE ISOCONCENTRATION MAP
MARCH/APRIL 2006
Whirlpool Corporation
Fort Smith, Arkansas
ERM
DESIGN: TWM
DRAWN: RLM
CHKD.: TWM
DATE: 08/07/06
SCALE: AS SHOWN
REV.:
W.O.NO.: H:\dwg\H06\0048030b207.dwg, 8/25/2006 11:17:20 AM




**ERM-Southwest, Inc.**

HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE

| | | |
|---|---|---|
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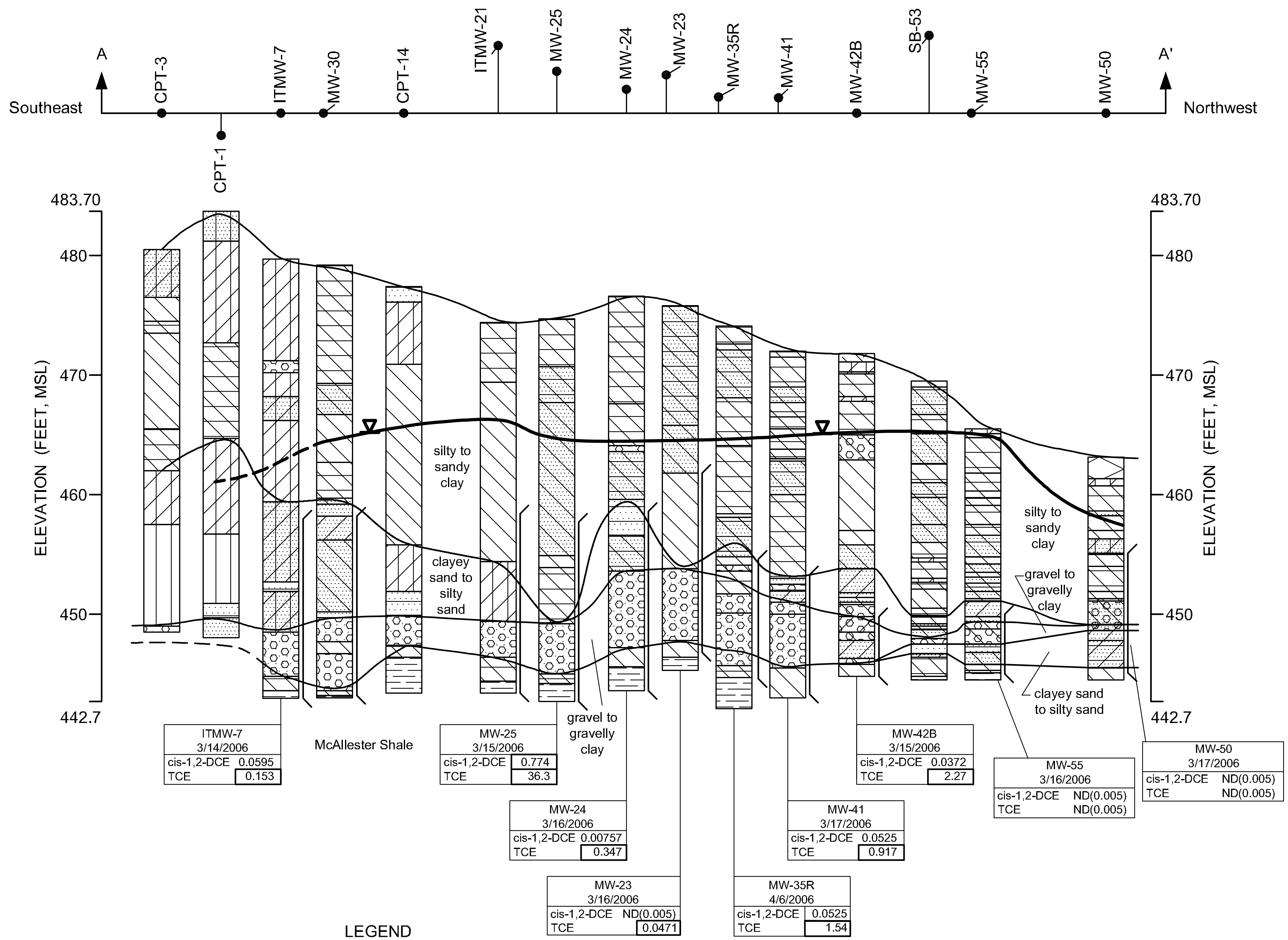
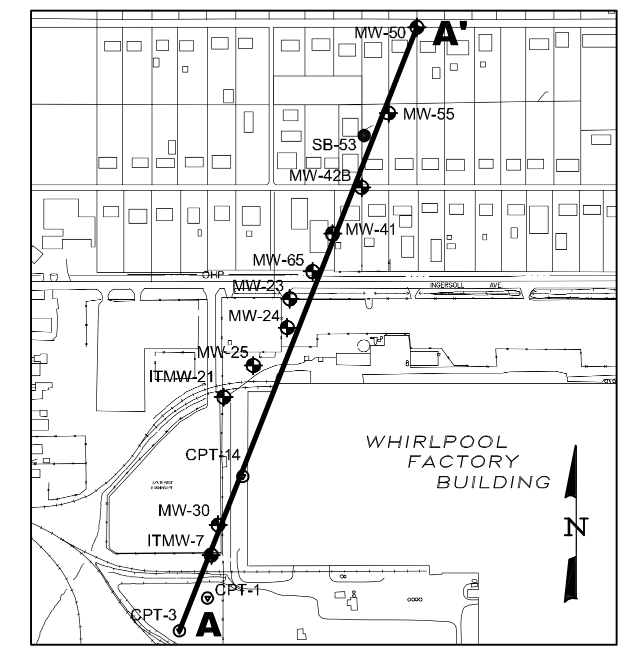
| DATE: 08/30/06 | SCALE: AS SHOWN | REV.: |
| W.O.NO.: H:\dwg\H06\0048030b215.dwg, 8/30/2006 5:00:01 PM | | |

FIGURE 2-5
APPROXIMATE EXTENT OF AFFECTED SOIL
Whirlpool Corporation
Fort Smith, Arkansas

ERM®




CROSS-SECTION LOCATION MAP
SCALE: 1" = 700'

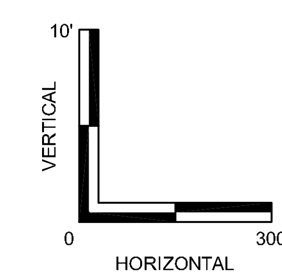
NOTES

ALL DATA ARE mg/L IN MARCH/APRIL 2006

cis-1,2-DCE = cis-1,2-DICHLOROETHENE

TCE = TRICHLOROETHENE

EXCEEDS EPA REGION 6 HUMAN HEALTH MEDIUM SPECIFIC SCREEN LEVEL FOR TAPWATER




LEGEND

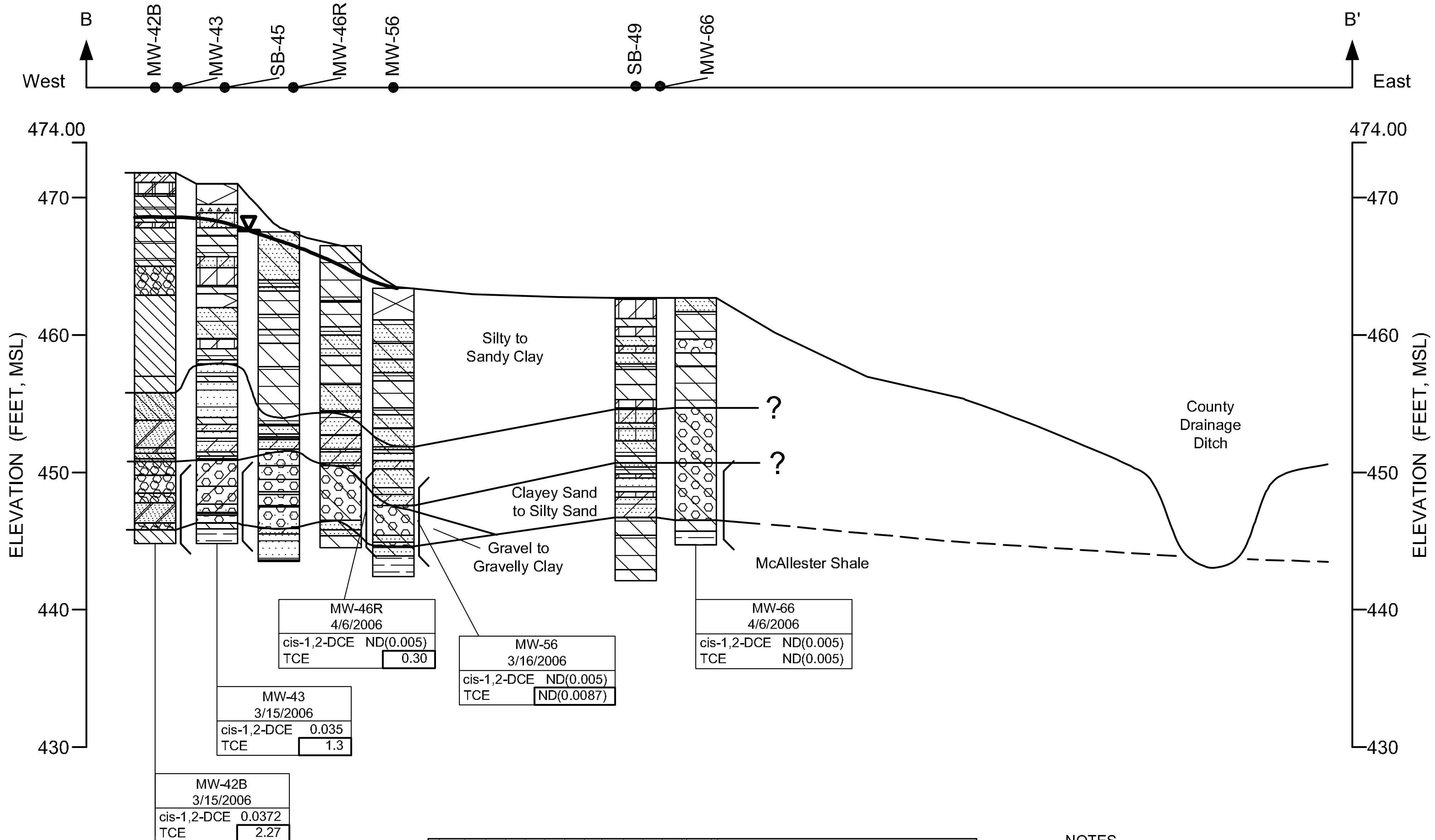
CLAY
CLAYEY SAND
CLAYEY SILT
FILL
GRAVELY SAND
SAND
SHALE
SILTY CLAY
SILTY SAND
SILT
SANDY CLAY
SANDY CLAYEY SILT
GRAVELLY CLAY
SCREENED INTERVAL
FEBRUARY 2005 POTENTIOMETRIC SURFACE

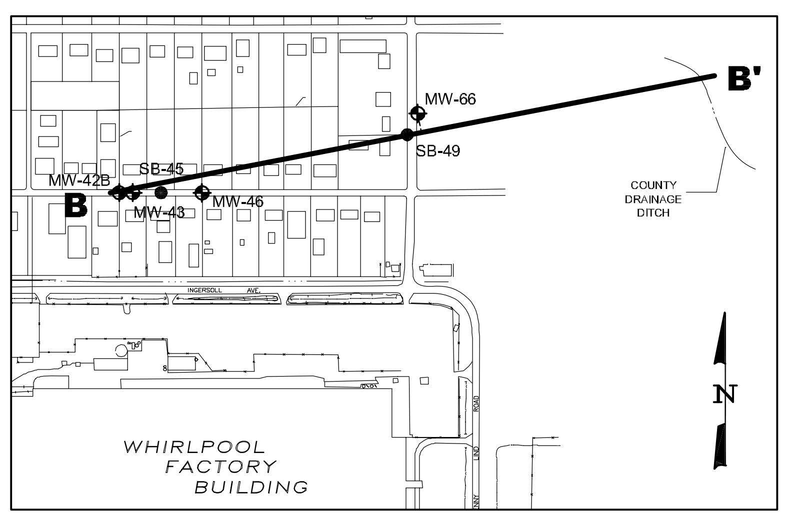
**ERM-Southwest, Inc.**
HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE

FIGURE 2-6
CROSS-SECTION A-A'
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| | | |
|---|---|---|
| DESIGN: TWM | DRAWN: EFC | CHKD.: TWM |
| DATE: 08/25/06 | SCALE: AS SHOWN | REV.: |
| W.O.NO.: H:\dwg\H06\0048030B209.dwg, 8/25/2006 10:47:05 AM | | |




CROSS-SECTION LOCATION MAP
SCALE: 1" = 700'

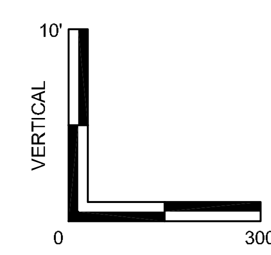
NOTES

ALL DATA ARE mg/L IN MARCH/APRIL 2006

cis-1,2-DCE = cis-1,2-DICHLOROETHENE

TCE = TRICHLOROETHENE

EXCEEDS EPA REGION 6 HUMAN HEALTH MEDIUM SPECIFIC SCREEN LEVEL FOR TAPWATER




LEGEND

- CLAY
- CLAYEY SAND
- CLAYEY SILT
- CONCRETE
- COARSE SAND
- FILL
- GRAVEL
- GRAVELLY SAND
- NO RECOVERY
- SHALE
- SILTY CLAY
- SILTY CLAYEY SAND
- SILTY SAND
- SANDY CLAY
- SANDY CLAYEY SILT
- SANDY SILTY CLAY
- GRAVELLY CLAY
- SCREENED INTERVAL
- FEBRUARY 2005 POTENTIOMETRIC SURFACE

**ERM-Southwest, Inc.**
HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE

FIGURE 2-7
CROSS-SECTION B-B'
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| | | |
|---|---|---|
| DESIGN: TWM | DRAWN: EFC | CHKD.: TWM |
| DATE: 08/25/06 | SCALE: AS SHOWN | REV.: |
| W.O.NO.: H:\dwg\H06\0048030B209.dwg, 8/25/2006 10:52:03 AM | | |


LEGEND

EXISTING MONITORING WELL

APPROXIMATE AREA OF GRAVEL ZONE (MINIMUM THICKNESS OF 1 FOOT)

0 150 300

SCALE FEET

**ERM-Southwest, Inc.**

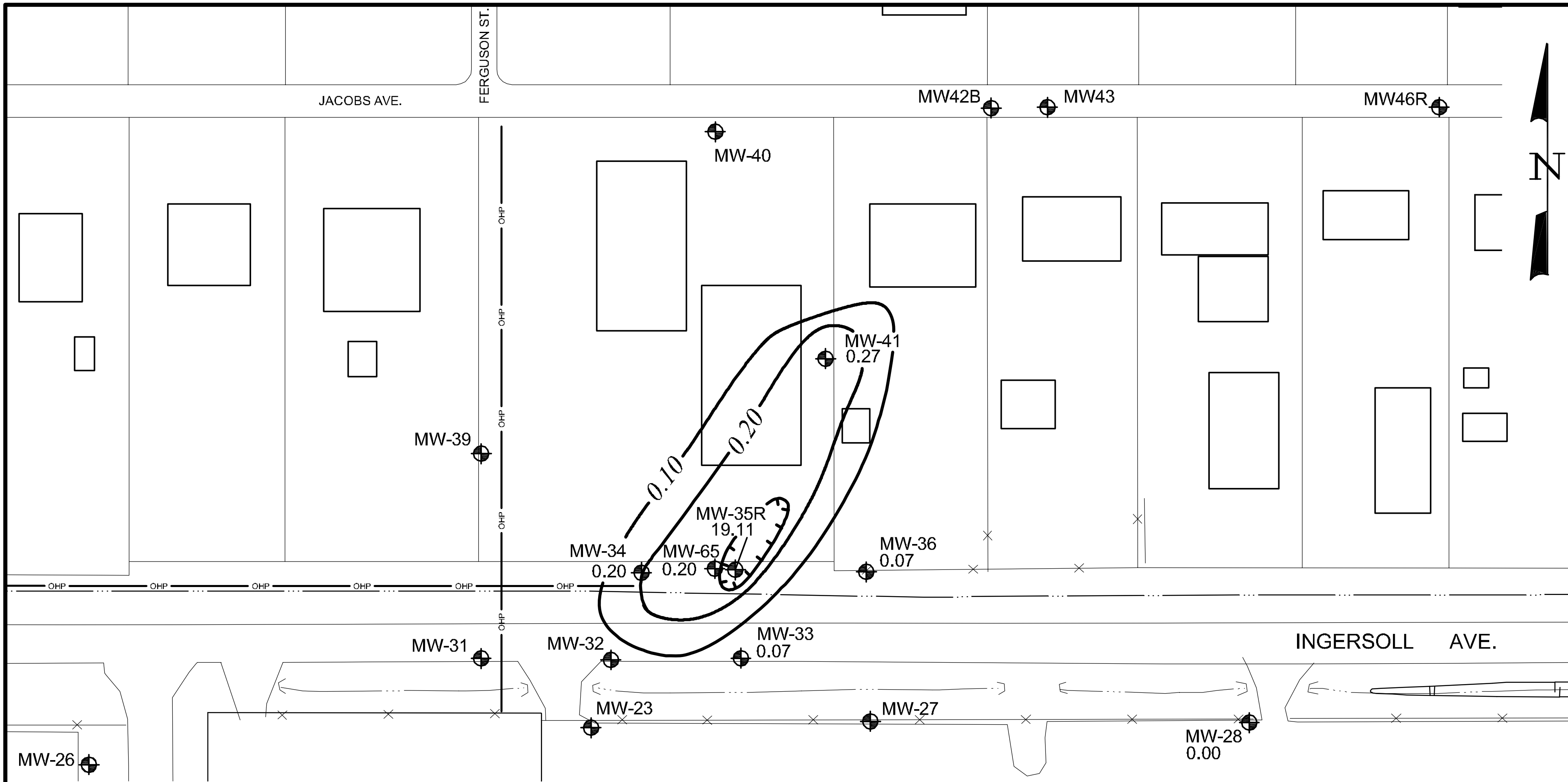
HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE · CORPUS CHRISTI

FIGURE 2-8
DISTRIBUTION OF GRAVEL ZONE
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| | | |
|---|---|---|
| DESIGN: TWM | DRAWN: JMH | CHKD.: TWM |
| DATE: 08/25/06 | SCALE: AS SHOWN | REV.: |

W.O.NO.: H:\dwg\H06\0048030b212.dwg, 8/25/2006 10:53:36 AM




0 100 200

SCALE FEET

LEGEND

EXISTING MONITORING WELL

NOTE

TIME OF MAXIMUM DRAWDOWN IS 24
HOURS AFTER START OF AQUIFER TEST.

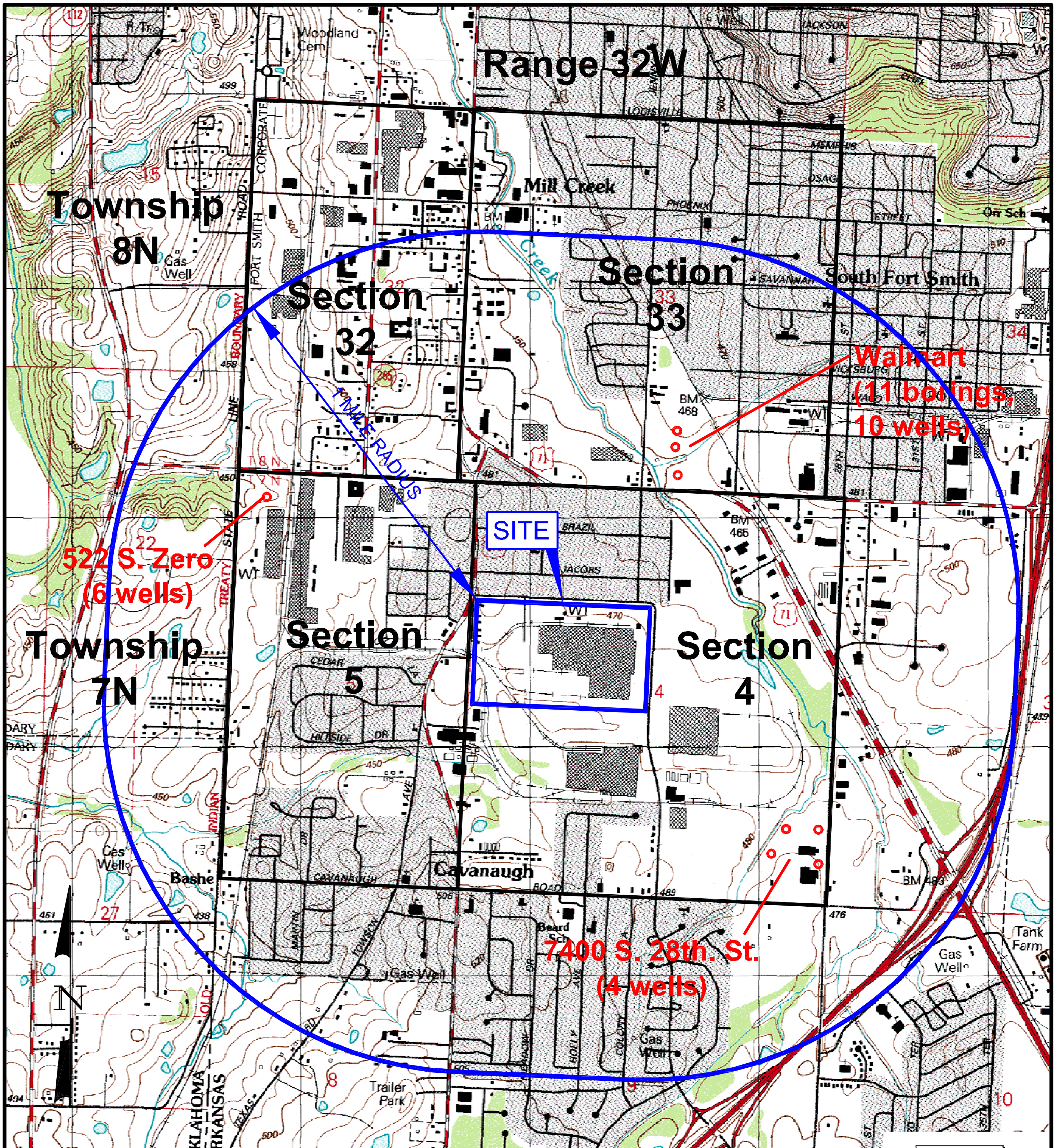
**ERM-Southwest, Inc.**

HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE

| | | |
|---|---|---|
| DESIGN: DCB | DRAWN: JMH | CHKD.: TWM |
| DATE: 08/25/06 | SCALE: AS SHOWN | REV.: |
| W.O.NO.: H:\dwg\H06\0048030a214.dwg, 8/25/2006 10:57:54 AM | | |

FIGURE 2-9
PRESSURE-CONNECTED DRAWDOWN MAP
APRIL 2006
Whirlpool Corporation
Fort Smith, Arkansas

ERM®




0 2000 4000

SCALE FEET

SOURCE: U.S.G.S. 7.5' QUADRANGLE, SOUTH FORT SMITH, ARK.-OKLA., (o35094C4) 1987.


QUADRANGLE LOCATION

**ERM-Southwest, Inc.**

HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE · CORPUS CHRISTI

| | | |
|---|---|---|
| DESIGN: DCB | DRAWN: EFC | CHKD.: TWM |
| DATE: 08/25/06 | SCALE: AS SHOWN | REV.: |

W.O.NO.: H:\dwg\H06\0048030_Site_Loc.dwg, 8/25/2006 10:59:54 AM

FIGURE 2-10
WELL SURVEY SUMMARY MAP
Whirlpool Corporation
Fort Smith, Arkansas

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# Boring Logs

*Appendix A*

*August 30, 2006*
*Project No. 0014507*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

ERM

# SB-53
# DRILLING LOG

| | | | | | |
|---|---|---|---|---|---|
| W.O. NO. | 0014507 | Boring/Well ID | SB-53 | Date Drilled | 11/17/2004 |
| Project | WP Offsite Delineation | Owner | Whirlpool | | |
| Location | Ft. Smith, AR | Boring T.D. | 25 ' | Boring Diam. | 3 " |
| N. Coord. | 9902.2 | E. Coord. | 8015.1 | Surface Elevation | 469.5' Ft. MSL Datum |

Screen: Type none Diam. 0 " Length 0 ' Slot Size 0 "

Casing: Type none Diam. 0 " Length 0 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. ______ (______) 2. Ft. ______ (______)

Drilling Company CCI Driller Donna R. Lewis

Drilling Method Direct Push/Geoprobe Log By Misty D. Savell

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | 0-4 | 0-0.5 | SILTY CLAY: reddish medium brown, moist, loose, occasional root hairs,100% recovery, no detectable odor. |
| | | | | | 0 | | 0.5-2.8 | SILTY SANDY CLAY: orangish light brown with medium brown mottlings, moist, slightly plastic, very soft, occasional iron nodules (~2 mm - 1 cm), 43% recovery, no detectable odor. |
| -2 | 2 | | | | | | | |
| | | | | | 0 | | 2.8-4.4 | SILTY CLAY: orange with red mottlings, moist, slightly plastic, soft, abundant iron nodules (~2 mm - 1 cm), 100% recovery, no detectable odor. |
| -4 | 4 | | | | | 4-8 | | |
| | | | | | 0 | | 4.4-6.9 | SANDY CLAY: orange with red mottlings, damp, plastic, stiff, abundant iron nodules (2-4 mm), abundant clay nodules (light brown, damp, plastic, stiff, ~1-3 cm), 100% recovery, no detectable odor. |
| -6 | 6 | | | | | | | |
| | | | | | 0 | | 6.9-8.5 | SILTY CLAY: orange with light grey mottling, damp, plastic, very stiff, occasional silt veins (orange and black), 100% recovery, no detectable odor. |
| -8 | 8 | | | | | 8-12 | | |
| | | | | | 0 | | 8.5-9.75 | SANDY SILTY CLAY: light grey with orange mottling, damp, plastic, stiff, occasional very fine sand veins (light grey, orange, and black) ,100% recovery,no detectable odor. |
| -10 | 10 | | | | 0 | | 9.75-12 | SANDY CLAY: orange with light brown to light grey mottling, damp, plastic, stiff, abundant silt and very fine sand veins (light brown, orange, and black), 100% recovery, no detectable odor. |

ERM

# SB-53
# DRILLING LOG

W.O. NO. 0014507 Boring/Well ID SB-53 Date Drilled 11/17/2004

Project WP Offsite Delineation Owner Whirlpool

Location Ft. Smith, AR Boring T.D. 25 ' Boring Diam. 3 "

N. Coord. 9902.2 E. Coord. 8015.1 Surface Elevation 469.5' Ft. MSL Datum

Screen: Type none Diam. 0 " Length 0 ' Slot Size 0 "

Casing: Type none Diam. 0 " Length 0 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. ______ (______) 2. Ft. ______ (______)

Drilling Company CCI Driller Donna R. Lewis

Drilling Method Direct Push/Geoprobe Log By Misty D. Savell

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -10 | 10 | | | | | | | |
| -12 | 12 | | | | 0 | 12-16 | 12-13.5 | SANDY CLAY: orange, moist, plastic, soft, occasional silt to very fine sands veins (light brown and black) ,100% recovery, no detectable odor. |
| | | | | | 0 | | 13.5-14.82 | SILTY CLAY: mottled orange and light greyish brown, moist, plastic, stiff, occasional very fine sand veins (black to light greyish brown) at 13.5-13.8 ft and 14.4-14.8 ft., 100% recovery, no detectable odor. |
| -14 | 14 | | | | | | | |
| | | | | | 0 | | 14.82-15.15 | CLAYEY SILT: reddish dark brown,moist, loose, 100% recovery, no detectable odor. |
| | | | | | 0 | | 15.15-16.5 | SILTY CLAY: orange with reddish medium brown and light brown mottling, moist, plastic, soft, occasional very fine sand veins (black and light brown), 100% recovery, no detectable odor. |
| -16 | 16 | | | | | 16-19 | | |
| | | | | | 0 | | 16.5-16.85 | CLAYEY SILT: reddish dark brown, moist, loose, 100% recovery, no detectable odor. |
| | | | | | 0 | | 16.85-17.4 | SILTY CLAY: mottled orange and light greyish brown, moist, plastic, stiff, occasional silt veins (light brown and rarely black), 100% recovery, no detectable odor. |
| | | | | | 0 | | 17.4-19 | CLAY: orange, light greyish brown mottling, moist, plastic, stiff, abundant silt and very fine sands veins (black, light brown, and orange), 100% recovery, no detectable odor. |
| -18 | 18 | | | | | | | |
| | | | | | 0 | 19-22 | 19-19.65 | SILTY CLAY: mottled orange and light greyish brown, moist, plastic, soft,occasional silt veins (light brown and orange), 100% recovery, no detectable odor. |
| | | | | | 0 | | 19.65-19.75 | SILTY CLAY: reddish dark brown, moist, slightly plastic, soft, abundant silt and very fine sand veins (black), 100% recovery, no detectable odor. |
| -20 | 20 | | | | 0 | | 19.75-20.3 | SILTY CLAY: mottled orange and light greyish brown, moist, plastic, soft, occasional silt veins (light brown and orange), 100% recovery, no detectable odor. |

ERM

# SB-53
# DRILLING LOG

W.O. NO. 0014507 Boring/Well ID SB-53 Date Drilled 11/17/2004

Project WP Offsite Delineation Owner Whirlpool

Location Ft. Smith, AR Boring T.D. 25 ' Boring Diam. 3 "

N. Coord. 9902.2 E. Coord. 8015.1 Surface Elevation 469.5' Ft. MSL Datum

Screen: Type none Diam. 0 " Length 0 ' Slot Size 0 "

Casing: Type none Diam. 0 " Length 0 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. ______ (______) 2. Ft. ______ (______)

Drilling Company CCI Driller Donna R. Lewis

Drilling Method Direct Push/Geoprobe Log By Misty D. Savell

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| -20 | 20 | | | | |
| | | 0 | | 20.3-20.5 | SANDY CLAY: mottled orange and light grey, moist, slightly plastic, stiff, 100% recovery, no detectable odor. |
| | | 0 | | 20.5-20.8 | SILTY CLAY: mottled orange and light greyish brown, moist, plastic, soft,occasional silt veins (light brown and orange), 100% recovery, no detectable odor. |
| | | 0 | | 20.8-21.55 | SANDY CLAY: orange with light grey mottling, moist, very slightly plastic, stiff, occasional iron nodules (~2-4 mm), occasional quartzite gravels,100% recovery, no detectable odor. |
| | | 0 | | 21.55-22 | GRAVELLY CLAY: orange, moist, very slightly plastic, stiff, abundant iron nodules (~2-4 mm), numerous quartzite gravels (1-2 cm), 100% recovery, no detectable odor. |
| -22 | 22 | 0 | 22-25 | 22-22.8 | SILTY SAND: brownish orange, saturated, flowing, occasional quartzite gravels (~2 mm - 1.5 cm), 100% recovery, no detectable odor. |
| | | 0 | | 22.8-23.1 | CLAYEY SAND: dark brown with orange mottling, wet, loose, occasional quartzite gravels (~1-2.5 cm), 100% recovery, no detectable odor. |
| | | 0 | | 23.1-24.7 | SILTY CLAY: mottled orange, medium brownish grey, and reddish orange, moist, plastic, hard, occasional silt veins (black, orange, medium brownish grey, reddish orange), 100% recovery, no detectable odor. |
| -24 | 24 | | | | |
| | | 0 | | 24.7-25 | SHALE: dark grey with occasional orange mottlings, damp, crumbly, hard, fissile, 100% recovery, no detectable odor. |
| | | 0 | | | T.D. = 25 ' |
| -26 | 26 | | | | |
| -28 | 28 | | | | |
| -30 | 30 | | | | |

ERM

# SB-54
# DRILLING LOG

| | | | |
|---|---|---|---|
| W.O. NO. 0014507 | Boring/Well ID SB-54 | Date Drilled 11/17/2004 | |
| Project WP Offsite Delineation | Owner Whirlpool | | |
| Location Ft. Smith, AR | Boring T.D. 25 ' | Boring Diam. 3 " | |
| N. Coord. 9835.7 | E. Coord. 8102.4 | Surface Elevation 467.4' | Ft. MSL Datum |

| | | | | |
|---|---|---|---|---|
| Screen: | Type none | Diam. 0 " | Length 0 ' | Slot Size 0 " |
| Casing: | Type none | Diam. 0 " | Length 0 ' | Sump Length 0 ' |
| | Top of Casing Elevation 0 ' | | | Stickup 0 ' |

Depth to Water: 1. Ft. ______ (______) 2. Ft. ______ (______)

Drilling Company CCI — Driller Donna R. Lewis

Drilling Method Direct Push/Geoprobe — Log By Misty D. Savell

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | 0-4 | 0-0.3 | SANDY SILT: dark brown, wet, loose, abundant root hairs and vegetative material, 100% recovery, no detectable odor. |
| | | | | | 0 | | 0.3-2.1 | SANDY CLAY: brownish orange, saturated,very slightly plastic, very soft, 44% recovery, no detectable odor. |
| -2 | 2 | | | | 0 | | 2.1-3.4 | SANDY CLAY: brownish orange, wet, plastic, very soft, occasional iron nodules (~2 mm), 46% recovery, no detectable odor. |
| | | | | | 0 | | 3.4-4 | SILTY CLAY: mottled orange and light brown, moist, plastic, stiff occasional iron nodules (~2 mm), 100% recovery, no detectable odor. |
| -4 | 4 | | | | 0 | 4-8 | 4-4.85 | SANDY CLAY: orange with greyish brown mottling, damp, plastic, soft, occasional silt veins (light brown and black), 100% recovery, no detectable odor. |
| | | | | | 0 | | 4.85-7.3 | SANDY CLAY: mottled orange, light brown, medium greyish brown, damp, plastic, stiff, abundant iron nodules (~2-4 mm), occasional clay nodules (light brown to medium greyish brown), 100% recovery, no detectable odor. |
| -6 | 6 | | | | | | | |
| | | | | | 0 | | 7.3-9.5 | SILTY SANDY CLAY: mottled orange and light brown, damp, plastic, stiff, occasional very fine sand veins (orange and black), occasional iron nodules (~2 mm), 100% recovery, no detectable odor. |
| -8 | 8 | | | | | 8-12 | | |
| | | | | | 0 | | 9.5-10.7 | SANDY CLAY: mottled orange and light grey, moist, plastic, stiff, occasional silt veins (light brown and orange), 100% recovery, no detectable odor. |
| -10 | 10 | | | | | | | |

ERM

# SB-54 DRILLING LOG

| | | | | | |
|---|---|---|---|---|---|
| W.O. NO. | 0014507 | Boring/Well ID | SB-54 | Date Drilled | 11/17/2004 |
| Project | WP Offsite Delineation | Owner | Whirlpool | | |
| Location | Ft. Smith, AR | Boring T.D. | 25 ' | Boring Diam. | 3 " |
| N. Coord. | 9835.7 | E. Coord. | 8102.4 | Surface Elevation | 467.4' Ft. MSL Datum |

Screen: Type none Diam. 0 " Length 0 ' Slot Size 0 "

Casing: Type none Diam. 0 " Length 0 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. ______ (______) 2. Ft. ______ (______)

Drilling Company CCI Driller Donna R. Lewis

Drilling Method Direct Push/Geoprobe Log By Misty D. Savell

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -10 | 10 | | | | | | | |
| | | | | | 0 | | 10.7-13.45 | SILTY CLAY: mottled orange and light grey, moist, plastic, stiff, occasional silt veins (orange,light brown and rarely black), 100% recovery, no detectable odor. |
| -12 | 12 | | | | | 12-15 | | |
| | | | | | 0 | | 13.45-14.35 | SILTY CLAY: mottled orange and light grey, moist, plastic, stiff, abundant silt veins (orange, light brown and black), 100% recovery, no detectable odor. |
| -14 | 14 | | | | | | | |
| | | | | | 0 | | 14.35-15.1 | SILTY CLAY: light grey with occasional orange mottling, damp, plastic, hard, occasional silt veins (light brown and black), 100% recovery, no detectable odor. |
| | | | | | 0 | 15-18 | 15.1-16 | SILTY SANDY CLAY: light grey with orange mottling, damp, plastic, hard, abundant silt veins (light brown and rarely black), 100% recovery, no detectable odor. |
| -16 | 16 | | | | 0 | | 16-16.85 | SANDY CLAY: orange, wet, slightly plastic, hard, 100% recovery, no detectable odor. |
| | | | | | 0 | | 16.85-17.2 | SILTY SAND: orange, wet, loose, 100% recovery, no detectable odor. |
| | | | | | 0 | | 17.2-17.4 | SANDY CLAY: light grey with orange mottling, moist, plastic, stiff, 100% recovery, no detectable odor. |
| | | | | | 0 | | 17.4-18 | SILTY SAND: mottled orange and light brown, saturated, loose, 100% recovery, no detectable odor. |
| -18 | 18 | | | | 0 | 18-21 | 18-18.2 | SANDY CLAY: mottled orange and grey, moist, plastic, hard, 100% recovery, no detectable odor. |
| | | | | | 0 | | 18.2-20 | SILTY SAND: orangish brown, saturated, loose, 50% recovery, no detectable odor. |
| -20 | 20 | | | | | | | |

ERM

# SB-54
# DRILLING LOG

W.O. NO. 0014507 Boring/Well ID SB-54 Date Drilled 11/17/2004

Project WP Offsite Delineation Owner Whirlpool

Location Ft. Smith, AR Boring T.D. 25 ' Boring Diam. 3 "

N. Coord. 9835.7 E. Coord. 8102.4 Surface Elevation 467.4' Ft. MSL Datum

Screen: Type none Diam. 0 " Length 0 ' Slot Size 0 "

Casing: Type none Diam. 0 " Length 0 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. ______ (______) 2. Ft. ______ (______)

Drilling Company CCI Driller Donna R. Lewis

Drilling Method Direct Push/Geoprobe Log By Misty D. Savell

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -20 | 20 | | | | 0 | | 20-20.6 | SANDY CLAY: orange with light grey mottling, damp, slightly plastic, stiff, occasional quartzite gravels (~2 mm - 2 cm), 100% recovery, no detectable odor. |
| | | | | | 0 | | 20.6-20.7 | SILTY SAND: brownish orange, moist, loose, 100% recovery, no detectable odor. |
| | | | | | 0 | 21-25 | 20.7-21 | SANDY CLAY: orange with light grey mottling, moist, very slightly plastic, stiff, occasional iron nodules (~2 mm), 100% recovery, no detectable odor. |
| | | | | | 0 | | 21-21.8 | SILTY SAND: orangish brown, saturated, flowing, occasional quartzite gravels (~2-3 cm), 100% recovery, no detectable odor. |
| -22 | 22 | | | | 0 | | 21.8-22.3 | SILTY CLAY: mottled orange and light grey, moist, plastic, stiff, occasional quartzite gravels (~2cm), 100% recovery, no detectable odor. |
| | | | | | 0 | | 22.3-24.5 | SILTY CLAY: orange, black and greyish brown laminae, moist, plastic, very stiff, 100% recovery, no detectable odor. |
| -24 | 24 | | | | 0 | | 24.5-25 | SHALE: dark grey with occasional orange mottlings, damp, crumbly, hard, fissile, 100% recovery, no detectable odor. |
| | | | | | 0 | | | T.D. = 25 ' |
| -26 | 26 | | | | | | | |
| -28 | 28 | | | | | | | |
| -30 | 30 | | | | | | | |

ERM

# MW-55
# DRILLING LOG

W.O. NO. 0014507 Boring/Well ID MW-55 Date Drilled 11/17/2004

Project WP Offsite Delineation Owner Whirlpool

Location Ft. Smith, AR Boring T.D. 21 ' Boring Diam. 3 "

N. Coord. 9984.19 E. Coord. 8104.37 Surface Elevation 465.5' Ft. MSL Datum

Screen: Type Stainless prepak Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 15.5 ' Sump Length 0.5 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. ______ ( ______ ) 2. Ft. ______ ( ______ )

Drilling Company CCI Driller Donna R. Lewis

Drilling Method Direct Push/Geoprobe Log By Misty D. Savell

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | 37.9 | 0-4 | 0-0.4 | CLAYEY SILT: dark brown, moist, loose, abundant root hairs, roots, and vegetative matter, 100% recovery, strong pine odor. |
| | | | | | 0 | | 0.4-0.75 | SILTY CLAY: greyish medium brown to greyish reddish brown, moist, plastic, very soft, slight pine odor, 100% recovery, slight pine odor. |
| | | | | | 0 | | 0.75-3.7 | SILTY CLAY: reddish light brown, wet, plastic, very soft, occasional iron nodules (~2 mm), 72% recovery, no detectable odor. |
| -2 | 2 | | | | | | | |
| -4 | 4 | | | | 0 | 4-8 | 3.7-5.2 | SILTY CLAY: mottled orange and light brown, moist, plastic, soft, occasional silt veins (light brown), clay nodules (reddish light brown very soft, 1-3 cm), rare iron nodules (~2 mm ), 100% recovery, no detectable odor. |
| | | | | | 0 | | 5.2-5.8 | SILTY CLAY: orangish light brown, moist, plastic, soft, abundant sand veins (light brown and orange), 100% recovery, no detectable odor. |
| -6 | 6 | | | | 0 | | 5.8-6.4 | SILTY CLAY: mottled orange and light to medium grey, moist,plastic, soft, occasional sand veins (light brown and orange), 100% recovery, no detectable odor. |
| | | | | | 0 | | 6.4-8 | SILTY CLAY: medium to dark grey with orange and light brown mottling, moist, plastic, soft, 100% recovery, no detectable odor. |
| -8 | 8 | | | | 0 | 8-12 | 8-8.9 | SILTY CLAY: medium to dark grey with orange and light brown mottling, moist, plastic, very soft, 100% recovery, no detectable odor. |
| | | | | | 0 | | 8.9-10.7 | SANDY SILTY CLAY: orange with light grey mottling, moist, plastic, clay interbeds with abundant iron nodules, occasional silt veins (light brown and orange), abundant iron nodules (~2 mm), 100% recovery, no detectable odor. |
| -10 | 10 | | | | | | | |

ERM

# MW-55
# DRILLING LOG

W.O. NO. 0014507 Boring/Well ID MW-55 Date Drilled 11/17/2004

Project WP Offsite Delineation Owner Whirlpool

Location Ft. Smith, AR Boring T.D. 21 ' Boring Diam. 3 "

N. Coord. 9984.19 E. Coord. 8104.37 Surface Elevation 465.5' Ft. MSL Datum

Screen: Type Stainless prepak Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 15.5 ' Sump Length 0.5 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. ________ (________) 2. Ft. ________ (________)

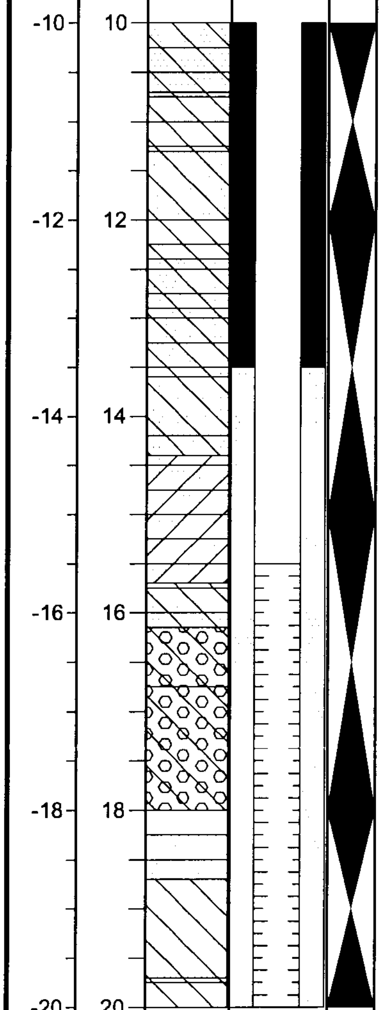
Drilling Company CCI Driller Donna R. Lewis

Drilling Method Direct Push/Geoprobe Log By Misty D. Savell

SKETCH MAP

NOTES

Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type




| OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|
| 0 | | 10.7-11.3 | SILTY CLAY: orange with occasional reddish medium brown and light grey mottling, moist, plastic, stiff, common silt to very fine sand veins (orange and light grey), 100% recovery, no detectable odor. |
| 0 | | 11.3-12 | SANDY CLAY: light grey with orange mottling, moist, plastic, soft, occasional sand veins (light grey and orange), 100% recovery, no detectable odor. |
| 0 | 12-15 | 12-12.4 | SILTY CLAY: reddish light brown, moist, plastic, very soft, 100% recovery, no detectable odor. |
| 0 | | 12.4-12.9 | SILTY SANDY CLAY: greyish light brown, moist, plastic, very soft, rare silt veins (light grey), 100% recovery, no detectable odor. |
| 0 | | 12.9-13.6 | SANDY SILTY CLAY: light grey with orange and greyish medium brown, moist, plastic, stiff, occasional silt veins (orange, light brown, and black), 100% recovery, no detectable odor. |
| 0 | | 13.6-14.2 | SANDY CLAY: orange with light grey and medium brown mottling, moist, slightly plastic, very soft, 100% recovery, no detectable odor. |
| 0 | | 14.2-14.4 | SANDY CLAY: light grey with orange mottling, moist, slightly plastic, very soft, occasional silt veins (light grey and black), 100% recovery, no detectable odor. |
| 0 | 15-18 | 14.4-15.7 | SILTY CLAYEY SAND: orange, saturated, loose, 100% recovery, no detectable odor. |
| 0 | | 15.7-16.15 | SILTY SANDY CLAY: orange, moist, plastic, stiff, abundant quartzite gravels (~2 mm), occasional iron nodules (~2 mm), and occasional clay inclusions (light grey, ~2-5 mm), 100% recovery, no detectable odor. |
| 0 | | 16.15-16.75 | GRAVELLY CLAY: greenish light grey, moist,plastic, stiff, abundant quartzite gravels (~1-2 cm), 100% recovery, no detectable odor. |
| 0 | | 16.75-18 | GRAVELLY CLAY: orange with rare greenish light grey mottling, moist, slightly plastic, stiff, abundant quartzite gravels (~1-3 cm), rare iron nodules (~2 mm), 100% recovery, no detectable odor. |
| 0 | 18-21 | 18-18.7 | SILTY SAND: orange, saturated, flowing, occasional quartzite gravels (~1 cm), 100% recovery, no detectable odor. |
| 0 | | 18.7-19.7 | SANDY CLAY: orange with light brown and medium grey mottling and rare black mottling, moist, slightly plastic, stiff, common quartzite gravels (~1-3 cm), 100% recovery, no detectable odor. |
| 0 | | 19.7-20.2 | SILTY CLAY: orange with light grey and black laminae, moist, plastic, stiff, occasional silt laminae (orange, light grey, and black), 100% recovery, no detectable odor. |

ERM

# MW-55 DRILLING LOG

| | | | | | |
|---|---|---|---|---|---|
| W.O. NO. | 0014507 | Boring/Well ID | MW-55 | Date Drilled | 11/17/2004 |
| Project | WP Offsite Delineation | Owner | Whirlpool | | |
| Location | Ft. Smith, AR | Boring T.D. | 21 ' | Boring Diam. | 3 " |
| N. Coord. | 9984.19 | E. Coord. | 8104.37 | Surface Elevation | 465.5' Ft. MSL Datum |

Screen: Type Stainless prepak  Diam. 0.75 "  Length 5 '  Slot Size 0.01 "

Casing: Type Schedule 40 PVC  Diam. 0.75 "  Length 15.5 '  Sump Length 0.5 '

Top of Casing Elevation 0 '  Stickup 0 '

Depth to Water: 1. Ft. ______ ( ______ ) 2. Ft. ______ ( ______ )

Drilling Company CCI  Driller Donna R. Lewis

Drilling Method Direct Push/Geoprobe  Log By Misty D. Savell

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -20 | 20 | | | | 0 | | 20.2-20.4 | SILTY CLAY: light grey with orange and black laminae, moist, plastic, very stiff, occasional silt laminae (light grey, orange, and black), 100% recovery, no detectable odor. |
| | | | | | 0 | | 20.4-21 | SHALE: dark grey with occasional orange mottlings, damp, crumbly, hard, fissile, 100% recovery, no detectable odor. |
| | | | | | 0 | | | T.D. = 21 ' |
| -22 | 22 | | | | | | | |
| -24 | 24 | | | | | | | |
| -26 | 26 | | | | | | | |
| -28 | 28 | | | | | | | |
| -30 | 30 | | | | | | | |

ERM

# MW-56
# DRILLING LOG

W.O. NO. 0014507 Boring/Well ID MW-56 Date Drilled 11/18/2004

Project WP Offsite Delineation Owner Whirlpool

Location Ft. Smith, AR Boring T.D. 21 ' Boring Diam. 3 "

N. Coord. 9846.68 E. Coord. 8510.04 Surface Elevation 463.4' Ft. MSL Datum

Screen: Type Stainless prepak Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 14.5 ' Sump Length 0.5 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. ________ (________) 2. Ft. ________ (________)

Drilling Company CCI Driller Donna R. Lewis

Drilling Method Direct Push/Geoprobe Log By Misty D. Savell

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | 0-4 | 0-2.3 | NO RECOVERY: 0% recovery, extremely wet conditions. |
| -2 | 2 | | | | | | 2.3-4 | SILTY SANDY CLAY: greyish medium brown with orange mottling, moist, plastic, soft, 100% recovery, no detectable odor. |
| -4 | 4 | | | | | 4-8 | 4-5.2 | SILTY SANDY CLAY: dark grey with occasional light grey mottling, moist, plastic, stiff, occasional very fine sand and silt inclusions (orange and light grey, ~1 cm), 100% recovery, no detectable odor. |
| | | | | | | | 5.2-6.15 | SILTY SANDY CLAY: dark grey with light grey mottling, moist, plastic, stiff, occasional very fine sand and silt inclusions (orange and light grey, ~1 cm), occaional iron nobules (1-2 mm), 100% recovery, no detectable odor. |
| -6 | 6 | | | | | | 6.15-6.75 | SILTY CLAY: light grey with dark grey mottling, moist, plastic, stiff, occasional silt veins (orange), occasional iron nodules (~2 mm), 100% recovery, no detectable odor. |
| | | | | | | | 6.75-8.7 | SILTY CLAY: light grey with occasional dark grey mottling and occasional orange mottling, moist, plastic, stiff, occasional silt and very fine sand (orange and rare light brown) veins, occasional iron nodules (~2 mm), silt and very fine sand inclusions (orange and rare light brown, <1 cm), 100% recovery, no detectable odor. |
| -8 | 8 | | | | | 8-12 | | |
| | | | | | | | 8.7-9.2 | SILTY CLAY: light grey with orange mottling, moist, plastic, clay interbeds with abundant iron nodules, stiff, abundand silt and very fine sand inclusions (light brown, <1 cm), occasional quartzite gravels (~1-2 cm), 100% recovery, no detectable odor. |
| | | | | | | | 9.2-10.2 | SILTY SANDY CLAY: orange with light grey mottling, moist,plastic, stiff, occasional silt and very fine sand (orange, light brown, and black) veins, occasional iron nodules (~2-4 mm), 100% recovery, no detectable odor. |
| -10 | 10 | | | | | | | |

ERM

# MW-56
# DRILLING LOG

W.O. NO. 0014507 Boring/Well ID MW-56 Date Drilled 11/18/2004

Project WP Offsite Delineation Owner Whirlpool

Location Ft. Smith, AR Boring T.D. 21 ' Boring Diam. 3 "

N. Coord. 9846.68 E. Coord. 8510.04 Surface Elevation 463.4' Ft. MSL Datum

Screen: Type Stainless prepak Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 14.5 ' Sump Length 0.5 '

Top of Casing Elevation 0 ' Stickup 0 '

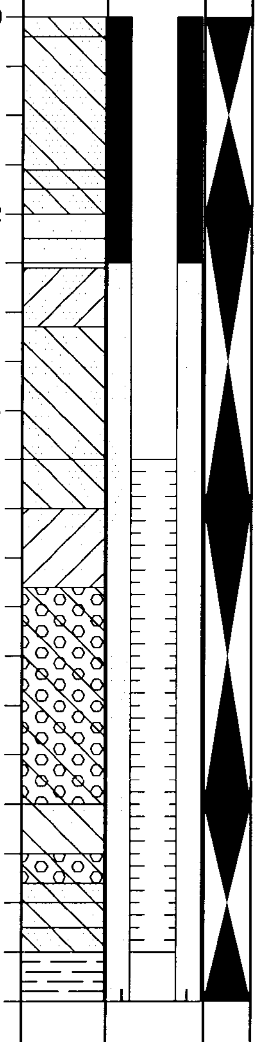
Depth to Water: 1. Ft. ______ ( ______ ) 2. Ft. ______ ( ______ )

Drilling Company CCI Driller Donna R. Lewis

Drilling Method Direct Push/Geoprobe Log By Misty D. Savell

SKETCH MAP

NOTES



| Elevation (Feet) | Depth (Feet) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|
| -10 | 10 | | 10.2-11.55 | SANDY CLAY: with gravel, light brown with orange and black mottling, moist, very slightly plastic, stiff, abundant iron nodules (~1 mm to ~1 cm), 100% recovery, no detectable odor. |
| | | | 11.55-11.75 | SANDY CLAY: light brown with orange and black mottling, moist, plastic, stiff, 100% recovery, no detectable odor. |
| | | | 11.75-12 | SANDY CLAY: light grey with orange and light brown mottling, moist, plastic, stiff, occasional very fine sand and silt inclusions (orange and light brown, ~1 cm), occaional iron nodules (1-2 mm), 100% recovery, no detectable odor. |
| -12 | 12 | 12-15 | 12-12.55 | SILTY SAND: orangish light brown, wet, loose, 100% recovery, no detectable odor. |
| | | | 12.55-13.15 | CLAYEY SAND: orange, wet, loose, occasional iron nodules (~2 mm), abundant quartzite gravels (~1cm), 100% recovery, no detectable odor. |
| | | | 13.15-14.5 | SANDY CLAY: orange, wet, very slightly plastic, stiff, abundant iron nodules (~2 mm), abundant quartzite gravels (~1-2 cm), 100% recovery, no detectable odor. |
| -14 | 14 | | 14.5-15 | SANDY CLAY: orange, wet, very slightly plastic, stiff , 100% recovery, abundant quartzite gravels (~1cm), no detectable odor. |
| | | 15-18 | 15-15.8 | CLAYEY SAND: light brown, saturated, loose, 100% recovery, no detectable odor. |
| -16 | 16 | | 15.8-18 | GRAVELLY CLAY: orange, moist, stiff, abundant iron nodules (~2 mm - 1 cm), abundant quartzite gravels (~1-3 cm), 100% recovery, no detectable odor. |
| -18 | 18 | 18-21 | 18-18.5 | SANDY CLAY: reddish light brown, saturated, slightly plastic, very soft, 100% recovery, no detectable odor. |
| | | | 18.5-18.8 | GRAVELLY CLAY: orange, moist, slightly plastic, stiff, abundant iron nodules (~2 mm), 100% recovery, no detectable odor. |
| | | | 18.8-19.5 | SILTY SANDY CLAY: orange with light and medium grey mottling, moist, plastic, very stiff, 100% recovery, no detectable odor. |
| | | | 19.5-21 | SHALE: dark grey with occasional orange mottlings, damp, crumbly, hard, fissile, 100% recovery, no detectable odor. |
| -20 | 20 | | | |

ERM

# MW-56 DRILLING LOG

W.O. NO. 0014507 | Boring/Well ID MW-56 | Date Drilled 11/18/2004

Project WP Offsite Delineation | Owner Whirlpool

Location Ft. Smith, AR | Boring T.D. 21 ' | Boring Diam. 3 "

N. Coord. 9846.68 | E. Coord. 8510.04 | Surface Elevation 463.4' | Ft. MSL Datum

Screen: Type Stainless prepak | Diam. 0.75 " | Length 5 ' | Slot Size 0.01 "

Casing: Type Schedule 40 PVC | Diam. 0.75 " | Length 14.5 ' | Sump Length 0.5 '

Top of Casing Elevation 0 ' | Stickup 0 '

Depth to Water: 1. Ft. ______ ( ______ ) 2. Ft. ______ ( ______ )

Drilling Company CCI | Driller Donna R. Lewis

Drilling Method Direct Push/Geoprobe | Log By Misty D. Savell

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -20 | 20 | | | | | | | SHALE: dark grey with occasional orange mottlings, damp, crumbly, hard, fissile, 100% recovery, no detectable odor. |
| | | | | | | | | T.D. = 21 ' |
| -22 | 22 | | | | | | | |
| -24 | 24 | | | | | | | |
| -26 | 26 | | | | | | | |
| -28 | 28 | | | | | | | |
| -30 | 30 | | | | | | | |

ERM

# MW-57 DRILLING LOG

| | | | | | |
|---|---|---|---|---|---|
| W.O. NO. | 0014507 | Boring/Well ID | MW-57 | Date Drilled | 11/18/2004 |
| Project | WP Offsite Delineation | Owner | Whirlpool | | |
| Location | Ft. Smith, AR | Boring T.D. | 20.5 ' | Boring Diam. | 3 " |
| N. Coord. | 9927.44 | E. Coord. | 8506.98 | Surface Elevation | 463.1' Ft. MSL Datum |

| | | | | | |
|---|---|---|---|---|---|
| Screen: Type | Stainless prepak | Diam. 0.75 " | Length 5 ' | Slot Size | 0.01 " |
| Casing: Type | Schedule 40 PVC | Diam. 0.75 " | Length 14 ' | Sump Length | 0.5 ' |
| Top of Casing Elevation | 0 ' | | | Stickup | 0 ' |

Depth to Water: 1. Ft. ________ (________) 2. Ft. ________ (________)

| | | | |
|---|---|---|---|
| Drilling Company | CCI | Driller | Donna R. Lewis |
| Drilling Method | Direct Push/Geoprobe | Log By | Misty D. Savell |

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| 0 | 0 | | 0-4 | 0-1.5 | SILTY SANDY CLAY: medium brown, saturated, plastic, very soft, occasional iron nodules (~2 mm), 100% recovery, no detectable odor. |
| | | 0 | | 1.5-3.45 | SILTY SANDY CLAY: light to medium brown with orange mottling, moist, plastic, stiff, occasional silt and very fine sand (orange, and light brown) veins, occasional silt and very fine sand inclusions (orange and light brown, <1 cm), 100% recovery, no detectable odor. |
| -2 | 2 | | | | |
| | | 0 | | 3.45-4.1 | SANDY CLAY: medium brown with orange mottling, slightly damp, plastic, stiff, occasional silt and very fine sand (orange, and light brown) veins and inclusions (orange and light brown, <1 cm), 100% recovery, no detectable odor. |
| -4 | 4 | 0 | 4-8 | 4.1-4.3 | GRAVEL: quartzite gravel in a clay matrix, orange, moist, iron nodules (~2-4 mm), 100% recovery, no detectable odor. |
| | | 0 | | 4.3-5.9 | SILTY CLAY: light grey with orange mottling, moist, plastic, stiff, occasional silt (light brown) veins and inclusions, occasional iron nodules (~2 mm), 100% recovery, no detectable odor. |
| -6 | 6 | 0 | | 5.9-6.55 | SANDY SILT: light brown to light grey, slightly damp, loose, 100% recovery, no detectable odor. |
| | | 0 | | | |
| | | 0 | | 6.55-6.8 | SILTY CLAY: light grey with dark grey mottling, moist, plastic, soft, occasional silt (light brown) veins and inclusions, 100% recovery, no detectable odor. |
| | | 0 | | 6.8-8 | SILTY CLAY: dark brown with black and orange mottling, moist, plastic, soft, occasional silt inclusions (orange, light brown, and dark brown, <1 cm), 100% recovery, no detectable odor. |
| -8 | 8 | 0 | 8-12 | 8-8.8 | SILTY CLAY: light to medium brown, wet, slightly plastic, very soft, 100% recovery, no detectable odor. |
| | | 0 | | 8.8-9.95 | SILTY SANDY CLAY: orange, moist, slightly plastic, stiff, abundant iron nodules (~2-4 mm), 100% recovery, no detectable odor. |
| -10 | 10 | 0 | | 9.95-13.5 | SANDY SILTY CLAY: light grey and orange, moist, plastic, stiff, occasional iron nodules (~2 mm), occasional silt and very fine sand inclusions (light brown, <1 cm), 100% recovery, no detectable odor. |

ERM

# MW-57
# DRILLING LOG

| | | | | | |
|---|---|---|---|---|---|
| W.O. NO. | 0014507 | Boring/Well ID | MW-57 | Date Drilled | 11/18/2004 |
| Project | WP Offsite Delineation | Owner | Whirlpool | | |
| Location | Ft. Smith, AR | Boring T.D. | 20.5 ' | Boring Diam. | 3 " |
| N. Coord. | 9927.44 | E. Coord. | 8506.98 | Surface Elevation | 463.1' Ft. MSL Datum |

Screen: Type Stainless prepak Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 14 ' Sump Length 0.5 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. ______ ( ______ ) 2. Ft. ______ ( ______ )

Drilling Company CCI Driller Donna R. Lewis

Drilling Method Direct Push/Geoprobe Log By Misty D. Savell

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) |
|---|---|
| -10 | 10 |
| -12 | 12 |
| -14 | 14 |
| -16 | 16 |
| -18 | 18 |
| -20 | 20 |

| OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|
| 0 | 12-16 | 13.5-13.7 | SILTY CLAY: light greenish grey with orange mottling, moist, plastic, stiff, occasional silt (light brown) veins, 100% recovery, no detectable odor. |
| 0 | | 13.7-14.45 | SANDY SILTY CLAY: light grey with rare orange mottlings, moist, plastic, stiff, occasional silt and very fine sand (light brown) veins and inclusions, 100% recovery, no detectable odor. |
| 0 | | 14.45-15.2 | SANDY SILTY CLAY: orange with rare light grey mottling, moist, plastic, stiff, abundant iron nodules (~2 mm), numerous quartzite gravels (~2-3 cm), 100% recovery, no detectable odor. |
| 0 | | 15.2-15.5 | SANDY SILTY CLAY: dark brown, moist, slightly plastic, stiff, abundant iron nodules (~2 mm), 100% recovery, no detectable odor. |
| 0 | | 15.5-15.85 | SANDY CLAY: mottled light grey and orange, moist, slightly plastic, soft, occasional quartzite gravels (~3-4 cm), 100% recovery, no detectable odor. |
| 0 | | 15.85-16 | SANDY CLAY: orange, moist, slightly plastic, soft, abundant iron nodules (~2 mm), occasional quartzite gravels (~1cm), 100% recovery, no detectable odor. |
| 0 | 16-19 | 16-16.6 | CLAYEY SILTY SAND: orangish light brown, saturated, flowing, 100% recovery, no detectable odor. |
| 0 | | 16.6-17.55 | SANDY CLAY: orange with light grey mottling, moist, slightly plastic, soft, occasional quartzite gravels (~1-3 cm), 100% recovery, no detectable odor. |
| 0 | | 17.55-18.5 | GRAVELLY CLAY: orange, moist, plastic, stiff, abundant quartzite gravels (~2-3 cm), 100% recovery, no detectable odor. |
| 0 | | 18.5-18.8 | SILTY CLAY: greenish grey, moist,plastic, soft, 100% recovery, no detectable odor. |
| 0 | | 18.8-19 | SILTY CLAY: dark brown to dark grey, damp, plastic, very stiff, 100% recovery, no detectable odor. |
| 0 | | 19-20.5 | SHALE: dark grey with occasional orange mottlings, damp, crumbly, hard, fissile, 100% recovery, no detectable odor. |

ERM

# MW-57
# DRILLING LOG

W.O. NO. 0014507 Boring/Well ID MW-57 Date Drilled 11/18/2004

Project WP Offsite Delineation Owner Whirlpool

Location Ft. Smith, AR Boring T.D. 20.5 ' Boring Diam. 3 "

N. Coord. 9927.44 E. Coord. 8506.98 Surface Elevation 463.1' Ft. MSL Datum

Screen: Type Stainless prepak Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 14 ' Sump Length 0.5 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. ______ (______) 2. Ft. ______ (______)

Drilling Company CCI Driller Donna R. Lewis

Drilling Method Direct Push/Geoprobe Log By Misty D. Savell

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -20 | 20 | | | | 0 | | | SHALE: dark grey with occasional orange mottlings, damp, crumbly, hard, fissile, 100% recovery, no detectable odor.<br>T.D. = 20.5 ' |
| -22 | 22 | | | | | | | |
| -24 | 24 | | | | | | | |
| -26 | 26 | | | | | | | |
| -28 | 28 | | | | | | | |
| -30 | 30 | | | | | | | |

ERM

# MW-58
# DRILLING LOG

W.O. NO. 0014507 | Boring/Well ID MW-58 | Date Drilled 11/19/2004

Project WP Offsite Delineation | Owner Whirlpool

Location Ft. Smith, AR | Boring T.D. 19 ' | Boring Diam. 3 "

N. Coord. 10012.09 | E. Coord. 8380.45 | Surface Elevation 462.9' | Ft. MSL Datum

Screen: Type Stainless prepak | Diam. 0.75 " | Length 5 ' | Slot Size 0.01 "

Casing: Type Schedule 40 PVC | Diam. 0.75 " | Length 12.5 ' | Sump Length 0.5 '

Top of Casing Elevation 0 ' | Stickup 0 '

Depth to Water: 1. Ft. ______ ( ______ ) 2. Ft. ______ ( ______ )

Drilling Company CCI | Driller Donna R. Lewis

Drilling Method Direct Push/Geoprobe | Log By Misty D. Savell

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | 0-4 | 0-1.65 | SILTY SANDY CLAY: medium brown with iron staining along root hairs, wet, plastic, very soft, abundant root hairs, vegetative debris in top 0.3 ft., 61% recovery, no detectable odor. |
| | | | | | 0 | | 1.65-2.3 | SILTY SANDY CLAY: medium brown with occasional orange mottlings, saturated, plastic, very soft, occasional iron nodules (~2 mm), 100% recovery, no detectable odor. |
| -2 | 2 | | | | 0 | | 2.3-2.85 | SILTY SANDY CLAY: dark brown with red mottlings, moist, plastic, soft, occasional silt and very fine sand (light brown) veins and inclusions, 100% recovery, no detectable odor. |
| | | | | | 0 | | 2.85-5.15 | SILTY SANDY CLAY: dark brown with orange mottlings, moist, plastic, soft, occasional silt and very fine sand (light brown) veins and inclusions, 100% recovery, no detectable odor. |
| -4 | 4 | | | | | 4-8 | | |
| | | | | | 0 | | 5.15-8 | SILTY CLAY: light greenish grey with orange mottling and rare dark grey and brown mottling, moist, plastic, stiff, occasional silt and very fine sand (light brown and orange) veins and inclusions, 100% recovery, no detectable odor. |
| -6 | 6 | | | | | | | |
| -8 | 8 | | | | 0 | 8-12 | 8-9.7 | SILTY CLAY: light greenish grey with orange mottlings and rare dark grey to dark brown mottling, very moist, plastic, very soft, occasional silt and very fine sand (light brown and orange) veins and inclusions, occasional iron nodules (2mm to 1 cm), 100% recovery, no detectable odor. |
| | | | | | 0 | | 9.7-10.25 | SILTY SANDY CLAY: light greenish grey, moist, plastic, stiff, occasional silt and very fine sand (light brown and orange) veins and inclusions, occasional iron nodules (2mm to 1 cm), 100% recovery, no detectable odor. |
| -10 | 10 | | | | | | | |

ERM

# MW-58 DRILLING LOG

W.O. NO. 0014507 Boring/Well ID MW-58 Date Drilled 11/19/2004

Project WP Offsite Delineation Owner Whirlpool

Location Ft. Smith, AR Boring T.D. 19 ' Boring Diam. 3 "

N. Coord. 10012.09 E. Coord. 8380.45 Surface Elevation 462.9' Ft. MSL Datum

Screen: Type Stainless prepak Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 12.5 ' Sump Length 0.5 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. ______ (______) 2. Ft. ______ (______)

Drilling Company CCI Driller Donna R. Lewis

Drilling Method Direct Push/Geoprobe Log By Misty D. Savell

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -10 | 10 | | | | 0 | | 10.25-11.55 | SANDY CLAY: orange, moist, plastic, stiff, abundant iron nodules (~2-4 mm), occasional quartzite gravels (~1cm), 100% recovery, no detectable odor. |
| | | | | | 0 | | 11.55-12 | SILTY CLAY: mottled orange, black and rarely light brown, moist, plastic, stiff, occasional silt (light brown and orange) veins, 100% recovery, no detectable odor. |
| -12 | 12 | | | | 0 | 12-15 | 12-12.55 | SANDY CLAY: light grey with orange and black mottling, moist, slightly plastic, stiff, 100% recovery, no detectable odor. |
| | | | | | 0 | | 12.55-13.4 | CLAYEY SAND: light grey with orange and black mottling, moist, dense, 100% recovery, no detectable odor. |
| | | | | | 0 | | 13.4-14.1 | CLAYEY SAND: mottled orange and light grey, moist, dense, occasional quartzite gravels (~2-3 cm), 100% recovery, no detectable odor. |
| -14 | 14 | | | | 0 | | 14.1-15 | CLAYEY SAND: orange, moist, dense, abundant iron nodules (~2 mm - 1 cm), occasional quartzite gravels (~2-3 cm), 100% recovery, no detectable odor. |
| | | | | | 0 | 15-19 | 15-16 | SILTY SAND: orangish medium brown, saturated, flowing, 100% recovery, no detectable odor. |
| -16 | 16 | | | | 0 | | 16-16.55 | SANDY CLAY: orange, moist,very slightly plastic, stiff, occasional iron nodules (~2 mm), occasional quartzite gravels (~3 mm - 1 cm), 100% recovery, no detectable odor. |
| | | | | | 0 | | 16.55-17 | CLAYEY SAND: orange, wet, loose, occasional quartzite gravels (~2 mm), 100% recovery, no detectable odor. |
| | | | | | 0 | | 17-17.6 | SILTY CLAY: orange with dark brown light grey and black mottling, slightly damp, slightly plastic, very stiff, occasional silt (light brown, black and orange) veins, 100% recovery, no detectable odor. |
| -18 | 18 | | | | 0 | | 17.6-18.2 | SILTY CLAY: dark brown to dark grey with orange, light grey and black mottling, slightly damp, slightly plastic, hard, occasional silt (black, light brown, and orange) veins, 100% recovery, no detectable odor. |
| | | | | | 0 | | 18.2-19 | SHALE: black, damp, crumbly, hard, fissile, 100% recovery, no detectable odor. |
| | | | | | 0 | | | T.D. = 19 ' |
| -20 | 20 | | | | | | | |

ERM

# SB-59
# DRILLING LOG

W.O. NO. 0014507 Boring/Well ID SB-59 Date Drilled 11/18/2004

Project WP Offsite Delineation Owner Whirlpool

Location Ft. Smith, AR Boring T.D. 20 ' Boring Diam. 3 "

N. Coord. 9917.6 E. Coord. 8313.1 Surface Elevation 464.3' Ft. MSL Datum

Screen: Type none Diam. 0 " Length 0 ' Slot Size 0 "

Casing: Type none Diam. 0 " Length 0 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. ______ (______) 2. Ft. ______ (______)

Drilling Company CCI Driller Donna R. Lewis

Drilling Method Direct Push/Geoprobe Log By Misty D. Savell

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0-4 | 0-0.9 | CLAYEY SANDY SILT: dark brown, wet, loose, occasional root hairs and vegetative debris, 100% recovery, no detectable odor. |
| | | 0 | | 0.9-2.85 | SILTY SANDY CLAY: medium brown, saturated, slightly plastic, very soft, occasional iron nodules (~2 mm), 100% recovery, no detectable odor. |
| -2 | 2 | | | | |
| | | 0 | | 2.85-4.75 | SILTY SANDY CLAY: dark brown with orange and red mottling, moist, plastic, stiff, occasional silt and very fine sand (light brown and orange) veins and inclusions, occasional iron nodules (~2 mm), 100% recovery, no detectable odor. |
| | | 0 | | | |
| -4 | 4 | | 4-8 | | |
| | | 0 | | 4.75-6.2 | SILTY CLAY: dark brown with medium grey, light grey, and orange mottlings, damp, plastic, stiff, rare quartzite gravels (~3 mm), abundant silt inclusions (~1-3 cm), 100% recovery, no detectable odor. |
| -6 | 6 | | | | |
| | | 0 | | 6.2-8 | SILTY CLAY: mottled dark brown, light grey, orange and black, damp, plastic, stiff, occasional silt inclusions (light brown, ~3 cm), 100% recovery, no detectable odor. |
| | | | | | SANDY CLAY: medium brown, wet, plastic, very soft, occasional quartzite gravels (~3 mm - 1 cm), 100% recovery, no detectable odor. |
| -8 | 8 | 0 | 8-12 | 8-9 | SILTY CLAY: dark brown with occasional red mottlings, damp, plastic, stiff, occasional silt and very fine sand (light brown) veins, occasional silt inclusions (light brown, <1 cm), 100% recovery, no detectable odor. |
| | | 0 | | 9-9.2 | SILTY CLAY: light grey with orange mottlings, moist, plastic, stiff, occasional silt (light brown and orange) veins and inclusions, 100% recovery, no detectable odor. |
| | | 0 | | 9.2-9.55 | |
| | | 0 | | 9.55-10.25 | SILTY CLAY: light grey with orange mottling, moist, plastic, stiff, occasional silt (orange, black, and light brown) veins and inclusions, abundant iron nodule (~2 mm), 100% recovery, no detectable odor. |
| -10 | 10 | | | | |

ERM

# SB-59 DRILLING LOG

| | | | | | |
|---|---|---|---|---|---|
| W.O. NO. | 0014507 | Boring/Well ID | SB-59 | Date Drilled | 11/18/2004 |
| Project | WP Offsite Delineation | Owner | Whirlpool | | |
| Location | Ft. Smith, AR | Boring T.D. | 20 ' | Boring Diam. | 3 " |
| N. Coord. | 9917.6 | E. Coord. | 8313.1 | Surface Elevation | 464.3' Ft. MSL Datum |

Screen: Type none  Diam. 0 "  Length 0 '  Slot Size 0 "

Casing: Type none  Diam. 0 "  Length 0 '  Sump Length 0 '

Top of Casing Elevation 0 '  Stickup 0 '

Depth to Water: 1. Ft. ______ (______) 2. Ft. ______ (______)

Drilling Company CCI  Driller Donna R. Lewis

Drilling Method Direct Push/Geoprobe  Log By Misty D. Savell

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -10 | 10 | | | | 0 | | 10.25-12 | SILTY CLAY: light grey with orange mottling, plastic, stiff, occasional silt and very fine sand (light brown and orange) veins and inclusions, rare iron nodule (~2 mm), 100% recovery, no detectable odor. |
| -12 | 12 | | | | 0 | 12-16 | 12-13.7 | SANDY CLAY: mottled light grey, dark grey, and orange, moist, plastic, soft, occasional silt and very fine sand (light brown, orange, and dark grey) veins and inclusions, 100% recovery, no detectable odor. |
| | | | | | 0 | | 13.7-14.5 | SANDY CLAY: orange with occasional black mottling, moist, slightly plastic, stiff, very abundant iron nodules (~2 mm), occasional quartzite gravels (~1cm), 100% recovery, no detectable odor. |
| -14 | 14 | | | | 0 | | 14.5-15.1 | SILTY CLAY: greenish light grey with occasional orange mottling, moist, plastic, stiff, occasional fine to medium-grained sand inclusions (orange, and light brown, ~<1cm), 100% recovery, no detectable odor. |
| | | | | | 0 | | 15.1-15.5 | CLAYEY SAND: brownish light grey, very moist, dense, 100% recovery, no detectable odor. |
| | | | | | 0 | | 15.5-16 | SANDY CLAY: orange, moist, plastic, stiff, occasional iron nodules (~2 mm), common quartzite gravels (~1cm), 100% recovery, no detectable odor. |
| -16 | 16 | | | | 0 | 16-19 | 16-17.5 | SILTY SAND: orange, saturated, flowing, 100% recovery, no detectable odor. |
| | | | | | 0 | | 17.5-18.8 | GRAVELLY CLAY: orange, slightly moist, slightly plastic, stiff, occasional iron nodules (~2 mm), occasional quartzite gravels (~3 mm - 1 cm), 100% recovery, no detectable odor. |
| -18 | 18 | | | | 0 | | 18.8-19 | SILTY SAND: yellowish light brown, slightly damp, loose, occasional quartzite gravels (~3 mm - 1 cm), 100% recovery, no detectable odor. |
| | | | | | 0 | 19-20 | 19-19.7 | SILTY CLAY: dark brown, moist, plastic, very stiff, 100% recovery, no detectable odor. |
| | | | | | 0 | | 19.7-20 | SHALE: black, damp, crumbly, hard, fissile, 100% recovery, no detectable odor. |
| -20 | 20 | | | | 0 | | | T.D. = 20 ' |

ERM

# MW-60
# DRILLING LOG

W.O. NO. 0014507 Boring/Well ID MW-60 Date Drilled 4/4/2005

Project WP Offsite Delineation Owner Whirlpool

Location Fort Smith, AR Boring T.D. 17.5 ' Boring Diam. 3 "

N. Coord. 10307.87 E. Coord. 8503.43 Surface Elevation 461' Ft. MSL Datum

Screen: Type Stainless prepak Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 12 ' Sump Length 0.5 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 11.34 ( 4-5-05 17:21; predevelopment ) 2. Ft. 5.8 ( 4-11-05 10:17; postdevelopment )

Drilling Company CCI Driller Donna R. Lewis

Drilling Method Direct Push/Geoprobe Log By Misty D. Savell

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | 0-4 | 0-1.7 | SANDY CLAY: dark brown with minor yellowish-red mottling, moist, plastic, very soft, abundant roots and root hairs, 100% recovery, no detectable odor. |
| -2 | 2 | | | | 0 ppm | | 1.7-2.2 | SANDY CLAY: dark brown, damp, slightly plastic, very soft, occasional root hairs, 100% recovery. |
| | | | | | 3.3 ppm | | 2.2-2.8 | CLAYEY SAND: brown, saturated, loose, 100% recovery, no odor. |
| | | | | | 0 ppm | | 2.8-3.5 | SANDY CLAY: brown, very moist, plastic, very soft, occasional iron nodules (2 mm), 100% recovery, no odor. |
| | | | | | 0 ppm | | 3.5-4 | SANDY CLAY: saturated, slightly plastic, very soft, occasional iron nodules (2 mm), 100% recovery, no odor. |
| -4 | 4 | | | | 0 ppm | 4-8 | 4-5.1 | SANDY CLAY: mottled light grey, yellowish-red, and reddish-brown, very moist, slightly plastic, stiff, occasional iron nodules (2 mm), 100% recovery, no odor. |
| | | | | | 0 ppm | | 5.1-5.4 | SANDY CLAY: reddish-brown, moist, plastic, stiff, abundant iron nodules (2 mm), 100% recovery, no odor. |
| | | | | | 0 ppm | | 5.4-5.75 | SANDY CLAY: mottled light grey, yellowish-red, and reddish-brown, very moist, slightly plastic, stiff, occasional iron nodules (2 mm), 100% recovery, no odor. |
| | | | | | 0 ppm | | 5.75-6 | SANDY CLAY: reddish-brown, moist, plastic, stiff, abundant iron nodules (2 mm), 100% recovery, no odor. |
| -6 | 6 | | | | 0 ppm | | 6-6.2 | SANDY CLAY: mottled light grey, yellowish-red, and reddish-brown, very moist, slightly plastic, stiff, occasional iron nodules (2 mm), 100% recovery, no odor. |
| | | | | | 0 ppm | | 6.2-6.8 | SANDY CLAY: reddish-brown, moist, plastic, stiff, abundant iron nodules (2 mm), 100% recovery, no odor. |
| | | | | | 0 ppm | | 6.8-7.2 | SANDY CLAY: mottled light grey, yellowish-red, and reddish-brown, very moist, slightly plastic, stiff, occasional iron nodules (2 mm), 100% recovery, no odor. |
| | | | | | 0 ppm | | 7.2-8 | SANDY CLAY: reddish-brown, moist, plastic, stiff, abundant iron nodules (2 mm), 100% recovery, no odor. |
| -8 | 8 | | | | 0 ppm | 8-12 | 8-10.6 | SANDY CLAY: greyish-brown, saturated, slightly plastic, very soft, 100% recovery, no odor. |
| -10 | 10 | | | | | | | |

ERM

# MW-60 DRILLING LOG

W.O. NO. 0014507 Boring/Well ID MW-60 Date Drilled 4/4/2005

Project WP Offsite Delineation Owner Whirlpool

Location Fort Smith, AR Boring T.D. 17.5 ' Boring Diam. 3 "

N. Coord. 10307.87 E. Coord. 8503.43 Surface Elevation 461' Ft. MSL Datum

Screen: Type Stainless prepak Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 12 ' Sump Length 0.5 '

Top of Casing Elevation 0 ' Stickup 0 '

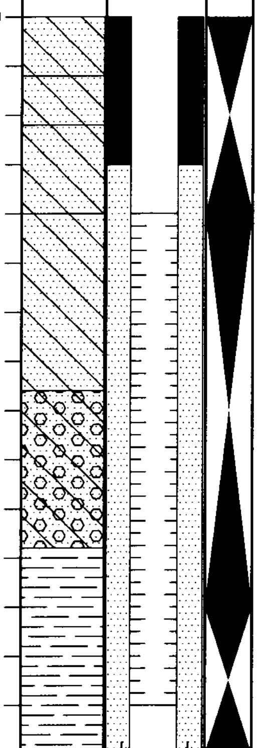
Depth to Water: 1. Ft. 11.34 ( 4-5-05 17:21; predevelopment ) 2. Ft. 5.8 ( 4-11-05 10:17; postdevelopment )

Drilling Company CCI Driller Donna R. Lewis

Drilling Method Direct Push/Geoprobe Log By Misty D. Savell

SKETCH MAP

NOTES



| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -10 | 10 | | | | | | | |
| | | | | | 0 ppm | | 10.6-11.1 | SANDY CLAY TO CLAYEY SAND: dark greyish brown with minor yellowish-red mottling, damp, very slightly plastic, stiff, abundant iron nodules (2 mm), abundant coarse-grained sand, 100% recovery, no odor. |
| | | | | | 0 ppm | | 11.1-12 | SANDY CLAY TO CLAYEY SAND: mottled yellowish-red and greenish-grey, damp, very slightly plastic, stiff, abundant iron nodules (2 mm), abundant coarse-grained sand,100% recovery, no odor. |
| -12 | 12 | | | | 0 ppm | 12-16 | 12-13.8 | SANDY CLAY: mottled yellowish-red, light grey, and light brown, moist, slightly plastic, stiff, occasional iron nodules (2 mm), 100% recovery, no odor. |
| -14 | 14 | | | | 0 ppm | | 13.8-15.4 | GRAVELLY SANDY CLAY: mottled yellowish-red and brown, damp, stiff, very slightly plastic, occasional iron nodules (2 mm), abundant gravel (1-3 cm, quartzite), abundant coarse-grained sand, 100% recovery, no odor. |
| | | | | | 0 ppm | | 15.4-17.5 | SHALE: weathered, dark grey with minor yellowish-red mottling, very slightly damp, hard, fissile, 100% recovery, no odor. |
| -16 | 16 | | | | | 16-17.5 | | |
| | | | | | 0 ppm | | | T.D. = 17.5 ' |
| -18 | 18 | | | | | | | |
| -20 | 20 | | | | | | | |

ERM

# MW-61
# DRILLING LOG

W.O. NO. 0014507  Boring/Well ID MW-61  Date Drilled 4/4/2005

Project WP Offsite Delineation  Owner Whirlpool

Location Fort Smith, AR  Boring T.D. 16 '  Boring Diam. 3 "

N. Coord. 10308.13  E. Coord. 8796.61  Surface Elevation 459.8'  Ft. MSL Datum

Screen: Type Stainless prepak  Diam. 0.75 "  Length 5 '  Slot Size 0.01 "

Casing: Type Schedule 40 PVC  Diam. 0.75 "  Length 10.5 '  Sump Length 0.5 '

Top of Casing Elevation 0 '  Stickup 0 '

Depth to Water: 1. Ft. 12.13 ( 4-5-05 17:12; predevelopment ) 2. Ft. 7.98 ( 4-11-05 17:12; postdevelopment )

Drilling Company CCI  Driller Donna R. Lewis

Drilling Method Geoprobe  Log By Misty D. Savell

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| 0 | 0 | | 0-5 | 0-1 | SANDY CLAY: dark brown, moist, slightly plastic, very soft, abundant roots and root hairs, 100% recovery, no odor. |
| | | 0 ppm | | 1-2 | SANDY CLAY: brown, moist, slightly plastic, very soft, occasional root hairs, 100% recovery, no odor. |
| -2 | 2 | 0 ppm | | 2-4.5 | SANDY CLAY: mottled yellowish-red and brown, damp very slightly plastic, soft, occasional iron nodules (2 mm), occasional quartzite gravel (2 cm), 100% recovery, no odor. |
| -4 | 4 | 0 ppm | | 4.5-5 | SANDY CLAY: reddish-brown, damp, very slightly plastic, stiff, abundant iron nodules (2-4 mm), 100% recovery, no odor. |
| | | 0 ppm | 5-8 | 5-5.4 | SANDY CLAY: yellowish-red with minor light brown mottling, slightly damp, very slightly plastic, stiff, occasional iron nodules (2-4 mm), 100% recovery, no odor. |
| | | 76 ppm | | 5.4-6.2 | SANDY CLAY: reddish-brown, damp, very slightly plastic, stiff, abundant iron nodules (2-4 mm), 100% recovery, no odor. |
| -6 | 6 | 83 ppm | | 6.2-6.5 | SANDY CLAY: mottled yellowish-red and light grey, slightly damp, slightly plastic, soft, 100% recovery, no odor. |
| | | | | 6.5-6.8 | SANDY CLAY: reddish-brown, damp, very slightly plastic, stiff, abundant iron nodules (2-4 mm), 100% recovery, no odor. |
| | | | | 6.8-7.2 | SANDY CLAY: mottled yellowish-red and light grey, slightly damp, slightly plastic, soft, 100% recovery, no odor. |
| | | | | 7.2-8 | SANDY CLAY: reddish-brown, damp, very slightly plastic, stiff, abundant iron nodules (2-4 mm), 100% recovery, no odor. |
| -8 | 8 | 254 ppm | 8-12 | 8-10.8 | SANDY CLAY: reddish-brown, saturated, slightly plastic, very soft, 100% recovery, no odor. |
| -10 | 10 | | | | |

ERM.

# MW-61
# DRILLING LOG

W.O. NO. 0014507 Boring/Well ID MW-61 Date Drilled 4/4/2005

Project WP Offsite Delineation Owner Whirlpool

Location Fort Smith, AR Boring T.D. 16 ' Boring Diam. 3 "

N. Coord. 10308.13 E. Coord. 8796.61 Surface Elevation 459.8' Ft. MSL Datum

Screen: Type Stainless prepak Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 10.5 ' Sump Length 0.5 '

Top of Casing Elevation 0 ' Stickup 0 '

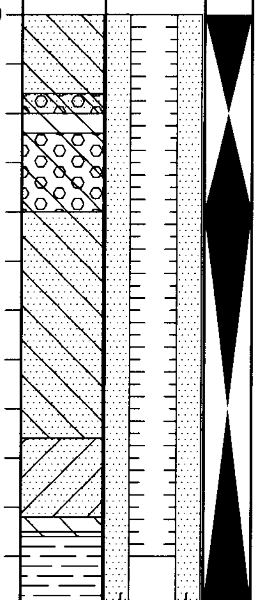
Depth to Water: 1. Ft. 12.13 ( 4-5-05 17:12; predevelopment ) 2. Ft. 7.98 ( 4-11-05 17:12; postdevelopment )

Drilling Company CCI Driller Donna R. Lewis

Drilling Method Geoprobe Log By Misty D. Savell

SKETCH MAP

NOTES



| Elevation (Feet) | Depth (Feet) | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| -10 | 10 | | | | |
| | | 763 ppm | | 10.8-11 | GRAVELLY SANDY CLAY: with gravel (quartzite 1-2 cm), damp, slightly plastic, soft, 100% recovery, no odor. |
| | | 512 ppm | | 11-11.2 | SILTY CLAY: light brown, damp, stiff, slightly plastic, 100% recovery, no odor. |
| | | 534 ppm | | 11.2-12 | GRAVELLY CLAY: yellowish-brown, damp, plastic, soft, abundant quartzite (1-3 cm), 100% recovery, no odor. |
| -12 | 12 | 524 ppm | 12-16 | 12-14.3 | SANDY CLAY: yellowish-brown, damp, slightly plastic, soft, occasional iron nodules (2 mm), occasional quartzite (2 mm - 1 cm), 100% recovery, no odor. |
| -14 | 14 | | | | |
| | | 151 ppm | | 14.3-15.1 | CLAYEY SAND: coarse-grained sand, saturated, loose, occasional quartzite (1-2 cm), 100% recovery, no odor. |
| | | 757 ppm | | 15.1-15.3 | SILTY CLAY: yellowish-red, damp, slightly plastic, stiff, 100% recovery, no odor. |
| | | 0 ppm | | 15.3-16 | SHALE: dark grey with minor yellowish-red mottling, very slightly damp, hard, fissile, 100% recovery, no odor. |
| -16 | 16 | 0 ppm | | | T.D. = 16 ' |
| -18 | 18 | | | | |
| -20 | 20 | | | | |

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ERM

# MW-62
# DRILLING LOG

W.O. NO. 0014507 Boring/Well ID MW-62 Date Drilled 4/4/2005

Project WP Offsite Delineation Owner Whirlpool

Location Fort Smith, AR Boring T.D. 21 ' Boring Diam. 3 "

N. Coord. 9693.47 E. Coord. 8622.29 Surface Elevation 464.5' Ft. MSL Datum

Screen: Type Stainless prepak Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 15.5 ' Sump Length 0.5 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 3.46 ( 4-6-05 16:15; predevelopment ) 2. Ft. 3.22 ( 4-11-05 10:36; postdevelopment )

Drilling Company CCI Driller Donna R. Lewis

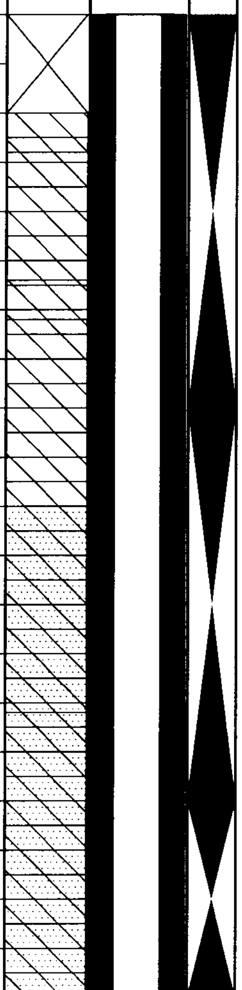
Drilling Method Geoprobe Log By Misty D. Savell

SKETCH MAP

NOTES

Elevation (Feet): 0 to -10 (ticks at 0, -2, -4, -6, -8, -10). Depth (Feet): 0 to 10 (ticks at 0, 2, 4, 6, 8, 10).

Columns: Graphic Log, Well Construction, Sample Type



| OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|
| | 0-4 | 0-1 | SILTY CLAY: dark brown with minor yellowish-red mottling, moist, loose, abundant root hairs, poor recovery, no odor. |
| | | 1-1.4 | SILTY CLAY: dark brown, moist, plastic, very soft, occasional root hairs, 100% recovery, no odor. |
| 0 ppm | | 1.4-2 | SILTY CLAY: brown with occasional yellowish-red mottling, moist, plastic, very soft, rare root hairs, 100% recovery, no odor. |
| 0 ppm | | 2-2.7 | SILTY CLAY: brown with occasional yellowish-red mottling, wet, plastic, very soft, 100% recovery, no odor. |
| 0 ppm | | 2.7-3.1 | SILTY CLAY: brown with occasional red mottling, moist, plastic, very soft, 100% recovery, no odor. |
| 0 ppm | | 3.1-4 | SILTY CLAY: brown with occasional yellowish-red mottling, damp, slightly plastic, stiff, occasional light brown silt to very fine sandy veins and inclusions, 100% recovery, no odor. |
| 0 ppm | 4-8 | 4-5 | SILTY CLAY: brown with occasional red mottling, moist, plastic, very soft, 100% recovery, no odor. |
| 0 ppm | | 5-6 | SILTY SANDY CLAY: brown with occasional yellowish-red and light brown mottling, damp, slightly plastic, stiff, occasional silt and very fine sand veins (light brown), 100% recovery, no odor. |
| 0 ppm | | 6-6.5 | SILTY SANDY CLAY: light grey with occasional yellowish-red mottling, damp, slightly plastic, stiff, occasional silt and very fine sand veins (light brown), 100% recovery, no odor. |
| 0 ppm | | 6.5-7.1 | SILTY SANDY CLAY: mottled light grey and yellowish-red, damp, slightly plastic, stiff, occasional iron nodules (1-3 mm), 100% recovery, no odor. |
| 0 ppm | | 7.1-10.7 | SILTY SANDY CLAY: mottled light grey and yellowish-red, damp, slightly plastic, stiff, slightly plastic, 100% recovery, no odor. |
| | 8-12 | | |

ERM

# MW-62 DRILLING LOG

W.O. NO. 0014507 Boring/Well ID MW-62 Date Drilled 4/4/2005

Project WP Offsite Delineation Owner Whirlpool

Location Fort Smith, AR Boring T.D. 21 ' Boring Diam. 3 "

N. Coord. 9693.47 E. Coord. 8622.29 Surface Elevation 464.5' Ft. MSL Datum

Screen: Type Stainless prepak Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 15.5 ' Sump Length 0.5 '

Top of Casing Elevation 0 ' Stickup 0 '

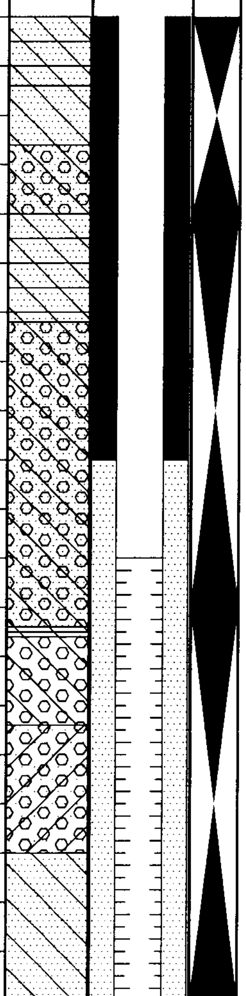
Depth to Water: 1. Ft. 3.46 ( 4-6-05 16:15; predevelopment ) 2. Ft. 3.22 ( 4-11-05 10:36; postdevelopment )

Drilling Company CCI Driller Donna R. Lewis

Drilling Method Geoprobe Log By Misty D. Savell

SKETCH MAP

NOTES



| Elevation (Feet) | Depth (Feet) | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| -10 | 10 | | | | |
| | | 0 ppm | | 10.7-11.3 | SANDY CLAY: yellowish-red with minor light grey mottling, damp, very slightly plastic, stiff, abundant iron nodules (2-4 mm), 100% recovery, no odor. |
| | | 0 ppm | | 11.3-12 | SANDY GRAVELLY CLAY: yellowish-red, damp, very slightly plastic, stiff, abundant iron nodules (2-4 mm), abundant quartzite (1 cm), 100% recovery, no odor. |
| -12 | 12 | 0 ppm | 12-16 | 12-13.1 | SILTY SANDY CLAY: mottled yellowish-red, light grey, and dark grey, damp, plastic, soft, 100% recovery, no odor. |
| | | 0 ppm | | 13.1-16.2 | SANDY GRAVELLY CLAY: yellowish-red, damp, very slightly plastic, stiff, abundant iron nodules (2-4 mm), abundant quartzite (1 cm), 100% recovery, no odor. |
| -14 | 14 | | | | |
| -16 | 16 | | 16-20 | | |
| | | 0 ppm | | 16.2-16.3 | SILTY SANDY CLAY: brown with minor red mottling, moist, plastic, very soft, plastic, 100% recovery, no odor. |
| | | 0 ppm | | 16.3-17.2 | GRAVELLY CLAY: yellowish-red, damp, very slightly plastic, stiff, abundant iron nodules (2-4 mm), abundant quartzite (1-3 cm), 100% recovery, no odor. |
| | | 0 ppm | | 17.2-18.5 | GRAVELLY CLAYEY SAND: with clay, mottled light brown and yellowish-red, damp, loose, abundant quartzite (1-3 cm), 100% recovery, no odor. |
| -18 | 18 | | | | |
| | | 0 ppm | | 18.5-20.3 | SANDY CLAY: brown, saturated, slightly plastic, very soft, 100% recovery, no odor. |
| -20 | 20 | | | | |

ERM

# MW-62
# DRILLING LOG

W.O. NO. 0014507 Boring/Well ID MW-62 Date Drilled 4/4/2005

Project WP Offsite Delineation Owner Whirlpool

Location Fort Smith, AR Boring T.D. 21 ' Boring Diam. 3 "

N. Coord. 9693.47 E. Coord. 8622.29 Surface Elevation 464.5' Ft. MSL Datum

Screen: Type Stainless prepak Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 15.5 ' Sump Length 0.5 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 3.46 ( 4-6-05 16:15; predevelopment ) 2. Ft. 3.22 ( 4-11-05 10:36; postdevelopment )

Drilling Company CCI Driller Donna R. Lewis

Drilling Method Geoprobe Log By Misty D. Savell

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -20 | 20 | | | | 0 ppm | 20-21 | 20.3-21 | SHALE: dark grey, very slightly damp, hard, fissile, 100% recovery, no odor.<br>T.D. = 21 ' |
| -22 | 22 | | | | | | | |
| -24 | 24 | | | | | | | |
| -26 | 26 | | | | | | | |
| -28 | 28 | | | | | | | |
| -30 | 30 | | | | | | | |

ERM

# MW-63
# DRILLING LOG

W.O. NO. 0014507 Boring/Well ID MW-63 Date Drilled 4/5/2005

Project WP Offsite Delineation Owner Whirlpool

Location Fort Smith, AR Boring T.D. 21.5 ' Boring Diam. 3 "

N. Coord. 9692.48 E. Coord. 8826.28 Surface Elevation 464' Ft. MSL Datum

Screen: Type Stainless prepak Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 16 ' Sump Length 0.5 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 5.91 ( 4-6-05 14:00; predevelopment ) 2. Ft. 2.78 ( 4-11-05 10:40; postdevelopment )

Drilling Company CCI Driller Donna R. Lewis

Drilling Method Geoprobe Log By Misty D. Savell

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | 0-4 | 0-0.45 | CLAYEY SILT: brown with minor yellowish-red mottling, moist, loose, abundant root hairs, 100% recovery, no odor. |
| | | | | | 0 ppm | | 0.45-1.15 | SILTY CLAY: brown, moist, plastic, soft, rare root hairs, 100% recovery, no odor. |
| | | | | | 0 ppm | | 1.15-3.2 | SILTY SANDY CLAY: saturated, very slightly plastic, soft, 29 % recovery, no odor. |
| -2 | 2 | | | | | | | |
| | | | | | 0 ppm | | 3.2-3.6 | SANDY CLAY: brown with occasional red mottling, moist, plastic, soft, 100% recovery, no odor. |
| | | | | | 0 ppm | | 3.6-4 | SANDY CLAY: brown with occasional yellowish-red mottling, moist, plastic, soft, 100% recovery, no odor. |
| -4 | 4 | | | | 0 ppm | 4-8 | 4-4.7 | NO RECOVERY: no recovery. |
| | | | | | | | 4.7-5.1 | SANDY CLAY: brown with minor red mottling, moist, plastic, soft, 100% recovery, no odor. |
| | | | | | 0 ppm | | 5.1-5.8 | SANDY CLAY: brown with minor yellowish-red mottling, saturated, very slightly plastic, very soft, 100% recovery, no odor. |
| -6 | 6 | | | | 0 ppm | | 5.8-6.3 | SANDY CLAY: mottled brown, grey, and yellowish-red, moist, plostic, soft, 100% recovery, no odor. |
| | | | | | 0 ppm | | 6.3-8 | SANDY CLAY: mottled brown, grey, yellowish-red, moist, plastic, stiff, 100% recovery, no odor. |
| -8 | 8 | | | | 0 ppm | 8-12 | 8-10.5 | SANDY CLAY: mottled grey and yellowish-red, moist, plastic, soft, poor recovery, no odor. |
| -10 | 10 | | | | | | | |

ERM

# MW-63
# DRILLING LOG

W.O. NO. 0014507 Boring/Well ID MW-63 Date Drilled 4/5/2005

Project WP Offsite Delineation Owner Whirlpool

Location Fort Smith, AR Boring T.D. 21.5 ' Boring Diam. 3 "

N. Coord. 9692.48 E. Coord. 8826.28 Surface Elevation 464' Ft. MSL Datum

Screen: Type Stainless prepak Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 16 ' Sump Length 0.5 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 5.91 ( 4-6-05 14:00; predevelopment ) 2. Ft. 2.78 ( 4-11-05 10:40; postdevelopment )

Drilling Company CCI Driller Donna R. Lewis

Drilling Method Geoprobe Log By Misty D. Savell

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -10 | 10 | | | | | | | |
| | | | | | 0 ppm | | 10.5-12 | SANDY CLAY: yellowish-red with minor brown mottling, damp, plastic, hard, 100% recovery, no odor. |
| -12 | 12 | | | | 0 ppm | 12-16 | 12-15.5 | SANDY CLAY TO CLAYEY SAND: yellowish-red with minor light brown mottling, damp, very slightly plastic, stiff, abundant coarse-grained sand, poor recovery, no odor. |
| -14 | 14 | | | | | | | |
| | | | | | 0 ppm | | 15.5-16 | GRAVELLY CLAY: yellowish-red with minor light brown mottling, damp, very slightly plastic, stiff, abundant iron nodules (1-2 mm), abundant quartzite (1 cm) with coarse-grained sand, 100% recovery, no odor. |
| -16 | 16 | | | | 0 ppm | 16-20 | 16-19.3 | SANDY CLAY: yellowish-red, damp, very slightly plastic, stiff, occasional quartzite (1-3 cm), poor recovery, no odor. |
| -18 | 18 | | | | | | | |
| | | | | | 0 ppm | | 19.3-19.5 | CLAYEY SAND: light brown, damp, loose, occasional quartzite (2-5 mm), 100% recovery, no odor. |
| | | | | | 0 ppm | | 19.5-20 | SILTY CLAY: yellowish-red, damp, very slightly plastic, hard, becomming fissile,100% recovery, no odor. |
| -20 | 20 | | | | | | | |

ERM

# MW-63
# DRILLING LOG

W.O. NO. 0014507 | Boring/Well ID MW-63 | Date Drilled 4/5/2005

Project WP Offsite Delineation | Owner Whirlpool

Location Fort Smith, AR | Boring T.D. 21.5 ' | Boring Diam. 3 "

N. Coord. 9692.48 | E. Coord. 8826.28 | Surface Elevation 464' | Ft. MSL Datum

Screen: Type Stainless prepak | Diam. 0.75 " | Length 5 ' | Slot Size 0.01 "

Casing: Type Schedule 40 PVC | Diam. 0.75 " | Length 16 ' | Sump Length 0.5 '

Top of Casing Elevation 0 ' | Stickup 0 '

Depth to Water: 1. Ft. 5.91 ( 4-6-05 14:00; predevelopment ) 2. Ft. 2.78 ( 4-11-05 10:40; postdevelopment )

Drilling Company CCI | Driller Donna R. Lewis

Drilling Method Geoprobe | Log By Misty D. Savell

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -20 | 20 | | | | 0 ppm | 20-21.5 | 20-21.5 | SHALE: dark grey, very slightly damp, hard, fissile, 100% recovery, no odor. |
| | | | | | 0 ppm | | | T.D. = 21.5 ' |
| -22 | 22 | | | | | | | |
| -24 | 24 | | | | | | | |
| -26 | 26 | | | | | | | |
| -28 | 28 | | | | | | | |
| -30 | 30 | | | | | | | |

ERM

# SB-64
# DRILLING LOG

W.O. NO. 0014507 Boring/Well ID SB-64 Date Drilled 4/5/2005

Project WP Offsite Delineation Owner Whirlpool

Location Fort Smith, AR Boring T.D. 19.5 ' Boring Diam. 3 "

N. Coord. 9884.5 E. Coord. 9045.8 Surface Elevation 462.5 Ft. MSL Datum

Screen: Type none Diam. 0 " Length 0 ' Slot Size 0 "

Casing: Type none Diam. 0 " Length 0 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 0 ( not measured ) 2. Ft. 0 ( not measured )

Drilling Company CCI Driller Donna R. Lewis

Drilling Method Geoprobe Log By Misty D. Savell

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | 0-7 | 0-0.5 | FILL: gravely (3 cm) silty sand, brown, moist, loose, 100% recovery, no odor. |
| | | | | | | | 0.5-1 | FILL: gravely (3-5 cm) silty sand, brown, moist, loose, 100% recovery, no odor. |
| | | | | | | | 1-6 | FILL: sandy clay with gravel (1 cm), mottled brown, light brown, and yellowish-red, moist, plstic, soft, 100% recovery, no odor. |
| -2 | 2 | | | | | | | |
| -4 | 4 | | | | | | | |
| -6 | 6 | | | | | | 6-7 | FILL: silty clay, yellowish-red, moist, plastic, soft, occasional iron nodules (2-4 mm), 100% recovery, no odor. |
| | | | | | | 7-8 | 7-8 | FILL: sandy clay, mottled light brown, yellowish-red, and grey, wet, plastic, stiff, 100% recovery, no odor. |
| -8 | 8 | | | | | 8-12 | 8-11.3 | SANDY CLAY: brown, saturated, slightly plastic, very soft, poor recovery, no odor. |
| -10 | 10 | | | | | | | |

ERM

# SB-64 DRILLING LOG

W.O. NO. 0014507 Boring/Well ID SB-64 Date Drilled 4/5/2005

Project WP Offsite Delineation Owner Whirlpool

Location Fort Smith, AR Boring T.D. 19.5 ' Boring Diam. 3 "

N. Coord. 9884.5 E. Coord. 9045.8 Surface Elevation 462.5 Ft. MSL Datum

Screen: Type none Diam. 0 " Length 0 ' Slot Size 0 "

Casing: Type none Diam. 0 " Length 0 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 0 ( not measured ) 2. Ft. 0 ( not measured )

Drilling Company CCI Driller Donna R. Lewis

Drilling Method Geoprobe Log By Misty D. Savell

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -10 | 10 | | | | | | | |
| | | | | | | | 11.3-11.7 | SANDY CLAY: grey, moist, plastic, soft, 100% recovery, no odor. |
| | | | | | | | 11.7-12 | SANDY CLAY: mottled yellowish-red and light grey, damp, slightly plastic, soft, 100% recovery, no odor. |
| -12 | 12 | | | | | 12-16 | 12-15.6 | CLAYEY SAND: mottled yellowish-red and light grey, moist, loose, poor recovery, no odor. |
| -14 | 14 | | | | | | | |
| | | | | | | | 15.6-17.9 | GRAVELLY CLAY: with sand, yellowish-brown, wet, very slightly plastic, stiff, abundant quartzite (1-2 cm), poor recovery, no odor. |
| -16 | 16 | | | | | 16-19.5 | | |
| -18 | 18 | | | | | | 17.9-18.2 | SANDY CLAY: yellowish-red, wet, slightly plastic, stiff, 100% recovery, no odor. |
| | | | | | | | 18.2-18.4 | SANDY GRAVELLY CLAY:light greenish-grey, moist, slightly plastic, soft, occasional quartzite (1 cm), 100% recovery, no odor. |
| | | | | | | | 18.4-19.1 | SILTY CLAY: yellowish-red, damp, plastic, stiff, 100% recovery, no odor. |
| | | | | | | | 19.1-19.5 | SHALE: dark grey with minor yellowish-red mottling, very slightly damp, hard, fissile, 100% recovery, no odor. |
| -20 | 20 | | | | | | | T.D. = 19.5 ' |

ERM

# MW-65
# DRILLING LOG

W.O. NO. 0014507 Boring/Well ID MW-65 Date Drilled 3/28/2006

Project WP Offsite Delineation Owner Whirlpool

Location Fort Smith, AR Boring T.D. 32 ' Boring Diam. 8 "

N. Coord. 9407.19 ' E. Coord. 7828.14 ' Surface Elevation 474.1 ' Ft. MSL Datum

Screen: Type Sch 40 PVC Diam. 2 " Length 10 ' Slot Size 0.01 "

Casing: Type Sch 40 PVC Diam. 2 " Length 19.5 ' Sump Length 2.5 '

Top of Casing Elevation 473.91 ' Stickup 0 '

Depth to Water: 1. Ft. 0 ( ) 2. Ft. 0 ( )

Drilling Company CCI Driller Donna R. Lewis

Drilling Method Hollow-Stem Auger Log By Doss Barker

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 474.1 | 0 | | | | | 0-2 | 0-1.5 | SILTY CLAY: gray, moist, firm, slightly crumbly, abundant rootlets, occasional iron nodules |
| | | | | | | | 1.5-2 | SILTY CLAY: gray to black, moist, firm, slightly crumbly, abundant rootlets |
| | | | | | 0.6 | 2-4 | 2-6 | SILTY SANDY CLAY: brown, moist, firm, slightly crumbly, occasional red mottling |
| 470 | | | | | 2.7 | 4-6 | | |
| | 5 | | | | | | | |
| | | | | | 2.7 | 6-8 | 6-10 | SILTY CLAY: gray, moist, firm, black and red mottling |
| | | | | | 5.3 | 8-10 | | |
| 465 | | | | | | | | |
| | 10 | | | | 9.1 | 10-12 | 10-15.7 | SILTY CLAY: gray, moist, firm, red mottling |
| | | | | | 4.9 | 12-14 | | |
| 460 | | | | | 0.2 | 14-16 | | |
| | 15 | | | | | | | |
| | | | | | 0.2 | 16-18 | 15.7-16 | SILTY SANDY CLAY: gray, moist, firm, black and red mottling |
| | | | | | | | 16-19.3 | SILTY CLAY: gray, moist, firm, black and red mottling |
| | | | | | 0.2 | 18-20 | | |
| 455 | | | | | | | 19.3-20 | SILTY CLAY: gray, moist, firm |
| | 20 | | | | | | | |

ERM

# MW-65
# DRILLING LOG

W.O. NO. 0014507 Boring/Well ID MW-65 Date Drilled 3/28/2006

Project WP Offsite Delineation Owner Whirlpool

Location Fort Smith, AR Boring T.D. 32 ' Boring Diam. 8 "

N. Coord. 9407.19 ' E. Coord. 7828.14 ' Surface Elevation 474.1 ' Ft. MSL Datum

Screen: Type Sch 40 PVC Diam. 2 " Length 10 ' Slot Size 0.01 "

Casing: Type Sch 40 PVC Diam. 2 " Length 19.5 ' Sump Length 2.5 '

Top of Casing Elevation 473.91 ' Stickup 0 '

Depth to Water: 1. Ft. 0 ( ) 2. Ft. 0 ( )

Drilling Company CCI Driller Donna R. Lewis

Drilling Method Hollow-Stem Auger Log By Doss Barker

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| | 20 | | | | 0.6 | 20-22 | 20-20.5 | GRAVELLY CLAY: silty clay, brown, moist, crumbly with quartzite gravel from 1/4" to 1" diameter |
| | | | | | | | 20.5-22.4 | SILTY CLAY: gray, water saturated, firm, black and gray mottling |
| | | | | | 0.0 | 22-24 | 22.4-24 | GRAVELLY SAND: silty sand, brown, water saturated, crumbly with quartzite gravel from 1/4" to 1/2" diameter |
| 450 | | | | | 0.0 | 24-26 | 24-28.4 | GRAVELLY SAND: silty sand and shale fragments up to 1/4" diameter, brown, water saturated, crumbly with quartzite gravel from 1/4" to 1/2" diameter |
| | 25 | | | | 0.6 | 26-28 | | |
| | | | | | 0.2 | 28-30 | 28.4-29.4 | SILTY CLAY: brown, moist, black mottling, slightly fissile (weathered shale) |
| 445 | | | | | | | 29.4-32 | SHALE: black, crumbly, fissile |
| | 30 | | | | 0.2 | 30-32 | | |
| | | | | | 0.0 | | | T.D. = 32 ' |
| 440 | 35 | | | | | | | |
| 435 | 40 | | | | | | | |

ERM

# MW-66
# DRILLING LOG

W.O. NO. 0014507 | Boring/Well ID MW-66 | Date Drilled 3/19/2006

Project WP Offsite Delineation | Owner Whirlpool

Location Fort Smith, AR | Boring T.D. 18 ' | Boring Diam. 8 "

N. Coord. 10002.76 ' | E. Coord. 9094.06 ' | Surface Elevation 462.7 ' | Ft. MSL Datum

Screen: Type Sch 40 PVC | Diam. 2 " | Length 5 ' | Slot Size 0.01 "

Casing: Type Sch 40 PVC | Diam. 2 " | Length 12.6 ' | Sump Length 0.4 '

Top of Casing Elevation 462.05 ' | Stickup 0 '

Depth to Water: 1. Ft. 0 ( ) 2. Ft. 0 ( )

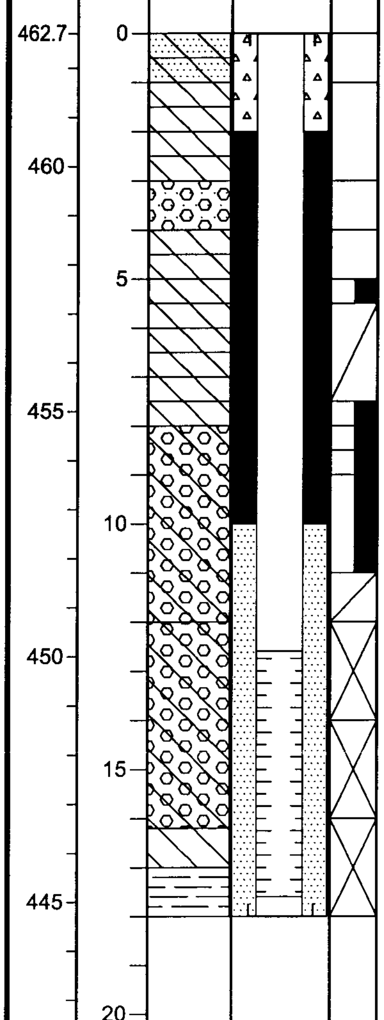
Drilling Company CCI | Driller Donna R. Lewis

Drilling Method Hollow-Stem Auger | Log By Troy Meinen / Doss Barker

SKETCH MAP

NOTES

Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type




| Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|
| 0-1 | 0-1 | SILTY SANDY CLAY: dark brown, moist, plastic to crumbly |
| 1-3 | 1-3 | SILTY CLAY: pale brown, moist, stiff, plastic |
| 3-4 | 3-4 | GRAVELLY SAND: with silty clayey sand, water saturated, up to 1/2" diameter |
| 4-5 | 4-5 | SILTY CLAY: pale brown, moist, stiff, plastic |
| 5-5.5<br>5.5-7.5 | 5-8 | SILTY CLAY: pale brown and gray, moist, stiff, plastic |
| 7.5-8<br>8-8.5<br>8.5-9<br>9-11 | 8-12 | GRAVELLY CLAY: pale brown and gray, moist to wet, hard to stiff, plastic, with quartzite gravel 1/4" to 1/2" diameter |
| 11-12 | | |
| 12-14 | 12-16.2 | GRAVELLY CLAY: brown, moist, firm, crumbly, black mottling, with quartzite gravel from 1/4" to 2" diameter |
| 14-16 | | |
| 16-18 | 16.2-17 | CLAY: brown, firm, moist, crumbly, fissile (weathered shale) |
| | 17-18 | SHALE: gray to black, crumbly, fissile |
| | | T.D. = 18 ' |

ERM

# MW-67
# DRILLING LOG

W.O. NO. 0014507 | Boring/Well ID MW-67 | Date Drilled 3/29/2006

Project WP Offsite Delineation | Owner Whirlpool

Location Fort Smith, AR | Boring T.D. 16 ' | Boring Diam. 8 "

N. Coord. 10174.17 ' | E. Coord. 9093.86 ' | Surface Elevation 459.4 ' | Ft. MSL Datum

Screen: Type Sch 40 PVC | Diam. 2 " | Length 5 ' | Slot Size 0.01 "

Casing: Type Sch 40 PVC | Diam. 2 " | Length 9.6 ' | Sump Length 0.4 '

Top of Casing Elevation 459.01 ' | Stickup 0 '

Depth to Water: 1. Ft. 0 ( ) 2. Ft. 0 ( )

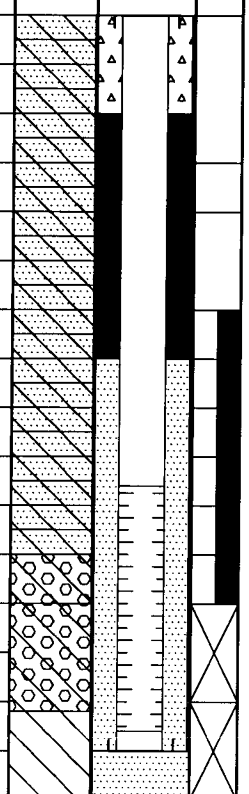
Drilling Company CCI | Driller Donna R. Lewis

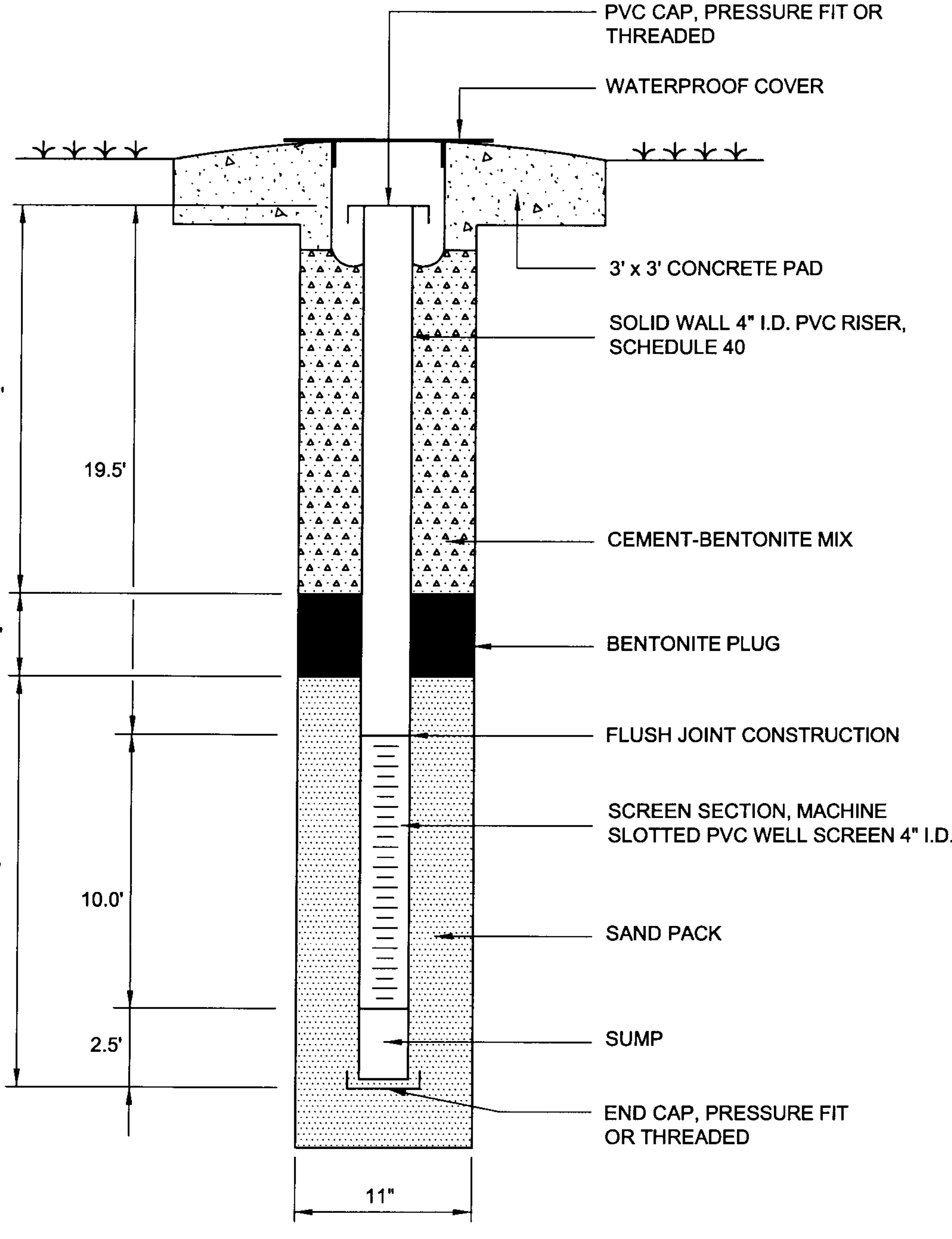
Drilling Method Hollow-Stem Auger | Log By Doss Barker

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|
| 459.4 | 0 | 0-3 | 0-4 | SILTY SANDY CLAY: dark brown, firm, moist, slightly crumbly, abundant rootlets, water saturated below 3 feet |
| | | 3-4 | | |
| 455 | | 4-6 | 4-7 | SILTY SANDY CLAY: pale gray, firm, moist, slightly crumbly, occasional 1/4" diameter gravel, black and red mottling, occasional rootlets |
| | 5 | | | |
| | | 6-7 | | |
| | | 7-8 | 7-10 | SILTY SANDY CLAY: pale gray, firm, moist, slightly crumbly, red mottling |
| | | 8-9 | | |
| 450 | | 9-10 | | |
| | 10 | 10-11 | 10-11 | SILTY SANDY CLAY: pale gray, firm, moist, slightly crumbly, occasional 1/8" diameter gravel, black and red mottling |
| | | 11-12 | 11-12 | GRAVELLY CLAY: red, firm, moist, crumbly, abundant gravel 1/4" to 2" diameter |
| | | 12-14 | 12-14.2 | GRAVELLY CLAY: brown, firm, moist, crumbly, gray mottling, abundant gravel 1/4" to 1" diameter |
| 445 | | 14-16 | 14.2-16 | CLAY: black with very pale brown silt lenses, firm, moist, fissile (weathered shale) |
| | 15 | | | |
| | | | | T.D. = 16 ' |
| 440 | 20 | | | |






NOTE: MW-35R REPLACES MW-35

NOT TO SCALE

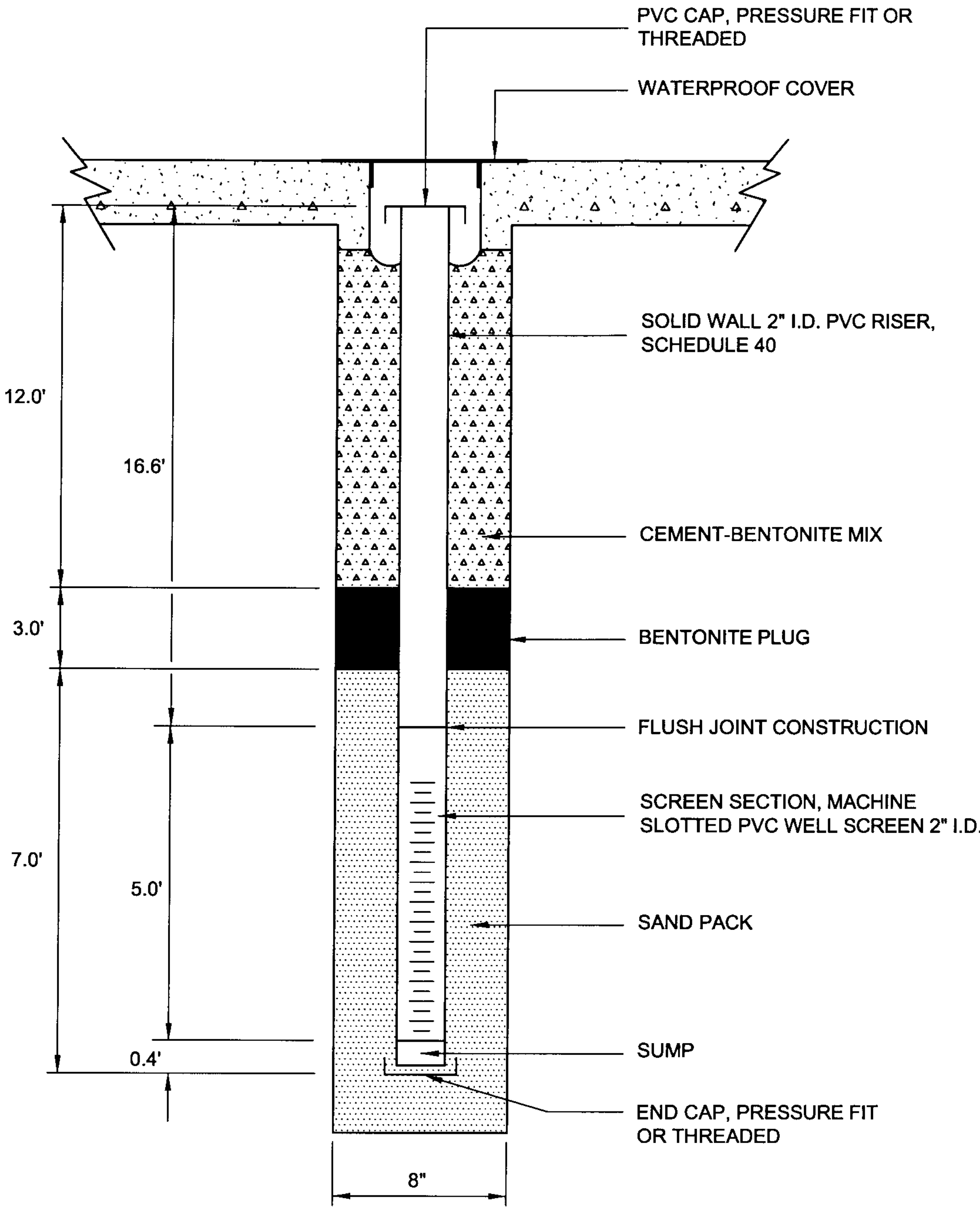
**ERM-Southwest, Inc.**

HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE · CORPUS CHRISTI

| | | |
|---|---|---|
| DESIGN: | DRAWN: | CHKD.: |
| DATE: 05/01/06 | SCALE: AS SHOWN | REV.: |
| W.O.NO.: H:\dwg\E06\0014507a225.dwg, 5/1/2006 1:04:27 PM | | |

FIGURE
GENERAL WELL CONSTRUCTION DETAIL
COMPLETED BELOW GRADE
MW-35R
Whirlpool
Fort Smith, Arkansas

ERM




NOTE: MW-46R REPLACES MW-46

NOT TO SCALE

**ERM-Southwest, Inc.**

HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE · CORPUS CHRISTI

| | | |
|---|---|---|
| DESIGN: DB | DRAWN: LMc | CHKD.: |
| DATE: 05/01/06 | SCALE: AS SHOWN | REV.: |
| W.O.NO.: H:\dwg\E06\0014507a225.dwg, 5/1/2006 1:04:40 PM | | |

FIGURE
GENERAL WELL CONSTRUCTION DETAIL
COMPLETED BELOW GRADE
MW-46R
Whirlpool
Fort Smith, Arkansas

ERM

# Aquifer Test Results

*Appendix B*

*August 30, 2006*
*Project No. 0014507*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

**PUMP TEST ANALYSIS SUMMARY**
Whirlpool Corporation
Ft. Smith, Arkansas

| Well ID | Distance (ft) | Max. Drawdown (ft) | T ft2/d | K ft/d | S | Method | Data Type | Comment |
|---|---|---|---|---|---|---|---|---|
| MW-35R | 0.455 | 19.11 | 7.17 | 0.788 | 9.83E-02 | Theis | Hermit | Odd curve with poor fit to type curve |
| | | | 4.56 | 0.50 | — | Theis Recovery | | Good fit |
| MW-65 | 13.5 | 0.20 | **495** | **54.4** | **9.76E-03** | Theis | Hermit | Good fit |
| | | | **840** | **92.31** | — | Theis Recovery | | Good fit |
| | | | **699** | **76.81** | **7.17E-03** | Time-Drawdown | | Good fit |
| MW-33 | 57.5 | 0.07 | 1110 | 123 | 2.75E-02 | Theis | Dip Logger | Straight curve with poor fit |
| | | | 4060 | 446.15 | — | Theis Recovery | | Good fit; scattered data |
| MW-34 | 31.3 | 0.20 | **284** | **31.2** | **2.36E-02** | Theis | Hermit | Good fit |
| | | | 2970 | 326.37 | — | Theis Recovery | | Good fit; scattered data |
| | | | **880** | **96.70** | 6.06E-03 | Time-Drawdown | | Good fit; scattered data |
| MW-36 | 85.8 | 0.07 | 1210 | 133 | — | Theis | Dip Logger | Straight curve with poor fit |
| MW-41 | 150.7 | 0.27 | **562** | **61.8** | **3.80E-04** | Theis | Hermit | Noise in data |
| | | | **984** | **108.1** | — | Theis Recovery | | Noise in data; uncertain fit |
| | | | **832** | **91.4** | **4.34E-04** | Time-Drawdown | | Good fit; scattered data |
| MW-65,34 & 41 | n/a | n/a | **1210** | **133.0** | **9.60E-05** | Distance-Drawdown | Hermit | Evaluation at 340 minutes |
| MW-65,34 & 41 | n/a | n/a | **1337** | **146.9** | **1.60E-03** | Distance-Drawdown | | Evaluation at 700 minutes |
| MW-65,34 & 41 | n/a | n/a | **1425** | **156.6** | **1.87E-04** | Distance-Drawdown | | Evaluation at 1060 minutes |
| MW-65,34 & 41 | n/a | n/a | 2365 | 259.9 | 5.64E-08 | Distance-Drawdown | | Evaluation at 1420 minutes |
| Geomean of preferred results | | | **792** | **87** | **1.54E-03** | | | |
| Geomean of all results | | | 598 | 66 | 5.67E-04 | | | |

Notes:
1) Water level data were logged by automated datalogger.
2) Hermit datalogger data was normalized with aquifer barametric efficiency regression equations determined for each well.
3) Dip Logger datalogger data was normalized to MW-28 background fluid level data. MW-28 was assumed to have zero drawdown.
4) Analysis was completed with Starpoint's Infinite Extent software with the indicated methods.
5) Preferred results are shown in boldface.

DISTANCE-DRAWDOWN ANALYSIS
APRIL 4-5, 2006 PUMP TEST
Whirlpool Corporation
Ft. Smith, Arkansas

**Distance & Drawdown Data (@340 min.):**

| Well | Dist (ft) | Drawdown (ft) | Ln-dist |
|---|---|---|---|
| MW-65 | 13.5 | 0.21 | 2.60 |
| MW-34 | 81.3 | 0.14 | 4.40 |
| MW-41 | 150.7 | 0.11 | 5.02 |

**Regression-Based Calculations:**

| | |
|---|---|
| Slope | -0.040 |
| Intercept | 0.318 |

**Compute Distance and Drawdown from equation:**

| Distance (ft) | Drawdown (ft) |
|---|---|
| 10 | 0.22 |
| 100 | 0.13 |
| 2588.02 | 0 |

**Compute T from $\Delta s_{cyle}$ and rate Q:**

$T = 2.3Q/(\Delta s*2\pi)$

| Parameter | Value | Units |
|---|---|---|
| Q | 1.6 | gpm |
| $\Delta s$ | 0.09 | ft |
| **T** | **1210** | $ft^2/d$ |

**Compute Storativity, S, from T, time, and $r_0$:**

$S = 2.25Tt/r_0^2$

| Parameter | Value | Units |
|---|---|---|
| T | 1209.96 | $ft^2/d$ |
| t | 340 | min |
| $r_0$ | 2588.02 | ft |
| **S** | **9.60E-05** | unitless |

Notes:

1) Transmissivity and storativity are computed for selected wells in this table through use of the Jacob (1950) distance-drawdown method.
2) Regression lines are determined for each time-drawdown data series and equation parameters used to compute aquifer properties.
3) Distance-drawdown data and regression lines are shown in the accompanying figure.

DISTANCE-DRAWDOWN ANALYSIS
APRIL 4-5, 2006 PUMP TEST
Whirlpool Corporation
Ft. Smith, Arkansas

**Distance & Drawdown Data (@700 min.):**

| Well | Dist (ft) | Drawdown (ft) | Ln-dist |
|---|---|---|---|
| MW-65 | 13.5 | 0.15 | 2.60 |
| MW-34 | 81.3 | 0.10 | 4.40 |
| MW-41 | 150.7 | 0.06 | 5.02 |

**Regression-Based Calculations:**

| | |
|---|---|
| Slope | -0.037 |
| Intercept | 0.251 |

**Compute Distance and Drawdown from equation:**

| Distance (ft) | Drawdown (ft) |
|---|---|
| 10 | 0.17 |
| 100 | 0.08 |
| 955.66 | 0 |

**Compute T from $\Delta s_{cyle}$ and rate Q:**

$T = 2.3Q/(\Delta s^*2\pi)$

| Parameter | Value | Units |
|---|---|---|
| Q | 1.6 | gpm |
| $\Delta s$ | 0.08 | ft |
| **T** | **1337** | $ft^2/d$ |

**Compute Storativity, S, from T, time, and $r_0$:**

$S = 2.25Tt/r_0^2$

| Parameter | Value | Units |
|---|---|---|
| T | 1336.92 | $ft^2/d$ |
| t | 700 | min |
| $r_0$ | 955.66 | ft |
| **S** | **1.60E-03** | unitless |

Notes:

1) Transmissivity and storativity are computed for selected wells in this table through use of the Jacob (1950) distance-drawdown method.
2) Regression lines are determined for each time-drawdown data series and equation parameters used to compute aquifer properties.
3) Distance-drawdown data and regression lines are shown in the accompanying figure.

DISTANCE-DRAWDOWN ANALYSIS
APRIL 4-5, 2006 PUMP TEST
Whirlpool Corporation
Ft. Smith, Arkansas

**Distance & Drawdown Data (@1060 min.):**

| Well | Dist (ft) | Drawdown (ft) | Ln-dist |
|---|---|---|---|
| MW-65 | 13.5 | 0.12 | 2.60 |
| MW-34 | 81.3 | 0.10 | 4.40 |
| MW-41 | 150.7 | 0.06 | 5.02 |

**Regression-Based Calculations:**

| | |
|---|---|
| Slope | -0.023 |
| Intercept | 0.184 |

**Compute Distance and Drawdown from equation:**

| Distance (ft) | Drawdown (ft) |
|---|---|
| 10 | 0.13 |
| 100 | 0.08 |
| 3553.31 | 0 |

**Compute T from $\Delta s_{cyle}$ and rate Q:**

$T = 2.3Q/(\Delta s * 2\pi)$

| Parameter | Value | Units |
|---|---|---|
| Q | 1.05 | gpm |
| $\Delta s$ | 0.05 | ft |
| **T** | **1425** | $ft^2/d$ |

**Compute Storativity, S, from T, time, and $r_0$:**

$S = 2.25Tt/r_0^2$

| Parameter | Value | Units |
|---|---|---|
| T | 1425.42 | $ft^2/d$ |
| t | 1060 | min |
| $r_0$ | 3553.31 | ft |
| **S** | **1.87E-04** | unitless |

Notes:

1) Transmissivity and storativity are computed for selected wells in this table through use of the Jacob (1950) distance-drawdown method.
2) Regression lines are determined for each time-drawdown data series and equation parameters used to compute aquifer properties.
3) Distance-drawdown data and regression lines are shown in the accompanying figure.

DISTANCE-DRAWDOWN ANALYSIS
APRIL 4-5, 2006 PUMP TEST
Whirlpool Corporation
Ft. Smith, Arkansas

**Distance & Drawdown Data (@1420 min.):**

| Well | Dist (ft) | Drawdown (ft) | Ln-dist |
|---|---|---|---|
| MW-65 | 13.5 | 0.12 | 2.60 |
| MW-34 | 81.3 | 0.10 | 4.40 |
| MW-41 | 150.7 | 0.09 | 5.02 |

**Regression-Based Calculations:**

| | |
|---|---|
| Slope | -0.012 |
| Intercept | 0.150 |

**Compute Distance and Drawdown from equation:**

| Distance (ft) | Drawdown (ft) |
|---|---|
| 10 | 0.12 |
| 100 | 0.09 |
| 305101.05 | 0 |

**Compute T from $\Delta s_{cyle}$ and rate Q:**

$T = 2.3Q/(\Delta s*2\pi)$

| Parameter | Value | Units |
|---|---|---|
| Q | 0.915 | gpm |
| $\Delta$s | 0.03 | ft |
| **T** | **2365** | $ft^2/d$ |

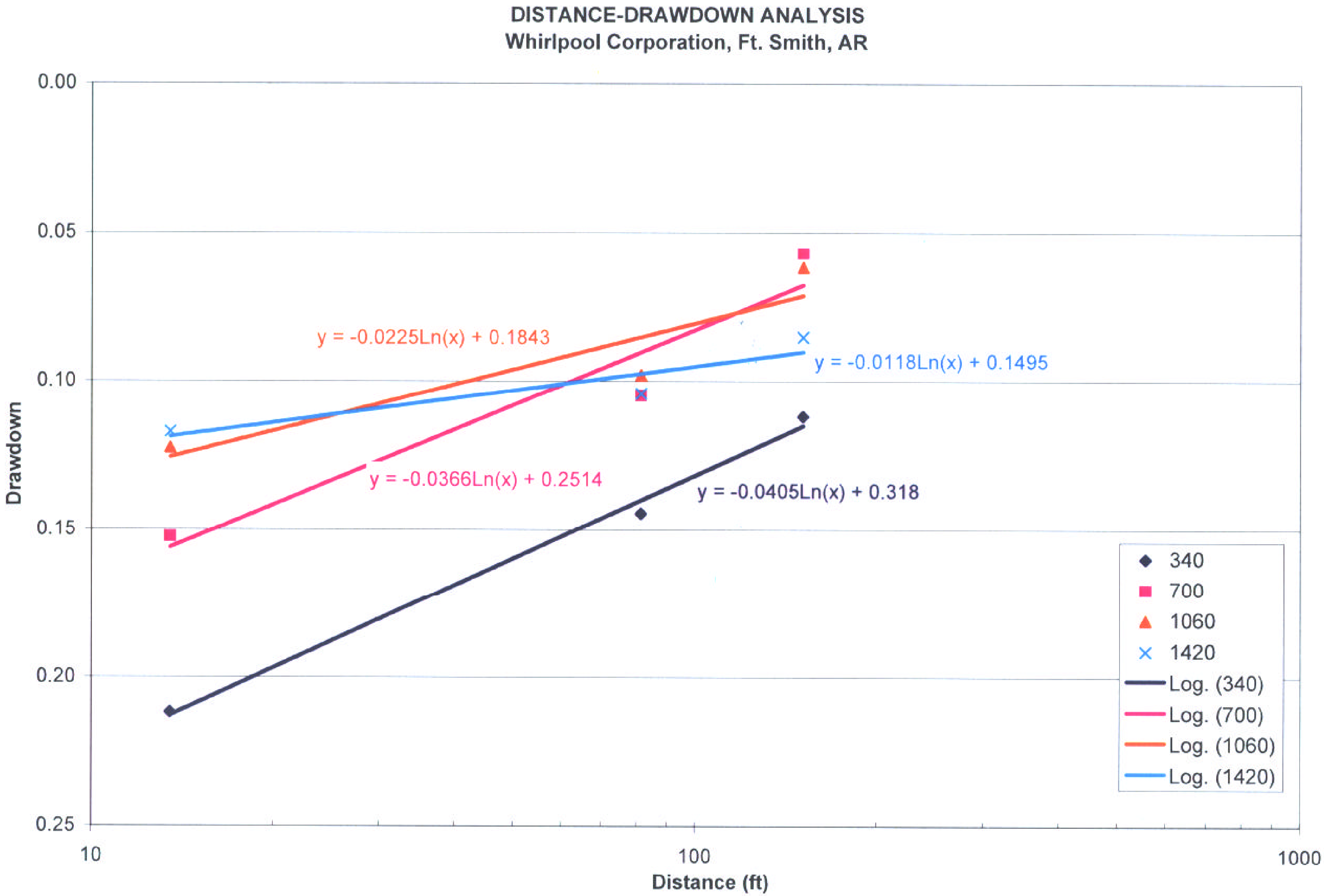
**Compute Storativity, S, from T, time, and $r_0$:**

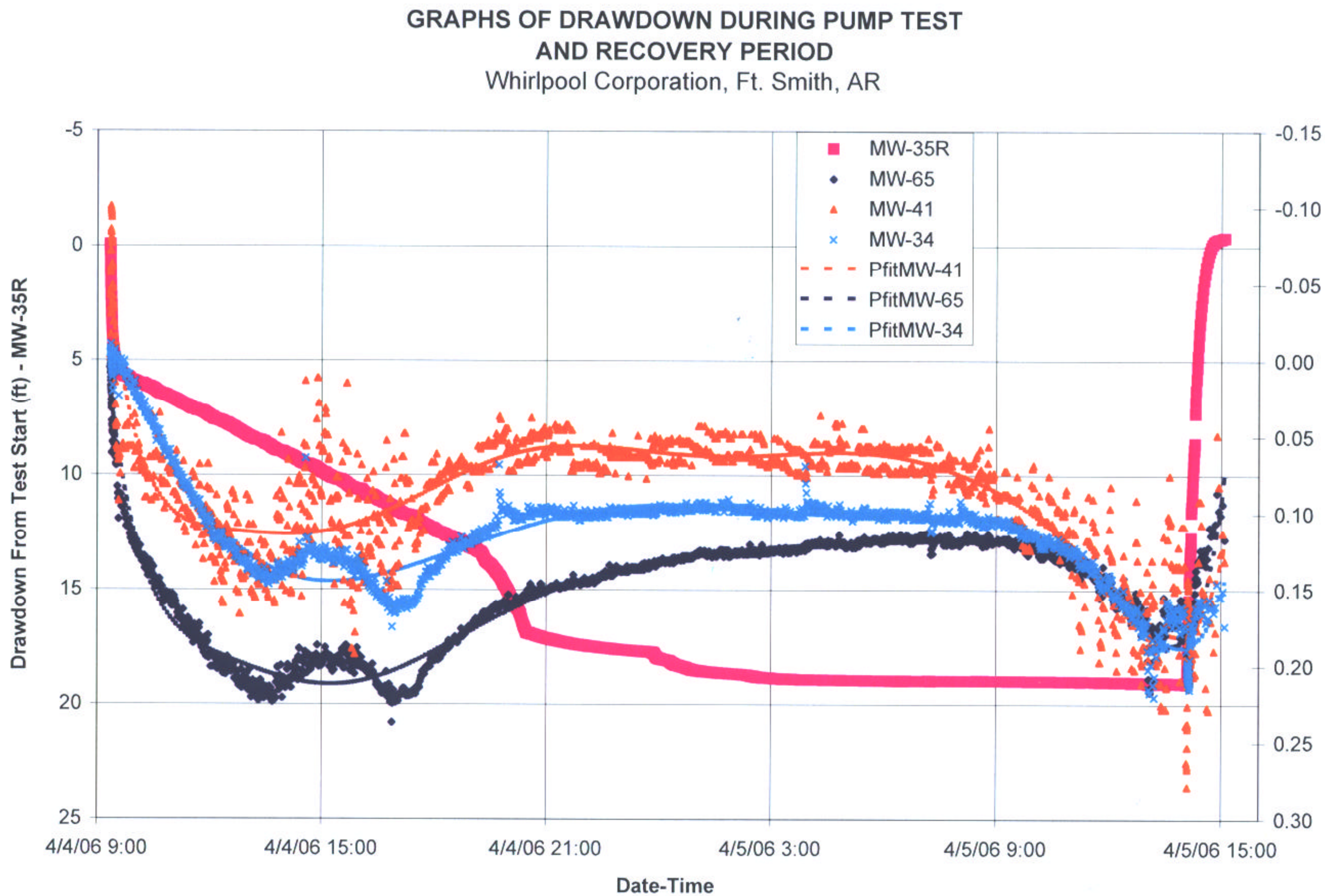
$S = 2.25Tt/r_0^2$

| Parameter | Value | Units |
|---|---|---|
| T | 2365.11 | $ft^2/d$ |
| t | 1420 | min |
| $r_0$ | 305101.05 | ft |
| **S** | **5.64E-08** | unitless |

Notes:

1) Transmissivity and storativity are computed for selected wells in this table through use of the Jacob (1950) distance-drawdown method.
2) Regression lines are determined for each time-drawdown data series and equation parameters used to compute aquifer properties.
3) Distance-drawdown data and regression lines are shown in the accompanying figure.


DISTANCE-DRAWDOWN ANALYSIS
Whirlpool Corporation, Ft. Smith, AR
Drawdown
0.00
0.05
0.10
0.15
0.20
0.25
10
100
1000
Distance (ft)
y = -0.0225Ln(x) + 0.1843
y = -0.0118Ln(x) + 0.1495
y = -0.0366Ln(x) + 0.2514
y = -0.0405Ln(x) + 0.318
340
700
1060
1420
Log. (340)
Log. (700)
Log. (1060)
Log. (1420)


GRAPHS OF DRAWDOWN DURING PUMP TEST
AND RECOVERY PERIOD
Whirlpool Corporation, Ft. Smith, AR
MW-35R
MW-65
MW-41
MW-34
PfitMW-41
PfitMW-65
PfitMW-34
Drawdown From Test Start (ft) - MW-35R
Drawdown from Test Start (ft) - MW-34, 41, 65
-5
0
5
10
15
20
25
-0.15
-0.10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
4/4/06 9:00
4/4/06 15:00
4/4/06 21:00
4/5/06 3:00
4/5/06 9:00
4/5/06 15:00
Date-Time

## TIME-DRAWDOWN PUMP TEST ANALYSIS

Whirlpool Corporation
Ft. Smith, Arkansas

### MW-65

**Regression Parameters**

Equation from graph trendline:
y = 0.0368Ln(x) - 0.0066

| | |
|---|---|
| Slope | 0.0368 |
| Intercept | -0.0066 |

**Time, Drawdown and Change**

| Time (min) | Drawdown (ft) | Change (ft) |
|---|---|---|
| 1 | -0.01 | |
| 10 | 0.08 | 0.08 |
| 100 | 0.16 | 0.08 |
| 1.20 | 0.00 | |

**Compute Transmissivity (T)**

$T = 2.3Q/(4\pi * \Delta s)$

| Parameter | Value | Units |
|---|---|---|
| Q | 1.68 | gpm |
| $\Delta s$ | 0.08 | ft |
| **T** | **699** | $ft^2/d$ |

**Compute Storativity (S)**

$S = 2.25Tt_0/r^2$

| Parameter | Value | Units |
|---|---|---|
| T | 698.59 | $ft^2/d$ |
| $t_0$ | 1.20 | min |
| r | 13.50 | ft |
| **S** | **7.17E-03** | |

### MW-34

**Regression Parameters**

Equation from graph trendline:
y = 0.0292Ln(x) - 0.0427

| | |
|---|---|
| Slope | 0.0292 |
| Intercept | -0.0427 |

**Time, Drawdown and Change**

| Time (min) | Drawdown (ft) | Change (ft) |
|---|---|---|
| 1 | -0.04 | |
| 10 | 0.02 | 0.07 |
| 100 | 0.09 | 0.07 |
| 4.32 | 0.00 | |

**Compute Transmissivity (T)**

$T = 2.3Q/(4\pi * \Delta s)$

| Parameter | Value | Units |
|---|---|---|
| Q | 1.68 | gpm |
| $\Delta s$ | 0.07 | ft |
| **T** | **880** | $ft^2/d$ |

**Compute Storativity (S)**

$S = 2.25Tt_0/r^2$

| Parameter | Value | Units |
|---|---|---|
| T | 880.42 | $ft^2/d$ |
| $t_0$ | 4.32 | min |
| r | 31.30 | ft |
| **S** | **6.06E-03** | |

### MW-41

**Regression Parameters**

Equation from graph trendline:
y = 0.0309Ln(x) - 0.0626

| | |
|---|---|
| Slope | 0.0309 |
| Intercept | -0.0626 |

**Time, Drawdown and Change**

| Time (min) | Drawdown (ft) | Change (ft) |
|---|---|---|
| 1 | -0.06 | |
| 10 | 0.01 | 0.07 |
| 100 | 0.08 | 0.07 |
| 7.58 | 0 | |

**Compute Transmissivity (T)**

$T = 2.3Q/(4\pi * \Delta s)$

| Parameter | Value | Units |
|---|---|---|
| Q | 1.68 | gpm |
| $\Delta s$ | 0.07 | ft |
| **T** | **832** | $ft^2/d$ |

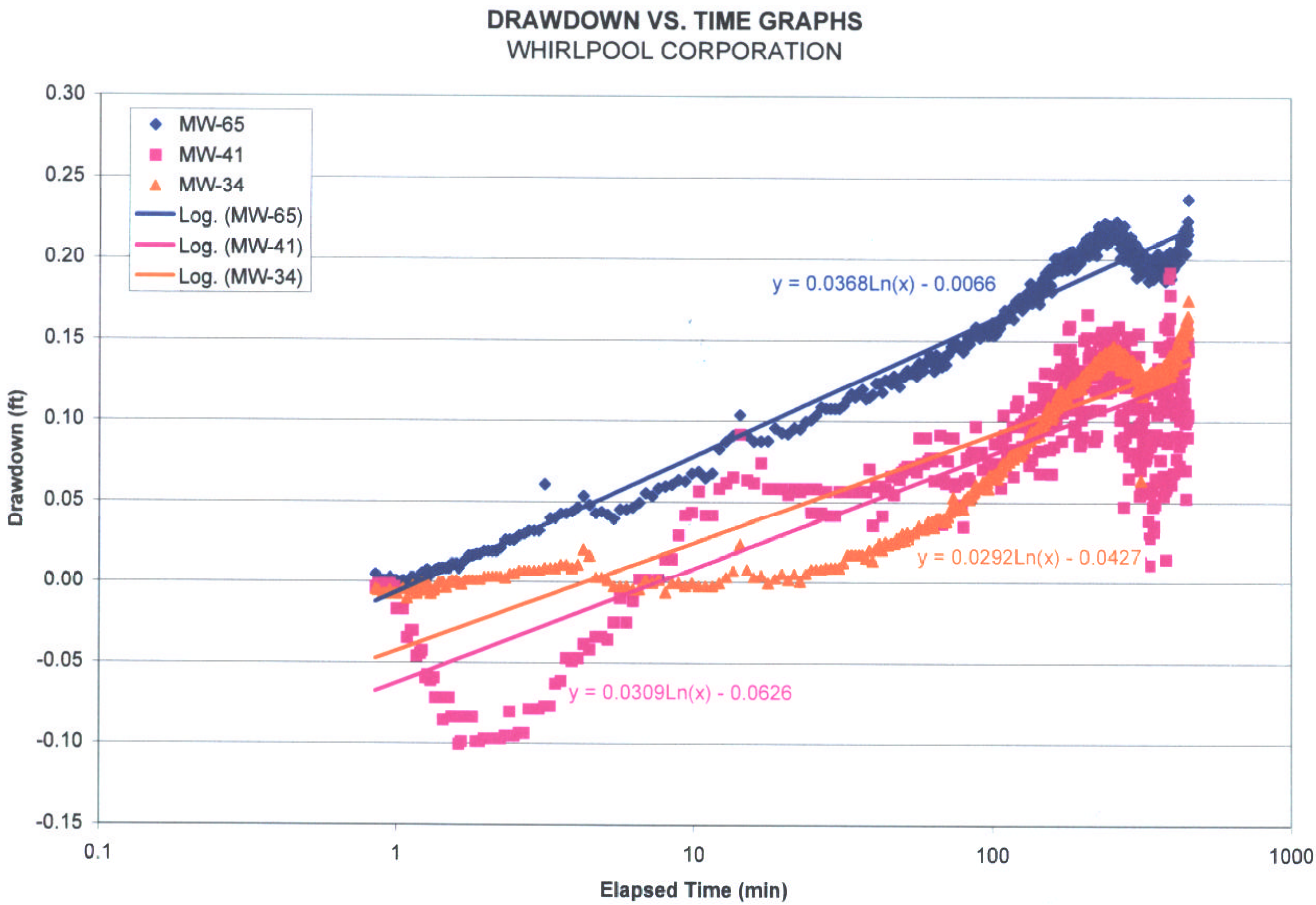
**Compute Storativity (S)**

$S = 2.25Tt_0/r^2$

| Parameter | Value | Units |
|---|---|---|
| T | 831.98 | $ft^2/d$ |
| $t_0$ | 7.58 | min |
| r | 150.70 | ft |
| **S** | **4.34E-04** | |

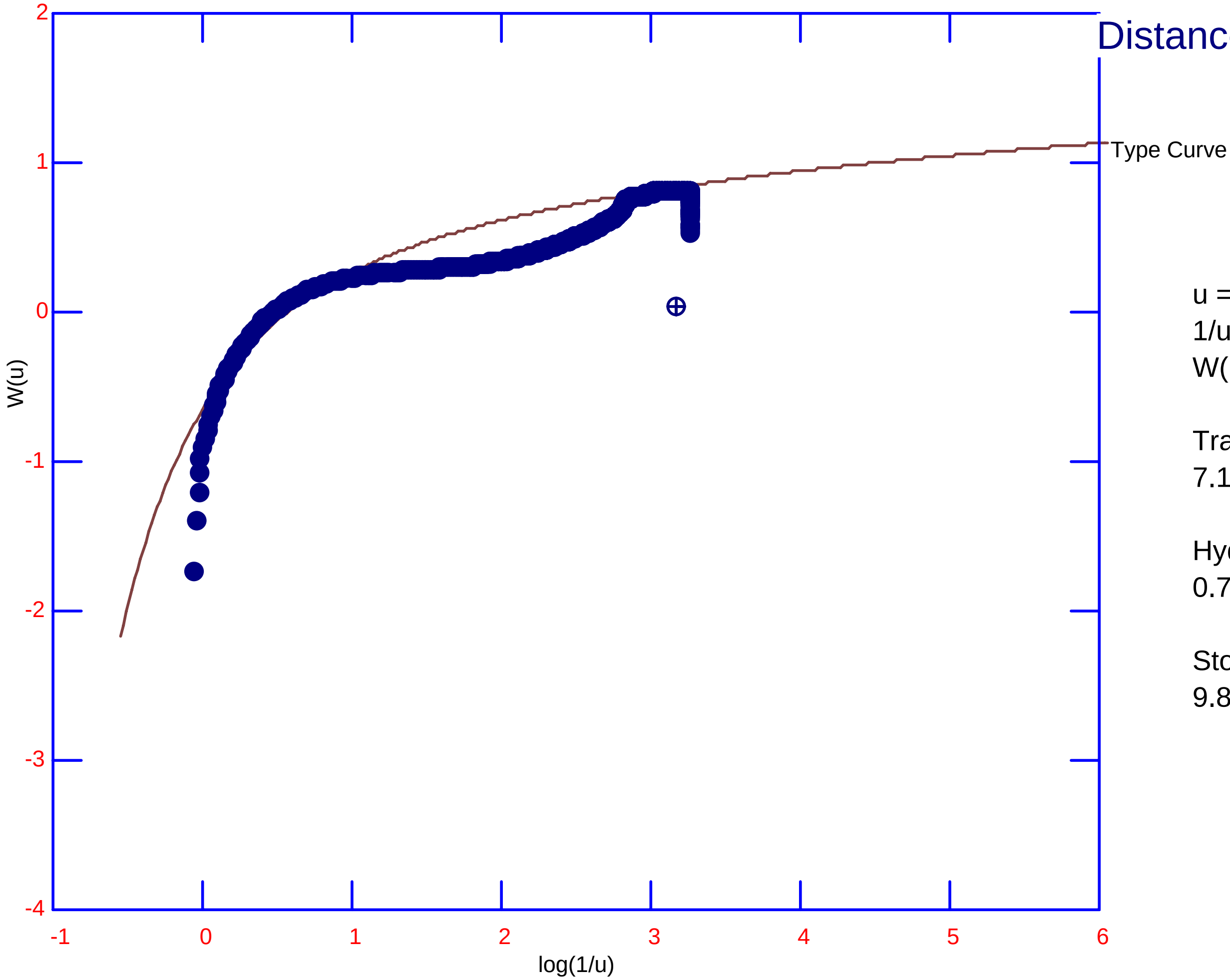
Notes:

1) Transmissivity and storativity are computed for selected wells in this table through use of the Jacob (1950) time-drawdown method.
2) Regression lines are determined for each time-drawdown data series and equation parameters used to compute aquifer properties.
3) Time-drawdown data and regression lines are shown in the accompanying figure.



DRAWDOWN VS. TIME GRAPHS
WHIRLPOOL CORPORATION
MW-65
MW-41
MW-34
Log. (MW-65)
Log. (MW-41)
Log. (MW-34)
y = 0.0368Ln(x) - 0.0066
y = 0.0292Ln(x) - 0.0427
y = 0.0309Ln(x) - 0.0626
Drawdown (ft)
0.30
0.25
0.20
0.15
0.10
0.05
0.00
-0.05
-0.10
-0.15
0.1
1
10
100
1000
Elapsed Time (min)

# Theis Type Curve MW-35R Pump Test April 4-5, 2006




Distance to Obs Well: MW-35R
0.46 feet

u = 7.26e-004
1/u = 1.38e+003
W(u) = 1.14

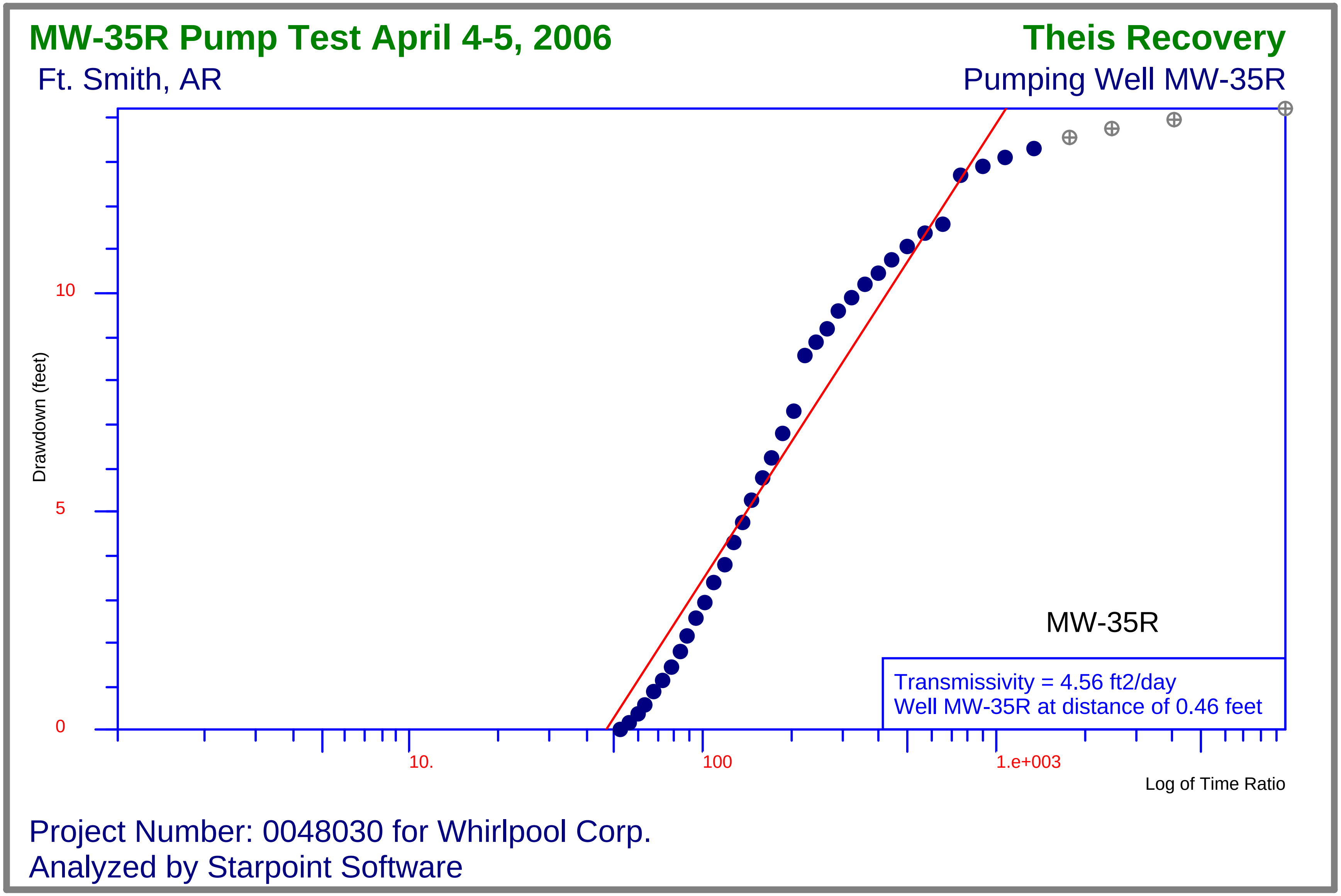
Transmissivity
7.17 ft2/day

Hydraulic Conductivity
0.788 feet/day

Storativity
9.83e-002

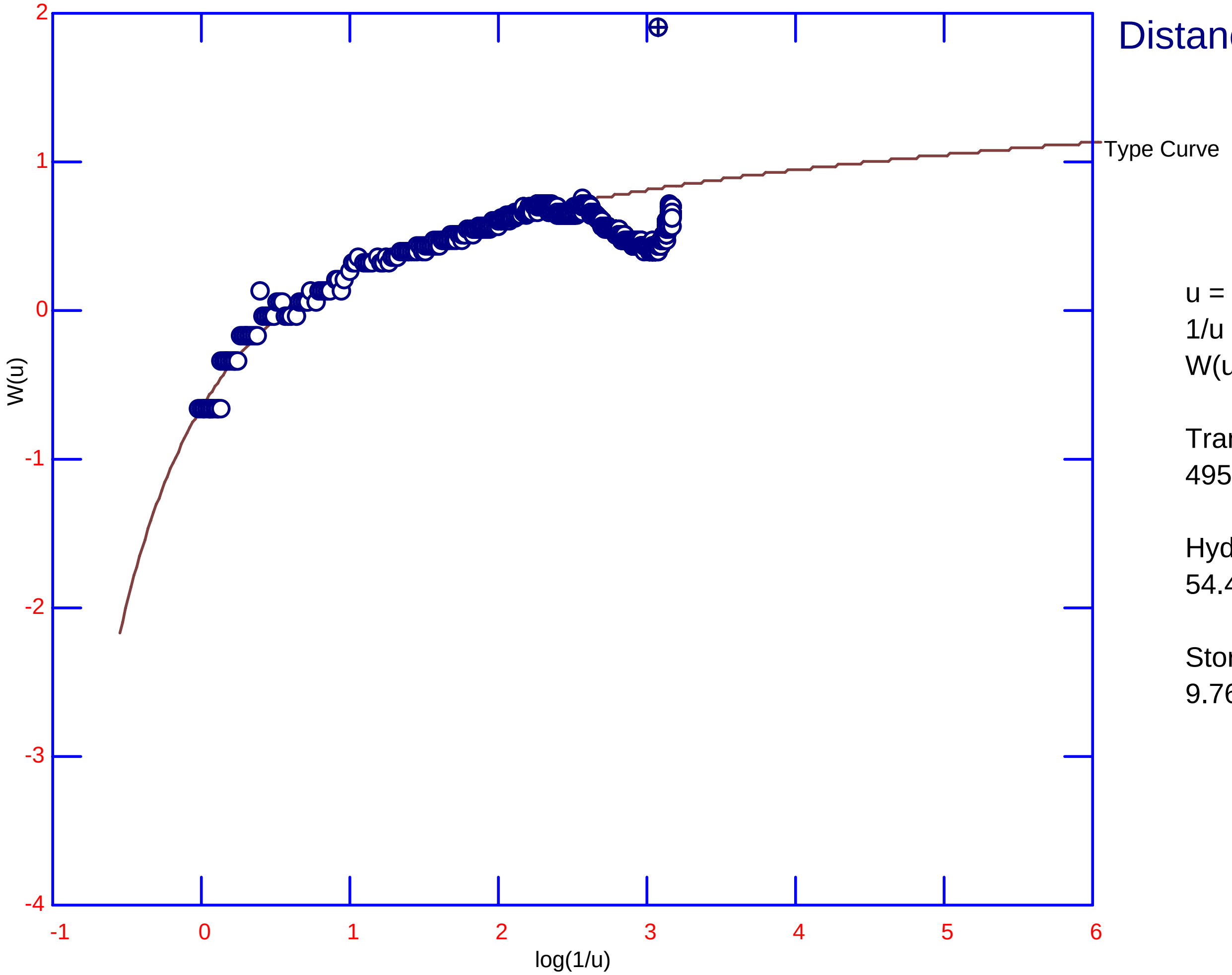
Ft. Smith, AR
Project Number: 0048030 for Whirlpool Corp.
Analyzed by Starpoint Software
MW-35R Pump Test April 4-5, 2006

5/5/2006


MW-35R Pump Test April 4-5, 2006
Ft. Smith, AR
Theis Recovery
Pumping Well MW-35R
Drawdown (feet)
0
5
10
10.
100
1.e+003
Log of Time Ratio
MW-35R
Transmissivity = 4.56 ft2/day
Well MW-35R at distance of 0.46 feet
Project Number: 0048030 for Whirlpool Corp.
Analyzed by Starpoint Software

5/5/2006

## Theis Type Curve MW-35R Pump Test April 4-5, 2006




Distance to Obs Well: MW-65
13.5 feet

u = 8.99e-004
1/u = 1.11e+003
W(u) = 78.5

Transmissivity
495 ft2/day

Hydraulic Conductivity
54.4 feet/day

Storativity
9.76e-003

Ft. Smith, AR
Project Number: 0048030 for Whirlpool Corp.
Analyzed by Starpoint Software
MW-35R Pump Test April 4-5, 2006

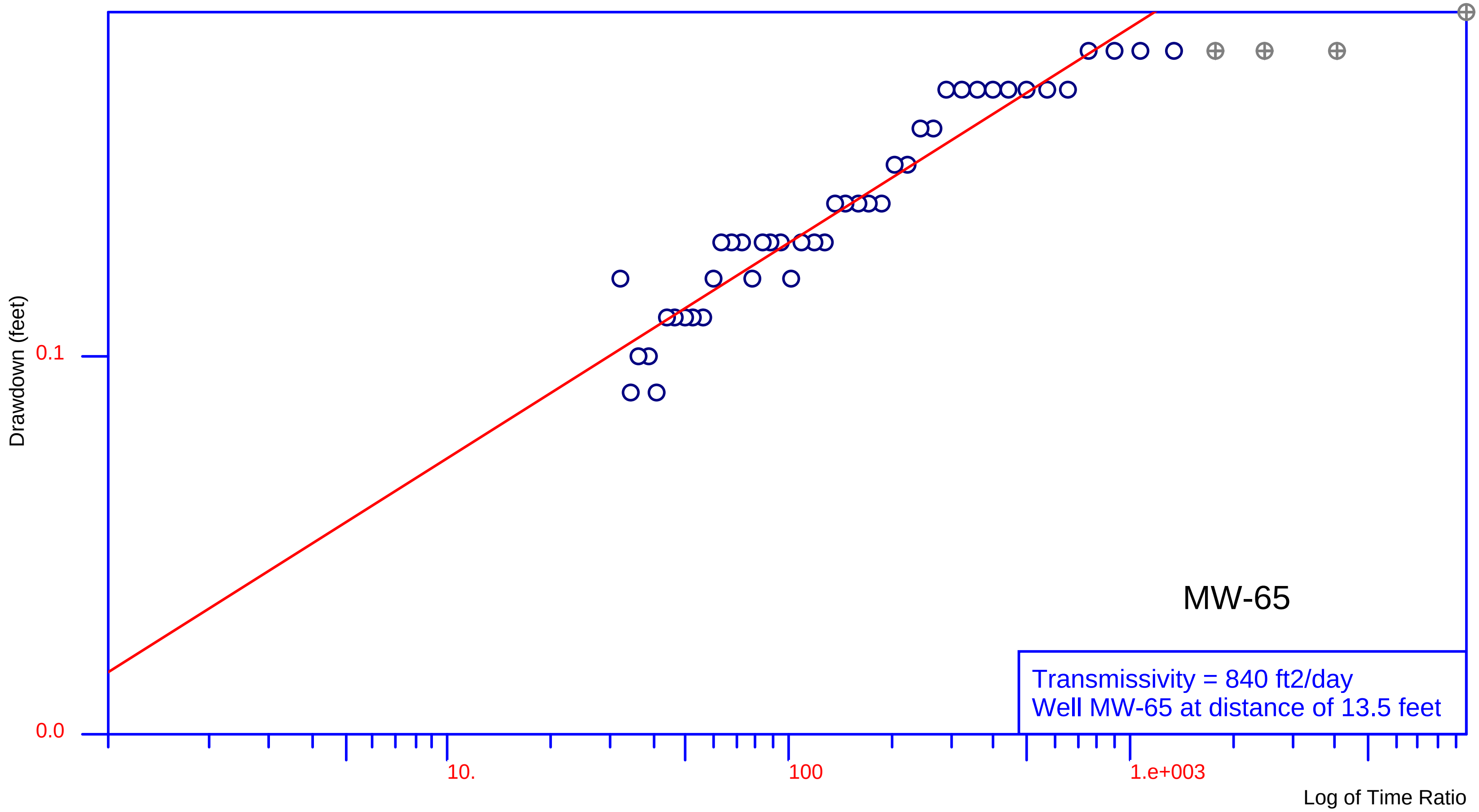
5/5/2006

**MW-35R Pump Test April 4-5, 2006**

Ft. Smith, AR

**Theis Recovery**

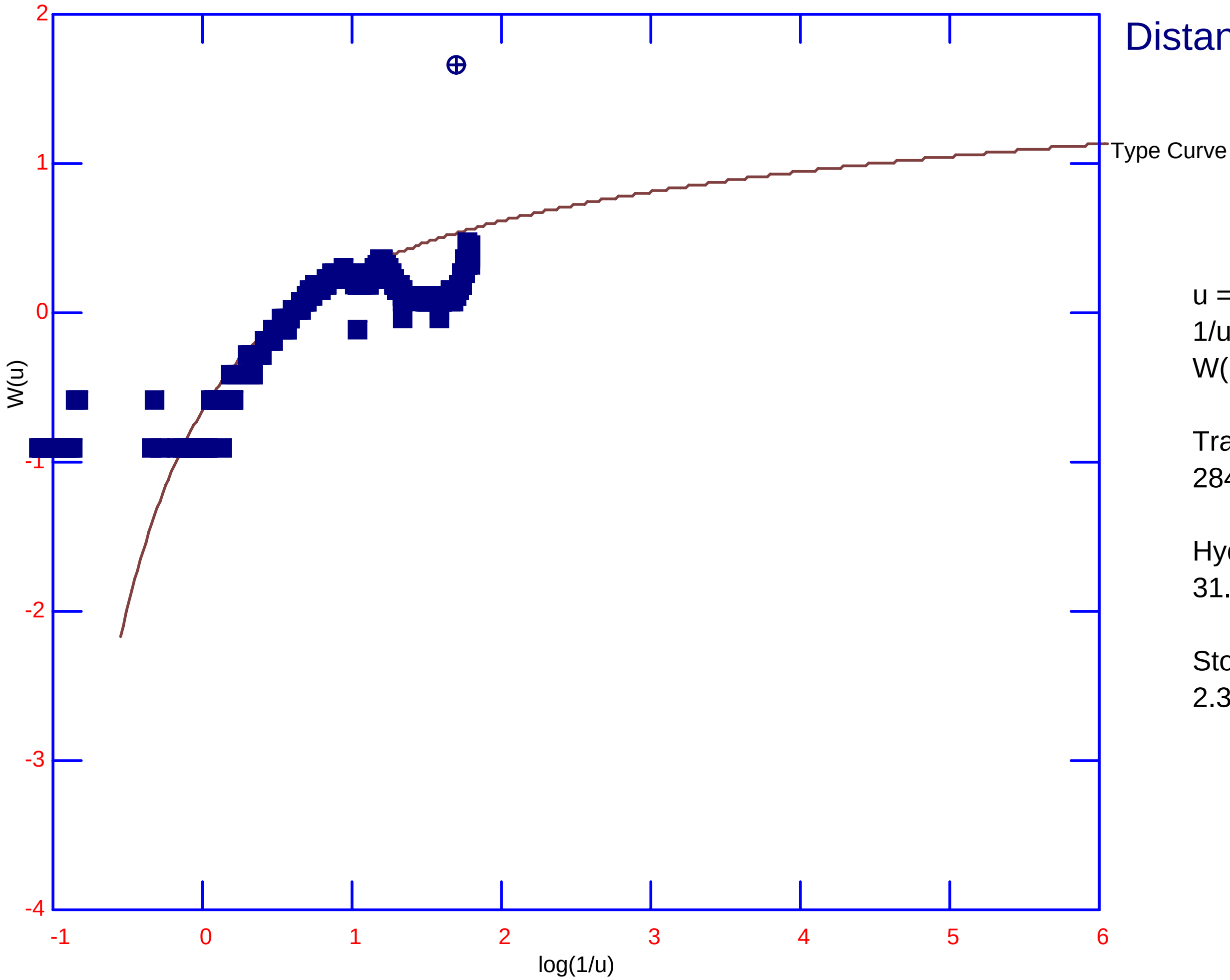
Pumping Well MW-35R




Project Number: 0048030 for Whirlpool Corp.

Analyzed by Starpoint Software

# Theis Type Curve MW-35R Pump Test April 4-5, 2006




Distance to Obs Well: MW-34
31.3 feet

u = 2.04e-002
1/u = 49.
W(u) = 45.

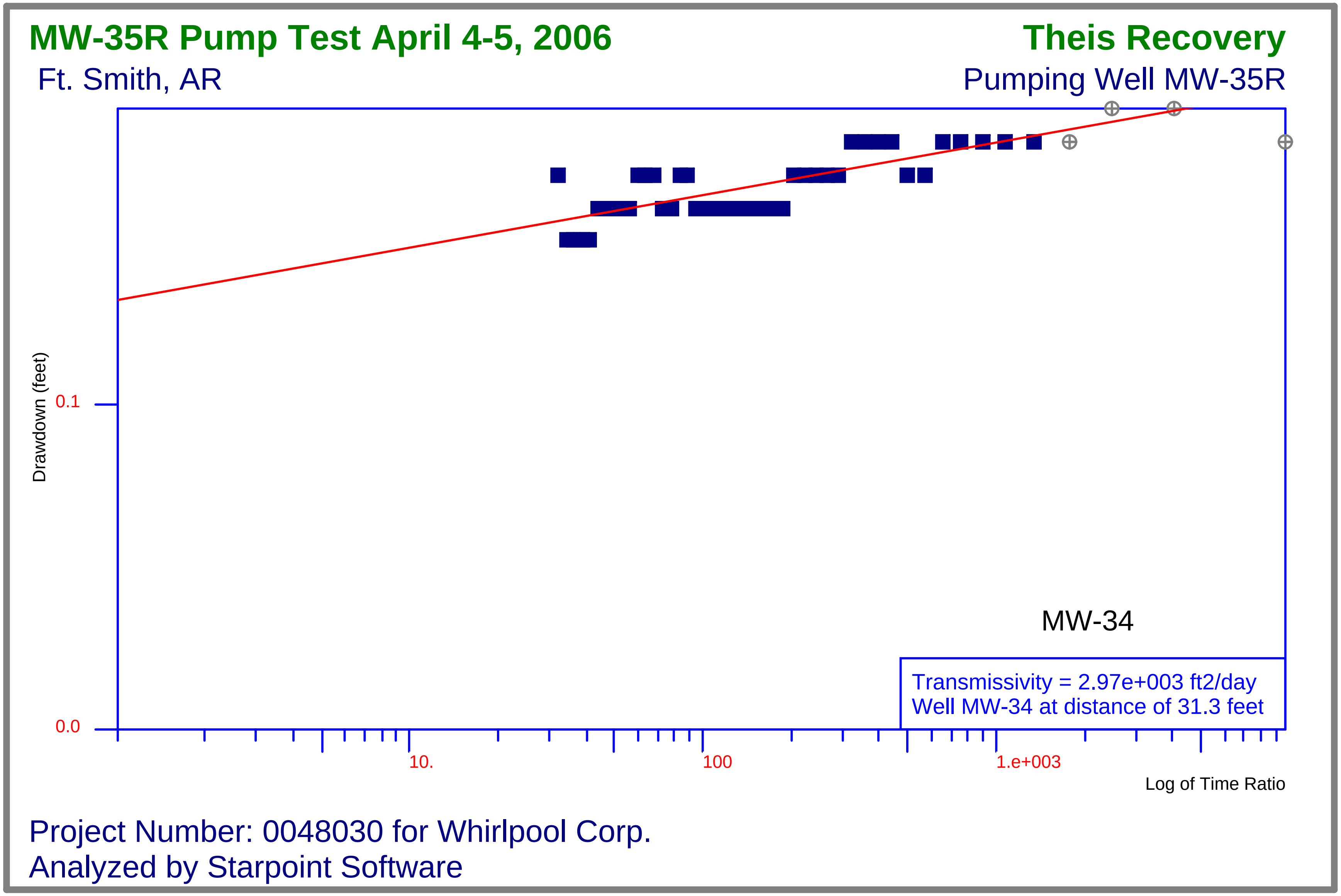
Transmissivity
284 ft2/day

Hydraulic Conductivity
31.2 feet/day

Storativity
2.36e-002

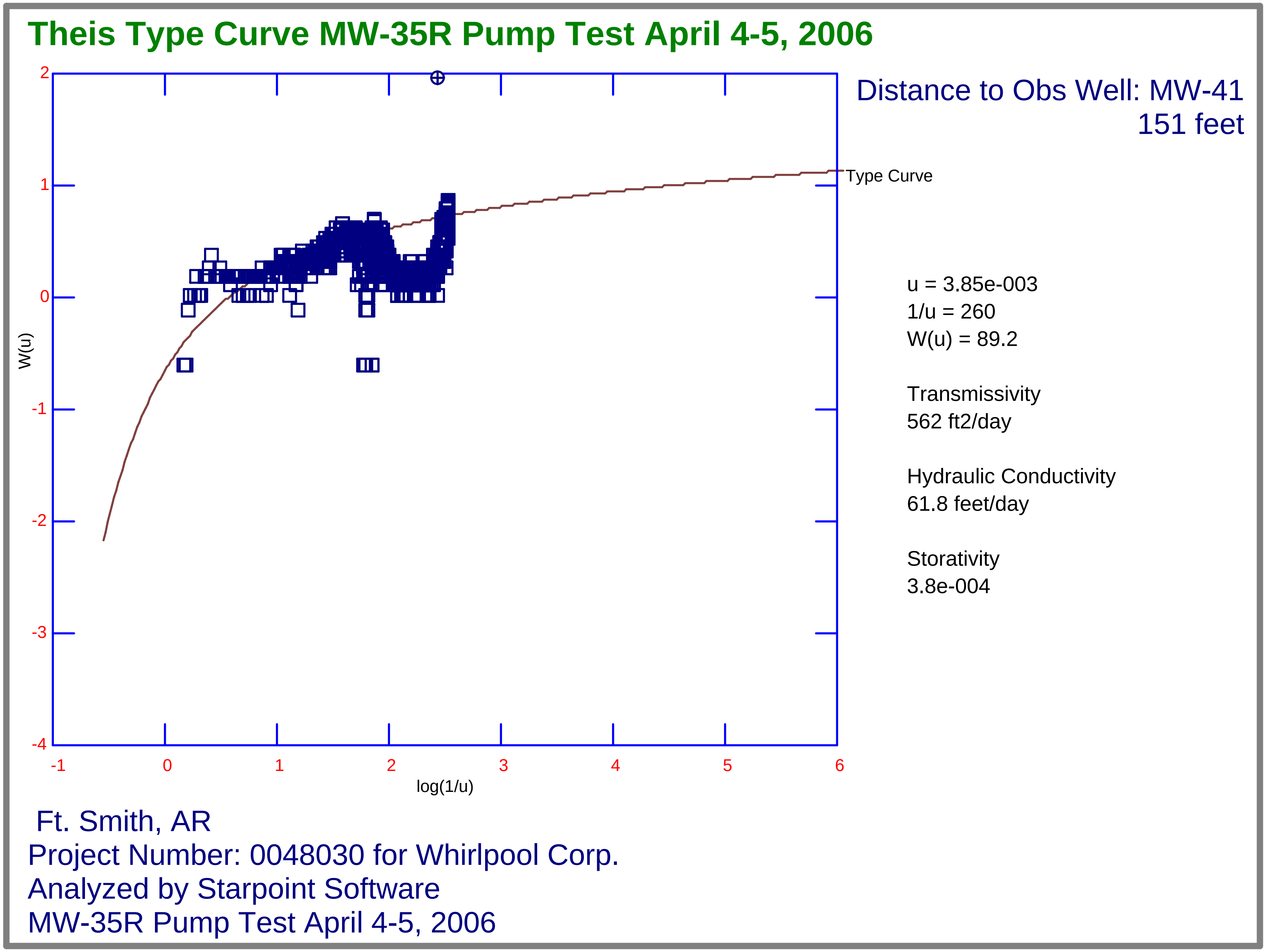
Ft. Smith, AR
Project Number: 0048030 for Whirlpool Corp.
Analyzed by Starpoint Software
MW-35R Pump Test April 4-5, 2006

5/5/2006



MW-35R Pump Test April 4-5, 2006
Ft. Smith, AR
Theis Recovery
Pumping Well MW-35R
Drawdown (feet)
0.1
0.0
10.
100
1.e+003
Log of Time Ratio
MW-34
Transmissivity = 2.97e+003 ft2/day
Well MW-34 at distance of 31.3 feet
Project Number: 0048030 for Whirlpool Corp.
Analyzed by Starpoint Software


5/5/2006



Theis Type Curve MW-35R Pump Test April 4-5, 2006
Distance to Obs Well: MW-41
151 feet
Type Curve
u = 3.85e-003
1/u = 260
W(u) = 89.2
Transmissivity
562 ft2/day
Hydraulic Conductivity
61.8 feet/day
Storativity
3.8e-004
W(u)
log(1/u)
2
1
0
-1
-2
-3
-4
-1
0
1
2
3
4
5
6
Ft. Smith, AR
Project Number: 0048030 for Whirlpool Corp.
Analyzed by Starpoint Software
MW-35R Pump Test April 4-5, 2006

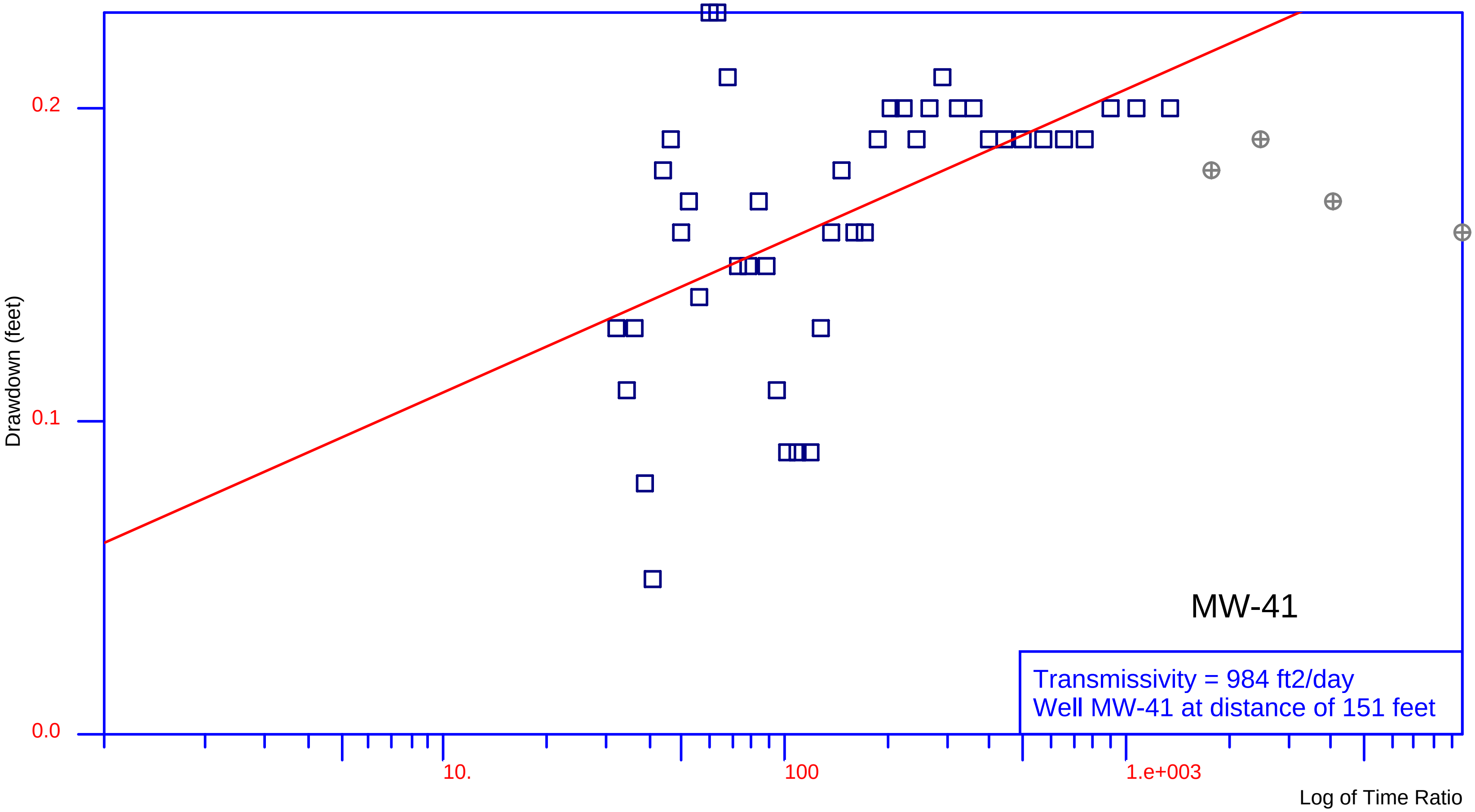

5/5/2006

**MW-35R Pump Test April 4-5, 2006**

**Theis Recovery**

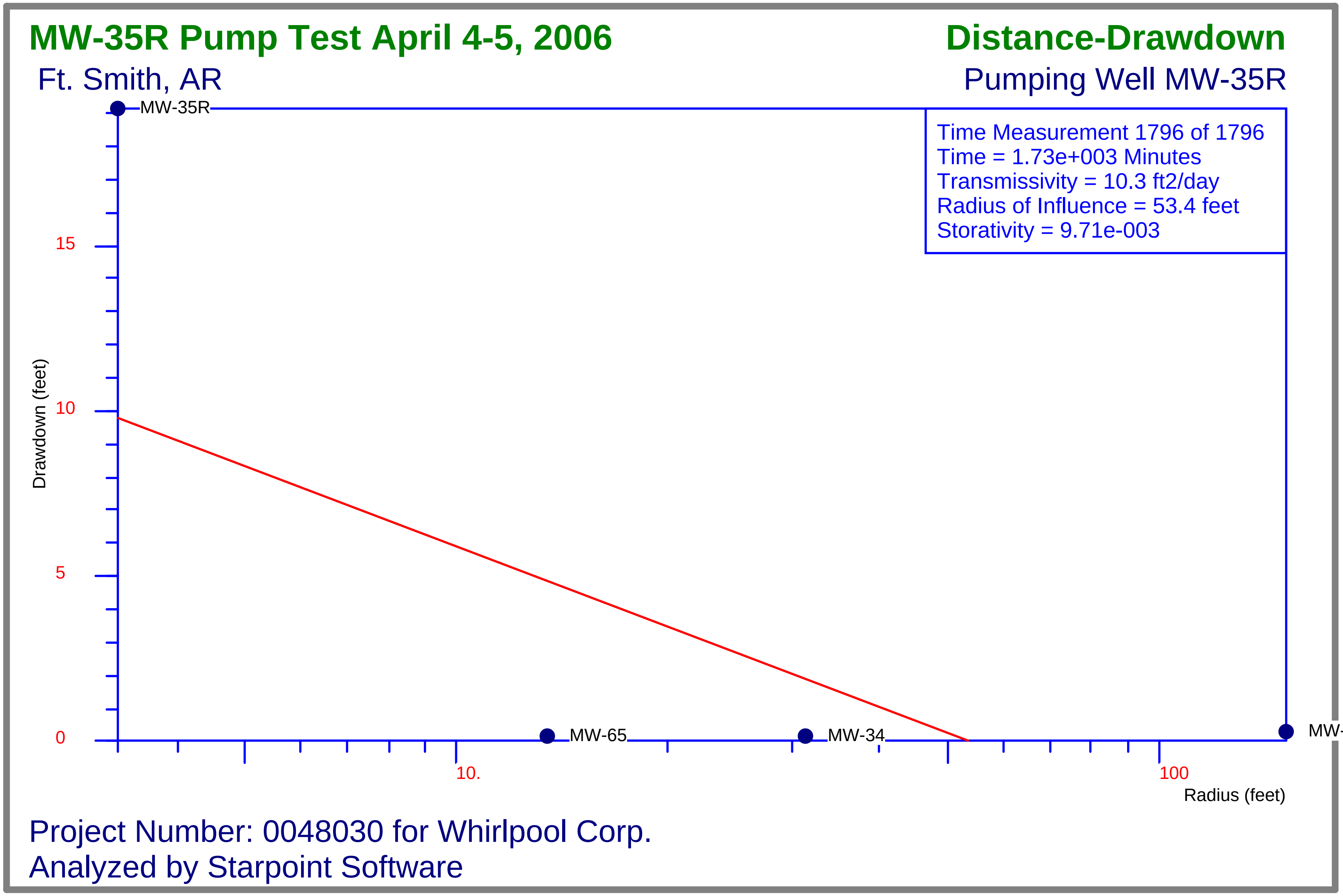
Ft. Smith, AR

Pumping Well MW-35R



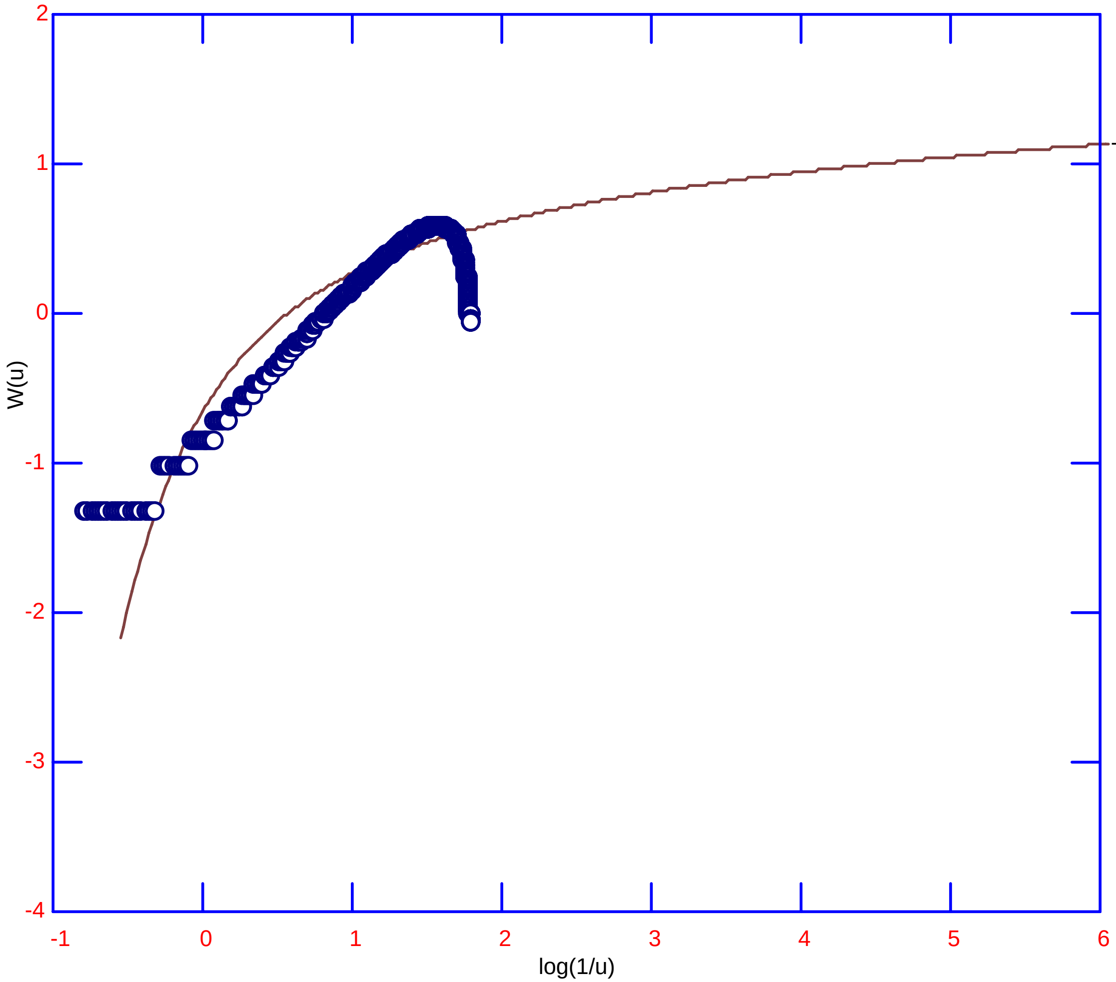

Project Number: 0048030 for Whirlpool Corp.
Analyzed by Starpoint Software

5/5/2006



MW-35R Pump Test April 4-5, 2006
Distance-Drawdown
Ft. Smith, AR
Pumping Well MW-35R
MW-35R
Time Measurement 1796 of 1796
Time = 1.73e+003 Minutes
Transmissivity = 10.3 ft2/day
Radius of Influence = 53.4 feet
Storativity = 9.71e-003
Drawdown (feet)
15
10
5
0
MW-65
MW-34
MW-41
10.
100
Radius (feet)
Project Number: 0048030 for Whirlpool Corp.
Analyzed by Starpoint Software

# Theis Type Curve MW-35R Pump Test April 4-5, 2006




Distance to Obs Well: MW-33
57.5 feet

u = 2.04e-002
1/u = 49.
W(u) = 169

Transmissivity
1.07e+003 ft2/day

Hydraulic Conductivity
117 feet/day

Storativity
2.64e-002

Ft. Smith, AR
Project Number: 0048030 for Whirlpool Corp.
Analyzed by Starpoint Software
MW-35R Pump Test April 4-5, 2006

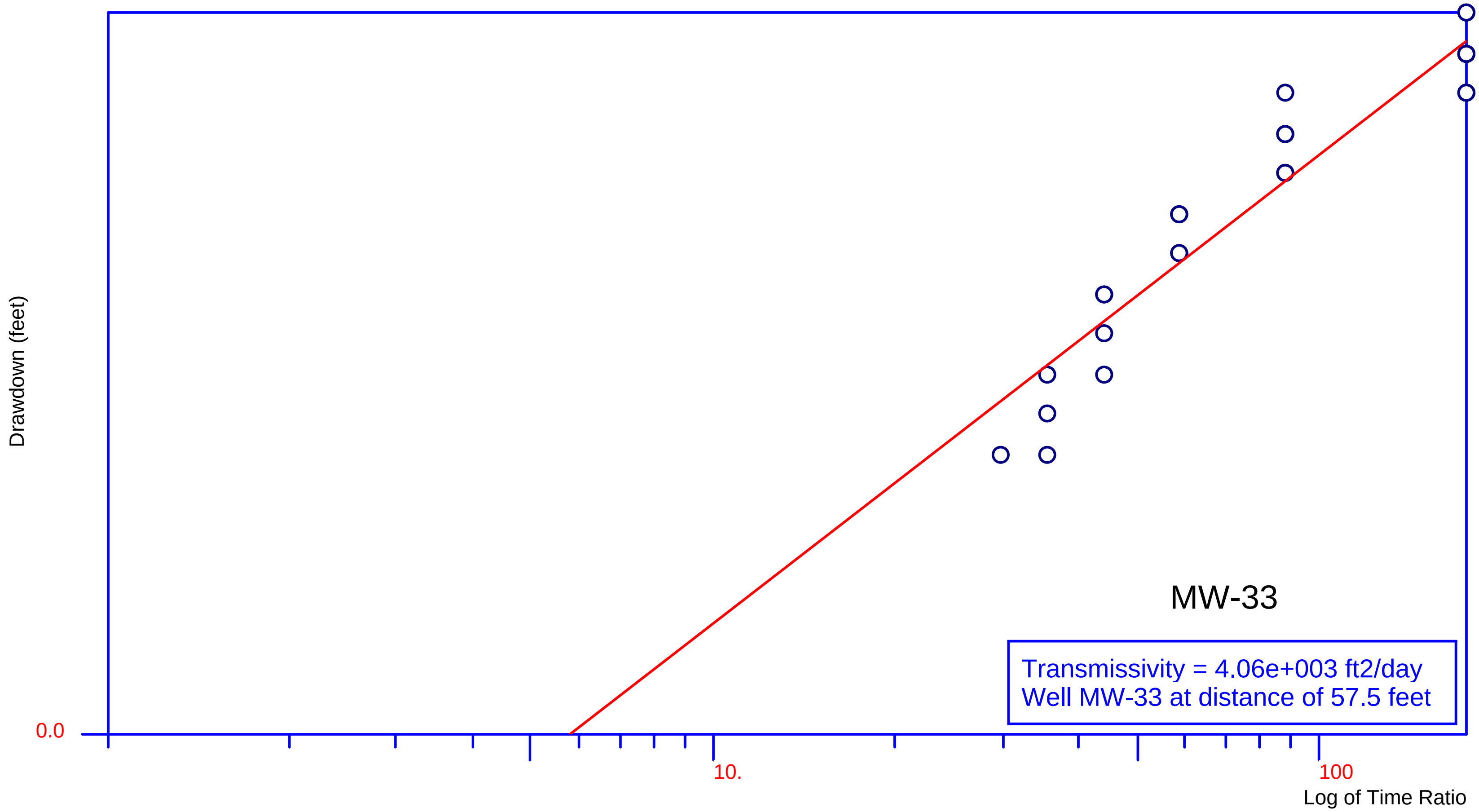
5/5/2006

# MW-35R Pump Test April 4-5, 2006

Ft. Smith, AR

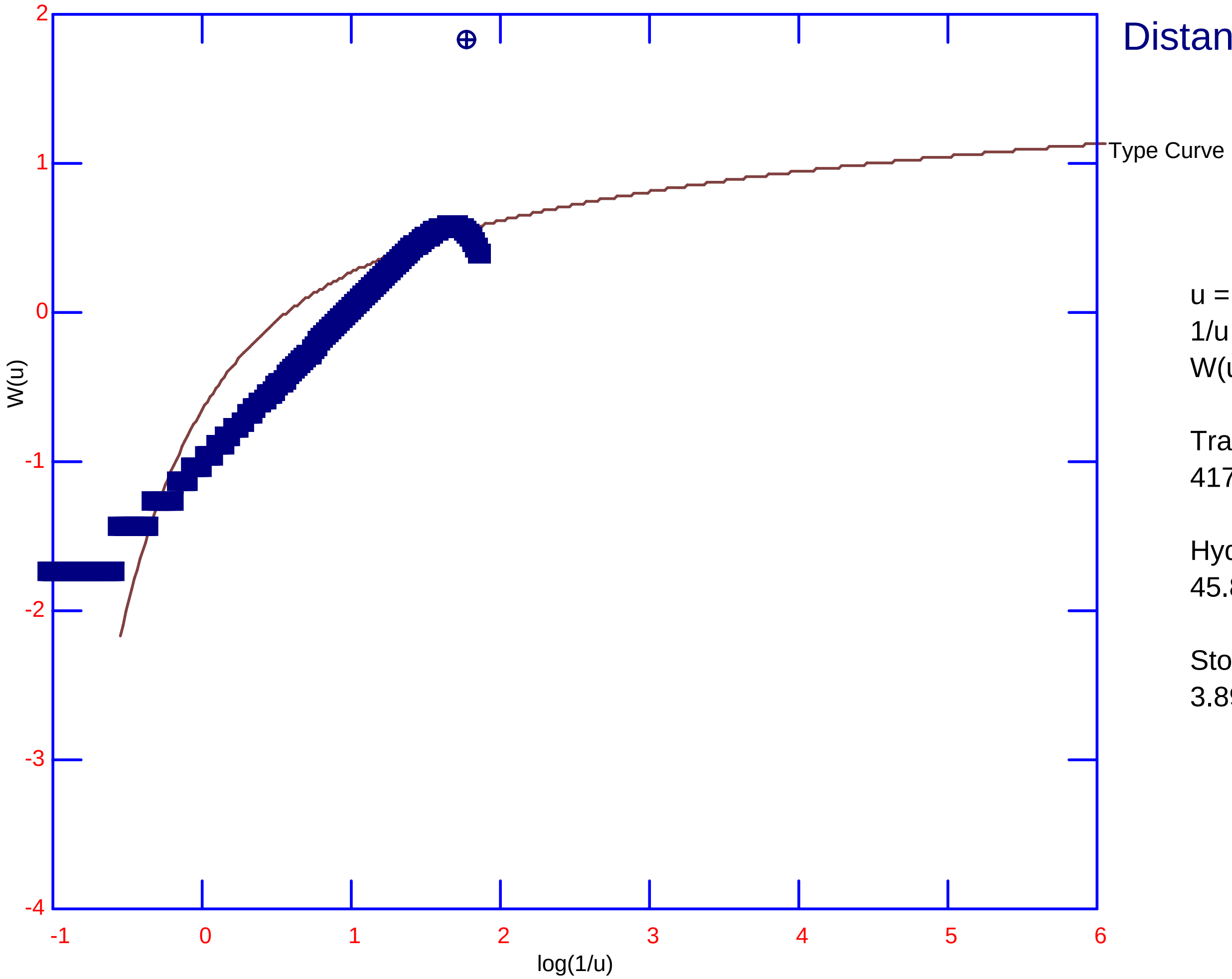
## Theis Recovery

Pumping Well MW-35R




Project Number: 0048030 for Whirlpool Corp.
Analyzed by Starpoint Software

# Theis Type Curve MW-35R Pump Test April 4-5, 2006




Distance to Obs Well: MW-36
85.8 feet

u = 1.72e-002
1/u = 58.2
W(u) = 66.1

Transmissivity
417 ft2/day

Hydraulic Conductivity
45.8 feet/day

Storativity
3.89e-003

Ft. Smith, AR
Project Number: 0048030 for Whirlpool Corp.
Analyzed by Starpoint Software
MW-35R Pump Test April 4-5, 2006

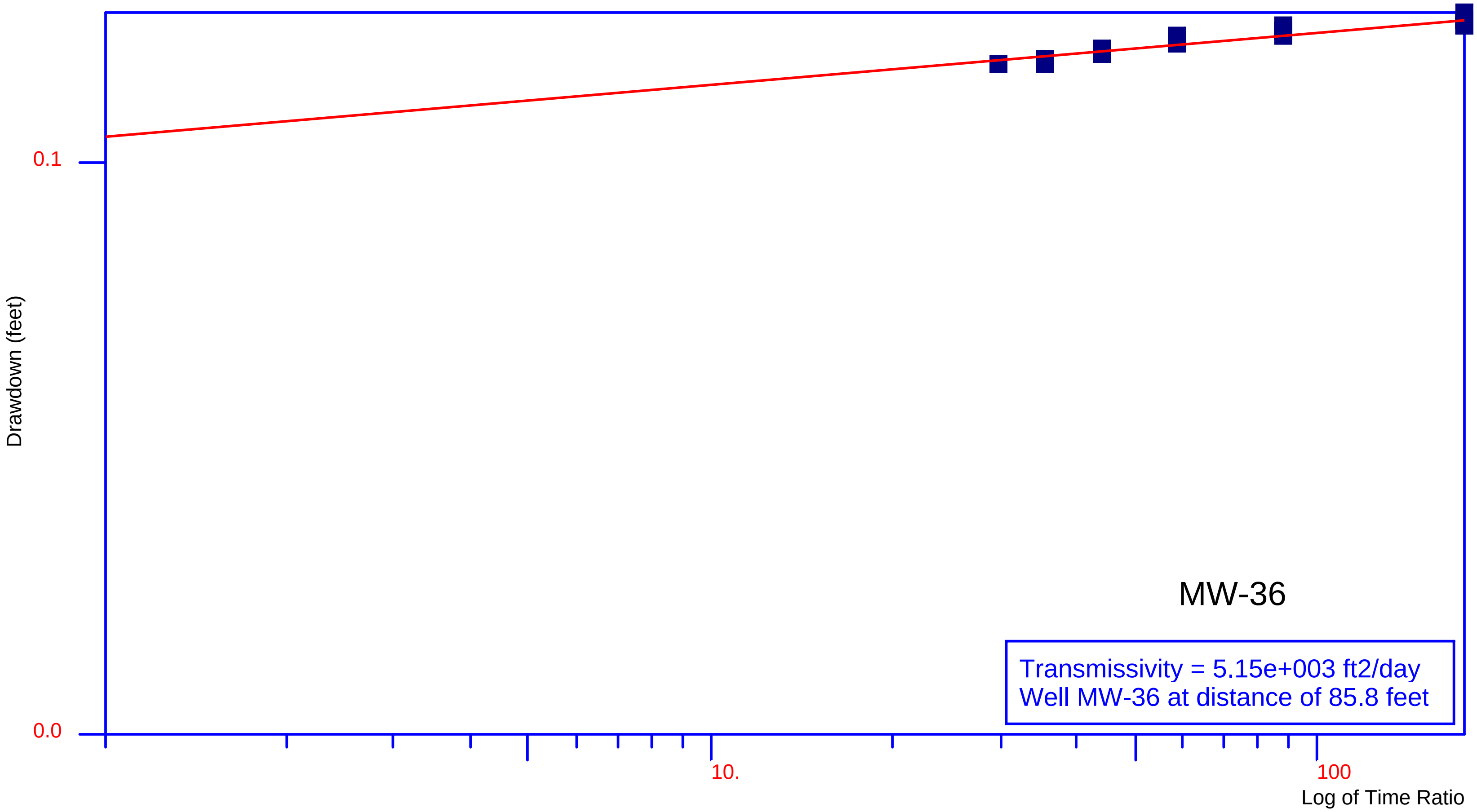
5/5/2006

# MW-35R Pump Test April 4-5, 2006

Ft. Smith, AR

## Theis Recovery

Pumping Well MW-35R




Project Number: 0048030 for Whirlpool Corp.

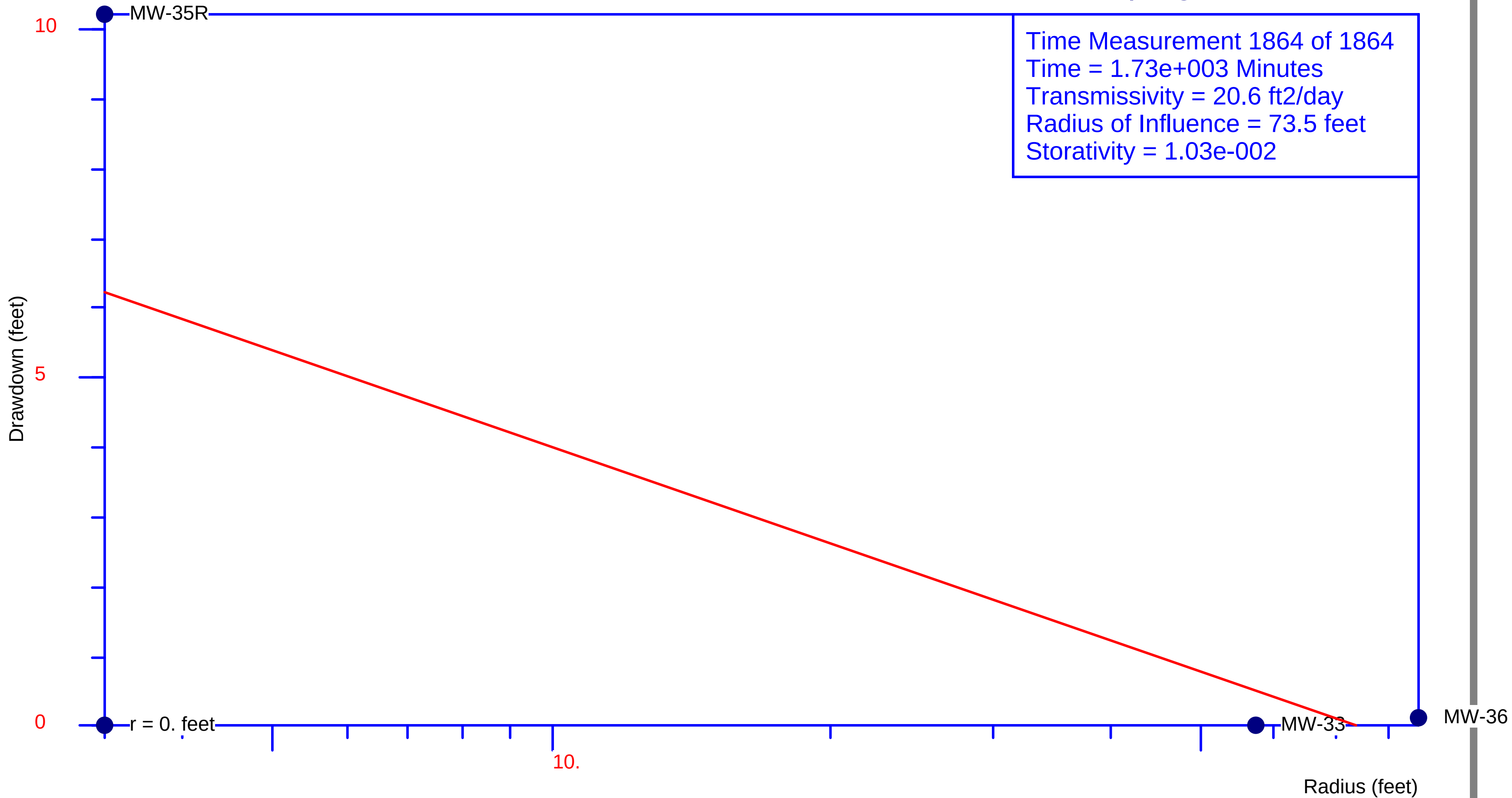
Analyzed by Starpoint Software

# MW-35R Pump Test April 4-5, 2006

Ft. Smith, AR

# Distance-Drawdown

Pumping Well MW-35R




Project Number: 0048030 for Whirlpool Corp.

Analyzed by Starpoint Software

5/5/2006

# Environmental Data Resources, Inc. Geocheck® Report

*Appendix C*

*August 30, 2006*
*Project No. 0014507*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

# The EDR GeoCheck® Report

**Whirlpool Corp**
**6400 Jenny Lind Road**
**Fort Smith, AR 72908**

**Inquiry Number: 1669115.1s**

**May 04, 2006**

EDR® Environmental
Data Resources Inc

**The Standard in Environmental Risk Management Information**

440 Wheelers Farms Road
Milford, Connecticut 06461

**Nationwide Customer Service**

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

# TABLE OF CONTENTS

**SECTION** **PAGE**

**GEOCHECK ADDENDUM**



***Thank you for your business.***
Please contact EDR at 1-800-352-0050
with any questions or comments.

# GEOCHECK® - PHYSICAL SETTING SOURCE REPORT

**TARGET PROPERTY ADDRESS**

WHIRLPOOL CORP
6400 JENNY LIND ROAD
FORT SMITH, AR 72908

**TARGET PROPERTY COORDINATES**

| | |
|---|---|
| Latitude (North): | 35.32240 - 35˚ 19' 20.6" |
| Longitude (West): | 94.4137 - 94˚ 24' 49.3" |
| Universal Tranverse Mercator: | Zone 15 |
| UTM X (Meters): | 371498.2 |
| UTM Y (Meters): | 3909515.0 |
| Elevation: | 469 ft. above sea level |

**USGS TOPOGRAPHIC MAP**

| | |
|---|---|
| Target Property Map: | 35094-C4 SOUTH FORT SMITH, OK |
| Most Recent Revision: | 1987 |

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

## GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**GROUNDWATER FLOW DIRECTION INFORMATION**

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

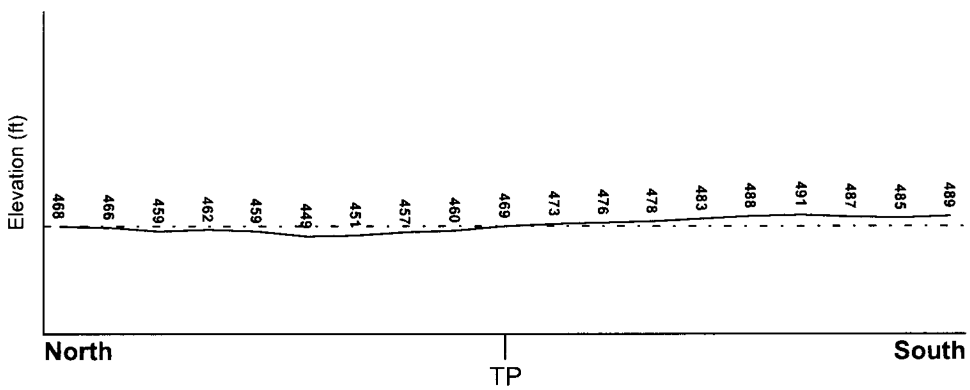
**TOPOGRAPHIC INFORMATION**

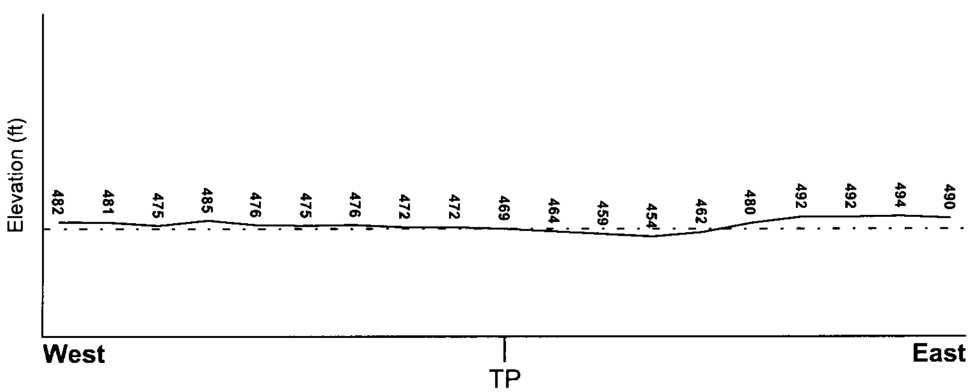
Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

**TARGET PROPERTY TOPOGRAPHY**

General Topographic Gradient: General NE

**SURROUNDING TOPOGRAPHY: ELEVATION PROFILES**




**Target Property Elevation: 469 ft.**

0 1/2 1 Miles

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

## GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**HYDROLOGIC INFORMATION**

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

**FEMA FLOOD ZONE**

| Target Property County | FEMA Flood Electronic Data |
|---|---|
| SEBASTIAN, AR | YES - refer to the Overview Map and Detail Map |

Flood Plain Panel at Target Property: 0550130015D

Additional Panels in search area: 0504620010B

**NATIONAL WETLAND INVENTORY**

| NWI Quad at Target Property | NWI Electronic Data Coverage |
|---|---|
| SOUTH FORT SMITH | Not Available |

**HYDROGEOLOGIC INFORMATION**

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

**AQUIFLOW®**

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

| MAP ID | LOCATION FROM TP | GENERAL DIRECTION GROUNDWATER FLOW |
|---|---|---|
| Not Reported | | |

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

## GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

## GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

**ROCK STRATIGRAPHIC UNIT**

| | |
|---|---|
| Era: | Paleozoic |
| System: | Pennsylvanian |
| Series: | Des Moinesian Series |
| Code: | PP2 *(decoded above as Era, System & Series)* |

**GEOLOGIC AGE IDENTIFICATION**

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

### DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps. The following information is based on Soil Conservation Service STATSGO data.

| | |
|---|---|
| Soil Component Name: | FALKNER |
| Soil Surface Texture: | silt loam |
| Hydrologic Group: | Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures. |
| Soil Drainage Class: | Somewhat poorly. Soils commonly have a layer with low hydraulic conductivity, wet state high in profile, etc. Depth to water table is 1 to 3 feet. |

Hydric Status: Soil does not meet the requirements for a hydric soil.

| | |
|---|---|
| Corrosion Potential - Uncoated Steel: | HIGH |
| Depth to Bedrock Min: | > 60 inches |
| Depth to Bedrock Max: | > 60 inches |

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | | |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | Permeability Rate (in/hr) | Soil Reaction (pH) |
| 1 | 0 inches | 6 inches | silt loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt. | Max: 0.60 Min: 0.20 | Max: 6.00 Min: 4.50 |
| 2 | 6 inches | 21 inches | silt loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 0.60 Min: 0.20 | Max: 6.00 Min: 4.50 |
| 3 | 21 inches | 65 inches | silty clay | Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay. | Max: 0.20 Min: 0.06 | Max: 6.50 Min: 4.50 |

**OTHER SOIL TYPES IN AREA**

Based on Soil Conservation Service STATSGO data, the following additional subordinant soil types may appear within the general area of target property.

Soil Surface Textures: loam

Surficial Soil Types: loam

Shallow Soil Types: No Other Soil Types

Deeper Soil Types: silty clay loam
very gravelly - loam
silt loam

**LOCAL / REGIONAL WATER AGENCY RECORDS**

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**WELL SEARCH DISTANCE INFORMATION**

| DATABASE | SEARCH DISTANCE (miles) |
|---|---|
| Federal USGS | 1.000 |
| Federal FRDS PWS | 1.000 |
| State Database | 1.000 |

**FEDERAL USGS WELL INFORMATION**

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| No Wells Found | | |

**FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION**

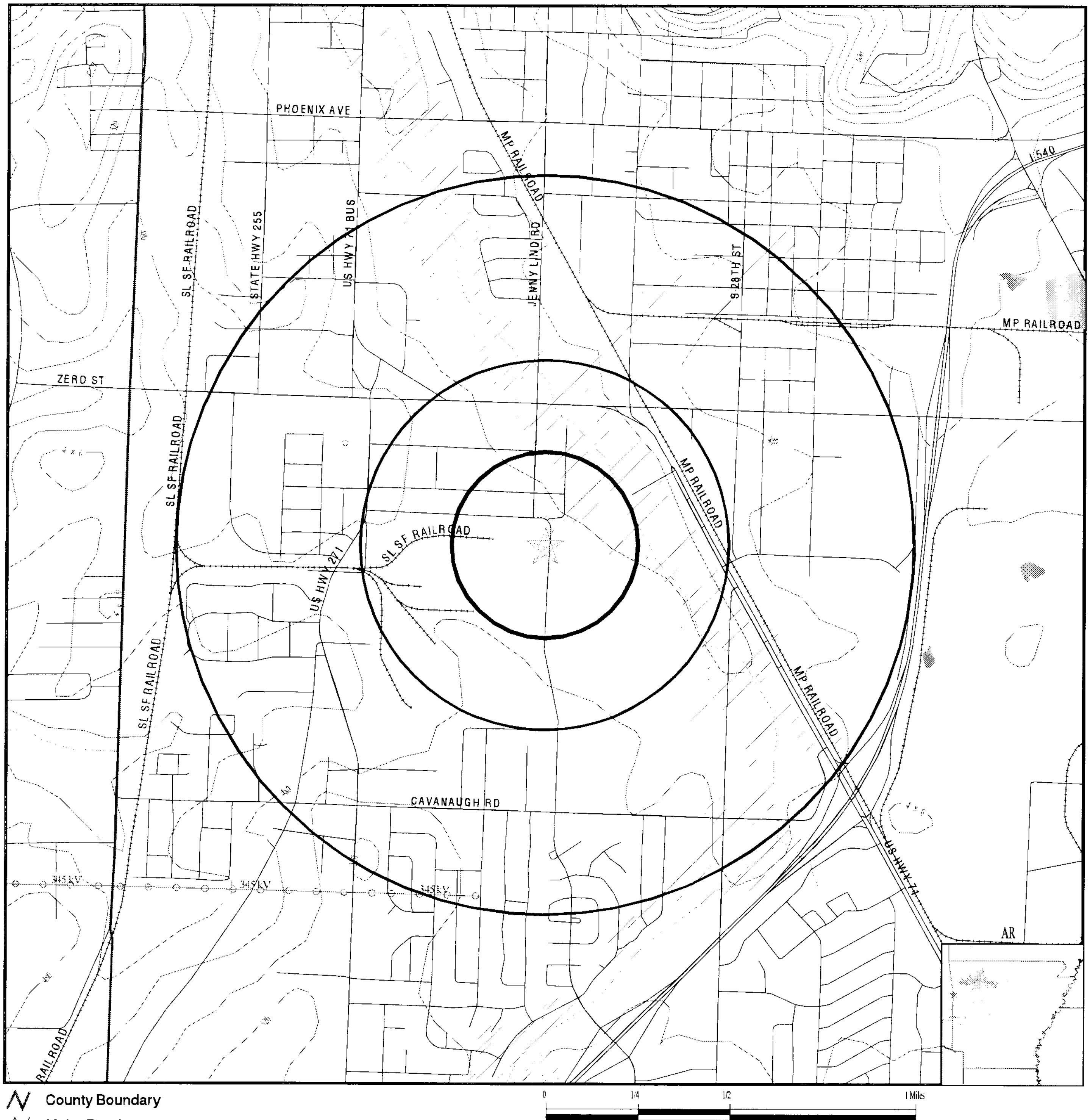
| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| No PWS System Found | | |

Note: PWS System location is not always the same as well location.

**STATE DATABASE WELL INFORMATION**

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| No Wells Found | | |

# PHYSICAL SETTING SOURCE MAP - 1669115.1s




- County Boundary
- Major Roads
- Contour Lines
- Power transmission lines
- Airports
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons

- Groundwater Flow Direction
- (GI) Indeterminate Groundwater Flow at Location
- (GV) Groundwater Flow Varies at Location
- (HD) Closest Hydrogeological Data
- 100-year flood zone
- 500-year flood zone

| | | | |
|---|---|---|---|
| SITE NAME: | Whirlpool Corp | CLIENT: | ERM - Southwest, Inc. |
| ADDRESS: | 6400 Jenny Lind Road<br>Fort Smith AR 72908 | CONTACT: | Doss Barker |
| | | INQUIRY #: | 1669115.1s |
| LAT/LONG: | 35.3224 / 94.4137 | DATE: | May 04, 2006 |

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
# RADON

**AREA RADON INFORMATION**

Federal EPA Radon Zone for SEBASTIAN County: 3

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

---

Federal Area Radon Information for SEBASTIAN COUNTY, AR

Number of sites tested: 63

| Area | Average Activity | % <4 pCi/L | % 4-20 pCi/L | % >20 pCi/L |
|---|---|---|---|---|
| Living Area - 1st Floor | 0.668 pCi/L | 100% | 0% | 0% |
| Living Area - 2nd Floor | Not Reported | Not Reported | Not Reported | Not Reported |
| Basement | 1.767 pCi/L | 100% | 0% | 0% |

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

## TOPOGRAPHIC INFORMATION

**USGS 7.5' Digital Elevation Model (DEM)**
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

## HYDROLOGIC INFORMATION

**Flood Zone Data:** This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

**NWI:** National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 from the U.S. Fish and Wildlife Service.

**State Wetlands Data: Wetlands, Swamps, or Marshes**
Source: Center for Advanced Spatial Technologies, University of Arkansas
Telephone: 605-594-6933

## HYDROGEOLOGIC INFORMATION

**AQUIFLOW[R] Information System**
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

## GEOLOGIC INFORMATION

**Geologic Age and Rock Stratigraphic Unit**
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

**STATSGO:** State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

**SSURGO: Soil Survey Geographic Database**
Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

## LOCAL / REGIONAL WATER AGENCY RECORDS

### FEDERAL WATER WELLS

**PWS:** Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

**PWS ENF:** Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

**USGS Water Wells:** USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

### STATE RECORDS

**Arkansas Community Public Water Systems**
Source: Health Department
Telephone: 501-661-2623

## OTHER STATE DATABASE INFORMATION

### RADON

**Area Radon Information**
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

**EPA Radon Zones**
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

### OTHER

**Airport Landing Facilities:** Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

**Epicenters:** World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

**STREET AND ADDRESS INFORMATION**

# Boring Logs from Arkansas USGS Office Well Search

*Appendix D*

*August 30, 2006*
*Project No. 0014507*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

≈ 4000 ft SE of orig'd well

# STATE OF ARKANSAS
## REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

**A**
1. Contractor Name & Number: Horizon Environmental Drilling C# 1380
2. Driller Name & Number: Mike Sever D# 2384
3. Pump Installer Name & Number: P#
4. Date Well Completed: 8-19-98 New Well ☒ Replace or Work-over ☐

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastian | SE ¼ of SE ¼ of | 4 | 7N | 32W |

11 LONGITUDE 94 ° 40 ' 68 "
11 LATITUDE 35 ° 31 ' 35 "

10 LOCATE WITH 'X' IN SECTION BELOW

**B**
1. DESCRIPTION OF FORMATION: DEPTHS IN FEET

| | FROM | TO |
|---|---|---|
| Fill | 0 | 8 |
| sandy Clay | 8 | 12 |
| sandy Clay w/ gravels | 12 | 15 |
| | | |
| | | |
| | | |

*ATTACH ADDITIONAL SHEETS IF NECESSARY*

2. TOTAL DEPTH OF WELL 15 ft
3. DEPTHS TO WATER PRODUCING FORMATIONS 8
4. STATIC WATER LEVEL Ft below land surface
5. YIELD gallons per ☐ min ☐ hr
6. DIAMETER OF BORE HOLE 8.75 IN

**C** PUMP REPORT
1. TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐
2. SETTING DEPTH: FEET
3. BRAND NAME AND SERIAL NUMBERS:
4. RATED CAPACITY gallons per minute
5. TYPE LUBRICATION
6. DROP PIPE OR COLUMN PIPE SIZE
7. WIRE SIZE
8. PRESSURE TANK . . . SIZE, MAKE, MODEL
9. DATE OF INSTALLATION OR REPAIR
10. Is there an abandoned water well on the property?

**D**
1. LAND OWNER OR OTHER CONTACT PERSON:
NAME Chris Whitt
STREET ADDRESS 7400 S. 28th St.
CITY Ft. Smith, AR 72903
2. CASING FROM 0 TO 5 W/ 2" "ID
FROM TO W/ "ID
TYPE CASING: PVC
3. SCREEN TYPE: PVC DIA 2" SLOT/GA .010
SET FROM 5 FT TO 15 FT
TYPE: DIA SLOT/GA
SET FROM FT TO FT
4. GRAVEL PACK FROM 4 FT TO 15 FT
5. BACK FILLED WITH: Holeplug
FROM 2 FT TO 4 FT
6. SEALED WITH: cement
FROM 0 FT TO 2 FT
FROM FT TO FT
7. DISINFECTED WITH:
8. USE OF WELL:
DOMESTIC ☐ COMMERCIAL ☐
IRRIGATION ☐ MONITOR ☒
LIVESTOCK/POULTRY ☐ TEST WELL ☐
OIL/GAS SUPPLY ☐ SEMI-PUBLIC ☐
PUBLIC SUPPLY ☐ OTHER
(A/C HEATPUMP TYPE WELLS)
SOURCE ☐ RETURN ☐
CLOSED LOOP ☐
9. (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?
If yes, name use: yes ☐ no ☐
10. (For A/C open-loop only) Into what medium is water returned?
11. REMARKS MW-3
12. SIGNED Mike Sever DATE 8/26/98

≈ 4500 ft SE of onsite well

# STATE OF ARKANSAS
## REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

RECEIVED

**A**

1. Contractor Name & Number: Horizon Environmental Drilling C# 1380
2. Driller Name & Number: Mike Sever D# 2384
3. Pump Installer Name & Number: P#
4. Date Well Completed: 8-20-98 New Well ☒ Replace or Work-over ☐

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastian | SE ¼ of SE ¼ of | 4 | 7N | 32W |

11 LONGITUDE 94 ° 40 ' 68 "
11 LATITUDE 35 ° 31 ' 35 "

10 LOCATE WITH 'X' IN SECTION BELOW

**B** 1 DESCRIPTION OF FORMATION: DEPTHS IN FEET

| | FROM | TO |
|---|---|---|
| stiff clay | 0 | 8 |
| | | |
| tan weathered shale | 8 | 18 |
| | | |
| grey shale | 18 | 32.2 |
| | | |
| | | |

ATTACH ADDITIONAL SHEETS IF NECESSARY.

2. TOTAL DEPTH OF WELL 32.2 ft
3. DEPTHS TO WATER PRODUCING FORMATIONS ~ 25
4. STATIC WATER LEVEL ~ 7 Ft below land surface
5. YIELD ______ gallons per ☐ min ☐ hr
6. DIAMETER OF BORE HOLE 8.75 IN

**C** PUMP REPORT

1. TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐
2. SETTING DEPTH: FEET
3. BRAND NAME AND SERIAL NUMBERS:
4. RATED CAPACITY gallons per minute
5. TYPE LUBRICATION
6. DROP PIPE OR COLUMN PIPE SIZE
7. WIRE SIZE
8. PRESSURE TANK . . . SIZE, MAKE, MODEL
9. DATE OF INSTALLATION OR REPAIR
10. Is there an abandoned water well on the property?

**D** 1 LAND OWNER OR OTHER CONTACT PERSON:

NAME Chris Whitt
STREET ADDRESS 7400 S. 28th St.
CITY Ft. Smith, AR 72903

2. CASING FROM 0 TO 22.2 W/ 2" "ID
   FROM TO W/ "ID
   TYPE CASING: PVC
3. SCREEN
   TYPE: PVC DIA 2" SLOT/GA .010
   SET FROM 22.2 FT TO 32.2 FT
   TYPE: DIA SLOT/GA
   SET FROM FT TO FT
4. GRAVEL PACK FROM 20 FT TO 32.2 FT
5. BACK FILLED WITH: Holeplug
   FROM 10 FT TO 20 FT
6. SEALED WITH: cement grout
   FROM 0 FT TO 17 FT
   FROM FT TO FT
7. DISINFECTED WITH:
8. USE OF WELL:

| | | | |
|---|---|---|---|
| DOMESTIC | ☐ | COMMERCIAL | ☐ |
| IRRIGATION | ☐ | MONITOR | ☒ |
| LIVESTOCK/POULTRY | ☐ | TEST WELL | ☐ |
| OIL/GAS SUPPLY | ☐ | SEMI-PUBLIC | ☐ |
| PUBLIC SUPPLY | ☐ | OTHER | |

(A/C HEATPUMP TYPE WELLS)

| | | | |
|---|---|---|---|
| SOURCE | ☐ | RETURN | ☐ |
| CLOSED LOOP | ☐ | | |

9. (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning? If yes, name use: yes ☐ no ☐
10. (For A/C open-loop only) Into what medium is water returned?
11. REMARKS MW-1
12. SIGNED Mike Sever DATE 8/26/98

AWD-7 JAN 89 Arkansas Water Well Construction Commission, One Capitol Mall, Suite 2-C, Little Rock, AR 72201
ACI–5945

GEOLOGY COPY

2 4000 ft
SE of Drgd
well

# STATE OF ARKANSAS
## REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

RECEIVED

**A**
1. Contractor Name & Number: Horizon Environmental Drilling C# 1380
2. Driller Name & Number: Mike Sever D# 2384
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| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
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| Sebastian | SE ¼ of SE ¼ of | 4 | 7N | 32W |

11 LONGITUDE 94 ° 40 ' 68 "
11 LATITUDE 35 ° 31 ' 35 "

10 LOCATE WITH 'X' IN SECTION BELOW

**B** 1 DESCRIPTION OF FORMATION: DEPTHS IN FEET

| | FROM | TO |
|---|---|---|
| stiff Clay, some silts | 0 | 8 |
| tan weathered shale | 8 | 15 |
| grey shale | 15 | 32.8 |
| | | |
| | | |

ATTACH ADDITIONAL SHEETS IF NECESSARY

2. TOTAL DEPTH OF WELL 32.8 ft
3. DEPTHS TO WATER PRODUCING FORMATIONS ~ 25'
4. STATIC WATER LEVEL 8 Ft below land surface
5. YIELD ______ gallons per ☐ min ☐ hr
6. DIAMETER OF BORE HOLE 8.75 IN

**C** PUMP REPORT
1. TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐
2. SETTING DEPTH: FEET
3. BRAND NAME AND SERIAL NUMBERS:
4. RATED CAPACITY gallons per minute
5. TYPE LUBRICATION
6. DROP PIPE OR COLUMN PIPE SIZE
7. WIRE SIZE
8. PRESSURE TANK . . . SIZE, MAKE, MODEL
9. DATE OF INSTALLATION OR REPAIR
10. Is there an abandoned water well on the property?

**D** 1 LAND OWNER OR OTHER CONTACT PERSON:
NAME Chris Whitt
STREET ADDRESS 7400 S. 28th St.
CITY Ft. Smith, AR 72903

2. CASING FROM 0 TO 22.8 W/ 2 "ID
FROM TO W/ "ID
TYPE CASING: PVC

3. SCREEN TYPE: PVC DIA 2" SLOT/GA 010
SET FROM 22.8 FT TO 32.8 FT
TYPE: DIA SLOT/GA
SET FROM FT TO FT

4. GRAVEL PACK FROM 20 FT TO 32.8 FT
5. BACK FILLED WITH: Holeplug
FROM 17 FT TO 20 FT
6. SEALED WITH: cement grout
FROM 0 FT TO 17 FT
FROM FT TO FT
7. DISINFECTED WITH:
8. USE OF WELL:
DOMESTIC ☐ COMMERCIAL ☐
IRRIGATION ☐ MONITOR ☒
LIVESTOCK/POULTRY ☐ TEST WELL ☐
OIL/GAS SUPPLY ☐ SEMI-PUBLIC ☐
PUBLIC SUPPLY ☐ OTHER

(A/C HEATPUMP TYPE WELLS)
SOURCE ☐ RETURN ☐
CLOSED LOOP ☐

9. (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?
If yes, name use: yes ☐ no ☐
10. (For A/C open-loop only) Into what medium is water returned?
11. REMARKS
MW-2
12. SIGNED Mike Sever DATE 8/26/98

AWD-7 JAN 89 Arkansas Water Well Construction Commission, One Capitol Mall, Suite 2-C, Little Rock, AR 72201
ACI—5945
GEOLOGY COPY

≈ 4500 ft
SE of dngrd
well

# STATE OF ARKANSAS
## REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

**A**
1 Contractor Name & Number: Horizon Environmental Drilling C# 1380
2 Driller Name & Number: Mike Swer D# 2384
3 Pump Installer Name & Number: P#
4 Date Well Completed: 8-19-98 New Well ☒ Replace or Work-over ☐

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastian | SE ¼ of SE ¼ of | 4 | 7N | 32W |

LONGITUDE 11 94 ° 40 ' 68 "
LATITUDE 11 35 ° 31 ' 35 "

10 LOCATE WITH 'X' IN SECTION BELOW: x

**B** 1 DESCRIPTION OF FORMATION: DEPTHS IN FEET

| MW-4 | FROM | TO |
|---|---|---|
| Fill | 0 | 8 |
| sandy clay | 8 | 12 |
| gravely sandy clay | 12 | 15 |
| | | |
| | | |
| | | |

ATTACH ADDITIONAL SHEETS IF NECESSARY

2 TOTAL DEPTH OF WELL 15 ft
3 DEPTHS TO WATER PRODUCING FORMATIONS. ~ 8
4 STATIC WATER LEVEL Ft below land surface
5 YIELD ______ gallons per ☐ min ☐ hr
6 DIAMETER OF BORE HOLE 8.75 IN

**C** PUMP REPORT
1 TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐
2 SETTING DEPTH: FEET
3 BRAND NAME AND SERIAL NUMBERS:
4 RATED CAPACITY gallons per minute
5 TYPE LUBRICATION
6 DROP PIPE OR COLUMN PIPE SIZE
7 WIRE SIZE
8 PRESSURE TANK . . . SIZE, MAKE, MODEL
9 DATE OF INSTALLATION OR REPAIR
10 Is there an abandoned water well on the property?

**D** 1 LAND OWNER OR OTHER CONTACT PERSON:
NAME Chris Whitt
STREET ADDRESS 7400 S. 28th St.
CITY Ft. Smith, AR 72903

2 CASING FROM 0 TO 5 W/ 2" "ID
FROM TO W/ "ID
TYPE CASING: 2" PVC

3 SCREEN
TYPE: PVC DIA 2" SLOT/GA .010
SET FROM 5 FT TO 15 FT
TYPE: DIA SLOT/GA
SET FROM FT TO FT

4 GRAVEL PACK FROM 4 FT TO 15 FT
5 BACK FILLED WITH: Holeplug
FROM 2 FT TO 4 FT
6 SEALED WITH: Cement
FROM 0 FT TO 2 FT
FROM FT TO FT
7 DISINFECTED WITH:
8 USE OF WELL:
DOMESTIC ☐ COMMERCIAL ☐
IRRIGATION ☐ MONITOR ☒
LIVESTOCK/POULTRY ☐ TEST WELL ☐
OIL/GAS SUPPLY ☐ SEMI-PUBLIC ☐
PUBLIC SUPPLY ☐ OTHER

(A/C HEATPUMP TYPE WELLS)
SOURCE ☐ RETURN ☐
CLOSED LOOP ☐

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?
If yes, name use: yes ☐ no ☐
10 (For A/C open-loop only) Into what medium is water returned?
11 REMARKS
MW-4
12 SIGNED Mike Swer DATE 8/26/98

AWD-7 JAN 89 Arkansas Water Well Construction Commission, One Capitol Mall, Suite 2-C, Little Rock, AR 72201
ACI--5945
GEOLOGY COPY

# STATE OF ARKANSAS
# REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

**A**
1 Contractor Name & Number: WILLIAMS DRILLING CO — C# 160
2 Driller Name & Number: HURCEL WILLIAMS — D# 2323
3 Pump Installer Name & Number: — P#
4 Date Well Completed: 9-27-94 — New Well ☒ Replace or Work-over ☐

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| SEB | ¼ of ¼ of | 5 | 7N | 32W |

11 LONGITUDE ° ' "
11 LATITUDE ° ' "

10 LOCATE WITH 'X' IN SECTION BELOW

**B**
1 DESCRIPTION OF FORMATION: DEPTHS IN FEET

| | FROM | TO |
|---|---|---|
| Top Soil | | 3' |
| Blue Shale | | 105' |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

*ATTACH ADDITIONAL SHEETS IF NECESSARY*

2 TOTAL DEPTH OF WELL 105' ft
3 DEPTHS TO WATER PRODUCING FORMATIONS 85'
4 STATIC WATER LEVEL Ft below land surface
5 YIELD 1200 gallons per ☐ min ☒ hr
6 DIAMETER OF BORE HOLE 8½ IN

**C** PUMP REPORT
1 TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐
2 SETTING DEPTH: FEET
3 BRAND NAME AND SERIAL NUMBERS:
4 RATED CAPACITY gallons per minute
5 TYPE LUBRICATION
6 DROP PIPE OR COLUMN PIPE SIZE
7 WIRE SIZE
8 PRESSURE TANK SIZE, MAKE, MODEL
9 DATE OF INSTALLATION OR REPAIR
10 Is there an abandoned water well on the property?

**D**
1 LAND OWNER OR OTHER CONTACT PERSON:
NAME Ron Monks
STREET ADDRESS Td OFF Driving Range
CITY ~~Rye Hill~~ Fort Smith, AR 72901
2 CASING FROM TO W/ "ID
FROM gr TO 20' W/ 6" "ID
TYPE CASING: PVC
3 SCREEN
TYPE: DIA SLOT/GA
SET FROM FT TO FT
TYPE: DIA SLOT/GA
SET FROM FT TO FT
4 GRAVEL PACK FROM FT TO FT
5 BACK FILLED WITH:
FROM FT TO FT
6 SEALED WITH: Cement
FROM gr FT TO 20 FT
FROM FT TO FT
7 DISINFECTED WITH: Clorox
8 USE OF WELL:
DOMESTIC ☐ COMMERCIAL ☒
IRRIGATION ☐ MONITOR ☐
LIVESTOCK/POULTRY ☐ TEST WELL ☐
OIL/GAS SUPPLY ☐ SEMI-PUBLIC ☐
PUBLIC SUPPLY ☐ OTHER
(A/C HEATPUMP TYPE WELLS)
SOURCE ☐ RETURN ☐
CLOSED LOOP ☐
9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?
If yes, name use: yes ☐ no ☐
10 (For A/C open-loop only) Into what medium is water returned?
11 REMARKS
Hurcel Williams
12 SIGNED DATE 12-26-94

AWD-7 JAN 89 Arkansas Water Well Construction Commission, One Capitol Mall, Suite 2-C, Little Rock, AR 72201
ACI—5945
GEOLOGY COPY

Wrong Township

# STATE OF ARKANSAS
## REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

**A**

1 Contractor Name & Number: THOMAS DRILLING C# 2212

2 Driller Name & Number: Clinton Thomas D# 1238

3 Pump Installer Name & Number: P#

4 Date Well Completed: 5-11-04 New Well ☒ Replace or Work-over ☐

5 COUNTY ~~Crawford~~ Sebastian | 6 FRACTION SW ¼ of SE ¼ of | 7 SECTION 32 | 8 TOWNSHIP 8N | 9 RANGE 32W

10 LOCATE WITH 'X' IN SECTION BELOW

11 LONGITUDE 35° 39' 29"

11 LATITUDE 094° 11' 50"

**B**

1 DESCRIPTION OF FORMATION: DEPTHS IN FEET

| | FROM | TO |
|---|---|---|
| Clay | 0 | 10 |
| Sandstone | 10 | 30 |
| Shale | 30 | 90 |
| | | |
| | | |
| | | |
| | | |

ATTACH ADDITIONAL SHEETS IF NECESSARY

RECEIVED JUL 28 PM 2:21 OIL & WATER COMM.

2 TOTAL DEPTH OF WELL 92½ ft

3 DEPTHS TO WATER PRODUCING FORMATIONS: 38'

4 STATIC WATER LEVEL 20' Ft below land surface

5 YIELD 600 gallons per ☐ min ☒ hr

6 DIAMETER OF BORE HOLE 6 IN

**C** PUMP REPORT

1 TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐

2 SETTING DEPTH: FEET

3 BRAND NAME AND SERIAL NUMBERS:

4 RATED CAPACITY gallons per minute

5 TYPE LUBRICATION

6 DROP PIPE OR COLUMN PIPE SIZE

7 WIRE SIZE

8 PRESSURE TANK ... SIZE, MAKE, MODEL

9 DATE OF INSTALLATION OR REPAIR

10 Is there an abandoned water well on the property?

**D**

1 LAND OWNER OR OTHER CONTACT PERSON:

NAME MR+MRS Phillip Snider

STREET ADDRESS 4320 N. 32nd St.

CITY Ft. Smith, AR, 72904

2 CASING FROM 0 TO 16 W/ 6 1/8" ID

FROM TO W/ "ID

TYPE CASING: PVC.

3 SCREEN

TYPE: DIA SLOT/GA

SET FROM FT TO FT

TYPE: DIA SLOT/GA

SET FROM FT TO FT

4 GRAVEL PACK FROM FT TO FT

5 BACK FILLED WITH: cement

FROM 0 FT TO 15 FT

6 SEALED WITH: Cement

FROM 0 FT TO 15 FT

FROM FT TO FT

7 DISINFECTED WITH: Clorox

8 USE OF WELL

| | | | |
|---|---|---|---|
| DOMESTIC | ☒ | COMMERCIAL | ☐ |
| IRRIGATION | ☐ | MONITOR | ☐ |
| LIVESTOCK/POULTRY | ☐ | TEST WELL | ☐ |
| OIL/GAS SUPPLY | ☐ | SEMI-PUBLIC | ☐ |
| PUBLIC SUPPLY | ☐ | OTHER | |

(A/C HEATPUMP TYPE WELLS)

SOURCE ☐ RETURN ☐

CLOSED LOOP ☐

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?

If yes, name use: yes ☐ no ☐

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS

12 SIGNED Clinton Thomas DATE 7-24-04

AWD-7 JAN 89
ACI--5945

Arkansas Water Well Construction Commission, 101 East Capitol, Suite 350, Little Rock, AR 72201

Wilson Township

# STATE OF ARKANSAS
## REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

DRILLING

**A**

1 Contractor Name & Number: Thomas ~~[illegible]~~ C# 2212

2 Driller Name & Number: Clinton Thomas D# 1238

3 Pump Installer Name & Number: P#

4 Date Well Completed: 5-13-04 New Well ☒ Replace or Work-over ☐

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastian | SW ¼ of SE ¼ of | 32 | 8N | 32W |

11 LONGITUDE 35 ° 19 ' 51 "

11 LATITUDE 094 ° 25 ' 41 "

10 LOCATE WITH 'X' IN SECTION BELOW

**B**

1 DESCRIPTION OF FORMATION: DEPTHS IN FEET

| | FROM | TO |
|---|---|---|
| Clay | 0 | 22 |
| Shale | 22 | 75 |
| Sandstone | 75 | 130 |
| Shale | 130 | 190 |
| | | |
| | | |
| | | |

ATTACH ADDITIONAL SHEETS IF NECESSARY

RECEIVED JUL 28 2004 PM 2:23 ... WATER ...

2 TOTAL DEPTH OF WELL 218' ~~[illegible]~~ ft

3 DEPTHS TO WATER PRODUCING FORMATIONS 65' + 130'

4 STATIC WATER LEVEL 18 Ft below land surface

5 YIELD 150 gallons per ☐ min ☒ hr

6 DIAMETER OF BORE HOLE 6 IN

**C** PUMP REPORT

1 TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐

2 SETTING DEPTH: FEET

3 BRAND NAME AND SERIAL NUMBERS

4 RATED CAPACITY gallons per minute

5 TYPE LUBRICATION

6 DROP PIPE OR COLUMN PIPE SIZE

7 WIRE SIZE

8 PRESSURE TANK ... SIZE, MAKE, MODEL

9 DATE OF INSTALLATION OR REPAIR

10 Is there an abandoned water well on the property?

**D**

1 LAND OWNER OR OTHER CONTACT PERSON: #1

NAME Bob settle

STREET ADDRESS P.O. 1333

CITY Ft. Smith, AR. 72902

2 CASING FROM 0 TO 32 W/ 6 5/8 "ID

FROM TO W/ "ID

TYPE CASING: P.V.C.

3 SCREEN

TYPE: DIA SLOT/GA

SET FROM FT TO FT

TYPE: DIA SLOT/GA

SET FROM FT TO FT

4 GRAVEL PACK FROM FT TO FT

5 BACK FILLED WITH: Cement

FROM 0 FT TO 31 FT

6 SEALED WITH: Cement

FROM 0 FT TO 31 FT

FROM FT TO FT

7 DISINFECTED WITH:

8 USE OF WELL:

| | | | |
|---|---|---|---|
| DOMESTIC | ☒ | COMMERCIAL | ☐ |
| IRRIGATION | ☐ | MONITOR | ☐ |
| LIVESTOCK/POULTRY | ☐ | TEST WELL | ☐ |
| OIL/GAS SUPPLY | ☐ | SEMI-PUBLIC | ☐ |
| PUBLIC SUPPLY | ☐ | OTHER | |

(A/C HEATPUMP TYPE WELLS)

SOURCE ☐ RETURN ☐

CLOSED LOOP ☐

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning? If yes, name use: yes ☐ no ☐

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS

12 SIGNED Clinton Thomas DATE 7-24-04

state line road does not go through Section 4

NEW WELL ☑ REPLACEMENT WELL ☐

**STATE OF ARKANSAS**
**Report of Water Well Construction**

County in which well is located: Seb.

(Please print or type)

OWNER OF WELL: EDD PARHAM
WELL CONTRACTOR: FARRELL BRYAN
CONTRACTOR LICENSE NO.: C1212
NAME OF DRILLER: FARRELL BRYAN
DRILLER REGISTRATION NO.: D2474
DATE WELL WAS COMPLETED: 4 (MO.) 27 (DAY) 78 (YR.)

Well is ~~near~~ on State Line Road road, approximately 2 miles N NE E SE S SW W NW of Ft. Smith (TOWN, ETC.)
Section 4, Township 7N, Range 32 W
Directions for reaching well: (use permanent landmarks) 2 miles South of Ft. Smith on State line road

1. Total Depth of Well: 197
2. Water Producing Formation: From 60 ft. To 61 ft.
3. Method of Construction: Rotary ✓ Cable ___ R.C. ___ Driven ___ Jetted ___ Bored ___
4. Water Level Below Land Surface: 50' ft.
5. Gallons per Hour: 20 Gallons per Minute
6. Well disinfected with: Purex
7. Cased to 10 ft. with 6" Diameter PVC. Casing
8. Cemented from 0 ft. to 10 ft.
9. Casing Perforated from ___ ft. to ___ ft.
10. Well Backfilled with: ___ from ___ ft. to ___ ft.
(SAND, CLAY, CEMENT, MUD)
11. Gravel Pack from ___ ft. to ___ ft.
12. Screen Diameter: ___ inches from ___ ft. to ___ ft.
13. Type Screen ___ Fittings ___ Slot Size ___
14. Use of Well: ✓ DOMESTIC ___ IRRIGATION ___ MUNICIPAL ___ OTHER

| Description and Color of Formation: (Sand, Shale, Sandstone, etc.) | Depths in Feet From | To |
|---|---|---|
| Clay | 0 | 4' |
| Blue Shale | 4' | 197 |

RECEIVED
JUN 13 1978
COMMITTEE ON WATER WELL CONSTRUCTION

Remarks:

This well is guaranteed against defective material or workmanship for a period of ___

Signed: Farrell Bryan

Date: 4 (MONTH) 27 (DAY) 78 (YEAR)

Mail to: Committee on Water Well Construction — 3815 W. Roosevelt Road — Little Rock, Arkansas 72204

**GEOLOGY COPY**

FORM NO. WD-1

STATE OF ARKANSAS
REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

SOIL & WATER COMM.

**A**
1. Contractor Name & Number: Evergreen Enviromental, Inc. C# 1415
2. Driller Name & Number: Curtis R Branch D# 2330
3. Pump Installer Name & Number: P#
4. Date Well Completed: 05/28/97 New Well [X] Replace or Work-over [ ]

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastion | NW ¼ of SW ¼ of SE | 33 | 8N | 32W |

11 LONGITUDE 94 ° 25 ' 10 "
11 LATITUDE 35 ° ~~18~~ 20 ' 08 " - 05

10 LOCATE WITH 'X' IN SECTION BELOW

MW-5

**B**
1. DESCRIPTION OF FORMATION: DEPTHS IN FEET

| | | FROM | TO |
|---|---|---|---|
| Orange tan clay, some silt | damp | 0 | 4.5 |
| Alternating blue gray & orange clay | damp | 4.5 | 13.5 |
| Orange brown clay, some gravel | damp | 13.5 | 14.5 |
| Tan gravely clay | wet | 14.5 | 15.5 |
| Orange brown sand | | 15.5 | 16.75 |
| Gray & brown weathered shale | | 16.75 | 19.5 |
| | | | |

*ATTACH ADDITIONAL SHEETS IF NECESSARY*

2. TOTAL DEPTH OF WELL 19.5 ft
3. DEPTHS TO WATER PRODUCING FORMATIONS.
4. STATIC WATER LEVEL Ft below land surface
5. YIELD gallons per [ ] min. [ ] hr
6. DIAMETER OF BORE HOLE 8 5/8 IN

**C** PUMP REPORT N/A
1. TYPE PUMP: SUBMERSIBLE [ ] TURBINE [ ] JET [ ]
2. SETTING DEPTH: FEET
3. BRAND NAME AND SERIAL NUMBERS:
4. RATED CAPACITY gallons per minute
5. TYPE LUBRICATION
6. DROP PIPE OR COLUMN PIPE SIZE
7. WIRE SIZE
8. PRESSURE TANK ... SIZE, MAKE, MODEL
9. DATE OF INSTALLATION OR REPAIR
10. Is there an abandoned water well on the property?

**D**
1. LAND OWNER OR OTHER CONTACT PERSON:
NAME WalMart
STREET ADDRESS Jenny Lind & "O" Streets
CITY South Fort Smith, AR

2. CASING FROM 0 TO 9.5 W/ 2" "ID
FROM TO W/ "ID
TYPE CASING: 2" PVC

3. SCREEN
TYPE: 2" DIA .020 SLOT/GA
SET FROM 9.5 FT TO 19.5 FT
TYPE: DIA SLOT/GA
SET FROM FT TO FT

4. GRAVEL PACK 10/20 silica FROM 9.00 FT TO 19.5 FT

5. BACK-FILLED WITH: Bentonite
FROM 6.5 FT TO 9.0 FT

6. SEALED WITH:
FROM FT TO FT
FROM FT TO FT

7. DISINFECTED WITH:

8. USE OF WELL:
- DOMESTIC [ ] COMMERCIAL [ ]
- IRRIGATION [ ] MONITOR [X]
- LIVESTOCK/POULTRY [ ] TEST WELL [ ]
- OIL/GAS SUPPLY [ ] SEMI-PUBLIC [ ]
- PUBLIC SUPPLY [ ] OTHER

(A/C HEATPUMP TYPE WELLS)
- SOURCE [ ] RETURN [ ]
- CLOSED LOOP [ ]

9. (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?
If yes, name use: yes [ ] no [ ]

10. (For A/C open-loop only) Into what medium is water returned?

11. REMARKS

12. SIGNED C R B DATE 6/27/97

AWD-7 JAN 89 Arkansas Water Well Construction Commission, 101 East Capitol, Suite 350, Little Rock, AR 72201
ACI--5945

STATE OF ARKANSAS
REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

SOIL & WATER COMM.

**A**

1 Contractor Name & Number: Evergreen Enviromental, Inc. C# 1415
2 Driller Name & Number: Curtis R Branch D# 2330
3 Pump Installer Name & Number: P#
4 Date Well Completed: 05/27/97 New Well ☒ Replace or Work-over ☐

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastion | NW ¼ of SW ¼ of SE | 33 | 8N | 32W |

LONGITUDE 11 94 ° 25 ' 10 "
LATITUDE 11 35 ° ~~18~~ 20 ' 08 " -01

10 LOCATE WITH 'X' IN SECTION BELOW

MW-1

**B**

1 DESCRIPTION OF FORMATION: DEPTHS IN FEET

| Description | FROM | TO |
|---|---|---|
| Brown silty clay some ash damp | 0 | 2 |
| Orange Clay, little black particles, little silt damp | 2 | 4.5 |
| Orange & brown clay with silt & little black particles damp | 4.5 | 10.5 |
| Orange brown gravely clay & little black particles damp | 10.5 | 11 |
| Orange brown clay Little silt damp | 11 | 14.5 |
| Orange brwn to gray & orange clay damp | 14.5 | 19.5 |
| | | |
| *ATTACH ADDITIONAL SHEETS IF NECESSARY* | | |

2 TOTAL DEPTH OF WELL 24.5 ft
3 DEPTHS TO WATER PRODUCING FORMATIONS
4 STATIC WATER LEVEL Ft below land surface
5 YIELD gallons per ☐ min ☐ hr
6 DIAMETER OF BORE HOLE 8 5/8 IN

**C** PUMP REPORT N/A

1 TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐
2 SETTING DEPTH FEET
3 BRAND NAME AND SERIAL NUMBERS:
4 RATED CAPACITY gallons per minute
5 TYPE LUBRICATION
6 DROP PIPE OR COLUMN PIPE SIZE
7 WIRE SIZE
8 PRESSURE TANK SIZE, MAKE, MODEL
9 DATE OF INSTALLATION OR REPAIR
10 Is there an abandoned water well on the property?

**D**

1 LAND OWNER OR OTHER CONTACT PERSON:
NAME WalMart
STREET ADDRESS Jenny Lind &"O" Streets
CITY South Fort Smith, AR

2 CASING FROM 0 TO 14.5 W/ "ID
2" FROM TO W/ "ID
TYPE CASING: 2" PVC

3 SCREEN
TYPE: 2" DIA .020 SLOT/GA
SET FROM 14.5 FT TO 24.5 FT
TYPE: DIA SLOT/GA
SET FROM FT TO FT

4 GRAVEL PACK FROM 13 FT TO 24.5 FT

5 BACK FILLED WITH: Bentonite
FROM 9 FT TO 13 FT

6 SEALED WITH:
FROM FT TO FT
FROM FT TO FT

7 DISINFECTED WITH:

8 USE OF WELL:
DOMESTIC ☐ COMMERCIAL ☐
IRRIGATION ☐ MONITOR ☒
LIVESTOCK/POULTRY ☐ TEST WELL ☐
OIL/GAS SUPPLY ☐ SEMI-PUBLIC ☐
PUBLIC SUPPLY ☐ OTHER

(A/C HEATPUMP TYPE WELLS)
SOURCE ☐ RETURN ☐
CLOSED LOOP ☐

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?
If yes, name use: yes ☐ no ☐

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS

12 SIGNED C R Branch DATE 6/27/97

# STATE OF ARKANSAS
## REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

30 PM 1:20
SOIL & WATER COMM.

**A**
1 Contractor Name & Number: Evergreen Environmental, Inc. C# 1415
2 Driller Name & Number: Curtis R Branch D# 2330
3 Pump Installer Name & Number: P#
4 Date Well Completed: 05/27/97 New Well ☒ Replace or Work-over ☐

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastion | NW ¼ of SW ¼ of SE | 33 | 8N | 32W |

11 LONGITUDE 94 ° 25 ' 10 "
11 LATITUDE 35 ° ~~18~~ 20 ' 08 " -03

10 LOCATE WITH 'X' IN SECTION BELOW
MW-3

**B** 1 DESCRIPTION OF FORMATION: DEPTHS IN FEET

| Description | | FROM | TO |
|---|---|---|---|
| Brown silty clay, trace gravel | damp | 0 | 2 |
| Brown sand, fine loose grain | weet | 2 | 2.5 |
| Gray clay, little silt | damp | 2.5 | 3.5 |
| Gray brown clay, little silt | moist | 3.5 | 4.5 |
| Gray clay | damp | 4.5 | 5.5 |
| Gray & orange clay, some silt | damp | 5.5 | 8.0 |
| Gray clay, little silt | damp | 8.0 | 9.5 |
| Brown silty clay | damp | 9.5 | 11.0 |
| Gray shale | dry | 11.0 | 14.5 |

*ATTACH ADDITIONAL SHEETS IF NECESSARY*

2 TOTAL DEPTH OF WELL 14.5 ft
3 DEPTHS TO WATER PRODUCING FORMATIONS
4 STATIC WATER LEVEL Ft below land surface
5 YIELD gallons per ☐ min ☐ hr
6 DIAMETER OF BORE HOLE 8 5/8 IN

**C** PUMP REPORT N/A
1 TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐
2 SETTING DEPTH: FEET
3 BRAND NAME AND SERIAL NUMBERS:
4 RATED CAPACITY gallons per minute
5 TYPE LUBRICATION
6 DROP PIPE OR COLUMN PIPE SIZE
7 WIRE SIZE
8 PRESSURE TANK - SIZE, MAKE, MODEL
9 DATE OF INSTALLATION OR REPAIR
10 Is there an abandoned water well on the property?

**D** 1 LAND OWNER OR OTHER CONTACT PERSON:
NAME WalMart
STREET ADDRESS Jenny Lind & "O" streets
CITY South Fort Smith, AR

2 CASING FROM TO W/ "ID
FROM TO W/ "ID
TYPE CASING:

3 SCREEN
TYPE: 2" DIA .020 SLOT/GA
SET FROM 0 FT TO 5 FT
TYPE: DIA SLOT/GA
SET FROM FT TO FT

4 GRAVEL PACK 10/20 FROM 1 FT TO 5 FT

5 BACK FILLED WITH: Bentonite
FROM 0 FT TO 1 FT

6 SEALED WITH:
FROM FT TO FT
FROM FT TO FT

7 DISINFECTED WITH:

8 USE OF WELL:
DOMESTIC ☐ COMMERCIAL ☐
IRRIGATION ☐ MONITOR ☒
LIVESTOCK/POULTRY ☐ TEST WELL ☐
OIL/GAS SUPPLY ☐ SEMI-PUBLIC ☐
PUBLIC SUPPLY ☐ OTHER

(A/C HEATPUMP TYPE WELLS)
SOURCE ☐ RETURN ☐
CLOSED LOOP ☐

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?
If yes, name use: yes ☐ no ☐

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS

12 SIGNED C R B DATE 6/27/97

AWD-7 JAN 89 Arkansas Water Well Construction Commission, 101 East Capitol, Suite 350, Little Rock, AR 72201
ACI--5945

GEOLOGY COPY

STATE OF ARKANSAS
REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

[stamp] ... 30 ... 1:19
SOIL & WATER COMM.

**A**

1. Contractor Name & Number: Evergreen Enviromental, Inc. C# 1415
2. Driller Name & Number: Curtis R Branch D# 2330
3. Pump Installer Name & Number: P#
4. Date Well Completed: 05/27/97 New Well ☒ Replace or Work-over ☐

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastion | NW ¼ of SW ¼ of SE | 33 | 8N | 32W |

11 LONGITUDE 94° 25' 10"
11 LATITUDE 35° ~~16~~ 20' 08" -02

10 LOCATE WITH 'X' IN SECTION BELOW
MW-2

**B**

1. DESCRIPTION OF FORMATION: DEPTHS IN FEET

| | FROM | TO |
|---|---|---|
| Brown silty clay | 0 | .25 |
| Black ash, some gravel wet | .25 | 1.5 |
| Light tan silty clay damp little black particles | 1.5 | 7 |
| | | |
| | | |
| | | |
| | | |

*ATTACH ADDITIONAL SHEETS IF NECESSARY*

2. TOTAL DEPTH OF WELL 7 ft
3. DEPTHS TO WATER PRODUCING FORMATIONS
4. STATIC WATER LEVEL Ft below land surface
5. YIELD gallons per ☐ min ☐ hr
6. DIAMETER OF BORE HOLE 8 5/8 IN

**C** PUMP REPORT N/A

1. TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐
2. SETTING DEPTH: FEET
3. BRAND NAME AND SERIAL NUMBERS:
4. RATED CAPACITY gallons per minute
5. TYPE LUBRICATION
6. DROP PIPE OR COLUMN PIPE SIZE
7. WIRE SIZE
8. PRESSURE TANK SIZE, MAKE, MODEL
9. DATE OF INSTALLATION OR REPAIR
10. Is there an abandoned water well on the property?

**D**

1. LAND OWNER OR OTHER CONTACT PERSON:
   NAME WalMart
   STREET ADDRESS Jenny Lind & "O" Streets
   CITY South Fort Smith, AR
2. CASING FROM TO W/ "ID
   FROM TO W/ "ID
   TYPE CASING:
3. SCREEN
   TYPE: 2" DIA .020 SLOT/GA
   SET FROM 0 FT TO 7 FT
   TYPE: DIA SLOT/GA
   SET FROM FT TO FT
4. GRAVEL PACK 10/20 FROM 1 FT TO 7 FT
5. BACK FILLED WITH: Bentonite
   FROM 0 FT TO 1 FT
6. SEALED WITH:
   FROM FT TO FT
   FROM FT TO FT
7. DISINFECTED WITH:
8. USE OF WELL:

| | | | |
|---|---|---|---|
| DOMESTIC | ☐ | COMMERCIAL | ☐ |
| IRRIGATION | ☐ | MONITOR | ☒ |
| LIVESTOCK/POULTRY | ☐ | TEST WELL | ☐ |
| OIL/GAS SUPPLY | ☐ | SEMI-PUBLIC | ☐ |
| PUBLIC SUPPLY | ☐ | OTHER | |

(A/C HEATPUMP TYPE WELLS)

| | | | |
|---|---|---|---|
| SOURCE | ☐ | RETURN | ☐ |
| CLOSED LOOP | ☐ | | |

9. (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?
   If yes, name use: yes ☐ no ☐
10. (For A/C open-loop only) Into what medium is water returned?
11. REMARKS
12. SIGNED [signature] DATE 6/27/97



GEOLOGY COPY

97 JUN 30 PM 1:20
SOIL & WATER COMM.

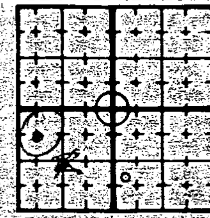
# STATE OF ARKANSAS
## REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

**A**
1 Contractor Name & Number: Evergreen Enviromental, Inc. C# 1415
2 Driller Name & Number: Curtis R Branch D# 2330
3 Pump Installer Name & Number: P#
4 Date Well Completed: 05/28/97 New Well ☒ Replace or Work-over ☐

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastion | NW ¼ of SW ¼ of SE | 33 | 8N | 32W |

LONGITUDE 11 94 ° 25 ' 10 "
LATITUDE 11 35 ° ~~18~~20.08 " -04

10 LOCATE WITH 'X' IN SECTION BELOW



MW-4

**B** 1 DESCRIPTION OF FORMATION: DEPTHS IN FEET

| | | FROM | TO |
|---|---|---|---|
| Brown silty clay | damp | 0 | 1 |
| Black ash | damp | 1 | 2 |
| Orange brown clay, little black particles | | 2 | 4.5 |
| Orange brown silty clay | damp | 4.5 | 9.5 |
| Tan sand, firm grain | wet | 9.5 | 10.5 |
| Tan & orange sand | wet | 10.5 | 11.5 |
| Blue gray & orange clayey sand | wet | 11.5 | 14.5 |

*ATTACH ADDITIONAL SHEETS IF NECESSARY*

2 TOTAL DEPTH OF WELL 14.5 ft
3 DEPTHS TO WATER PRODUCING FORMATIONS
4 STATIC WATER LEVEL Ft below land surface
5 YIELD gallons per ☐ min ☐ hr
6 DIAMETER OF BORE HOLE 8 5/8 IN

**C** PUMP REPORT
1 TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐
2 SETTING DEPTH FEET
3 BRAND NAME AND SERIAL NUMBERS
4 RATED CAPACITY gallons per minute
5 TYPE LUBRICATION
6 DROP PIPE OR COLUMN PIPE SIZE
7 WIRE SIZE
8 PRESSURE TANK — SIZE, MAKE, MODEL
9 DATE OF INSTALLATION OR REPAIR
10 Is there an abandoned water well on the property?

**D** 1 LAND OWNER OR OTHER CONTACT PERSON:
NAME WalMart
STREET ADDRESS Jenny Lind & "O" Streets
CITY South Fort Smith, AR

2 CASING FROM 0 TO 4.5 W/ "ID
2" FROM TO W/ "ID
TYPE CASING 2" PVC

3 SCREEN
TYPE 2" DIA .020 SLOT/GA
SET FROM 4.5 FT TO 14.5 FT
TYPE DIA SLOT/GA
SET FROM FT TO FT

4 GRAVEL PACK 10/20 FROM 4.0 FT TO 14.5 FT

5 BACK FILLED WITH: Bentonite
FROM 2 FT TO 4 FT

6 SEALED WITH:
FROM FT TO FT
FROM FT TO FT

7 DISINFECTED WITH:

8 USE OF WELL:
DOMESTIC ☐ COMMERCIAL ☐
IRRIGATION ☐ MONITOR ☒
LIVESTOCK/POULTRY ☐ TEST WELL ☐
OIL/GAS SUPPLY ☐ SEMI-PUBLIC ☐
PUBLIC SUPPLY ☐ OTHER
(A/C HEATPUMP TYPE WELLS)
SOURCE ☐ RETURN ☐
CLOSED LOOP ☐

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?
If yes, name use: yes ☐ no ☐

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS

12 SIGNED Curt R Branch DATE 6/27/97

AWD-7 JAN 89 Arkansas Water Well Construction Commission, 101 East Capitol, Suite 350, Little Rock, AR 72201
ACI—5945

GEOLOGY COPY

STATE OF ARKANSAS
REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

SOIL & WATER COMM.

**A**

1 Contractor Name & Number: Evergreen Enviromental, Inc. C# 1415

2 Driller Name & Number: Curtis R Branch D# 2330

3 Pump Installer Name & Number: P#

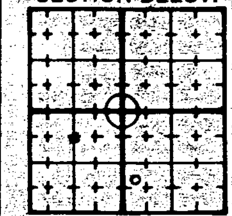
4 Date Well Completed: 05/29/97 New Well ☒ Replace or Work-over ☐

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastion | NW ¼ of SW ¼ of | SE 33 | 8N | 32W |

11 LONGITUDE 94 ° 25 ' 10 "

11 LATITUDE 35 ° ~~18~~ 20 ' 08 " -06

10 LOCATE WITH 'X' IN SECTION BELOW



MW-6

**B**

1 DESCRIPTION OF FORMATION: DEPTHS IN FEET

| | FROM | TO |
|---|---|---|
| Black orange clay damp | 0 | 1 |
| Orange brown clay & gray damp | 1 | 4.5 |
| Orange brown clay little black particles | 4.5 | 5.5 |
| Orange brown gray clay damp | 5.5 | 12.0 |
| Red brown gray with yellow brown sand | 12.0 | 14.5 |
| Orange brown sand, fine | 14.5 | 15.0 |
| Orange brown clay | 15.0 | 16.0 |
| Gray black shale, weathered | 16.0 | 19.5 |
| ATTACH ADDITIONAL SHEETS IF NECESSARY | | |

2 TOTAL DEPTH OF WELL 19.5 ft

3 DEPTHS TO WATER PRODUCING FORMATIONS

4 STATIC WATER LEVEL Ft below land surface

5 YIELD gallons per ☐ min ☐ hr

6 DIAMETER OF BORE HOLE 8 5/8 IN

**C** PUMP REPORT N/A

1 TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐

2 SETTING DEPTH: FEET

3 BRAND NAME AND SERIAL NUMBERS:

4 RATED CAPACITY gallons per minute

5 TYPE LUBRICATION

6 DROP PIPE OR COLUMN PIPE SIZE

7 WIRE SIZE

8 PRESSURE TANK SIZE, MAKE, MODEL

9 DATE OF INSTALLATION OR REPAIR

10 Is there an abandoned water well on the property?

**D**

1 LAND OWNER OR OTHER CONTACT PERSON:

NAME WalMart

STREET ADDRESS Jenny Lind & "O" Streets

CITY South Fort Smith, AR

2 CASING FROM 0 TO 9.5 W/ "ID

2" FROM TO W/ "ID

TYPE CASING: 2" PVC

3 SCREEN

TYPE: 2" DIA .020 SLOT/GA

SET FROM 9.5 FT TO 19.5 FT

TYPE: DIA SLOT/GA

SET FROM FT TO FT

4 GRAVEL PACK 10/20 silica FROM 9.0 FT TO 19.5 FT

5 BACK FILLED WITH: Bentonite

FROM 6.5 FT TO 9.5 FT

6 SEALED WITH:

FROM FT TO FT

FROM FT TO FT

7 DISINFECTED WITH:

8 USE OF WELL:

| | | | |
|---|---|---|---|
| DOMESTIC | ☐ | COMMERCIAL | ☐ |
| IRRIGATION | ☐ | MONITOR | ☒ |
| LIVESTOCK/POULTRY | ☐ | TEST WELL | ☐ |
| OIL/GAS SUPPLY | ☐ | SEMI-PUBLIC | ☐ |
| PUBLIC SUPPLY | ☐ | OTHER | |

(A/C HEATPUMP TYPE WELLS)

SOURCE ☐ RETURN ☐

CLOSED LOOP ☐

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?
If yes, name use: yes ☐ no ☐

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS

12 SIGNED Curt R Branch DATE 6/27/97

AWD-7 JAN 89 Arkansas Water Well Construction Commission, 101 East Capitol, Suite 350, Little Rock, AR 72201
ACI-5945

GEOLOGY COPY

STATE OF ARKANSAS
REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

JUN 30 PM 1:20
SOIL & WATER COMM.

**A**

1 Contractor Name & Number: Evergreen Enviromental, Inc. C# 1415

2 Driller Name & Number: Curtis R Branch D# 2220

3 Pump Installer Name & Number: P#

4 Date Well Completed: 05/28/97 New Well ☒ Replace or Work-over ☐

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastion | SW ¼ of SW ¼ of SE | 33 | 8 N | 32W |

11 LONGITUDE 94 ° 25 ' 10 "

11 LATITUDE 35 ° 19 ' 50 " -01

10 LOCATE WITH 'X' IN SECTION BELOW

MW-D1

**B**

1 DESCRIPTION OF FORMATION: DEPTHS IN FEET

| Description | | FROM | TO |
|---|---|---|---|
| Brown, silty clay | damp | 0 | 1 |
| Black, ash | wet | 1 | 115 |
| Brownish gray &slighty or silty clay | damp | 1.5 | 3.5 |
| Brown wilty clay, trace gravel | wee | 3.5 | 4.5 |
| Gray & orange clay, trace gravel | damp | 4.5 | 6.0 |
| Gray & brown clay | dry | 6.0 | 7.0 |
| Orange brown clay | damp | 7.0 | 8.0 |
| Brown & gray clay | damp | 8.0 | 9.5 |
| Gray & browntto gray clay | damp | 9.5 | 10.5 |
| Gray shalee | | 10.5 | 14.5 |

ATTACH ADDITIONAL SHEETS IF NECESSARY

2 TOTAL DEPTH OF WELL ft

3 DEPTHS TO WATER PRODUCING FORMATIONS 8

4 STATIC WATER LEVEL Ft below land surface

5 YIELD gallons per ☐ min ☐ hr

6 DIAMETER OF BORE HOLE 8 5/8 IN

**C** PUMP REPORT N/A

1 TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐

2 SETTING DEPTH: FEET

3 BRAND NAME AND SERIAL NUMBERS:

4 RATED CAPACITY gallons per minute

5 TYPE LUBRICATION

6 DROP PIPE OR COLUMN PIPE SIZE

7 WIRE SIZE

8 PRESSURE TANK SIZE, MAKE, MODEL

9 DATE OF INSTALLATION OR REPAIR

10 Is there an abandoned water well on the property?

**D**

1 LAND OWNER OR OTHER CONTACT PERSON:

NAME WalMart

STREET ADDRESS Jenny Lind & "O" Streets

CITY South Fort Smith, AR

2 CASING FROM 0 TO 2 W/ "ID

2" FROM TO W/ "ID

TYPE CASING: 2" PVC

3 SCREEN

TYPE: DIA 2" SLOT/GA .020

SET FROM FT TO 2 FT 7

TYPE: DIA SLOT/GA

SET FROM FT TO FT

4 GRAVEL PACK FROM FT TO FT

5 BACK FILLED WITH: Bentonite

FROM 0 FT TO 2 FT

6 SEALED WITH:

FROM FT TO FT

FROM FT TO FT

7 DISINFECTED WITH:

8 USE OF WELL:

| | | | |
|---|---|---|---|
| DOMESTIC | ☐ | COMMERCIAL | ☐ |
| IRRIGATION | ☐ | MONITOR | ☒ |
| LIVESTOCK/POULTRY | ☐ | TEST WELL | ☐ |
| OIL/GAS SUPPLY | ☐ | SEMI-PUBLIC | ☐ |
| PUBLIC SUPPLY | ☐ | OTHER | |

(A/C HEATPUMP TYPE WELLS)

| | | | |
|---|---|---|---|
| SOURCE | ☐ | RETURN | ☐ |
| CLOSED LOOP | ☐ | | |

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?
If yes, name use: yes ☐ no ☐

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS

12 SIGNED [signature] DATE 6/27/97

AWD-7 JAN 89 Arkansas Water Well Construction Commission, 101 East Capitol, Suite 350, Little Rock, AR 72201
ACI-5945

GEOLOGY COPY

STATE OF ARKANSAS
REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

97 JUN 30 PM 1:20
SOIL & WATER COMM.

**A**
1. Contractor Name & Number: Evergreen Environmental, Inc. C# 1415
2. Driller Name & Number: Curtis R Branch D# 2220
3. Pump Installer Name & Number: P#
4. Date Well Completed: 05/28/97 New Well [X] Replace or Work-over [ ]

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastion | SW ¼ of SW ¼ of SE | 33 | 8N | 32W |

11 LONGITUDE 94 ° 25 ' 10 "
11 LATITUDE 35 ° 19 ' 50 " -02

10 LOCATE WITH 'X' IN SECTION BELOW
MW-D2

**B**
1. DESCRIPTION OF FORMATION: DEPTHS IN FEET

| DESCRIPTION | FROM | TO |
|---|---|---|
| Brown silty clay trace gravel | 0 | 1 |
| Or. brwn silty clay tr grav damp | | 4.5 |
| Black stained silty clay moist | 4.5 | 5.0 |
| Gray brown silt wet | 5.0 | 7.5 |
| Gray brown clay damp | 7.5 | 9.0 |
| Orange br clay, tr gravel damp | 9.0 | 9.5 |
| Orange br sand, fine grain moist | 9.5 | 10.5 |
| Gray shale damp | 10.5 | 14.5 |

*ATTACH ADDITIONAL SHEETS IF NECESSARY*

2. TOTAL DEPTH OF WELL 14.5 ft
3. DEPTHS TO WATER PRODUCING FORMATIONS 8
4. STATIC WATER LEVEL Ft below land surface
5. YIELD gallons per [ ] min [ ] hr
6. DIAMETER OF BORE HOLE 8 5/8 IN

**C** PUMP REPORT N/A
1. TYPE PUMP SUBMERSIBLE [ ] TURBINE [ ] JET [ ]
2. SETTING DEPTH: FEET
3. BRAND NAME AND SERIAL NUMBERS:
4. RATED CAPACITY gallons per minute
5. TYPE LUBRICATION
6. DROP PIPE OR COLUMN PIPE SIZE
7. WIRE SIZE
8. PRESSURE TANK SIZE, MAKE, MODEL
9. DATE OF INSTALLATION OR REPAIR
10. Is there an abandoned water well on the property?

**D**
1. LAND OWNER OR OTHER CONTACT PERSON:
NAME WalMart
STREET ADDRESS Jenny Lind & "O" Streets
CITY South Fort Smith, AR
2. CASING FROM 0' TO 3' W/ "ID
2" FROM TO W/ "ID
TYPE CASING: 2" PVC
3. SCREEN
TYPE: DIA 2" SLOT/GA .020
SET FROM 3' FT TO 13' FT
TYPE: DIA SLOT/GA
SET FROM FT TO FT
4. GRAVEL PACK FROM FT TO FT
5. BACK FILLED WITH: Bentonite
FROM 0 FT TO 2.5 FT
6. SEALED WITH:
FROM FT TO FT
FROM FT TO FT
7. DISINFECTED WITH:
8. USE OF WELL:
DOMESTIC [ ] COMMERCIAL [ ]
IRRIGATION [ ] MONITOR [X]
LIVESTOCK/POULTRY [ ] TEST WELL [ ]
OIL/GAS SUPPLY [ ] SEMI-PUBLIC [ ]
PUBLIC SUPPLY [ ] OTHER
(A/C HEATPUMP TYPE WELLS)
SOURCE [ ] RETURN [ ]
CLOSED LOOP [ ]
9. (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?
If yes, name use: yes [ ] no [ ]
10. (For A/C open-loop only) Into what medium is water returned?
11. REMARKS
12. SIGNED Curtis R Branch DATE 6/27/97

AWD-7 JAN 89 Arkansas Water Well Construction Commission, 101 East Capitol, Suite 350, Little Rock, AR 72201
ACI--5945

GEOLOGY COPY

STATE OF ARKANSAS
REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

SOIL & WATER COMM 1:20

**A**
1 Contractor Name & Number: Evergreen Enviromental, Inc. C# 1415
2 Driller Name & Number: Curtis R Branch D# 2380
3 Pump Installer Name & Number: P#
4 Date Well Completed: 05/28/97 New Well ☒ Replace or Work-over ☐

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastion | SW ¼ of SW ¼ of SE | 33 | 8N | 32W |

11 LONGITUDE 94 ° 25 ' 10 "
11 LATITUDE 35 ° 19 ' 50 " -03

10 LOCATE WITH 'X' IN SECTION BELOW
MW-D3

**B**
1 DESCRIPTION OF FORMATION: DEPTHS IN FEET

| | FROM | TO |
|---|---|---|
| Brown &Orange brown silty clay damp | 0 | 4.5 |
| Gray to gray brown silty clay moist | 4.5 | 7 |
| Gray brown & or. clay damp | 7 | 9 |
| Brwn sandy clay, little gravel very moist | 9 | 9.5 |
| Gray brwn weathered shale moist | 9.5 | 11.0 |
| Gray shale damp | 11.0 | 14.5 |
| | | |

*ATTACH ADDITIONAL SHEETS IF NECESSARY*

2 TOTAL DEPTH OF WELL 14.5 ft
3 DEPTHS TO WATER PRODUCING FORMATIONS
4 STATIC WATER LEVEL Ft below land surface
5 YIELD ______ gallons per ☐ min ☐ hr
6 DIAMETER OF BORE HOLE 8 5/8 IN

**C**
PUMP REPORT N/A
1 TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐
2 SETTING DEPTH: FEET
3 BRAND NAME AND SERIAL NUMBERS:
4 RATED CAPACITY gallons per minute
5 TYPE LUBRICATION
6 DROP PIPE OR COLUMN PIPE SIZE
7 WIRE SIZE
8 PRESSURE TANK SIZE, MAKE, MODEL
9 DATE OF INSTALLATION OR REPAIR
10 Is there an abandoned water well on the property?

**D**
1 LAND OWNER OR OTHER CONTACT PERSON:
NAME WalMart
STREET ADDRESS Jenny Lind & "O" Streets
CITY South Fort Smith, AR

2 CASING FROM 0' TO 2' W/ "ID
2" FROM TO W/ "ID
TYPE CASING: 2" PVC

3 SCREEN
TYPE: DIA 2" SLOT/GA .020
SET FROM 2 FT TO 12 FT
TYPE: DIA SLOT/GA
SET FROM FT TO FT

4 GRAVEL PACK FROM FT TO FT

5 BACK FILLED WITH: Bentonite
FROM 0 FT TO 1.5 FT

6 SEALED WITH:
FROM FT TO FT
FROM FT TO FT

7 DISINFECTED WITH:

8 USE OF WELL:
DOMESTIC ☐ COMMERCIAL ☐
IRRIGATION ☐ MONITOR ☒
LIVESTOCK/POULTRY ☐ TEST WELL ☐
OIL/GAS SUPPLY ☐ SEMI-PUBLIC ☐
PUBLIC SUPPLY ☐ OTHER

(A/C HEATPUMP TYPE WELLS)
SOURCE ☐ RETURN ☐
CLOSED LOOP ☐

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?
If yes, name use: yes ☐ no ☐

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS

12 SIGNED Curt R Branch DATE 6/27/97

AWD-7 JAN 89 Arkansas Water Well Construction Commission, 101 East Capitol, Suite 350, Little Rock, AR 72201
ACI-5945

GEOLOGY COPY

STATE OF ARKANSAS
REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

97 JUN 30 AM 11:21
SOIL & WATER COMM.

**A**
1 Contractor Name & Number: Evergreen Enviromental, Inc. C# 1415 0
2 Driller Name & Number: Curtis R Branchn D# 2330
3 Pump Installer Name & Number: P#
4 Date Well Completed: 05/28/97 New Well ☒ Replace or Work-over ☐

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastion | SW ¼ of SW ¼ of SE | 33 | 8N | 32W |

LOCATE WITH 'X' IN SECTION BELOW

MW-D4

11 LONGITUDE 94° 25' 10"
11 LATITUDE 35° 19' 50" -04

**B** 1 DESCRIPTION OF FORMATION: DEPTHS IN FEET

| Tan silty clay | | FROM | TO |
|---|---|---|---|
| Tan silty clay, gravel | damp | 0 | 1.5 |
| Black silty clay & ash | damp | 1.5 | 2.5 |
| Brown silt clay | damp | 2.5 | 5.5 |
| Brown & orange clay little silt&gravel | damp | 5.5 | 8.5 |
| Orange brwn clayey gravel some black part. | damp | 8.5 | 9.0 |
| Gray clay | damp | 9.0 | 9.5 |
| Gray brown silty clay | Moist | 9.5 | 11.5 |
| Gray shale | damp | 11.5 | 14.5 |

*ATTACH ADDITIONAL SHEETS IF NECESSARY*

2 TOTAL DEPTH OF WELL 14.5 ft
3 DEPTHS TO WATER PRODUCING FORMATIONS
4 STATIC WATER LEVEL Ft below land surface
5 YIELD ______ gallons per ☐ min ☐ hr
6 DIAMETER OF BORE HOLE 8 5/8 IN

**C** PUMP REPORT N/A
1 TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐
2 SETTING DEPTH: FEET
3 BRAND NAME AND SERIAL NUMBERS:
4 RATED CAPACITY gallons per minute
5 TYPE LUBRICATION
6 DROP PIPE OR COLUMN PIPE SIZE
7 WIRE SIZE
8 PRESSURE TANK SIZE, MAKE, MODEL
9 DATE OF INSTALLATION OR REPAIR
10 Is there an abandoned water well on the property?

**D** 1 LAND OWNER OR OTHER CONTACT PERSON:
NAME WalMart
STREET ADDRESS Jenny Lind & "O" Streets
CITY South Fort Smith, AR

2 CASING FROM TO W/ "ID
FROM TO W/ "ID
TYPE CASING: 2" PVC

3 SCREEN
TYPE: DIA 2" SLOT/GA .020
SET FROM FT TO FT
TYPE: DIA SLOT/GA
SET FROM FT TO FT

4 GRAVEL PACK FROM FT TO FT

5 BACK FILLED WITH: Bentonite
FROM 0 FT TO .5 FT

6 SEALED WITH:
FROM FT TO FT
FROM FT TO FT

7 DISINFECTED WITH:

8 USE OF WELL:
DOMESTIC ☐ COMMERCIAL ☐
IRRIGATION ☐ MONITOR ☒
LIVESTOCK/POULTRY ☐ TEST WELL ☐
OIL/GAS SUPPLY ☐ SEMI-PUBLIC ☐
PUBLIC SUPPLY ☐ OTHER

(A/C HEATPUMP TYPE WELLS)
SOURCE ☐ RETURN ☐
CLOSED LOOP ☐

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?
If yes, name use: yes ☐ no ☐

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS

12 SIGNED CRB DATE 6/27/97

AWD-7 JAN 89 Arkansas Water Well Construction Commission, 101 East Capitol, Suite 350, Little Rock, AR 72201
ACI--5945

GEOLOGY COPY

2000 ft NE of site
1500 ft [illegible] of MW-50
accross mill CK

# STATE OF ARKANSAS
## REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

SOIL [illegible] COMM.

**A**
1 Contractor Name & Number: Evergreen Enviromental, Inc — C# 1415
2 Driller Name & Number: Curtis R Branch — D# 2330
3 Pump Installer Name & Number: — P#
4 Date Well Completed: 05/22/97 — New Well ☒ Replace or Work-over ☐

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastion | NW ¼ of SW ¼ of SE | 33 | 8N | 32W |

11 LONGITUDE 94° 25' 10"
11 LATITUDE 35° 20' 08" -07

10 LOCATE WITH 'X' IN SECTION BELOW

BE-101

**B**
1 DESCRIPTION OF FORMATION: DEPTHS IN FEET

| Description | | FROM | TO |
|---|---|---|---|
| Brown silty clay | damp | 0 | 1 |
| Black ash | | 1 | 3 |
| Orange & gray clay some silt | damp | 3 | 9.5 |
| Orange & gray gravely clay | moist | 9.5 | 11.0 |
| Orange sand | moist | 11.0 | 11.5 |
| Brown clay | dry | 11.5 | 12.0 |
| Brown & tan silty clay | damp | 12.0 | 15.0 |
| Orange & gray shale weathered | dry | 15.0 | 17.5 |
| Gray shale | dry | 17.5 | 19.5 |

*ATTACH ADDITIONAL SHEETS IF NECESSARY*

2 TOTAL DEPTH OF WELL 19.5 ft
3 DEPTHS TO WATER PRODUCING FORMATIONS
4 STATIC WATER LEVEL — Ft below land surface
5 YIELD — gallons per ☐ min ☐ hr
6 DIAMETER OF BORE HOLE 8 5/8 IN

**C** PUMP REPORT N/A
1 TYPE PUMP SUBMERSIBLE ☐ TURBINE ☐ JET ☐
2 SETTING DEPTH: FEET
3 BRAND NAME AND SERIAL NUMBERS:
4 RATED CAPACITY gallons per minute
5 TYPE LUBRICATION
6 DROP PIPE OR COLUMN PIPE SIZE
7 WIRE SIZE
8 PRESSURE TANK — SIZE, MAKE, MODEL
9 DATE OF INSTALLATION OR REPAIR
10 Is there an abandoned water well on the property?

**D**
1 LAND OWNER OR OTHER CONTACT PERSON:
NAME WalMart
STREET ADDRESS Jenny Lind & "O" Streets
CITY South Fort Smith, AR

2 CASING FROM TO W/ "ID
FROM TO W/ "ID
TYPE CASING:

3 SCREEN
TYPE: DIA SLOT/GA
SET FROM FT TO FT
TYPE: DIA SLOT/GA
SET FROM FT TO FT

4 GRAVEL PACK FROM FT TO FT
5 BACK FILLED WITH:
FROM FT TO FT
6 SEALED WITH:
FROM FT TO FT
FROM FT TO FT
7 DISINFECTED WITH:

8 USE OF WELL:
DOMESTIC ☐ COMMERCIAL ☐
IRRIGATION ☐ MONITOR ☐
LIVESTOCK/POULTRY ☐ TEST WELL ☒
OIL/GAS SUPPLY ☐ SEMI-PUBLIC ☐
PUBLIC SUPPLY ☐ OTHER

(A/C HEATPUMP TYPE WELLS)
SOURCE ☐ RETURN ☐
CLOSED LOOP ☐

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?
If yes, name use: yes ☐ no ☐

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS

12 SIGNED [signature] DATE 6/27/97

AWD-7 JAN 89 Arkansas Water Well Construction Commission, 101 East Capitol, Suite 350, Little Rock, AR 72201
ACI-5945

GEOLOGY COPY

STATE OF ARKANSAS
REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

97 ... 30 PM 1:20
SOIL & WATER COMM.

**A**

1. Contractor Name & Number: Evergreen Environmental, Inc  C# 1415
2. Driller Name & Number: Curtis R Branch  D# 2330
3. Pump Installer Name & Number:  P#
4. Date Well Completed: 05/22/97  New Well ☒  Replace or Work-over ☐

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastion | SW ¼ of SW ¼ of SE | 33 | 8N | 32W |

11 LONGITUDE 94° 25' 10"
11 LATITUDE 35° 19' 50" -09

10 LOCATE WITH 'X' IN SECTION BELOW

BE-102

**B**

1 DESCRIPTION OF FORMATION: DEPTHS IN FEET

| Description | | FROM | TO |
|---|---|---|---|
| Bwrn silty clay some gravel | damp | 0 | 1.25 |
| Gray black clay some gravel | damp | 1.25 | 2.5 |
| Orange silty clay | | 2.54 | 4.5 |
| Brwn clayey cobbles | wet | 4.5 | 5.5 |
| Orange, brwn, & bl sand | wet | 5.5 | 6.0 |
| Orange & gray clay | damp | 6.0 | 6.75 |
| Tan silty clay | damp | 6.75 | 9.5 |

*ATTACH ADDITIONAL SHEETS IF NECESSARY*

2 TOTAL DEPTH OF WELL 9.5 ft
3 DEPTHS TO WATER PRODUCING FORMATIONS
4 STATIC WATER LEVEL Ft below land surface
5 YIELD gallons per ☐ min ☐ hr
6 DIAMETER OF BORE HOLE 8 5/8 IN

**C** PUMP REPORT N/A

1 TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐
2 SETTING DEPTH: FEET
3 BRAND NAME AND SERIAL NUMBERS:
4 RATED CAPACITY gallons per minute
5 TYPE LUBRICATION
6 DROP PIPE OR COLUMN PIPE SIZE
7 WIRE SIZE
8 PRESSURE TANK SIZE, MAKE, MODEL
9 DATE OF INSTALLATION OR REPAIR
10 Is there an abandoned water well on the property?

**D**

1 LAND OWNER OR OTHER CONTACT PERSON:
NAME WalMart
STREET ADDRESS Jenny Lind & "O" Streets
CITY South Fort Smith, AR

2 CASING FROM TO W/ "ID
FROM TO W/ "ID
TYPE CASING:

3 SCREEN
TYPE: DIA SLOT/GA
SET FROM FT TO FT
TYPE: DIA SLOT/GA
SET FROM FT TO FT

4 GRAVEL PACK FROM FT TO FT

5 BACK FILLED WITH:
FROM FT TO FT

6 SEALED WITH:
FROM FT TO FT
FROM FT TO FT

7 DISINFECTED WITH:

8 USE OF WELL:
DOMESTIC ☐ COMMERCIAL ☐
IRRIGATION ☐ MONITOR ☐
LIVESTOCK/POULTRY ☐ TEST WELL ☒
OIL/GAS SUPPLY ☐ SEMI-PUBLIC ☐
PUBLIC SUPPLY ☐ OTHER

(A/C HEATPUMP TYPE WELLS)
SOURCE ☐ RETURN ☐
CLOSED LOOP ☐

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?
If yes, name use: yes ☐ no ☐

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS
East of B-35

12 SIGNED Curt R Branch DATE 6/27/97

AWD-7 JAN 89 Arkansas Water Well Construction Commission, 101 East Capitol, Suite 350, Little Rock, AR 72201
ACI-5945

GEOLOGY COPY

STATE OF ARKANSAS

REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

[stamp] ... 30 PM 1:20 SOIL & WATER COMM.

**A**

1 Contractor Name & Number: Evergreen Enviromental, Inc. C# 1415

2 Driller Name & Number: Curtis R Brannh D# 2330

3 Pump Installer Name & Number: P#

4 Date Well Completed: 05/22/97 New Well ☒ Replace or Work-over ☐

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastion | SW ¼ of SW ¼ of SE | 33 | 8N | 32W |

11 LONGITUDE 94 ° 25 ' 10 "

11 LATITUDE 35 ° 19 ' 50 " -08

10 LOCATE WITH 'X' IN SECTION BELOW

BE-103

**B**

1 DESCRIPTION OF FORMATION: DEPTHS IN FEET

| | FROM | TO |
|---|---|---|
| Brown silty clay | 0 | .5 |
| Orange, brown clay some silt | .5 | 2.25 |
| Blue clayey ash moist | 2.25 | 2.5 |
| Brown silty clay wet | 2.5 | 4.5 |
| Orange & tan clay trace black particles moist | 4.5 | 7.75 |
| Orange brown sand moist | 7.75 | 8.0 |
| Orange brown clay moist | 8.0 | 8.5 |
| Orange brown sand very moist | 8.5 | 9.5 |

*ATTACH ADDITIONAL SHEETS IF NECESSARY*

2 TOTAL DEPTH OF WELL 9.5 ft

3 DEPTHS TO WATER PRODUCING FORMATIONS

4 STATIC WATER LEVEL Ft below land surface

5 YIELD gallons per ☐ min ☐ hr

6 DIAMETER OF BORE HOLE 8 5/8 IN

**C** PUMP REPORT N/A

1 TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐

2 SETTING DEPTH: FEET

3 BRAND NAME AND SERIAL NUMBERS:

4 RATED CAPACITY gallons per minute

5 TYPE LUBRICATION

6 DROP PIPE OR COLUMN PIPE SIZE

7 WIRE SIZE

8 PRESSURE TANK SIZE, MAKE, MODEL

9 DATE OF INSTALLATION OR REPAIR

10 Is there an abandoned water well on the property?

**D**

1 LAND OWNER OR OTHER CONTACT PERSON:

NAME WalMart

STREET ADDRESS Jenny Lind & "O" Streets

CITY South Fort Smith, AR

2 CASING FROM TO W/ "ID

FROM TO W/ "ID

TYPE CASING:

3 SCREEN

TYPE: DIA SLOT/GA

SET FROM FT TO FT

TYPE: DIA SLOT/GA

SET FROM FT TO FT

4 GRAVEL PACK FROM FT TO FT

5 BACK FILLED WITH:

FROM FT TO FT

6 SEALED WITH:

FROM FT TO FT

FROM FT TO FT

7 DISINFECTED WITH:

8 USE OF WELL:

DOMESTIC ☐ COMMERCIAL ☐

IRRIGATION ☐ MONITOR ☐

LIVESTOCK/POULTRY ☐ TEST WELL ☒

OIL/GAS SUPPLY ☐ SEMI-PUBLIC ☐

PUBLIC SUPPLY ☐ OTHER

(A/C HEATPUMP TYPE WELLS)

SOURCE ☐ RETURN ☐

CLOSED LOOP ☐

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?

If yes, name use: yes ☐ no ☐

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS

Between B-17 & B-30

12 SIGNED Curt R Brl DATE 6/27/97

# STATE OF ARKANSAS
# REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

JUL 30 PM 1:20
SOIL & WATER COMM

**A**
1 Contractor Name & Number: Evergreen Enviromental, Inc. C# 1415
2 Driller Name & Number: Curtis R Branch D# 2330
3 Pump Installer Name & Number: P#
4 Date Well Completed: 05/22/97 New Well ☒ Replace or Work-over ☐

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastion | NW ¼ of SW ¼ of SE | 33 | 8N | 32W |

LONGITUDE 11 94 ° 25 ' 10 "
LATITUDE 11 35 ° ~~18~~ 20 ' 08 " -08

10 LOCATE WITH 'X' IN SECTION BELOW
BE-104

**B** 1 DESCRIPTION OF FORMATION: DEPTHS IN FEET

| | FROM | TO |
|---|---|---|
| Brown silty clay | 0 | 2.75 |
| Black Ash, trace gravel moist | 2.75 | 3.0 |
| Brown silty clay, little black ash moist | 3.0 | 4.0 |
| Black ash wet | 4.0 | 5.5 |
| Brown & orange clay some silt moist | 5.5 | 6.5 |
| cobbles large | 6.5 | 9.5 |
| | | |

*ATTACH ADDITIONAL SHEETS IF NECESSARY*

2 TOTAL DEPTH OF WELL 9.5 ft
3 DEPTHS TO WATER PRODUCING FORMATIONS
4 STATIC WATER LEVEL 2 Ft below land surface
5 YIELD ______ gallons per ☐ min ☐ hr
6 DIAMETER OF BORE HOLE 8 5/8 IN

**C** PUMP REPORT N/A
1 TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐
2 SETTING DEPTH: FEET
3 BRAND NAME AND SERIAL NUMBERS:
4 RATED CAPACITY gallons per minute
5 TYPE LUBRICATION
6 DROP PIPE OR COLUMN PIPE SIZE
7 WIRE SIZE
8 PRESSURE TANK: SIZE, MAKE, MODEL
9 DATE OF INSTALLATION OR REPAIR
10 Is there an abandoned water well on the property?

**D** 1 LAND OWNER OR OTHER CONTACT PERSON:
NAME WalMart
STREET ADDRESS Jenny Lind & "O" Streets
CITY South Fort Smith, AR

2 CASING FROM TO W/ "ID
FROM TO W/ "ID
TYPE CASING:

3 SCREEN
TYPE: DIA SLOT/GA
SET FROM FT TO FT
TYPE: DIA SLOT/GA
SET FROM FT TO FT

4 GRAVEL PACK FROM FT TO FT

5 BACK FILLED WITH:
FROM FT TO FT

6 SEALED WITH:
FROM FT TO FT
FROM FT TO FT

7 DISINFECTED WITH:

8 USE OF WELL:
DOMESTIC ☐ COMMERCIAL ☐
IRRIGATION ☐ MONITOR ☐
LIVESTOCK/POULTRY ☐ TEST WELL ☒
OIL/GAS SUPPLY ☐ SEMI-PUBLIC ☐
PUBLIC SUPPLY ☐ OTHER

(A/C HEATPUMP TYPE WELLS)
SOURCE ☐ RETURN ☐
CLOSED LOOP ☐

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?
If yes, name use: yes ☐ no ☐

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS

12 SIGNED Curtis R Branch DATE 6/27/97

AWD-7 JAN 89 Arkansas Water Well Construction Commission, 101 East Capitol, Suite 350, Little Rock, AR 72201
ACI--5945

GEOLOGY COPY

# STATE OF ARKANSAS
## REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

97 JUN 30 PM 1:20
SOIL & WATER COMM.

**A**

1 Contractor Name & Number: Evergreen Enviromental, INC. C# 1415
2 Driller Name & Number: Curtis R Branch D# 2330
3 Pump Installer Name & Number: P#
4 Date Well Completed: 05/27/97 New Well ☒ Replace or Work-over ☐

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastion | NW ¼ of SW ¼ of SE | 33 | 8N | 32W |

11 LONGITUDE 94° 25' 10"
11 LATITUDE 35° ~~18~~ 20' 08" -09

10 LOCATE WITH 'X' IN SECTION BELOW
BE-106

**B**

1 DESCRIPTION OF FORMATION: DEPTHS IN FEET

| Description | | FROM | TO |
|---|---|---|---|
| Brown silty clay | damp | 0 | 2.5 |
| Orange & gray clay some silt | damp | 2.5 | 5.5 |
| Tan clay | damp | 5.5 | 9.5 |
| Orange & brown &gray silty clay | damp | 9.5 | 14.5 |
| Orange & brown clay, trace gravel | damp | 14.5 | 16.5 |
| Tan & gray sand fine grain | wet | 16.5 | 18.5 |
| Tan sand, some clay | wet | 18.5 | 19.5 |
| | | | |

*ATTACH ADDITIONAL SHEETS IF NECESSARY*

2 TOTAL DEPTH OF WELL 19.5 ft
3 DEPTHS TO WATER PRODUCING FORMATIONS
4 STATIC WATER LEVEL Ft below land surface
5 YIELD gallons per ☐ min ☐ hr
6 DIAMETER OF BORE HOLE 8 5/8 IN

**C** PUMP REPORT N/A

1 TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐
2 SETTING DEPTH: FEET
3 BRAND NAME AND SERIAL NUMBERS:
4 RATED CAPACITY gallons per minute
5 TYPE LUBRICATION
6 DROP PIPE OR COLUMN PIPE SIZE
7 WIRE SIZE
8 PRESSURE TANK - SIZE, MAKE, MODEL
9 DATE OF INSTALLATION OR REPAIR
10 Is there an abandoned water well on the property?

**D**

1 LAND OWNER OR OTHER CONTACT PERSON:
NAME WalMart
STREET ADDRESS Jenny Lind & "O" Streets
CITY South Fort Smith, AR

2 CASING FROM TO W/ "ID
FROM TO W/ "ID
TYPE CASING:

3 SCREEN
TYPE: DIA SLOT/GA
SET FROM FT TO FT
TYPE: DIA SLOT/GA
SET FROM FT TO FT

4 GRAVEL PACK FROM FT TO FT

5 BACK FILLED WITH:
FROM FT TO FT

6 SEALED WITH:
FROM FT TO FT
FROM FT TO FT

7 DISINFECTED WITH:

8 USE OF WELL:

| | | | |
|---|---|---|---|
| DOMESTIC | ☐ | COMMERCIAL | ☐ |
| IRRIGATION | ☐ | MONITOR | ☐ |
| LIVESTOCK/POULTRY | ☐ | TEST WELL | ☒ |
| OIL/GAS SUPPLY | ☐ | SEMI-PUBLIC | ☐ |
| PUBLIC SUPPLY | ☐ | OTHER | |

(A/C HEATPUMP TYPE WELLS)
SOURCE ☐ RETURN ☐
CLOSED LOOP ☐

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?
If yes, name use: yes ☐ no ☐

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS

12 SIGNED Curt R Branch DATE 6/27/97

AWD-7 JAN 89 Arkansas Water Well Construction Commission, 101 East Capitol, Suite 350, Little Rock, AR 72201
ACI-5945

GEOLOGY COPY

STATE OF ARKANSAS

REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

30 PM 1:28 SOIL WATER COMM.

**A**

1 Contractor Name & Number: Evergreen Enviromental, INC C# 1415

2 Driller Name & Number: Curtis R Branch D# 2330

3 Pump Installer Name & Number: P#

4 Date Well Completed: 05/29/97 New Well ☒ Replace or Work-over ☐

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastion | NW ¼ of SW ¼ of SE | 33 | 8N | 32W |

11 LONGITUDE 94 ° 25 ' 10 "

11 LATITUDE 35 ° ~~18~~ 20 ' 08 " -10

10 LOCATE WITH 'X' IN SECTION BELOW

BE-115

**B**

1 DESCRIPTION OF FORMATION: DEPTHS IN FEET

| | FROM | TO |
|---|---|---|
| Black ash damp | 0 | 3.5 |
| Orange, blue &gray damp clay - some silt | 3.5 | 9.5 |
| Brown, orange brown clay | 9.5 | 13.5 |
| Gray shale | 13.5 | 14.5 |
| | | |
| | | |
| | | |

*ATTACH ADDITIONAL SHEETS IF NECESSARY*

2 TOTAL DEPTH OF WELL 14.5 ft

3 DEPTHS TO WATER PRODUCING FORMATIONS

4 STATIC WATER LEVEL Ft below land surface

5 YIELD gallons per ☐ min ☐ hr

6 DIAMETER OF BORE HOLE 8 5/8 IN

**C** PUMP REPORT N/A

1 TYPE PUMP SUBMERSIBLE ☐ TURBINE ☐ JET ☐

2 SETTING DEPTH FEET

3 BRAND NAME AND SERIAL NUMBERS:

4 RATED CAPACITY gallons per minute

5 TYPE LUBRICATION

6 DROP PIPE OR COLUMN PIPE SIZE

7 WIRE SIZE

8 PRESSURE TANK SIZE, MAKE, MODEL

9 DATE OF INSTALLATION OR REPAIR

10 Is there an abandoned water well on the property?

**D**

1 LAND OWNER OR OTHER CONTACT PERSON:

NAME WalMart

STREET ADDRESS Jenny Lind & "O" Streets

CITY South Fort Smith, AR

2 CASING FROM TO W/ "ID

FROM TO W/ "ID

TYPE CASING:

3 SCREEN

TYPE: DIA SLOT/GA

SET FROM FT TO FT

TYPE: DIA SLOT/GA

SET FROM FT TO FT

4 GRAVEL PACK FROM FT TO FT

5 BACK FILLED WITH:

FROM FT TO FT

6 SEALED WITH:

FROM FT TO FT

FROM FT TO FT

7 DISINFECTED WITH:

8 USE OF WELL:

| | | | |
|---|---|---|---|
| DOMESTIC | ☐ | COMMERCIAL | ☐ |
| IRRIGATION | ☐ | MONITOR | ☐ |
| LIVESTOCK/POULTRY | ☐ | TEST WELL | ☒ |
| OIL/GAS SUPPLY | ☐ | SEMI-PUBLIC | ☐ |
| PUBLIC SUPPLY | ☐ | OTHER | |

(A/C HEATPUMP TYPE WELLS)

SOURCE ☐ RETURN ☐

CLOSED LOOP ☐

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?

If yes, name use: yes ☐ no ☐

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS

12 SIGNED Curt R Branch DATE 6/27/97

AWD-7 JAN 89 Arkansas Water Well Construction Commission, 101 East Capitol, Suite 350, Little Rock, AR 72201

ACI--5945

GEOLOGY COPY

STATE OF ARKANSAS
REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

97 JUN 30 PM 1:20
SOIL & WATER COMM.

**A**

1 Contractor Name & Number: Evergreen Enviromental, INC. C# 1415
2 Driller Name & Number: Curtis R Branch D# 2330
3 Pump Installer Name & Number: P#
4 Date Well Completed: 05/29/97 New Well [x] Replace or Work-over [ ]

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastion | NW ¼ of SW ¼ of SE | 33 | 8N | 32W |

11 LONGITUDE 94 ° 25 ' 10 "
11 LATITUDE 35 ° ~~18~~ 20 ' 08 " -11

10 LOCATE WITH 'X' IN SECTION BELOW

BE-117

**B**

1 DESCRIPTION OF FORMATION: DEPTHS IN FEET

| Description | | FROM | TO |
|---|---|---|---|
| Brown silty clay | damp | 0 | .075 |
| Black clay, silty trace gravel | damp | .075 | 1.75 |
| Orange brown clay little silt | damp | 1.75 | 2.5 |
| Tan silty clay | moist | 2.5 | 3.5 |
| Orange brown clay trace gravel | | 3.5 | 4.5 |
| Orange, brown & gray clay | damp | 4.5 | 9.5 |

*ATTACH ADDITIONAL SHEETS IF NECESSARY*

2 TOTAL DEPTH OF WELL 9.5 ft
3 DEPTHS TO WATER PRODUCING FORMATIONS
4 STATIC WATER LEVEL Ft below land surface
5 YIELD gallons per [ ] min [ ] hr
6 DIAMETER OF BORE HOLE 8 5/8 IN

**C**

PUMP REPORT N/A

1 TYPE PUMP: SUBMERSIBLE [ ] TURBINE [ ] JET [ ]
2 SETTING DEPTH: FEET
3 BRAND NAME AND SERIAL NUMBERS:
4 RATED CAPACITY gallons per minute
5 TYPE LUBRICATION
6 DROP PIPE OR COLUMN PIPE SIZE
7 WIRE SIZE
8 PRESSURE TANK SIZE, MAKE, MODEL
9 DATE OF INSTALLATION OR REPAIR
10 Is there an abandoned water well on the property?

**D**

1 LAND OWNER OR OTHER CONTACT PERSON:
NAME WalMart
STREET ADDRESS Jenny Lind & "O" Streets
CITY South Fort Smith, AR

2 CASING FROM TO W/ "ID
FROM TO W/ "ID
TYPE CASING:

3 SCREEN
TYPE: DIA SLOT/GA
SET FROM FT TO FT
TYPE: DIA SLOT/GA
SET FROM FT TO FT

4 GRAVEL PACK FROM FT TO FT

5 BACK FILLED WITH:
FROM FT TO FT

6 SEALED WITH:
FROM FT TO FT
FROM FT TO FT

7 DISINFECTED WITH:

8 USE OF WELL:

| | | | |
|---|---|---|---|
| DOMESTIC | [ ] | COMMERCIAL | [ ] |
| IRRIGATION | [ ] | MONITOR | [ ] |
| LIVESTOCK/POULTRY | [ ] | TEST WELL | [x] |
| OIL/GAS SUPPLY | [ ] | SEMI-PUBLIC | [ ] |
| PUBLIC SUPPLY | [ ] | OTHER | |

(A/C HEATPUMP TYPE WELLS)
SOURCE [ ] RETURN [ ]
CLOSED LOOP [ ]

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?
If yes, name use: yes [ ] no [ ]

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS

12 SIGNED Curt R Branch DATE 6/27/97

AWD-7 JAN 89 Arkansas Water Well Construction Commission, 101 East Capitol, Suite 350, Little Rock, AR 72201
ACI--5945

GEOLOGY COPY

STATE OF ARKANSAS
REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

97 JUN 30 PM 1:20
SOIL & WATER COMM.

**A**

1 Contractor Name & Number: Evergreen Enviromental, Inc. C# 1415
2 Driller Name & Number: Curtis R Branch D# 2330
3 Pump Installer Name & Number: P#
4 Date Well Completed: 05/29/97 New Well [x] Replace or Work-over [ ]

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastion | SW ¼ of SW ¼ of SE | 33 | 8N | 32W |

LONGITUDE 11 94 ° 25 ' 10 "
LATITUDE 11 35 ° 19 ' 50 " -05

10 LOCATE WITH 'X' IN SECTION BELOW

BE 178

**B**

1 DESCRIPTION OF FORMATION: DEPTHS IN FEET

| Description | FROM | TO |
|---|---|---|
| Orange brown silty clay damp | 0 | 1 |
| Black, ash, clayey | 1 | 5.5 |
| Orange, Brown Clay with some gravell | 5.5 | 9.5 |

ATTACH ADDITIONAL SHEETS IF NECESSARY

2 TOTAL DEPTH OF WELL 9.5 ft
3 DEPTHS TO WATER PRODUCING FORMATIONS
4 STATIC WATER LEVEL Ft below land surface
5 YIELD gallons per [ ] min [ ] hr
6 DIAMETER OF BORE HOLE 8 5/8 IN

**C** PUMP REPORT N/A

1 TYPE PUMP: SUBMERSIBLE [ ] TURBINE [ ] JET [ ]
2 SETTING DEPTH: FEET
3 BRAND NAME AND SERIAL NUMBERS:
4 RATED CAPACITY gallons per minute
5 TYPE LUBRICATION
6 DROP PIPE OR COLUMN PIPE SIZE
7 WIRE SIZE
8 PRESSURE TANK SIZE, MAKE, MODEL
9 DATE OF INSTALLATION OR REPAIR
10 Is there an abandoned water well on the property?

**D**

1 LAND OWNER OR OTHER CONTACT PERSON:
NAME WalMart
STREET ADDRESS Jenny Lind & "o" Streets
CITY South Fort Smith, AR

2 CASING FROM TO W/ "ID
FROM TO W/ "ID
TYPE CASING:

3 SCREEN
TYPE: DIA SLOT/GA
SET FROM FT TO FT
TYPE: DIA SLOT/GA
SET FROM FT TO FT

4 GRAVEL PACK FROM FT TO FT

5 BACK FILLED WITH:
FROM FT TO FT

6 SEALED WITH:
FROM FT TO FT
FROM FT TO FT

7 DISINFECTED WITH:

8 USE OF WELL:

| | | | |
|---|---|---|---|
| DOMESTIC | [ ] | COMMERCIAL | [ ] |
| IRRIGATION | [ ] | MONITOR | [ ] |
| LIVESTOCK/POULTRY | [ ] | TEST WELL | [x] |
| OIL/GAS SUPPLY | [ ] | SEMI-PUBLIC | [ ] |
| PUBLIC SUPPLY | [ ] | OTHER | |

(A/C HEATPUMP TYPE WELLS)
SOURCE [ ] RETURN [ ]
CLOSED LOOP [ ]

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?
If yes, name use: yes [ ] no [ ]

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS

12 SIGNED Curt R Branch DATE 6/27/97

AWD-7 JAN 89 Arkansas Water Well Construction Commission, 101 East Capitol, Suite 350, Little Rock, AR 72201
ACI-5945

WalMart
Jenny Lind & "o" Streets

GEOLOGY COPY

# STATE OF ARKANSAS
## REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

PM 1:20

SOIL & WATER COMM.

**A**
1. Contractor Name & Number: Evergreen Enviromental, Inc. C# 1415
2. Driller Name & Number: Curtis R Branch D# 2330
3. Pump Installer Name & Number: P#
4. Date Well Completed: 05/29/97 New Well ☒ Replace or Work-over ☐

10 LOCATE WITH 'X' IN SECTION BELOW

BE-119

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastion | SW ¼ of SW ¼ of SE | 33 | 8N | 32W |

11 LONGITUDE 94° 25' 10"

11 LATITUDE 35° 19' 50" -06

**B**
1 DESCRIPTION OF FORMATION: DEPTHS IN FEET

| | FROM | TO |
|---|---|---|
| Orange, brwn silty clay damp | 0 | 2.5 |
| Brown clay moist | 2.5 | 4.5 |
| Brwn silty clay traceeof sand moist | 4.5 | 5.5 |
| brwn clay w/gravel wet | 5.5 | 5.75 |
| Brown silty clay moist | 5.75 | 6.5 |
| Orange brown clay some silt | 6.5 | 9.5 |

ATTACH ADDITIONAL SHEETS IF NECESSARY

2 TOTAL DEPTH OF WELL 9.5 ft

3 DEPTHS TO WATER PRODUCING FORMATIONS

4 STATIC WATER LEVEL Ft below land surface

5 YIELD gallons per ☐ min ☐ hr

6 DIAMETER OF BORE HOLE 8 5/8 IN

**C** PUMP REPORT N/A

1 TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐

2 SETTING DEPTH: FEET

3 BRAND NAME AND SERIAL NUMBERS:

4 RATED CAPACITY gallons per minute

5 TYPE LUBRICATION

6 DROP PIPE OR COLUMN PIPE SIZE

7 WIRE SIZE

8 PRESSURE TANK SIZE, MAKE, MODEL

9 DATE OF INSTALLATION OR REPAIR

10 Is there an abandoned water well on the property?

**D**
1 LAND OWNER OR OTHER CONTACT PERSON:

NAME WalMart

STREET ADDRESS Jenny Lind & "O" Streets

CITY South Fort Smith, AR

2 CASING FROM TO W/ "ID

FROM TO W/ "ID

TYPE CASING: [illegible]

3 SCREEN

TYPE: DIA SLOT/GA

SET FROM FT TO FT

TYPE: DIA SLOT/GA

SET FROM FT TO FT

4 GRAVEL PACK FROM FT TO FT

5 BACK FILLED WITH:

FROM FT TO FT

6 SEALED WITH:

FROM FT TO FT

FROM FT TO FT

7 DISINFECTED WITH:

8 USE OF WELL:

| | | | |
|---|---|---|---|
| DOMESTIC | ☐ | COMMERCIAL | ☐ |
| IRRIGATION | ☐ | MONITOR | ☐ |
| LIVESTOCK/POULTRY | ☐ | TEST WELL | ☒ |
| OIL/GAS SUPPLY | ☐ | SEMI-PUBLIC | ☐ |
| PUBLIC SUPPLY | ☐ | OTHER | |

(A/C HEATPUMP TYPE WELLS)

SOURCE ☐ RETURN ☐

CLOSED LOOP ☐

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?

If yes, name use: yes ☐ no ☐

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS

12 SIGNED CRB DATE 6/27/97

AWD-7 JAN 89 Arkansas Water Well Construction Commission, 101 East Capitol, Suite 350, Little Rock, AR 72201

ACI-5945

GEOLOGY COPY

STATE OF ARKANSAS
REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

97 JUN 30 AM 11:20
SOIL & WATER COMM.

**A**
1 Contractor Name & Number: Evergreen Enviromental, Inc. C# 1415
2 Driller Name & Number: Curtis R Branch D# 2330
3 Pump Installer Name & Number: P#
4 Date Well Completed: 05/29/97 New Well ☒ Replace or Work-over ☐

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| 1Sebastion | SW ¼ of SW ¼ of SE | 33 | 8N | 32W |

11 LONGITUDE 94° 25' 10"
11 LATITUDE 35° 19' 50"-07

10 LOCATE WITH 'X' IN SECTION BELOW

BE-120

**B**
1 DESCRIPTION OF FORMATION: DEPTHS IN FEET

| | FROM | TO |
|---|---|---|
| Orange brwn silty clay damp | 0 | 4.5 |
| Orange brwn clay mosst | 4.5 | 5.5 |
| Orange brwn & blue gray sandy clay | 5.5 | 9.5 |
| | | |
| | | |
| | | |

ATTACH ADDITIONAL SHEETS IF NECESSARY

2 TOTAL DEPTH OF WELL 9.5 ft
3 DEPTHS TO WATER PRODUCING FORMATIONS
4 STATIC WATER LEVEL Ft below land surface
5 YIELD gallons per ☐ min ☐ hr
6 DIAMETER OF BORE HOLE 8 5/8 IN

**C** PUMP REPORT N/A
1 TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐
2 SETTING DEPTH: FEET
3 BRAND NAME AND SERIAL NUMBERS:
4 RATED CAPACITY gallons per minute
5 TYPE LUBRICATION
6 DROP PIPE OR COLUMN PIPE SIZE
7 WIRE SIZE
8 PRESSURE TANK SIZE, MAKE, MODEL
9 DATE OF INSTALLATION OR REPAIR
10 Is there an abandoned water well on the property?

**D**
1 LAND OWNER OR OTHER CONTACT PERSON:
NAME WalMart
STREET ADDRESS Jenny Lind & "O" Streets
CITY South Fort Smith, AR

2 CASING FROM TO W/ "ID
FROM TO W/ "ID
TYPE CASING:

3 SCREEN
TYPE: DIA SLOT/GA
SET FROM FT TO FT
TYPE: DIA SLOT/GA
SET FROM FT TO FT

4 GRAVEL PACK FROM FT TO FT
5 BACK FILLED WITH:
FROM FT TO FT
6 SEALED WITH:
FROM FT TO FT
FROM FT TO FT
7 DISINFECTED WITH:

8 USE OF WELL:
DOMESTIC ☐ COMMERCIAL ☐
IRRIGATION ☐ MONITOR ☐
LIVESTOCK/POULTRY ☐ TEST WELL ☒
OIL/GAS SUPPLY ☐ SEMI-PUBLIC ☐
PUBLIC SUPPLY ☐ OTHER

(A/C HEATPUMP TYPE WELLS)
SOURCE ☐ RETURN ☐
CLOSED LOOP ☐

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?
If yes, name use: yes ☐ no ☐

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS

12 SIGNED Curt R Branch DATE 6/27/97



GEOLOGY COPY

# STATE OF ARKANSAS
# REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

RECEIVED
97 JUN 30 PM 1:20
SOIL

**A**
1 Contractor Name & Number: Evergreen Enviromental, Inc. C# 1415
2 Driller Name & Number: Curtis R Branch D# 3330
3 Pump Installer Name & Number: P#
4 Date Well Completed: 05/29/97 New Well [x] Replace or Work-over [ ]

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastion | NW ¼ of SW ¼ of SE | 33 | 8N | 32W |

LONGITUDE 11 94 ° 25 ' 10 "
LATITUDE 11 35 ° 18 20 08 " -12

10 LOCATE WITH 'X' IN SECTION BELOW

BE-121

**B**
1 DESCRIPTION OF FORMATION — DEPTHS IN FEET

| | FROM | TO |
|---|---|---|
| Orange, brown & tan clay | 0 | 4.5 |
| Orange, brown clay w/small gravel | 4.5 | 6.5 |
| Orange, brown & blue clay | 6.5 | 9.5 |
| | | |
| | | |
| | | |

ATTACH ADDITIONAL SHEETS IF NECESSARY

2 TOTAL DEPTH OF WELL 9.5 ft
3 DEPTHS TO WATER PRODUCING FORMATIONS
4 STATIC WATER LEVEL Ft below land surface
5 YIELD gallons per [ ] min [ ] hr
6 DIAMETER OF BORE HOLE 8 5/8 IN

**C**
PUMP REPORT N/A
1 TYPE PUMP: SUBMERSIBLE [ ] TURBINE [ ] JET [ ]
2 SETTING DEPTH: FEET
3 BRAND NAME AND SERIAL NUMBERS:
4 RATED CAPACITY gallons per minute
5 TYPE LUBRICATION
6 DROP PIPE OR COLUMN PIPE SIZE
7 WIRE SIZE
8 PRESSURE TANK SIZE, MAKE, MODEL
9 DATE OF INSTALLATION OR REPAIR
10 Is there an abandoned water well on the property?

**D**
1 LAND OWNER OR OTHER CONTACT PERSON:
NAME WalMart
STREET ADDRESS Jenny Lind & "O" Streets
CITY South Fort Smith, AR

2 CASING FROM 0 TO 2 W/ "ID
2" FROM TO W/ "ID
TYPE CASING 2" PVC

3 SCREEN
TYPE: DIA 2" SLOT/GA .020
SET FROM FT TO 2 FT 7
TYPE: DIA SLOT/GA
SET FROM FT TO FT

4 GRAVEL PACK FROM FT TO FT

5 BACK FILLED WITH: Bentonite
FROM 0 FT TO 2 FT

6 SEALED WITH:
FROM FT TO FT
FROM FT TO FT

7 DISINFECTED WITH:

8 USE OF WELL:
DOMESTIC [ ] COMMERCIAL [ ]
IRRIGATION [ ] MONITOR [ ]
LIVESTOCK/POULTRY [ ] TEST WELL [x]
OIL/GAS SUPPLY [ ] SEMI-PUBLIC [ ]
PUBLIC SUPPLY [ ] OTHER
(A/C HEATPUMP TYPE WELLS)
SOURCE [ ] RETURN [ ]
CLOSED LOOP [ ]

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning?
If yes, name use: yes [ ] no [ ]

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS
Plugged back w/portland

12 SIGNED Curt R Branch DATE 6/27/97

# STATE OF ARKANSAS
## REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

**A**

1 Contractor Name & Number: A.W. Pool, Inc. C# 1099

2 Driller Name & Number: Arvil Keith Pool D# 2101

3 Pump Installer Name & Number: —NA— P#

4 Date Well Completed: 9/18/90 New Well ☒ Replace or Work-over ☐

| 5 COUNTY | 6 FRACTION | | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|---|
| Sebastian | NE ¼ of | NW ¼ of | 5 | 7N | 32W |

LONGITUDE 11 35 ° 19 ' 40 "

LATITUDE 11 94 ° 25 ' 20 "

10 LOCATE WITH 'X' IN SECTION BELOW: X

**B**

1 DESCRIPTION OF FORMATION: DEPTHS IN FEET MW #6

| | FROM | TO |
|---|---|---|
| Sand w/ Gravel | 0 | 1 |
| Sandstone - yellow | 1 | 6 |
| Shale - black | 6 | 20 |
| | | |
| | | |
| | | |
| | | |

ATTACH ADDITIONAL SHEETS IF NECESSARY

2 TOTAL DEPTH OF WELL 20 ft

3 DEPTHS TO WATER PRODUCING FORMATIONS.

4 STATIC WATER LEVEL 7 Ft below land surface

5 YIELD ______ gallons per ☐ min ☐ hr

6 DIAMETER OF BORE HOLE 7 IN

**C** PUMP REPORT

1 TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐

2 SETTING DEPTH: FEET

3 BRAND NAME AND SERIAL NUMBERS:

4 RATED CAPACITY gallons per minute

5 TYPE LUBRICATION NA

6 DROP PIPE OR COLUMN PIPE SIZE

7 WIRE SIZE

8 PRESSURE TANK SIZE, MAKE, MODEL

9 DATE OF INSTALLATION OR REPAIR

10 Is there an abandoned water well on the property?

**D**

1 LAND OWNER OR OTHER CONTACT PERSON:

NAME Westinghouse (Desoto South)

STREET ADDRESS 522 S. Zero St.

CITY Ft. Smith, Arkansas

2 CASING FROM +2 TO 8 W/ 2 "ID

FROM TO W/ "ID

TYPE CASING: PVC Sch 40

3 SCREEN

TYPE: PVC Sch40 DIA 2" SLOT/GA .010

SET FROM 8 FT TO 18 FT

TYPE: DIA SLOT/GA

SET FROM FT TO FT

4 GRAVEL PACK FROM 6 FT TO 20 FT

5 BACK FILLED WITH: ______

FROM FT TO FT

6 SEALED WITH: Cement & Bentonite

Cement FROM 0 FT TO 4 FT 2 bags

Bentonite FROM 4 FT TO 6 FT 40 #

7 DISINFECTED WITH:

8 USE OF WELL:

| | | | |
|---|---|---|---|
| DOMESTIC | ☐ | COMMERCIAL | ☐ |
| IRRIGATION | ☐ | MONITOR | ☒ |
| LIVESTOCK/POULTRY | ☐ | TEST WELL | ☐ |
| OIL/GAS SUPPLY | ☐ | SEMI-PUBLIC | ☐ |
| PUBLIC SUPPLY | ☐ | OTHER | |

(A/C HEATPUMP TYPE WELLS)

SOURCE ☐ RETURN ☐

CLOSED LOOP ☐

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning? NA

If yes, name use: yes ☐ no ☐

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS

12 SIGNED Keith Pool DATE 10/23/90



Geology

½ 3000 TO 3500 ft
cross gradient to
up gradient

# STATE OF ARKANSAS
## REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

**A** 1 Contractor Name & Number: A.W. Pool, Inc  C# 1099
2 Driller Name & Number: Arvil Keith Pool  D# 2101
3 Pump Installer Name & Number: – NA  P# —
4 Date Well Completed: 9/18/90  New Well ☒  Replace or Work-over ☐

10 LOCATE WITH 'X' IN SECTION BELOW

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastian | NE ¼ of NW ¼ of | 5 | 7N | 32W |

11 LONGITUDE 35 ° 19 ' 40 "
11 LATITUDE 94 ° 25 ' 20 "

**B** 1 DESCRIPTION OF FORMATION: DEPTHS IN FEET MW#1

| | FROM | TO |
|---|---|---|
| Sand w/Clay & Gravel-brown-dry-stiff | 0 | 2 |
| Silty Clay-brown-wet-soft | 2 | 12 |
| Clay-dry-brown-stiff | 12 | 17 |

ATTACH ADDITIONAL SHEETS IF NECESSARY

2 TOTAL DEPTH OF WELL 17 ft
3 DEPTHS TO WATER PRODUCING FORMATIONS.
4 STATIC WATER LEVEL 6 Ft below land surface
5 YIELD ______ gallons per ☐ min ☐ hr
6 DIAMETER OF BORE HOLE 7 IN

**C** PUMP REPORT
1 TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐
2 SETTING DEPTH: FEET
3 BRAND NAME AND SERIAL NUMBERS:
4 RATED CAPACITY gallons per minute
5 TYPE LUBRICATION NA
6 DROP PIPE OR COLUMN PIPE SIZE
7 WIRE SIZE
8 PRESSURE TANK . . . SIZE, MAKE, MODEL
9 DATE OF INSTALLATION OR REPAIR
10 Is there an abandoned water well on the property?

**D** 1 LAND OWNER OR OTHER CONTACT PERSON:
NAME Westinghouse (Desoto South)
STREET ADDRESS 522 S. Zero St.
CITY Ft. Smith, Arkansas

2 CASING FROM +2 TO 6 W/ 2 "ID
FROM TO W/ "ID
TYPE CASING: PVC Sch 40

3 SCREEN
TYPE: PVC Sch 40 DIA 2" SLOT/GA .010
SET FROM 6 FT TO 16 FT
TYPE: DIA SLOT/GA
SET FROM FT TO FT

4 GRAVEL PACK 300# FROM 4 FT TO 17 FT

5 BACK FILLED WITH: NA
FROM FT TO FT

6 SEALED WITH: Cement & Bentonite
Cement FROM 0 FT TO 2 FT 1 bag
Bentonite FROM 2 FT TO 4 FT 50#

7 DISINFECTED WITH:

8 USE OF WELL:

| | | | |
|---|---|---|---|
| DOMESTIC | ☐ | COMMERCIAL | ☐ |
| IRRIGATION | ☐ | MONITOR | ☒ |
| LIVESTOCK/POULTRY | ☐ | TEST WELL | ☐ |
| OIL/GAS SUPPLY | ☐ | SEMI-PUBLIC | ☐ |
| PUBLIC SUPPLY | ☐ | OTHER | |

(A/C HEATPUMP TYPE WELLS)
SOURCE ☐ RETURN ☐
CLOSED LOOP ☐

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning? NA
If yes, name use: yes ☐ no ☐

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS

12 SIGNED Keith Pool  DATE 10/23/90

AWD-7 JAN 89  Arkansas Water Well Construction Commission, One Capitol Mall, Suite 2-C, Little Rock, AR 72201
ACI--5945

Geologist

3000 TO 3500 ft
Cross gradient to upgradient

# STATE OF ARKANSAS
## REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

**A**

1 Contractor Name & Number: A.W. Pool, Inc C# 1099

2 Driller Name & Number: Arvil Keith Pool D# 2101

3 Pump Installer Name & Number: NA P# —

4 Date Well Completed: 9/17/90 New Well ☒ Replace or Work-over ☐

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastian | NE ¼ of NW ¼ of | 5 | 7N | 32W |

11 LONGITUDE 35 ° 19 ' 40 "

11 LATITUDE 94 ° 25 ' 20 "

10 LOCATE WITH 'X' IN SECTION BELOW

**B**

1 DESCRIPTION OF FORMATION: DEPTHS IN FEET MW#2

| | FROM | TO |
|---|---|---|
| Sand & Gravels-dry-tan-stiff | 0 | 2 |
| Clay w/silt-brown-moist | 2 | 12 |
| Clay w/shale-moist-tan | 12 | 17 |
| Clay w/shale-dry-stiff-brown | 17 | 27 |

ATTACH ADDITIONAL SHEETS IF NECESSARY

2 TOTAL DEPTH OF WELL 27 ft

3 DEPTHS TO WATER PRODUCING FORMATIONS.

4 STATIC WATER LEVEL 25 Ft below land surface

5 YIELD ______ gallons per ☐ min ☐ hr

6 DIAMETER OF BORE HOLE 7 IN

**C** PUMP REPORT

1 TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐

2 SETTING DEPTH: FEET

3 BRAND NAME AND SERIAL NUMBERS:

4 RATED CAPACITY gallons per minute

5 TYPE LUBRICATION NA

6 DROP PIPE OR COLUMN PIPE SIZE

7 WIRE SIZE

8 PRESSURE TANK . . . SIZE, MAKE, MODEL

9 DATE OF INSTALLATION OR REPAIR

10 Is there an abandoned water well on the property?

**D**

1 LAND OWNER OR OTHER CONTACT PERSON:
NAME Westinghouse (Desoto South)
STREET ADDRESS 522 S. Zero St.
CITY Ft. Smith, Arkansas

2 CASING FROM +2' TO 17' W/ 2 "ID
FROM TO W/ "ID
TYPE CASING: PVC Sch 40

3 SCREEN
TYPE: PVC Sch 40 DIA 2" SLOT/GA .010
SET FROM 17 FT TO 27 FT
TYPE: DIA SLOT/GA
SET FROM FT TO FT

4 GRAVEL PACK 300# FROM 15 FT TO 27 FT

5 BACK FILLED WITH: NA
FROM FT TO FT

6 SEALED WITH: Cement & Bentonite
Cement FROM 0 FT TO 13 FT 2 bags
Bentonite FROM 13 FT TO 15 FT 50#

7 DISINFECTED WITH:

8 USE OF WELL:

| | | | |
|---|---|---|---|
| DOMESTIC | ☐ | COMMERCIAL | ☐ |
| IRRIGATION | ☐ | MONITOR | ☒ |
| LIVESTOCK/POULTRY | ☐ | TEST WELL | ☐ |
| OIL/GAS SUPPLY | ☐ | SEMI-PUBLIC | ☐ |
| PUBLIC SUPPLY | ☐ | OTHER | |

(A/C HEATPUMP TYPE WELLS)
SOURCE ☐ RETURN ☐
CLOSED LOOP ☐

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning? NA
If yes, name use: yes ☐ no ☐

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS

12 SIGNED Keith Pool DATE 10/23/90



Geology

COMMISSION COPY

# STATE OF ARKANSAS
## REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

**A**
1 Contractor Name & Number: A.W. Pool, Inc C# 1099
2 Driller Name & Number: Arvil Keith Pool D# 2101
3 Pump Installer Name & Number: — NA P#
4 Date Well Completed: 9/17/90 New Well ☒ Replace or Work-over ☐

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastian | NE ¼ of NW ¼ of | 5 | 7N | 32W |

LONGITUDE 11 35 ° 19 ' 40 "
LATITUDE 11 94 ° 25 ' 20 "

10 LOCATE WITH 'X' IN SECTION BELOW: X

**B** 1 DESCRIPTION OF FORMATION: DEPTHS IN FEET MW#3

| | FROM | TO |
|---|---|---|
| Sand & Gravel-white | 0 | 7 |
| Sand-red | 7 | 12 |
| Shaley sand-gray & black | 12 | 18 |

ATTACH ADDITIONAL SHEETS IF NECESSARY

2 TOTAL DEPTH OF WELL 18 ft
3 DEPTHS TO WATER PRODUCING FORMATIONS.
4 STATIC WATER LEVEL 3 Ft below land surface
5 YIELD ______ gallons per ☐ min ☐ hr
6 DIAMETER OF BORE HOLE IN

**C** PUMP REPORT
1 TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐
2 SETTING DEPTH: FEET
3 BRAND NAME AND SERIAL NUMBERS:
4 RATED CAPACITY NA gallons per minute
5 TYPE LUBRICATION
6 DROP PIPE OR COLUMN PIPE SIZE
7 WIRE SIZE
8 PRESSURE TANK: SIZE, MAKE, MODEL
9 DATE OF INSTALLATION OR REPAIR
10 Is there an abandoned water well on the property?

**D** 1 LAND OWNER OR OTHER CONTACT PERSON:
NAME Westinghouse (Desoto South)
STREET ADDRESS 522 S. Zero St.
CITY Ft. Smith, Arkansas

2 CASING FROM +2 TO 8 W/ 2 "ID
FROM TO W/ "ID
TYPE CASING: PVC Sch 40

3 SCREEN
TYPE: PVC Sch 40 DIA 2" SLOT/GA .010
SET FROM 8 FT TO 18 FT
TYPE: DIA SLOT/GA
SET FROM FT TO FT

4 GRAVEL PACK 300# FROM 5 FT TO 18 FT

5 BACK FILLED WITH: NA
FROM FT TO FT

6 SEALED WITH: Cement & Bentonite
Cement FROM 0 FT TO ~~2~~ 4 FT 2 bag
Bentonite FROM 4 ~~8~~ FT TO 5 FT 20#

7 DISINFECTED WITH:

8 USE OF WELL:
DOMESTIC ☐ COMMERCIAL ☐
IRRIGATION ☐ MONITOR ☒
LIVESTOCK/POULTRY ☐ TEST WELL ☐
OIL/GAS SUPPLY ☐ SEMI-PUBLIC ☐
PUBLIC SUPPLY ☐ OTHER

(A/C HEATPUMP TYPE WELLS)
SOURCE ☐ RETURN ☐
CLOSED LOOP ☐

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning? NA
If yes, name use: yes ☐ no ☐

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS

12 SIGNED Keith Pool DATE 10/23/90



Geology

3000 TO 3500 f
Upgradient To
crossgradient

# STATE OF ARKANSAS
# REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

**A**

1 Contractor Name & Number: A.W. Pool, Inc. C# 1099
2 Driller Name & Number: Arvil Keith Pool D# 2101
3 Pump Installer Name & Number: NA P#
4 Date Well Completed: 9/17/90 New Well [X] Replace or Work-over [ ]

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastian | NE ¼ of NW ¼ of | 5 | 7N | 32W |

11 LONGITUDE 35 ° 19 ' 40 "
11 LATITUDE 94 ° 25 ' 20 "

10 LOCATE WITH 'X' IN SECTION BELOW

**B** 1 DESCRIPTION OF FORMATION: DEPTHS IN FEET MW#4

| | FROM | TO |
|---|---|---|
| Sand w/ Gravel - orange brown - damp - soft | 0 | 2 |
| Sand w/ Clay - tan - wet | 2 | 7 |
| Sand - wet | 7 | 8 |
| Clay w/ Siltstone - dry - stiff | 8 | 12 |
| Shale w/ Clay - dry - stiff | 12 | 17 |
| | | |
| | | |

ATTACH ADDITIONAL SHEETS IF NECESSARY

2 TOTAL DEPTH OF WELL 17 ft
3 DEPTHS TO WATER PRODUCING FORMATIONS.
4 STATIC WATER LEVEL 6 Ft below land surface
5 YIELD ______ gallons per [ ] min [ ] hr
6 DIAMETER OF BORE HOLE 7 IN

**C** PUMP REPORT

1 TYPE PUMP: SUBMERSIBLE [ ] TURBINE [ ] JET [ ]
2 SETTING DEPTH: FEET
3 BRAND NAME AND SERIAL NUMBERS:
4 RATED CAPACITY gallons per minute
5 TYPE LUBRICATION NA
6 DROP PIPE OR COLUMN PIPE SIZE
7 WIRE SIZE
8 PRESSURE TANK SIZE, MAKE, MODEL
9 DATE OF INSTALLATION OR REPAIR
10 Is there an abandoned water well on the property?

**D** 1 LAND OWNER OR OTHER CONTACT PERSON:
NAME Westinghouse (Desoto South)
STREET ADDRESS 522 S. Zero St.
CITY Ft. Smith, Arkansas

2 CASING FROM +2 TO 6 W/ 2 "ID
FROM TO W/ "ID
TYPE CASING: PVC Sch 40

3 SCREEN
TYPE: PVC Sch 40 DIA 2" SLOT/GA .010
SET FROM 6 FT TO 16 FT
TYPE: DIA SLOT/GA
SET FROM FT TO FT

4 GRAVEL PACK 300# FROM 5 FT TO 17 FT

5 BACK FILLED WITH: ~~Sem~~
FROM FT TO FT NA

6 SEALED WITH: Cement & Bentonite
Cement FROM 1 FT TO 2 FT 2 Bags
Bentonite FROM 2 FT TO 5 FT 40#

7 DISINFECTED WITH:

8 USE OF WELL:

| | | | |
|---|---|---|---|
| DOMESTIC | [ ] | COMMERCIAL | [ ] |
| IRRIGATION | [ ] | MONITOR | [X] |
| LIVESTOCK/POULTRY | [ ] | TEST WELL | [ ] |
| OIL/GAS SUPPLY | [ ] | SEMI-PUBLIC | [ ] |
| PUBLIC SUPPLY | [ ] | OTHER | |

(A/C HEATPUMP TYPE WELLS)
SOURCE [ ] RETURN [ ]
CLOSED LOOP [ ]

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning? NA
If yes, name use: yes [ ] no [ ]

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS

12 SIGNED Keith Pool DATE 10/23/90

AWD-7 JAN 89 Arkansas Water Well Construction Commission, One Capitol Mall, Suite 2-C, Little Rock, AR 72201
ACI--5945

Geology

COMMISSION COPY

# STATE OF ARKANSAS
# REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

**A**

1 Contractor Name & Number: A. W. Pool, Inc. C# 1099
2 Driller Name & Number: Arvil Keith Pool D# 2101
3 Pump Installer Name & Number: NA P#
4 Date Well Completed: 9/17/90 New Well ☒ Replace or Work-over ☐

| 5 COUNTY | 6 FRACTION | 7 SECTION | 8 TOWNSHIP | 9 RANGE |
|---|---|---|---|---|
| Sebastian | NE ¼ of NW ¼ of | 5 | 7N | 32W |

11 LONGITUDE 35 ° 19 ' 40 "
11 LATITUDE 94 ° 25 ' 20 "

10 LOCATE WITH 'X' IN SECTION BELOW

**B**

1 DESCRIPTION OF FORMATION: DEPTHS IN FEET MW#5

| | FROM | TO |
|---|---|---|
| Sand w/Gravel-orangebrown-damp | 0 | 2 |
| Sand w/Clay-wet-orange-soft | 2 | 12 |
| Clay-tan-dry | 12 | 13 |
| Clay w/shale-dk gray-stiff | 13 | 17 |
| | | |
| | | |
| | | |

ATTACH ADDITIONAL SHEETS IF NECESSARY

2 TOTAL DEPTH OF WELL 17 ft
3 DEPTHS TO WATER PRODUCING FORMATIONS.
4 STATIC WATER LEVEL 8.5 Ft below land surface
5 YIELD ______ gallons per ☐ min ☐ hr
6 DIAMETER OF BORE HOLE 7 IN

**C** PUMP REPORT

NA

1 TYPE PUMP: SUBMERSIBLE ☐ TURBINE ☐ JET ☐
2 SETTING DEPTH: FEET
3 BRAND NAME AND SERIAL NUMBERS:
4 RATED CAPACITY gallons per minute
5 TYPE LUBRICATION
6 DROP PIPE OR COLUMN PIPE SIZE
7 WIRE SIZE
8 PRESSURE TANK . . . SIZE, MAKE, MODEL
9 DATE OF INSTALLATION OR REPAIR
10 Is there an abandoned water well on the property?

**D**

1 LAND OWNER OR OTHER CONTACT PERSON:
NAME Westinghouse (Desoto South)
STREET ADDRESS 522 S. Zero St.
CITY Ft. Smith, Arkansas

2 CASING FROM +2 TO 7 W/ 2 "ID
FROM TO W/ "ID
TYPE CASING: PVC Sch 40

3 SCREEN
TYPE: PVC Sch 40 DIA 2" SLOT/GA .010
SET FROM 7 FT TO 17 FT
TYPE: DIA SLOT/GA
SET FROM FT TO FT

4 GRAVEL PACK 300# FROM 5 FT TO 17 FT

5 BACK FILLED WITH: NA
FROM FT TO FT

6 SEALED WITH: Cement & Bentonite
Cement FROM 5 FT TO 2.5 FT 2 bags
Bentonite FROM 2.5 FT TO 5 FT

7 DISINFECTED WITH:

8 USE OF WELL:

| | | | |
|---|---|---|---|
| DOMESTIC | ☐ | COMMERCIAL | ☐ |
| IRRIGATION | ☐ | MONITOR | ☒ |
| LIVESTOCK/POULTRY | ☐ | TEST WELL | ☐ |
| OIL/GAS SUPPLY | ☐ | SEMI-PUBLIC | ☐ |
| PUBLIC SUPPLY | ☐ | OTHER | |

(A/C HEATPUMP TYPE WELLS)
SOURCE ☐ RETURN ☐
CLOSED LOOP ☐

9 (For A/C only) Will system also be used for purposes other than Heating or Air Conditioning? NA
If yes, name use: yes ☐ no ☐

10 (For A/C open-loop only) Into what medium is water returned?

11 REMARKS

12 SIGNED Keith Pool DATE 10/23/90



Geology

# Ecological Exclusion Worksheet

*Appendix E*

*August 30, 2006*
*Project No. 0014507*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

# APPENDIX E

# ECOLOGICAL EXCLUSION SCREENING

## ECOLOGICAL EXCLUSION CRITERIA WORKSHEET
## AND
## ECOLOGICAL ASSESSMENT CHECKLIST

**Ecological Screening**

Introduction

Region 6 is providing an Ecological Exclusion Criteria Worksheet and Ecological Assessment Checklist to help facilities and regulators determine whether or not further ecological evaluation is necessary at an affected property where corrective action is being pursued. Chapter 2 of the CAS provides additional information on the Ecological Screening process.

Ecological screening under the CAS is a relatively simple process. It involves; 1) collecting general information about the facility, its operation, physical site characteristics, ecological habitats and receptors utilizing the Ecological Exclusion Criteria Worksheet and determining if incomplete or insignificant exposure pathways exist at the affected property that eliminate the need for further ecological evaluation, and 2) if an area cannot be excluded from further evaluation, collecting more detailed information about ecological areas utilizing the Ecological Assessment Checklist to assist in further ecological risk evaluations.

If the affected property meets the exclusion criteria, then the facility should document the site conditions and justification for how the criteria have been met within the risk evaluation report. Upon review and approval of the exclusion by the administrative authority, the facility will not be required to conduct any further evaluation of ecological risk.

If the affected property does not meet the exclusion criteria, then further evaluation is warranted and the facility should address the conduct of additional activities (screening level or detailed risk assessment, interim measures) within the risk management plan. Additional ecological risk screening/assessment should be conducted following EPAs *Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments dated June 5, 1997 and Guidelines for Ecological Risk Assessment (EPA/630/R-95/002F) dated April 1998* or a state approved guidance for ecological risk evaluation. Natural Resources Trustees should also be notified to see if they choose to participate, in order to ensure that natural resources under their jurisdiction are adequately protected.

Additional references and sources of information to aid further ecological assessment follows:


- U.S. EPA. 1999. *Ecological Risk Assessment and Risk Management Principles for Superfund Sites*, Final. OSWER Directive 9285.7-28 P. http://www.epa.gov/superfund/programs/risk/ecorisk/ final99.pdf
- U.S. EPA. 1999. *ECOTOX Version 2.0*. Office of Research and Development, National;
  Health and Environmental Effects Lab, Mid-Continent Ecology Division. http://www.epa.gov/ecotox
- U.S. EPA. 1998. *Guidelines for Ecological Risk Assessment*, Final. EPA/630/R 95/002F. http://www.epa.gov/ncea/ecorsk.htm
- U. S. EPA. 1997. *Ecological Risk Assessment Guidance for Superfund, Process for Designing and Conducting Ecological Risk Assessments*, Interim Final. EPA 540-R-97 006, OSWER Directive # 9285.7-25.

http://www.epa.gov/superfund/programs/risk/ecorisk/ecorisk.htm

- U.S. EPA. 1996. *ECOTOX Thresholds*. ECO Update, Interim Bulletin, Volume 3, Number 2. Washington, D.C. Office of Emergency and Remedial Response, Hazardous Site Evaluation Division; Publication 9345.0-12Fsi EPA/540/F-95/038; NTIS PB95963324.
- U.S. EPA. 1996. *Ecological Significance and Selection of Candidate Assessment Endpoints*. ECO Update, Interim Bulletin, Volume 3, Number 1. Washington, D.C. Office of Emergency and Remedial Response, Hazardous Site Evaluation Division; Publication 9345.0-11Fsi; EPA/540/F-95/037; NTIS PB95-963323.
- U.S. EPA. 1994. *Selecting and Using Reference Information in Superfund Risk Assessments*. ECO Update, Interim Bulletin, Volume 2, Number 4. Washington, D.C. Office of Emergency and Remedial Response, Hazardous Site Evaluation Division; Publication 9345.10; EPA/540/F-94/050; NTIS PB94-963319.
- U.S. EPA. 1994. *Field Studies for Ecological Risk Assessment*. ECO Update, Interim Bulletin, Volume 2, Number 3. Washington, D.C. Office of Emergency and Remedial Response, Hazardous Site Evaluation Division; Publication 9345.05I; EPA/540/F-94/014; NTIS PB94-963305.
- U.S. EPA. 1994. *Catalogue of Standard Toxicity Tests for Ecological Risk Assessment*. ECO Update, Interim Bulletin, Volume 2, Number 2. Washington, D.C. Office of Emergency and Remedial Response, Hazardous Site Evaluation Division; Publication 93450-05I; EPA/540/F-94/013; NTIS PB94-963304.
- U.S. EPA. 1994. *Using Toxicity Tests in Ecological Risk Assessment*. ECO Update, Interim Bulletin, Volume 2, Number 1. Washington, D.C. Office of Emergency and Remedial Response, Hazardous Site Evaluation Division; Publication 9345.05I; EPA/540/F-94/012; NTIS PB94-963303.
- U.S. EPA. 1992. *Briefing the BTAG: Initial Description of Setting, History and Ecology of a Site*. ECO Update, Interim Bulletin, Volume 1, Number 5. Washington,
- D.C. Office of Emergency and Remedial Response, Hazardous Site Evaluation Division; Publication 9345.0-05I.
- U.S. EPA. 1992. *Developing a Work Scope for Ecological Assessments*. ECO Update, Interim Bulletin, Volume 1, Number 4. Washington, D.C. Office of Emergency and Remedial Response, Hazardous Site Evaluation Division; Publication 9345.005I.
- U.S. EPA. 1992. *The Role of the Natural Resource Trustees in the Superfund Process*. ECO Update, Interim Bulletin, Volume 1, Number 3. Washington, D.C. Office of Emergency and Remedial Response, Hazardous Site Evaluation Division; Publication 9345.0-05I.
- U.S. EPA. 1991. *Ecological Assessment of Superfund Sites: An Overview*. ECO Update, Interim Bulletin, Volume 1, Number 2. Washington, D.C. Office of Emergency and Remedial Response, Hazardous Site Evaluation Division; Publication 9345-0-05I.
- U.S. EPA. 1991. *The Role of BTAGs in Ecological Assessment*. ECO Update, Interim Bulletin, Volume 1, Number 1. Washington, D.C. Office of Emergency and Remedial Response, Hazardous Site Evaluation Division; Publication 9345-0-05I.

## ECOLOGICAL EXCLUSION CRITERIA WORKSHEET

The Exclusion Criteria Worksheet is intended to aid facilities and regulators in determining whether or not further ecological evaluation is necessary at an affected property where a response action is being pursued utilizing the CAS. Exclusion criteria refer to those conditions at an affected property which preclude the need for a formal ecological risk assessment (ERA) because there are incomplete or insignificant ecological exposure pathways due to the nature of the affected property setting and/or the condition of the affected property media. The person completing the worksheet should be familiar with the affected property but need not be a professional scientist in order to respond, although some questions will likely require contacting a wildlife management agency (U.S. Fish and Wildlife Service, etc.). The worksheet is designed for general applicability to all affected property; however, there may be unusual circumstances which require professional judgement in order to determine the need for further ecological evaluation (e.g., cave-dwelling receptors). In these cases, it is strongly encouraged to contact your state regulatory agency for additional guidance before proceeding.

The worksheet consists of three major parts. Part 1, identification of the affected property and background information, Part 2, the actual exclusion criteria and supportive information, and Part 3, a qualitative summary statement and certification of the information submitted. Answers to the worksheet should reflect existing conditions and should not consider future remedial actions at the affected property. Completion of the worksheet should lead to a logical conclusion as to whether further ecological evaluation is warranted. Definitions of terms used in the worksheet are provided and users are encouraged to review these definitions before completing the worksheet.

The Exclusion Worksheet has been adapted from and follows the Texas Natural Resources Conservation Commission (TNRCC) Texas Risk Reduction Program (TRRP) Tier 1 Checklist. TNRCC has developed some additional information regarding the use of their Tier 1 Checklist which should also be consulted in completing the CAS Ecological Exclusion Criteria Worksheet. This information can be found in Chapter 2 of TNRCCs Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas, Draft Final, August 2000; http://www.tnrcc.state.tx.us/permitting/remed/techsupp/erag8_00.pdf

### Part 1. Affected Property Identification and Background Information

1) Provide a description of the specific area of the response action and the nature of the release. Include estimated acreage of the affected property and the facility property, and a description of the type of facility and/or operation associated with the affected property. Also describe the location of the affected property with respect to the facility property boundaries and public roadways.

   The Whirlpool Fort Smith facility (Figure 1) consists of approximately 153 acres. The developed portion of the property consists of a warehouse, manufacturing facility and water treatment plant. Concrete driveways and concrete and asphalt parking areas surround the structures. Residential areas are located to the north and south of the property, and commercial industrial properties are located to the east and west. Affected soil that is limited to an area less than one acre in size is covered with concrete and/or gravel road base and is located inside the manufacturing area property line. Affected ground water is present in the vicinity of the manufacturing building on-site extends north across Ingersoll Avenue and Jacobs Avenue over an area that is approximately 25 acres in size. Based on delineation activities, the affected ground water does not contact any surface water bodies.

Attach available USGS topographic maps and/or aerial or other affected property photographs to this form to depict the affected property and surrounding area.
__X__ Topo map Figure 1 ______ Aerial photo __X__ Other Figure 2

2) Identify the environmental media known or suspected to contain chemicals of concern (COCs) at the present time. Check all that apply:

| Known/Suspected COC Location | | Based on sampling data? | | | |
|---|---|---|---|---|---|
| X | Soil ≤ 5 ft below ground surface | X | Yes | | No |
| X | Soil > 5 ft below ground surface | X | Yes | | No |
| X | Groundwater | X | Yes | | No |
| | Surface Water/Sediments | | Yes | X | No |

Explain (previously collected information may be referenced):

The area where COCs have been identified in near-surface soils (≤5 feet below ground surface) is totally contained within the fence line of the manufacturing facility. All areas of affected soil are covered with road-base gravel and/or concrete. The ground water plume (as defined by the 0.005 mg/l concentration level of TCE) extends approximately 600 feet to the north facility boundary (Figure 2)

3) Provide the information below for the nearest surface water body which has become or has the potential to become impacted from migrating COCs via surface water runoff, air deposition, groundwater seepage, etc.

Exclude: wastewater treatment facilities and stormwater conveyances/impoundments authorized by permit.

Also exclude: conveyances, decorative ponds, and those portions of the process facilities which are:

a. Not in contact with surface waters of the State or other surface waters which are ultimately in contact with surface waters of the State; and
b. Not consistently or routinely utilized as valuable habitat for natural communities including birds, mammals, reptiles, etc.

The nearest surface water body is 1200 feet from the affected property. The surface water body is named Mill Creek. The surface water body is best described as a:

___X_ Freshwater stream: __X__ perennial (has water year round)
______ intermittent (dries up completely for at least one week per year)
______ intermittent with perennial pools

______ Freshwater swamp/marsh/wetland
______ Saltwater or brackish swamp/marsh/wetland
______ Reservoir, lake or pond; approximate surface acres ________________________
______ Drainage ditch
______ Tidal stream
______ Other (specify) ______________________________________________________

Is the water body listed as a State classified segment?

__X____Yes Segment # 11110105002991 Use classification: Primary Contact Recreation, Secondary Contact Recreation, Fisheries, Domestic Water Supply, Industrial Water Supply, and Agricultural Water Supply (ADEQ Water Regulation #2, Chapter #3, pages 15-19 and A20).
________ No

If the water body is not a State classified segment, identify the first downstream classified segment.
Name: ______________________________________________________________
Segment #: ___________________________________________________________
Use classification _________________________________________________________

As necessary, provide further description of surface waters in the vicinity of the affected property:

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

**Part 2. Exclusion Criteria and Supportive Information**

**Subpart A. Surface Water/Sediment Exposure**

1) Regarding the affected property where a response action is being pursued, have COCs migrated and resulted in a release or imminent threat of release to either surface waters or to their associated sediments via surface water runoff, air deposition, groundwater seepage, etc.

<u>Exclude</u>: wastewater treatment facilities and storm water conveyances/impoundments authorized by permit.

<u>Also exclude</u>: conveyances, decorative ponds, and those portions of the process facilities which are:

a. Not in contact with surface waters of the State or other surface waters which are ultimately in contact with surface waters of the State; and
b. Not consistently or routinely utilized as valuable habitat for natural communities including birds, mammals, reptiles, etc.

_______ Yes ___X___ No

Explain: Based on ground water data collected in April 2006, Mill Creek is more than 1,000 feet from the apparent edge of the ground water plume as defined by 0.005 mg/l tetrachloroethene. An interpretation of boring logs indicates the transmissive zone that contains the TCE is discontinuous in the area to the northeast of the plume and is not connected to the creek.

**If the answer is Yes to Subpart A above, the affected property does not meet the exclusion criteria.** (However, complete the remainder of Part 2, to determine if there is a complete and/or significant soil exposure pathway, then complete Part 3, Qualitative Summary and Certification).

**If the answer is No to Subpart A above, go to Subpart B.**

**Subpart B. Affected Property Setting**

In answering Yes to the following question, it is understood that the affected property is not attractive to wildlife or livestock, including threatened or endangered species (i.e., the affected property does not serve as valuable habitat, foraging area, or refuge for ecological communities). May require consultation with management agencies.

1). Is the affected property wholly contained within contiguous land characterized by: pavement, buildings, landscaped area, functioning cap, roadways, equipment storage area, manufacturing or process area, or other surface cover or structure, or otherwise disturbed ground?

_______ Yes ___X___ No

Explain: The affected soil is wholly contained within the manufacturing area and is covered by concrete and/or road-base gravel. The affected ground water extends beyond the manufacturing facility property line to the north approximately 600 feet into a residential area that is characterized by residential buildings and landscaped yards. The affected ground water does not appear to contact any surface water body.

**If the answer is Yes to Subpart B above, the affected property meets the exclusion criteria, assuming the answer to Subpart A was No.** (Skip Subparts C and D and complete Part 3, Qualitative Summary and Certification).

**If the answer is No to Subpart B above, go to Subpart C.**

**Subpart C. Soil Exposure**

1) Are COCs which are in the soil of the affected property solely below the first 5 feet beneath ground surface or does the affected property have a physical barrier present to prevent exposure to receptors to COCs in the surface soil?

___X___ Yes ______ No

Explain: COCs in the soil of the affected property are solely below the first five feet with the exception of TCE in two locations that are wholly contained within the manufacturing area and are covered by concrete and/or road-base gravel. Reported TCE concentrations in these locations (0.009 to 0.012 ppm) are an order of magnitude below the residential media specific screening value (2.8 ppm).

**If the answer is Yes to Subpart C above, the affected property meets the exclusion criteria, assuming the answer to Subpart A was No.** (Skip Subpart D and complete Part 3, Qualitative Summary and Certification).

**If the answer is No to Subpart C above, go to Subpart D.**

**Subpart D. DeMinimus Land Area**

In answering Yes to the question below, it is understood that all of the follow conditions apply:

- The affected property is not known to serve as habitat, foraging area, or refuge to threatened/endangered or otherwise protected species. (Will likely require consultation with wildlife management agencies).
- Similar but unimpacted habitat exists within a half-mile radius.
- The affected property is not know to be located within one-quarter mile of sensitive environmental areas (e.g., rookeries, wildlife management areas, preserves). (Will likely require consultation with wildlife management agencies).
- There is no reason to suspect that the COCs associated with the affected property will migrate such that the affected property will become larger than one acre.
- Using human health protective concentration levels as a basis to determine the extent of the COCs, does the affected property consist of one acre or less and does it meet all the conditions described above?

______ Yes ______ No

Explain how the conditions are/are not met: ______________________________________

______________________________________________________________________

______________________________________________________________________

**If the answer is Yes to Subpart D, then no further ecological evaluation is needed at the affected property, assuming the answer to Subpart A was No.** (Complete Part 3, Qualitative Summary and Certification).

**If the answer is No to Subpart D, Proceed to an Ecological Risk Evaluation.**

**Part 3. Qualitative Summary and Certification (Complete in all cases)**

Attach a brief statement (1 page or less) summarizing the information you have provided in this form. This summary should include sufficient information to verify that the affected property meets or does not meet the exclusion criteria. The facility should make the initial decision regarding the need to conduct further ecological evaluation based on the results of this worksheet. However, the State will make a final determination on the need for further ecological assessment.

The Whirlpool Fort Smith facility consists of approximately 153 acres. The developed portion of the property consists of a warehouse, manufacturing facility and water treatment plant. Concrete driveways and concrete and asphalt parking areas surround the structures. Residential areas are located to the north and south of the property, and commercial industrial properties are located to the east and west.

There are two separate areas that are affected by COCs. One area contains affected soil that is covered with concrete and/or gravel road base, is located inside the manufacturing area property line, and is less than one acre in size. The other area contains affected ground water that extends from inside the facility's property line to north of Ingersoll Avenue and Jacobs Avenue and is less than twenty acres in size.

COCs in the soil of the affected property are solely below the first five feet with the exception of TCE in two locations that are wholly contained within the manufacturing area and are covered by concrete and/or road-base gravel. Reported TCE concentrations in these locations (0.009 to 0.012 ppm) are an order of magnitude below the residential media specific screening value (2.8 ppm).

Based on delineation activities, the affected ground water does not likely contact any surface water bodies. Based on groundwater data collected in April 2006, Mill Creek (the nearest surface water body) is more than 1000 feet from the apparent edge of the ground water plume as defined by 0.005 mg/l tetrachloroethene. Lithology indicates the transmissive zone that contains the COCs is discontinuous in the area to the northeast of the plume and is probably not connected to the creek or any other ecological receptors in the vicinity of the facility.

Therefore, no further ecological evaluations are warranted at the site.

**Note : the facility has the continuing obligation to re-enter the ERA process if changing circumstances result in the affected property not meeting the exclusion criteria requirements presented in this worksheet.**

Completed by: Troy Meinen (Typed Name)
Project Geologist (Title)
8/31/06 (Date)

I believe that the information submitted is true, accurate, and complete, to the best of my knowledge.

Troy Meinen (Typed Name of Person)
Project Geologist (Title of Person)
_______________ (Signature of Person)
8/31/2006 (Date Signed)

**Definitions** (applicable to Exclusion Worksheet)

**Affected property** - The entire area (i.e., on-site and off-site; including all environmental media) which contains releases of chemicals of concern at concentrations equal to or greater than the assessment level applicable for the land use (i.e., residential or commercial/industrial) and groundwater classification.

**Assessment level** - a critical protective concentration level for a chemical of concern used for affected property assessments where the human health protective concentration level is established by State regulation or guidance.

**Bedrock** - the solid rock (i.e., consolidated, coherent, and relatively hard naturally formed material that cannot normally be excavated by manual methods alone) that underlies gravel, soil, or other surficial material.

**Chemicals of concern** - any chemical that has the potential to adversely affect ecological or human receptors due to its concentration, distribution, and mode of toxicity.

**Community** - an assembledge of plant and animal populations occupying the same habitat in which the various species interact via spatial and trophic relationships (e.g., a desert community or a pond community).

**Complete exposure pathway** - an exposure pathway where a human or ecological receptor is exposed to a chemical of concern via an exposure route (e.g., incidental soil ingestion, inhalation of volatiles and particulates, consumption of prey, etc).

**De Minimus** - the description of an area of affected property comprised of one acre or less where the ecological risk is considered to be insignificant because the small extent of contamination, the absence of protected species, the availability of similar unimpacted habitat nearby, and the lack of adjacent sensitive environmental areas.

**Ecological protective concentration level** - the concentration of a chemical of concern at the point of exposure within an exposure medium (e.g., soil, sediment, groundwater, or surface water) which is determined to be protective for ecological receptors. These concentration levels are intended to be protective for more mobile or wide-ranging ecological receptors and, where appropriate benthic invertebrate communities within waters of the State. These concentration levels are not intended to be directly protective of receptors with limited mobility or ranges (e.g., plants, soil invertebrates, and small rodents), particularly those residing within active areas of a facility, unless these receptors are threatened/endangered species or unless impacts to these receptors result in disruption of the ecosystem or other unacceptable consequences of the more mobile or wide-ranging receptors (e.g., impacts to an off-site grassland habitat eliminate rodents which causes a desirable owl population to leave the area).

**Ecological risk assessment** - a process that evaluates the likelihood that adverse ecological effects may occur or are occurring as a result of exposure to one or more stressors; however, as used in this context, only chemical stressors (i.e., COCs) are evaluated.

**Environmental medium** - a material found in the natural environment such as soil, (including non-waste fill materials), groundwater, air, surface water, and sediments, or a mixture of such materials with liquids, sludges, gasses or solids, including hazardous waste which is inseparable by simple mechanical removal processes, and is made up of primarily of natural environmental material.

**Exclusion criteria** - those conditions at an affected property which preclude the need to establish a protective concentration level for an ecological exposure pathway because the exposure pathway between the chemical of concern and the ecological receptors is not complete or is insignificant.

**Exposure medium** - the environmental medium or biological tissue in which or by which exposure to chemicals of concern by human or ecological receptors occurs.

**Facility** - the installation associated with the affected property where the release of chemicals of concern have occurred.

**Functioning cap** - a low permeability layer or other approved cover meeting its design specifications to minimize water infiltration and chemical of concern migration, and prevent ecological or human receptor exposure to chemical of concern, where design requirements are routinely maintained.

**Landscaped area** - an area of ornamental, or introduced, or commercially installed, or manicured vegetation, which is routinely maintained.

**Off-site property** - all environmental media which is outside the legal boundaries of the on-site property.

**On-site property** - all environmental media within the legal boundaries of a property that has become subject to corrective action, either through voluntary action, permit or order.

**Physical barrier** - any structure or system, natural or manmade, that prevents exposure or prevents physical migration of chemicals of concern to points of exposure.

**Point of exposure** - the location within an environmental medium where a receptor will be assumed to have a reasonable potential to come into contact with chemicals of concern. The point of exposure may be a discrete point, plane, or an area within or beyond some location.

**Protective concentration level** - the concentration of a chemical of concern which can remain within the source medium and not result in levels which exceed the applicable human health risk based exposure limit considering cumulative risk and hazard index for both carcinogenic and non-carcinogenic effects respectively, or ecological protective concentration level at the point of exposure for that exposure pathway.

**Release** - any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment, with the exception of:

- a release that results in an exposure to a person solely within a workplace, concerning a claim that the person may assert against the persons employer;
- an emission from the engine exhaust of a motor vehicle, rolling stock, aircraft, vessel, pipeline pumping station engine;
- a release of source, by product, or special nuclear material a nuclear incident, as those terms identified by the Atomic Energy Act of 1954, as amended (42 USC 2201 et. seq.); if the release area is subject to requirements concerning financial protection established by the Nuclear Regulatory Commission under Section 170 of that Act;
- for the purpose of the environmental response law Section 104, as amended, or other response action, release of source, by-product, or special nuclear material from a processing site designated under Section 102(a)(1) for Section 302(a) of the Uranium Mill Tailings Radiation Control Act of 1978 (42 USC Section 7912 and Section 7942) as amended; and
- the normal application of fertilizer.

**Sediment** - non-suspended particulate material lying below surface waters such as bays, the ocean, rivers, streams, lakes, ponds, or other similar surface water body (including intermittent streams). Dredged sediments which have been removed from surface water bodies and placed on land shall be considered soils.

**Sensitive environmental areas** - areas that provide unique and often protected habitat for wildlife species. These areas are typically used during critical life stages such as breeding, hatching, rearing of young, and overwintering. Examples include; critical habitat for threatened and endangered species, wilderness areas, parks and wildlife refuges.

**Source medium** - an environmental medium containing chemicals of concern which must be removed, decontaminated and/or controlled in order to protect human health and the environment. The source medium may be the exposure medium for some exposure pathways.

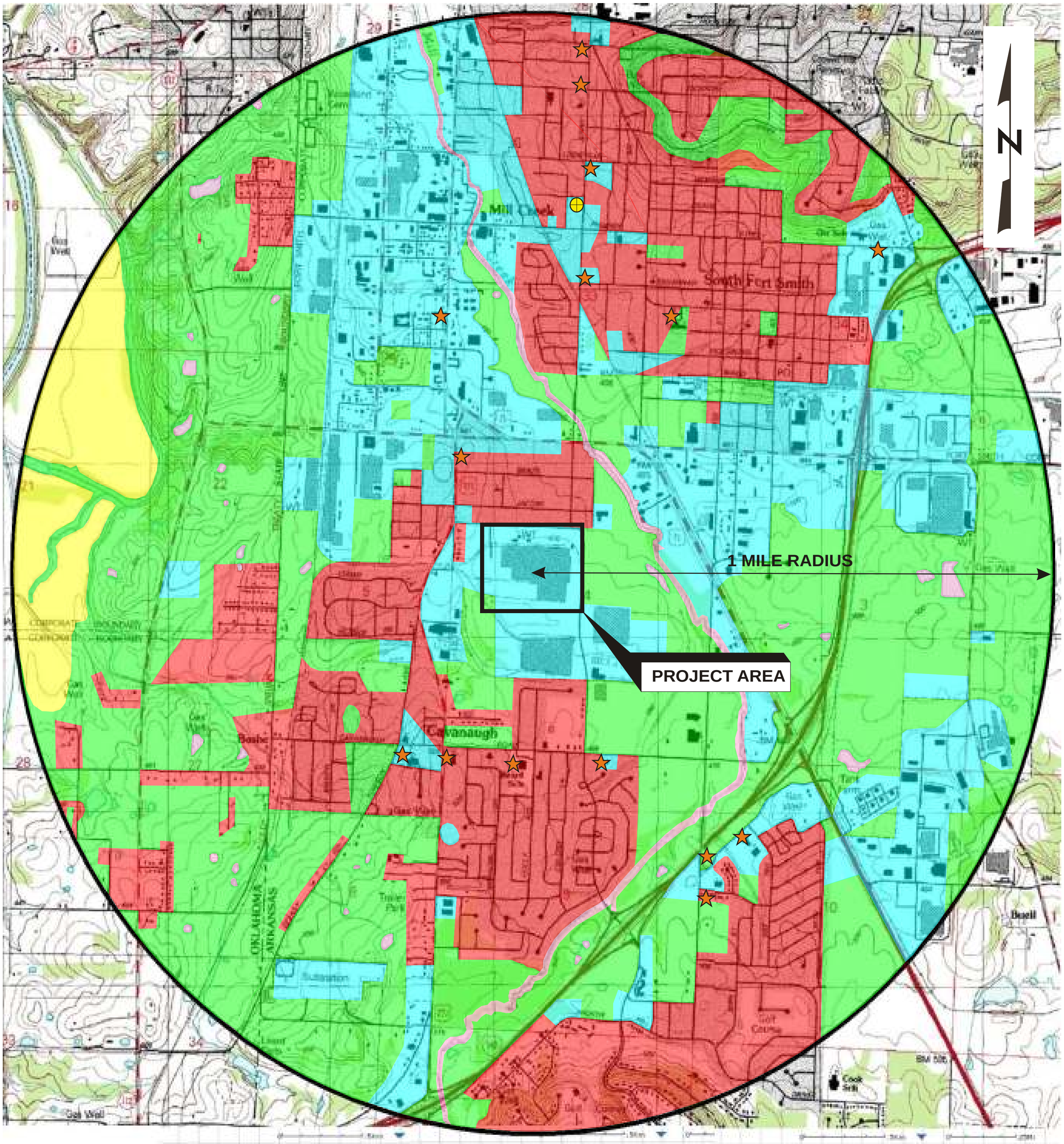
**Stressor** - any physical, chemical, or biological entity that can induce an adverse response; however, as used in this context, only chemical entities apply.

**Subsurface soil** - for human health exposure pathways, the portion of the soil zone between the base of the surface soil and the top of the groundwater-bearing unit(s). For ecological exposure pathways, the portion of the soil zone between 0.5 feet and 5 feet in depth.

**Surface cover** - a layer of artificially placed utility material (e.g., shell, gravel).

**Surface soil** - for human health exposure pathways, the soil zone extending from ground surface to 15 feet in depth for residential land use and from ground surface to 5 feet in depth for commercial/industrial land use; or to the top of the uppermost groundwater-bearing unit or bedrock, whichever is less in depth. For ecological exposure pathways, the soil zone extending from ground surface to 0.5 feet in depth.

**Surface water** - any water meeting the definition of surface water as defined by the authorized State.




SOURCE: U.S.G.S. 7.5 Minute Quadrangle, South Forth Smith, Arkansas, 19__.

LEGEND:

RESIDENTIAL
UNDERDEVELOPED
AGRICULTURAL
COMMERCIAL / INDUSTRIAL
SURFACE WATER
HOSPITAL
SCHOOL / DAYCARE

0 1500 3000

SCALE FEET

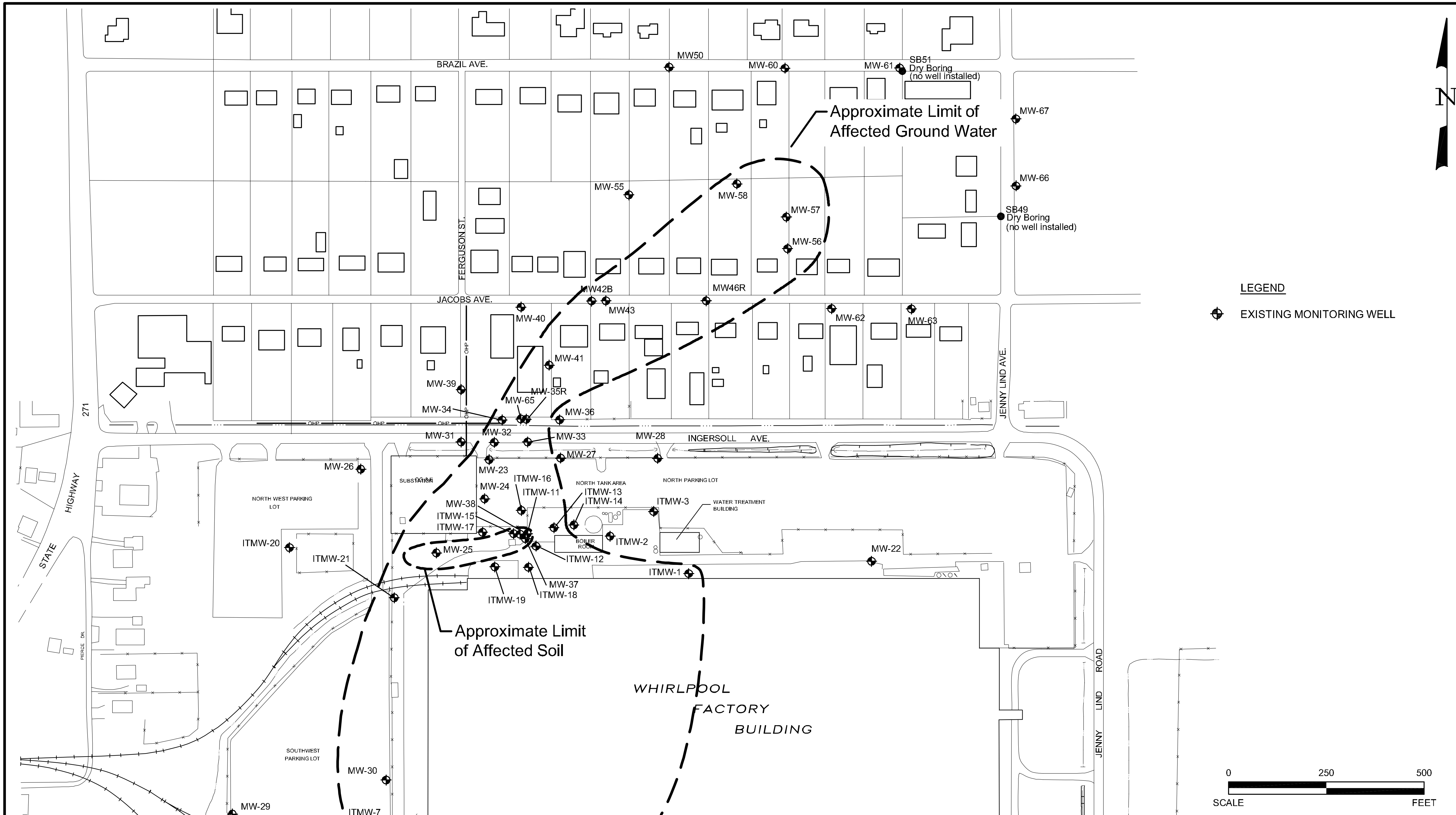
ERM-Southwest, Inc.

HOUSTON • NEW ORLEANS • AUSTIN • DALLAS • BEAUMONT • BATON ROUGE

FIGURE E-1
TOPOGRAPHIC MAP
Whirlpool Corporation
Fort Smith, Arkansas

ERM®

| | | | |
|---|---|---|---|
| DESIGN: JCT | CHKD.: TM | DATE: 08/25/06 | REV.: 0 |
| DRAWN: JEM | SCALE: AS SHOWN | W.O.NO.: 581007A208 H06 | |




**ERM-Southwest, Inc.**

HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE

FIGURE E-2
APPROXIMATE EXTENT OF AFFECTED SOIL
AND GROUND WATER MAP
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| DESIGN: DCB | DRAWN: CAK | CHKD.: TWM |
|---|---|---|
| DATE: 08/23/06 | SCALE: AS SHOWN | REV.: |

W.O.NO.: H:\dwg\H06\0048030b205.dwg, 8/25/2006 11:12:02 AM

# Correspondence with Local Government

*Appendix F*

*August 30, 2006*
*Project No. 0014507*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

Phone# 783-3932

fax 784-1541

Whirlpool CORPORATION

6400 JENNY LIND • FORT SMITH, ARKANSAS 72908-7493

February 15, 2001

LEPC

Gerald Roberts, Coordinator
LEPC
40 South 4th St.
Fort Smith, AR 72901

Dear Mr. Roberts,

This letter is a follow-up to our recent telephone conversation regarding Whirlpool's groundwater testing that will occur in March 2001.

As I mentioned, Whirlpool is expanding its groundwater testing on its property, north of its Fort Smith manufacturing facility some time in March. We wanted you to be aware of the testing because the wells will be drilled adjacent to Ingersol Road and you may receive inquiries from members of the community.

Here's some background information on this project: The Fort Smith plant has been monitoring groundwater at its facility since 1989 when traces of Trichloroethylene (TCE) were found while removing underground fuel storage tanks. TCE was widely used by Whirlpool, other industries and sold commercially for home use during this time. Whirlpool discontinued use of TCE in 1985 and parts are now cleaned with a water-based material.

All tests conducted prior to December 2000 confirmed the substance has been confined within Whirlpool property, however, results of the December tests showed small traces of TCE on the north side of its property which is driving further testing in this area. Environmental experts monitoring the wells believe the substance is confined within our property, however, as an added precaution, the company will test the groundwater on its property, north of Ingersol Road to rule out that the substance has moved beyond our property.

We are working with the Arkansas Department of Environmental Quality (ADEQ) during this testing phase and are contacting neighbors in the area and the local government agencies listed below.

If you have any questions, please contact me at 648-2698.

Gerald,

I talked to your receptionist this morning, but I'll ~~try to~~ call you again, later today.

Sincerely,

Scott Horton
Senior Environmental Engineer

cc: LEPC
Health Department
City Administrator
Mayor's Office

Whirlpool CORPORATION

Fort Smith Division

6400 JENNY LIND • FORT SMITH, ARKANSAS 72908-7493 • AREA CODE 501 648-2000

February 15, 2001

Paula Dozier, Administrator
County Health Department
3112 So. 70th
Fort Smith, AR 72903

Dear Mrs. Dozier:

This letter is a follow-up to our recent telephone conversation regarding Whirlpool's groundwater testing that will occur in March 2001.

As I mentioned, Whirlpool is expanding its groundwater testing on its property, north of its Fort Smith manufacturing facility some time in March. We wanted you to be aware of the testing because the wells will be drilled adjacent to Ingersol Road and you may receive inquiries from members of the community.

Here's some background information on this project: The Fort Smith plant has been monitoring groundwater at its facility since 1989 when traces of Trichloroethylene (TCE) were found while removing underground fuel storage tanks. TCE was widely used by Whirlpool, other industries and sold commercially for home use during this time. Whirlpool discontinued use of TCE in 1985 and parts are now cleaned with a water-based material.

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We are working with the Arkansas Department of Environmental Quality (ADEQ) during this testing phase and are contacting neighbors in the area and the local government agencies listed below.

If you have any questions, please contact me at 648-2698.

Sincerely,

Scott Horton
Senior Environmental Engineer

Phone #
452-8600
fax #
452-7844

cc: LEPC
Health Department
City Administrator
Mayor's Office

Health Dept

Whirlpool CORPORATION

# FAX TRANSMISSION

DATE: 2/15/2001

TO: David Miesner

COMPANY: ADEQ - Ft. Smith Office

FAX #: 452-4827

FROM: Scott Horton

FAX #: 648-2431

PHONE #: -2698

cc. Dean Stallings
Randy Beard
Justin Sparrow

MESSAGE:

David, Thanks for distributing copies of this letter to the other guys in the office.

Please call if you have any questions

Scott Horton

2 PAGES, INCLUDING THIS PAGE

Whirlpool CORPORATION

Fort Smith Division

6400 JENNY LIND • FORT SMITH, ARKANSAS 72908-7493 • AREA CODE 501 648-2000

February 15, 2001

Paula Dozier, Administrator
County Health Department
3112 So. 70th
Fort Smith, AR 72903

Dear Mrs. Dozier:

This letter is a follow-up to our recent telephone conversation regarding Whirlpool's groundwater testing that will occur in March 2001.

As I mentioned, Whirlpool is expanding its groundwater testing on its property, north of its Fort Smith manufacturing facility some time in March. We wanted you to be aware of the testing because the wells will be drilled adjacent to Ingersol Road and you may receive inquiries from members of the community.

Here's some background information on this project: The Fort Smith plant has been monitoring groundwater at its facility since 1989 when traces of Trichloroethylene (TCE) were found while removing underground fuel storage tanks. TCE was widely used by Whirlpool, other industries and sold commercially for home use during this time. Whirlpool discontinued use of TCE in 1985 and parts are now cleaned with a water-based material.

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If you have any questions, please contact me at 648-2698.

Sincerely,

Scott Horton
Senior Environmental Engineer

cc: LEPC
Health Department
City Administrator
Mayor's Office
ADEQ - Ft. Smith Office

David Miesner
Dean Stallings
Randy Beard
Justin Sparrow

Whirlpool CORPORATION

FAX TRANSMISSION

DATE: 2/15/2001

TO: Mayor Baker

COMPANY: City of Ft. Smith - Mayor's Office

FAX #: 784-2430

FROM: Scott Horton - Whirlpool

FAX #:
PHONE #: 648-2698

MESSAGE:

Mayor Baker,

Although I haven't been able to reach you by phone this morning, I wanted to send this letter to you.

I wanted you to have this information in case concerned citizens called your office.

Please call if you have any questions.

Thanks,
Scott

2 PAGES, INCLUDING THIS PAGE

Whirlpool CORPORATION

Fort Smith Division

6400 JENNY LIND • FORT SMITH, ARKANSAS 72908-7493 • AREA CODE 501 648-2000

February 15, 2001

Mayor's Office
623 Garrison, 3rd. Floor, Rm. 315
Fort Smith, AR 72901

Dear Mayor,

This letter is a follow-up to our recent telephone conversation regarding Whirlpool's groundwater testing that will occur in March 2001.

As I mentioned, Whirlpool is expanding its groundwater testing on its property, north of its Fort Smith manufacturing facility some time in March. We wanted you to be aware of the testing because the wells will be drilled adjacent to Ingersol Road and you may receive inquiries from members of the community.

Here's some background information on this project: The Fort Smith plant has been monitoring groundwater at its facility since 1989 when traces of Trichloroethylene (TCE) were found while removing underground fuel storage tanks. TCE was widely used by Whirlpool, other industries and sold commercially for home use during this time. Whirlpool discontinued use of TCE in 1985 and parts are now cleaned with a water-based material.

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We are working with the Arkansas Department of Environmental Quality (ADEQ) during this testing phase and are contacting neighbors in the area and the local government agencies listed below.

If you have any questions, please contact me at 648-2698.

Sincerely,

Scott Horton
Senior Environmental Engineer

cc: LEPC
Health Department
City Administrator
Mayor's Office

Whirlpool CORPORATION

FAX TRANSMISSION

DATE: 2/15/2001

TO: Bill Harding - City Administrator's Office

COMPANY: City of Ft. Smith

FAX #: 784-2430

FROM: Scott Horton - Whirpool

FAX #:

PHONE #: 648-2698

MESSAGE:

Bill,

Although I haven't been able to reach you by phone this morning, I wanted you to have a copy of this letter.

In the event concerned citizens call your office, I hope this information will be beneficial.

Please call if you have any questions.

Thanks,

Scott

2 PAGES, INCLUDING THIS PAGE

Whirlpool CORPORATION

Fort Smith Division

6400 JENNY LIND • FORT SMITH, ARKANSAS 72908-7493 • AREA CODE 501 648-2000

February 15, 2001

Bill Harding, City Administrator
City Administrator's Office
P.O. Box 1908
Fort Smith, AR 72902

Dear Mr. Harding,

This letter is a follow-up to our recent telephone conversation regarding Whirlpool's groundwater testing that will occur in March 2001.

As I mentioned, Whirlpool is expanding its groundwater testing on its property, north of its Fort Smith manufacturing facility some time in March. We wanted you to be aware of the testing because the wells will be drilled adjacent to Ingersol Road and you may receive inquiries from members of the community.

Here's some background information on this project: The Fort Smith plant has been monitoring groundwater at its facility since 1989 when traces of Trichloroethylene (TCE) were found while removing underground fuel storage tanks. TCE was widely used by Whirlpool, other industries and sold commercially for home use during this time. Whirlpool discontinued use of TCE in 1985 and parts are now cleaned with a water-based material.

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We are working with the Arkansas Department of Environmental Quality (ADEQ) during this testing phase and are contacting neighbors in the area and the local government agencies listed below.

If you have any questions, please contact me at 648-2698.

Sincerely,

Scott Horton
Senior Environmental Engineer

cc: LEPC
Health Department
City Administrator
Mayor's Office

# Community Question and Answer Sheet and Letters to Residents

*Appendix G*

*August 30, 2006*
*Project No. 0014507*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

# APPENDIX G

# COMMUNITY QUESTION AND ANSWER SHEET AND LETTERS TO RESIDENTS

# Community Question and Answer Sheet

**Q1. Briefly, what is the nature of the problem identified at Whirlpool's Ft. Smith manufacturing facility?**
**A1**. The Fort Smith plant has been installing monitoring wells and monitoring groundwater at its facility since 1989 when traces of Trichloroethylene were found while removing unrelated underground fuel storage tanks.

**Q2. How hazardous is TCE? Is it a threat to my family, pets or property?**
**A2.** The levels of TCE found on plant property would be a concern only if the affected groundwater were used for drinking. A search of available public records indicates there are no private, semi-private or public water wells in the area that contains the affected groundwater. Consequently, we believe the TCE presents no direct harm to the surrounding community, including people, pets and property.

**Q3. Are the workers at the Ft. Smith Plant at risk?**
**A3**. No. The affected groundwater is approximately fifteen feet below the surface. Whirlpool controls access to these areas and limits activities that could result in workers coming in contact with any of these hazardous materials.

**Q4. Is Whirlpool in touch with the appropriate government agencies in this matter?**
**A4.** Yes. We have contacted the Arkansas Department of Environmental Quality (ADEQ) as well as the City of Ft. Smith, Mayor's Office, LEPC and the local health department. We believe in open, constructive dialogue with our community and consider our relationship with local government and institutions extremely important.

**Q5. Does the contamination pose long-term risks to the community and the surrounding environment?**
**A5.** Based on our current findings, we do not believe the community is at risk and believe the problem can be resolved.

**Q6. What caused the groundwater contamination?**
**A6.** At this point, it's difficult to determine how the contamination occurred. TCE was widely used in our industry for years to clean and degrease metal parts. It was considered to be a safer material, since unlike other industrial-strength cleaners on the market, TCE products had a lower flammability.

**Q7. Does Whirlpool still use materials containing TCE?**

**A7.** No. We discontinued the use of TCE and other chlorinated hydrocarbon degreasers in the early -1980s. Water-based cleaners were chosen as replacements.

**Q8. When did the contamination take place?**
**A8.** Based on historical operations at the facility, we believe the release of TCE occurred sometime before the early -1980s when TCE use was discontinued. Present activities at the Ft. Smith facility do not use TCE and are not contributing to the identified problem.

**Q9. Why has it taken so long for Whirlpool to take action?**
**A9.** Situations like this can take years to investigate and correct. When you consider groundwater studies, this is not considered a relatively long period of time. There are several factors that come into play when identifying a groundwater concern and developing a corrective action plan. Some of these factors include installing and monitoring the wells (we have now installed over 65 wells), studying whether any other contaminants were present, conducting and reviewing health/risk assessments, and conducting studies for TCE concentration reduction, etc.

**Q10. What areas at the Ft. Smith plant are affected by the contamination?**
**A10.** A large portion of the site has been investigated to some extent. The area of concern is along the north side of the facility.

**Q12. What are the results of your investigation so far?**
**A12.** At this point we have identified chlorinated solvents in the shallow aquifer and in some limited areas of shallow soils on our site. We believe that the majority of the problem presently exists within Whirlpool's property. We do, however see some indication that a small portion of the affected groundwater has migrated onto Whirlpool's property on the north side of Ingersol Road and moved northeastward along a small, defined gravel unit where it stops between Jacobs and Brazil.

**Q13. What steps is Whirlpool Corporation taking to address the problem?**
**A13.** Whirlpool has entered into a Letter of Agreement with the Arkansas Dept. of Environmental Quality (ADEQ) to further delineate the contamination. This step has been completed.

**Q14. Is it possible to successfully clean up the affected groundwater?**
**A14.** Yes. Whirlpool is working with ADEQ to develop a Corrective Action Strategy and Remedial Action Plan to correct the problem. We believe the affected groundwater can be controlled and restored as necessary with no threat to human health and the surrounding environment.

**Q15. If it is not possible to remove the contaminants completely, what will the consequences be for the environment, employees and for the local community?**
**A15.** Based on the information we currently have, there is no reason to think the issue can not be resolved.

**Q16. What if Whirlpool decides the clean up is too costly and closes its Ft. Smith plant?**
**A16.** Whirlpool does not consider closing this plant, as an answer to eliminating the TCE problem. With the cooperation of ADEQ, our neighbors and experts trained in handling environmental projects, we expect a successful resolution.

**Q17. Where did the TCE come from?**
**A17**. TCE was used until the early 1980's to degrease manufactured parts and we believe the contamination originated from this process.

**Q18. How will you get the TCE out of the ground?**
**A18**. There are various remediation techniques that are being investigated*. [i.e., air sparging, pump-and-treat, soil vapor extraction methods]* The ADEQ will approve any Remedial Action Plan.

**Q19. How long will it take?**
**A19**. Generally, groundwater remediation projects are long in nature and can take decades.

**Q20. Will you get it all?**
**A20**. We will extract as much as the technologies will allow us to remove.

**Q21. How much property do you own north of Ingersol Road?**
**A21**. There is a 5'-wide strip that runs east/west along the northside of Ingersol which Whirlpool owns.

**Q22. Why does Whirlpool own this property?**
**A22**. It was part of the original land purchase

**Q23. Which way does the groundwater move?**
**A23**. Primarily, it flows from northwest to southeast

**Q24. What other chemicals are you monitoring?**
**A24**. We are monitoring all the degradation products of TCE *[C-1, 2-DCE, t-1,2-DCE, 1,1-DCE, PCE, & vinyl chloride] (PCE is perchloroethylene & DCE is Dichloroethylene.)*

**Q25. Didn't Whirlpool complete a soil clean-up project a few years ago behind the plant?**
**A25**. [Excavation March to May 1999 - thermal treatment in Sept. 1993] Yes we did and it was in conjunction with some underground oil supply lines [oil for

compressor charging] and associated leaks into the soil. This clean-up project was approved by the ADEQ. Since that time oil supply lines have been routed overhead. [Report name: 1994 Stockpile Remediation Report]

**Q26. How extensive is the TCE problem on your property?**
**A26**. There are varying degrees of contamination on our property, however, all concentration levels are manageable.

**Q.27 Is it possible to successfully clean up the ground water?**
**A. 27** YES. Although we are continuing to work with the state to investigate and manage the groundwater, we are confident that the ground water can be successfully managed to avoid all risk to public health and the environment.

# Soil and Ground Water Analytical Data

*Appendix H*

*August 30, 2006*
*Project No. 0014507*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

TABLE H-1

Summary of Soil Analysis Data

Whirlpool Corporation
Fort Smith, Arkansas

| | MW-27(26') 12/07/99 Result (ug/kg) | Flag | LOQ (ug/kg) | ERM-1(4') 12/08/99 Result (ug/kg) | Flag | LOQ (ug/kg) | ERM-1(12') 12/08/99 Result (ug/kg) | Flag | LOQ (ug/kg) | ERM-2(14') 12/08/99 Result (ug/kg) | Flag | LOQ (ug/kg) | ERM-3(12') 12/08/99 Result (ug/kg) | Flag | LOQ (ug/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Volatiles (TCL List) | | | | | | | | | | | | | | | |
| Acetone | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| Benzene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Bromodichloromethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Bromoform | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Bromomethane (Methyl bromide) | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| 2-Butanone (MEK) | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| Carbon disulfide | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Carbon tetrachloride | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Chlorobenzene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Chlorodibromomethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Chloroethane (Ethyl chloride) | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| Chloroform | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Chloromethane (Methyl chloride) | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| 1,1-Dichloroethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,2-Dichloroethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,1-Dichloroethene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,2-Dichloroethene (total) | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| Dichloromethane | ND | | 5 | ND | | 5 | 6 | (a) | 5 | ND | | 5 | ND | | 5 |
| 1,2-Dichloropropane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| cis-1,3-Dichloropropene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| trans-1,3-Dichloropropene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Ethylbenzene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 2-Hexanone | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| 4-Methyl-2-pentanone (MIBK) | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| Styrene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,1,1,2-Tetrachloroethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Tetrachloroethene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Toluene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,1,1-Trichloroethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,1,2-Trichloroethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Trichloroethene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Vinyl chloride | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| Xylene (total) | ND | | 20 | ND | | 20 | ND | | 20 | ND | | 20 | ND | | 20 |
| cis-1,2-Dichloroethene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| trans-1,2-Dichloroethene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |

NOTES:

(a) - possible lab contamination
ND - Not Detected

TABLE H-1 (Cont'd)

Summary of Soil Analysis Data

Whirlpool Corporation
Fort Smith, Arkansas

| | MW-27(26') 12/07/99 Result (ug/kg) | Flag | LOQ (ug/kg) | ERM-4(14') 12/08/99 Result (ug/kg) | Flag | LOQ (ug/kg) | ERM-5(9') 12/08/99 Result (ug/kg) | Flag | LOQ (ug/kg) | ERM-5(3') 12/08/99 Result (ug/kg) | Flag | LOQ (ug/kg) | ERM-5(18') 12/08/99 Result (ug/kg) | Flag | LOQ (ug/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Volatiles (TCL List) | | | | | | | | | | | | | | | |
| Acetone | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| Benzene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Bromodichloromethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Bromoform | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Bromomethane (Methyl bromide) | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| 2-Butanone (MEK) | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| Carbon disulfide | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Carbon tetrachloride | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Chlorobenzene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Chlorodibromomethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Chloroethane (Ethyl chloride) | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| Chloroform | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Chloromethane (Methyl chloride) | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| 1,1-Dichloroethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,2-Dichloroethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,1-Dichloroethene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,2-Dichloroethene (total) | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| Dichloromethane | ND | | 5 | 5 | (a) | 5 | 7 | (a) | 5 | ND | | 5 | ND | | 5 |
| 1,2-Dichloropropane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| cis-1,3-Dichloropropene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| trans-1,3-Dichloropropene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Ethylbenzene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 2-Hexanone | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| 4-Methyl-2-pentanone (MIBK) | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| Styrene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,1,1,2-Tetrachloroethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Tetrachloroethene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Toluene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,1,1-Trichloroethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,1,2-Trichloroethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Trichloroethene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Vinyl chloride | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| Xylene (total) | ND | | 20 | ND | | 20 | ND | | 20 | ND | | 20 | ND | | 20 |
| cis-1,2-Dichloroethene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| trans-1,2-Dichloroethene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |

NOTES:

(a) - possible lab contamination
ND - Not Detected

TABLE H-1 (Cont'd)

Summary of Soil Analysis Data

Whirlpool Corporation
Fort Smith, Arkansas

| Volatiles (TCL List) | MW-27(26') 12/07/99 Result (ug/kg) | Flag | LOQ (ug/kg) | ERM-6(11') 12/08/99 Result (ug/kg) | Flag | LOQ (ug/kg) | ERM-7(8') 12/08/99 Result (ug/kg) | Flag | LOQ (ug/kg) | ERM-8(2') 12/09/99 Result (ug/kg) | Flag | LOQ (ug/kg) | ERM-8(14') 12/09/99 Result (ug/kg) | Flag | LOQ (ug/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Acetone | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| Benzene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Bromodichloromethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Bromoform | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Bromomethane (Methyl bromide) | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| 2-Butanone (MEK) | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| Carbon disulfide | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Carbon tetrachloride | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Chlorobenzene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Chlorodibromomethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Chloroethane (Ethyl chloride) | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| Chloroform | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Chloromethane (Methyl chloride) | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| 1,1-Dichloroethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,2-Dichloroethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,1-Dichloroethene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,2-Dichloroethene (total) | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | 12 | | 10 |
| Dichloromethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | 6 | (a) | 5 |
| 1,2-Dichloropropane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| cis-1,3-Dichloropropene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| trans-1,3-Dichloropropene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Ethylbenzene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 2-Hexanone | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| 4-Methyl-2-pentanone (MIBK) | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| Styrene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,1,1,2-Tetrachloroethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Tetrachloroethene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Toluene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,1,1-Trichloroethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,1,2-Trichloroethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Trichloroethene | ND | | 5 | ND | | 5 | 32 | | 5 | 12 | | 5 | 186 | | 5 |
| Vinyl chloride | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| Xylene (total) | ND | | 20 | ND | | 20 | ND | | 20 | ND | | 20 | ND | | 20 |
| cis-1,2-Dichloroethene | ND | | 5 | ND | | 5 | 6 | | 5 | ND | | 5 | 12 | | 5 |
| trans-1,2-Dichloroethene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |

NOTES:

(a) - possible lab contamination
ND - Not Detected

TABLE H-1 (Cont'd)

Summary of Soil Analysis Data

Whirlpool Corporation
Fort Smith, Arkansas

| | MW-27(26') 12/07/99 Result (ug/kg) | Flag | LOQ (ug/kg) | ERM-9(2') 12/09/99 Result (ug/kg) | Flag | LOQ (ug/kg) | ERM-9(8') 12/09/99 Result (ug/kg) | Flag | LOQ (ug/kg) | ERM-DUP 12/09/99 Result (ug/kg) | Flag | LOQ (ug/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Volatiles (TCL List) | | | | | | | | | | | | |
| Acetone | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| Benzene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Bromodichloromethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Bromoform | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Bromomethane (Methyl bromide) | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| 2-Butanone (MEK) | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| Carbon disulfide | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Carbon tetrachloride | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Chlorobenzene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Chlorodibromomethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Chloroethane (Ethyl chloride) | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| Chloroform | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Chloromethane (Methyl chloride) | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| 1,1-Dichloroethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,2-Dichloroethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,1-Dichloroethene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,2-Dichloroethene (total) | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| Dichloromethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,2-Dichloropropane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| cis-1,3-Dichloropropene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| trans-1,3-Dichloropropene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Ethylbenzene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 2-Hexanone | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| 4-Methyl-2-pentanone (MIBK) | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| Styrene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,1,1,2-Tetrachloroethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Tetrachloroethene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Toluene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,1,1-Trichloroethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| 1,1,2-Trichloroethane | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| Trichloroethene | ND | | 5 | 9 | | 5 | ND | | 5 | ND | | 5 |
| Vinyl chloride | ND | | 10 | ND | | 10 | ND | | 10 | ND | | 10 |
| Xylene (total) | ND | | 20 | ND | | 20 | ND | | 20 | ND | | 20 |
| cis-1,2-Dichloroethene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |
| trans-1,2-Dichloroethene | ND | | 5 | ND | | 5 | ND | | 5 | ND | | 5 |

NOTES:

(a) - possible lab contamination
ND - Not Detected

TABLE H-2

Historic Field Data, Natural Parameters

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Temp ($^oC$) | SC (uS/cm) | DO (mg/l) | pH (standard units) | ORP (mV) |
|---|---|---|---|---|---|---|
| ITMW-1 | 2/2/02 | 19.62 | 742 | 2.79 | 5.99 | 408.3 |
| | 9/2/02 | 24.61 | 1071 | 2.65 | 5.64 | 304.9 |
| | 9/2/02 | 24.61 | 1071 | 2.65 | 5.64 | 304.9 |
| | 2/1/03 | 18.08 | 879 | 22.43 | 5.89 | 36.8 |
| | 9/24/03 | 22.73 | 640 | 1.53 | 5.84 | 143.3 |
| | 4/13/04 | 18.68 | 566 | 4.21 | 6.00 | 86.5 |
| | 9/21/04 | 21.83 | 580 | 0.54 | 5.93 | 250.3 |
| | 9/28/05 | 23.05 | 0.737 | 0.58 | 5.5 | 210 |
| ITMW-2 | 2/2/02 | --- | --- | --- | --- | --- |
| | 9/2/02 | 27.56 | 2.60 | 1.93 | 5.57 | 281.3 |
| | 2/1/03 | 15.16 | 301.0 | 24.45 | 6.29 | -25.8 |
| | 9/23/03 | 26.98 | 263.0 | 0.91 | 5.56 | 169.4 |
| | 4/13/04 | 20.20 | 312.0 | 5.50 | 6.68 | 85.1 |
| | 9/21/04 | 24.90 | 1174.0 | 0.40 | 5.87 | 151.8 |
| | 9/29/05 | 23.69 | 981 | 0.35 | 5.8 | 51.2 |
| ITMW-3 | 2/2/02 | --- | --- | --- | --- | --- |
| | 9/2/02 | 25.01 | 223 | 0.45 | 5.96 | 389.6 |
| | 2/3/03 | 15.86 | 205 | 1.72 | 6.50 | 179.2 |
| | 9/23/03 | 23.33 | 246 | 0.68 | 5.03 | 241.3 |
| | 4/13/04 | 19.49 | 239 | 1.86 | 6.11 | 79.1 |
| | 9/21/04 | 23.20 | 4.55 | 0.69 | 6.09 | 211.7 |
| | 9/28/05 | 23.41 | 0.276 | 0.46 | 5.77 | 195.7 |
| ITMW-4 | 2/2/02 | --- | --- | --- | --- | --- |
| | 9/2/02 | 22.31 | 889 | 2.89 | 6.61 | -16.1 |
| | 2/1/03 | 15.59 | 411 | 35.35 | 6.61 | 10.3 |
| | 9/23/03 | 23.90 | 583 | 2.09 | 6.35 | -18.6 |
| | 4/14/04 | 21.69 | 664 | 2.40 | 6.56 | 60.1 |
| | 9/22/04 | 24.16 | 485 | 0.45 | 6.16 | 24.4 |
| | 9/27/05 | 23.73 | 506 | 0.85 | 6.29 | -43.4 |
| ITMW-5 | 2/2/02 | 19.65 | 695 | 2.96 | 6.10 | 485.2 |
| | 9/2/02 | 22.68 | 539 | 0.73 | 5.90 | 369.4 |
| | 2/1/03 | 14.91 | 442 | 3.59 | 6.40 | 220.9 |
| | 9/24/03 | 22.47 | 688 | 0.95 | 6.08 | 263.8 |
| | 4/14/04 | 20.78 | 624 | 4.86 | 5.61 | 406.5 |
| | 9/22/04 | 25.17 | 672 | 0.47 | 5.61 | 525.1 |
| | 4/6/05 | 18.42 | 750 | 2.11 | 6.88 | 84.7 |
| | 9/28/05 | 22.79 | 819 | 0.60 | 5.92 | 75.2 |

NOTES:

--- = Parameter not monitored - well not sampled using low-flow techniques.
SC = specific conductants
DO = dissolved oxygen
ORP = oxidation-reduction potential
uS/cm = microsiemens per centimeter
(a) MW-46 through MW-63 were pumped dry prior to sampling.
(b) MW-38 was used as an injection well for the pilot study and has not been sampled using low-flow techniques.

TABLE H-2 (Cont'd)

Historic Field Data, Natural Parameters

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Temp ($^oC$) | SC (uS/cm) | DO (mg/l) | pH (standard units) | ORP (mV) |
|---|---|---|---|---|---|---|
| ITMW-6 | 2/2/02 | 18.47 | 840 | 0.24 | 6.00 | 339.0 |
| | 9/2/02 | 21.55 | 704 | 0.64 | 5.93 | 574 |
| | 2/1/03 | 15.06 | 615 | 4.01 | 6.39 | 210.3 |
| | 9/24/03 | 21.06 | 906 | 1.36 | 6.04 | 273.9 |
| | 4/14/04 | 18.95 | 1083 | 4.65 | 6.19 | 120.1 |
| | 9/22/04 | 22.75 | 870 | 0.54 | 5.77 | 450.7 |
| | 9/28/05 | 21.84 | 987 | 0.68 | 5.91 | 67.1 |
| ITMW-7 | 2/2/02 | 18.29 | 1021 | 2.85 | 5.63 | 401 |
| | 9/2/02 | 22.64 | 1659 | 1.34 | 4.54 | 334.6 |
| | 2/1/03 | 16.88 | 749 | 3.16 | 5.40 | 200.9 |
| | 9/24/03 | 23.38 | 1036 | 0.97 | 4.53 | 396.8 |
| | 4/14/04 | 19.98 | 966 | 1.81 | 4.62 | 363.5 |
| | 9/22/04 | 20.47 | 950 | 0.35 | 5.09 | 350.1 |
| | 4/7/05 | 18.69 | 1134 | 0.48 | 4.64 | 88.3 |
| | 9/28/05 | 24.01 | 1.132 | 0.71 | 4.96 | 66.4 |
| ITMW-9 | 2/2/02 | --- | --- | --- | --- | --- |
| | 9/2/02 | 22.40 | 1235 | 2.49 | 5.26 | 246 |
| | 2/1/03 | 16.31 | 560 | 55.10 | 6.08 | 61.9 |
| | 9/23/03 | 23.30 | 802 | 0.25 | 4.78 | 313.5 |
| | 4/14/04 | 21.03 | 965 | 6.07 | 5.98 | 100.0 |
| | 9/22/04 | 25.99 | 671 | 0.35 | 5.20 | 467.2 |
| | 4/6/05 | 19.06 | 796 | 3.05 | 7.77 | 50.8 |
| | 9/27/05 | 23.9 | 679 | 2.39 | 5.36 | 94.3 |
| ITMW-10 | 2/2/02 | 17.90 | 623 | 0.77 | 5.98 | 348.6 |
| | 9/2/02 | 21.74 | 513 | 0.73 | 5.84 | 347.8 |
| | 2/1/03 | 15.71 | 496 | 3.03 | 6.30 | 228.1 |
| | 9/23/03 | 25.53 | 684 | 2.75 | 5.22 | 370.8 |
| | 4/14/04 | 20.49 | 656 | 3.24 | 5.42 | 309.2 |
| | 9/22/04 | 25.78 | 1119 | 1.24 | 5.55 | 267.9 |
| | 4/7/05 | 18.68 | 763 | 1.40 | 8.41 | -2.6 |
| | 9/28/05 | 21.77 | 722 | 0.53 | 5.69 | 79.7 |
| ITMW-11 | 9/1/01 | 21.4 | 330 | 1.70 | 6.07 | 130.0 |
| | 11/1/01 | 22.2 | 392 | 2.90 | 5.31 | 793.0 |
| | 2/2/02 | 20.04 | 366 | 3.60 | 6.17 | 549.1 |
| | 9/2/02 | 23.87 | 232 | 2.79 | 6.11 | 391.2 |
| | 2/1/03 | 13.70 | 209 | 3.71 | 6.96 | 157.2 |
| | 9/24/03 | 25.05 | 2491 | 1.01 | 4.60 | 289.5 |
| | 4/13/04 | 19.12 | 366 | 2.20 | 5.93 | 473.0 |
| | 9/21/04 | 25.38 | 449 | 0.58 | 5.77 | 321.9 |
| | 4/7/05 | 19.01 | 295 | 1.81 | 6.62 | 49.0 |
| | 9/29/05 | 22.8 | 336 | 1.55 | 6.54 | 42.7 |

NOTES:

--- = Parameter not monitored - well not sampled using low-flow techniques.
SC = specific conductants
DO = dissolved oxygen
ORP = oxidation-reduction potential
uS/cm = microsiemens per centimeter
(a) MW-46 through MW-63 were pumped dry prior to sampling.
(b) MW-38 was used as an injection well for the pilot study and has not been sampled using low-flow techniques.

TABLE H-2 (Cont'd)

Historic Field Data, Natural Parameters

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Temp ($^oC$) | SC (uS/cm) | DO (mg/l) | pH (standard units) | ORP (mV) |
|---|---|---|---|---|---|---|
| ITMW-12 | 9/1/01 | 21.9 | 320 | 1.60 | 5.88 | 156.0 |
| | 11/1/01 | 22.6 | 217 | 0.30 | 5.15 | 603.0 |
| | 2/2/02 | 19.91 | 275 | 3.26 | 6.10 | 573.7 |
| | 9/2/02 | 27.03 | 168 | 1.41 | 5.28 | 370.1 |
| | 2/1/03 | 10.77 | 179 | 9.01 | 6.40 | -197.6 |
| | 9/24/03 | 25.14 | 232 | 1.26 | 4.81 | 495.3 |
| | 4/12/04 | 19.45 | 298 | 2.87 | 5.80 | 443.1 |
| | 9/21/04 | 25.95 | 348 | 1.96 | 6.02 | 166.3 |
| | 9/29/05 | 23.00 | 235.00 | 0.60 | 6.11 | 38.70 |
| ITMW-13 | 2/2/02 | 19.91 | 357 | 3.54 | 6.19 | 416.7 |
| | 9/2/02 | 23.86 | 221 | 1.55 | 5.72 | 241.3 |
| | 2/1/03 | 15.34 | 175 | 11.62 | 6.37 | -11.1 |
| | 9/24/03 | 25.35 | 2228 | 1.89 | 5.42 | 316.0 |
| | 4/13/04 | 18.76 | 310 | 2.15 | 5.64 | 398.1 |
| | 9/21/04 | 26.89 | 371 | 5.19 | 5.72 | 136.7 |
| | 4/7/05 | 18.26 | 240 | 1.50 | 5.30 | 281.8 |
| | 9/30/05 | 20.56 | 246 | 1.04 | 6.14 | 48.5 |
| ITMW-14 | 2/2/02 | --- | --- | --- | --- | --- |
| | 9/2/02 | 25.50 | 103 | 0.85 | 5.84 | 285.2 |
| | 2/3/03 | 15.35 | 131 | 3.13 | 6.37 | 155.3 |
| | 9/24/03 | 25.30 | 2195 | 1.97 | 5.19 | 347.7 |
| | 4/13/04 | 18.87 | 235 | 3.47 | 5.35 | 349.7 |
| | 9/21/04 | 24.41 | 259 | 0.48 | 5.46 | 316.8 |
| | 9/30/05 | 21.52 | 151 | 0.40 | 5.89 | 57.1 |
| ITMW-15 | 9/1/01 | 21.5 | 174 | --- | 6.10 | --- |
| | 11/1/01 | 22.0 | 274 | 1.00 | 5.39 | 565.0 |
| | 2/2/02 | 20.30 | 330 | 1.98 | 6.68 | 313.7 |
| | 9/2/02 | 25.33 | 277 | 1.98 | 5.96 | 357.8 |
| | 2/1/03 | 13.66 | 242 | 11.45 | 7.92 | -53.2 |
| | 9/25/03 | 21.81 | 315 | 1.45 | 6.37 | 107.0 |
| | 4/14/04 | 18.79 | 406 | 4.51 | 6.79 | 64.1 |
| | 9/21/04 | 24.05 | 405 | 0.54 | 6.17 | 321.7 |
| | 4/7/05 | 18.82 | 377 | 1.49 | 5.99 | 82.3 |
| | 9/29/05 | 24.29 | 393 | 0.41 | 6.48 | -12.9 |
| ITMW-16 | 2/2/02 | 19.93 | 181 | 0.02 | 6.57 | 350.3 |
| | 9/2/02 | 24.12 | 106 | 0.36 | 6.64 | -55.2 |
| | 2/1/03 | --- | 225 | 8.15 | 7.47 | 183.6 |
| | 9/25/03 | 24.01 | 321 | 2.58 | 6.42 | -13.1 |
| | 4/15/04 | 20.91 | 1442 | 6.34 | 5.11 | 109.1 |
| | 9/23/04 | 23.44 | 199 | 0.56 | 6.86 | -45.5 |
| | 9/29/05 | 24.05 | 0.27 | 0.63 | 6.48 | 28.3 |

NOTES:

--- = Parameter not monitored - well not sampled using low-flow techniques.
SC = specific conductants
DO = dissolved oxygen
ORP = oxidation-reduction potential
uS/cm = microsiemens per centimeter
(a) MW-46 through MW-63 were pumped dry prior to sampling.
(b) MW-38 was used as an injection well for the pilot study and has not been sampled using low-flow techniques.

TABLE H-2 (Cont'd)

Historic Field Data, Natural Parameters

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Temp ($^oC$) | SC (uS/cm) | DO (mg/l) | pH (standard units) | ORP (mV) |
|---|---|---|---|---|---|---|
| ITMW-17 | 2/2/02 | 17.69 | 817 | 2.92 | 5.49 | 487.5 |
| | 9/2/02 | 26.65 | 633 | 1.02 | 5.27 | 364.3 |
| | 2/3/03 | 14.73 | 634 | 4.71 | 5.61 | 185.3 |
| | 9/25/03 | 23.78 | 811 | 1.56 | 5.57 | 198.3 |
| | 4/14/04 | 18.34 | 796 | 4.72 | 5.63 | 303.7 |
| | 9/21/04 | 27.02 | 810 | 0.50 | 5.44 | 425.4 |
| | 4/7/05 | 19.05 | 965 | 2.65 | 5.74 | 60.9 |
| | 9/29/05 | 23.48 | 1.095 | 0.51 | 5.36 | 33.3 |
| ITMW-18 | 2/2/02 | --- | --- | --- | --- | --- |
| | 9/2/02 | 24.24 | 537 | 4.59 | 5.27 | 278.3 |
| | 2/1/03 | 15.52 | 444 | 5.52 | 6.60 | 183.2 |
| | 9/24/03 | 22.96 | 556 | 2.41 | 5.40 | 168.5 |
| | 4/13/04 | 18.42 | 494 | 4.05 | 5.94 | 90.3 |
| | 9/21/04 | 24.03 | 501 | 1.72 | 5.38 | 335.6 |
| | 4/8/05 | 19.38 | 572 | 1.16 | 4.82 | 192.4 |
| | 9/29/05 | 21.7 | 0.546 | 0.86 | 5.57 | 264.9 |
| ITMW-19 | 9/1/01 | 21.9 | 920 | 1.90 | 5.16 | 254.0 |
| | 11/1/01 | 19.2 | 859 | 1.00 | 5.08 | 669.0 |
| | 2/2/02 | 18.20 | 809 | 0.12 | 5.65 | 336.9 |
| | 9/2/02 | 24.30 | 808 | 3.66 | 5.37 | 302.8 |
| | 2/1/03 | 16.16 | 621 | 16.87 | 6.19 | 48.3 |
| | 9/24/03 | 22.56 | 797 | 1.48 | 5.51 | 178.5 |
| | 4/13/04 | 18.56 | 680 | 5.99 | 6.07 | 89.1 |
| | 9/21/04 | 23.37 | 811 | 0.36 | 5.96 | 344.2 |
| | 4/7/05 | 18.34 | 860 | 2.54 | 5.59 | 105.9 |
| | 9/29/05 | 21.51 | 880 | 0.7 | 5.68 | 46.6 |
| ITMW-20 | 2/2/02 | 19.05 | 447 | 0.14 | 5.94 | 361.5 |
| | 9/2/02 | 24.85 | 364 | 1.84 | 5.56 | 406.3 |
| | 2/1/03 | 14.81 | 326 | 4.24 | 6.25 | 193.9 |
| | 9/24/03 | 25.36 | 434 | 2.64 | 5.29 | 308.1 |
| | 4/14/04 | 19.63 | 443 | 5.89 | 5.10 | 398.6 |
| | 9/22/04 | 23.80 | 745 | 0.92 | 5.45 | 208.7 |
| | 9/28/05 | 20.61 | 480 | 0.72 | 5.52 | 163.5 |
| MW-21 | 9/1/01 | 21.2 | 627 | --- | 5.65 | --- |
| | 11/1/01 | 19.4 | 2300 | 2.00 | 4.69 | 686.0 |
| | 2/2/02 | | | | | |
| | 9/2/02 | 25.59 | 3852 | 1.96 | 4.47 | 365.7 |
| | 2/3/03 | --- | 1571 | 6.14 | 5.13 | 195.6 |
| | 9/23/03 | 28.07 | 258 | 0.79 | 5.61 | 166.3 |
| | 4/14/04 | 18.41 | 1757 | 4.07 | 4.95 | 328.3 |
| | 9/22/04 | 20.98 | 3936 | 0.50 | 4.77 | 189.8 |
| | 9/28/05 | 25.94 | 2.599 | 0.94 | 5.02 | 41.1 |

NOTES:

--- = Parameter not monitored - well not sampled using low-flow techniques.
SC = specific conductants
DO = dissolved oxygen
ORP = oxidation-reduction potential
uS/cm = microsiemens per centimeter
(a) MW-46 through MW-63 were pumped dry prior to sampling.
(b) MW-38 was used as an injection well for the pilot study and has not been sampled using low-flow techniques.

TABLE H-2 (Cont'd)

Historic Field Data, Natural Parameters

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Temp ($^oC$) | SC (uS/cm) | DO (mg/l) | pH (standard units) | ORP (mV) |
|---|---|---|---|---|---|---|
| MW-22 | 2/2/02 | --- | --- | --- | --- | --- |
| | 9/2/02 | 26.71 | 347 | 1.60 | 5.29 | 297.8 |
| | 2/3/03 | 16.40 | 159 | 2.13 | 5.78 | 208.2 |
| | 9/23/03 | 24.93 | 257 | 0.75 | 4.97 | 199.6 |
| | 4/13/04 | 19.82 | 192 | 1.64 | 5.58 | 48.1 |
| | 9/21/04 | 24.50 | 145 | 0.63 | 5.31 | 221.3 |
| | 9/30/05 | 24.45 | 223 | 0.44 | 5.55 | 20.3 |
| MW-23 | 2/2/02 | 17.48 | 1088 | 3.24 | 4.89 | 471.7 |
| | 9/2/02 | 23.43 | 918 | 1.29 | 4.76 | 405.3 |
| | 2/3/03 | 15.60 | 706 | 3.20 | 5.12 | 220.3 |
| | 9/25/03 | 24.36 | 1110 | 3.51 | 4.74 | 269.9 |
| | 4/15/04 | 19.91 | 1018 | 6.59 | 5.00 | 109.4 |
| | 9/22/04 | 27.08 | 1455 | 0.59 | 4.36 | 267.3 |
| | 9/29/05 | 23.38 | 1.289 | 0.26 | 4.55 | 317.7 |
| MW-24 | 2/2/02 | 20.71 | 1671 | --- | 4.76 | --- |
| | 9/2/02 | 24.58 | 1259 | 6.49 | 4.93 | 289.2 |
| | 2/3/03 | 16.57 | 835 | 3.31 | 5.44 | 209.2 |
| | 9/25/03 | 25.38 | 1451 | 4.25 | 4.70 | 311.1 |
| | 9/25/03 | 25.38 | 1451 | 4.25 | 4.70 | 311.1 |
| | 9/23/04 | 23.37 | 1201 | 1.25 | 5.11 | 252.6 |
| | 4/6/05 | 19.62 | 1254 | 0.96 | 3.41 | 137.10 |
| | 9/29/05 | 25.88 | 1.64 | 0.86 | 4.67 | 304.40 |
| MW-25 | 2/2/02 | 18.96 | 1785 | 0.84 | 4.85 | 364.1 |
| | 9/2/02 | 23.17 | 1919 | 3.41 | 5.08 | 229.0 |
| | 2/1/03 | 15.48 | 1420 | 5.41 | 5.01 | 51.4 |
| | 9/24/03 | 24.50 | 1910 | 3.4 | 4.92 | 261.8 |
| | 4/14/04 | 19.27 | 2010 | 6.43 | 5.04 | 93.0 |
| | 9/21/04 | 26.51 | 1713 | 0.47 | 4.79 | 335.6 |
| | 4/7/05 | 19.19 | 1646 | 0.48 | 5.50 | 56.6 |
| | 9/28/05 | 28.63 | 1.993 | 0.83 | 5.28 | 26.4 |
| MW-26 | 2/2/02 | 19.07 | 1094 | 2.13 | 5.21 | 452.5 |
| | 9/2/02 | 23.53 | 872 | 0.52 | 5.15 | 389.9 |
| | 2/1/03 | 16.51 | 747 | 3.47 | 5.61 | 201.8 |
| | 9/24/03 | 23.53 | 1011 | 2.71 | 5.04 | 285.8 |
| | 4/14/04 | 19.95 | 897 | 2.05 | 4.71 | 410.1 |
| | 9/22/04 | 22.67 | 1723 | 0.53 | 5.11 | 147.5 |
| | 9/29/05 | 19.98 | 1.189 | 0.57 | 5.28 | 51.5 |

NOTES:

--- = Parameter not monitored - well not sampled using low-flow techniques.
SC = specific conductants
DO = dissolved oxygen
ORP = oxidation-reduction potential
uS/cm = microsiemens per centimeter
(a) MW-46 through MW-63 were pumped dry prior to sampling.
(b) MW-38 was used as an injection well for the pilot study and has not been sampled using low-flow techniques.

TABLE H-2 (Cont'd)

Historic Field Data, Natural Parameters

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Temp ($^oC$) | SC (uS/cm) | DO (mg/l) | pH (standard units) | ORP (mV) |
|---|---|---|---|---|---|---|
| MW-27 | 2/2/02 | --- | --- | --- | --- | --- |
| | 9/2/02 | 22.94 | 275 | 2.48 | 5.83 | 216.7 |
| | 2/1/03 | 16.40 | 210 | 22.10 | 6.09 | 113.4 |
| | 9/25/03 | 23.49 | 243 | 2.42 | 5.95 | 167.3 |
| | 4/15/04 | 19.46 | 214 | 3.09 | 6.15 | 73.3 |
| | 9/22/04 | 26.10 | 426 | 0.26 | 5.53 | 110.8 |
| | 9/29/05 | 24.49 | 0.275 | 0.31 | 5.45 | 215.9 |
| MW-28 | 2/2/02 | 18.58 | 482 | 0.37 | 5.99 | 333.3 |
| | 9/2/02 | 26.36 | 367 | 0.71 | 6.15 | 318.7 |
| | 2/1/03 | 15.62 | 603 | 14.37 | 6.19 | 76.3 |
| | 9/25/03 | 24.18 | 432 | 1.44 | 6.39 | 55.8 |
| | 4/15/04 | 21.98 | 494 | 3.34 | 6.21 | 99.4 |
| | 9/22/04 | 28.61 | 710 | 0.47 | 5.85 | 80.4 |
| | 9/30/05 | 25.48 | 460 | 0.43 | 6.26 | -9.1 |
| MW-29 | 2/2/02 | --- | --- | --- | --- | --- |
| | 9/2/02 | 25.71 | 598 | 0.93 | 4.64 | 437.8 |
| | 2/1/03 | 16.61 | 720 | 18.08 | 5.31 | 153.0 |
| | 9/24/03 | 25.16 | 690 | 2.05 | 4.26 | 308.6 |
| | 4/14/04 | 19.94 | 718 | 2.86 | 5.21 | 100.4 |
| | 9/22/04 | 23.46 | 627 | 0.51 | 4.57 | 376.8 |
| | 9/28/05 | 24.41 | 756 | 0.51 | 4.92 | 50.3 |
| MW-30 | 2/2/02 | --- | --- | --- | --- | --- |
| | 9/2/02 | 25.71 | 1721 | 2.48 | 4.61 | 321.9 |
| | 2/1/03 | 14.90 | 1454 | 13.41 | 4.90 | 168.6 |
| | 9/24/03 | 24.45 | 648 | 1.75 | 4.33 | 374.5 |
| | 4/14/04 | 21.63 | 1328 | 6.71 | 4.98 | 116.3 |
| | 9/22/04 | 25.19 | 932 | 0.35 | 5.19 | 336.4 |
| | 9/28/05 | 24.14 | 1.071 | 0.46 | 4.89 | 60.1 |
| MW-31 | 2/2/02 | --- | --- | --- | --- | --- |
| | 9/2/02 | --- | --- | --- | --- | --- |
| | 2/1/03 | 14.49 | 947.0 | 55.44 | 6.02 | 70.6 |
| | 9/25/03 | 25.33 | 1262.0 | 4.71 | 5.23 | 158.2 |
| | 4/15/04 | --- | --- | --- | --- | --- |
| | 9/20/04 | --- | --- | --- | --- | --- |
| | 4/5/05 | 18.46 | 606.00 | 0.31 | 5.38 | 229.80 |
| | 9/27/05 | 23.6 | 0.633 | 0.87 | 5.09 | 75.4 |

NOTES:

--- = Parameter not monitored - well not sampled using low-flow techniques.
SC = specific conductants
DO = dissolved oxygen
ORP = oxidation-reduction potential
uS/cm = microsiemens per centimeter
(a) MW-46 through MW-63 were pumped dry prior to sampling.
(b) MW-38 was used as an injection well for the pilot study and has not been sampled using low-flow techniques.

TABLE H-2 (Cont'd)

Historic Field Data, Natural Parameters

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Temp ($^oC$) | SC (uS/cm) | DO (mg/l) | pH (standard units) | ORP (mV) |
|---|---|---|---|---|---|---|
| MW-32 | 2/2/02 | 19.08 | 1316 | 4.81 | 5.18 | 343.6 |
| | 9/2/02 | 26.41 | 801 | 2.04 | 5.72 | 281.3 |
| | 2/1/03 | 17.92 | 924 | 44.25 | 4.85 | 137.2 |
| | 9/25/03 | 25.40 | 1176 | 5.58 | 4.89 | 264.7 |
| | 4/15/04 | --- | --- | --- | --- | --- |
| | 9/20/04 | 22.84 | 1231.00 | 3.16 | 5.01 | -16.80 |
| | 9/27/05 | 24.7 | 1.157 | 0.36 | 4.62 | 283.8 |
| MW-33 | 2/2/02 | 19.14 | 575 | 4.10 | 5.57 | 403.2 |
| | 9/2/02 | 25.41 | 310 | 1.04 | 5.34 | 341.9 |
| | 2/1/03 | 14.87 | 275 | 52.52 | 5.41 | 147.1 |
| | 9/25/03 | 29.09 | 382 | 5.83 | 5.46 | 258.1 |
| | 4/15/04 | 21.72 | 533 | 2.67 | 5.23 | 106.0 |
| | 9/20/04 | 21.08 | 536 | 1.20 | 5.13 | 100.4 |
| | 9/27/05 | 25.08 | 532 | 0.61 | 4.95 | 84.5 |
| MW-34 | 2/2/02 | 18.77 | 1209 | 4.32 | 5.67 | 226.4 |
| | 9/1/02 | 24.81 | 450 | 5.71 | 5.41 | 241.3 |
| | 2/1/03 | 16.43 | 563 | 4.23 | 6.02 | 230.4 |
| | 9/25/03 | 24.91 | 2520 | 1.24 | 5.03 | 286.0 |
| | 4/15/04 | 21.27 | 1117 | 1.05 | 4.32 | 412.3 |
| | 9/23/04 | 23.05 | 1551 | 0.50 | 4.88 | 264.6 |
| | 4/5/05 | 18.55 | 951 | 0.44 | 4.65 | 155.8 |
| | 9/30/05 | 23.44 | 1206 | 0.49 | 5.08 | 102.3 |
| MW-35 | 2/2/02 | 20.20 | 1013 | 3.02 | 5.91 | 318.6 |
| | 9/2/02 | 22.98 | 816 | 3.43 | 6.33 | 225.1 |
| | 2/1/03 | 15.73 | 635 | 7.57 | 5.72 | 235.3 |
| | 9/25/03 | 22.42 | 9228 | 1.83 | 4.81 | 132.2 |
| | 4/15/04 | 21.03 | 1056 | 1.22 | 4.54 | 399.1 |
| | 9/23/04 | 22.49 | 1653 | 0.43 | 4.75 | 438.7 |
| | 9/30/05 | 22.28 | 1.037 | 0.42 | 4.35 | 315.6 |
| MW-36 | 2/2/02 | 20.18 | 1232 | 3.98 | 5.72 | 216.1 |
| | 9/2/02 | 22.79 | 828 | 3.81 | 5.63 | 270.3 |
| | 2/1/03 | 16.31 | 660 | 4.12 | 5.70 | 232.3 |
| | 9/25/03 | 23.92 | 4015 | 1.12 | 4.25 | 258.6 |
| | 4/15/04 | 20.20 | 1419 | 1.18 | 4.55 | 316.5 |
| | 9/23/04 | 21.98 | 2007 | 0.43 | 5.00 | 315.6 |
| | 9/30/05 | 22.26 | 1.445 | 0.39 | 4.43 | 252.8 |

NOTES:

--- = Parameter not monitored - well not sampled using low-flow techniques.
SC = specific conductants
DO = dissolved oxygen
ORP = oxidation-reduction potential
uS/cm = microsiemens per centimeter
(a) MW-46 through MW-63 were pumped dry prior to sampling.
(b) MW-38 was used as an injection well for the pilot study and has not been sampled using low-flow techniques.

TABLE H-2 (Cont'd)

Historic Field Data, Natural Parameters

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Temp ($^oC$) | SC (uS/cm) | DO (mg/l) | pH (standard units) | ORP (mV) |
|---|---|---|---|---|---|---|
| ITMW-37 | 3/1/00 | --- | --- | --- | --- | --- |
| | 9/1/00 | --- | --- | --- | --- | --- |
| | 3/1/01 | --- | --- | --- | --- | --- |
| | 11/1/01 | 22.6 | 311 | 2.10 | 5.51 | 816.0 |
| | 2/2/02 | 19.81 | 392 | 2.98 | 6.59 | 320.6 |
| | 9/2/02 | 25.35 | 539 | 2.79 | 6.45 | -39.9 |
| | 2/1/03 | 17.63 | 801 | 22.63 | 11.31 | 91.3 |
| | 9/24/03 | 26.04 | 2520 | 0.77 | 5.83 | -43.2 |
| | 4/13/04 | 19.13 | 252 | 3.46 | 7.30 | 52.0 |
| | 9/21/04 | 24.91 | 617 | 0.60 | 5.78 | -81.4 |
| | 9/29/05 | 23.82 | 351 | 0.33 | 6.35 | -128.3 |
| MW-38 | 2/2/02 | --- | --- | --- | --- | --- |
| | 9/2/02 | --- | --- | --- | --- | --- |
| | 9/29/05 | 23.29 | 732 | 0.43 | 6.63 | -142.1 |
| MW-39 | 7/18/03 | 19.73 | 968 | -123 | 4.82 | 181.3 |
| | 9/25/03 | 20.77 | 1043 | 1.18 | 4.33 | 222.7 |
| | 4/15/04 | 19.97 | 1181 | 1.43 | 4.60 | 270.1 |
| | 9/23/04 | 22.4 | 970 | 1.1 | 5.10 | 210.9 |
| | 4/8/05 | 17.6 | 1172 | 0.16 | 4.99 | 101.5 |
| | 9/30/05 | 21.7 | 1160 | 0.64 | 5.17 | 78.2 |
| MW-40 | 7/18/03 | 20.08 | 967 | -99.9 | 4.76 | 186.4 |
| | 9/25/03 | 24.79 | 3102 | 0.91 | 4.08 | 236.4 |
| | 4/15/04 | 18.76 | 877 | 1.16 | 5.03 | 207 |
| | 9/23/04 | 23.95 | 920 | 0.48 | 5.1 | 193.6 |
| | 9/29/05 | 22.36 | 0.852 | 0.35 | 4.8 | 259.5 |
| MW-41 | 7/18/03 | 19.63 | 0.696 | -24.1 | 5.08 | 72.8 |
| | 9/25/03 | 20.41 | 526 | 1.06 | 5.17 | 164.3 |
| | 4/15/04 | 18.93 | 984 | 1.24 | 5.16 | 203.1 |
| | 9/23/04 | 20.3 | 1285 | 0.45 | 5.43 | 207.8 |
| | 9/30/05 | 19.99 | 0.834 | 0.45 | 4.69 | 293.7 |
| MW-42 | 4/15/04 | 20.36 | 1059 | 4.08 | 5.17 | 79.2 |
| | 9/20/04 | 19.94 | 1016 | 3.81 | 5.29 | 81.4 |
| | 4/5/05 | 18.65 | 962 | 0.25 | 5.3 | -125 |
| | 9/27/05 | 23.29 | 0.968 | 0.27 | 5.17 | -4.5 |
| MW-43 | 4/15/04 | 19.41 | 414 | 1.86 | 6.97 | 86.3 |
| | 9/20/04 | 20.01 | 301 | 2.01 | 9.05 | 100.4 |
| | 9/27/05 | 25.27 | 386 | 0.49 | 5.2 | -18.3 |

NOTES:

--- = Parameter not monitored - well not sampled using low-flow techniques.
SC = specific conductants
DO = dissolved oxygen
ORP = oxidation-reduction potential
uS/cm = microsiemens per centimeter
(a) MW-46 through MW-63 were pumped dry prior to sampling.
(b) MW-38 was used as an injection well for the pilot study and has not been sampled using low-flow techniques.

TABLE H-2 (Cont'd)

Historic Field Data, Natural Parameters

Whirlpool Corporation
Fort Smith, Arkansas

| Well | | Date | Temp ($^oC$) | SC (uS/cm) | DO (mg/l) | pH (standard units) | ORP (mV) |
|---|---|---|---|---|---|---|---|
| MW-46 | (a) | 4/15/04 | 19.63 | 425 | 3.1 | 6.92 | 104.9 |
| | | 9/20/04 | 19.36 | 444 | 3.21 | 7.09 | 99.1 |
| | | 9/28/05 | 26.12 | 859 | 1.48 | 10.04 | -200 |
| MW-50 | (a) | 4/15/04 | 19.51 | 426 | 3.32 | 6.33 | 93.6 |
| | | 9/23/04 | --- | --- | --- | --- | --- |
| | | 4/5/05 | 18.72 | 1120 | 0.47 | 6.45 | -76.5 |
| | | 9/28/05 | 23.72 | 1.14 | 2.57 | 6.62 | -70.2 |
| MW-55 | (a) | 9/28/05 | 21.93 | 0.923 | 1.82 | 5.53 | 125.9 |
| MW-56 | (a) | 9/28/05 | 21.33 | 0.324 | 2.49 | 5.33 | 231.7 |
| MW-57 | (a) | 9/28/05 | 22.88 | 0.941 | 1.57 | 5.62 | 107.1 |
| MW-58 | (a) | 9/28/05 | 22.69 | 0.916 | 0.92 | 4.82 | 124.3 |
| MW-60 | (a) | 9/30/05 | 22.89 | 0.953 | 0.93 | 6.34 | -31.4 |
| MW-61 | (a) | 9/30/05 | 21.14 | 0.804 | 1.51 | 6.55 | 83.3 |
| MW-62 | (a) | 9/30/05 | 20.42 | 0.626 | 2.07 | 5.52 | 248.6 |
| MW-63 | (a) | 9/30/05 | 18.53 | 0.669 | 2.48 | 5.73 | 129.1 |

NOTES:

--- = Parameter not monitored - well not sampled using low-flow techniques.
SC = specific conductants
DO = dissolved oxygen
ORP = oxidation-reduction potential
uS/cm = microsiemens per centimeter
(a) MW-46 through MW-63 were pumped dry prior to sampling.
(b) MW-38 was used as an injection well for the pilot study and has not been sampled using low-flow techniques.

TABLE H-3

Geochemical Parameters

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Nitrogen, Nitrate (mg/l) | Sulfates (mg/l) | Chloride (mg/l) | Potassium (mg/l) | Ferrous Fe (mg/l) |
|---|---|---|---|---|---|---|
| ITMW-1 | 2/2/02 | 0.6 | 15.72 | --- | --- | 0.11 |
| | 9/2/02 | 0.4 | 14.71 | 180.5 | 0.93 | 0.02 |
| | 2/1/03 | 0.595 | 18.21 | 168.5 | 1.35 | 0.01 |
| | 9/24/03 | 0.2 | 17.97 | 166.5 | 1.41 | 0.00 |
| | 4/13/04 | 1.1 | 10.90 | 166.0 | <1 | 0.01 |
| | 9/21/04 | 0.5 | 31.40 | 142.5 | <1 | 0.00 |
| | Sept.-04 (Dup-2) | 0.5 | 31.90 | 140.0 | <1 | 0.00 |
| | 9/28/05 | 0.3 | 23.40 | 170 | <1 | 0.00 |
| ITMW-2 | 2/2/02 | --- | --- | --- | --- | |
| | 9/2/02 | 0.7 | 16.29 | 220 | 0.383 | 0.16 |
| | 2/1/03 | 0.401 | 16.17 | 32.5 | 1.26 | 0.05 |
| | 9/23/03 | 0.4 | 20.85 | 145 | 1.05 | 0.58 |
| | 4/13/04 | 0.4 | 7.70 | 45 | 2.100 | 0.49 |
| | April-04 (Dupl.1) | 0.6 | 8.50 | 47 | 2.200 | --- |
| | 9/21/04 | 0.6 | 26.10 | 150 | <1 | 0.06 |
| | Sept.-04 (Dup-1) | 0.6 | 24.70 | 150 | <1 | 0.06 |
| | 9/29/05 | 0.4 | 24.50 | 19 | <1 | 0.00 |
| ITMW-3 | 2/2/02 | --- | --- | --- | --- | --- |
| | 9/2/02 | 2.1 | 24.66 | 41.5 | 0.10 | 0.00 |
| | 2/1/03 | 0.587 | 31.26 | 31 | 0.192 | 0.05 |
| | 9/23/03 | 1.5 | 31.14 | 24.5 | 0.198 | 0.39 |
| | 4/13/04 | 1.6 | 25.80 | 25 | <1 | 0.02 |
| | 9/21/04 | 2.1 | 3.76 | 15 | <1 | 0.09 |
| | 9/28/05 | 0.9 | 37.30 | 40 | <1 | 0.00 |
| ITMW-4 | 2/2/02 | --- | --- | --- | --- | --- |
| | 9/2/02 | 0.1 | 27.82 | 18 | 0.82 | 3.30 |
| | 2/1/03 | 0.097 | 39.25 | 10.5 | 1.94 | 2.74 |
| | 9/23/03 | 17.5 | 49.38 | 21.5 | 1.25 | 3.31 |
| | 4/14/04 | 0.1 | 32.90 | 47.5 | 3.70 | 2.00 |
| | 9/22/04 | 0.1 | 30.00 | 10.0 | 1.80 | 3.30 |
| | 9/27/05 | 0.4 | 57.50 | 20 | 1.3 | 3.30 |
| ITMW-5 | 2/2/02 | 12.5 | 37.67 | --- | --- | 0.00 |
| | 9/2/02 | 15.0 | 35.46 | 116 | 0.21 | 0.00 |
| | 2/1/03 | 7.49 | 44.85 | 97.5 | 0.530 | 0.00 |

NOTES:

--- = Parameter not tested.
All units are mg/L
(a) MW-38 was used as an injection well for the pilot study and has not been sampled using low-flow techniques.

TABLE H-3 (Cont'd)

Geochemical Parameters

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Nitrogen, Nitrate (mg/l) | Sulfates (mg/l) | Chloride (mg/l) | Potassium (mg/l) | Ferrous Fe (mg/l) |
|---|---|---|---|---|---|---|
| ITMW-5 | 9/24/03 | 15.0 | 37.89 | 12 | 0.581 | 0.09 |
| (Cont'd) | 4/14/04 | 17.5 | 36.80 | 147.5 | <1 | 0.00 |
| | 9/22/04 | 25.7 | 40.00 | 100 | <1 | 0.00 |
| | 4/6/05 | 7.5 | 45.00 | 100 | <1 | 0.00 |
| | 9/28/05 | 5.0 | 19.90 | 125 | <1 | 0.00 |
| ITMW-6 | 2/2/02 | 27.5 | 123.9 | --- | --- | 0.15 |
| | 9/2/02 | 20 | 120.5 | 89 | 0.59 | 0.05 |
| | Sep-02 (Dupl.) | 20.0 | 122.90 | 86 | 0.57 | --- |
| | 2/1/03 | 25.79 | 140.7 | 74 | 0.991 | 0.11 |
| | 9/24/03 | 25 | 91.04 | 37 | 1.03 | 0.01 |
| | 4/14/04 | 30.0 | 95.00 | 125 | 1.00 | 0.36 |
| | 9/22/04 | 25.7 | 170.00 | 85 | 1.10 | 0.00 |
| | 9/28/05 | 7.5 | 180.50 | 100 | <1 | 0.00 |
| ITMW-7 | 2/2/02 | 3.1 | 22.39 | --- | --- | 0.24 |
| | 9/2/02 | 4.2 | 25.66 | 405 | 0.32 | 0.10 |
| | Sep-02 (Dupl.) | 3.7 | 21.50 | 410 | 0.32 | --- |
| | 2/1/03 | 1.375 | 26.73 | 297.5 | 0.649 | 0.06 |
| | 9/24/03 | 2.2 | 23.17 | 312 | 0.681 | 0.04 |
| | 4/14/04 | 2.7 | 22.50 | 309 | <1 | 0.05 |
| | 9/22/04 | 2.5 | 37.90 | 270 | <1 | 0.00 |
| | 4/7/05 | 2.0 | 26.40 | 312 | <1 | 0.00 |
| | 9/28/05 | 1.4 | 27.00 | 280 | <1 | 0.00 |
| ITMW-9 | 2/2/02 | --- | --- | --- | --- | --- |
| | 9/2/02 | 27.5 | 20.52 | 156.5 | 0.42 | 0.00 |
| | 2/1/03 | 21.99 | 28.82 | 132.0 | 1.63 | 0.07 |
| | 9/23/03 | 17.5 | 34.90 | 134 | 0.424 | 0.00 |
| | Sep-03(Dup-1) | 17.5 | 33.23 | 131 | 0.488 | 0.00 |
| | 4/14/04 | 27.5 | 20.43 | 152.5 | 1.20 | 0.14 |
| | 9/22/04 | 22.5 | 34.00 | 115.0 | <1 | 0.00 |
| | 4/6/05 | 17.5 | 30.70 | 130.0 | 1.10 | 0.00 |
| | 9/27/05 | 22.5 | 30.90 | 105 | <1 | 0.00 |
| ITMW-10 | 2/2/02 | 20 | 48.58 | --- | --- | 0.10 |
| | 9/2/02 | 15.0 | 41.41 | 106.5 | 0.24 | 0.05 |
| | 2/1/03 | 11.44 | 48.7 | 106 | 0.503 | 0.10 |

NOTES:

--- = Parameter not tested.
All units are mg/L
(a) MW-38 was used as an injection well for the pilot study and has not been sampled using low-flow techniques.

TABLE H-3 (Cont'd)

Geochemical Parameters

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Nitrogen, Nitrate (mg/l) | Sulfates (mg/l) | Chloride (mg/l) | Potassium (mg/l) | Ferrous Fe (mg/l) |
|---|---|---|---|---|---|---|
| ITMW-10 | 9/23/03 | 15 | 48.07 | 104.5 | 0.445 | 0.09 |
| (Cont'd) | 4/14/04 | 7.5 | 40.1 | 152.5 | <1 | 0.00 |
| | 9/22/04 | 15.0 | 50 | 100.0 | <1 | 0.00 |
| | 4/6/05 | 10.0 | 48.3 | 115.0 | <1 | 0.00 |
| | 9/28/05 | 5.0 | 15.20 | 110 | <1 | 0.00 |
| ITMW-11 | 2/2/02 | 0.4 | 25.14 | 23 | 0.785 | 0.09 |
| | 9/2/02 | 0.4 | 25.85 | 14 | 0.22 | 0.24 |
| | 2/1/03 | 0.136 | 13.82 | 16.5 | 0.727 | 0.09 |
| | Feb-03(Dup 1l) | 0.069 | 26.69 | 22.5 | 0.75 | --- |
| | 9/24/03 | 0.1 | 20.68 | 8 | 0.384 | 0.00 |
| | 4/13/04 | <0.1 | 15.30 | 5.5 | <1 | 0.00 |
| | 9/21/04 | 0.1 | 37.50 | 5.0 | <1 | 0.01 |
| | 4/7/05 | <0.2 | 18.30 | 20.0 | 9.800 | 0.00 |
| | 9/30/05 | <0.2 | 23.10 | 11 | 1.6 | 0.00 |
| ITMW-12 | 2/2/02 | 0.1 | 18.70 | 20.5 | 0.305 | 0.11 |
| | 9/2/02 | 0.1 | 17.56 | 35 | 0.168 | 0.05 |
| | 2/1/03 | 0.026 | 35.38 | 12.5 | 0.442 | 0.00 |
| | Feb-03 (Dupl 2) | 0.012 | 25.90 | 13.5 | 0.465 | --- |
| | 9/24/03 | 0.1 | 19.84 | 14 | 0.312 | 0.22 |
| | 4/13/04 | 0.1 | 18.90 | 13.5 | <1 | 0.06 |
| | 9/21/04 | <0.1 | 30.7 | 10.0 | <1 | 0.00 |
| | 9/29/05 | <0.2 | 21.30 | 11 | <1 | 0.00 |
| ITMW-13 | 2/2/02 | 0.6 | 10.70 | 39 | 0.755 | 0.00 |
| | 9/2/02 | 0.7 | 14.38 | 33 | 0.35 | 0.05 |
| | 2/1/03 | 0.243 | 33.86 | 27 | 0.760 | 0.00 |
| | 9/24/03 | 0.7 | 14.79 | 21 | 0.781 | 0.07 |
| | 4/13/04 | 0.6 | 7.20 | 25.5 | <1 | 0.26 |
| | 9/21/04 | 0.4 | 6.8 | 20.0 | <1 | 0.00 |
| | 4/7/05 | <0.2 | 7.66 | 20.0 | <1 | 0.00 |
| | 9/30/05 | 0.2 | 7.93 | 14 | <1 | 0.04 |
| ITMW-14 | 2/2/02 | --- | --- | --- | --- | --- |
| | 9/2/02 | 0.7 | 13.25 | 10 | 0.129 | 0.10 |
| | 2/1/03 | 0.372 | 17.68 | 9.5 | 0.407 | 0.07 |
| | 9/24/03 | 1.7 | 10.08 | 11.5 | 0.272 | 0.00 |
| | 4/13/04 | 0.4 | 13.00 | 9.5 | <1 | 0.21 |
| | 9/21/04 | 0.4 | 14.1 | 12.5 | <1 | 0.00 |
| | 9/30/05 | 0.3 | 15.20 | 9.0 | <1 | 0.01 |

NOTES:

--- = Parameter not tested.
All units are mg/L
(a) MW-38 was used as an injection well for the pilot study and has not been sampled using low-flow techniques.

TABLE H-3 (Cont'd)

Geochemical Parameters

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Nitrogen, Nitrate (mg/l) | Sulfates (mg/l) | Chloride (mg/l) | Potassium (mg/l) | Ferrous Fe (mg/l) |
|---|---|---|---|---|---|---|
| ITMW-15 | 2/2/02 | 1.2 | 15.03 | 16 | 1.74 | 2.70 |
| | 9/2/02 | 0.7 | 14.20 | 12.5 | 0.539 | 3.30 |
| | 2/1/03 | 0.067 | 13.95 | 8 | 1.17 | 0.00 |
| | 9/25/03 | 0.1 | 12.77 | 16.5 | 0.660 | 0.10 |
| | 4/14/04 | <0.1 | 11.00 | 47.5 | <1 | 0.42 |
| | 9/21/04 | 0.2 | 14.9 | 25.0 | <1 | 0.00 |
| | 4/7/05 | <0.2 | 9.13 | 40.0 | 2.000 | 0.00 |
| | 9/29/05 | 0.2 | 15.30 | 33 | 1.6 | 0.05 |
| ITMW-16 | 2/2/02 | --- | --- | --- | --- | 0.82 |
| | 9/2/02 | 2.5 | 16.02 | 10 | 1.82 | 3.04 |
| | 2/1/03 | 3.52 | 87.3 | 3.0 | 3.51 | 0.06 |
| | 9/25/03 | 0.3 | 26.65 | 1.5 | 3.91 | 1.07 |
| | 4/15/04 | 0.3 | 6.90 | 35 | 3.600 | 0.11 |
| | 9/23/04 | 0.2 | 21.60 | 10 | 3.700 | 0.02 |
| | 9/29/05 | 0.3 | 23.10 | 6 | 4.0 | 0.37 |
| | 9/29/2005 (Dup-2) | 0.3 | 20.20 | 8 | 4.1 | --- |
| ITMW-17 | 2/2/02 | 0.4 | 7.956 | 412.5 | 1.66 | 0.03 |
| | 9/2/02 | 0.2 | 10.63 | 230 | 0.494 | 0.00 |
| | 2/1/03 | 0.163 | 10.30 | 250.5 | 1.46 | 0.00 |
| | 9/25/03 | <0.1 | 8.836 | 195.5 | 0.940 | 0.03 |
| | 4/14/04 | 0.2 | 4.80 | 249 | 1.10 | 0.05 |
| | April-04 (Dupl.2) | 0.2 | 4.70 | 245 | 1.20 | --- |
| | 9/23/04 | 0.1 | 8.89 | 200 | <1 | 0.00 |
| | 4/7/05 | <0.2 | 2.44 | 250 | <1 | 0.00 |
| | 9/29/05 | 0.2 | 3.31 | 259 | 1.2 | 0.00 |
| ITMW-18 | 2/2/02 | --- | --- | --- | --- | --- |
| | 9/2/02 | 4.2 | 0.814 | 165 | 0.337 | 0.22 |
| | 2/1/03 | 2.18 | <1 | 127.5 | 1.59 | 0.16 |
| | 9/24/03 | 2.20 | <1 | 160.5 | 0.706 | 0.32 |
| | 4/13/04 | 2.6 | 2.00 | 137 | <1 | 0.23 |
| | 9/21/04 | 2.6 | <1 | 115 | <1 | 0.00 |
| | 4/8/05 | 1.9 | <1 | 185 | <1 | 0.00 |
| | 9/29/05 | 1.5 | 2.78 | 93 | <1 | 0.00 |

NOTES:

--- = Parameter not tested.
All units are mg/L
(a) MW-38 was used as an injection well for the pilot study and has not been sampled using low-flow techniques.

TABLE H-3 (Cont'd)

Geochemical Parameters

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Nitrogen, Nitrate (mg/l) | Sulfates (mg/l) | Chloride (mg/l) | Potassium (mg/l) | Ferrous Fe (mg/l) |
|---|---|---|---|---|---|---|
| ITMW-19 | 2/2/02 | 2.7 | 0.753 | 437.5 | 1.33 | 0.08 |
| | 9/2/02 | 2.5 | 9.678 | 232.5 | 0.519 | 0.10 |
| | 2/1/03 | 4.95 | 9.586 | 235.5 | 1.02 | 0.00 |
| | 9/24/03 | 1.7 | 2.403 | 237 | 0.916 | 0.00 |
| | 4/13/04 | 1.9 | 4.00 | 218.5 | <1 | 0.00 |
| | 9/21/04 | 2.2 | 3.84 | 185.0 | <1 | 0.00 |
| | 4/7/05 | 1.1 | <1 | 215 | 1.0 | 0.00 |
| | 9/29/05 | 1.1 | <1 | 226 | <1 | 0.01 |
| ITMW-20 | 2/2/02 | 0.5 | 22.53 | --- | --- | 3.19 |
| | 9/2/02 | 30 | 20.47 | 117 | 0.56 | 0.05 |
| | 2/1/03 | 0.329 | 27.25 | 104 | 0.955 | 0.10 |
| | 9/24/03 | 0.4 | 19.08 | 112 | 0.941 | 0.04 |
| | 4/14/04 | 0.4 | 18.6 | 150 | <1 | 0.09 |
| | 9/22/04 | 0.7 | 30.00 | 90 | 1.20 | 0.04 |
| | 9/29/05 | 0.6 | 27.00 | 109 | <1 | 0.00 |
| ITMW-21 | 2/2/02 | --- | --- | --- | --- | --- |
| | 9/2/02 | 0.1 | 7.03 | 405 | 0.17 | 2.75 |
| | 2/1/03 | 0.479 | <1 | 697.5 | 0.633 | 0.08 |
| | 9/23/03 | 0.3 | <1 | 285 | 0.291 | 0.00 |
| | 4/14/04 | 0.5 | 1.90 | 585 | <1 | 0.00 |
| | 9/22/04 | 0.2 | 7.04 | 100 | <1 | 0.17 |
| | 9/28/05 | <0.2 | <1 | 600 | <1 | 0.00 |
| MW-22 | 2/2/02 | --- | --- | --- | --- | --- |
| | 9/2/02 | <0.1 | 17.27 | 36.5 | 0.09 | 0.01 |
| | 2/1/03 | 0.052 | 24.12 | 25.5 | 0.253 | 0.57 |
| | 9/23/03 | 0.2 | 22.61 | 25.5 | 0.176 | 0.00 |
| | Sep-03(Dup-2) | 0.20 | 20.65 | 28.5 | 0.175 | 0.00 |
| | 4/13/04 | 0.2 | 16.70 | 25.5 | <1 | 0.00 |
| | 9/21/04 | <0.1 | 13.50 | 20 | <1 | 0.00 |
| | 9/30/05 | <0.2 | 23.60 | 19 | <1 | 0.00 |
| MW-23 | 2/2/02 | 0.3 | 12.27 | --- | --- | 0.08 |
| | 9/2/02 | 0.2 | 8.988 | 372 | 0.369 | 0.00 |
| | Sep-02 (Dupl.) | 0.4 | 9.40 | 366 | 0.37 | --- |
| | 2/1/03 | 0.177 | 19.52 | 292.0 | 0.74 | 0.00 |

NOTES:

--- = Parameter not tested.
All units are mg/L
(a) MW-38 was used as an injection well for the pilot study and has not been sampled using low-flow techniques.

TABLE H-3 (Cont'd)

Geochemical Parameters

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Nitrogen, Nitrate (mg/l) | Sulfates (mg/l) | Chloride (mg/l) | Potassium (mg/l) | Ferrous Fe (mg/l) |
|---|---|---|---|---|---|---|
| MW-23 | 9/25/03 | 0.3 | 8.383 | 335 | 0.628 | 0.29 |
| (Cont'd) | 4/15/04 | 0.3 | 7.60 | 329 | <1 | 0.72 |
| | 9/22/04 | 0.1 | 67.50 | 245 | <1 | 0.05 |
| | 4/5/05 | <0.2 | 17.90 | 250 | <1 | 0.00 |
| | 9/29/05 | 0.4 | 9.12 | 278 | <1 | |
| MW-24 | 2/2/02 | --- | --- | --- | --- | --- |
| | 9/2/02 | 1.9 | 0.955 | 497.5 | 0.411 | 0.25 |
| | 2/1/03 | 0.375 | <1.0 | 395.5 | 0.664 | 0.00 |
| | 9/25/03 | 0.9 | <1 | 425 | 0.749 | 0.59 |
| | 4/15/04 | 0.8 | 1.80 | 225 | <1 | 0.16 |
| | 9/23/04 | 0.7 | <1 | 330 | <1 | 0.06 |
| | 4/6/05 | 0.5 | <1 | 393 | <1 | 0.00 |
| | 9/29/05 | 1.1 | <1 | 452 | <1 | 0.00 |
| MW-25 | 2/2/02 | 0.4 | 0.402 | --- | --- | 0.19 |
| | 9/2/02 | <0.1 | 0.651 | 865 | 0.35 | 0.72 |
| | 2/1/03 | 0.617 | <1 | 677 | 0.503 | 0.08 |
| | 9/24/03 | <0.1 | <1 | 652.5 | 0.530 | 0.53 |
| | 4/14/04 | 0.3 | <1 | 495 | <1 | 0.32 |
| | 9/21/04 | 0.1 | <1 | 475 | <1 | 0.07 |
| | 4/7/05 | <0.2 | <1 | 570 | <1 | 0.01 |
| | 9/28/05 | <0.2 | <1 | 530 | <1 | 0.44 |
| MW-26 | 2/2/02 | 1.5 | 22.53 | --- | --- | 0.03 |
| | 9/2/02 | 3.6 | 10.35 | 339.5 | 0.14 | 0.00 |
| | 2/1/03 | 1.245 | 10.24 | 249 | 0.236 | 0.07 |
| | 9/24/03 | 2.0 | 8.679 | 324.5 | 0.237 | 0.02 |
| | 4/14/04 | 1.8 | 5.90 | 325 | <1 | 0.07 |
| | 9/22/04 | 2.7 | 10.00 | 270 | <1 | 0.00 |
| | 9/29/05 | 2.0 | 4.29 | 352 | <1 | 0.00 |
| MW-27 | 2/2/02 | | | | | |
| | 9/2/02 | 0.3 | 19.97 | 48 | 0.241 | 0.06 |
| | Sep-02 (Dupl.) | 0.2 | 20.43 | 36 | 0.23 | --- |
| | 2/1/03 | 0.183 | 18.03 | 21.5 | 1.10 | 0.49 |
| | 9/25/03 | 0.4 | 18.01 | 50 | 0.848 | 0.07 |
| | 4/15/04 | 0.9 | 9.60 | 57.5 | <1 | 0.23 |
| | 9/22/04 | 0.2 | 26.50 | 35 | <1 | 0.61 |
| | 9/29/05 | 0.4 | 31.30 | 30.5 | <1 | 0.01 |

NOTES:

--- = Parameter not tested.
All units are mg/L
(a) MW-38 was used as an injection well for the pilot study and has not been sampled using low-flow techniques.

TABLE H-3 (Cont'd)

Geochemical Parameters

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Nitrogen, Nitrate (mg/l) | Sulfates (mg/l) | Chloride (mg/l) | Potassium (mg/l) | Ferrous Fe (mg/l) |
|---|---|---|---|---|---|---|
| MW-28 | 2/2/02 | 0.3 | 47.63 | --- | --- | 3.30 |
| | 9/2/02 | 0.2 | 42.98 | 57 | 0.180 | 1.03 |
| | 2/1/03 | 0.004 | 48.14 | 57.5 | 0.500 | 0.16 |
| | 9/25/03 | 0.2 | 45.39 | 70 | 0.330 | 0.62 |
| | 4/15/04 | <0.1 | 36.00 | 77.5 | <1 | 0.13 |
| | 9/22/04 | 0.1 | 59.00 | 40 | <1 | 0.21 |
| | 9/30/05 | <0.2 | 35.40 | 36 | <1 | 0.22 |
| MW-29 | 2/2/02 | --- | --- | --- | --- | --- |
| | 9/2/02 | 3.3 | 12.19 | 231.5 | 0.20 | 0.00 |
| | 2/1/03 | 1.107 | 19.21 | 108.5 | 0.551 | 0.03 |
| | 9/24/03 | 2.2 | 15.03 | 2115 | 0.367 | 0.07 |
| | 4/14/04 | 2.2 | 28.50 | 167.5 | <1 | 0.24 |
| | 9/22/04 | 3.4 | 33.10 | 170 | <1 | 0.10 |
| | 9/28/05 | 2.2 | 27.10 | 185 | <1 | 0.00 |
| MW-30 | 2/2/02 | --- | --- | --- | --- | --- |
| | 9/2/02 | 3.3 | 8.667 | 351.5 | 0.56 | 0.00 |
| | 2/1/03 | 1.328 | 10.91 | 339 | 0.460 | 0.01 |
| | 9/24/03 | 1.3 | 4.802 | 355 | 0.562 | 0.13 |
| | 4/14/04 | 1.5 | 4.60 | 615 | <1 | 0.00 |
| | 9/22/04 | 1.6 | 6.40 | 265 | <1 | 0.07 |
| | 9/28/05 | 1.3 | 2.04 | 330 | <1 | 0.01 |
| MW-31 | 2/2/02 | 0.5 | 10.92 | --- | --- | --- |
| | 9/2/02 | 0.7 | 17.33 | 233.5 | 0.682 | --- |
| | 2/1/03 | 0.010 | 19.58 | 385 | 0.93 | --- |
| | 9/25/03 | 1.1 | 8.598 | 348 | 0.885 | 3.30 |
| | 4/15/04 | 0.2 | 5.50 | 377.5 | <1 | 0.05 |
| | 9/23/04 | 0.2 | 33.30 | 300.0 | 1.700 | --- |
| | 4/5/05 | <0.2 | 32.30 | 105 | <1 | 0.17 |
| | 9/27/05 | 0.4 | 11.20 | 170 | <1 | 0.31 |
| MW-32 | 2/2/02 | 0.4 | <1.0 | --- | --- | 0.56 |
| | 9/2/02 | 2.5 | 0.746 | 378 | 0.380 | 3.30 |
| | 2/1/03 | 0.078 | 15.83 | 387 | 2.58 | 0.53 |
| | 9/25/03 | 0.2 | 1.097 | 490 | 1.22 | 1.81 |
| | 4/15/04 | 0.6 | <1 | 440 | <1 | 0.13 |

NOTES:

--- = Parameter not tested.
All units are mg/L
(a) MW-38 was used as an injection well for the pilot study and has not been sampled using low-flow techniques.

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TABLE H-3 (Cont'd)

Geochemical Parameters

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Nitrogen, Nitrate (mg/l) | Sulfates (mg/l) | Chloride (mg/l) | Potassium (mg/l) | Ferrous Fe (mg/l) |
|---|---|---|---|---|---|---|
| MW-32 | 9/23/04 | <0.1 | 295 | 323 | 1.80 | --- |
| (Cont'd) | 4/5/05 | <0.2 | <1 | 375 | <1 | 0.06 |
| | 9/27/05 | 0.3 | 8.46 | 350 | <1 | 0.00 |
| MW-33 | 2/2/02 | 0.3 | 6.502 | --- | --- | 0.48 |
| | 9/2/02 | 5.0 | 11.83 | 77 | 0.324 | --- |
| | 2/1/03 | 0.853 | 3.725 | 43 | 0.621 | 0.48 |
| | 9/25/03 | 0.2 | 3.065 | 110 | 0.386 | 2.03 |
| | 4/15/04 | 7.5 | <1 | 182.5 | 1.40 | 0.07 |
| | 9/23/04 | 0.5 | 182 | 100.0 | 1.90 | --- |
| | 4/5/05 | 3.6 | 20.40 | 225 | 2.30 | 0.48 |
| | 9/27/05 | <0.2 | 7.19 | 141 | <1 | 0.04 |
| MW-34 | 2/2/02 | 0.4 | 4.05 | --- | --- | 3.30 |
| | 9/1/02 | 10 | 2.422 | 355 | 1.07 | 3.30 |
| | 2/1/03 | 0.089 | 7.515 | 206.5 | 2.91 | 3.30 |
| | 9/25/03 | 22.5 | 1.168 | 230 | 3.59 | 3.30 |
| | 4/15/04 | 1.1 | 1.20 | 342.5 | 1.30 | 3.30 |
| | 9/23/04 | 0.3 | <1 | 255.0 | <1 | 0.00 |
| | 4/5/05 | 0.4 | 21.90 | 265 | 1.1 | 0.46 |
| | 9/30/05 | 0.2 | <1 | 349 | <1 | 0.05 |
| MW-35 | 2/2/02 | 0.7 | 6.190 | --- | --- | 0.42 |
| | 9/2/02 | 0.8 | 6.098 | 340 | 0.69 | 0.06 |
| | 2/1/03 | 0.189 | 6.9 | 289 | 3.90 | 0.00 |
| | 9/25/03 | 2.6 | 1.62 | 280 | 3.49 | 3.30 |
| | 4/15/04 | 0.9 | 2.00 | 327.5 | 1.20 | 3.30 |
| | 9/23/04 | 0.7 | 4.16 | 270.0 | <1 | 0.06 |
| | 4/6/05 | 0.3 | <1 | 305 | <1 | 0.00 |
| | 9/30/05 | 0.5 | 2.58 | 249 | <1 | 0.00 |
| MW-36 | 2/2/02 | 0.6 | <1.0 | --- | --- | 2.21 |
| | 9/2/02 | 0.1 | 0.261 | 505 | 1.35 | 0.41 |
| | 2/1/03 | 1.608 | <1.0 | 214 | 2.89 | 0.00 |
| | 9/25/03 | 1.2 | 10.89 | 550 | 1.45 | 3.30 |
| | 4/15/04 | 0.1 | <1 | 500 | <1 | 1.87 |
| | 9/23/04 | <0.1 | <1 | 345 | <1 | 0.18 |
| | 4/6/05 | 0.4 | <1 | 395 | <1 | 0.04 |
| | 9/30/05 | <0.2 | <1 | 377.0 | <1 | 0.00 |

NOTES:

--- = Parameter not tested.
All units are mg/L
(a) MW-38 was used as an injection well for the pilot study and has not been sampled using low-flow techniques.

TABLE H-3 (Cont'd)

Geochemical Parameters

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Nitrogen, Nitrate (mg/l) | Sulfates (mg/l) | Chloride (mg/l) | Potassium (mg/l) | Ferrous Fe (mg/l) |
|---|---|---|---|---|---|---|
| MW-37 | 2/2/02 | 1.1 | 11.68 | 19.5 | 19.6 | 0.13 |
| | 9/2/02 | 0.1 | 26.12 | 22.5 | 2.08 | 3.30 |
| | 2/1/03 | 1.131 | 24.52 | 28.5 | 4.21 | 0.31 |
| | 9/25/03 | 0.2 | 19.80 | 17 | 2.89 | 3.30 |
| | 4/13/04 | 0.2 | 13.90 | 15.5 | 4.000 | 0.40 |
| | 9/21/04 | <0.1 | 20.60 | 10.0 | 2.900 | 0.00 |
| | 4/8/05 | <0.2 | 22.20 | 15 | 4.0 | 0.61 |
| | 9/29/05 | 0.2 | 33.10 | 18 | 2.8 | 2.19 |
| MW-38 | 2/2/02 | --- | --- | --- | --- | --- |
| | 9/29/05 | 0.7 | 35.00 | 14 | 67.0 | 3.30 |
| MW-39 | 9/25/03 | 0.4 | 1.512 | 340 | 1.00 | 0.58 |
| | 4/15/04 | <0.1 | 1.10 | 342.5 | <1 | 0.56 |
| | 9/23/04 | 0.1 | 12.80 | 240 | 1.20 | 0.00 |
| | 4/8/05 | <0.2 | <1 | 340 | <1 | 0.20 |
| | 9/30/05 | 0.2 | <1 | 287 | <1 | 0.13 |
| MW-40 | 9/25/03 | 0.4 | <1 | 285 | 0.55 | 0.48 |
| | 4/15/04 | 0.1 | 2.20 | 267.5 | <1 | 0.68 |
| | 9/23/04 | 0.1 | <1 | 185 | <1 | 0.01 |
| | 4/7/05 | <0.2 | <1 | 225 | <1 | 0.12 |
| | 9/29/05 | <0.2 | <1 | 192 | <1 | 0.00 |
| | 9/29/2005 (MS) | <0.2 | <1 | 189 | <1 | --- |
| | 9/29/2005 (MSD) | <0.2 | <1 | 196 | <1 | --- |
| MW-41 | 9/25/03 | 0.3 | <1 | 164.5 | 3.70 | 0.72 |
| | 4/15/04 | 0.2 | 2.90 | 250 | 2.30 | 0.68 |
| | 9/23/04 | 0.5 | <1 | 210.00 | 1.10 | 0.41 |
| | 4/7/05 | <0.2 | <1 | 380 | <1 | 0.34 |
| | 9/30/05 | 0.5 | <1 | 183 | <1 | 0.00 |
| (a) | 9/2/02 | --- | --- | --- | --- | --- |
| MW-42 | 4/15/04 | 5.0 | 1.00 | 345 | 1.600 | 0.26 |
| | 9/20/04 | 0.2 | 31.00 | 325 | 2.800 | --- |
| | 4/5/05 | <0.2 | 15.00 | 280 | 1.2 | 3.30 |
| | 9/28/05 | 0.3 | 1.73 | 290 | 1.4 | 3.30 |

NOTES:

--- = Parameter not tested.
All units are mg/L
(a) MW-38 was used as an injection well for the pilot study and has not been sampled using low-flow techniques.

TABLE H-3 (Cont'd)

Geochemical Parameters

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Nitrogen, Nitrate (mg/l) | Sulfates (mg/l) | Chloride (mg/l) | Potassium (mg/l) | Ferrous Fe (mg/l) |
|---|---|---|---|---|---|---|
| MW-43 | 4/15/04 | 2.5 | 16.80 | 125 | 3.500 | 2.26 |
| | 9/20/04 | 1.1 | 231.20 | 50 | 15.000 | --- |
| | 4/5/05 | 0.9 | 72.00 | 40 | 1.2 | 0.63 |
| | 9/27/05 | <0.2 | 30.10 | 95 | 1.2 | 1.00 |
| MW-46 | 4/15/04 | 7.5 | 6.20 | 120 | 55.000 | 0.16 |
| | 9/20/04 | 0.4 | 65.50 | 100 | 11.000 | --- |
| | 4/6/05 | 0.2 | 3.33 | 230 | 5.8 | --- |
| | 9/28/05 | 0.6 | 25.40 | 250 | 4.1 | 2.46 |
| MW-50 | 4/15/04 | 0.5 | 47.50 | 155 | 130.00 | --- |
| | 9/20/04 | 0.4 | 136.80 | 165 | 3.20 | --- |
| | 4/6/05 | 0.2 | 24.90 | 190 | 1.5 | 2.76 |
| | 9/28/05 | 2.4 | 108.00 | 200 | 2.1 | 2.49 |
| MW-55 | 4/8/05 | 0.3 | 1.14 | 270 | 1.0 | 1.11 |
| | 9/28/05 | 0.3 | 16.60 | 285 | <1 | 1.98 |
| MW-56 | 4/8/05 | 3.2 | 95.30 | 40 | 1.5 | 0.00 |
| | 9/28/05 | 1.5 | 58.00 | 119 | <1 | --- |
| MW-57 | 4/8/05 | <0.2 | 11.20 | 375 | <1 | --- |
| | 9/28/05 | 0.6 | 33.60 | 285 | <1 | 1.24 |
| MW-58 | 4/7/05 | 0.2 | 1 | 0.1 | 1 | 0.86 |
| | 9/28/05 | 3.0 | 106.50 | 285 | <1 | 0.10 |
| MW-60 | 9/30/05 | 10.0 | 675.00 | 137 | 1.7 | 0.60 |
| MW-61 | 9/30/05 | 27.5 | 560.00 | 47 | 2.8 | 0.02 |
| MW-62 | 9/30/05 | 37.5 | 68.80 | 137 | 1.3 | 0.00 |
| MW-63 | 9/30/05 | 22.5 | 480.00 | 162 | 1.5 | --- |

NOTES:

--- = Parameter not tested.
All units are mg/L
(a) MW-38 was used as an injection well for the pilot study and has not been sampled using low-flow techniques.

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-1 ITMW-1 11/1/1989 | ITMW-1 ITMW-1 1/1/1990 | ITMW-1 ITMW-1 11/1/1993 | ITMW-1 ITMW-1 12/1/1996 | ITMW-1 ITMW-1 2/1/1999 | ITMW-1 ITMW-1 3/1/2000 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| 1,1,2,2-Tetrachloroethane | | | | | | |
| 1,1,2-Trichloroethane | | | | | | |
| 1,1-Dichloroethane | | | | | | |
| 1,1-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| 1,2-Dichloroethane | | | | | | |
| 1,2-Dichloroethene (total) | | | | | | |
| 1,2-Dichloropropane | | | | | | |
| 2-Hexanone | | | | | | |
| 4-Methyl-2-pentanone (MIBK) | | | | | | |
| Acetone | | | | | | |
| Benzene | | | | | | |
| Bromodichloromethane | | | | | | |
| Bromoform | | | | | | |
| Bromomethane | | | | | | |
| Carbon Disulfide | | | | | | |
| Carbon Tetrachloride | | | | | | |
| Chlorobenzene | | | | | | |
| Chloroethane | | | | | | |
| Chloroform | | | | | | |
| Chloromethane | | | | | | |
| cis-1,2-Dichloroethene | | | | | ND (unk) | 0.008 |
| cis-1,3-Dichloropropene | | | | | | |
| Dibromochloromethane | | | | | | |
| Ethylbenzene | | | | | | |
| Methyl Ethyl Ketone (2-Butanone) | | | | | | |
| Methylene Chloride | | | | | | |
| Styrene | | | | | | |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| trans-1,2-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| trans-1,3-Dichloropropene | | | | | | |
| Trichloroethene | ND (unk) | ND (unk) | 0.01 | 0.021 | 0.037 | 0.125 |
| Vinyl Chloride | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| Xylenes (total) | | | | | | |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-1 MW-1 9/19/2000 | ITMW-1 MW-1 3/27/2001 | ITMW-1 MW-1 9/11/2001 | ITMW-1 ITMW-1 9/10/2002 | ITMW-1 ITMW-1 2/27/2003 | ITMW-1 ITMW-1 9/23/2003 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | ND (0.01) | ND (0.01) | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.005) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.00745 | 0.006 | 0.009 | 0.009 | 0.00714 | 0.012 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.0307 | 0.03 | 0.027 | 0.035 | 0.0296 | 0.025 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.01) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | ITMW-1 ITMW-1 4/13/2004 | ITMW-1 ITMW-1 9/21/2004 | ITMW-1 ITMW-1 Dup2 9/21/2004 | ITMW-1 ITMW-1 9/28/2005 |
|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | 0.0113 |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.0111 | 0.0167 | 0.0158 | 0.0113 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.0422 | 0.026 | 0.0261 | 0.0347 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | ITMW-2<br>ITMW-2<br>10/1/1989 | ITMW-2<br>ITMW-2<br>11/1/1989 | ITMW-2<br>ITMW-2<br>1/1/1990 | ITMW-2<br>ITMW-2 DUP<br>11/1/1990 | ITMW-2<br>ITMW-2<br>3/1/1991 | ITMW-2<br>ITMW-2<br>11/1/1993 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| 1,1,2,2-Tetrachloroethane | | | | | | |
| 1,1,2-Trichloroethane | | | | | | |
| 1,1-Dichloroethane | | | | | | |
| 1,1-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| 1,2-Dichloroethane | | | | | | |
| 1,2-Dichloroethene (total) | | | | | | |
| 1,2-Dichloropropane | | | | | | |
| 2-Hexanone | | | | | | |
| 4-Methyl-2-pentanone (MIBK) | | | | | | |
| Acetone | | | | | | |
| Benzene | | | | | | |
| Bromodichloromethane | | | | | | |
| Bromoform | | | | | | |
| Bromomethane | | | | | | |
| Carbon Disulfide | | | | | | |
| Carbon Tetrachloride | | | | | | |
| Chlorobenzene | | | | | | |
| Chloroethane | | | | | | |
| Chloroform | | | | | | |
| Chloromethane | | | | | | |
| cis-1,2-Dichloroethene | | | | | | |
| cis-1,3-Dichloropropene | | | | | | |
| Dibromochloromethane | | | | | | |
| Ethylbenzene | | | | | | |
| Methyl Ethyl Ketone (2-Butanone) | | | | | | |
| Methylene Chloride | | | | | | |
| Styrene | | | | | | |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| trans-1,2-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| trans-1,3-Dichloropropene | | | | | | |
| Trichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | 0.004 |
| Vinyl Chloride | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| Xylenes (total) | | | | | | |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | ITMW-2<br>ITMW-2<br>12/1/1996 | ITMW-2<br>ITMW-2<br>3/1/2000 | ITMW-2<br>MW-2<br>9/19/2000 | ITMW-2<br>MW-2<br>3/27/2001 | ITMW-2<br>MW-2<br>9/13/2001 | ITMW-2<br>ITMW-2<br>9/11/2002 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | ND (0.01) | ND (0.01) | | |
| 1,2-Dichloropropane | | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | | | 0.0223 | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | | | ND (0.005) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.0034 | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (unk) | ND (unk) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | | | ND (0.01) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID / Sample ID / Constituents / Date | ITMW-2<br>ITMW-2<br>2/27/2003 | ITMW-2<br>ITMW-2<br>9/23/2003 | ITMW-2<br>ITMW-2<br>4/13/2004 | ITMW-2<br>ITMW-2 DUP-1<br>4/13/2004 | ITMW-2<br>ITMW-2<br>9/21/2004 | ITMW-2<br>ITMW-2 Dup1<br>9/21/2004 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID / Sample ID / Constituents Date | ITMW-3<br>ITMW-3<br>10/1/1989 | ITMW-3<br>ITMW-3<br>1/1/1990 | ITMW-3<br>ITMW-3<br>11/1/1993 | ITMW-3<br>ITMW-3<br>12/1/1996 | ITMW-3<br>ITMW-3<br>2/1/1999 | ITMW-3<br>ITMW-3<br>3/1/2000 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| 1,1,2,2-Tetrachloroethane | | | | | | |
| 1,1,2-Trichloroethane | | | | | | |
| 1,1-Dichloroethane | | | | | | |
| 1,1-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| 1,2-Dichloroethane | | | | | | |
| 1,2-Dichloroethene (total) | | | | | | |
| 1,2-Dichloropropane | | | | | | |
| 2-Hexanone | | | | | | |
| 4-Methyl-2-pentanone (MIBK) | | | | | | |
| Acetone | | | | | | |
| Benzene | | | | | | |
| Bromodichloromethane | | | | | | |
| Bromoform | | | | | | |
| Bromomethane | | | | | | |
| Carbon Disulfide | | | | | | |
| Carbon Tetrachloride | | | | | | |
| Chlorobenzene | | | | | | |
| Chloroethane | | | | | | |
| Chloroform | | | | | | |
| Chloromethane | | | | | | |
| cis-1,2-Dichloroethene | | | | | ND (unk) | ND (unk) |
| cis-1,3-Dichloropropene | | | | | | |
| Dibromochloromethane | | | | | | |
| Ethylbenzene | | | | | | |
| Methyl Ethyl Ketone (2-Butanone) | | | | | | |
| Methylene Chloride | | | | | | |
| Styrene | | | | | | |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| trans-1,2-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| trans-1,3-Dichloropropene | | | | | | |
| Trichloroethene | ND (unk) | ND (unk) | 0.003 | 0.0017 | ND (unk) | ND (unk) |
| Vinyl Chloride | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| Xylenes (total) | | | | | | |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | ITMW-3<br>ITMW-3 DUP<br>3/1/2000 | ITMW-3<br>MW-3<br>9/19/2000 | ITMW-3<br>MW-3<br>3/27/2001 | ITMW-3<br>MW-3<br>9/11/2001 | ITMW-3<br>ITMW-3<br>9/10/2002 | ITMW-3<br>ITMW-3<br>2/27/2003 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | ND (0.01) | ND (0.01) | | | |
| 1,2-Dichloropropane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | | ND (0.005) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | 0.015 | ND (0.005) |
| Vinyl Chloride | ND (unk) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | | ND (0.01) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID<br>Sample ID<br>Constituents Date | ITMW-3<br>ITMW-30<br>2/27/2003 | ITMW-3<br>ITMW-3<br>9/23/2003 | ITMW-3<br>ITMW-3<br>4/13/2004 | ITMW-3<br>ITMW-3<br>9/21/2004 | ITMW-3<br>ITMW-3<br>9/28/2005 |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.0203 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.06 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-4 ITMW-4 10/1/1989 | ITMW-4 ITMW-4 11/1/1989 | ITMW-4 ITMW-4 1/1/1990 | ITMW-4 ITMW-4 11/1/1993 | ITMW-4 ITMW-4 12/1/1996 | ITMW-4 ITMW-4 2/1/1999 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| 1,1,2,2-Tetrachloroethane | | | | | | |
| 1,1,2-Trichloroethane | | | | | | |
| 1,1-Dichloroethane | | | | | | |
| 1,1-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| 1,2-Dichloroethane | | | | | | |
| 1,2-Dichloroethene (total) | | | | | | |
| 1,2-Dichloropropane | | | | | | |
| 2-Hexanone | | | | | | |
| 4-Methyl-2-pentanone (MIBK) | | | | | | |
| Acetone | | | | | | |
| Benzene | | | | | | |
| Bromodichloromethane | | | | | | |
| Bromoform | | | | | | |
| Bromomethane | | | | | | |
| Carbon Disulfide | | | | | | |
| Carbon Tetrachloride | | | | | | |
| Chlorobenzene | | | | | | |
| Chloroethane | | | | | | |
| Chloroform | | | | | | |
| Chloromethane | | | | | | |
| cis-1,2-Dichloroethene | | | | | | 0.054 |
| cis-1,3-Dichloropropene | | | | | | |
| Dibromochloromethane | | | | | | |
| Ethylbenzene | | | | | | |
| Methyl Ethyl Ketone (2-Butanone) | | | | | | |
| Methylene Chloride | | | | | | |
| Styrene | | | | | | |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| trans-1,2-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| trans-1,3-Dichloropropene | | | | | | |
| Trichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | 0.075 | 0.093 |
| Vinyl Chloride | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| Xylenes (total) | | | | | | |
| | | | | | | |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroric data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | ITMW-4<br>ITMW-4<br>3/1/2000 | ITMW-4<br>MW-4<br>9/20/2000 | ITMW-4<br>MW-4<br>3/28/2001 | ITMW-4<br>MW-4<br>9/13/2001 | ITMW-4<br>ITMW-4<br>9/10/2002 | ITMW-4<br>ITMW-4<br>2/28/2003 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | 0.0106 | ND (0.01) | | | |
| 1,2-Dichloropropane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | | ND (0.005) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | | 0.00574 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.016 | 0.0106 | ND (0.005) | 0.008 | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | | 0.0677 | ND (0.01) | 0.04 | ND (0.01) | ND (0.01) |
| Styrene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.022 | 0.0139 | 0.009 | 0.006 | 0.009 | ND (0.005) |
| Vinyl Chloride | ND (unk) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | | ND (0.01) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |
| | | | | | | |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroric data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | ITMW-4 ITMW-4 9/23/2003 | ITMW-4 ITMW-4 4/14/2004 | ITMW-4 ITMW-4 9/22/2004 | ITMW-4 ITMW-4 9/27/2005 |
|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | 0.0117 | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | 0.0109 | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | ITMW-5<br>ITMW-5<br>10/1/1989 | ITMW-5<br>ITMW-5<br>1/1/1990 | ITMW-5<br>ITMW-5<br>12/1/1996 | ITMW-5<br>ITMW-5<br>2/1/1999 | ITMW-5<br>ITMW-5<br>3/1/2000 | ITMW-5<br>MW-5<br>9/20/2000 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | | | | | | ND (0.005) |
| 1,1,2-Trichloroethane | | | | | | ND (0.005) |
| 1,1-Dichloroethane | | | | | | ND (0.005) |
| 1,1-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | 0.007 | ND (unk) | 0.006 |
| 1,2-Dichloroethane | | | | | | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | | 0.0644 |
| 1,2-Dichloropropane | | | | | | ND (0.005) |
| 2-Hexanone | | | | | | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | | | | | | ND (0.01) |
| Acetone | | | | | | ND (0.01) |
| Benzene | | | | | | ND (0.005) |
| Bromodichloromethane | | | | | | ND (0.005) |
| Bromoform | | | | | | ND (0.005) |
| Bromomethane | | | | | | ND (0.005) |
| Carbon Disulfide | | | | | | ND (0.005) |
| Carbon Tetrachloride | | | | | | ND (0.005) |
| Chlorobenzene | | | | | | ND (0.005) |
| Chloroethane | | | | | | ND (0.01) |
| Chloroform | | | | | | ND (0.005) |
| Chloromethane | | | | | | ND (0.01) |
| cis-1,2-Dichloroethene | | | | 0.039 | 0.059 | 0.0644 |
| cis-1,3-Dichloropropene | | | | | | ND (0.005) |
| Dibromochloromethane | | | | | | ND (0.005) |
| Ethylbenzene | | | | | | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | | | | | | ND (0.01) |
| Methylene Chloride | | | | | | ND (0.01) |
| Styrene | | | | | | ND (0.005) |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| trans-1,3-Dichloropropene | | | | | | ND (0.005) |
| Trichloroethene | ND (unk) | ND (unk) | 0.021 | 0.086 | 0.073 | 0.085 |
| Vinyl Chloride | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.01) |
| Xylenes (total) | | | | | | ND (0.01) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID<br>Sample ID<br>Constituents Date | ITMW-5<br>MW-5<br>3/28/2001 | ITMW-5<br>MW-5<br>9/13/2001 | ITMW-5<br>ITMW-5<br>9/10/2002 | ITMW-5<br>ITMW-5<br>2/28/2003 | ITMW-5<br>ITMW-5<br>9/24/2003 | ITMW-5<br>ITMW-5<br>4/14/2004 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | 0.007 | 0.00598 | 0.0062 | 0.00589 |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | 0.05 | | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.046 | 0.064 | 0.072 | 0.0687 | 0.0737 | 0.0554 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.1 | 0.072 | 0.108 | 0.0904 | 0.0973 | 0.0839 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-5<br>ITMW-5<br>9/22/2004 | ITMW-5<br>DUP-040605<br>4/6/2005 | ITMW-5<br>ITMW-5<br>4/6/2005 | ITMW-5<br>DUP-1<br>9/28/2005 | ITMW-5<br>ITMW-5<br>9/28/2005 | ITMW-5<br>DUP-1<br>3/14/2006 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | 0.00707 | 0.00585 | 0.00663 | ND (0.005) | ND (0.005) | 0.0055 |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | 0.071 | 0.0726 | 0.0544 | 0.0535 | 0.0661 |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.0758 | 0.071 | 0.0726 | 0.0544 | 0.0535 | 0.0661 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.105 | 0.087 | 0.0932 | 0.0821 | 0.079 | 0.0984 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | ITMW-6<br>ITMW-6<br>10/1/1989 | ITMW-6<br>ITMW-6<br>1/1/1990 | ITMW-6<br>ITMW-6<br>12/1/1996 | ITMW-6<br>ITMW-6<br>5/1/1997 | ITMW-6<br>ITMW-6<br>2/1/1999 | ITMW-6<br>ITMW-6 DUP<br>2/1/1999 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| 1,1,2,2-Tetrachloroethane | | | | | | |
| 1,1,2-Trichloroethane | | | | | | |
| 1,1-Dichloroethane | | | | | | |
| 1,1-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| 1,2-Dichloroethane | | | | | | |
| 1,2-Dichloroethene (total) | | | | | | |
| 1,2-Dichloropropane | | | | | | |
| 2-Hexanone | | | | | | |
| 4-Methyl-2-pentanone (MIBK) | | | | | | |
| Acetone | | | | | | |
| Benzene | | | | | | |
| Bromodichloromethane | | | | | | |
| Bromoform | | | | | | |
| Bromomethane | | | | | | |
| Carbon Disulfide | | | | | | |
| Carbon Tetrachloride | | | | | | |
| Chlorobenzene | | | | | | |
| Chloroethane | | | | | | |
| Chloroform | | | | | | |
| Chloromethane | | | | | | |
| cis-1,2-Dichloroethene | | | | ND (unk) | ND (unk) | ND (unk) |
| cis-1,3-Dichloropropene | | | | | | |
| Dibromochloromethane | | | | | | |
| Ethylbenzene | | | | | | |
| Methyl Ethyl Ketone (2-Butanone) | | | | | | |
| Methylene Chloride | | | | | | |
| Styrene | | | | | | |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| trans-1,2-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | |
| trans-1,3-Dichloropropene | | | | | | |
| Trichloroethene | ND (unk) | ND (unk) | 0.0068 | 0.007 | ND (unk) | 0.006 |
| Vinyl Chloride | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| Xylenes (total) | | | | | | |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-6<br>ITMW-6<br>3/1/2000 | ITMW-6<br>MW-6<br>9/20/2000 | ITMW-6<br>MW-6<br>3/28/2001 | ITMW-6<br>MW-6<br>9/13/2001 | ITMW-6<br>ITMW-6<br>9/10/2002 | ITMW-6<br>ITMW-6 DUP-1<br>9/10/2002 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | ND (0.01) | ND (0.01) | | | |
| 1,2-Dichloropropane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | | ND (0.005) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (unk) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | | ND (0.01) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-6<br>ITMW-6<br>2/27/2003 | ITMW-6<br>ITMW-6<br>9/24/2003 | ITMW-6<br>ITMW-6<br>4/14/2004 | ITMW-6<br>ITMW-6<br>9/22/2004 | ITMW-6<br>ITMW-6<br>9/28/2005 |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-7 ITMW-7 11/1/1989 | ITMW-7 ITMW-7 1/1/1990 | ITMW-7 ITMW-7 12/1/1996 | ITMW-7 ITMW-7 5/1/1997 | ITMW-7 ITMW-7 2/1/1999 | ITMW-7 ITMW-7 6/1/1999 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| 1,1,2,2-Tetrachloroethane | | | | | | |
| 1,1,2-Trichloroethane | | | | | | |
| 1,1-Dichloroethane | | | | | | |
| 1,1-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| 1,2-Dichloroethane | | | | | | |
| 1,2-Dichloroethene (total) | | | | | | |
| 1,2-Dichloropropane | | | | | | |
| 2-Hexanone | | | | | | |
| 4-Methyl-2-pentanone (MIBK) | | | | | | |
| Acetone | | | | | | |
| Benzene | | | | | | |
| Bromodichloromethane | | | | | | |
| Bromoform | | | | | | |
| Bromomethane | | | | | | |
| Carbon Disulfide | | | | | | |
| Carbon Tetrachloride | | | | | | |
| Chlorobenzene | | | | | | |
| Chloroethane | | | | | | |
| Chloroform | | | | | | |
| Chloromethane | | | | | | |
| cis-1,2-Dichloroethene | | | | 0.18 | ND (unk) | 0.144 |
| cis-1,3-Dichloropropene | | | | | | |
| Dibromochloromethane | | | | | | |
| Ethylbenzene | | | | | | |
| Methyl Ethyl Ketone (2-Butanone) | | | | | | |
| Methylene Chloride | | | | | | |
| Styrene | | | | | | |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| trans-1,2-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| trans-1,3-Dichloropropene | | | | | | |
| Trichloroethene | ND (unk) | ND (unk) | 0.29 | 0.38 | ND (unk) | 0.32 |
| Vinyl Chloride | ND (unk) | ND (unk) | 0.003 | ND (unk) | ND (unk) | ND (unk) |
| Xylenes (total) | | | | | | |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-7<br>ITMW-7 DUP<br>6/1/1999 | ITMW-7<br>ITMW-7<br>3/1/2000 | ITMW-7<br>ITMW-7 DUP<br>3/1/2000 | ITMW-7<br>MW-7<br>9/19/2000 | ITMW-7<br>ITMW-7 DUP-3<br>9/21/2000 | ITMW-7<br>MW-7<br>3/28/2001 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | 0.1 | ND (0.01) | 0.07 |
| 1,2-Dichloropropane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | | | | ND (0.01) | ND (0.02) | ND (0.01) |
| Benzene | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | | | | ND (0.005) | ND (0.005) | ND (0.01) |
| Carbon Disulfide | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.14 | 0.1 | 0.092 | 0.1 | ND (0.005) | 0.066 |
| cis-1,3-Dichloropropene | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.3 | 0.262 | 0.207 | 0.207 | 0.109 | 0.161 |
| Vinyl Chloride | ND (unk) | ND (unk) | ND (unk) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | | | | ND (0.01) | ND (0.01) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-7<br>MW-7<br>9/13/2001 | ITMW-7<br>ITMW-7<br>9/10/2002 | ITMW-7<br>ITMW-7 DUP-2<br>9/10/2002 | ITMW-7<br>ITMW-7<br>2/27/2003 | ITMW-7<br>ITMW-7<br>9/24/2003 | ITMW-7<br>ITMW-7<br>4/14/2004 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.068 | 0.056 | 0.054 | 0.0925 | 0.0573 | 0.0807 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.139 | 0.137 | 0.128 | 0.172 | 0.125 | 0.201 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-7<br>ITMW-7<br>9/22/2004 | ITMW-7<br>ITMW-7<br>4/7/2005 | ITMW-7<br>ITMW-7<br>9/28/2005 | ITMW-7<br>ITMW-7<br>3/14/2006 |
|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | 0.039 | 0.0305 | 0.0595 |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.0484 | 0.039 | 0.0305 | 0.0595 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.132 | 0.122 | 0.1 | 0.153 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-9<br>ITMW-9<br>1/1/1990 | ITMW-9<br>ITMW-9<br>12/1/1996 | ITMW-9<br>ITMW-9<br>5/1/1997 | ITMW-9<br>ITMW-9<br>2/1/1999 | ITMW-9<br>ITMW-9<br>3/1/2000 | ITMW-9<br>ITMW-9 DUP-2<br>9/20/2000 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | | | | | | ND (0.005) |
| 1,1,2-Trichloroethane | | | | | | ND (0.005) |
| 1,1-Dichloroethane | | | | | | ND (0.005) |
| 1,1-Dichloroethene | ND (unk) | 0.015 | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| 1,2-Dichloroethane | | | | | | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | | 0.014 |
| 1,2-Dichloropropane | | | | | | ND (0.005) |
| 2-Hexanone | | | | | | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | | | | | | ND (0.01) |
| Acetone | | | | | | ND (0.01) |
| Benzene | | | | | | ND (0.005) |
| Bromodichloromethane | | | | | | ND (0.005) |
| Bromoform | | | | | | ND (0.005) |
| Bromomethane | | | | | | ND (0.005) |
| Carbon Disulfide | | | | | | ND (0.005) |
| Carbon Tetrachloride | | | | | | ND (0.005) |
| Chlorobenzene | | | | | | ND (0.005) |
| Chloroethane | | | | | | ND (0.01) |
| Chloroform | | | | | | ND (0.005) |
| Chloromethane | | | | | | ND (0.01) |
| cis-1,2-Dichloroethene | | | ND (unk) | 0.024 | 0.045 | 0.014 |
| cis-1,3-Dichloropropene | | | | | | ND (0.005) |
| Dibromochloromethane | | | | | | ND (0.005) |
| Ethylbenzene | | | | | | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | | | | | | ND (0.01) |
| Methylene Chloride | | | | | | ND (0.01) |
| Styrene | | | | | | ND (0.005) |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| trans-1,3-Dichloropropene | | | | | | ND (0.005) |
| Trichloroethene | ND (unk) | 0.23 | 0.007 | 0.04 | 0.069 | 0.0548 |
| Vinyl Chloride | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.01) |
| Xylenes (total) | | | | | | ND (0.01) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID<br>Sample ID<br>Constituents Date | ITMW-9<br>MW-9<br>9/20/2000 | ITMW-9<br>MW-9<br>3/28/2001 | ITMW-9<br>MW-9<br>9/13/2001 | ITMW-9<br>ITMW-9<br>9/10/2002 | ITMW-9<br>ITMW-9<br>2/28/2003 | ITMW-9<br>ITMW-9<br>9/23/2003 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | 0.0143 | 0.01 | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.005) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.0143 | 0.012 | 0.012 | 0.021 | 0.0372 | 0.0495 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.0573 | 0.04 | 0.04 | 0.061 | 0.0542 | 0.091 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.01) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID / Sample ID / Constituents Date | ITMW-9<br>ITMW-9 DUP-1<br>9/23/2003 | ITMW-9<br>ITMW-9<br>4/14/2004 | ITMW-9<br>ITMW-9<br>9/22/2004 | ITMW-9<br>ITMW-9<br>4/6/2005 | ITMW-9<br>ITMW-9<br>9/27/2005 | ITMW-9<br>ITMW-9<br>3/14/2006 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | 0.0304 | 0.0546 | 0.0787 |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.0539 | 0.0388 | 0.0211 | 0.0304 | 0.0546 | 0.0787 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.0976 | 0.0718 | 0.0807 | 0.079 | 0.0988 | 0.101 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | ITMW-10 ITMW-10 1/1/1990 | ITMW-10 ITMW-10 12/1/1996 | ITMW-10 ITMW-10 2/1/1999 | ITMW-10 ITMW-10 3/1/2000 | ITMW-10 MW-10 9/20/2000 | ITMW-10 MW-10 3/28/2001 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | | | | | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | | | | | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | | | | | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (unk) | 0.002 | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | | | | | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | 0.0159 | 0.02 |
| 1,2-Dichloropropane | | | | | ND (0.005) | ND (0.005) |
| 2-Hexanone | | | | | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | | | | | ND (0.01) | ND (0.01) |
| Acetone | | | | | ND (0.01) | ND (0.01) |
| Benzene | | | | | ND (0.005) | ND (0.005) |
| Bromodichloromethane | | | | | ND (0.005) | ND (0.005) |
| Bromoform | | | | | ND (0.005) | ND (0.005) |
| Bromomethane | | | | | ND (0.005) | ND (0.01) |
| Carbon Disulfide | | | | | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | | | | | ND (0.005) | ND (0.005) |
| Chlorobenzene | | | | | ND (0.005) | ND (0.005) |
| Chloroethane | | | | | ND (0.01) | ND (0.01) |
| Chloroform | | | | | ND (0.005) | ND (0.005) |
| Chloromethane | | | | | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | | | 0.013 | 0.017 | 0.0159 | 0.021 |
| cis-1,3-Dichloropropene | | | | | ND (0.005) | ND (0.005) |
| Dibromochloromethane | | | | | ND (0.005) | ND (0.005) |
| Ethylbenzene | | | | | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | | | | | ND (0.01) | ND (0.01) |
| Methylene Chloride | | | | | ND (0.01) | ND (0.01) |
| Styrene | | | | | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | | | | | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (unk) | 0.004 | 0.025 | 0.023 | 0.0181 | 0.04 |
| Vinyl Chloride | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.01) | ND (0.01) |
| Xylenes (total) | | | | | ND (0.01) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID<br>Sample ID<br>Constituents Date | ITMW-10 MW-10 9/13/2001 | ITMW-10 MW-10 DUP 9/13/2001 | ITMW-10<br>ITMW-10<br>9/10/2002 | ITMW-10<br>ITMW-10<br>2/28/2003 | ITMW-10 MW-10 7/16/2003 | ITMW-10<br>ITMW-10<br>9/23/2003 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.028 | 0.027 | 0.038 | 0.0509 | 0.0492 | 0.0565 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | 0.0116 | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.029 | 0.03 | 0.055 | 0.0576 | 0.0553 | 0.0659 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | ITMW-10<br>ITMW-10<br>4/14/2004 | ITMW-10 MW-10 9/22/2004 | ITMW-10<br>ITMW-10<br>4/6/2005 | ITMW-10<br>ITMW-10<br>9/28/2005 | ITMW-10<br>ITMW-10<br>3/14/2006 |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | 0.00532 | ND (0.005) | 0.00593 | ND (0.005) | 0.00549 |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | 0.0577 | 0.0416 | 0.0672 |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.0574 | 0.05 | 0.0577 | 0.0416 | 0.0672 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | 0.00978 | ND (0.005) | 0.0157 | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.08 | 0.0596 | 0.0721 | 0.0576 | 0.082 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-11<br>ITMW-11<br>1/1/1990 | ITMW-11<br>ITMW-11<br>11/1/1990 | ITMW-11<br>ITMW-11<br>2/1/1991 | ITMW-11<br>ITMW-11<br>11/1/1993 | ITMW-11<br>ITMW-11<br>12/1/1996 | ITMW-11<br>ITMW-11<br>2/1/1999 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| 1,1,2,2-Tetrachloroethane | | | | | | |
| 1,1,2-Trichloroethane | | | | | | |
| 1,1-Dichloroethane | | | | | | |
| 1,1-Dichloroethene | ND (unk) | 0.0089 | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| 1,2-Dichloroethane | | | | | | |
| 1,2-Dichloroethene (total) | | | | | | |
| 1,2-Dichloropropane | | | | | | |
| 2-Hexanone | | | | | | |
| 4-Methyl-2-pentanone (MIBK) | | | | | | |
| Acetone | | | | | | |
| Benzene | | | | | | |
| Bromodichloromethane | | | | | | |
| Bromoform | | | | | | |
| Bromomethane | | | | | | |
| Carbon Disulfide | | | | | | |
| Carbon Tetrachloride | | | | | | |
| Chlorobenzene | | | | | | |
| Chloroethane | | | | | | |
| Chloroform | | | | | | |
| Chloromethane | | | | | | |
| cis-1,2-Dichloroethene | | | | | | 0.01 |
| cis-1,3-Dichloropropene | | | | | | |
| Dibromochloromethane | | | | | | |
| Ethylbenzene | | | | | | |
| Methyl Ethyl Ketone (2-Butanone) | | | | | | |
| Methylene Chloride | | | | | | |
| Styrene | | | | | | |
| Tetrachloroethene | 0.015 | ND (unk) | 0.0089 | 0.001 | ND (unk) | ND (unk) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| trans-1,2-Dichloroethene | 3.6 | 1.5 | 1 | ND (unk) | 0.011 | ND (unk) |
| trans-1,3-Dichloropropene | | | | | | |
| Trichloroethene | 19 | 4.7 | 3.4 | 2.3 | 0.51 | 0.65 |
| Vinyl Chloride | 0.18 | 0.093 | ND (unk) | 0.043 | ND (unk) | ND (unk) |
| Xylenes (total) | | | | | | |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID<br>Sample ID<br>Constituents Date | ITMW-11<br>ITMW-11<br>3/1/2000 | ITMW-11<br>MW-11<br>9/19/2000 | ITMW-11<br>MW-11<br>3/27/2001 | ITMW-11<br>MW-11<br>9/13/2001 | ITMW-11<br>MW-11<br>11/20/2001 | ITMW-11<br>ITMW-11L<br>9/9/2002 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | 0.327 | ND (0.25) | | | |
| 1,2-Dichloropropane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | | ND (0.01) | ND (0.01) | ND (0.01) | 0.01 | ND (0.01) |
| Benzene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | | ND (0.005) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.206 | 0.327 | 0.2 | 0.183 | ND (0.005) | 0.206 |
| cis-1,3-Dichloropropene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (unk) | 0.00584 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 3.37 | 8.03 | 7 | 6 | ND (0.005) | 7.1 |
| Vinyl Chloride | ND (unk) | 0.0117 | ND (0.01) | ND (0.01) | ND (0.01) | 0.01 |
| Xylenes (total) | | ND (0.01) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | ITMW-11<br>ITMW-11T<br>9/9/2002 | ITMW-11<br>ITMW-11<br>2/26/2003 | ITMW-11<br>ITMW-11<br>9/24/2003 | ITMW-11<br>ITMW-11 DUP-1<br>2/26/2003 | ITMW-11<br>ITMW-11<br>4/13/2004 | ITMW-11<br>ITMW-11<br>9/21/2004 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.00803 | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.007 | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.072 | 0.346 | 0.269 | 0.306 | 0.24 | 0.204 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.8 | 4.11 | 3.99 | 3.63 | 3.16 | 3.45 |
| Vinyl Chloride | ND (0.01) | 0.0588 | 0.0118 | 0.0607 | 0.0378 | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-11<br>ITMW-11<br>4/7/2005 | ITMW-11<br>ITMW-11<br>9/29/2005 | ITMW-11<br>DUP-2<br>3/16/2006 | ITMW-11<br>ITMW-11<br>3/16/2006 |
|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | 0.0146 | ND (0.02) |
| 1,1-Dichloroethene | 0.00599 | ND (0.005) | 0.033 | 0.0338 |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) |
| 1,2-Dichloroethene (total) | 0.29 | 0.199 | 1.2 | 1.3 |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.05) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.05) |
| Acetone | ND (0.01) | ND (0.01) | 0.0198 | ND (0.05) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.05) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.05) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.05) |
| cis-1,2-Dichloroethene | 0.282 | 0.199 | 1.21 | 1.29 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.05) |
| Methylene Chloride | ND (0.01) | ND (0.01) | 0.0272 | ND (0.05) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) |
| Toluene | ND (0.005) | ND (0.005) | 0.0183 | ND (0.02) |
| trans-1,2-Dichloroethene | 0.00801 | ND (0.005) | ND (0.005) | ND (0.02) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) |
| Trichloroethene | 4.21 | 3.91 | 12.8 | 14.6 |
| Vinyl Chloride | 0.0667 | 0.018 | 0.381 | 0.482 |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.075) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | ITMW-12 ITMW-12 11/1/1990 | ITMW-12 ITMW-12 2/1/1991 | ITMW-12 ITMW-12 11/1/1993 | ITMW-12 ITMW-12 12/1/1996 | ITMW-12 ITMW-12 2/1/1999 | ITMW-12 ITMW-12 3/1/2000 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| 1,1,2,2-Tetrachloroethane | | | | | | |
| 1,1,2-Trichloroethane | | | | | | |
| 1,1-Dichloroethane | | | | | | |
| 1,1-Dichloroethene | 0.0099 | ND (unk) | 0.004 | ND (unk) | ND (unk) | ND (unk) |
| 1,2-Dichloroethane | | | | | | |
| 1,2-Dichloroethene (total) | | | | | | |
| 1,2-Dichloropropane | | | | | | |
| 2-Hexanone | | | | | | |
| 4-Methyl-2-pentanone (MIBK) | | | | | | |
| Acetone | | | | | | |
| Benzene | | | | | | |
| Bromodichloromethane | | | | | | |
| Bromoform | | | | | | |
| Bromomethane | | | | | | |
| Carbon Disulfide | | | | | | |
| Carbon Tetrachloride | | | | | | |
| Chlorobenzene | | | | | | |
| Chloroethane | | | | | | |
| Chloroform | | | | | | |
| Chloromethane | | | | | | |
| cis-1,2-Dichloroethene | | | | | 0.48 | 0.32 |
| cis-1,3-Dichloropropene | | | | | | |
| Dibromochloromethane | | | | | | |
| Ethylbenzene | | | | | | |
| Methyl Ethyl Ketone (2-Butanone) | | | | | | |
| Methylene Chloride | | | | | | |
| Styrene | | | | | | |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| trans-1,2-Dichloroethene | 1.3 | 1 | 0.002 | ND (unk) | ND (unk) | ND (unk) |
| trans-1,3-Dichloropropene | | | | | | |
| Trichloroethene | 2.4 | 2.1 | 2.5 | 1.2 | 3.1 | 3.11 |
| Vinyl Chloride | 0.14 | ND (unk) | 0.035 | ND (unk) | 0.034 | 0.019 |
| Xylenes (total) | | | | | | |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-12<br>MW-12<br>9/19/2000 | ITMW-12<br>MW-12<br>3/27/2001 | ITMW-12<br>MW-12<br>9/13/2001 | ITMW-12<br>MW-12<br>11/20/2001 | ITMW-12<br>ITMW-12<br>9/11/2002 | ITMW-12<br>ITMW-12<br>2/26/2003 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | 0.18 | ND (0.25) | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.005) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.18 | 0.2 | 0.159 | 0.3 | 0.3 | 0.287 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 3.35 | 3.9 | 3.1 | 2.4 | 4.2 | 3.46 |
| Vinyl Chloride | 0.012 | 0.02 | ND (0.01) | 0.02 | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.01) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID<br>Sample ID<br>Constituents Date | ITMW-12<br>ITMW-12 DUP-2<br>2/26/2003 | ITMW-12<br>ITMW-12<br>9/24/2003 | ITMW-12<br>ITMW-12<br>4/13/2004 | ITMW-12<br>ITMW-12<br>9/21/2004 | ITMW-12<br>ITMW-12<br>9/29/2005 |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | 0.273 |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.308 | 0.242 | 0.245 | 0.238 | 0.273 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 3.94 | 2.92 | 2.41 | 1.78 | 2.12 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-13<br>ITMW-13<br>11/1/1990 | ITMW-13<br>ITMW-13<br>2/1/1991 | ITMW-13<br>ITMW-13<br>11/1/1993 | ITMW-13<br>ITMW-13<br>12/1/1996 | ITMW-13<br>ITMW-13<br>2/1/1999 | ITMW-13<br>ITMW-13<br>3/1/2000 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| 1,1,2,2-Tetrachloroethane | | | | | | |
| 1,1,2-Trichloroethane | | | | | | |
| 1,1-Dichloroethane | | | | | | |
| 1,1-Dichloroethene | ND (unk) | ND (unk) | | 0.0016 | ND (unk) | ND (unk) |
| 1,2-Dichloroethane | | | | | | |
| 1,2-Dichloroethene (total) | | | | | | |
| 1,2-Dichloropropane | | | | | | |
| 2-Hexanone | | | | | | |
| 4-Methyl-2-pentanone (MIBK) | | | | | | |
| Acetone | | | | | | |
| Benzene | | | | | | |
| Bromodichloromethane | | | | | | |
| Bromoform | | | | | | |
| Bromomethane | | | | | | |
| Carbon Disulfide | | | | | | |
| Carbon Tetrachloride | | | | | | |
| Chlorobenzene | | | | | | |
| Chloroethane | | | | | | |
| Chloroform | | | | | | |
| Chloromethane | | | | | | |
| cis-1,2-Dichloroethene | | | | | 0.14 | 0.121 |
| cis-1,3-Dichloropropene | | | | | | |
| Dibromochloromethane | | | | | | |
| Ethylbenzene | | | | | | |
| Methyl Ethyl Ketone (2-Butanone) | | | | | | |
| Methylene Chloride | | | | | | |
| Styrene | | | | | | |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| trans-1,2-Dichloroethene | 0.19 | 0.17 | | 0.0013 | ND (unk) | ND (unk) |
| trans-1,3-Dichloropropene | | | | | | |
| Trichloroethene | 0.034 | 0.032 | | 0.036 | 0.036 | 0.037 |
| Vinyl Chloride | 0.018 | 0.035 | 0.029 | 0.036 | 0.048 | 0.053 |
| Xylenes (total) | | | | | | |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | ITMW-13<br>MW-13<br>9/19/2000 | ITMW-13<br>MW-13<br>3/28/2001 | ITMW-13<br>MW-13<br>9/13/2001 | ITMW-13<br>ITMW-13L<br>9/9/2002 | ITMW-13<br>ITMW-13T<br>9/9/2002 | ITMW-13<br>ITMW-13<br>2/26/2003 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | 0.112 | 0.09 | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.005) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.112 | 0.092 | 0.111 | 0.11 | 0.086 | 0.0855 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.0224 | 0.044 | 0.035 | 0.099 | 0.081 | 0.0702 |
| Vinyl Chloride | 0.0505 | 0.04 | 0.08 | 0.01 | 0.02 | ND (0.01) |
| Xylenes (total) | ND (0.01) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents Well ID / Sample ID / Date | ITMW-13 ITMW-13 9/24/2003 | ITMW-13 ITMW-13 4/13/2004 | ITMW-13 ITMW-13 9/21/2004 | ITMW-13 ITMW-13 4/7/2005 | ITMW-13 ITMW-13 9/30/2005 | ITMW-13 ITMW-13 3/16/2006 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | 0.103 | 0.114 | 0.187 |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.13 | 0.0872 | 0.0716 | 0.103 | 0.114 | 0.187 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.159 | 0.0484 | 0.0255 | 0.0718 | 0.0727 | 0.141 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | 0.0179 | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | ITMW-14<br>ITMW-14<br>11/1/1990 | ITMW-14<br>ITMW-14<br>2/1/1991 | ITMW-14<br>ITMW-14<br>11/1/1993 | ITMW-14<br>ITMW-14<br>12/1/1996 | ITMW-14<br>ITMW-14<br>2/1/1999 | ITMW-14<br>ITMW-14<br>3/1/2000 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| 1,1,2,2-Tetrachloroethane | | | | | | |
| 1,1,2-Trichloroethane | | | | | | |
| 1,1-Dichloroethane | | | | | | |
| 1,1-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| 1,2-Dichloroethane | | | | | | |
| 1,2-Dichloroethene (total) | | | | | | |
| 1,2-Dichloropropane | | | | | | |
| 2-Hexanone | | | | | | |
| 4-Methyl-2-pentanone (MIBK) | | | | | | |
| Acetone | | | | | | |
| Benzene | | | | | | |
| Bromodichloromethane | | | | | | |
| Bromoform | | | | | | |
| Bromomethane | | | | | | |
| Carbon Disulfide | | | | | | |
| Carbon Tetrachloride | | | | | | |
| Chlorobenzene | | | | | | |
| Chloroethane | | | | | | |
| Chloroform | | | | | | |
| Chloromethane | | | | | | |
| cis-1,2-Dichloroethene | | | | | 0.029 | 0.024 |
| cis-1,3-Dichloropropene | | | | | | |
| Dibromochloromethane | | | | | | |
| Ethylbenzene | | | | | | |
| Methyl Ethyl Ketone (2-Butanone) | | | | | | |
| Methylene Chloride | | | | | | |
| Styrene | | | | | | |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| trans-1,2-Dichloroethene | 0.03 | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| trans-1,3-Dichloropropene | | | | | | |
| Trichloroethene | ND (unk) | ND (unk) | 0.006 | ND (unk) | ND (unk) | ND (unk) |
| Vinyl Chloride | 0.013 | ND (unk) | ND (unk) | ND (unk) | 0.02 | 0.012 |
| Xylenes (total) | | | | | | |

ND — Constituent reported as Not Detected at the posted Reporting Limit
(unk) — Reporting Limit unknown histroric data from summary tables
'(0.005) — Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-14<br>MW-14<br>9/19/2000 | ITMW-14<br>MW-14<br>3/27/2001 | ITMW-14<br>MW-14<br>9/13/2001 | ITMW-14<br>ITMW-14<br>9/11/2002 | ITMW-14<br>ITMW-14<br>2/26/2003 | ITMW-14<br>ITMW-14<br>9/24/2003 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | 0.0136 | 0.02 | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.005) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.0136 | 0.024 | 0.005 | 0.006 | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | 0.00565 |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | 0.041 | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | 0.01 | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.01) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID / Sample ID / Constituents Date | ITMW-14<br>ITMW-14<br>4/13/2004 | ITMW-14<br>ITMW-14<br>9/21/2004 | ITMW-14<br>ITMW-14<br>9/30/2005 |
|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | 0.00768 | 0.0078 | 0.00787 |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents Well ID / Sample ID / Date | ITMW-15<br>ITMW-15<br>11/1/1990 | ITMW-15<br>ITMW-15<br>2/1/1991 | ITMW-15<br>ITMW-15<br>4/15/1991 | ITMW-15<br>ITMW-15<br>4/19/1991 | ITMW-15<br>ITMW-15<br>4/20/1991 | ITMW-15<br>ITMW-15<br>11/1/1993 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| 1,1,2,2-Tetrachloroethane | | | | | | |
| 1,1,2-Trichloroethane | | | | | | |
| 1,1-Dichloroethane | | | | | | |
| 1,1-Dichloroethene | 0.0081 | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| 1,2-Dichloroethane | | | | | | |
| 1,2-Dichloroethene (total) | | | | | | |
| 1,2-Dichloropropane | | | | | | |
| 2-Hexanone | | | | | | |
| 4-Methyl-2-pentanone (MIBK) | | | | | | |
| Acetone | | | | | | |
| Benzene | | | | | | |
| Bromodichloromethane | | | | | | |
| Bromoform | | | | | | |
| Bromomethane | | | | | | |
| Carbon Disulfide | | | | | | |
| Carbon Tetrachloride | | | | | | |
| Chlorobenzene | | | | | | |
| Chloroethane | | | | | | |
| Chloroform | | | | | | |
| Chloromethane | | | | | | |
| cis-1,2-Dichloroethene | | | | | | |
| cis-1,3-Dichloropropene | | | | | | |
| Dibromochloromethane | | | | | | |
| Ethylbenzene | | | | | | |
| Methyl Ethyl Ketone (2-Butanone) | | | | | | |
| Methylene Chloride | | | | | | |
| Styrene | | | | | | |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| trans-1,2-Dichloroethene | 1.5 | 0.87 | 0.6 | 1 | 1.1 | 0.001 |
| trans-1,3-Dichloropropene | | | | | | |
| Trichloroethene | 2.5 | 1.7 | 2 | 2.1 | 2.4 | 4.3 |
| Vinyl Chloride | 0.055 | ND (unk) | ND (unk) | ND (unk) | ND (unk) | 0.01 |
| Xylenes (total) | | | | | | |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-15<br>ITMW-15<br>12/1/1996 | ITMW-15<br>ITMW-15<br>2/1/1999 | ITMW-15<br>ITMW-15<br>3/1/2000 | ITMW-15<br>ITMW-15 DUP-1<br>9/19/2000 | ITMW-15<br>MW-15<br>9/19/2000 | ITMW-15<br>MW-15<br>3/28/2001 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | 0.091 | 0.0927 | 0.06 |
| 1,2-Dichloropropane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | | | | ND (0.005) | ND (0.005) | ND (0.01) |
| Carbon Disulfide | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | | 0.12 | 0.097 | 0.091 | 0.0927 | 0.057 |
| cis-1,3-Dichloropropene | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.24 | 0.4 | 0.339 | 0.376 | 0.362 | 0.29 |
| Vinyl Chloride | ND (unk) | ND (unk) | ND (unk) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | | | | ND (0.01) | ND (0.01) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-15<br>MW-15<br>9/13/2001 | ITMW-15<br>MW-15 DUP<br>9/13/2001 | ITMW-15<br>MW-15<br>11/20/2001 | ITMW-15<br>ITMW-15<br>9/11/2002 | ITMW-15<br>ITMW-15<br>2/26/2003 | ITMW-15<br>ITMW-15<br>9/25/2003 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | 0.01 | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.087 | 0.08 | 0.03 | 0.075 | 0.0987 | 0.0919 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.38 | 0.37 | 0.157 | 0.32 | 0.301 | 0.49 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | ITMW-15 / ITMW-15 / 4/14/2004 | ITMW-15 / ITMW-15 / 9/21/2004 | ITMW-15 / ITMW-15 / 4/7/2005 | ITMW-15 / ITMW-15 / 9/29/2005 | ITMW-15 / ITMW-15 / 3/16/2006 |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | 0.133 | 0.189 | 0.183 |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.126 | 0.118 | 0.133 | 0.189 | 0.183 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.334 | 0.774 | 0.685 | 0.862 | 0.908 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | 0.012 |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroric data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | ITMW-16<br>ITMW-16<br>2/1/1991 | ITMW-16<br>ITMW-16<br>11/1/1993 | ITMW-16<br>ITMW-16<br>12/1/1996 | ITMW-16<br>ITMW-16<br>2/1/1999 | ITMW-16<br>ITMW-16<br>3/1/2000 | ITMW-16<br>MW-16<br>9/21/2000 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | | | | | | ND (0.005) |
| 1,1,2-Trichloroethane | | | | | | ND (0.005) |
| 1,1-Dichloroethane | | | | | | ND (0.005) |
| 1,1-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| 1,2-Dichloroethane | | | | | | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | | ND (0.01) |
| 1,2-Dichloropropane | | | | | | ND (0.005) |
| 2-Hexanone | | | | | | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | | | | | | ND (0.01) |
| Acetone | | | | | | ND (0.02) |
| Benzene | | | | | | ND (0.005) |
| Bromodichloromethane | | | | | | ND (0.005) |
| Bromoform | | | | | | ND (0.005) |
| Bromomethane | | | | | | ND (0.005) |
| Carbon Disulfide | | | | | | ND (0.005) |
| Carbon Tetrachloride | | | | | | ND (0.005) |
| Chlorobenzene | | | | | | ND (0.005) |
| Chloroethane | | | | | | ND (0.01) |
| Chloroform | | | | | | ND (0.005) |
| Chloromethane | | | | | | ND (0.01) |
| cis-1,2-Dichloroethene | | | | ND (unk) | ND (unk) | ND (0.005) |
| cis-1,3-Dichloropropene | | | | | | ND (0.005) |
| Dibromochloromethane | | | | | | ND (0.005) |
| Ethylbenzene | | | | | | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | | | | | | ND (0.01) |
| Methylene Chloride | | | | | | ND (0.01) |
| Styrene | | | | | | ND (0.005) |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| trans-1,2-Dichloroethene | 0.06 | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| trans-1,3-Dichloropropene | | | | | | ND (0.005) |
| Trichloroethene | 0.031 | 0.041 | ND (unk) | ND (unk) | 0.007 | ND (0.005) |
| Vinyl Chloride | ND (unk) | 0.007 | ND (unk) | ND (unk) | ND (unk) | ND (0.01) |
| Xylenes (total) | | | | | | ND (0.01) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-16<br>MW-16<br>3/26/2001 | ITMW-16<br>MW-16<br>9/13/2001 | ITMW-16<br>ITMW-16<br>9/11/2002 | ITMW-16<br>ITMW-16<br>2/27/2003 | ITMW-16<br>ITMW-16<br>9/25/2003 | ITMW-16<br>ITMW-16<br>4/15/2004 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | ND (0.01) | | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-16<br>ITMW-16<br>9/23/2004 | ITMW-16<br>DUP-2<br>9/29/2005 | ITMW-16<br>ITMW-16<br>9/29/2005 |
|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | ND (0.01) | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID / Sample ID / Constituents Date | ITMW-17 ITMW-17 2/1/1991 | ITMW-17 ITMW-17 4/15/1991 | ITMW-17 ITMW-17 4/24/1991 | ITMW-17 ITMW-17 11/1/1993 | ITMW-17 ITMW-17 12/1/1996 | ITMW-17 ITMW-17 2/1/1999 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| 1,1,2,2-Tetrachloroethane | | | | | | |
| 1,1,2-Trichloroethane | | | | | | |
| 1,1-Dichloroethane | | | | | | |
| 1,1-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | 0.013 |
| 1,2-Dichloroethane | | | | | | |
| 1,2-Dichloroethene (total) | | | | | | |
| 1,2-Dichloropropane | | | | | | |
| 2-Hexanone | | | | | | |
| 4-Methyl-2-pentanone (MIBK) | | | | | | |
| Acetone | | | | | | |
| Benzene | | | | | | |
| Bromodichloromethane | | | | | | |
| Bromoform | | | | | | |
| Bromomethane | | | | | | |
| Carbon Disulfide | | | | | | |
| Carbon Tetrachloride | | | | | | |
| Chlorobenzene | | | | | | |
| Chloroethane | | | | | | |
| Chloroform | | | | | | |
| Chloromethane | | | | | | |
| cis-1,2-Dichloroethene | | | | | | 0.24 |
| cis-1,3-Dichloropropene | | | | | | |
| Dibromochloromethane | | | | | | |
| Ethylbenzene | | | | | | |
| Methyl Ethyl Ketone (2-Butanone) | | | | | | |
| Methylene Chloride | | | | | | |
| Styrene | | | | | | |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (unk) | 0.004 | ND (unk) | ND (unk) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| trans-1,2-Dichloroethene | ND (unk) | ND (unk) | 0.58 | 0.003 | ND (unk) | ND (unk) |
| trans-1,3-Dichloropropene | | | | | | |
| Trichloroethene | 21 | 21 | 21 | 18 | 9.3 | 11 |
| Vinyl Chloride | ND (unk) | ND (unk) | ND (unk) | 0.015 | ND (unk) | ND (unk) |
| Xylenes (total) | | | | | | |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID / Sample ID / Constituents Date | ITMW-17 ITMW-17 3/1/2000 | ITMW-17 MW-17 9/19/2000 | ITMW-17 MW-17 1/5/2001 | ITMW-17 MW-17 3/28/2001 | ITMW-17 MW-17 9/13/2001 | ITMW-17 ITMW-17 9/11/2002 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (unk) | 0.009 | ND (0.005) | 0.007 | 0.007 | 0.008 |
| 1,2-Dichloroethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | 0.18 | 0.18 | 0.13 | | |
| 1,2-Dichloropropane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | | ND (0.005) | ND (0.005) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.171 | 0.18 | 0.179 | 0.134 | 0.158 | 0.153 |
| cis-1,3-Dichloropropene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 6.78 | 5.5 | 8.31 | 6.7 | 6.3 | 6.5 |
| Vinyl Chloride | ND (unk) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | | ND (0.01) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | ITMW-17<br>ITMW-17<br>2/26/2003 | ITMW-17<br>ITMW-17<br>9/25/2003 | ITMW-17<br>ITMW-17<br>4/14/2004 | ITMW-17<br>ITWM-17 DUP-2<br>4/14/2004 | ITMW-17<br>ITMW-17<br>9/21/2004 | ITMW-17<br>ITMW-17<br>4/7/2005 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | 0.00646 | 0.00719 | 0.0102 | 0.00912 | 0.00963 | 0.0095 |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | | 0.156 |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.134 | 0.136 | 0.184 | 0.182 | 0.156 | 0.156 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 4.38 | 6.09 | 5.05 | 4.92 | 5.76 | 5.75 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | ITMW-18<br>ITMW-18<br>2/1/1991 | ITMW-18<br>ITMW-18<br>11/1/1993 | ITMW-18<br>ITMW-18<br>12/1/1996 | ITMW-18<br>ITMW-18<br>2/1/1999 | ITMW-18<br>ITMW-18<br>3/1/2000 | ITMW-18<br>MW-18<br>9/19/2000 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | | | | | | ND (0.005) |
| 1,1,2-Trichloroethane | | | | | | ND (0.005) |
| 1,1-Dichloroethane | | | | | | ND (0.005) |
| 1,1-Dichloroethene | ND (unk) | 0.009 | ND (unk) | ND (unk) | ND (unk) | 0.007 |
| 1,2-Dichloroethane | | | | | | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | | 0.409 |
| 1,2-Dichloropropane | | | | | | ND (0.005) |
| 2-Hexanone | | | | | | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | | | | | | ND (0.01) |
| Acetone | | | | | | ND (0.01) |
| Benzene | | | | | | ND (0.005) |
| Bromodichloromethane | | | | | | ND (0.005) |
| Bromoform | | | | | | ND (0.005) |
| Bromomethane | | | | | | ND (0.005) |
| Carbon Disulfide | | | | | | ND (0.005) |
| Carbon Tetrachloride | | | | | | ND (0.005) |
| Chlorobenzene | | | | | | ND (0.005) |
| Chloroethane | | | | | | ND (0.01) |
| Chloroform | | | | | | ND (0.005) |
| Chloromethane | | | | | | ND (0.01) |
| cis-1,2-Dichloroethene | | | | 0.48 | 0.401 | 0.409 |
| cis-1,3-Dichloropropene | | | | | | ND (0.005) |
| Dibromochloromethane | | | | | | ND (0.005) |
| Ethylbenzene | | | | | | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | | | | | | ND (0.01) |
| Methylene Chloride | | | | | | ND (0.01) |
| Styrene | | | | | | ND (0.005) |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| trans-1,2-Dichloroethene | 0.33 | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| trans-1,3-Dichloropropene | | | | | | ND (0.005) |
| Trichloroethene | 3.7 | 4.5 | 1.6 | 6.3 | 3.56 | 4.08 |
| Vinyl Chloride | ND (unk) | 0.006 | ND (unk) | ND (unk) | ND (unk) | ND (0.01) |
| Xylenes (total) | | | | | | ND (0.01) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-18<br>MW-18<br>3/27/2001 | ITMW-18<br>MW-18<br>9/11/2001 | ITMW-18<br>ITMW-18<br>9/11/2002 | ITMW-18<br>ITMW-18<br>2/26/2003 | ITMW-18<br>ITMW-18<br>9/24/2003 | ITMW-18<br>ITMW-18<br>4/13/2004 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | 0.006 | ND (0.005) | 0.008 | 0.0087 | 0.0102 | 0.0158 |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | 0.38 | | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.4 | 0.3 | 0.3 | 0.29 | 0.415 | 0.41 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | 0.007 | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 4 | 4.1 | 6.7 | 5.11 | 7.7 | 7.74 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID / Sample ID / Constituents Date | ITMW-18 / ITMW-18 / 9/21/2004 | ITMW-18 / ITMW-18 / 4/8/2005 | ITMW-18 / ITMW-18 / 9/29/2005 | ITMW-18 / ITMW-18 / 3/15/2006 | ITMW-18 / DUPLICATE 2 / 3/27/2001 |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) | ND (0.05) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) | ND (0.05) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) | ND (0.05) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) | ND (0.05) |
| 1,1-Dichloroethene | 0.0166 | 0.0207 | 0.0191 | ND (0.02) | ND (0.05) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) | ND (0.05) |
| 1,2-Dichloroethene (total) | | 0.389 | 0.241 | 0.373 | 0.4 |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) | ND (0.05) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.05) | ND (0.1) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.05) | ND (0.1) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.05) | ND (0.1) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) | ND (0.05) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) | ND (0.05) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) | ND (0.05) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.05) | ND (0.1) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) | ND (0.05) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) | ND (0.05) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) | ND (0.05) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.05) | ND (0.1) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) | ND (0.05) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.05) | ND (0.1) |
| cis-1,2-Dichloroethene | 0.38 | 0.389 | 0.241 | 0.373 | 0.37 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) | ND (0.05) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) | ND (0.05) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) | ND (0.05) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.05) | ND (0.1) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.05) | ND (0.1) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) | ND (0.05) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) | ND (0.05) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) | ND (0.05) |
| trans-1,2-Dichloroethene | 0.0119 | ND (0.005) | ND (0.005) | ND (0.02) | ND (0.05) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.02) | ND (0.05) |
| Trichloroethene | 7.05 | 7.08 | 4.66 | 5.75 | 4.2 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.05) | ND (0.1) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.075) | ND (0.15) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | ITMW-19<br>ITMW-19<br>2/1/1991 | ITMW-19<br>ITMW-19<br>11/1/1993 | ITMW-19<br>ITMW-19<br>12/1/1996 | ITMW-19<br>ITMW-19<br>2/1/1999 | ITMW-19<br>ITMW-19<br>3/1/2000 | ITMW-19<br>MW-19<br>9/19/2000 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | | | | | | ND (0.005) |
| 1,1,2-Trichloroethane | | | | | | ND (0.005) |
| 1,1-Dichloroethane | | | | | | ND (0.005) |
| 1,1-Dichloroethene | ND (unk) | | ND (unk) | 0.04 | 0.029 | 0.056 |
| 1,2-Dichloroethane | | | | | | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | | 0.197 |
| 1,2-Dichloropropane | | | | | | ND (0.005) |
| 2-Hexanone | | | | | | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | | | | | | ND (0.01) |
| Acetone | | | | | | ND (0.01) |
| Benzene | | | | | | ND (0.005) |
| Bromodichloromethane | | | | | | ND (0.005) |
| Bromoform | | | | | | ND (0.005) |
| Bromomethane | | | | | | ND (0.005) |
| Carbon Disulfide | | | | | | ND (0.005) |
| Carbon Tetrachloride | | | | | | ND (0.005) |
| Chlorobenzene | | | | | | ND (0.005) |
| Chloroethane | | | | | | ND (0.01) |
| Chloroform | | | | | | 0.00944 |
| Chloromethane | | | | | | ND (0.01) |
| cis-1,2-Dichloroethene | | | | 0.15 | 0.128 | 0.197 |
| cis-1,3-Dichloropropene | | | | | | ND (0.005) |
| Dibromochloromethane | | | | | | ND (0.005) |
| Ethylbenzene | | | | | | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | | | | | | ND (0.01) |
| Methylene Chloride | | | | | | ND (0.01) |
| Styrene | | | | | | ND (0.005) |
| Tetrachloroethene | ND (unk) | 0.005 | ND (unk) | 0.008 | 0.007 | 0.0102 |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| trans-1,3-Dichloropropene | | | | | | ND (0.005) |
| Trichloroethene | 9.9 | 27 | 25 | 33 | 33.1 | 35.7 |
| Vinyl Chloride | ND (unk) | 0.007 | ND (unk) | ND (unk) | ND (unk) | ND (0.01) |
| Xylenes (total) | | | | | | ND (0.01) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents Well ID / Sample ID / Date | ITMW-19<br>MW-19<br>1/5/2001 | ITMW-19<br>MW-19<br>3/28/2001 | ITMW-19<br>MW-19<br>9/13/2001 | ITMW-19<br>ITMW-19<br>9/11/2002 | ITMW-19<br>ITMW-19<br>2/26/2003 | ITMW-19<br>ITMW-19<br>9/24/2003 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | 0.0399 | 0.037 | 0.034 | 0.038 | 0.027 | 0.0417 |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | 0.166 | 0.12 | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | 0.01 | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.005) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | 0.00828 | 0.009 | 0.007 | 0.008 | 0.00588 | 0.00758 |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.166 | 0.119 | 0.132 | 0.167 | 0.126 | 0.186 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | 0.00971 | 0.01 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 34 | 38 | 19 | 27 | 16.2 | 27.3 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | ITMW-19 ITMW-19 4/13/2004 | ITMW-19 ITMW-19 9/21/2004 | ITMW-19 DUP-040705 4/7/2005 | ITMW-19 ITMW-19 4/7/2005 | ITMW-19 ITMW-19 9/29/2005 | ITMW-19 ITMW-19 3/15/2006 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.05) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.05) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.05) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.05) |
| 1,1-Dichloroethene | 0.0387 | 0.0352 | 0.0367 | 0.0363 | 0.0414 | ND (0.05) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.05) |
| 1,2-Dichloroethene (total) | | | 0.145 | 0.146 | 0.144 | 0.177 |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.05) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.1) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.1) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.1) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.05) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.05) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.05) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.1) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.05) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.05) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.05) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.1) |
| Chloroform | 0.00696 | 0.00616 | 0.00601 | 0.00574 | 0.00603 | ND (0.05) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.1) |
| cis-1,2-Dichloroethene | 0.186 | 0.148 | 0.145 | 0.146 | 0.144 | 0.177 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.05) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.05) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.05) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.1) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.1) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.05) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.05) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.05) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.05) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.05) |
| Trichloroethene | 19.4 | 20 | 16.2 | 18.3 | 25.7 | 21.3 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.1) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.15) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-20 ITMW-20 3/1/1991 | ITMW-20 ITMW-20 11/1/1993 | ITMW-20 ITMW-20 12/1/1996 | ITMW-20 ITMW-20 5/1/1997 | ITMW-20 ITMW-20 2/1/1999 | ITMW-20 ITMW-20 3/1/2000 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| 1,1,2,2-Tetrachloroethane | | | | | | |
| 1,1,2-Trichloroethane | | | | | | |
| 1,1-Dichloroethane | | | | | | |
| 1,1-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| 1,2-Dichloroethane | | | | | | |
| 1,2-Dichloroethene (total) | | | | | | |
| 1,2-Dichloropropane | | | | | | |
| 2-Hexanone | | | | | | |
| 4-Methyl-2-pentanone (MIBK) | | | | | | |
| Acetone | | | | | | |
| Benzene | | | | | | |
| Bromodichloromethane | | | | | | |
| Bromoform | | | | | | |
| Bromomethane | | | | | | |
| Carbon Disulfide | | | | | | |
| Carbon Tetrachloride | | | | | | |
| Chlorobenzene | | | | | | |
| Chloroethane | | | | | | |
| Chloroform | | | | | | |
| Chloromethane | | | | | | |
| cis-1,2-Dichloroethene | | | | ND (unk) | ND (unk) | ND (unk) |
| cis-1,3-Dichloropropene | | | | | | |
| Dibromochloromethane | | | | | | |
| Ethylbenzene | | | | | | |
| Methyl Ethyl Ketone (2-Butanone) | | | | | | |
| Methylene Chloride | | | | | | |
| Styrene | | | | | | |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| trans-1,2-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| trans-1,3-Dichloropropene | | | | | | |
| Trichloroethene | ND (unk) | ND (unk) | 0.29 | ND (unk) | ND (unk) | ND (unk) |
| Vinyl Chloride | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) |
| Xylenes (total) | | | | | | |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-20<br>ITMW-20<br>9/10/2002 | ITMW-20<br>ITMW-20<br>2/27/2003 | ITMW-20<br>ITMW-20<br>9/24/2003 | ITMW-20<br>ITMW-20<br>4/14/2004 | ITMW-20<br>ITMW-20<br>9/22/2004 | ITMW-20<br>ITMW-20<br>9/29/2005 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | ITMW-21 / ITMW-21 / 3/1/1991 | ITMW-21 / ITMW-21 / 11/1/1993 | ITMW-21 / ITMW-21 / 12/1/1996 | ITMW-21 / ITMW-21 / 2/1/1999 | ITMW-21 / ITMW-21 / 3/1/2000 | ITMW-21 / MW-21 / 9/19/2000 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | | | | | | ND (0.005) |
| 1,1,2-Trichloroethane | | | | | | ND (0.005) |
| 1,1-Dichloroethane | | | | | | ND (0.005) |
| 1,1-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| 1,2-Dichloroethane | | | | | | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | | ND (0.01) |
| 1,2-Dichloropropane | | | | | | ND (0.005) |
| 2-Hexanone | | | | | | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | | | | | | ND (0.01) |
| Acetone | | | | | | ND (0.01) |
| Benzene | | | | | | ND (0.005) |
| Bromodichloromethane | | | | | | ND (0.005) |
| Bromoform | | | | | | ND (0.005) |
| Bromomethane | | | | | | ND (0.005) |
| Carbon Disulfide | | | | | | ND (0.005) |
| Carbon Tetrachloride | | | | | | ND (0.005) |
| Chlorobenzene | | | | | | ND (0.005) |
| Chloroethane | | | | | | ND (0.01) |
| Chloroform | | | | | | ND (0.005) |
| Chloromethane | | | | | | ND (0.01) |
| cis-1,2-Dichloroethene | | | | ND (unk) | ND (unk) | ND (0.005) |
| cis-1,3-Dichloropropene | | | | | | ND (0.005) |
| Dibromochloromethane | | | | | | ND (0.005) |
| Ethylbenzene | | | | | | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | | | | | | ND (0.01) |
| Methylene Chloride | | | | | | ND (0.01) |
| Styrene | | | | | | ND (0.005) |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| trans-1,3-Dichloropropene | | | | | | ND (0.005) |
| Trichloroethene | 0.021 | 0.037 | 0.15 | 0.19 | 0.196 | 0.192 |
| Vinyl Chloride | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.01) |
| Xylenes (total) | | | | | | ND (0.01) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-21<br>MW-20<br>9/21/2000 | ITMW-21<br>MW-20<br>3/27/2001 | ITMW-21<br>MW-21<br>3/28/2001 | ITMW-21<br>MW-20<br>9/11/2001 | ITMW-21<br>MW-21<br>9/13/2001 | ITMW-21<br>ITMW-21<br>9/10/2002 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | ND (0.01) | ND (0.01) | ND (0.01) | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.02) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.005) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) | 0.123 | 0.021 | 0.116 | 0.013 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.01) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | ITMW-21<br>ITMW-21<br>2/26/2003 | ITMW-21<br>ITMW-21<br>9/23/2003 | ITMW-21<br>ITMW-21<br>4/14/2004 | ITMW-21<br>ITMW-21<br>9/22/2004 | ITMW-21<br>ITMW-21<br>9/28/2005 |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.0395 | 0.00909 | 0.0529 | 0.0078 | 0.00645 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents Well ID / Sample ID / Date | MW-22<br>MW-22<br>12/1/1996 | MW-22<br>MW-22<br>5/1/1997 | MW-22<br>MW-22<br>2/1/1999 | MW-22<br>MW-22<br>3/1/2000 | MW-22<br>MW-22<br>9/19/2000 | MW-22<br>MW-22<br>3/27/2001 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | | | | | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | | | | | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | | | | | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | | | | | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | ND (0.01) | ND (0.01) |
| 1,2-Dichloropropane | | | | | ND (0.005) | ND (0.005) |
| 2-Hexanone | | | | | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | | | | | ND (0.01) | ND (0.01) |
| Acetone | | | | | ND (0.01) | ND (0.01) |
| Benzene | | | | | ND (0.005) | ND (0.005) |
| Bromodichloromethane | | | | | ND (0.005) | ND (0.005) |
| Bromoform | | | | | ND (0.005) | ND (0.005) |
| Bromomethane | | | | | ND (0.005) | ND (0.01) |
| Carbon Disulfide | | | | | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | | | | | ND (0.005) | ND (0.005) |
| Chlorobenzene | | | | | ND (0.005) | ND (0.005) |
| Chloroethane | | | | | ND (0.01) | ND (0.01) |
| Chloroform | | | | | ND (0.005) | ND (0.005) |
| Chloromethane | | | | | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | | 0.005 | 0.005 | ND (unk) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | | | | | ND (0.005) | ND (0.005) |
| Dibromochloromethane | | | | | ND (0.005) | ND (0.005) |
| Ethylbenzene | | | | | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | | | | | ND (0.01) | ND (0.01) |
| Methylene Chloride | | | | | ND (0.01) | ND (0.01) |
| Styrene | | | | | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | | | | | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.01) | ND (0.01) |
| Xylenes (total) | | | | | ND (0.01) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | MW-22<br>MW-22<br>9/13/2001 | MW-22<br>MW-22<br>9/10/2002 | MW-22<br>ITMW-22<br>2/27/2003 | MW-22<br>MW-22<br>9/23/2003 | MW-22<br>MW-22 DUP-2<br>9/23/2003 | MW-22<br>MW-22<br>4/13/2004 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | 0.009 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | MW-22<br>MW-22<br>9/21/2004 | MW-22<br>MW-22<br>9/30/2005 |
|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID / Sample ID / Constituents Date | MW-23 / MW-23 / 12/1/1996 | MW-23 / MW-23 / 5/1/1997 | MW-23 / MW-23 / 2/1/1999 | MW-23 / MW-23 DUP / 2/1/1999 | MW-23 / MW-23 DUP / 3/1/2000 | MW-23 / MW-23 / 9/21/2000 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | | | | | | ND (0.005) |
| 1,1,2-Trichloroethane | | | | | | ND (0.005) |
| 1,1-Dichloroethane | | | | | | ND (0.005) |
| 1,1-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| 1,2-Dichloroethane | | | | | | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | | ND (0.01) |
| 1,2-Dichloropropane | | | | | | ND (0.005) |
| 2-Hexanone | | | | | | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | | | | | | ND (0.01) |
| Acetone | | | | | | ND (0.02) |
| Benzene | | | | | | ND (0.005) |
| Bromodichloromethane | | | | | | ND (0.005) |
| Bromoform | | | | | | ND (0.005) |
| Bromomethane | | | | | | ND (0.005) |
| Carbon Disulfide | | | | | | ND (0.005) |
| Carbon Tetrachloride | | | | | | ND (0.005) |
| Chlorobenzene | | | | | | ND (0.005) |
| Chloroethane | | | | | | ND (0.01) |
| Chloroform | | | | | | ND (0.005) |
| Chloromethane | | | | | | ND (0.01) |
| cis-1,2-Dichloroethene | | | 0.01 | 0.01 | ND (unk) | ND (0.005) |
| cis-1,3-Dichloropropene | | | | | | ND (0.005) |
| Dibromochloromethane | | | | | | ND (0.005) |
| Ethylbenzene | | | | | | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | | | | | | ND (0.01) |
| Methylene Chloride | | | | | | ND (0.01) |
| Styrene | | | | | | ND (0.005) |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) |
| trans-1,3-Dichloropropene | | | | | | ND (0.005) |
| Trichloroethene | 0.21 | 2.4 | 0.35 | 0.44 | 0.147 | 0.067 |
| Vinyl Chloride | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.01) |
| Xylenes (total) | | | | | | ND (0.01) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID<br>Sample ID<br>Constituents Date | MW-23<br>MW-23<br>1/5/2001 | MW-23<br>MW-23<br>3/26/2001 | MW-23<br>MW-23<br>9/11/2001 | MW-23<br>MW-23<br>9/11/2002 | MW-23<br>MW-23 DUP-3<br>9/11/2002 | MW-23<br>ITMW-23<br>2/27/2003 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | ND (0.01) | ND (0.01) | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.005) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.137 | 0.087 | 0.023 | 0.111 | 0.105 | 0.054 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | MW-23<br>MW-23<br>9/25/2003 | MW-23<br>MW-23<br>4/15/2004 | MW-23<br>MW-23<br>9/22/2004 | MW-23<br>MW-23<br>4/5/2005 | MW-23<br>MW-23<br>9/29/2005 | MW-23<br>MW-23<br>3/17/2006 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.0839 | 0.0703 | 0.0734 | 0.0555 | 0.0658 | 0.0471 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID / Sample ID / Constituents Date | MW-24 / MW-24 / 2/1/1999 | MW-24 / MW-24 / 3/1/2000 | MW-24 / MW-24 DUP / 3/1/2000 | MW-24 / MW-24 / 9/21/2000 | MW-24 / MW-24 / 1/5/2001 | MW-24 / MW-24 / 3/26/2001 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | 0.01 | 0.012 | 0.01 |
| 1,2-Dichloropropane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | | | | ND (0.02) | ND (0.01) | ND (0.01) |
| Benzene | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | | | | ND (0.005) | ND (0.005) | ND (0.01) |
| Carbon Disulfide | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.049 | 0.025 | 0.024 | 0.011 | 0.012 | 0.011 |
| cis-1,3-Dichloropropene | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 1.4 | 0.403 | 0.595 | 0.128 | 0.247 | 0.33 |
| Vinyl Chloride | ND (unk) | ND (unk) | ND (unk) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | | | | ND (0.01) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents Well ID / Sample ID / Date | MW-24 MW-24 9/11/2001 | MW-24 MW-24 9/11/2002 | MW-24 ITMW-24 2/27/2003 | MW-24 MW-24 9/25/2003 | MW-24 MW-24 4/15/2004 | MW-24 MW-24 9/23/2004 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.006 | 0.006 | 0.00701 | ND (0.005) | 0.00512 | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.124 | 0.199 | 0.253 | 0.155 | 0.181 | 0.116 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents Well ID / Sample ID / Date | MW-24<br>MW-24<br>4/6/2005 | MW-24<br>MW-24<br>9/29/2005 | MW-24<br>MW-24<br>3/16/2006 |
|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | ND (0.01) | ND (0.01) | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.00604 | ND (0.005) | 0.00757 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.152 | 0.161 | 0.347 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | MW-25<br>MW-25<br>2/1/1999 | MW-25<br>MW-25 DUP<br>2/1/1999 | MW-25<br>MW-25<br>12/1/1999 | MW-25<br>MW-25<br>3/1/2000 | MW-25<br>MW-25<br>9/21/2000 | MW-25<br>MW-25<br>3/28/2001 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (unk) | 0.023 | 0.007 |
| 1,1,2,2-Tetrachloroethane | | | | | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | | | | | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | | | | | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | 0.069 | 0.074 | ND (unk) | 0.066 | 0.092 | 0.047 |
| 1,2-Dichloroethane | | | | | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | 0.3 | 0.12 |
| 1,2-Dichloropropane | | | | | ND (0.005) | ND (0.005) |
| 2-Hexanone | | | | | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | | | | | ND (0.01) | ND (0.01) |
| Acetone | | | | | ND (0.02) | ND (0.01) |
| Benzene | | | | | ND (0.005) | ND (0.005) |
| Bromodichloromethane | | | | | ND (0.005) | ND (0.005) |
| Bromoform | | | | | ND (0.005) | ND (0.005) |
| Bromomethane | | | | | ND (0.005) | ND (0.01) |
| Carbon Disulfide | | | | | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | | | | | ND (0.005) | ND (0.005) |
| Chlorobenzene | | | | | ND (0.005) | ND (0.005) |
| Chloroethane | | | | | ND (0.01) | ND (0.01) |
| Chloroform | | | | | ND (0.005) | ND (0.005) |
| Chloromethane | | | | | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.17 | 0.18 | ND (unk) | 0.245 | 0.3 | 0.117 |
| cis-1,3-Dichloropropene | | | | | ND (0.005) | ND (0.005) |
| Dibromochloromethane | | | | | ND (0.005) | ND (0.005) |
| Ethylbenzene | | | | | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | | | | | ND (0.01) | ND (0.01) |
| Methylene Chloride | | | | | ND (0.01) | ND (0.01) |
| Styrene | | | | | ND (0.005) | ND (0.005) |
| Tetrachloroethene | 0.011 | 0.012 | ND (unk) | 0.011 | 0.014 | 0.012 |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | | | | | ND (0.005) | ND (0.005) |
| Trichloroethene | 29 | 27 | 94.5 | 35.9 | 59 | 34 |
| Vinyl Chloride | 0.1 | 0.11 | ND (unk) | 0.063 | 0.05 | 0.06 |
| Xylenes (total) | | | | | ND (0.01) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | MW-25<br>MW-25<br>9/13/2001 | MW-25<br>MW-25L<br>9/9/2002 | MW-25<br>MW-25T<br>9/9/2002 | MW-25<br>ITMW-25<br>2/26/2003 | MW-25<br>MW-25<br>7/17/2003 | MW-25<br>MW-25<br>9/24/2003 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 0.017 | 0.097 | 0.027 | 0.0199 | 0.0239 | 0.0347 |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | 0.008 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | 0.101 | 0.33 | 0.119 | 0.117 | 0.13 | ND (0.2) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | 0.01 | ND (0.01) | 0.0144 | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | 0.011 | ND (0.005) | ND (0.005) | ND (0.005) | 0.00508 |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.3 | 0.44 | 0.37 | 0.557 | 0.621 | 0.775 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | 0.011 | 0.036 | 0.013 | 0.0107 | 0.0144 | 0.0223 |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | 0.00566 | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 60 | 157 | 56 | 45.9 | 62.2 | 103 |
| Vinyl Chloride | ND (0.2) | 0.18 | 0.2 | 0.0757 | 0.243 | ND (0.5) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID<br>Sample ID<br>Constituents Date | MW-25<br>MW-25<br>4/14/2004 | MW-25<br>MW-25<br>9/21/2004 | MW-25<br>MW-25<br>4/7/2005 | MW-25<br>MW-25<br>9/28/2005 | MW-25<br>MW-25<br>3/15/2006 |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 0.0122 | 0.0313 | ND (0.005) | 0.0358 | ND (0.1) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.1) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.1) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.1) |
| 1,1-Dichloroethene | 0.0827 | 0.228 | 0.0685 | ND (0.2) | ND (0.1) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.1) |
| 1,2-Dichloroethene (total) | | | 0.353 | 0.837 | 0.8 |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.1) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.2) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.2) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.2) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.1) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.1) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.1) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.2) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.1) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.1) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.1) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.2) |
| Chloroform | ND (0.005) | 0.00526 | ND (0.005) | 0.00556 | ND (0.1) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.2) |
| cis-1,2-Dichloroethene | 0.255 | 0.819 | 0.353 | 0.837 | 0.774 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.1) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.1) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.1) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.2) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.2) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.1) |
| Tetrachloroethene | 0.00931 | 0.0169 | 0.00646 | 0.0196 | ND (0.1) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.1) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.1) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.1) |
| Trichloroethene | 25.6 | 85.2 | 21.1 | 136 | 36.3 |
| Vinyl Chloride | 0.0318 | 0.422 | 0.0611 | ND (0.5) | ND (0.2) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.3) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents Well ID / Sample ID / Date | MW-26 MW-26 2/1/1999 | MW-26 MW-26 6/1/1999 | MW-26 MW-26 3/1/2000 | MW-26 MW-26 9/21/2000 | MW-26 MW-26 3/26/2001 | MW-26 MW-26 9/11/2001 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | ND (0.01) | ND (0.01) | |
| 1,2-Dichloropropane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | | | | ND (0.02) | ND (0.01) | ND (0.01) |
| Benzene | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | | | | ND (0.005) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.15 | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (unk) | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.36 | ND (unk) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (unk) | ND (unk) | ND (unk) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | | | | ND (0.01) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID<br>Sample ID<br>Constituents Date | MW-26<br>MW-26 DUP<br>9/11/2001 | MW-26<br>MW-26<br>9/10/2002 | MW-26<br>ITMW-26<br>2/27/2003 | MW-26<br>MW-26<br>9/24/2003 | MW-26<br>MW-26<br>4/14/2004 | MW-26<br>ITMW-26<br>9/22/2004 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | MW-27 / MW-27 / 12/1/1999 | MW-27 / MW-27 26' / 12/7/1999 | MW-27 / MW-27 / 12/9/1999 | MW-27 / MW-27 / 3/1/2000 | MW-27 / MW-27 / 9/21/2000 | MW-27 / DUPLICATE / 1/5/2001 | MW-27 / MW-27 / 1/5/2001 |
|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (0.005) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | ND (0.01) | ND (0.01) | | ND (0.01) | ND (0.01) | ND (0.01) |
| 1,2-Dichloropropane | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | | ND (0.01) | ND (0.01) | | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | | ND (0.01) | ND (0.01) | | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | | ND (0.01) | ND (0.01) | | ND (0.02) | ND (0.01) | ND (0.01) |
| Benzene | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane (Methyl bromide) | | ND (0.01) | ND (0.01) | | | | |
| Carbon Disulfide | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorodibromomethane | | ND (0.005) | ND (0.005) | | | | |
| Chloroethane | | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroethane (Ethyl chloride) | | ND (0.01) | ND (0.01) | | | | |
| Chloroform | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloromethane (Methyl chloride) | | ND (0.01) | ND (0.01) | | | | |
| cis-1,2-Dichloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Dichloromethane | | ND (0.005) | ND (0.005) | | | | |
| Ethylbenzene | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | | ND (0.01) | ND (0.01) | | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (unk) | ND (0.005) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (unk) | ND (0.005) | 0.00555 | ND (0.005) |
| Vinyl Chloride | ND (unk) | ND (0.01) | ND (0.01) | ND (unk) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | | ND (0.02) | ND (0.02) | | ND (0.01) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID<br>Sample ID<br>Constituents Date | MW-27<br>MW-27<br>3/26/2001 | MW-27<br>MW-27<br>9/11/2001 | MW-27<br>MW-27<br>9/11/2002 | MW-27<br>MW-27 DUP-4<br>9/11/2002 | MW-27<br>ITMW-27<br>2/27/2003 | MW-27<br>MW-27<br>9/25/2003 | MW-27<br>MW-27<br>4/15/2004 |
|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | ND (0.01) | | | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Bromomethane (Methyl bromide) | | | | | | | |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorodibromomethane | | | | | | | |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroethane (Ethyl chloride) | | | | | | | |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloromethane (Methyl chloride) | | | | | | | |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dichloromethane | | | | | | | |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown historic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | MW-28<br>MW-28<br>12/1/1999 | MW-28<br>Duplicate<br>12/9/1999 | MW-28<br>MW-28<br>12/9/1999 | MW-28<br>MW-28<br>3/1/2000 | MW-28<br>MW-28<br>9/21/2000 | MW-28<br>MW-28<br>3/27/2001 | MW-28<br>DUPLICATE 1<br>3/27/2001 |
|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (0.005) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | ND (0.01) | ND (0.01) | | ND (0.01) | ND (0.01) | ND (0.01) |
| 1,2-Dichloropropane | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | | ND (0.01) | ND (0.01) | | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | | ND (0.01) | ND (0.01) | | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | | ND (0.01) | ND (0.01) | | ND (0.02) | ND (0.01) | ND (0.01) |
| Benzene | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | | | | | ND (0.005) | ND (0.01) | ND (0.01) |
| Bromomethane (Methyl bromide) | | ND (0.01) | ND (0.01) | | | | |
| Carbon Disulfide | | ND (0.005) | ND (0.005) | | ND (0.005) | 0.017 | ND (0.005) |
| Carbon Tetrachloride | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorodibromomethane | | ND (0.005) | ND (0.005) | | | | |
| Chloroethane | | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroethane (Ethyl chloride) | | ND (0.01) | ND (0.01) | | | | |
| Chloroform | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloromethane (Methyl chloride) | | ND (0.01) | ND (0.01) | | | | |
| cis-1,2-Dichloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | | | | | ND (0.005) | ND (0.005) | ND (0.005) |
| Dichloromethane | | ND (0.005) | ND (0.005) | | | | |
| Ethylbenzene | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | | ND (0.01) | ND (0.01) | | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (unk) | ND (0.005) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | | ND (0.005) | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (unk) | ND (0.005) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (unk) | ND (0.01) | ND (0.01) | ND (unk) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | | ND (0.02) | ND (0.02) | | ND (0.01) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | MW-28<br>MW-28<br>9/11/2001 | MW-28<br>MW-28<br>9/11/2002 | MW-28<br>ITMW-28<br>2/27/2003 | MW-28<br>MW-28<br>9/25/2003 | MW-28<br>MW-28<br>4/15/2004 | MW-28<br>MW-28<br>9/22/2004 | MW-28<br>MW-28<br>9/30/2005 |
|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | | | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Bromomethane (Methyl bromide) | | | | | | | |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorodibromomethane | | | | | | | |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroethane (Ethyl chloride) | | | | | | | |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloromethane (Methyl chloride) | | | | | | | |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dichloromethane | | | | | | | |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | MW-29<br>MW-29<br>12/1/1999 | MW-29<br>MW-29<br>12/9/1999 | MW-29<br>MW-29<br>3/1/2000 | MW-29<br>MW-29<br>9/20/2000 | MW-29<br>MW-29<br>3/27/2001 | MW-29<br>MW-29<br>9/11/2001 | MW-29<br>MW-29<br>9/10/2002 |
|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (unk) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | ND (0.01) | | ND (0.01) | ND (0.01) | | |
| 1,2-Dichloropropane | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | | ND (0.01) | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | | ND (0.01) | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | | ND (0.01) | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | | | | ND (0.005) | ND (0.01) | ND (0.01) | ND (0.01) |
| Bromomethane (Methyl bromide) | | ND (0.01) | | | | | |
| Carbon Disulfide | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorodibromomethane | | ND (0.005) | | | | | |
| Chloroethane | | | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroethane (Ethyl chloride) | | ND (0.01) | | | | | |
| Chloroform | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | | | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloromethane (Methyl chloride) | | ND (0.01) | | | | | |
| cis-1,2-Dichloroethene | ND (unk) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | | | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dichloromethane | | ND (0.005) | | | | | |
| Ethylbenzene | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | | ND (0.01) | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | | | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (unk) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (unk) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (unk) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (unk) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (unk) | ND (0.01) | ND (unk) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | | ND (0.02) | | ND (0.01) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents Well ID / Sample ID / Date | MW-29<br>ITMW-29<br>2/27/2003 | MW-29<br>MW-29<br>9/24/2003 | MW-29<br>MW-29<br>4/14/2004 | MW-29<br>MW-29<br>9/22/2004 | MW-29<br>MW-29<br>9/28/2005 |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Bromomethane (Methyl bromide) | | | | | |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorodibromomethane | | | | | |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroethane (Ethyl chloride) | | | | | |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloromethane (Methyl chloride) | | | | | |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dichloromethane | | | | | |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroric data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID<br>Sample ID<br>Constituents Date | MW-30<br>MW-30<br>12/1/1999 | MW-30<br>MW-30<br>12/9/1999 | MW-30<br>MW-30<br>3/1/2000 | MW-30<br>MW-30<br>9/20/2000 | MW-30<br>MW-30<br>3/27/2001 | MW-30<br>MW-30<br>9/11/2001 | MW-30<br>MW-30<br>9/10/2002 |
|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (unk) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (unk) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | 0.03 | | 0.025 | 0.01 | | |
| 1,2-Dichloropropane | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | | ND (0.01) | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | | ND (0.01) | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | | ND (0.01) | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | | | | ND (0.005) | ND (0.01) | ND (0.01) | ND (0.01) |
| Bromomethane (Methyl bromide) | | ND (0.01) | | | | | |
| Carbon Disulfide | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorodibromomethane | | ND (0.005) | | | | | |
| Chloroethane | | | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroethane (Ethyl chloride) | | ND (0.01) | | | | | |
| Chloroform | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | | | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloromethane (Methyl chloride) | | ND (0.01) | | | | | |
| cis-1,2-Dichloroethene | 0.034 | 0.034 | 0.025 | 0.025 | 0.011 | 0.018 | 0.014 |
| cis-1,3-Dichloropropene | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | | | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dichloromethane | | ND (0.005) | | | | | |
| Ethylbenzene | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | | ND (0.01) | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | | | | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (unk) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (unk) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (unk) | ND (0.005) | ND (unk) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | | ND (0.005) | | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.115 | 0.115 | 0.086 | 0.102 | 0.043 | 0.063 | 0.048 |
| Vinyl Chloride | ND (unk) | ND (0.01) | ND (unk) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | | ND (0.02) | | ND (0.01) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | MW-30<br>MW-30<br>9/24/2003 | MW-30<br>MW-30<br>4/14/2004 | MW-30<br>MW-30<br>9/22/2004 | MW-30<br>MW-30<br>9/28/2005 |
|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | 0.0156 |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Bromomethane (Methyl bromide) | | | | |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorodibromomethane | | | | |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroethane (Ethyl chloride) | | | | |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloromethane (Methyl chloride) | | | | |
| cis-1,2-Dichloroethene | 0.0137 | 0.0118 | 0.0121 | 0.0156 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dichloromethane | | | | |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | 0.00828 | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.0468 | 0.0366 | 0.0362 | 0.0596 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroric data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | MW-31<br>MW-31<br>1/5/2001 | MW-31<br>MW-31<br>3/26/2001 | MW-31<br>MW-31<br>9/13/2001 | MW-31<br>MW-31<br>9/11/2002 | MW-31<br>ITMW-31<br>2/28/2003 | MW-31<br>MW-31<br>9/25/2003 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | ND (0.01) | ND (0.01) | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | 0.02 | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.005) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | 0.043 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents Well ID / Sample ID / Date | MW-31<br>MW-31<br>4/15/2004 | MW-31<br>MW-31<br>9/23/2004 | MW-31<br>MW-31<br>4/5/2005 | MW-31<br>MW-31<br>9/27/2005 | MW-31<br>MW-31<br>3/15/2006 |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | ND (0.01) | ND (0.01) | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID / Sample ID / Constituents Date | MW-32 / MW-32 / 1/5/2001 | MW-32 / MW-32 / 3/27/2001 | MW-32 / MW-32 / 9/13/2001 | MW-32 / MW-32 / 9/11/2002 | MW-32 / ITMW-32 / 2/28/2003 | MW-32 / MW-32 / 9/25/2003 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | ND (0.01) | ND (0.01) | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | 0.0255 | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.005) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | 0.105 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.108 | 0.174 | 0.095 | 0.109 | 0.133 | 0.0323 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | MW-32<br>MW-32<br>4/15/2004 | MW-32<br>MW-32<br>9/23/2004 | MW-32<br>MW-32<br>4/5/2005 | MW-32<br>MW-32<br>9/27/2005 | MW-32<br>MW-32<br>3/15/2006 |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | ND (0.01) | ND (0.01) | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.0769 | 0.0514 | 0.158 | 0.0976 | 0.111 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | MW-33<br>MW-33<br>1/5/2001 | MW-33<br>MW-33<br>3/27/2001 | MW-33<br>MW-33<br>9/13/2001 | MW-33<br>MW-33<br>9/11/2002 | MW-33<br>ITMW-33<br>2/28/2003 | MW-33<br>MW-33<br>9/25/2003 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | ND (0.01) | ND (0.01) | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.005) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | 0.115 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | 0.007 | 0.008 | 0.008 | 0.00662 | 0.00595 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.12 | 0.26 | 0.31 | 0.45 | 0.274 | 0.198 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | MW-33 / MW-33 / 4/15/2004 | MW-33 / MW-33 / 9/23/2004 | MW-33 / MW-33 / 4/5/2005 | MW-33 / MW-33 / 9/27/2005 | MW-33 / MW-33 / 3/15/2006 |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | 0.0245 | 0.0152 | 0.0205 |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.0213 | 0.0153 | 0.0245 | 0.0152 | 0.0205 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.871 | 0.798 | 1.43 | 1.03 | 1.61 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | MW-34<br>MW-34<br>3/28/2001 | MW-34<br>MW-34<br>9/13/2001 | MW-34<br>MW-34L<br>9/9/2002 | MW-34<br>ITMW-34<br>2/28/2003 | MW-34<br>MW-34<br>9/25/2003 | MW-34<br>MW-34<br>11/14/2003 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | ND (0.01) | | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | 0.08 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.083 | 0.061 | 0.084 | ND (0.005) | 0.0284 | 0.121 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | MW-34<br>MW-34<br>4/15/2004 | MW-34<br>MW-34<br>9/23/2004 | MW-34<br>MW-34<br>12/9/2004 | MW-34<br>MW-34<br>4/5/2005 | MW-34<br>MW-34<br>9/30/2005 | MW-34<br>MW-34<br>3/14/2006 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.119 | 0.0811 | 0.0933 | 0.0658 | 0.0837 | 0.0771 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents Well ID / Sample ID / Date | MW-35<br>MW-35<br>3/28/2001 | MW-35<br>MW-35<br>9/13/2001 | MW-35<br>MW-35L<br>9/9/2002 | MW-35<br>ITMW-35<br>2/28/2003 | MW-35<br>MW-35<br>9/25/2003 | MW-35<br>MW-35<br>11/14/2003 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.01) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.01) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.01) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.01) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.01) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.01) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | 0.03 | | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.01) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.02) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.02) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.02) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.01) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.01) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.01) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.02) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | 0.008 | ND (0.01) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.01) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.01) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.02) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.01) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.02) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.034 | 0.04 | 0.031 | 0.0151 | 0.0198 | 0.0349 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.01) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.01) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.01) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.02) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.02) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.01) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.01) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.01) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.01) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.01) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.96 | 1.03 | 0.9 | 0.246 | 0.297 | 0.99 |
| Vinyl Chloride | ND (0.01) | ND (0.02) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.038) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | MW-35<br>MW-35<br>4/15/2004 | MW-35<br>MW-35<br>9/23/2004 | MW-35<br>MW-35<br>12/9/2004 | MW-35<br>MW-35<br>4/6/2005 | MW-35<br>MW-35<br>9/30/2005 | MW-35<br>MW-35<br>3/14/2006 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | 0.035 | 0.0293 | 0.0242 |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.0458 | 0.0284 | 0.042 | 0.035 | 0.0293 | 0.0242 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 1.15 | 0.685 | 0.88 | 0.886 | 0.804 | 0.858 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | MW-36 / MW-36 / 3/28/2001 | MW-36 / MW-36 / 9/13/2001 | MW-36 / MW-36L / 9/9/2002 | MW-36 / ITMW-36 / 2/28/2003 | MW-36 / MW-36 / 9/25/2003 | MW-36 / MW-36 / 11/14/2003 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | ND (0.01) | | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | 0.008 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroric data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | MW-36<br>MW-36<br>4/15/2004 | MW-36<br>MW-36<br>9/23/2004 | MW-36<br>MW-36<br>4/6/2005 | MW-36<br>MW-36<br>9/30/2005 | MW-36<br>MW-36<br>3/17/2006 |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | ND (0.01) | ND (0.01) | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | MW-37 / MW-37 / 9/29/2005 | MW-37 / MW-37 / 3/16/2006 |
|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.05) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.05) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.05) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.05) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.05) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.05) |
| 1,2-Dichloroethene (total) | 3.21 | 5 |
| 1,2-Dichloropropane | ND (0.005) | ND (0.05) |
| 2-Hexanone | ND (0.01) | ND (0.1) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.1) |
| Acetone | ND (0.01) | ND (0.1) |
| Benzene | ND (0.005) | ND (0.05) |
| Bromodichloromethane | ND (0.005) | ND (0.05) |
| Bromoform | ND (0.005) | ND (0.05) |
| Bromomethane | ND (0.01) | ND (0.1) |
| Carbon Disulfide | ND (0.005) | ND (0.05) |
| Carbon Tetrachloride | ND (0.005) | ND (0.05) |
| Chlorobenzene | ND (0.005) | ND (0.05) |
| Chloroethane | ND (0.01) | ND (0.1) |
| Chloroform | ND (0.005) | ND (0.05) |
| Chloromethane | ND (0.01) | ND (0.1) |
| cis-1,2-Dichloroethene | 3.21 | 5.02 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.05) |
| Dibromochloromethane | ND (0.005) | ND (0.05) |
| Ethylbenzene | ND (0.005) | ND (0.05) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.1) |
| Methylene Chloride | 0.012 | ND (0.1) |
| Styrene | ND (0.005) | ND (0.05) |
| Tetrachloroethene | ND (0.005) | ND (0.05) |
| Toluene | 0.00981 | ND (0.05) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.05) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.05) |
| Trichloroethene | 6.78 | 11.2 |
| Vinyl Chloride | 0.91 | 1.73 |
| Xylenes (total) | ND (0.015) | ND (0.15) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID / Sample ID / Constituents / Date | MW-38 / MW-38 / 9/29/2005 |
|---|---|
| 1,1,1-Trichloroethane | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) |
| 1,2-Dichloroethene (total) | 0.101 |
| 1,2-Dichloropropane | ND (0.005) |
| 2-Hexanone | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) |
| Acetone | 0.285 |
| Benzene | ND (0.005) |
| Bromodichloromethane | ND (0.005) |
| Bromoform | ND (0.005) |
| Bromomethane | ND (0.01) |
| Carbon Disulfide | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) |
| Chlorobenzene | ND (0.005) |
| Chloroethane | ND (0.01) |
| Chloroform | ND (0.005) |
| Chloromethane | ND (0.01) |
| cis-1,2-Dichloroethene | 0.0989 |
| cis-1,3-Dichloropropene | ND (0.005) |
| Dibromochloromethane | ND (0.005) |
| Ethylbenzene | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) |
| Methylene Chloride | ND (0.01) |
| Styrene | ND (0.005) |
| Tetrachloroethene | ND (0.005) |
| Toluene | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) |
| Trichloroethene | ND (0.005) |
| Vinyl Chloride | 2.15 |
| Xylenes (total) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroric data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | MW-39<br>MW-39<br>7/18/2003 | MW-39<br>MW-39<br>9/25/2003 | MW-39<br>MW-39<br>11/14/2003 | MW-39<br>MW-39<br>4/15/2004 | MW-39<br>MW-39<br>9/23/2004 | MW-39<br>MW-39<br>4/8/2005 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | 0.0392 | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | MW-39 MW-39 9/30/2005 | MW-39 MW-39 3/17/2006 |
|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | ND (0.01) | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | MW-40<br>MW-40<br>7/18/2003 | MW-40<br>MW-40<br>9/25/2003 | MW-40<br>MW-40<br>11/14/2003 | MW-40<br>MW-40 DUP-1<br>11/14/2003 | MW-40<br>MW-40<br>4/15/2004 | MW-40<br>MW-40<br>9/23/2004 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID<br>Sample ID<br>Constituents Date | MW-40<br>MW-40<br>4/7/2005 | MW-40<br>MW-40<br>9/29/2005 | MW-40<br>MW-40<br>3/14/2006 |
|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | ND (0.01) | ND (0.01) | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID<br>Sample ID<br>Constituents Date | MW-41<br>MW-41<br>7/18/2003 | MW-41<br>MW-41 DUP-1<br>7/18/2003 | MW-41<br>MW-41<br>9/25/2003 | MW-41<br>MW-41<br>11/14/2003 | MW-41<br>MW-41<br>4/15/2004 | MW-41<br>MW-41<br>9/23/2004 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | | | |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.0506 | 0.0455 | 0.0378 | 0.205 | 0.0542 | 0.048 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.972 | 0.964 | 0.722 | 0.331 | 0.76 | 1.06 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents Well ID / Sample ID / Date | MW-41<br>MW-41<br>4/7/2005 | MW-41<br>MW-41<br>9/30/2005 | MW-41<br>MW-41<br>3/17/2006 |
|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | 0.058 | 0.0558 | 0.0525 |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.058 | 0.0558 | 0.0525 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 1.17 | 1.12 | 0.917 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | MW-42B<br>MW-42<br>4/15/2004 | MW-42B<br>MW-42<br>9/23/2004 | MW-42B<br>MW-42<br>4/5/2005 | MW-42B<br>MW-42<br>9/27/2005 | MW-42B<br>MW-42<br>3/15/2006 |
|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | 0.032 | 0.0273 | 0.0372 |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.0293 | 0.0198 | 0.032 | 0.0273 | 0.0372 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.856 | 0.4 | 1.31 | 1.47 | 2.27 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | MW-43<br>MW-43<br>11/14/2003 | MW-43<br>MW-43<br>4/15/2004 | MW-43<br>MW-43<br>9/23/2004 | MW-43<br>MW-43<br>4/5/2005 | MW-43<br>MW-43<br>9/27/2005 | MW-43<br>MW-43<br>3/15/2006 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | 0.0119 | 0.0213 | 0.035 |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | 0.0286 | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.0185 | 0.0121 | 0.00631 | 0.0119 | 0.0213 | 0.035 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.223 | 0.51 | 0.0647 | 0.304 | 0.518 | 1.3 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID<br>Sample ID<br>Constituents Date | MW-46<br>MW-46<br>11/14/2003 | MW-46<br>MW-46<br>4/15/2004 | MW-46<br>MW-46<br>9/23/2004 | MW-46<br>MW-46<br>4/6/2005 | MW-46<br>MW-46<br>9/28/2005 | MW-46<br>MW-46<br>3/16/2006 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | 0.032 | 0.0156 | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | 0.0181 |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | 0.0272 | 0.0212 | 0.0284 | 0.0156 | 0.00637 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.0399 | 0.0771 | 0.142 | 0.21 | 0.222 | 0.111 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID<br>Sample ID<br>Constituents Date | MW-46<br>MW-46R<br>4/6/2006 |
|---|---|
| 1,1,1-Trichloroethane | |
| 1,1,2,2-Tetrachloroethane | |
| 1,1,2-Trichloroethane | |
| 1,1-Dichloroethane | |
| 1,1-Dichloroethene | |
| 1,2-Dichloroethane | |
| 1,2-Dichloroethene (total) | |
| 1,2-Dichloropropane | |
| 2-Hexanone | |
| 4-Methyl-2-pentanone (MIBK) | |
| Acetone | |
| Benzene | |
| Bromodichloromethane | |
| Bromoform | |
| Bromomethane | |
| Carbon Disulfide | |
| Carbon Tetrachloride | ND (0.005) |
| Chlorobenzene | |
| Chloroethane | |
| Chloroform | |
| Chloromethane | |
| cis-1,2-Dichloroethene | |
| cis-1,3-Dichloropropene | |
| Dibromochloromethane | |
| Ethylbenzene | |
| Methyl Ethyl Ketone (2-Butanone) | |
| Methylene Chloride | |
| Styrene | |
| Tetrachloroethene | |
| Toluene | |
| trans-1,2-Dichloroethene | |
| trans-1,3-Dichloropropene | |
| Trichloroethene | |
| Vinyl Chloride | |
| Xylenes (total) | |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | MW-50<br>MW-50<br>4/15/2004 | MW-50<br>NW-50<br>9/23/2004 | MW-50<br>MW-50<br>12/10/2004 | MW-50<br>MW-50<br>4/6/2005 | MW-50<br>MW-50<br>9/28/2005 | MW-50<br>MW-50<br>3/17/2006 |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | | | ND (0.01) | ND (0.01) | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | 0.0171 | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.00651 | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID / Sample ID / Constituents Date | MW-55<br>MW-55<br>12/9/2004 | MW-55<br>MW-55<br>4/8/2005 | MW-55<br>MW-55<br>9/28/2005 | MW-55<br>MW-55<br>3/16/2006 |
|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | ND (0.01) | ND (0.01) | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroric data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | MW-56<br>MW-56<br>12/10/2004 | MW-56<br>MW-56<br>4/8/2005 | MW-56<br>MW-56<br>9/28/2005 | MW-56<br>MW-56<br>3/16/2006 |
|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | ND (0.01) | ND (0.01) | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.0902 | 0.0882 | 0.207 | 0.0087 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | MW-57<br>MW-57<br>12/10/2004 | MW-57<br>MW-57<br>4/8/2005 | MW-57<br>MW-57<br>9/28/2005 | MW-57<br>MW-57<br>3/16/2006 |
|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | ND (0.01) | ND (0.01) | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.00672 | 0.00683 | ND (0.005) | 0.00756 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.207 | 0.282 | 0.096 | 0.254 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | MW-58 / MW-58 / 12/9/2004 | MW-58 / MW-58 / 4/7/2005 | MW-58 / MW-58 / 9/28/2005 | MW-58 / MW-58 / 3/16/2006 |
|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | | 0.0188 | 0.0109 | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | 0.0145 | 0.0188 | 0.0109 | 0.00866 |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.526 | 0.809 | 0.486 | 0.421 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | MW-60<br>MW-60<br>4/1/2005 | MW-60<br>MW-60<br>9/30/2005 | MW-60<br>MW-60<br>3/17/2006 |
|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | ND (0.01) | ND (0.01) | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroric data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | MW-61<br>DUP-041005<br>4/1/2005 | MW-61<br>MW-61<br>4/1/2005 | MW-61<br>MW-61<br>9/30/2005 | MW-61<br>MW-61<br>3/17/2006 |
|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | 0.0114 | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents / Well ID / Sample ID / Date | MW-62<br>MW-62<br>4/1/2005 | MW-62<br>MW-62<br>9/30/2005 | MW-62<br>MW-62<br>3/16/2006 |
|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | ND (0.01) | ND (0.01) | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | 0.0114 | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | ND (0.005) | ND (0.005) | ND (0.005) |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | MW-63<br>MW-63<br>4/1/2005 | MW-63<br>MW-63<br>9/30/2005 | MW-63<br>MW-63<br>3/16/2006 | MW-63<br>MW-63<br>4/6/2006 |
|---|---|---|---|---|
| 1,1,1-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 1,2-Dichloroethene (total) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| 2-Hexanone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Acetone | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Benzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromodichloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromoform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Bromomethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Carbon Disulfide | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chlorobenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloroethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Chloroform | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Chloromethane | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Dibromochloromethane | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Ethylbenzene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Methylene Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Styrene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Tetrachloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Toluene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) | ND (0.005) | ND (0.005) | ND (0.005) |
| Trichloroethene | 0.00814 | ND (0.005) | 0.00976 | 0.0116 |
| Vinyl Chloride | ND (0.01) | ND (0.01) | ND (0.01) | ND (0.01) |
| Xylenes (total) | ND (0.015) | ND (0.015) | ND (0.015) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit

Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | MW-66 / MW-66 / 4/6/2006 |
|---|---|
| 1,1,1-Trichloroethane | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) |
| 1,2-Dichloroethene (total) | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) |
| 2-Hexanone | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) |
| Acetone | ND (0.01) |
| Benzene | ND (0.005) |
| Bromodichloromethane | ND (0.005) |
| Bromoform | ND (0.005) |
| Bromomethane | ND (0.01) |
| Carbon Disulfide | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) |
| Chlorobenzene | ND (0.005) |
| Chloroethane | ND (0.01) |
| Chloroform | ND (0.005) |
| Chloromethane | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) |
| Dibromochloromethane | ND (0.005) |
| Ethylbenzene | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) |
| Methylene Chloride | ND (0.01) |
| Styrene | ND (0.005) |
| Tetrachloroethene | ND (0.005) |
| Toluene | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) |
| Trichloroethene | ND (0.005) |
| Vinyl Chloride | ND (0.01) |
| Xylenes (total) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroric data from summary tables
'(0.005) Reporting Limit

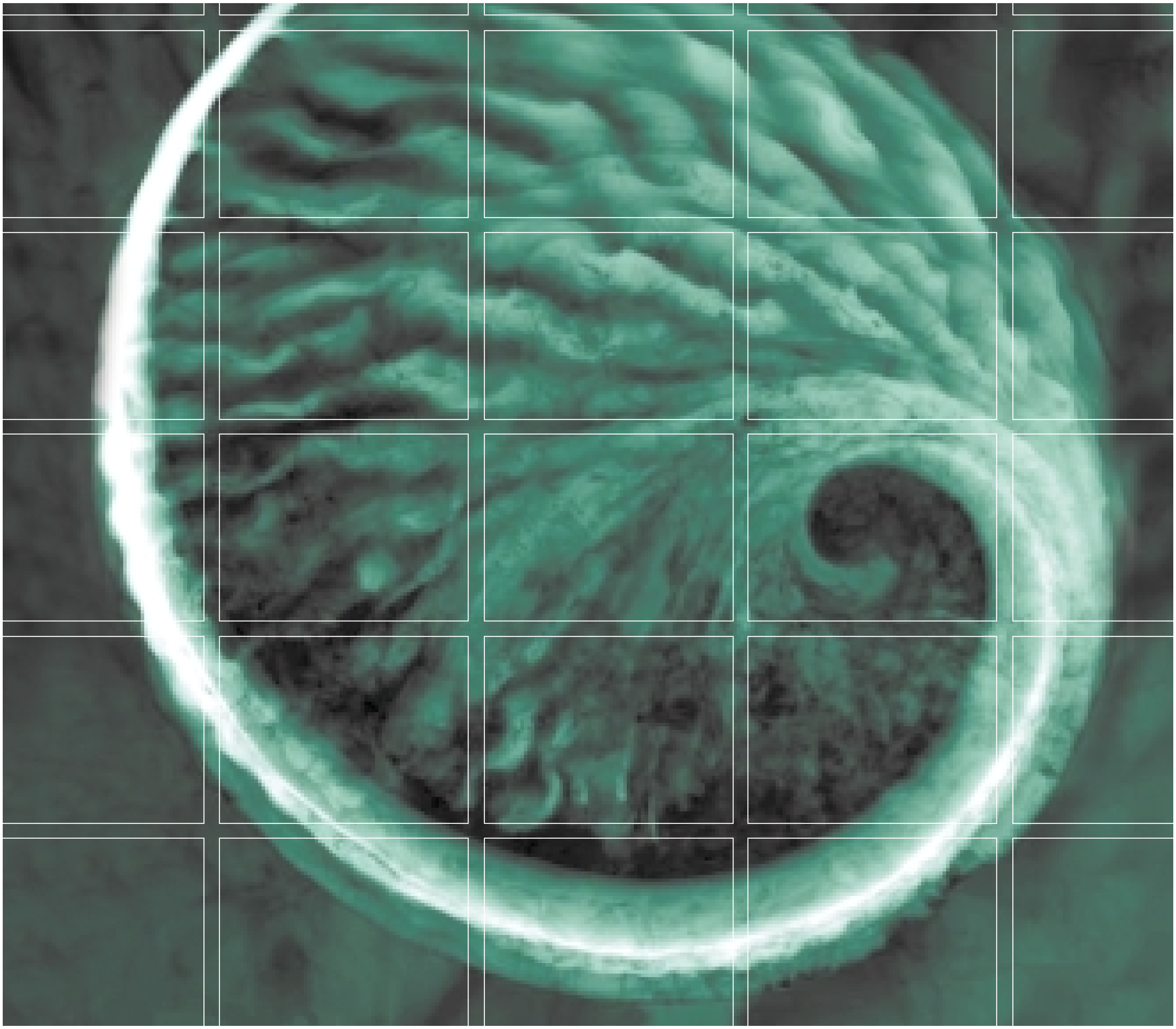
Table H-4

Ground Water Analytical Data

Whirlpool Corporation
Fort Smith, Arkansas

| Constituents — Well ID / Sample ID / Date | MW-67 / MW-67 / 4/6/2006 |
|---|---|
| 1,1,1-Trichloroethane | ND (0.005) |
| 1,1,2,2-Tetrachloroethane | ND (0.005) |
| 1,1,2-Trichloroethane | ND (0.005) |
| 1,1-Dichloroethane | ND (0.005) |
| 1,1-Dichloroethene | ND (0.005) |
| 1,2-Dichloroethane | ND (0.005) |
| 1,2-Dichloroethene (total) | ND (0.01) |
| 1,2-Dichloropropane | ND (0.005) |
| 2-Hexanone | ND (0.01) |
| 4-Methyl-2-pentanone (MIBK) | ND (0.01) |
| Acetone | ND (0.01) |
| Benzene | ND (0.005) |
| Bromodichloromethane | ND (0.005) |
| Bromoform | ND (0.005) |
| Bromomethane | ND (0.01) |
| Carbon Disulfide | ND (0.005) |
| Carbon Tetrachloride | ND (0.005) |
| Chlorobenzene | ND (0.005) |
| Chloroethane | ND (0.01) |
| Chloroform | ND (0.005) |
| Chloromethane | ND (0.01) |
| cis-1,2-Dichloroethene | ND (0.005) |
| cis-1,3-Dichloropropene | ND (0.005) |
| Dibromochloromethane | ND (0.005) |
| Ethylbenzene | ND (0.005) |
| Methyl Ethyl Ketone (2-Butanone) | ND (0.01) |
| Methylene Chloride | ND (0.01) |
| Styrene | ND (0.005) |
| Tetrachloroethene | ND (0.005) |
| Toluene | ND (0.005) |
| trans-1,2-Dichloroethene | ND (0.005) |
| trans-1,3-Dichloropropene | ND (0.005) |
| Trichloroethene | ND (0.005) |
| Vinyl Chloride | ND (0.01) |
| Xylenes (total) | ND (0.015) |

ND Constituent reported as Not Detected at the posted Reporting Limit
(unk) Reporting Limit unknown histroic data from summary tables
'(0.005) Reporting Limit



# Interim Status Report and CAS Work Plan Revision

**Whirlpool Facility, Ft. Smith, Arkansas**
**Prepared for Whirlpool Corporation**

June 25, 2004

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**Volume 1 of 3**

Whirlpool Corporation

# Interim Status Report and CAS Work Plan Revision

June 25, 2004

Project No. 0014507
Whirlpool, Ft. Smith, Arkansas


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## 1.0 INTRODUCTION

This Interim Status Report and Corrective Action Strategy (CAS) Work Plan Revision describes the current status of offsite investigations at the Whirlpool Ft. Smith Facility (the Facility) and the activities the facility intends to conduct during CAS implementation. This submittal consists of:

- An off-site delineation status report;
- An annotated CAS Work Plan (Appendix A), and the
- Conceptual Site Model (CSM) Report with updates as requested by ADEQ (Appendix B).

As specified in guidance for development of the CAS work plan described in Section 2.4.2 of the USEPA Region 6 Corrective Action Strategy, this submittal includes site data relevant to assessment of performance standards that are sufficient to protect human health and the environment. Table 1-1 summarized the CAS work plan requirements outlined in Section 2.4.2 of the CAS and indicates where the information may be found in this submittal.

## 1.1 BACKGROUND INFORMATION

The Whirlpool Fort Smith facility is located at 6400 Jenny Lind Road on the south side of Fort Smith, Arkansas (Figure 1-1). The facility manufactures side-by-side household refrigerators, trash compactors and icemakers. The facility has been operated by Whirlpool for over 30 years.

Information concerning waste management practices, and site releases can be found in The CSM in Appendix B. In summary, a series of soil and ground water studies were initiated in the late 1980's at the site as part of a project to remove an underground fuel storage tank (UST). That work indicated that there was no evidence of releases of petroleum hydrocarbons from the UST. However, the analytical data showed the presence of trichloroethylene (TCE) and other solvents not related to the UST in the shallow ground water. Subsequent investigations, including a soil investigation to assess the potential source area, have been conducted to characterize the nature of TCE in soil and ground water. It is believed that constituents in the soils and ground water identified in the facility investigation are the result of historical practices prior to 1980. Additional information can be found in Section 1.1 and 2.2 of the CSM, Appendix B.

Analytical data from the monitoring well system show that affected ground water has migrated from the apparent source area (near MW-25) in a southerly direction under the northwest corner of the main manufacturing building. The extent of affected ground water to the south and southwest appears to be limited to the Whirlpool property; that is, the ground water plume does not extend off site in that direction. However, data from wells north of Ingersoll Avenue indicate that affected ground water has migrated off site and extends as far as 1300 ft. north of the site.

## 1.2 GROUND WATER MANAGEMENT PROGRAM

In order to fully characterize on- and off-site impacts to ground water and assess whether remedial actions are necessary, Whirlpool developed a Ground Water Management Program.

Following completion of initial site investigations, Whirlpool initiated discussions with the Arkansas Department of Environmental Quality (ADEQ) and entered into a letter of agreement (LOA) to implement a CAS for the off-site ground water plume at the Facility. A CAS Work Plan Outline was prepared that describes the activities the facility intends to conduct during the CAS implementation. The CSM and CSM addendum letter dated August 30, 2002 were developed as the framework on which the implementation of the CAS is based.

In accordance with the CAS process (illustrated in Figure 1-2), the CAS Work Plan, CSM, and CSM addendum were presented to ADEQ at the scoping meeting held at the Whirlpool facility on August 13, 2002. After reviewing the documents provided at the scoping meeting, Mr. Mike Hill contacted Whirlpool on February 10, 2003 and gave verbal authorization to proceed with the off-site delineation activities. To date, two phases of additional off-site ground water investigations (Figure 1-2 (7)) have been conducted.

## 1.3 SCOPE OF PREVIOUS INVESTIGATIONS AT THE WHIRLPOOL FACILITY

### 1.3.1 Voluntary Semiannual Ground Water Monitoring Program

As part of its Ground Water Management Program, Whirlpool has implemented a voluntary semiannual ground water sampling program to monitor ground water conditions at the site. Periodic ground water monitoring activities at the Whirlpool facility began in 1989. Semiannual ground water monitoring was started in March 2000 and continues to the present. The semiannual monitoring events have expanded to include additional monitoring wells installed during off-site delineation activities.

The semiannual ground water monitoring program at the Facility currently includes sampling of 24 on-site monitoring wells and 16 off-site monitoring wells during the first and fourth quarters of each year. During each monitoring event the water levels in all wells are gauged to provide data for evaluating ground water flow conditions. Locations of the wells that are part of the regular monitoring program are shown in Figure 1-3.

### 1.3.2 Off-Site Delineation

In 2000, data collected as part of the Initial On-site Ground Water Investigations (Phase I, Figure 1-2) from wells at the northern boundary of the Facility indicated the presence of a TCE plume near the Northern boundary of the Facility. In order to evaluate ground water conditions in this area, additional investigations were conducted in 2001 at the northern limit of Whirlpool property (an easement at the north side of Ingersoll Avenue). These investigations confirmed the presence of TCE and indicated that it may be moving off site.

After ADEQ's review and approval of the CAS Work Plan, Whirlpool conducted two phases of delineation that focused on assessing the extent of the off-site TCE plume.

- Off-site Delineation Phase A was conducted in July 2003 and included the installation, development and sampling of three off-site wells between Ingersoll Avenue and Jacobs Avenue; and
- Off-site Delineation Phase B was conducted in November 2003 and included 10 Membrane Interface Probe (MID) borings, 11 Geoprobe soil borings, and installation, development and sampling of four wells between Jacobs Avenue, Jenny Lind, and Brazil Avenue.

Procedures employed during ground water monitoring and off-site delineation activities are described in Sections 2 and 3 below.

## 2.0 *GROUND WATER SAMPLING PROCEDURES*

Ground water samples have been collected as part of the Facility ground water monitoring program and the off-site delineation activities. Procedures employed during ground water sampling are described below.

Prior to 2002, each monitor well was sampled using a traditional purge and sample method. This method involves purging three well volumes from each well prior to collecting the sample. Ground water field parameters, such as pH, SC, and temperature are monitored following the purging of each well volume and after sample collection. Samples were typically collected with a bailer.

Since the beginning of 2002, ground water samples have been collected using low-flow ground water sampling techniques in accordance with the Environmental Protection Agency (EPA) *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures*. The change to low-flow sampling techniques followed a comparison study where numerous wells were sampled first by low-flow methods and then by traditional purge and sample techniques.

Low-flow ground water sampling techniques are performed using a peristaltic pump and dedicated polyethylene tubing. The tubing is placed in the middle of the screened interval, or water column depending on depth to water. Low-flow procedures are followed and wells are pumped at a rate generally less than 0.5 L/min in order to limit drawdown.

Water quality parameters are monitored using an YSI 650XL multiprobe and flow-thru cell or an equivalent meter. Readings are recorded approximately every 5 minutes until parameters stabilize over three successive readings. Stabilization parameters include:

- pH within 0.1 units;
- SC ± 3%;
- DO ± 10%; and
- ORP ± 10 mV.

In some cases, slow recovery rates prohibit the use of low-flow techniques. Wells with slow recovery rates are pumped dry once and then allowed to recover prior to sampling. Purge water generated during sampling is placed in containers for proper disposal by Whirlpool.

Samples are typically collected for analysis of the volatile organic compounds (VOCs) and natural attenuation parameters listed on Table 2-1. VOC samples are collected in 40-mL vials, labeled, stored on ice, and shipped to Severn Trent Laboratory (STL) in Houston, Texas for analyses by SW-846 Method 8260B. Chloride, nitrate and sulfate samples are collected in neat 250 to 500 mL plastic bottles, labeled, stored on ice, and delivered to Data Testing, Inc. in Fort Smith, Arkansas for analyses by EPA water/wastewater methods. Samples for ferrous iron analysis are analyzed in the field by using a Hach DR820 colorimeter glass ampule method 8146. Chain of custody procedures are established and followed from the time of sample collection until the analyses are complete.

During ground water sampling activities, the following QA/QC samples are routinely collected:

- one blind duplicate per 20 samples; and
- one field blank per day.

Duplicates are analyzed for all site constituents. Field blanks are analyzed for VOCs only.

## *3.0 OFF-SITE DELINEATION PROGRAM*

The purposes of the off-site delineation activities are to characterize the subsurface conditions and to delineate the extent of the off-site ground water plume. As discussed above, two phases of delineation have been conducted to date.

Off-site delineation Phase A (July 2003) involved the installation, development, and sampling of three wells between Ingersoll Avenue and Jacobs (Figure 3-1) This initial off-site work was focused on two properties immediately north of the known on-site extent of the plume.

Following confirmation of the off-site ground water flow directions and verification of the presence of an off-site TCE plume, a second phase of off-site delineation was conducted. Off-site Delineation Phase B, conducted in November 2003, included borings along the right-of-ways of Jacobs Avenue, Jenny Lind Street, and Brazil Avenue (Figure 3-2).

First, MIP screening borings were conducted at 11 locations to qualitatively assess the presence of TCE in ground water. Following qualitative delineation of the TCE plume with the MIP, geoprobe borings were conducted adjacent to 7 locations to evaluate the relationship between the site lithology and the location of the TCE Plume. Boring locations were selected both inside and outside of the suspected TCE plume and in areas where it was anticipated that additional data would help in delineating the gravel-rich units that appear to be influencing ground water flow.

Based on the MIP screening and geoprobe boring data, monitoring wells were installed in selected borings. Two monitoring wells were installed at locations near the suspected central area of the TCE plume as indicated by MIP screening data and two were installed near the suspected fringe. One well was also installed along Brazil Avenue in the suspected downgradient direction of the plume.

Procedures employed during off-site delineation activities for MIP screening, Geoprobe borings, and well installations are described in the following sections.

### *3.1 MIP SCREENING*

A drill rig equipped with an MIP was used to screen for the presence of TCE in the ground water by detecting VOCs in the subsurface. MIP screening is conducted by advancing the MIP tool into the soil at a constant rate using a direct-push drill rig or Geoprobe. The MIP tool consists of a semipermeable membrane attached to tubing and a drive point. The drive point is pushed into the soil to place the semipermeable membrane into contact with soil and ground water. The drive point heats the soil causing volatilization of constituents in the soil or ground water. These constituents pass through the semipermeable membrane and into the tubing where a carrier gas transports the constituents to the surface and into photoionization (PID) or flame ionization (FID) detectors where the concentration of the constituents are measured. A computer attached to the detector records the results on a graph that indicates the detections as a function of depth. A schematic drawing of the MIP system and a representative log are shown in Figure 3-3.

## *3.2 GEOPROBE SOIL BORINGS*

Geoprobe soil borings were conducted using a direct push Geoprobe drill rig to collect continuous soil cores for evaluation of lithology in the area of concern. The borings were conducted to refusal, which was generally encountered at a depth of approximately 30 feet.

Prior to drilling, the locations were cleared with local utility company representatives and then hand probed to a minimum of 5-feet to verify absence of underground utilities.

Soil cores from the Geoprobe borings were examined in the field by a geologist who prepared lithologic logs including a description of the lithology, and physical characteristics such as texture, color, plasticity, and moisture content. In addition, the cores were field-screened for the presence of volatile organics by placing representative pieces of the core in a sealable plastic bag, which was allowed to sit at ambient conditions for approximately 10 minutes. The maximum headspace was then measured by inserting the probe of a PID equipped with an 11.8 eV bulb into the plastic bag. Boring logs are included in Appendix C.

Monitor wells were installed in selected borings. The remainder of the borings in roadways were tremie grouted to the surface using neat cement. Borings located outside of roadways were backfilled with bentonite.

Upon completion of sampling, all soil cuttings and any other waste generated during sampling was contained and transferred to an on-site rolloff container. All drilling and reusable sampling equipment was decontaminated before advancing to the next drilling location.

## *3.3 MONITORING WELL INSTALLATION*

Monitoring wells were designed and constructed in accordance with the Arkansas Department of Pollution Control and Ecology Hazardous Waste Division Interim Policy PRCR 96-4. Each well installed during off-site delineation activities was constructed using ¾-inch diameter schedule 40 PVC casing and stainless steel, wire-wrapped, pre-pack screen.

Once the well casing and screen was installed in the borehole, a sand pack consisting of 20/40 sieve silica sand was poured into the annulus until the top of the sand pack was a minimum of two feet above the top of the well screen. A well seal consisting of a minimum three feet of pelletized bentonite was then added to the well annulus. Once the bentonite was hydrated, the remainder of the well annulus was filled to the surface with neat cement. A surface completion was installed consisting of a concrete pad and a steel cover. Well completion details are included in Table 3-1 and Appendix C.

Sample locations and monitoring wells were marked and surveyed for horizontal position and elevation relative to an established benchmark. The top of casing elevation of each monitoring well was also recorded.

### *3.4 MONITORING WELL DEVELOPMENT*

Following installation, each well was developed to remove fines present due to the drilling and completion activities. The wells were developed using a combination of surging and pumping using a Watera pump (tubing with a foot valve) and/or a peristaltic pump. During development, water quality parameters such as turbidity, pH, specific conductance, and temperature were monitored. Wells were considered developed when parameters stabilized and the water was relatively clear of silt. In some instances, due to slow recovery rates, wells were pumped dry. If a well went dry during development, it was allowed to recover overnight and then additional development was conducted. Well development records are included in Appendix D.

## 4.0 RESULTS

### 4.1 MONITORING PROGRAM

Data from ground water monitoring activities conducted since 1989 indicate that the predominate direction of shallow ground water flow across the majority of the site during fall is to the south/southwest (Figure 4-1). However, in the spring, flow shifts to the southeast (Figure 4-2).

Ground water elevations north of the Facility indicate that a ground water divide is present along an approximate line from MW-26 to MW-28 to MW-22. North of this divide, ground water appears to flow north and northeast away from Ingersoll Avenue. There does not appear to be any significant seasonal variation in ground water flow directions north of the site.

Analytical data from the monitoring well system show that affected ground water has migrated from the apparent source area (near MW-25) in a southerly and southwesterly direction under the northwest corner of the main manufacturing building (Figure 4-3). Based on the site analytical data, the ground water plume appears to be stable. Some wells show seasonal variation in concentration but the majority have decreasing or stabile trends (Table 4-1).

The extent of affected ground water to the south and southwest appears to be limited to the Whirlpool property; that is, the ground water plume does not extend off site in that direction. However, data from wells north of the main building, and off-site wells northwest of the facility indicate that affected ground water has migrated to the north of the facility across Ingersoll Avenue and Jacobs Avenue.

The area of concern for the off-site ground water investigation is defined as the apparent extent of ground water that exceeds 0.005 ppm TCE. This area is illustrated in Figure 4-3.

### 4.2 OFF-SITE DELINEATION

Off-site delineation activities have focused on two tasks, characterizing the lithology north of the facility and delineating the extent of the off-site ground water plume.

Data from the on-site investigations show that the Facility is generally underlain by alluvium composed of a shallow fine-grained unit, and a coarse-textured basal unit. This alluvial zone overlies the McAlester Shale which is generally encountered at depths between 25-30 feet. Additional detail concerning regional and local geology and hydrogeology is included in Section 4 of the CSM (Appendix B).

Based on the delineation completed thus far, the lithology off-site appears similar to that encountered on-site (Section 4.2 of the CSM (Appendix B)). The alluvial deposits are 26 to 30 feet thick near the facility and thin to 10 to 15 feet thick to the north and east. As illustrated in cross sections, the aquifer generally consists of clayey gravels and silty clayey sands ranging from 3 to 5 feet thick near the site and appears to pinch out to the north and northeast (Figures 4-4 and 4-5). As shown in Figure 4-6, there appears to be a fan-shaped gravel-rich deposit that extends north from Ingersoll Avenue across Jacobs Avenue. Based on ground water gradients in the off-site wells, it appears that this more permeable portion of the aquifer may influence ground water flow in the area.

MIP screening data and analytical results from the off-site delineation activities indicate that the off-site TCE plume is generally located within the gravel-rich alluvial deposit. MIP screening data from outside the extent of the gravel-rich alluvial deposit do not indicate the presence of VOCs and, furthermore, ground water samples from wells installed outside of the gravel-rich portion of the unit have very low concentrations of TCE or are reported as non-detect (Figure 4-7).

## 5.0 PLANNED ACTIVITIES FOR OFF-SITE DELINATION PHASE C

Additional off-site ground water delineation tasks are required in order to delineate the off-site ground water plume and complete characterization of the off-site lithology and hydrogeology. This additional work includes conducting additional Geoprobe borings and MIP screening north of Jacobs and east along Jacobs. The technical approach, methods, and schedule for the additional work to complete the delineation are described below.

This work will be conducted under the Health and Safety Plan included in Appendix E.

## 5.1 TECHNICAL APPROACH

Off-Site Delineation Phase C will consist of three general tasks:

Task 1 –Geoprobe boring and MIP screening will be conducted between Jacobs and Brazil;

Task 2 – Based on the observations from Task 1, approximately five locations will be selected for completion of wellpoints. Ground water samples will be collected from new wells during two consecutive semiannual events.

The approximate locations of the proposed MIP screening borings and well installations are illustrated in Figure 5-1. The actual number and location of the borings may need to be modified due to access constraints and other field conditions encountered at the site. Final locations will be determined in the field.

Task 3 –Based on the results of the delineation, the CSM will be updated accordingly.

## 5.2 INVESTIGATION METHODS

Off-site delineation Phase C will include MIP screening, geoprobe borings and monitor well installations.

### 5.2.1 MIP Screening and Geoprobe Soil Borings

Initially up to eight MIP screening borings will be conducted between Jacobs Avenue and Brazil Avenue to screen for the presence of TCE at locations shown on Figure 5-1. Geoprobe borings will be conducted adjacent to selected MIP screening locations to delineate the gravel-rich unit that is expected to control ground water flow. The soil borings between Jacobs Avenue and Brazil Avenue will be conducted using a drill rig equipped with hollow stem augers or a Geoprobe. All borings will be continuously sampled and logged. Borings will be advanced to a depth of approximately 30 feet or to the top of bedrock.

Soil cores will be logged in the field for lithology, and physical characteristics such as texture, color, plasticity, and moisture content. The cores will also be field-screened for the presence of volatile organics using a PID.

### *5.2.2 Monitoring Well Installation, Development, and Sampling*

Following evaluation of the MIP and soil boring data, up to five monitoring wells will be installed at selected locations near or downgradient of the expected fringe of the TCE plume. The additional monitoring wells will be designed and constructed in accordance with the Arkansas Department of Pollution Control and Ecology Hazardous Waste Division Interim Policy PRCR 96-4. Each well will be constructed using a ¾-inch diameter schedule 40 PVC casing with stainless-steel, wire-wrapped, pre-pack screens. The screen lengths will not exceed ten feet and will generally be placed to monitor the lower portion of the uppermost aquifer.

Once the well casing and screen is installed, a sand pack will be poured into the annulus until the top of the sand pack approximately two feet above the top of the well screen. The sand pack will be followed by a minimum of 3 feet of pelletized bentonite and the remainder will be grouted to the surface using neat cement.

Following installation, each well will be developed to remove fines present. Development techniques will include bailing, surging, and/or pumping. A minimum of eight borehole volumes will be removed or if the well goes dry, it will be allowed to recover over night and developed dry a second time. PH, specific conductance, and temperature will be monitored during development.

All drilling and sampling equipment will be decontaminated with laboratory-grade detergent before drilling each well and upon completion of drilling.

## *5.3 ANALYTICAL PROGRAM*

Ground water samples for chemical analyses will be collected in accordance with EPA SW-846 Methods. The target constituents and associated laboratory detection limits are provided in Table 2-1. Ground water samples will be collected directly from the tubing into laboratory-supplied containers. Testing is in accordance with Laboratory Quality Assurance Manual.

All VOC analytical samples will be submitted to STL in Houston, Texas for analyses. The laboratory will be required to meet the data-quality requirements. Chain of custody procedures are established and followed from the time of sample collection until the analyses are complete.

## *5.4 QUALITY ASSURANCE/QUALITY CONTROL SAMPLES*

In addition, to the chemical analytical samples, project quality assurance/quality control QA/QC samples will be collected. The QA/QC samples collected will include field blanks, equipment blanks, duplicates, matrix spikes, and matrix spike duplicates.

## *6.0 REPORTING*

Following the investigation, the CSM will be updated to include new data. Based on the information from off-site delineation investigations, a risk assessment will be conducted and the risk management profile for the CSM will be developed. In addition, the ecological exclusion checklist and a Risk Evaluation Report will be prepared. The CAS procedures will then be followed to develop appropriate response actions to protect human health and the environment if necessary.

# Tables

*June 25, 2003*
*Project No. 0014507*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

**TABLE 1-1**

**Summary of Section 2.4.2 of USEPA Region 6 CAS - CAS Work Plan**

**Whirlpool Corporation**
**Fort Smith, Arkansas**

| Cas Work Plan Guidance | CAS Work Plan June 6, 2003 | Relevant Sections of Attached Documents CSM August 2, 2002 | Status Report |
|---|---|---|---|
| Include performance standards for each release area with supporting facility-specific information | Section 1.3 | | Section 3.0 |
| List and describe releases and potential releases | Section 1.1 | Section 2.2 and Section 5.0 | Section 4.0 |
| List data quality objectives needed for achieving performance standards, including data quality project plans and sampling and analysis plans | Section 1.2, Section 1.3, Section 2.2, Section 2.3 | | |
| Describe proposed or planned release characterization activities, including, but not limited to : | | | |
| evaluation of existing data and assessment of whether additional data are necessary | Section 1.1 | Section 4.2, Section 4.3, Section 5.0, and Section 6.0 | Section 3.0 |
| procedures for additional investigation and data collection including process for identifying additional data gaps and data collection | Section 2.2 and Section 2.3 | | Section 4.0 |
| implementation of interim measures or stabilization of releases, if warranted | None warranted | | |
| revision of the conceptual site model to reflect the new or updated information | Section 3.0 | Section 7.0 | Section 5.0 |
| Describe how the facility intends to proceed through the CAS | Section 3.0 and Section 4.0 | Section 7.0 | Section 5.0 |
| Include schedule of all facility activities for conducing and completing the CAS | Section 4.0 | | Section 5.0 |

TABLE 2-1

Ground Water Analyte List

Whirlpool Corporation
Fort Smith, Arkansas

| Parameter | Target Practical Quantitation Limit (mg/l) |
|---|---|
| **Volatile Organics - Method SE-846 8260B 0.005** | |
| Benzene | 0.005 |
| Bromodichloromethane | 0.005 |
| Bromoform | 0.005 |
| Bromomethane | 0.005 |
| Carbon Tetrachloride | 0.005 |
| Chlorobenzene, Water | 0.01 |
| Chloroethane | 0.005 |
| Chloroform | 0.01 |
| Dichloromethane | 0.005 |
| 1,1-Dichloroethane | 0.005 |
| 1,2-Dichloroethane | 0.005 |
| 1,1-Dichloroethene | 0.005 |
| 1,2-Dichloroethene | 0.01 |
| cis-1,2-Dichloroethene | 0.005 |
| trans-1,2-Dichloroethene | 0.005 |
| 1,2-Dichloropropane | 0.005 |
| Ethylbenzene | 0.005 |
| Methylene Chloride | 0.01 |
| Styrene | 0.005 |
| 1,1,2,2-Tetrachloroethane | 0.005 |
| Tetrachloroethane | 0.005 |
| Toluene | 0.005 |
| 1,1,1-Trichloroethane | 0.005 |
| 1,1,2-Trichloroethane | 0.005 |
| Trichloroethene | 0.005 |
| Vinyl Chloride | 0.01 |
| Xylenes (Total) | 0.01 |
| Acetone | 0.02 |
| Carbon Disulfide | 0.005 |
| Methyl Ethyl Ketone (2-Butanone) | 0.01 |
| cis-1,3-Dichloropropene | 0.005 |
| trans-1,3-Dichloropropene | 0.005 |
| 2-Hexanone | 0.01 |
| 4-Methyl-2-pentanone (MIBK) | 0.01 |
| | |
| **Natural Attenuation Parameters** | |
| Nitrate | NA |
| Sulfate | NA |
| Chloride | NA |
| Potassium | NA |
| Iron | NA |

**TABLE 3-1**

**Monitor Well Completion Details**

**Whirlpool Corporation**
**Fort Smith, Arkansas**

| Well ID | Site Coordinates EASTING | NORTHING | Ground Surface (ft MSL) | TOC (ft MSL) | As-Built TD (ft bgs) | Screen Interval (ft bgs) |
|---|---|---|---|---|---|---|
| ITMW-1 | 8259.51 | 9007.54 | 474.6 | 476.93 | 30.5 | 16.5 - 30.25 |
| ITMW-2 | 8058.55 | 9103.07 | 475.1 | 477.58 | 27.5 | 12.75 - 27.2 |
| ITMW-3 | 8169.81 | 9165.86 | 472.8 | 474.72 | 26 | 10.65 - 25.45 |
| ITMW-4 | 8170.16 | 8296.26 | 477.6 | 478.19 | 32.5 | 18.2 - 32.2 |
| ITMW-5 | 7902.33 | 8278.92 | 476.6 | 478.93 | 30 | 19.9 - 29.65 |
| ITMW-6 | 7858.85 | 8042.21 | 481.1 | 483.04 | 36.7 | 21.65 - 36.15 |
| ITMW-7 | 7461.02 | 8370.89 | 479.7 | 481.95 | 36.75 | 21.9 - 36.9 |
| ITMW-9 | 8179.81 | 8237.69 | 479.5 | 481.90 | 34.5 | 19.95 - 33.45 |
| ITMW-10 | 7901.42 | 8230.16 | 478.6 | 480.84 | 34.15 | 22.65 - 33.60 |
| ITMW-11 | 7846.97 | 9109.44 | 474.0 | 476.50 | 29.45 | 15.25 - 28.7 |
| ITMW-12 | 7869.05 | 9077.56 | 474.7 | 476.67 | 30.5 | 15.0 - 30.0 |
| ITMW-13 | 7915.02 | 9124.81 | 475.4 | 477.79 | 29.5 | 14.0 - 29.0 |
| ITMW-14 | 7966.02 | 9131.80 | 475.7 | 477.30 | 30 | 14.8 - 29.5 |
| ITMW-15 | 7812.25 | 9109.60 | 474.8 | 476.49 | 30 | 15.0 - 30.0 |
| ITMW-16 | 7831.59 | 9168.78 | 476.5 | 478.79 | 32 | 17.0 - 32.0 |
| ITMW-17 | 7732.61 | 9112.96 | 476.1 | 477.90 | 31 | 16.0 - 31.0 |
| ITMW-18 | 7849.92 | 9023.55 | 473.9 | 473.55 | 29.5 | 15.0 - 30.0 |
| ITMW-19 | 7763.78 | 9024.94 | 474.3 | 476.25 | 31 | 16.0 - 31.0 |
| ITMW-20 | 7238.94 | 9074.08 | 475.7 | 477.87 | 29 | 14.0 - 29.0 |
| ITMW-21 | 7506.54 | 8945.65 | 474.4 | 476.52 | 31 | 16.0 - 31.0 |
| MW-22 | 8726.94 | 9038.96 | 473.9 | 473.93 | 29 | 14.0 - 29.0 |
| MW-23 | 7747.16 | 9303.10 | 475.8 | 475.80 | 29 | 14.0 - 29.0 |
| MW-24 | 7738.13 | 9198.53 | 476.6 | 476.39 | 33 | 18.0 - 33.0 |
| MW-25 | 7614.43 | 9060.33 | 474.7 | 476.89 | 32 | 17.0 - 32.0 |
| MW-26 | 7421.64 | 9273.87 | 476.1 | 478.05 | 33 | 18.5 -33.5 |
| MW-27 | 7932.29 | 9302.59 | 475.7 | 475.42 | 30 | 15.5 - 30.0 |
| MW-28 | 8180.18 | 9301.14 | 470.6 | 470.49 | 28 | 13.0 - 28.0 |
| MW-29 | 7092.87 | 8392.87 | 475.1 | 474.91 | 31 | 16.0 - 31.0 |
| MW-30 | 7485.76 | 8480.10 | 479.2 | 478.99 | 36 | 21.0 - 36.0 |
| MW-31 | 7675.36 | 9348.43 | 476.1 | 476.03 | 27.6 | 17.5 - 27.5 |
| MW-32 | 7760.17 | 9347.50 | 475.7 | 475.68 | 27 | 17.0 - 27.0 |
| MW-33 | 7845.31 | 9348.62 | 474.9 | 474.88 | 25.8 | 15.8 - 25.5 |
| MW-34 | 7760.24 | 9404.60 | 474.4 | 474.29 | 29.5 | 19.5 - 29.5 |
| MW-35 | 7841.74 | 9406.36 | 474.0 | 473.90 | 27 | 17.0 - 27.0 |
| MW-36 | 7927.38 | 9405.11 | 473.4 | 473.30 | 27 | 17.0 - 27.0 |
| MW-37 | 7839.60 | 9101.64 | 474.0 | 473.57 | 30 | 15.0 - 30.0 |
| MW-38 | 7840.94 | 9115.29 | 474.9 | 474.60 | 30 | 15.0 - 30.0 |
| MW-39 | 7675.49 | 9482.46 | 475.6 | 475.46 | 29.5 | 19.5 - 29.5 |
| MW-40 | 7828.52 | 9693.07 | 473.4 | 473.35 | 27.8 | 17.75 - 27.75 |
| MW-41 | 7900.63 | 9544.63 | 472.3 | 472.09 | 28.7 | 18.75 - 28.75 |
| MW-42B | 8009.04 | 9708.57 | 471.8 | 471.72 | 27 | 22.0 - 27.0 |
| MW-43 | 8045.73 | 9709.08 | 471.0 | 470.94 | 26.5 | 21.0 - 26.0 |
| MW-46 | 8302.01 | 9709.18 | 466.5 | 466.35 | 22 | 17.0 - 22.0 |
| MW-50 | 8207.29 | 10306.14 | 463.2 | 463.11 | 18 | 8.0 - 18.0 |

TABLE 4-1

Historic Analytical Data, Selected VOCs in Ground Water

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Sampler | PCE | TCE | c-1,2-DCE | t-1,2-DCE | 1,1-DCE | VC | Toluene | 1,1,1-TCE |
|---|---|---|---|---|---|---|---|---|---|---|
| ITMW-1 | Nov-89 | IT | ND | ND | NT | ND | ND | ND | ND | ND |
| | Jan-90 | IT | ND | ND | NT | ND | ND | ND | ND | ND |
| | Nov-93 | MP | ND | 0.01 | NT | ND | ND | ND | ND | ND |
| | Dec-96 | MP | ND | 0.021 | NT | ND | ND | ND | ND | ND |
| | Feb-99 | ERM | ND | 0.037 | ND | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.125 | 0.008 | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.031 | 0.007 | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.03 | 0.006 | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.027 | 0.009 | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.026 | 0.006 | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.025 | 0.007 | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | 0.035 | 0.009 | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | 0.0296 | 0.00714 | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | 0.0250 | 0.012 | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | 0.0422 | 0.011 | ND | ND | ND | ND | ND |
| ITMW-2 | Oct-89 | IT | ND | ND | NT | ND | ND | ND | ND | ND |
| | Nov-89 | IT | ND | ND | NT | ND | ND | ND | ND | ND |
| | Jan-90 | IT | ND | ND | NT | ND | ND | ND | ND | ND |
| | Nov-90 | IT | ND | ND | NT | ND | ND | ND | ND | ND |
| | Nov-90 (dupl.) | IT | ND | ND | NT | ND | ND | ND | ND | ND |
| | Mar-91 | IT | ND | ND | NT | ND | ND | ND | ND | ND |
| | Nov-93 | MP | ND | 0.004 | NT | ND | ND | ND | ND | ND |
| | Dec-96 | MP | ND | 0.0034 | NT | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | 0.006 | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| ITMW-3 | Oct-89 | IT | ND | ND | NT | ND | ND | ND | ND | ND |
| | Jan-90 | IT | ND | ND | NT | ND | ND | ND | ND | ND |
| | Nov-93 | MP | ND | 0.003 | NT | ND | ND | ND | ND | ND |
| | Dec-96 | MP | ND | 0.0017 | NT | ND | ND | ND | ND | ND |
| | Feb-99 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Mar-00 (Dup) | ERM | ND | **ND *** | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | 0.015 | ND | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |

NOTES:

Units used are **mg/L**. **ND** = not detected **NT** = not tested **NA** = not available
**(L)** = Sample collected using low-flow sampling methods.
**(T)** = Sample collected using traditional purge and sample methods.
**IT** = International Technology Corporation, Inc.
**ERM** = Environmental Resources Management
**MP** = Malcolm Pirnie, Inc.
**PCE** = perchloroethylene (tetrachloroethene) **TCE** = trichloroethylene
**c-1,2-DCE** = cis-1,2-dichloroethylene (not an analytical parameter until May 1997)
**t-1,2-DCE** = trans-1,2-dichloroethylene
**1,1-DCE** = 1,1-dichloroethylene **VC** = vinyl chloride
***** = Analysis was re-run due to QA/QC concerns. Data reported is for the second run.
SPL was used as the subcontract laboratory from 1996 to June 1999. ChemLab was used for earlier MP sampling events. The current laboratory is STL in Houston, Texas.
Pre-1999 data reproduced from "Remedial Investigation, North Side Ground Water, Whirlpool Corporation", Malcolm Pirnie, Inc., January 1997, (revised entry for MW-11, Jan-90) and SPL Certificates of Analysis, May 1997, supplied by Whirlpool Corporation.

TABLE 4-1 (Cont'd)

Historic Analytical Data, Selected VOCs in Ground Water

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Sampler | PCE | TCE | c-1,2-DCE | t-1,2-DCE | 1,1-DCE | VC | Toluene | 1,1,1-TCE |
|---|---|---|---|---|---|---|---|---|---|---|
| ITMW-4 | Oct-89 | IT | ND | ND | NT | ND | ND | ND | ND | ND |
| | Nov-89 | IT | ND | ND | NT | ND | ND | ND | ND | ND |
| | Jan-90 | IT | ND | ND | NT | ND | ND | ND | ND | ND |
| | Nov-93 | MP | ND | ND | NT | ND | ND | ND | ND | ND |
| | Dec-96 | MP | ND | 0.075 | NT | ND | ND | ND | ND | ND |
| | Feb-99 | ERM | ND | 0.093 | 0.054 | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.022 | 0.016 | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.014 | 0.011 | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.009 | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.006 | 0.008 | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.034 | 0.005 | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | 0.009 | ND | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| ITMW-5 | Oct-89 | IT | ND | ND | NT | ND | ND | ND | ND | ND |
| | Jan-90 | IT | ND | ND | NT | ND | ND | ND | ND | ND |
| | Dec-96 | MP | ND | 0.021 | NT | ND | ND | ND | ND | ND |
| | Feb-99 | ERM | ND | 0.086 | 0.039 | ND | 0.007 | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.073 | 0.059 | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.085 | 0.064 | ND | 0.006 | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.1 | 0.046 | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.072 | 0.064 | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.093 | 0.066 | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.081 | 0.063 | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | 0.108 | 0.072 | ND | 0.007 | ND | ND | ND |
| | Feb-03 | ERM | ND | 0.0904 | 0.0687 | ND | 0.00598 | ND | ND | ND |
| | Sep-03 | ERM | ND | 0.0973 | 0.0737 | ND | 0.0062 | ND | ND | ND |
| | Apr-04 | ERM | ND | 0.0839 | 0.0554 | ND | 0.00589 | ND | ND | ND |
| ITMW-6 | Oct-89 | IT | ND | ND | NT | ND | ND | ND | ND | ND |
| | Jan-90 | IT | ND | ND | NT | ND | ND | ND | ND | ND |
| | Dec-96 | MP | ND | 0.0068 | NT | ND | ND | ND | ND | ND |
| | May-97 | MP | ND | 0.007 | ND | ND | ND | ND | ND | ND |
| | Feb-99 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-99 | ERM (CoreLab) | ND | 0.025 | ND | NT | ND | ND | ND | ND |
| | Feb-99 | ERM (CoreLab Dupl.) | ND | 0.006 | ND | NT | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| ITMW-7 | Nov-89 | IT | ND | ND | NT | ND | ND | ND | ND | ND |
| | Jan-90 | IT | ND | ND | NT | ND | ND | ND | ND | ND |
| | Dec-96 | MP | ND | 0.29 | NT | ND | ND | 0.003 | ND | ND |
| | May-97 | MP | ND | 0.38 | 0.18 | ND | ND | ND | ND | ND |
| | Feb-99 | ERM (SPL) | ND | ND | ND | ND | ND | ND | ND | ND |
| | Jun-99 | ERM (SPL) | ND | 0.32 | 0.14 | ND | ND | ND | ND | ND |
| | Jun-99 | ERM (SPL Dupl.) | ND | 0.3 | 0.14 | ND | ND | ND | ND | ND |
| | Jun-99 | ERM (CoreLab) | ND | 0.306 | 0.144 | ND | ND | ND | ND | ND |

NOTES:

Units used are **mg/L**. **ND** = not detected **NT** = not tested **NA** = not available
**(L)** = Sample collected using low-flow sampling methods.
**(T)** = Sample collected using traditional purge and sample methods.
**IT** = International Technology Corporation, Inc.
**ERM** = Environmental Resources Management
**MP** = Malcolm Pirnie, Inc.
**PCE** = perchloroethylene (tetrachloroethene) **TCE** = trichloroethylene
**c-1,2-DCE** = cis-1,2-dichloroethylene (not an analytical parameter until May 1997)
**t-1,2-DCE** = trans-1,2-dichloroethylene
**1,1-DCE** = 1,1-dichloroethylene **VC** = vinyl chloride
***** = Analysis was re-run due to QA/QC concerns. Data reported is for the second run.
SPL was used as the subcontract laboratory from 1996 to June 1999. ChemLab was used for earlier MP sampling events. The current laboratory is STL in Houston, Texas.
Pre-1999 data reproduced from "Remedial Investigation, North Side Ground Water, Whirlpool Corporation", Malcolm Pirnie, Inc., January 1997, (revised entry for MW-11, Jan-90) and SPL Certificates of Analysis, May 1997, supplied by Whirlpool Corporation.

TABLE 4-1 (Cont'd)

Historic Analytical Data, Selected VOCs in Ground Water

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Sampler | PCE | TCE | c-1,2-DCE | t-1,2-DCE | 1,1-DCE | VC | Toluene | 1,1,1-TCE |
|---|---|---|---|---|---|---|---|---|---|---|
| ITMW-7 | Mar-00 | ERM | ND | 0.262 | 0.1 | ND | ND | ND | ND | ND |
| (Cont'd) | Mar-00 (dup) | ERM | ND | 0.207 | 0.092 | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.207 | 0.1 | ND | ND | ND | ND | ND |
| | Sep-00 (dup) | ERM | ND | 0.109 | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.161 | 0.066 | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.139 | 0.068 | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.261 | 0.107 | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.119 | 0.070 | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | 0.137 | 0.056 | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | 0.172 | 0.0925 | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | 0.125 | 0.0573 | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | 0.201 | 0.0807 | ND | ND | ND | ND | ND |
| ITMW-8 | Jan-90 | IT | ND | ND | NT | ND | ND | ND | ND | ND |
| ITMW-9 | Jan-90 | IT | ND | ND | NT | ND | ND | ND | ND | ND |
| | Dec-96 | MP | ND | 0.23 | NT | ND | 0.015 | ND | ND | ND |
| | May-97 | MP | ND | 0.007 | ND | ND | ND | ND | ND | ND |
| | Feb-99 | ERM | ND | 0.04 | 0.024 | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.069 | 0.045 | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.057 | 0.014 | ND | ND | ND | ND | ND |
| | Sep-00 (dup) | ERM | ND | 0.055 | 0.014 | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.04 | 0.012 | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.04 | 0.012 | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.046 | 0.023 | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | 0.061 | 0.021 | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | 0.0542 | 0.0372 | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | 0.091 | 0.0495 | ND | ND | ND | ND | ND |
| | Sep-03(Dup-1) | ERM | ND | 0.0976 | 0.0539 | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | 0.072 | 0.0388 | ND | ND | ND | ND | ND |
| ITMW-10 | Jan-90 | IT | ND | ND | NT | ND | ND | ND | ND | ND |
| | Dec-96 | MP | ND | 0.004 | NT | ND | 0.002 | ND | ND | ND |
| | Feb-99 | ERM | ND | 0.025 | 0.013 | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.023 | 0.017 | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.018 | 0.016 | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.04 | 0.021 | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.029 | 0.028 | ND | ND | ND | ND | ND |
| | Sep-01 (dup) | ERM | ND | 0.027 | 0.03 | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.056 | 0.048 | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.044 | 0.038 | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | 0.055 | 0.038 | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | 0.0576 | 0.0509 | ND | ND | ND | 0.0116 | ND |
| | Jul-03 | ERM | ND | 0.0553 | 0.0492 | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | 0.0659 | 0.0565 | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | 0.0800 | 0.0574 | ND | 0.00532 | ND | 0.00978 | ND |
| ITMW-11 | Jan-90 | IT | 0.015 | 19 | NT | 3.6 | ND | 0.18 | ND | ND |
| | Nov-90 | IT | ND | 4.7 | NT | 1.5 | 0.009 | 0.093 | ND | ND |
| | Feb-91 | IT | 0.0089 | 3.4 | NT | 1 | ND | ND | ND | ND |
| | Nov-93 | MP | 0.001 | 2.3 | NT | ND | ND | 0.043 | ND | ND |
| | Dec-96 | MP | ND | 0.51 | NT | 0.011 | ND | ND | ND | ND |
| | Feb-99 | ERM | ND | 0.65 | 0.01 | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | 3.37 | 0.206 | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | 0.006 | 8 | 0.330 | ND | ND | 0.01 | ND | ND |
| | Mar-01 | ERM | ND | 7 | 0.200 | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 6 | 0.183 | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 6.8 | ND | ND | 0.010 | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 2.48 | 0.123 | ND | ND | ND | ND | ND |

NOTES:

Units used are **mg/L**. **ND** = not detected **NT** = not tested **NA** = not available
**(L)** = Sample collected using low-flow sampling methods.
**(T)** = Sample collected using traditional purge and sample methods.
**IT** = International Technology Corporation, Inc.
**ERM** = Environmental Resources Management
**MP** = Malcolm Pirnie, Inc.
**PCE** = perchloroethylene (tetrachloroethene) **TCE** = trichloroethylene
**c-1,2-DCE** = cis-1,2-dichloroethylene (not an analytical parameter until May 1997)
**t-1,2-DCE** = trans-1,2-dichloroethylene
**1,1-DCE** = 1,1-dichloroethylene **VC** = vinyl chloride
***** = Analysis was re-run due to QA/QC concerns. Data reported is for the second run.
SPL was used as the subcontract laboratory from 1996 to June 1999. ChemLab was used for earlier MP sampling events. The current laboratory is STL in Houston, Texas.
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TABLE 4-1 (Cont'd)

Historic Analytical Data, Selected VOCs in Ground Water

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Sampler | PCE | TCE | c-1,2-DCE | t-1,2-DCE | 1,1-DCE | VC | Toluene | 1,1,1-TCE |
|---|---|---|---|---|---|---|---|---|---|---|
| ITMW-11 | Sep-02 | ERM (L) | ND | 7.1 | 0.206 | ND | ND | 0.01 | ND | ND |
| (Cont'd) | Sep-02 | ERM (T) | ND | 0.8 | 0.072 | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | 4.110 | 0.346 | ND | ND | 0.0588 | ND | ND |
| | Feb-03 (dup 1) | ERM | ND | 3.630 | 0.306 | ND | ND | 0.0607 | ND | ND |
| | Sep-03 | ERM | ND | 3.990 | 0.269 | ND | ND | 0.0118 | ND | ND |
| | Apr-04 | ERM | ND | 3.160 | 0.24 | ND | ND | 0.0378 | ND | ND |
| ITMW-12 | Nov-90 | IT | ND | 2.4 | NT | 1.3 | 0.0099 | 0.14 | ND | ND |
| | Feb-91 | IT | ND | 2.1 | NT | 1 | ND | ND | ND | ND |
| | Nov-93 | MP | ND | 2.5 | NT | 0.002 | 0.004 | 0.035 | ND | ND |
| | Dec-96 | MP | ND | 1.2 | NT | ND | ND | ND | ND | ND |
| | Feb-99 | ERM | ND | 3.1 | 0.48 | ND | ND | 0.034 | ND | ND |
| | Mar-00 | ERM | ND | 3.11 | 0.32 | ND | ND | 0.019 | ND | ND |
| | Sep-00 | ERM | ND | 3.3 | 0.18 | ND | ND | 0.01 | ND | ND |
| | Mar-01 | ERM | ND | 3.9 | 0.2 | ND | ND | 0.02 | ND | ND |
| | Sep-01 | ERM | ND | 3.1 | 0.159 | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 1.76 | 0.138 | ND | 0.007 | 0.023 | ND | ND |
| | Feb-02 | ERM (L) | ND | 3.6 | ND | ND | 0.008 | 0.019 | ND | ND |
| | Sep-02 | ERM | ND | 4.2 | 0.3 | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | 3.460 | 0.287 | ND | ND | ND | ND | ND |
| | Feb-03 (dup 2) | ERM | ND | 3.940 | 0.308 | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | 2.920 | 0.242 | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | 2.410 | 0.245 | ND | ND | ND | ND | ND |
| ITMW-13 | Nov-90 | IT | ND | 0.034 | NT | 0.19 | ND | 0.018 | ND | ND |
| | Feb-91 | IT | ND | 0.032 | NT | 0.17 | ND | 0.035 | ND | ND |
| | Nov-93 | MP | ND | NA | NT | NA | NA | 0.029 | ND | ND |
| | Dec-96 | MP | ND | 0.036 | NT | 0.0013 | 0.0016 | 0.036 | ND | ND |
| | Feb-99 | ERM | ND | 0.036 | 0.14 | ND | ND | 0.048 | ND | ND |
| | Mar-00 | ERM | ND | 0.037 | 0.121 | ND | ND | 0.053 | ND | ND |
| | Sep-00 | ERM | ND | 0.022 | 0.112 | ND | ND | 0.05 | ND | ND |
| | Mar-01 | ERM | ND | 0.044 | 0.092 | ND | ND | 0.04 | ND | ND |
| | Sep-01 | ERM | ND | 0.035 | 0.111 | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.129 | 0.195 | ND | ND | 0.035 | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.048 | 0.080 | ND | ND | ND | ND | ND |
| | Sep-02 | ERM (L) | ND | 0.099 | 0.110 | ND | ND | 0.010 | ND | ND |
| | Sep-02 | ERM (T) | ND | 0.081 | 0.086 | ND | ND | 0.020 | ND | ND |
| | Feb-03 | ERM | ND | 0.070 | 0.0855 | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | 0.159 | 0.1300 | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | 0.048 | 0.0872 | ND | ND | ND | ND | ND |
| ITMW-14 | Nov-90 | IT | ND | ND | NT | 0.03 | ND | 0.013 | ND | ND |
| | Feb-91 | IT | ND | ND | NT | ND | ND | ND | ND | ND |
| | Nov-93 | MP | ND | 0.006 | NT | ND | ND | ND | ND | ND |
| | Dec-96 | MP | ND | ND | NT | ND | ND | ND | ND | ND |
| | Feb-99 | ERM | ND | ND | 0.029 | ND | ND | 0.02 | ND | ND |
| | Mar-00 | ERM | ND | ND | 0.024 | ND | ND | 0.012 | ND | ND |
| | Sep-00 | ERM | ND | ND | 0.014 | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | 0.024 | ND | ND | 0.01 | ND | ND |
| | Sep-01 | ERM | ND | ND | 0.005 | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | 0.023 | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | 0.041 | 0.006 | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | 0.00565 | ND | ND | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | 0.00768 | ND | ND | ND | ND | ND | ND | ND |
| ITMW-15 | Nov-90 | IT | ND | 2.5 | NT | 1.5 | 0.0081 | 0.055 | ND | ND |
| | Feb-91 | IT | ND | 1.7 | NT | 0.87 | ND | ND | ND | ND |
| | 15-Apr-91 | IT | ND | 2 | NT | 0.6 | ND | ND | ND | ND |
| | 19-Apr-91 | IT | ND | 2.1 | NT | 1 | ND | ND | ND | ND |
| | 20-Apr-91 | IT | ND | 2.4 | NT | 1.1 | ND | ND | ND | ND |

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**1,1-DCE** = 1,1-dichloroethylene **VC** = vinyl chloride
***** = Analysis was re-run due to QA/QC concerns. Data reported is for the second run.
SPL was used as the subcontract laboratory from 1996 to June 1999. ChemLab was used for earlier MP sampling events. The current laboratory is STL in Houston, Texas.
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TABLE 4-1 (Cont'd)

Historic Analytical Data, Selected VOCs in Ground Water

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Sampler | PCE | TCE | c-1,2-DCE | t-1,2-DCE | 1,1-DCE | VC | Toluene | 1,1,1-TCE |
|---|---|---|---|---|---|---|---|---|---|---|
| ITMW-15 | Nov-93 | MP | ND | 4.3 | NT | 0.001 | ND | 0.01 | ND | ND |
| (Cont.) | Dec-96 | MP | ND | 0.24 | NT | ND | ND | ND | ND | ND |
| | Feb-99 | ERM | ND | 0.4 | 0.12 | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.339 | 0.097 | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.36 | 0.093 | ND | ND | ND | ND | ND |
| | Sep-00 (dup) | ERM | ND | 0.38 | 0.091 | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.29 | 0.057 | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.38 | 0.087 | ND | ND | ND | ND | ND |
| | Sep-01 (dup) | ERM | ND | 0.37 | 0.08 | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.186 | 0.064 | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.311 | 0.108 | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | 0.32 | 0.075 | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | 0.301 | 0.0987 | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | 0.490 | 0.0919 | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | 0.334 | 0.126 | ND | ND | ND | ND | ND |
| ITMW-16 | Feb-91 | IT | ND | 0.031 | NT | 0.06 | ND | ND | ND | ND |
| | Nov-93 | MP | ND | 0.041 | NT | ND | ND | 0.007 | ND | ND |
| | Dec-96 | MP | ND | ND | NT | ND | ND | ND | ND | ND |
| | Feb-99 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.007 | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| ITMW-17 | Feb-91 | IT | ND | 21 | NT | ND | ND | ND | ND | ND |
| | 15-Apr-91 | IT | ND | 18 | NT | 0.76 | ND | ND | ND | ND |
| | 24-Apr-91 | IT | ND | 21 | NT | 0.58 | ND | ND | ND | ND |
| | Nov-93 | MP | 0.004 | 18 | NT | 0.003 | ND | 0.015 | ND | ND |
| | Dec-96 | MP | ND | 9.3 | NT | ND | ND | ND | ND | ND |
| | Feb-99 | ERM | ND | 11 | 0.24 | ND | 0.013 | ND | ND | ND |
| | Mar-00 | ERM | ND | 6.78 | 0.171 | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | 5.5 | 0.18 | ND | 0.009 | ND | ND | ND |
| | Jan-01 | ERM | ND | 8.3 | 0.179 | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | 6.7 | 0.134 | ND | 0.007 | ND | ND | ND |
| | Sep-01 | ERM | ND | 6.3 | 0.158 | ND | 0.007 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 6.07 | 0.149 | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 6.29 | 0.174 | ND | 0.011 | ND | ND | ND |
| | Sep-02 | ERM | ND | 6.5 | 0.153 | ND | 0.008 | ND | ND | ND |
| | Feb-03 | ERM | ND | 4.380 | 0.134 | ND | 0.00646 | ND | ND | ND |
| | Sep-03 | ERM | ND | 6.090 | 0.136 | ND | 0.00719 | ND | ND | ND |
| | Apr-04 | ERM | ND | 5.050 | 0.184 | ND | 0.01020 | ND | ND | ND |
| ITMW-18 | Feb-91 | IT | ND | 3.7 | NT | 0.33 | ND | ND | ND | ND |
| | Nov-93 | MP | ND | 4.5 | NT | ND | 0.009 | 0.006 | ND | ND |
| | Dec-96 | MP | ND | 1.6 | NT | ND | ND | ND | ND | ND |
| | Feb-99 | ERM | ND | 6.3 | 0.48 | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | 3.56 | 0.401 | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | 4.1 | 0.4 | ND | 0.007 | ND | ND | ND |
| | Mar-01 | ERM | ND | 4 | 0.4 | ND | 0.006 | ND | ND | ND |
| | Sep-01 | ERM | ND | 4.1 | 0.3 | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 5.26 | 0.426 | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | 6.7 | 0.3 | 0.007 | 0.008 | ND | ND | ND |
| | Feb-03 | ERM (T) | ND | 5.11 | 0.29 | ND | 0.00870 | ND | ND | ND |
| | Sep-03 | ERM | ND | 7.700 | 0.415 | ND | 0.0102 | ND | ND | ND |
| | Apr-04 | ERM | ND | 7.740 | 0.41 | ND | 0.0158 | ND | ND | ND |

NOTES:

Units used are **mg/L**. **ND** = not detected **NT** = not tested **NA** = not available
**(L)** = Sample collected using low-flow sampling methods.
**(T)** = Sample collected using traditional purge and sample methods.
**IT** = International Technology Corporation, Inc.
**ERM** = Environmental Resources Management
**MP** = Malcolm Pirnie, Inc.
**PCE** = perchloroethylene (tetrachloroethene) **TCE** = trichloroethylene
**c-1,2-DCE** = cis-1,2-dichloroethylene (not an analytical parameter until May 1997) **t-1,2-DCE** = trans-1,2-dichloroethylene
**1,1-DCE** = 1,1-dichloroethylene **VC** = vinyl chloride
***** = Analysis was re-run due to QA/QC concerns. Data reported is for the second run.
SPL was used as the subcontract laboratory from 1996 to June 1999. ChemLab was used for earlier MP sampling events. The current laboratory is STL in Houston, Texas.
Pre-1999 data reproduced from "Remedial Investigation, North Side Ground Water, Whirlpool Corporation", Malcolm Pirnie, Inc., January 1997, (revised entry for MW-11, Jan-90) and SPL Certificates of Analysis, May 1997, supplied by Whirlpool Corporation.

TABLE 4-1 (Cont'd)

Historic Analytical Data, Selected VOCs in Ground Water

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Sampler | PCE | TCE | c-1,2-DCE | t-1,2-DCE | 1,1-DCE | VC | Toluene | 1,1,1-TCE |
|---|---|---|---|---|---|---|---|---|---|---|
| ITMW-19 | Feb-91 | IT | ND | 9.9 | NT | ND | ND | ND | ND | ND |
| | Nov-93 | MP | 0.005 | 27 | NT | ND | NA | 0.007 | ND | ND |
| | Dec-96 | MP | ND | 25 | NT | ND | ND | ND | ND | ND |
| | Feb-99 | ERM | 0.008 | 33 | 0.15 | ND | 0.04 | ND | ND | ND |
| | Mar-00 | ERM | 0.007 | 33.1 | 0.128 | ND | 0.029 | ND | ND | ND |
| | Sep-00 | ERM | 0.01 | 36 | 0.197 | ND | 0.056 | ND | ND | ND |
| | Jan-01 | ERM | 0.01 | 34 | 0.166 | ND | 0.04 | ND | ND | ND |
| | Mar-01 | ERM | 0.01 | 38 | 0.119 | ND | 0.037 | ND | ND | ND |
| | Sep-01 | ERM | ND | 19 | 0.132 | ND | 0.034 | ND | ND | ND |
| | Feb-02 | ERM (T) | 0.00621 | 26.1 | ND | 0.006 | 0.047 | ND | ND | ND |
| | Feb-02 | ERM (L) | 0.00512 | 24.6 | 0.192 | ND | 0.065 | ND | ND | ND |
| | Sep-02 | ERM | ND | 27 | 0.167 | ND | 0.038 | ND | ND | ND |
| | Feb-03 | ERM | ND | 16.200 | 0.126 | ND | 0.0270 | ND | ND | ND |
| | Sep-03 | ERM | ND | 27.300 | 0.186 | ND | 0.0417 | ND | ND | ND |
| | Apr-04 | ERM | ND | 19.400 | 0.186 | ND | 0.0387 | ND | ND | ND |
| ITMW-20 | Mar-91 | IT | ND | ND | NT | ND | ND | ND | ND | ND |
| | Nov-93 | MP | ND | ND | NT | ND | ND | ND | ND | ND |
| | Dec-96 | MP | ND | 0.29 | NT | ND | ND | ND | ND | ND |
| | May-97 | MP | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-99 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.021 | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| ITMW-21 | Mar-91 | IT | ND | 0.021 | NT | ND | ND | ND | ND | ND |
| | Nov-93 | MP | ND | 0.037 | NT | ND | ND | ND | ND | ND |
| | Dec-96 | MP | ND | 0.15 | NT | ND | ND | ND | ND | ND |
| | Feb-99 | ERM | ND | 0.19 | ND | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.196 | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.192 | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.123 | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.116 | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.152 | ND | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | 0.013 | ND | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | 0.0395 | ND | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | 0.00909 | ND | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | 0.0529 | ND | ND | ND | ND | ND | ND |
| MW-22 | Dec-96 | MP | ND | ND | NT | ND | ND | ND | ND | ND |
| | May-97 | MP | ND | ND | 0.005 | ND | ND | ND | ND | ND |
| | Feb-99 | ERM | ND | ND | 0.005 | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | 0.009 | ND | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-03(Dup-2) | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |

NOTES:

Units used are **mg/L**. **ND** = not detected **NT** = not tested **NA** = not available
**(L)** = Sample collected using low-flow sampling methods.
**(T)** = Sample collected using traditional purge and sample methods.
**IT** = International Technology Corporation, Inc.
**ERM** = Environmental Resources Management
**MP** = Malcolm Pirnie, Inc.
**PCE** = perchloroethylene (tetrachloroethene) **TCE** = trichloroethylene
**c-1,2-DCE** = cis-1,2-dichloroethylene (not an analytical parameter until May 1997)
**t-1,2-DCE** = trans-1,2-dichloroethylene
**1,1-DCE** = 1,1-dichloroethylene **VC** = vinyl chloride
***** = Analysis was re-run due to QA/QC concerns. Data reported is for the second run.
SPL was used as the subcontract laboratory from 1996 to June 1999. ChemLab was used for earlier MP sampling events. The current laboratory is STL in Houston, Texas.
Pre-1999 data reproduced from "Remedial Investigation, North Side Ground Water, Whirlpool Corporation", Malcolm Pirnie, Inc., January 1997, (revised entry for MW-11, Jan-90) and SPL Certificates of Analysis, May 1997, supplied by Whirlpool Corporation.

TABLE 4-1 (Cont'd)

Historic Analytical Data, Selected VOCs in Ground Water

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Sampler | PCE | TCE | c-1,2-DCE | t-1,2-DCE | 1,1-DCE | VC | Toluene | 1,1,1-TCE |
|---|---|---|---|---|---|---|---|---|---|---|
| MW-23 | Dec-96 | MP | ND | 0.21 | NT | ND | ND | ND | ND | ND |
| | May-97 | MP | ND | 2.4 | NT | ND | ND | ND | ND | ND |
| | Feb-99 | ERM | ND | 0.35 | 0.01 | ND | ND | ND | ND | ND |
| | Feb-99 (dup) | ERM | ND | 0.44 | 0.01 | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.147 | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.067 | ND | ND | ND | ND | ND | ND |
| | Jan-01 | ERM | ND | 0.137 | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.087 | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.023 | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.063 | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.098 | ND | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | 0.111 | ND | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | 0.054 | ND | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | 0.0839 | ND | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | 0.0703 | ND | ND | ND | ND | ND | ND |
| MW-24 | Feb-99 | ERM | ND | 1.4 | 0.049 | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | **0.403*** | **0.025*** | ND | ND | ND | ND | ND |
| | Mar-00 (dup) | ERM | ND | **0.595*** | **0.024*** | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.128 | 0.011 | ND | ND | ND | ND | ND |
| | Jan-01 | ERM | ND | 0.25 | 0.012 | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.33 | 0.011 | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.124 | 0.006 | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.204 | 0.006 | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | 0.199 | 0.006 | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | 0.253 | 0.007 | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | 0.155 | ND | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | 0.181 | 0.00512 | ND | ND | ND | ND | ND |
| MW-25 | Feb-99 | ERM | 0.011 | 29 | 0.17 | ND | 0.069 | 0.1 | ND | ND |
| | Feb-99 (dupl.) | ERM | 0.012 | 27 | 0.18 | ND | 0.074 | 0.11 | ND | ND |
| | Feb-99 | ERM (CoreLab) | 0.009 | 24.8 | 0.149 | ND | 0.057 | 0.074 | ND | ND |
| | Dec-99 | ERM (ERM) | ND | 94.5 | ND | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | 0.011 | 35.9 | 0.245 | ND | 0.066 | 0.063 | ND | ND |
| | Sep-00 | ERM | 0.014 | 59 | 0.3 | ND | 0.092 | 0.05 | ND | ND |
| | Mar-01 | ERM | 0.012 | 34 | 0.117 | ND | 0.047 | 0.06 | ND | ND |
| | Sep-01 | ERM | 0.011 | 60 | 0.3 | ND | 0.101 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 24.3 | 0.326 | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | 0.007 | 29.9 | 0.369 | ND | 0.052 | 0.052 | ND | ND |
| | Sep-02 | ERM (L) | 0.036 | 157.0 | 0.44 | ND | 0.33 | 0.18 | ND | ND |
| | Sep-02 | ERM (T) | 0.013 | 56.00 | 0.37 | ND | 0.119 | 0.200 | ND | ND |
| | Feb-03 | ERM | 0.0107 | 45.90 | 0.557 | 0.00566 | 0.117 | 0.0757 | ND | 0.0199 |
| | Jul-03 | ERM | 0.0144 | 62.20 | 0.621 | ND | 0.13 | 0.243 | ND | 0.0239 |
| | Sep-03 | ERM | 0.0223 | 103.000 | 0.775 | ND | ND | ND | ND | 0.0347 |
| | Apr-04 | ERM | 0.0093 | 25.600 | 0.255 | ND | 0.0827 | 0.0318 | ND | 0.0122 |
| MW-26 | Feb-99 | ERM (SPL) | ND | 0.36 | 0.15 | ND | ND | ND | ND | ND |
| | Jun-99 | ERM (SPL) | ND | ND | ND | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-01 (dup) | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |

NOTES:

Units used are **mg/L**. **ND** = not detected **NT** = not tested **NA** = not available
**(L)** = Sample collected using low-flow sampling methods.
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**IT** = International Technology Corporation, Inc.
**ERM** = Environmental Resources Management
**MP** = Malcolm Pirnie, Inc.
**PCE** = perchloroethylene (tetrachloroethene) **TCE** = trichloroethylene
**c-1,2-DCE** = cis-1,2-dichloroethylene (not an analytical parameter until May 1997)
**t-1,2-DCE** = trans-1,2-dichloroethylene
**1,1-DCE** = 1,1-dichloroethylene **VC** = vinyl chloride
***** = Analysis was re-run due to QA/QC concerns. Data reported is for the second run.
SPL was used as the subcontract laboratory from 1996 to June 1999. ChemLab was used for earlier MP sampling events. The current laboratory is STL in Houston, Texas.
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TABLE 4-1 (Cont'd)

Historic Analytical Data, Selected VOCs in Ground Water

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Sampler | PCE | TCE | c-1,2-DCE | t-1,2-DCE | 1,1-DCE | VC | Toluene | 1,1,1-TCE |
|---|---|---|---|---|---|---|---|---|---|---|
| MW-27 | Dec-99 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Jan-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-03 | ERM (T) | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-28 | Dec-99 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-29 | Dec-99 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-30 | Dec-99 | ERM | ND | 0.115 | 0.034 | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.086 | 0.025 | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.102 | 0.025 | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.043 | 0.011 | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.063 | 0.018 | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.067 | 0.021 | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | 0.048 | 0.014 | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | 0.0600 | 0.0203 | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | 0.0468 | 0.0137 | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | 0.0366 | 0.0118 | ND | ND | ND | 0.00828 | ND |
| MW-31 | Jan-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |

NOTES:

Units used are **mg/L**. **ND** = not detected **NT** = not tested **NA** = not available
**(L)** = Sample collected using low-flow sampling methods.
**(T)** = Sample collected using traditional purge and sample methods.
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**ERM** = Environmental Resources Management
**MP** = Malcolm Pirnie, Inc.
**PCE** = perchloroethylene (tetrachloroethene) **TCE** = trichloroethylene
**c-1,2-DCE** = cis-1,2-dichloroethylene (not an analytical parameter until May 1997)
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**1,1-DCE** = 1,1-dichloroethylene **VC** = vinyl chloride
***** = Analysis was re-run due to QA/QC concerns. Data reported is for the second run.
SPL was used as the subcontract laboratory from 1996 to June 1999. ChemLab was used for earlier MP sampling events. The current laboratory is STL in Houston, Texas.
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TABLE 4-1 (Cont'd)

Historic Analytical Data, Selected VOCs in Ground Water

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Sampler | PCE | TCE | c-1,2-DCE | t-1,2-DCE | 1,1-DCE | VC | Toluene | 1,1,1-TCE |
|---|---|---|---|---|---|---|---|---|---|---|
| MW-32 | Jan-01 | ERM | ND | 0.108 | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.174 | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.095 | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.0536 | ND | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | 0.109 | ND | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | 0.133 | ND | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | 0.0323 | ND | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | 0.0769 | ND | ND | ND | ND | ND | ND |
| MW-33 | Jan-01 | ERM | ND | 0.12 | 0.034 | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.26 | 0.007 | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.31 | 0.008 | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.115 | ND | ND | ND | ND | ND | ND |
| | Sep-02 | ERM | ND | 0.45 | 0.008 | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | 0.274 | 0.00662 | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | 0.198 | 0.00595 | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | 0.871 | 0.0213 | ND | ND | ND | ND | ND |
| MW-34 | Mar-01 | ERM | ND | 0.083 | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.061 | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.0214 | ND | ND | ND | ND | ND | ND |
| | Sep-02 | ERM (L) | ND | 0.084 | ND | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | 0.0284 | ND | ND | ND | ND | ND | ND |
| | Nov-03 | ERM | ND | 0.121 | ND | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | 0.119 | ND | ND | ND | ND | ND | ND |
| MW-35 | Mar-01 | ERM | ND | 0.91 | 0.034 | ND | ND | ND | ND | ND |
| | May-01 | ERM | ND | 0.86 | 0.036 | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 1.03 | 0.04 | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.325 | 0.0133 | ND | ND | ND | ND | ND |
| | Sep-02 | ERM (L) | ND | 0.9 | 0.031 | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | 0.246 | 0.0151 | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | 0.297 | 0.0198 | ND | ND | ND | ND | ND |
| | Nov-03 | ERM | ND | 0.99 | 0.0349 | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | 1.15 | 0.0458 | ND | ND | ND | ND | ND |
| MW-36 | Mar-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-02 | ERM (L) | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Sep-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Nov-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-37 | Sep-01 | ERM | ND | 5 | 0.34 | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.773 | 3.25 | 0.025 | 0.01 | ND | ND | ND |
| | Sep-02 | ERM | ND | 1.4 | 10 | ND | ND | 0.3 | ND | ND |
| | Feb-03 | ERM | ND | 4.050 | 5.660 | 0.0280 | 0.0197 | 2.500 | 0.0510 | ND |
| | Jul-03 | ERM | ND | 2.560 | 1.710 | 0.0052 | 0.00635 | 0.316 | 0.0107 | ND |
| | Sep-03 | ERM | ND | 3.700 | 7.020 | 0.00739 | 0.0155 | 0.973 | 0.0164 | ND |
| | Apr-04 | ERM | ND | 5.190 | 3.160 | 0.01130 | 0.0151 | 1.180 | 0.0504 | ND |
| MW-38 (a) | Sep-01 | ERM | ND | 0.62 | 0.09 | ND | ND | ND | ND | ND |

(a) MW-38 was used as an injection well for the pilot study and has not been sampled using low-flow techniques.

NOTES:

Units used are **mg/L**. **ND** = not detected **NT** = not tested **NA** = not available
**(L)** = Sample collected using low-flow sampling methods.
**(T)** = Sample collected using traditional purge and sample methods.
**IT** = International Technology Corporation, Inc.
**ERM** = Environmental Resources Management
**MP** = Malcolm Pirnie, Inc.
**PCE** = perchloroethylene (tetrachloroethene) **TCE** = trichloroethylene
**c-1,2-DCE** = cis-1,2-dichloroethylene (not an analytical parameter until May 1997)
**t-1,2-DCE** = trans-1,2-dichloroethylene
**1,1-DCE** = 1,1-dichloroethylene **VC** = vinyl chloride
***** = Analysis was re-run due to QA/QC concerns. Data reported is for the second run.
SPL was used as the subcontract laboratory from 1996 to June 1999. ChemLab was used for earlier MP sampling events. The current laboratory is STL in Houston, Texas.
Pre-1999 data reproduced from "Remedial Investigation, North Side Ground Water, Whirlpool Corporation", Malcolm Pirnie, Inc., January 1997, (revised entry for MW-11, Jan-90) and SPL Certificates of Analysis, May 1997, supplied by Whirlpool Corporation.

TABLE 4-1 (Cont'd)

Historic Analytical Data, Selected VOCs in Ground Water

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Sampler | PCE | TCE | c-1,2-DCE | t-1,2-DCE | 1,1-DCE | VC | Toluene | 1,1,1-TCE |
|---|---|---|---|---|---|---|---|---|---|---|
| MW-39 | Sep-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Nov-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-40 | Sep-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Nov-03 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-41 | Sep-03 | ERM | ND | 0.722 | 0.0378 | ND | ND | ND | ND | ND |
| | Nov-03 | ERM | ND | 0.331 | 0.205 | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | 0.760 | 0.0542 | ND | ND | ND | ND | ND |
| MW-42 | Nov-03 | ERM | ND | 0.481 | 0.0211 | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | 0.856 | 0.0293 | ND | ND | ND | ND | ND |
| MW-43 | Nov-03 | ERM | ND | 0.223 | 0.0185 | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | 0.51 | 0.0121 | ND | ND | ND | ND | ND |
| MW-46 | Nov-03 | ERM | ND | 0.0399 | ND | ND | ND | ND | ND | ND |
| | Apr-04 | ERM | ND | 0.0771 | 0.0272 | ND | ND | ND | ND | ND |
| MW-50 | Apr-04 | ERM | ND | 0.00651 | ND | ND | ND | ND | ND | ND |

NOTES:

Units used are **mg/L**. **ND** = not detected **NT** = not tested **NA** = not available
**(L)** = Sample collected using low-flow sampling methods.
**(T)** = Sample collected using traditional purge and sample methods.
**IT** = International Technology Corporation, Inc.
**ERM** = Environmental Resources Management
**MP** = Malcolm Pirnie, Inc.
**PCE** = perchloroethylene (tetrachloroethene) **TCE** = trichloroethylene
**c-1,2-DCE** = cis-1,2-dichloroethylene (not an analytical parameter until May 1997)
**t-1,2-DCE** = trans-1,2-dichloroethylene
**1,1-DCE** = 1,1-dichloroethylene **VC** = vinyl chloride
***** = Analysis was re-run due to QA/QC concerns. Data reported is for the second run.
SPL was used as the subcontract laboratory from 1996 to June 1999. ChemLab was used for earlier MP sampling events. The current laboratory is STL in Houston, Texas.
Pre-1999 data reproduced from "Remedial Investigation, North Side Ground Water, Whirlpool Corporation", Malcolm Pirnie, Inc., January 1997, (revised entry for MW-11, Jan-90) and SPL Certificates of Analysis, May 1997, supplied by Whirlpool Corporation.

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# Figures

*June 25, 2004*
*Project No. 0014507*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000


SOURCE: U.S.G.S. 7.5' QUADRANGLE, SOUTH FORT SMITH, ARK.-OKLA., 1987.

**ERM-Southwest, Inc.**

HOUSTON · NEW ORLEANS · AUSTIN · DALLAS · BEAUMONT · BATON ROUGE

FIGURE 1-1
SITE LOCATION MAP
Whirlpool Corporation
Fort Smith, Arkansas

| | | | |
|---|---|---|---|
| DESIGN: | CHKD.: SK | DATE: 10/23/00 | REV.: |
| DRAWN: EFC | SCALE: AS SHOWN | W.O.NO.: 581002A001 J00 | |

ERM

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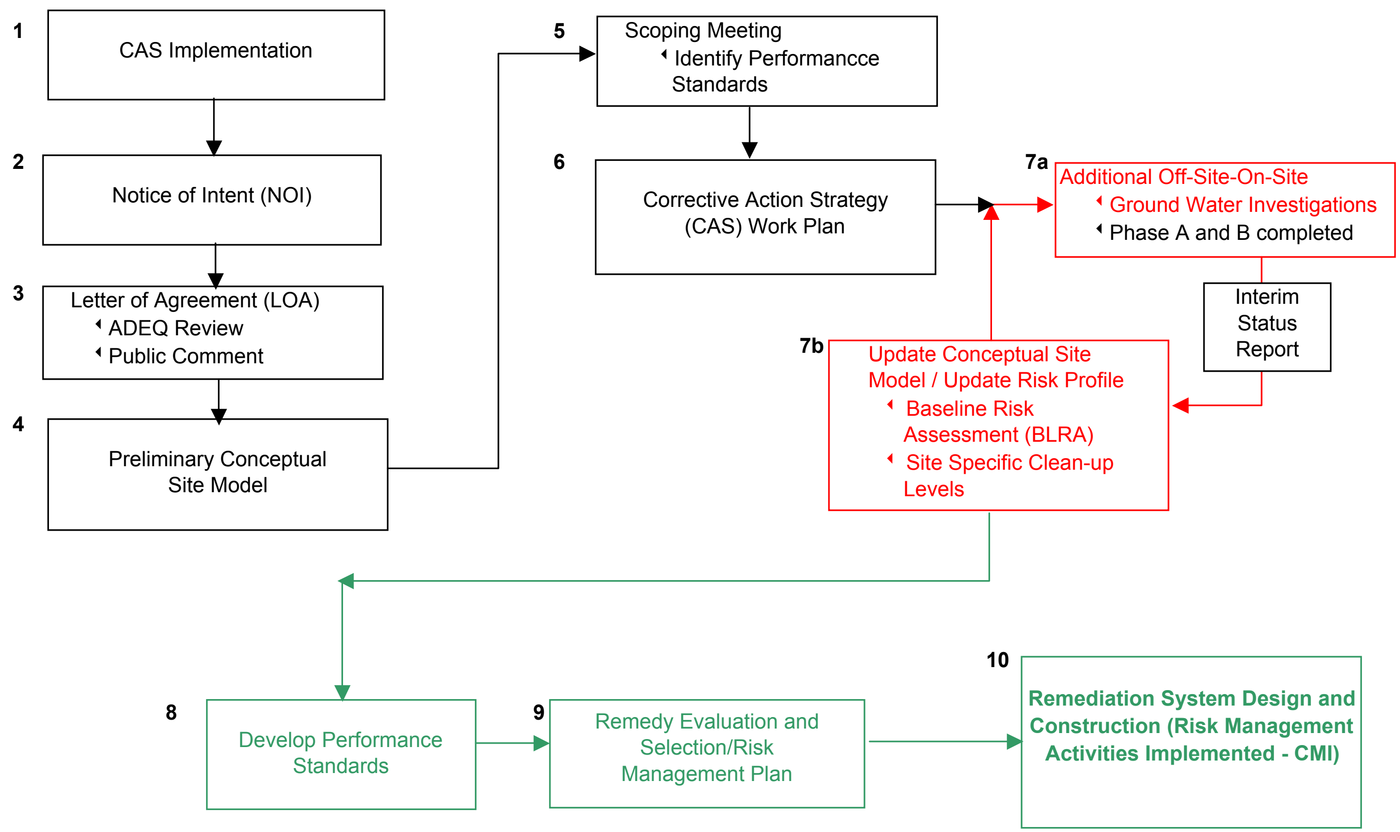
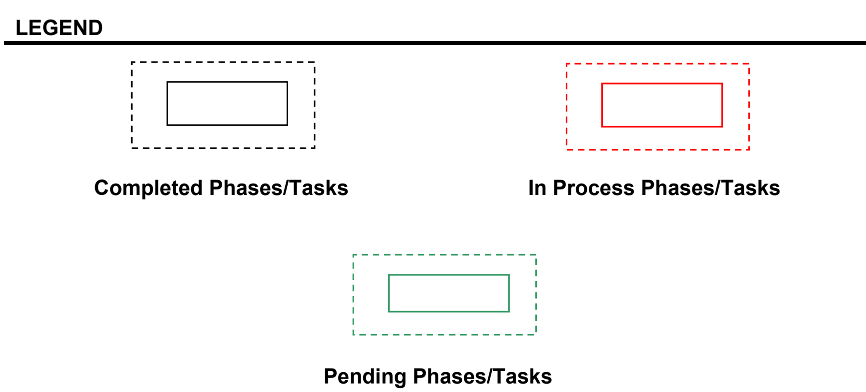
## CAS Implementation for Off-Site Area of Concern




# ERM-Southwest, Inc.

HOUSTON-NEW ORLEANS-AUSTIN-DALLAS-BEAUMONT-BATON ROUGE

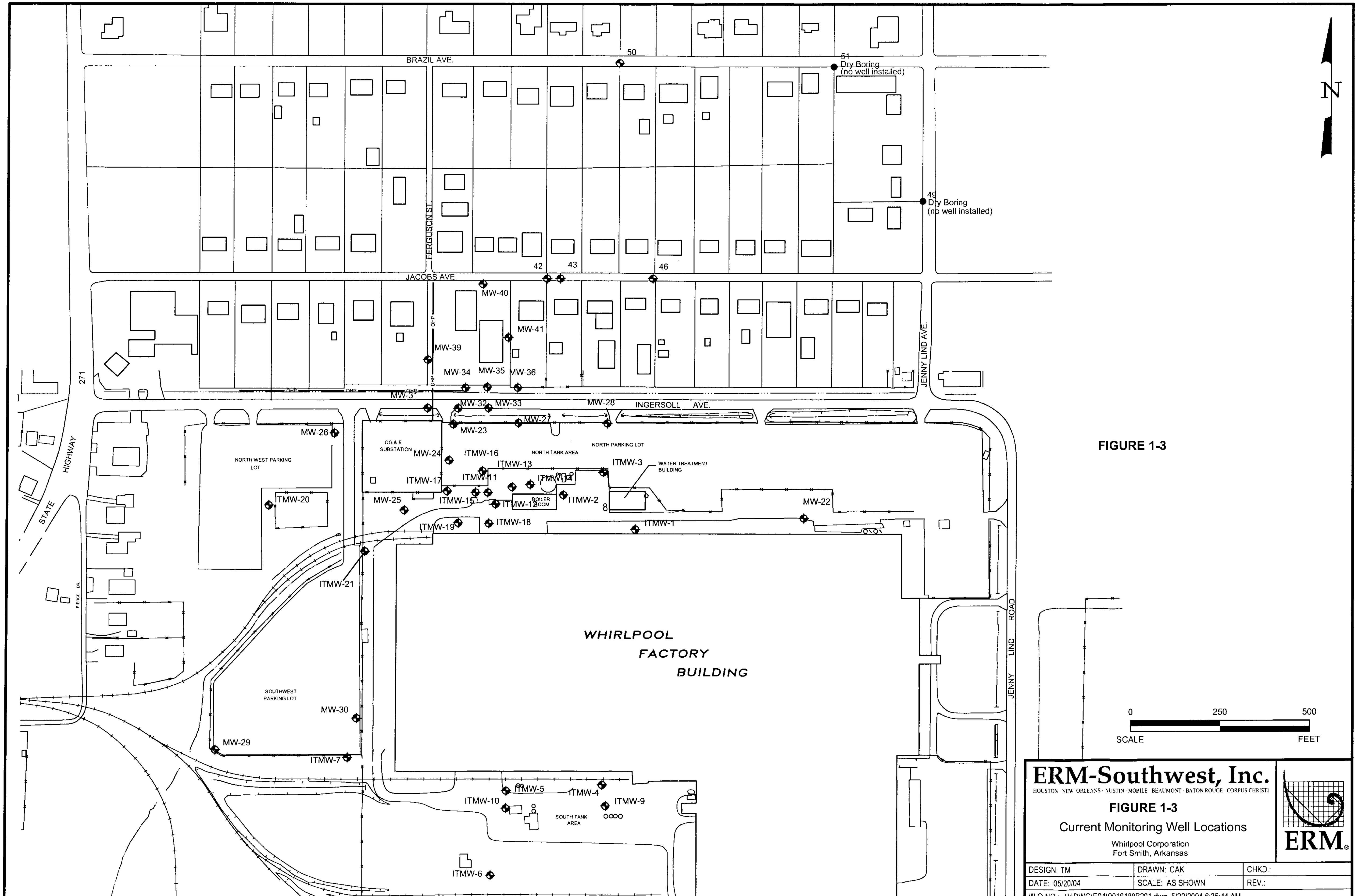
**FIGURE 1-2**
**CAS IMPLEMENTATION FOR OFF-SITE AREA OF CONCERN**

Whirlpool Corporation
Fort Smith, Arkansas

| | | | |
|---|---|---|---|
| DESIGN: TWM | CHKD: | DATE: 10/31/03 | REV: |
| DRAWN: TWM | SCALE: AS SHOWN | W.O.NO: 0014507 | |

ERM

g:\2004\006296\0014507\5578Hfig 1-2

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HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE · CORPUS CHRISTI

**FIGURE 1-3**

Current Monitoring Well Locations

Whirlpool Corporation
Fort Smith, Arkansas

ERM

| | | |
|---|---|---|
| DESIGN: TM | DRAWN: CAK | CHKD.: |
| DATE: 05/20/04 | SCALE: AS SHOWN | REV.: |
| W.O.NO.: H:\DWG\E04\0016188B201.dwg, 5/20/2004 6:35:44 AM | | |

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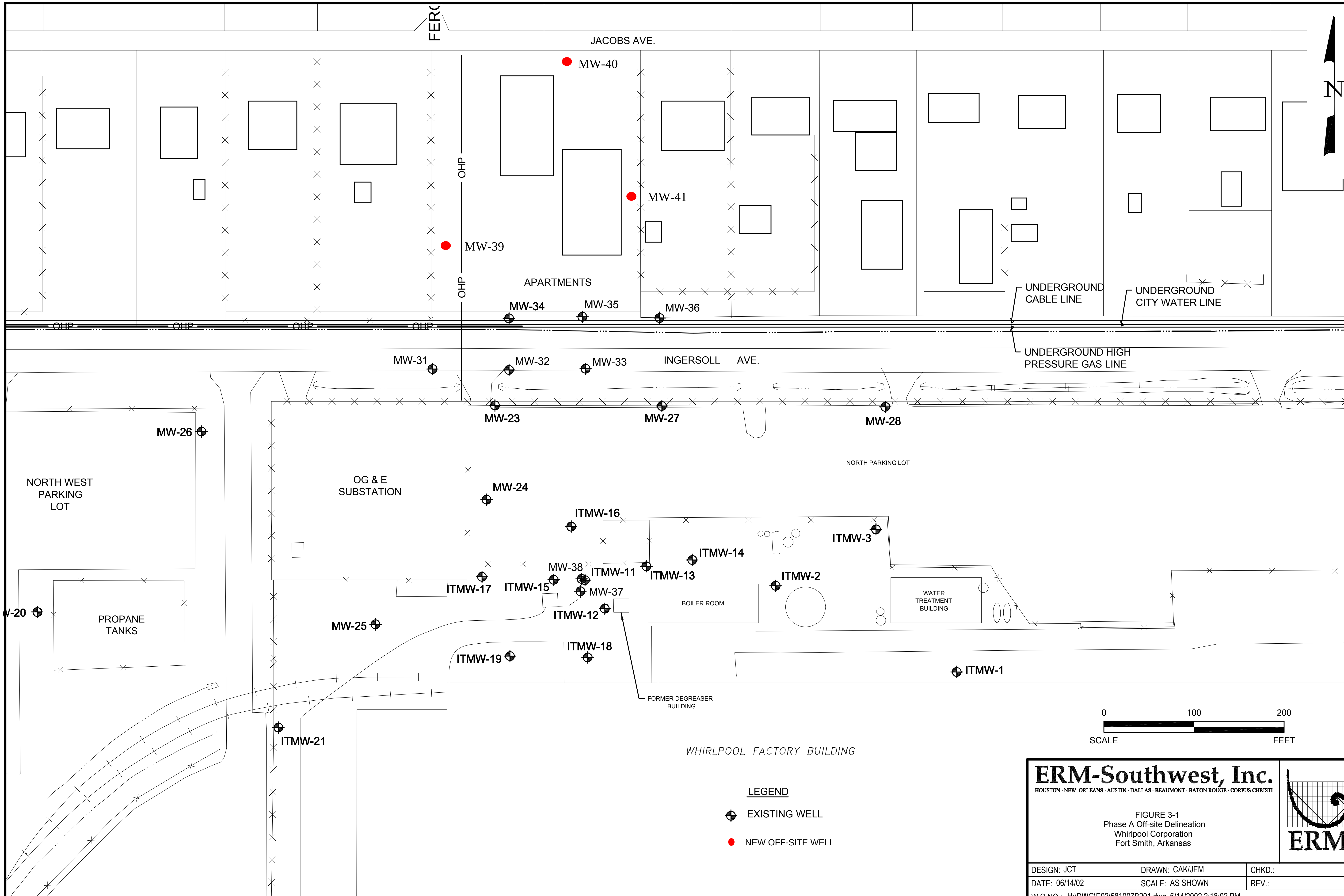


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ERM-Southwest, Inc.

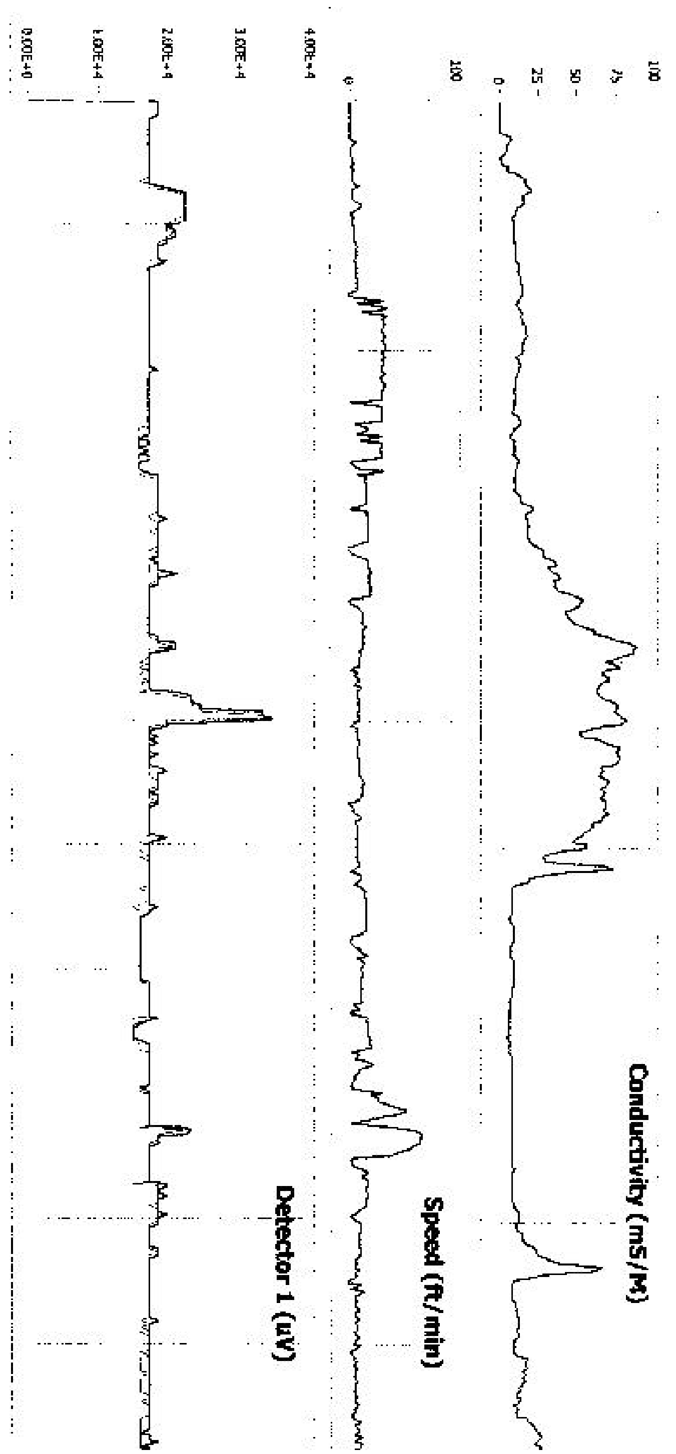
HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE · CORPUS CHRISTI

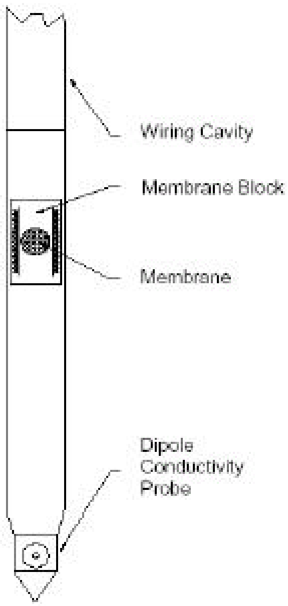
FIGURE 3-2
PHASE B OFF-SITE DELINEATION
Whirlpool Corporation
Fort Smith, Arkansas

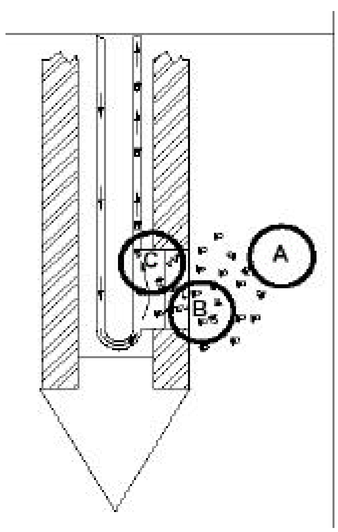
ERM

| | | |
|---|---|---|
| DESIGN: TM | DRAWN: CAK | CHKD.: |
| DATE: 10/06/03 | SCALE: AS SHOWN | REV.: |
| W.O.NO.: H:\DWG\J03\581013c201.dwg, 10/6/2003 3:25:00 PM | | |

## TYPICAL MIP LOG




A Subsurface Soil with VOCs
B Semi-Permeable Membrane
C Carrier Gas

**Schematic Drawings of MIP Probe**

Schematic drawings of MIP from the following web site:
http://www.geoprobe.com/literature/tech_papers/MIPpaperTMC.pdf

ERM-Southwest, Inc.

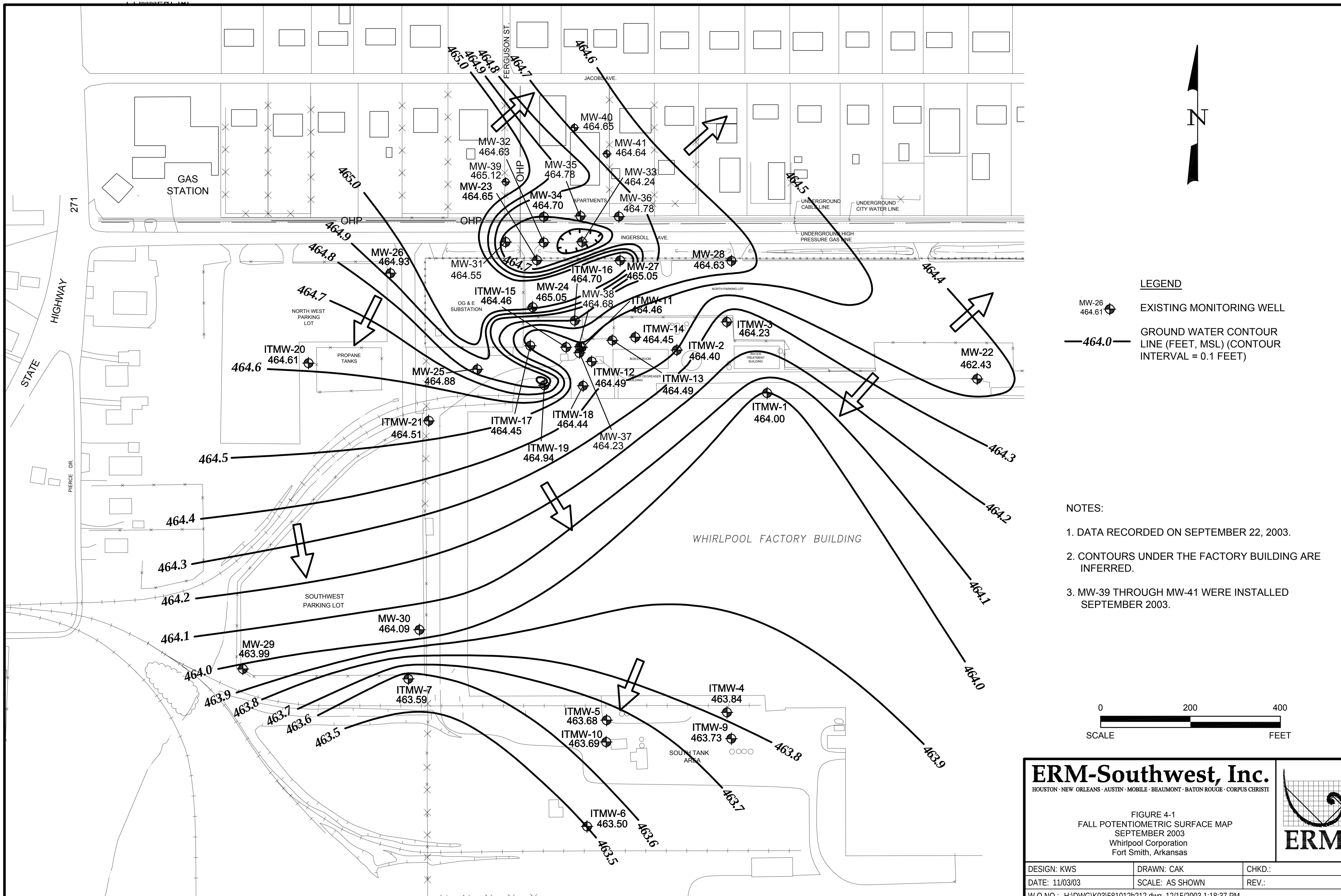
HOUSTON-NEW ORLEANS-AUSTIN-DALLAS-BEAUMONT-BATON ROUGE

FIGURE 3-3
SCHEMATIC DRAWINGS OF MIP AND TYPICAL LOG

Whirlpool Corporation
Fort Smith, Arkansas

| | | | | |
|---|---|---|---|---|
| DESIGN: TWM | CHKD: | | DATE: 10/31/03 | REV: |
| DRAWN: TWM | SCALE: AS SHOWN | | W.O.NO: 0014507 | |

ERM

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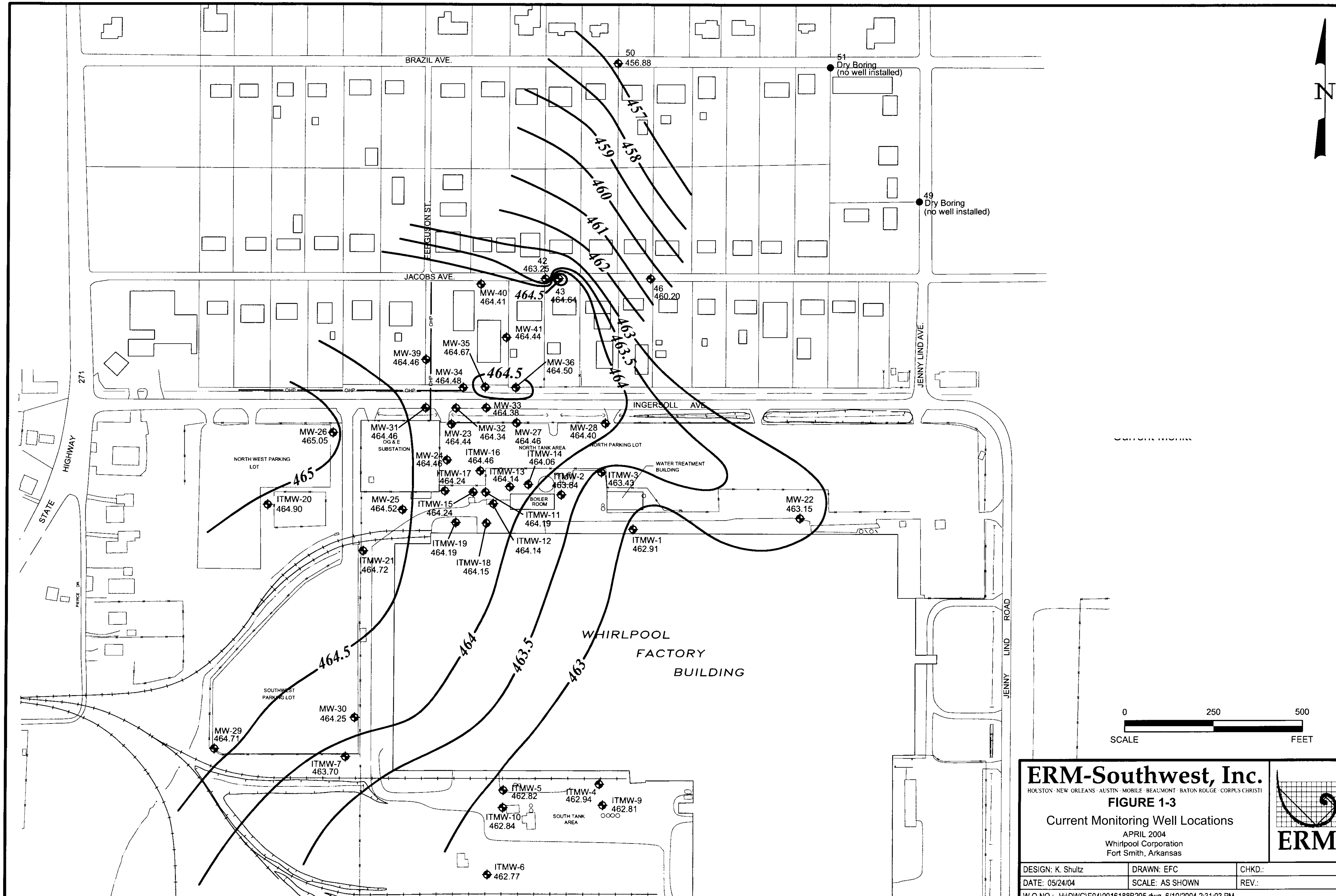


**ERM-Southwest, Inc.**

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**FIGURE 1-3**

Current Monitoring Well Locations

APRIL 2004

Whirlpool Corporation

Fort Smith, Arkansas

ERM

| DESIGN: K. Shultz | DRAWN: EFC | CHKD.: |
|---|---|---|
| DATE: 05/24/04 | SCALE: AS SHOWN | REV.: |
| W.O.NO.: H:\DWG\E04\0016188B205.dwg, 6/10/2004 2:31:03 PM | | |

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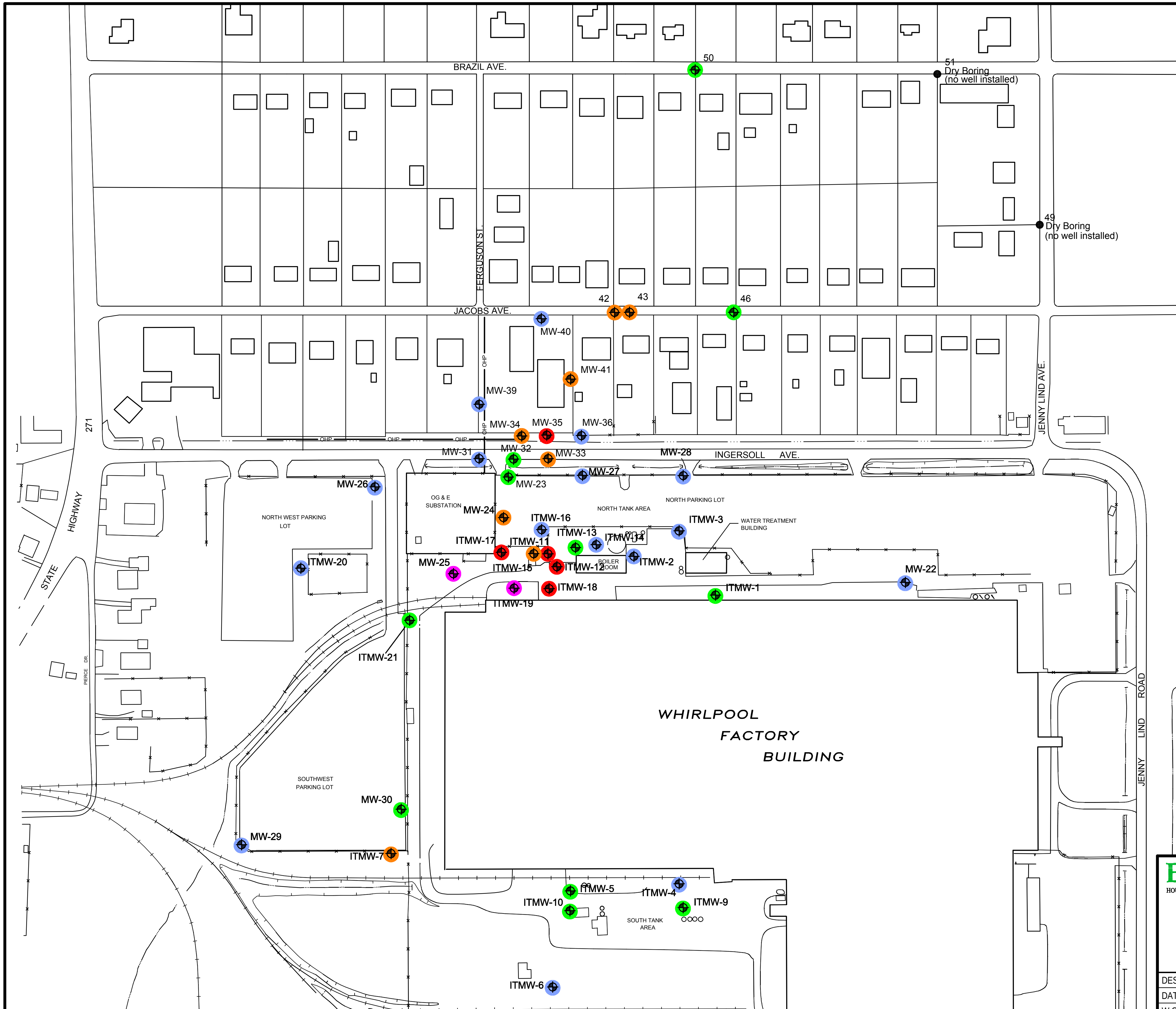


LEGEND

EXISTING MONITORING WELL

TCE CONCENTRATION (mg/l)
APRIL 2004

- < 0.005
- 0.005 to 0.10
- 0.10 to 1.00
- 1.00 to 10.0
- > 10.0

0 250 500
SCALE FEET

**ERM-Southwest, Inc.**
HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE · CORPUS CHRISTI

FIGURE 4-3
TCE ISOCONCENTRATION MAP
APRIL 2004
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| | | |
|---|---|---|
| DESIGN: TM | DRAWN: CAK/LMc | CHKD.: |
| DATE: 05/20/04 | SCALE: AS SHOWN | REV.: |
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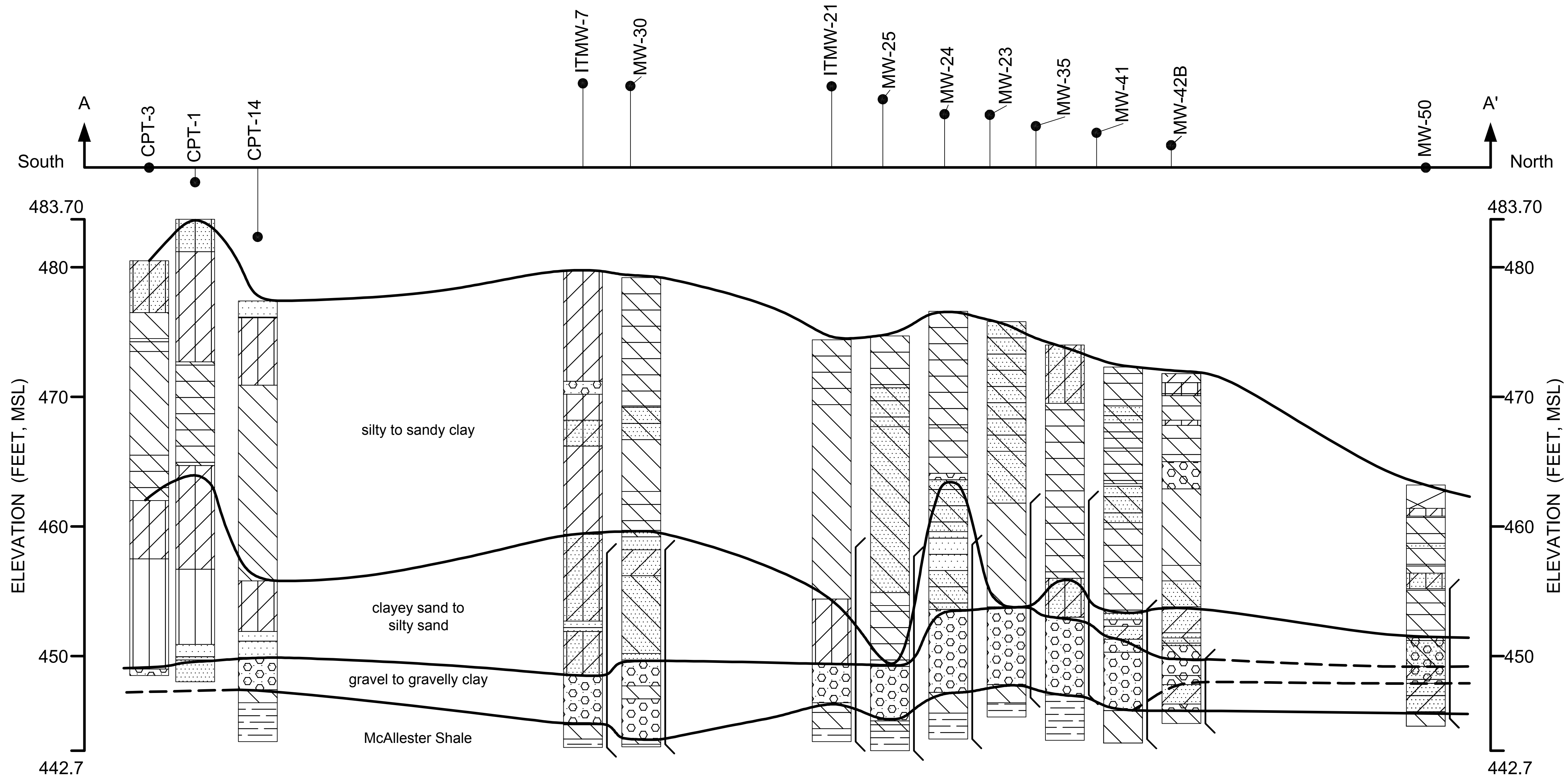
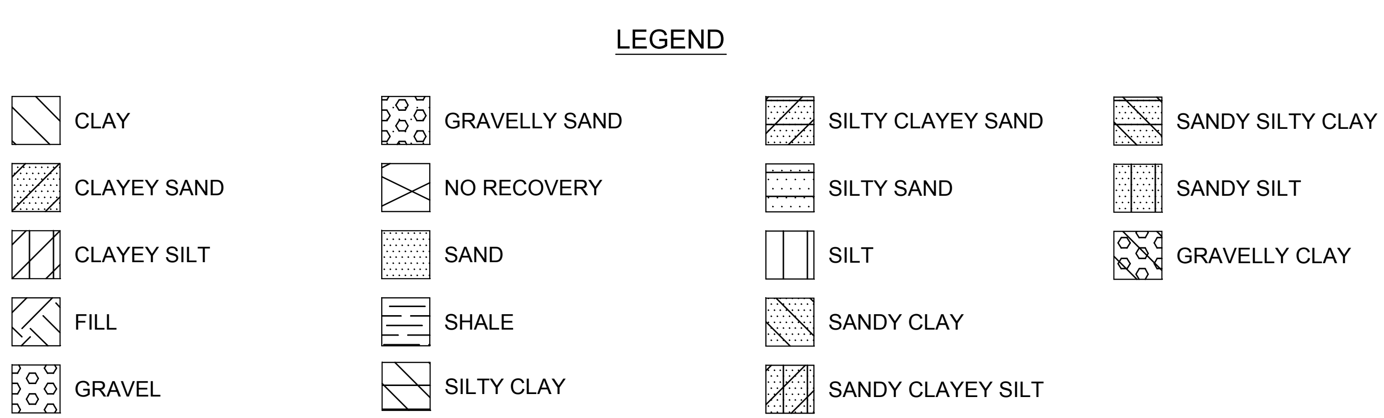
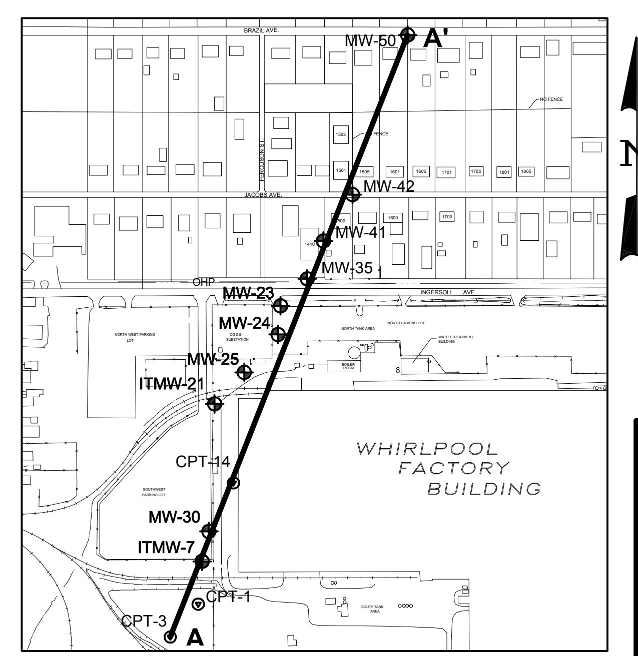
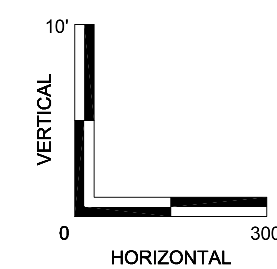



CROSS-SECTION LOCATION MAP
SCALE: 1" = 700'




**ERM-Southwest, Inc.**

HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE · CORPUS CHRISTI

FIGURE 4-4
CROSS-SECTION A-A'
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| | | |
|---|---|---|
| DESIGN: TM | DRAWN: LMc | CHKD.: |
| DATE: 01/14/04 | SCALE: AS SHOWN | REV.: |
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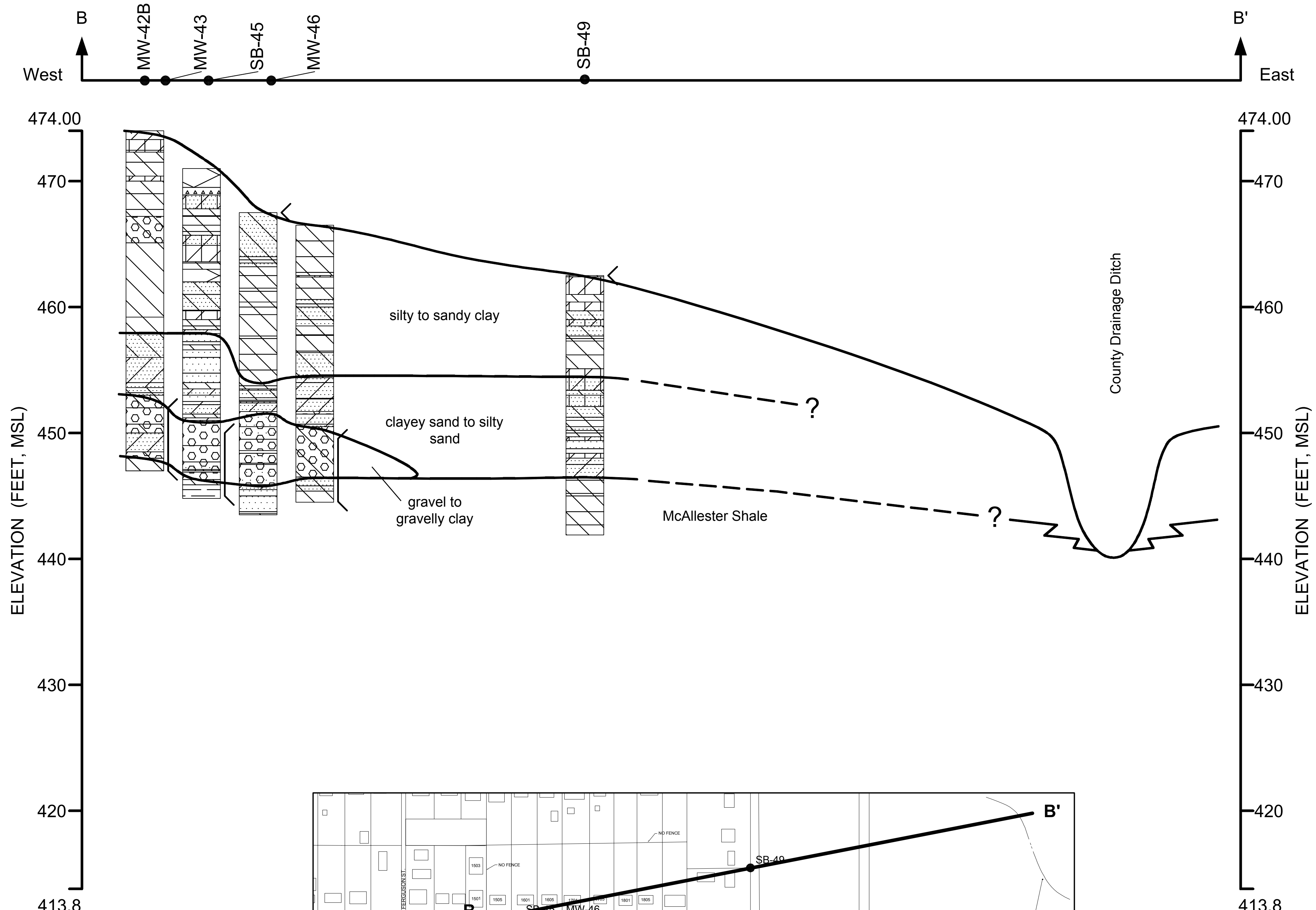


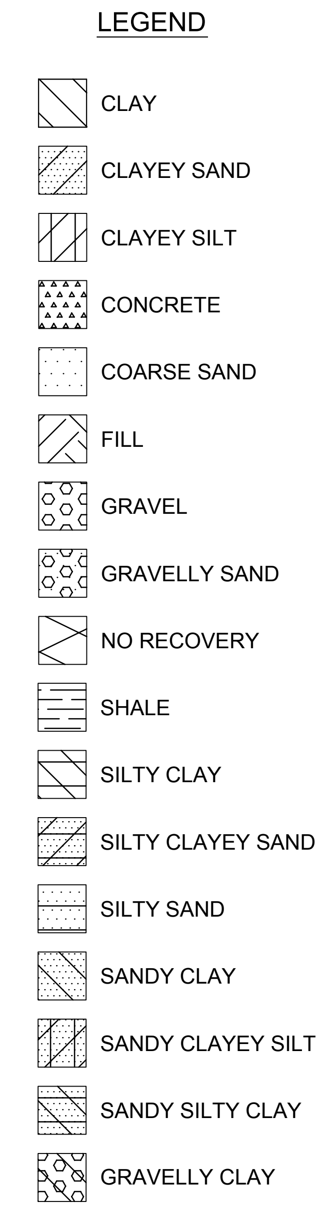


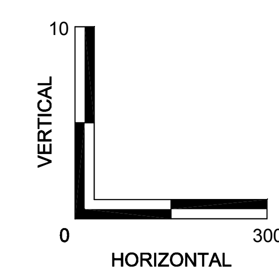


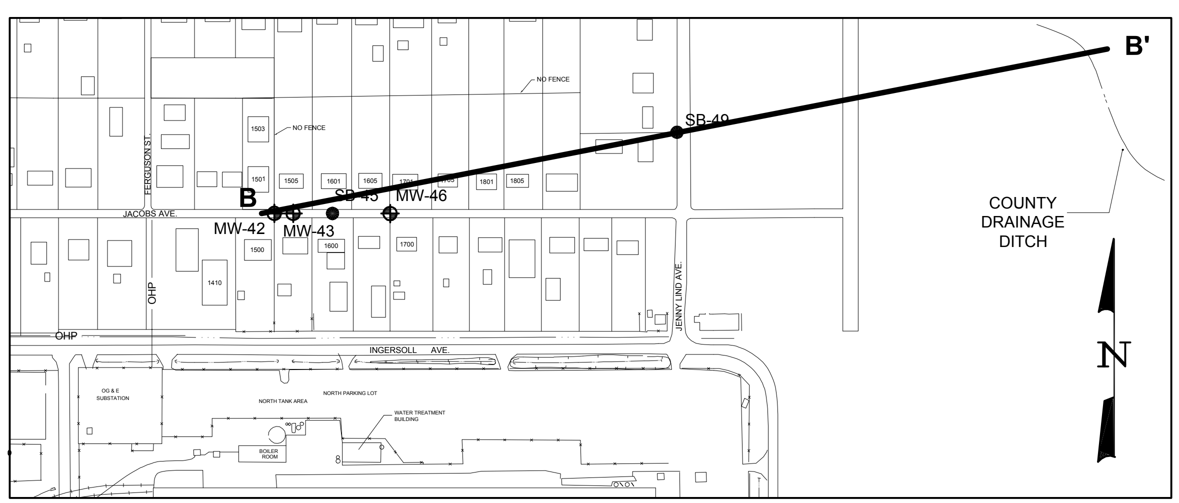


CROSS-SECTION LOCATION MAP
SCALE: 1" = 500'

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ERM

FIGURE 4-5
CROSS-SECTION B-B'
Whirlpool Corporation
Fort Smith, Arkansas

| | | |
|---|---|---|
| DESIGN: TM | DRAWN: LMc | CHKD.: |
| DATE: 01/15/04 | SCALE: AS SHOWN | REV.: |
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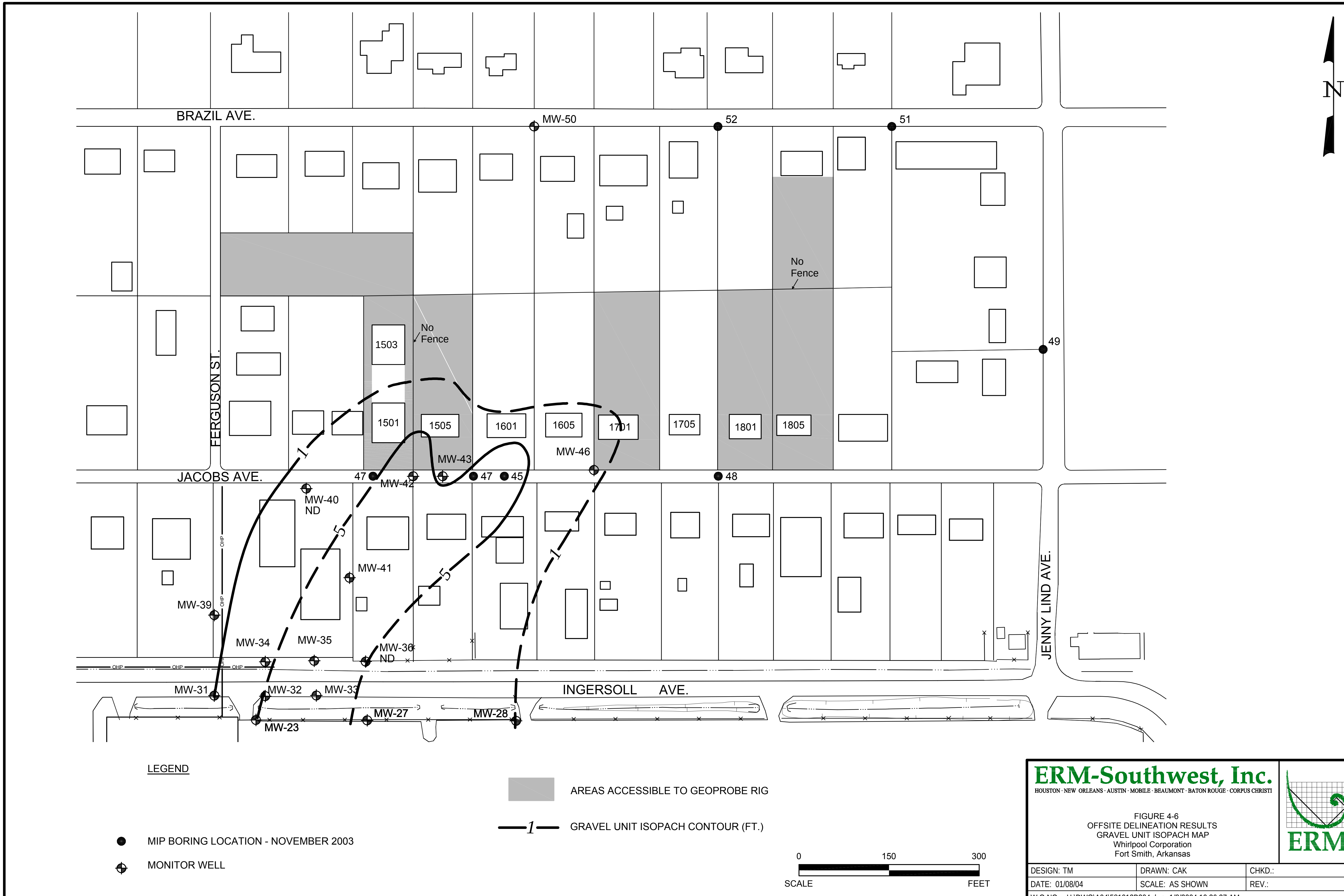


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LEGEND

EXISTING MONITORING WELL

APPROXIMATE AREA OF GRAVEL UNIT

TCE CONCENTRATION (mg/l)
APRIL 2004

< 0.005

0.005 to 0.10

1.00 to 10.0

0.10 to 1.00

0 150 300
SCALE FEET

ERM-Southwest, Inc.
HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE · CORPUS CHRISTI

FIGURE 4-7
OFFSITE DELINEATION RESULTS
TCE CONCENTRATIONS
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| | | |
|---|---|---|
| DESIGN: TM | DRAWN: CAK/LMc | CHKD.: |
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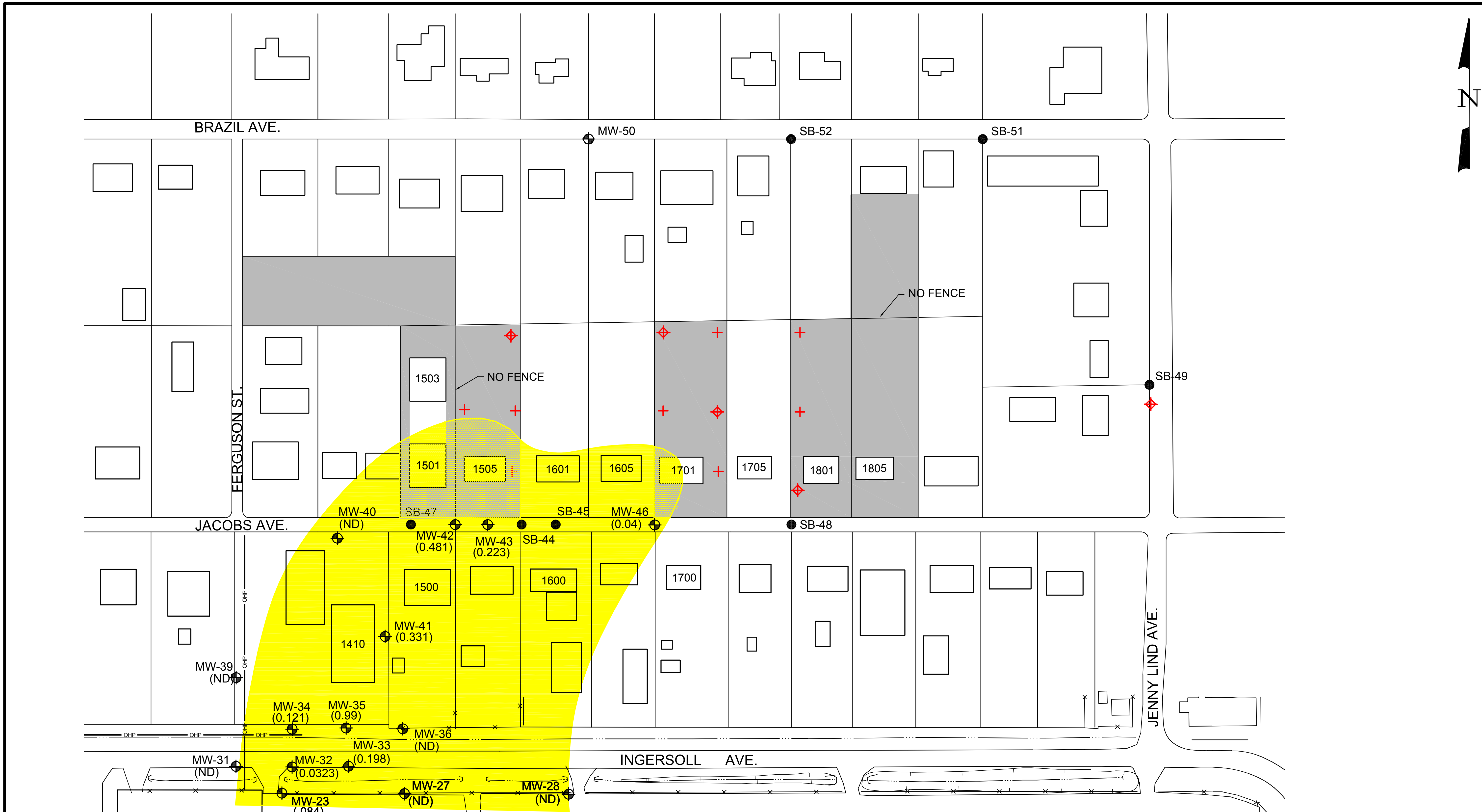



LEGEND

| | |
|---|---|
| + | PROPOSED MIP LOCATION |
| ⌖ | PROPOSED WELL LOCATION (TO BE BASED ON MIP RESULTS) |
| ● | MIP BORING LOCATION - NOVEMBER 2003 |
| ⌖ MW-43 (0.223) | EXISTING MONITOR WELL WITH NOVEMBER 2003 TCE CONCENTRATION IN mg/L |
| (grey) | PROPERTIES ACCESSIBLE TO GEOPROBE RIG |
| (yellow) | APPROXIMATE AREA OF GRAVEL UNIT |

0 150 300

SCALE FEET

**ERM-Southwest, Inc.**

HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE · CORPUS CHRISTI

FIGURE 5-1
OFF-SITE DELINEATION RESULTS
AND PROPOSED PHASE C MIP/WELL LOCATIONS
Whirlpool Corporation
Fort Smith, Arkansas

ERM

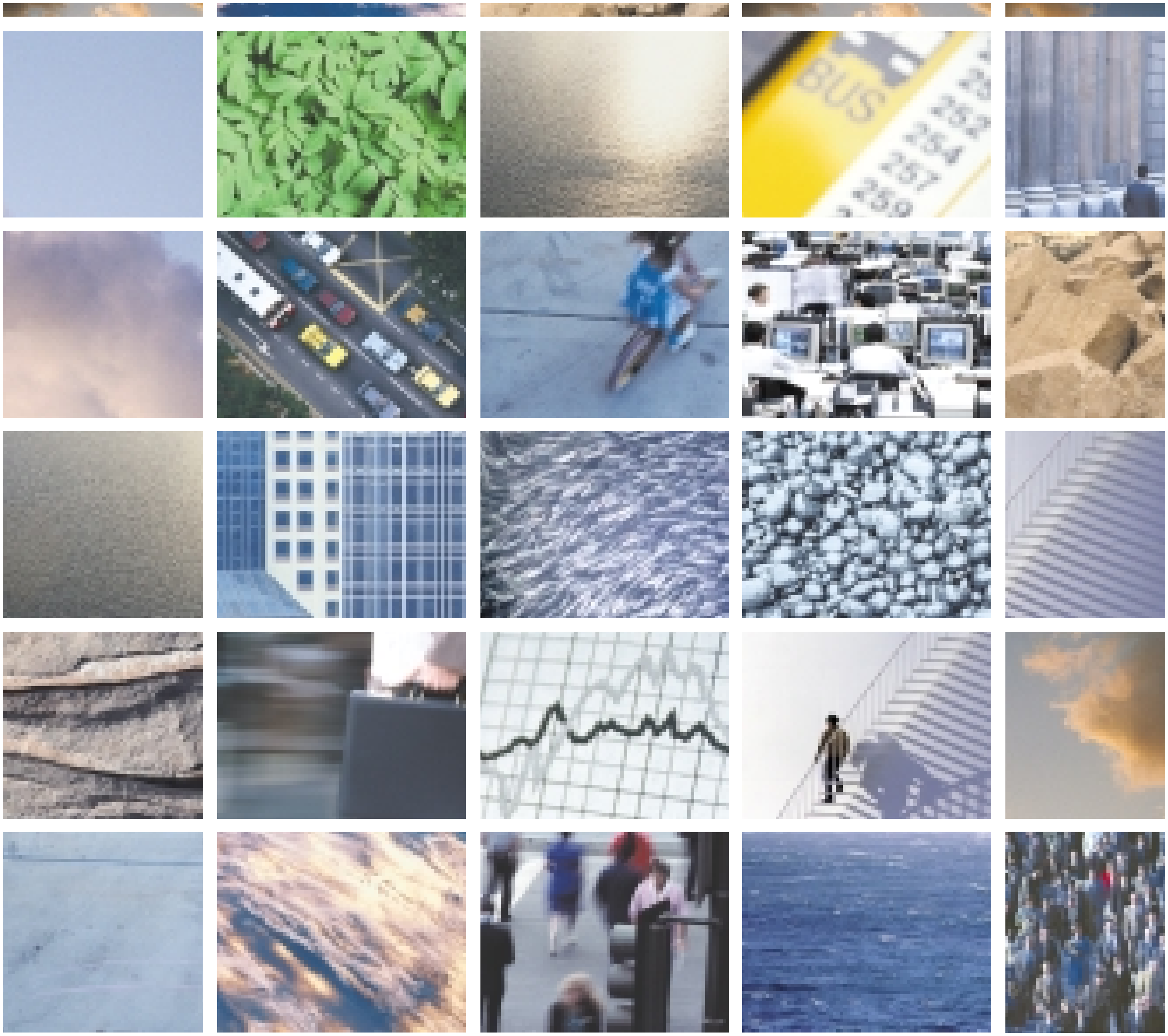
| | | |
|---|---|---|
| DESIGN: TM | DRAWN: CAK | CHKD.: |
| DATE: 05/20/04 | SCALE: AS SHOWN | REV.: |
| W.O.NO.: H:\DWG\E04\0016188B202.dwg, 5/20/2004 6:28:07 AM | | |

# Corrective Action Strategy Work Plan

*Appendix A*

*Revised June 25, 2004*
*Project No. 0014507*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000




# Corrective Action Strategy Work Plan

**Fort Smith, Arkansas**

**Prepared for Whirlpool Corporation, Inc.**

June 6, 2003
***(Revised June 25, 2004)***

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**CORRECTIVE ACTION STRATEGY**
**WORK PLAN**

**Whirlpool Corporation**

# 1.0 INTRODUCTION

## 1.1 Background

- Historical data ***(located in CSM Section 1.1, Section 4.0, and Section 5.0***)
- Identification of Data Gaps
  - Lithology north of site
  - Ground water flow at northern site boundary
  - Delineation of TCE plume north of site

## 1.2 Objectives

- Present Data Quality Objectives
- Present proposed methods and procedures to
  - Delineate TCE in off-site area north of facility and
  - Collect additional data for use in developing the risk management profile for the site and conducting site-specific risk assessment
- Present QA/QC requirements for the project

## 1.3 Performance Standards and Data Quality Objectives (DQOs)

- Use of Data
  - Assess the extent of affected media north of the site
  - Develop a risk management profile for the site and conduct site-specific risk assessment
- Performance Standards
  - Source Control Performance Standard
    1. In-situ treatment if found to be necessary (chemical oxidation with Potassium Permanganate)
    2. Expand from pilot test to address remainder of source area, if necessary
    3. To be conducted as an Interim Stabilization Measure, if necessary
  - Statutory and Regulatory Performance Standard
    Off Site: MCL 0.005 mg/l TCE
  - Final Risk Goal Performance Standard
    1. On Site: Industrial land use
    2. Evaluate risk-based TCE concentration protective of human health and the environment
- DQOs
  - Table of laboratory quantitation limits for ground water (Table 1-1)

## 2.0 OFF-SITE INVESTIGATION SAMPLING PLAN

### 2.1 Technical Approach

***See Section 4.0 of the Status Report for the Technical Approach for Off-Site Delineation Phase C***

| ***Technical approach for Off-Site Delineation Phase A*** |
| --- |
| • Install three additional wells (Figure 2-1)<br>• Sample wells for two semiannual events<br>• Monitor potentiometric surface for two semiannual events<br>• Update CSM with findings<br>• If plume delineation not complete, obtain additional off-site property access agreements and install additional wells downgradient (north or east) of the initial wells |

### 2.2 Investigation Methods

- Soil Borings
  - Drill rig equipped with hollow stem augers or geoprobe with continuous sampling and logging
  - Borings will be approximately 30 feet deep (to top of bedrock)
  - Soil cores will be collected continuously, lithology will be logged
  - Field screening for affected soils will be conducted every two feet using an organic vapor meter
- Well Installation, Development, and Sampling
  - Well Construction
  - 3/4–inch diameter well with pre-pack screen
  - Screen will be not more than 15 feet in length
  - Development will consist of surging, bailing, and/or pumping
  - A minimum of 8 borehole volumes will be removed (filter volume plus casing volume)
  - PH, specific conductance, and temperature will b e monitored during development
- Equipment Cleaning and Materials Management
  - Drilling equipment will be cleaned between boreholes with a pressure washer
  - Sampling equipment will be cleaned between samples with a laboratory-grade detergent
  - Investigation-derived material will be returned to the Whirlpool site for proper disposal
- Analytical Program
  - Testing for volatile organic compounds (VOCs) following SW-846 method 8260
  - List of target constituents and associated laboratory detection limits provided in Table (1-1)
  - Testing in accordance with Laboratory Quality Assurance Manual
- Quality Assurance/Quality Control Samples

- QA/QC samples will include field blanks, equipment blanks, duplicates, matrix spikes, and matrix spike duplicates
- QA/QC samples will be collected per SW-846 methods

- Sample Handling and Chain of Custody Procedures
  - Sample handling procedures per SW-846
  - Chain of Custody procedures per SW-846

## 2.3 Data Review, Validation, and Reporting Procedures

- Laboratory data screening to assess
  - Inclusion and frequency of the necessary QC supporting information
  - QC data outside established control limits
- Maintain data in a central location and/or database.
- Data Validation will be conducted in accordance with the National Functional Guideline for Organic Data Review and the National Functional Guideline for Inorganic Data Review
- QA/QC Audits

## 3.0 INVESTIGATION FOLLOWUP

- Update CSM with new data
- Prepare the risk management profile for the CSM
- Complete ecological exclusion checklist
- Conduct site-specific risk assessment and prepare Risk Evaluation Report
- Follow CAS procedures to develop appropriate response actions to protect human health and the environment
- Prepare Risk Management Plan

## 4.0 IMPLEMENTATION SCHEDULE AND COMMUNICATION STRATEGY

- Field work will be conducted during the week of July 7, 2003
- The CSM will be updated and a Risk Evaluation Report will be prepared approximately four weeks after final lab data is received
- A meeting with ADEQ will be scheduled following submission of the updated CSM and Risk Evaluation Report

## APPENDICES

- Conceptual Site Model (***Appendix B***)
- Health and Safety Plan (***Appendix G***)
- Laboratory Quality Assurance Manual (***Appendix H)***

# Tables

*June 6, 2003*
*(Revised June 25, 2004)*
*W.O. #581-007*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

TABLE 1-1

Planned Ground Water Analyte List

Whirlpool Corporation
Fort Smith, Arkansas

| Parameter | Target Practical Quantitation Limit (mg/l) |
|---|---|
| **Volatile Organics - Method SE-846 8260B 0.005** | |
| Benzene | 0.005 |
| Bromodichloromethane | 0.005 |
| Bromoform | 0.005 |
| Bromomethane | 0.005 |
| Carbon Tetrachloride | 0.005 |
| Chlorobenzene, Water | 0.01 |
| Chloroethane | 0.005 |
| Chloroform | 0.01 |
| Dichloromethane | 0.005 |
| 1,1-Dichloroethane | 0.005 |
| 1,2-Dichloroethane | 0.005 |
| 1,1-Dichloroethene | 0.005 |
| 1,2-Dichloroethene | 0.01 |
| cis-1,2-Dichloroethene | 0.005 |
| trans-1,2-Dichloroethene | 0.005 |
| 1,2-Dichloropropane | 0.005 |
| Ethylbenzene | 0.005 |
| Methylene Chloride | 0.01 |
| Styrene | 0.005 |
| 1,1,2,2-Tetrachloroethane | 0.005 |
| Tetrachloroethane | 0.005 |
| Toluene | 0.005 |
| 1,1,1-Trichloroethane | 0.005 |
| 1,1,2-Trichloroethane | 0.005 |
| Trichloroethene | 0.005 |
| Vinyl Chloride | 0.01 |
| Xylenes (Total) | 0.01 |
| Acetone | 0.02 |
| Carbon Disulfide | 0.005 |
| Methyl Ethyl Ketone (2-Butanone) | 0.01 |
| cis-1,3-Dichloropropene | 0.005 |
| trans-1,3-Dichloropropene | 0.005 |
| 2-Hexanone | 0.01 |
| 4-Methyl-2-pentanone (MIBK) | 0.01 |

# Figures

*June 6, 2003*
*(Revised June 25, 2004)*
*W.O. #581-007*


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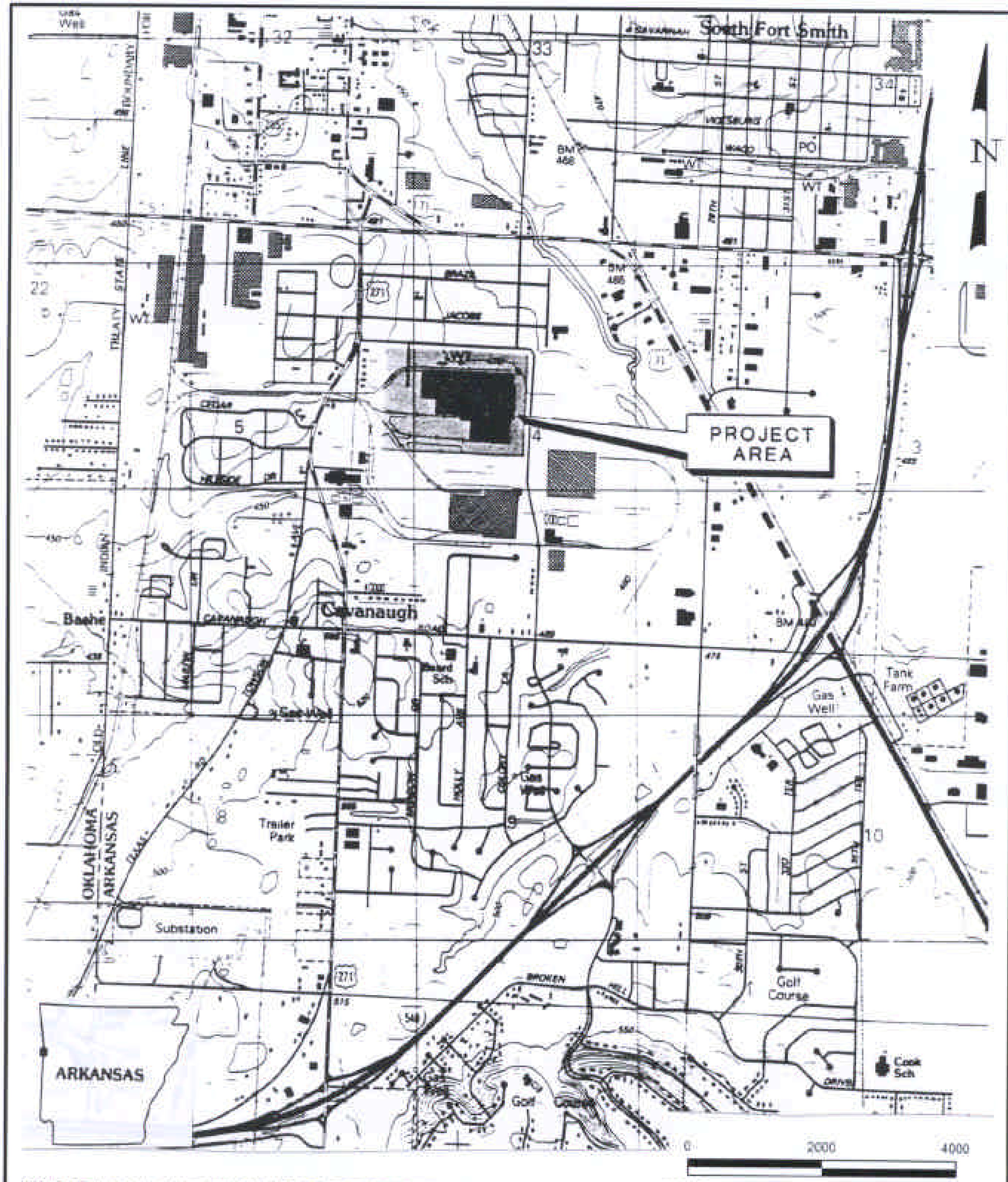



SOURCE: U.S.G.S. 7.5' QUADRANGLE, SOUTH FORT SMITH, ARK.-OKLA., 1987.

SCALE FEET

**ERM-Southwest, Inc.**

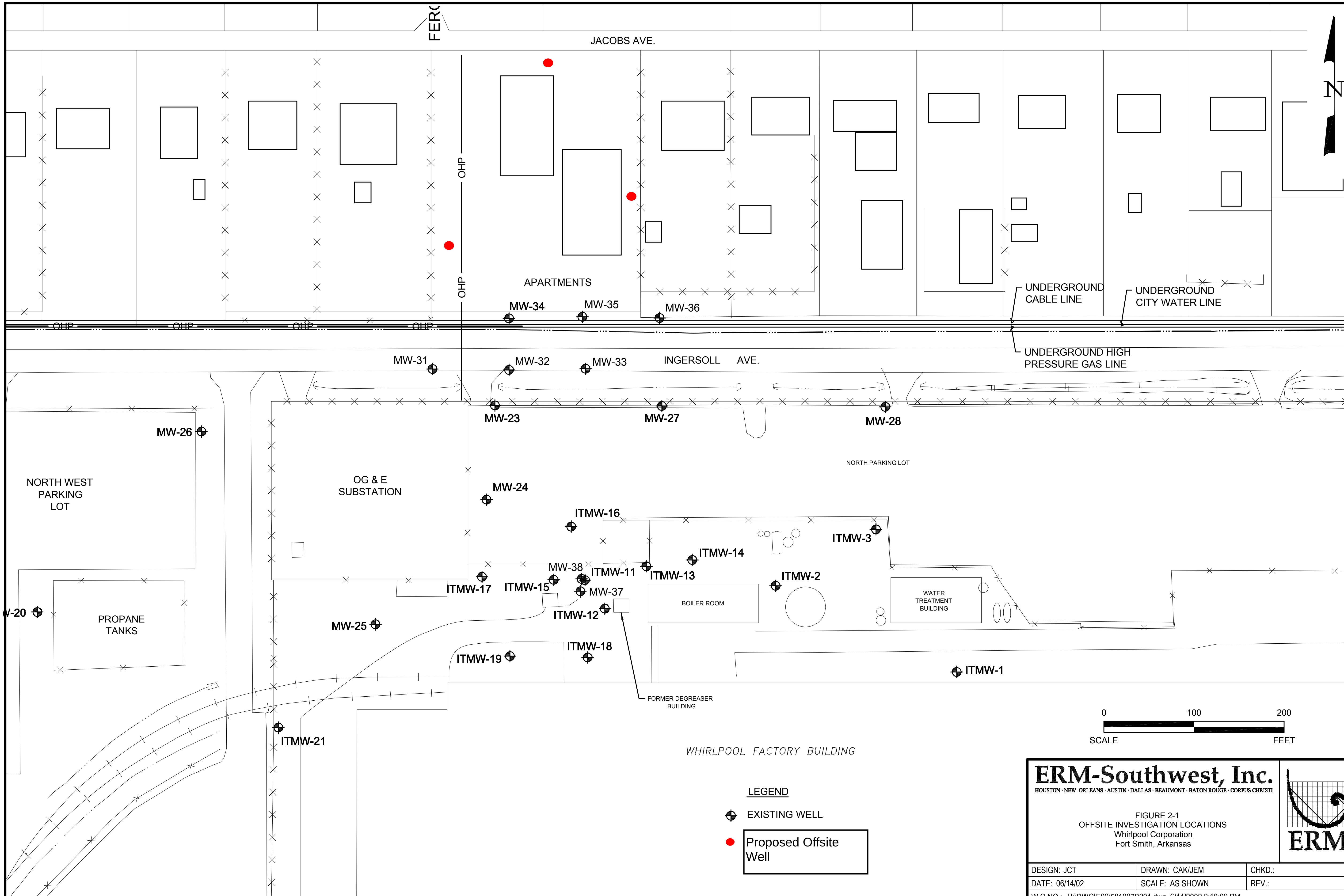
HOUSTON · NEW ORLEANS · AUSTIN · DALLAS · BEAUMONT · BATON ROUGE

FIGURE 1-1
SITE LOCATION MAP
Whirlpool Corporation
Fort Smith, Arkansas

| | | | |
|---|---|---|---|
| DESIGN: | CHKD.: SK | DATE: 10/23/00 | REV.: |
| DRAWN: EFC | SCALE: AS SHOWN | W.O.NO.: 581002A001 J00 | |

ERM

g:\2004\006296\0014507\5578Hfig1-1.pdf


JACOBS AVE.
N
OHP
APARTMENTS
MW-34
MW-35
MW-36
UNDERGROUND CABLE LINE
UNDERGROUND CITY WATER LINE
UNDERGROUND HIGH PRESSURE GAS LINE
MW-31
MW-32
MW-33
INGERSOLL AVE.
MW-23
MW-27
MW-28
MW-26
NORTH PARKING LOT
NORTH WEST PARKING LOT
OG & E SUBSTATION
MW-24
ITMW-16
ITMW-3
ITMW-14
MW-38
ITMW-11
ITMW-13
ITMW-2
ITMW-17
ITMW-15
MW-37
BOILER ROOM
WATER TREATMENT BUILDING
PROPANE TANKS
MW-25
ITMW-12
ITMW-19
ITMW-18
ITMW-1
FORMER DEGREASER BUILDING
ITMW-21
0
100
200
SCALE
FEET
WHIRLPOOL FACTORY BUILDING
LEGEND
EXISTING WELL
Proposed Offsite Well
ERM-Southwest, Inc.
HOUSTON · NEW ORLEANS · AUSTIN · DALLAS · BEAUMONT · BATON ROUGE · CORPUS CHRISTI
FIGURE 2-1
OFFSITE INVESTIGATION LOCATIONS
Whirlpool Corporation
Fort Smith, Arkansas
ERM
DESIGN: JCT
DRAWN: CAK/JEM
CHKD.:
DATE: 06/14/02
SCALE: AS SHOWN
REV.:
W.O.NO.: H:\DWG\E02\581007B201.dwg, 6/14/2002 2:18:02 PM

# Laboratory Quality Assurance Manual

*June 6, 2003*
*(Revised June 25, 2004)*
*W.O. #581-007*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

# QUALITY MANAGEMENT PLAN
Revision: 5

July 2002

**Approved by:**

| | | |
|---|---|---|
| President and CEO: | Rachel Brydon Janetta | Date: June 10, 2002 |
| Senior Vice President, Chief Operating Officer: | Dr. Keith C. Wheatstone | Date: June 10, 2002 |
| Vice President, Client and Operation Services: | Dr. Charles W. Carter | Date: June 10, 2002 |
| Director of Quality Assurance: | Raymond J. Frederici | Date: June 10, 2002 |

# *Table of Contents*

## Tables



## Figures

# 1. *Introduction, Purpose, and Scope*

## 1.1. Severn Trent Laboratories (STL) Overview

STL Inc. is a part of Severn Trent Plc , a major U.S. based company with 2,000 employees throughout the U.S., Europe and Asia. Severn Trent Plc., a British water, waste and utility services company, one of the top publicly traded companies in the United Kingdom, employing some 13,500 people.

STL offers a broad range of environmental testing services provided by over two thousand professionals in the US. STL's testing capabilities include chemical, physical, and biological analyses of a variety of matrices, including aqueous, solid, drinking water, waste, tissue, air and saline/estuarine samples. Specialty capabilities include dioxin and furan analysis, air toxics, radiological testing, geotechnical testing, tissue preparation and analysis, aquatic toxicology, asbestos analysis, microscopy services, High Resolution Mass Spectrometry (HRMS), Inductively Coupled Plasma/MS (ICP/MS), Liquid Chromatography/MS (LC/MS), and on-site technologies including mobile laboratories. STL facility locations and contact information are outlined in Table 1.

## 1.2. Quality Assurance Policy

It is STL's policy to:

- Provide high quality, consistent, and objective environmental testing services that meet all federal, state, and municipal regulatory requirements.
- Generate data that are scientifically sound, legally defensible, meet project objectives, and are appropriate for their intended use.
- Provide STL clients with the highest level of professionalism and the best service practices in the industry.
- Build continuous improvement mechanisms into all laboratory, administrative, and managerial activities.
- Maintain a working environment that fosters open communication with both clients and staff.

## Table 1 STL Facility Locations

**STL Austin**
14046 Summit Drive
Suite 111
Austin, TX 78728
Phone: 512-244-0855
Fax: 512-244-0160

**STL Billerica**
149 Rangeway Road
N. Billerica, MA 01862
Phone: 978-667-1400
Fax: 978-667-7871

**STL Buffalo**
10 Hazelwood Drive
Suite 106
Amherst, NY 14228
Phone: 716-691-2600
Fax: 716-691-7991

**STL Burlington**
208 South Park Drive
Suite 1
Colchester, VT 05446
Phone: 802-655-1203
Fax: 802-655-1248

**STL Connecticut**
128 Long Hill Cross Road
Shelton, CT 06484
Phone: 203-929-8140
Fax: 203-929-8142

**STL Chicago**
2417 Bond Street
University Park, IL 60466
Phone: 708-534-5200
Fax: 708-534-5211

**STL Corpus Christi**
1733 N. Padre Island Drive
Corpus Christi, TX 78408
Phone: 361-289-2673
Fax: 361-289-2471

**STL Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone: 303-421-6611
Fax: 303-431-7171

**STL Edison**
777 New Durham Road
Edison, NJ 08817
Phone: 732-549-3900
Fax: 732-549-3679

**STL Houston**
6310 Rothway Drive
Suite 130
Houston, TX 77040
Phone: 713-690-4444
Fax: 713-690-5646

**STL Knoxville**
5815 Middlebrook Pike
Knoxville, TN 37921
Phone: 865-291-3000
Fax: 865-584-4315

**STL Los Angeles**
1721 South Grand Avenue
Santa Ana, CA 92705
Phone: 714-258-8610
Fax: 714-258-0921

**STL Miami**
10200 USA Today Way
Miramar, FL 33025
Phone: 954-431-4550
Fax: 954-431-1959

**STL Mobile**
900 Lakeside Drive
Mobile, AL 36693
Phone: 334-666-6633
Fax: 334-666-6696

**STL Newburgh**
315 Fullerton Avenue
Newburgh, NY 12550
Phone: 845-562-0890
Fax: 845-562-0841

**STL North Canton**
4101 Shuffel Drive NW
North Canton, OH 44720
Phone: 330-497-9396
Fax: 330-497-0772

**STL On-Site Technology**
Westfield Executive Park
53 Southampton Road
Westfield, MA 01085
Phone: 413-572-4000
Fax: 413-572-3707

**STL Pensacola**
3355 McLemore Drive
Pensacola, FL 32514
Phone: 850-474-1001
Fax: 850-478-2671

**STL Pittsburgh**
450 William Pitt Way
Building 6
Pittsburgh, PA 15238
Phone: 412-820-8380
Fax: 412-820-2080

**STL Richland**
2800 George Washington Way
Richland, WA 99352
Phone: 509-375-3131
Fax: 509-375-5590

**STL Sacramento**
880 Riverside Parkway
West Sacramento, CA 95605
Phone: 916-373-5600
Fax: 916-372-1059

**STL San Francisco**
1220 Quarry Lane
Pleasanton, CA 94566-4756
Phone: 925-484-1919
Fax: 925-484-1096

**STL Seattle**
5755 8th Street East
Tacoma, WA 98424
Phone: 253-922-2310

**STL St. Louis**
13715 Rider Trail North
Earth City, MO 63045
Phone: 314-298-8566
Fax: 314-298-8757

**STL Savannah**
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858
Fax: 912-351-3673

**STL Tallahassee**
2846 Industrial Plaza Dr.
Tallahassee, FL 32301
Phone: 850-878-3994
Fax: 850-878-9504

**STL Tampa**
6712 Benjamin Road
Suite 100
Tampa, FL 33634
Phone: 813-885-7427
Fax: 813-885-7049

**STL Valparaiso**
2400 Cumberland Drive
Valparaiso, IN 46383
Phone: 219-464-2389
Fax: 219-462-2953

**STL Westfield**
Westfield Executive Park
53 Southampton Road
Westfield, MA 01085
Phone: 413-572-4000
Fax: 413-572-3707

## 1.3. Management Commitment to Quality Assurance

STL management is committed to providing the highest quality data and the best service in the environmental testing industry. To ensure that the data produced and reported by STL meet the requirements of its clients and comply with the letter and spirit of municipal, state and federal regulations, STL maintains a quality system that is clear, effective, well communicated, and supported at all levels in the company.

**STL Mission Statement**

We enable our customers to create safe and environmentally favorable policies and practices, by leading the market in scientific and consultancy services. We provide this support within a customer service framework that sets the standard to which others aspire. This is achieved by people whose professionalism and development is valued as the key to success and through continued investments in science and technology.

## 1.4. Purpose

The purpose of the Quality Management Plan (QMP) is to describe the STL quality system and to outline how that system enables all employees of STL to meet the Quality Assurance (QA) policy. The QMP also describes specific QA activities and requirements and prescribes their frequencies. Roles and responsibilities of management and laboratory staff in support of the quality system are also defined in the QMP.

## 1.5. Scope

The requirements set forth in this document are applicable to all STL facilities. Where the document uses the terms “must” and “shall”, this denotes required activities. Practices described in this QMP denotes how those activities are performed in general; and each laboratory may have a more detailed description of that activity.

Each STL facility has the responsibility and authority to operate in compliance with regulatory requirements of the jurisdiction in which the work is performed. Where this QMP conflicts with those regulatory requirements, the regulatory requirements of the jurisdiction shall hold primacy. The facility’s Laboratory Quality Manual (LQM) shall take precedence over the QMP in those cases. Secondarily, each STL facility has the responsibility and authority to operate in compliance with documented client requirements, where they do not conflict with regulatory requirements. STL shall not enter any client agreements that conflict with regulatory requirements in the jurisdiction in which the work is performed. Where documented client agreements conflict with this QMP, but meet the regulatory requirements of the jurisdiction in which the work is performed, the client agreements shall supercede requirements in this QMP.

STL operates under the regulations and guidelines of the following federal programs:

- Air Force Center for Environmental Excellence (AFCEE)
- US Army Corp of Engineers, Hazardous, Toxic and Radioactive Waste (USACE HTRW)
- Clean Air Act (CAA)
- Clean Water Act (CWA)
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- Department of Energy (DOE)
- Marine Protection, Research, and Sanctuaries Act (MPRSA)
- Navy Facilities Engineering Service Center (NFESC)
- National Pollutant, Discharge, and Elimination System (NPDES)
- Nuclear Regulatory Commission (NRC)
- Occupational Safety and Health Administration (OSHA)
- Resource Conservation and Recovery Act (RCRA)
- Safe Drinking Water Act (SDWA)
- Toxic Substances Control Act (TSCA)

STL also provides services under various state and local municipal guidelines. A listing of each laboratory's service offerings and certifications is presented on the MySTL webpage or available from the laboratory.

This QMP was written to comply with the National Environmental Laboratory Accreditation Conference (NELAC) standards. Refer to Table 2 for a cross-section comparison of this QMP to the NELAC standards.

**Table 2 Correlation of QMP Sections with NELAC Quality Manual Requirements**

| NELAC Chapter 5.5.2 Quality Manual | Quality Management Plan Section |
|---|---|
| a. Quality policy statement, including objectives and commitments | 1.2 Quality Assurance Policy<br>4.2.1 Objectives of the Quality System |
| b. Organization and management structure | 4.1 Organization and Management |
| c. Relationship between management, technical operations, support services and the quality systems | 4.1.2 Roles and Responsibilities<br>4.2 Quality System |
| d. Records retention procedures; document control procedures | 4.3 Document Control<br>4.12.2 Record Retention |
| e. Job descriptions of key staff and references to job descriptions of other staff | 4.1.2 Roles and Responsibilities |
| f. Identification of laboratory approved signatories | 4.1 Organization and Management |
| g. Procedures for achieving traceability of measurements | 5.5 Measurement Traceability |
| h. List of all test methods under which the laboratory performs its accredited testing | 5.3.1 Method Selection |
| i. Mechanisms for assuring the laboratory reviews all new work to ensure that it has the appropriate facilities and resources before commencing such work | 4.4.2 Project-Specific Quality Planning |
| j. Reference to the calibration and/or verification test procedures used | 5.4.3 Equipment Verification and Calibration |
| k. Procedures for handling submitted samples | 4.7.1 Sample Acceptance Policy<br>5.7 Sample Handling, Transport and Storage |
| l. Reference to the major equipment and reference measurement standards used as well as the facilities and services used in conducting tests | 4.1.1 Laboratory Facilities<br>5.4.2 Equipment Maintenance<br>5.4.3 Equipment Verification and Calibration |
| m. Reference to procedures for calibration, verification and maintenance of equipment | 5.4.2 Equipment Maintenance<br>5.4.3 Equipment Verification and Calibration |
| n. Reference to verification practices including interlaboratory comparisons, proficiency testing programs, use of reference materials and internal QC schemes | 5.8.1 Proficiency Testing<br>5.8.2 Control Samples |
| o. Procedures for feedback and corrective action whenever testing discrepancies are detected, or departures from documented procedures occur | 4.9 Control of Non-Conformances<br>4.10 Corrective Action<br>4.11 Preventive Action<br>5.8.5 Permitting Departures from Documented Procedures |
| p. Laboratory management arrangements for exceptionally permitting departures from documented policies and procedures | 4.4.2 Project-Specific Quality Planning<br>5.8.5 Permitting Departures from Documented Procedures |
| q. Procedures for dealing with complaints | 4.8 Complaints |
| r. Procedures for protecting confidentiality and proprietary rights | 4.7.2 Client Confidentiality and Proprietary Rights |
| s. Procedures for audits and data review | 4.13 Internal Audits<br>4.14 External Audits<br>5.3.6 Data Reduction and Review |

**Table 2 Correlation of QMP Sections with NELAC Quality Manual Requirements**

| NELAC Chapter 5.5.2 Quality Manual | Quality Management Plan Section |
|---|---|
| t. Process/procedures for establishing that personnel are adequately experienced in duties they are expected to carry out and are receiving any needed training | 5.1.2 Training |
| u. Ethics policy statement developed by the laboratory and training personnel in their ethical & legal responsibilities | 5.1.3 Ethics Policy |
| v. Reference to procedures for reporting analytical results | 5.3.6 Data Review<br>5.9 Project Reports |
| w. Table of contents, listing reference, glossaries and appendices | TOC Table of Contents<br>Appendix I: List of Cited SOPs and Work Instructions |

## 2. References

The following references were used in preparation of this document and as the basis of the STL Quality System:

EPA Guidance for Preparing Standard Operating Procedures (SOPs) for Quality Related Documents, EPA QA/G-6, US EPA, Office of Environmental Information, March 2001.

EPA Requirements for Quality Management Plans, EPA QA/R-2, US EPA, Office of Environmental Information, March 2001.

EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5, US EPA, Office of Environmental Information, March 2001.

EPA Quality Manual for Environmental Programs, 5360 A1, US EPA Office of Research and Development, National Center for Environmental Research and Quality Assurance, Quality Assurance Division, May 2000.

General Requirements for the Competence of Testing and Calibration Laboratories, ISO/IEC 17025, December 1999.

Good Automated Laboratory Practices, EPA 2185, August 1995.

Quality Assurance Project Plan, HQ Air Force Center for Environmental Excellence, Version 3.1, August 2001.

National Environmental Laboratory Accreditation Conference, Constitution, Bylaws, and Standards, EPA600/R-98/151, US EPA Office of Research and Development, July 1999.

Navy Installation Restoration Laboratory Quality Assurance Guide, Interim Guidance Document, Naval Facilities Engineering Service Center, February 1996.

Navy Installation Restoration Chemical Data Quality Manual, Navy IR CDQM, September 1999.

Quality Systems Manual for Environmental Laboratories, Department of Defense, Version 1, October 2000.

Shell for Analytical Chemistry Requirements, US Army Corps of Engineers, December 1998.

## 3. *Terms and Definitions*

**Accuracy:** the degree of agreement between a measurement and true or expected value, or between the average of a number of measurements and the true or expected value.

**Audit:** a systematic evaluation to determine the conformance to specifications of an operational function or activity.

**Batch:** environmental samples, which are prepared and/or analyzed together with the same process, using the same lot(s) of reagents. A preparation batch is composed of one to 20 environmental samples of a similar matrix, meeting the above mentioned criteria. Where no preparation method exists (example, volatile organics, water) the batch is defined as environmental samples that are analyzed together with the same process and personnel, using the same lots of reagents, not to exceed 20 environmental samples. An analytical batch is composed of prepared environmental samples, extracts, digestates or concentrates that are analyzed together as a group. An analytical batch can include prepared samples originating from various environmental matrices and can exceed 20 samples.

**Chain of Custody (COC):** A system of documentation demonstrating the physical possession and traceability of samples.

**Clean Air Act:** legislation in 42 U.S.C. 7401 et seq., Public Law 91-604, 84 Stat. 1676 Pub. L. 95-95, 91 Stat., 685 and Pub. L. 95-190, 91 Stat., 1399, as amended.

**Comprehensive Environmental Response, Compensation and Liability Act** (CERCLA/Superfund): legislation (42 U.S.C. 9601-9675 et seq., as amended by the Superfund Amendments and reauthorization Act of 1986 (SARA), 42 U.S.C. 9601et seq.

**Compromised Sample:** a sample received in a condition that jeopardizes the integrity of the results. See Section 4.7.1 for a description of these conditions.

**Confidential Business Information (CBI):** information that an organization designates as having the potential of providing a competitor with inappropriate insight into its management, operation or products.

**Confirmation:** verification of the presence of a component using an additional analytical technique. These may include second column confirmation, alternate wavelength, derivatization, mass spectral interpretation, alternative detectors, or additional cleanup procedures.

**Corrective Action:** action taken to eliminate the causes of an existing non-conformance, defect or other undesirable situation in order to prevent recurrence.

**Data Audit:** a qualitative and quantitative evaluation of the documentation and procedures associated with environmental measurements to verify that the resulting data are of acceptable quality.

**Demonstration of Capability (DOC):** procedure to establish the ability to generate acceptable accuracy and precision.

**Equipment Blank:** a portion of the final rinse water used after decontamination of field equipment; also referred to as Rinsate Blank and Equipment Rinsate.

**Document Control:** the act of ensuring that documents (electronic or hardcopy and revisions thereto) are proposed, reviewed for accuracy, approved for release by authorized personnel, distributed properly and controlled to ensure use of the correct version at the location where the prescribed activity is performed.

**Federal Insecticide, Fungicide and Rodenticide Act (FIFRA):** legislation under 7 U.S.C. 135 et seq., as amended.

**Federal Water Pollution Control Act (Clean Water Act, CWA):** legislation under 33 U.S.C. 1251 et seq., Public Law 92-50086 Stat. 816.

**Field Blank:** a blank matrix brought to the field and exposed to field environmental conditions.

**Field of Testing (FOT):** a field of testing is based on NELAC's categorization of accreditation based on program, matrix, analyte.

**Good Laboratory Practices (GLP):** formal regulations for performing basic laboratory operations outlined in 40 CFR Part 160 and 40 CFR Part 729 and required for activities performed under FIFRA and TSCA.

**Holding Time:** the maximum time that a sample may be held before preparation and/or analysis as promulgated by regulation or as specified in a test method.

**Instrument Blank:** a blank matrix that is the same as the processed sample matrix (i.e. extract, digestate, condensate) and introduced onto the instrument for analysis.

**Internal Chain of Custody:** an unbroken trail of accountability that ensures the physical security of samples, data and records. Internal Chain of Custody refers to additional documentation procedures implemented within the laboratory that includes special sample storage requirements, and documentation of all signatures and/or initials, dates, and times of personnel handling specific samples or sample aliquots.

**Instrument Detection Limit (IDL):** the minimum amount of a substance that can be measured with a specified degree of confidence that the amount is greater than zero using a specific instrument. The IDL is associated with the instrumental portion of a specific method only, and sample preparation steps are not considered in its derivation. The IDL is a statistical estimation at a specified confidence interval of the concentration at which the relative uncertainty is $\pm$100%. The IDL represents a range where qualitative detection occurs on a specific instrument. Quantitative results are not produced in this range.

**Laboratory Control Sample (LCS):** a blank matrix spiked with a known amount of analyte(s), processed simultaneously with, and under the same conditions as, samples through all steps of the analytical procedure.

**Laboratory Quality Manual (LQM):** a document stating the quality policy, quality system and quality practices of the laboratory. The LQM may include by reference other documentation relating to the laboratory's quality system.

**Limit of Detection (LOD):** the minimum amount of a substance that an analytical process can reliably detect.

**Matrix:** the substrate of a test sample. Common matrix descriptions are defined in Table 3.

**Matrix Duplicate (MD):** duplicate aliquot of a sample processed and analyzed independently; under the same laboratory conditions; also referred to as Sample Duplicate; Laboratory Duplicate.

**Matrix Spike (MS):** field sample to which a known amount of target analyte(s) is added.

**Matrix Spike Duplicate (MSD):** a replicate matrix spike.

**Table 3 Matrix Descriptions**

| Matrix | Description |
|---|---|
| Air | Air samples as analyzed directly or as adsorbed into a solution or absorption matrix and desorbed. |
| Aqueous | Aqueous sample excluded from the definition of Drinking Water or Saline/Estuarine source. Includes surface water, groundwater and effluents. |
| Drinking Water | Aqueous sample that has been designated a potable water source. |
| Saline | Aqueous sample from an ocean or estuary, or other salt-water source such as the Great Salt Lake. |
| Liquid | Liquid with <15% settleable solids. |
| Solid | Soil, sediment, sludge or other matrices with ≥15% settleable solids. |
| Waste | A product or by-product of an industrial process that results in a matrix not previously defined. |
| Tissue | Sample of a biological origin such as fish tissue, shellfish, or plant material. Such samples shall be grouped according to origin. |

**Method Blank:** a blank matrix processed simultaneously with, and under the same conditions as, samples through all steps of the analytical procedure.

**Method Detection Limit (MDL):** the minimum amount of a substance that can be measured with a specified degree of confidence that the amount is greater than zero using a specific measurement system. The MDL is a statistical estimation at a specified confidence interval of the concentration at which the relative uncertainty is ±100%. The MDL represents a range where qualitative detection occurs using a specific method. Quantitative results are not produced in this range.

**Non-conformance:** an indication, judgement, or state of not having met the requirements of the relevant specifications, contract, or regulation.

**Precision:** an estimate of variability. It is an estimate of agreement among individual measurements of the same physical or chemical property, under prescribed similar conditions.

**Preservation:** refrigeration and/or reagents added at the time of sample collection to maintain the chemical, physical and/or biological integrity of the sample.

**Proficiency Testing:** determination of the laboratory calibration or testing performance by means of inter-laboratory comparisons.

**Proficiency Test (PT) Sample:** a sample, the composition of which is unknown to the analyst, that is provided to test whether the analyst/laboratory can produce analytical results within specified performance limits. Also referred to as Performance Evaluation (PE) Sample.

**Proprietary:** belonging to a private person or company.

**Quality Assurance (QA):** an integrated system of activities involving planning, quality control, quality assessment, reporting and quality improvement to ensure that a product or service meets defined standards of quality with a stated level of confidence.

**Quality Assurance Project Plan (QAPP):** a formal document describing the detailed quality control procedures by which the quality requirements defined for the data and decisions pertaining to a specific project are to be achieved.

**Quality Control (QC):** the overall system of technical activities, the purpose of which is to measure and control the quality of a product or service.

**Quality Control Sample:** a control sample, generated at the laboratory or in the field, or obtained from an independent source, used to monitor a specific element in the sampling and/or testing process.

**Quality Management Plan (QMP):** a formal document describing the management policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan of an agency, organization or laboratory to ensure the quality of its product and the utility of the product to its users.

**Quality System:** a structured and documented management system describing the policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan of an organization for ensuring quality in its work processes, products (items), and services. The quality system provides the framework for planning, implementing, and assessing work performed by the organization and for carrying out required QA/QC.

**Quantitation Limit (QL):** the minimum amount of a substance that can be quantitatively measured with a specified degree of confidence and within the accuracy and precision guidelines of a specific measurement system. The QL can be based on the MDL, and is generally calculated as 3-5 times the MDL, however, there are analytical techniques and methods where this relationship is not applicable. Also referred to as Practical Quantitation Level (PQL), Estimated Quantitation Level (EQL), Limit of Quantitation (LOQ).

**Raw Data:** any original information from a measurement activity or study recorded in laboratory notebooks, worksheets, records, memoranda, notes, or exact copies thereof and that are necessary for the reconstruction and evaluation of the report of the activity or study. Raw data may include photography, microfilm or microfiche copies, computer printouts, magnetic/optical media, including dictated observations, and recorded data from automated instruments. Reports specifying inclusion of "raw data" do not need all of the above included, but sufficient information to create the reported data.

**Record Retention:** the systematic collection, indexing and storing of documented information under secure conditions.

**Reference Standard:** a standard, generally of the highest metrological quality available at a given location, from which measurements made at that location are derived.

**Reporting Limit (RL):** The level to which data is reported for a specific test method and/or sample. The RL is generally related to the QL. The RL must be minimally at or above the MDL.

**Resource Conservation and Recovery Act (RCRA):** legislation under 42 USC 321 et seq. (1976).

**Safe Drinking Water Act (SDWA):** legislation under 42 USC 300f et seq. (1974), (Public Law 93-523).

**Sampling and Analysis Plan (SAP):** a formal document describing the detailed sampling and analysis procedures for a specific project.

**Selectivity:** the capability of a measurement system to respond to a target substance or constituent.

**Sensitivity:** the difference in the amount or concentration of a substance that corresponds to the smallest difference in a response in a measurement system using a certain probability level.

**Spike:** a known amount of an analyte added to a blank, sample or sub-sample.

**Standard Operating Procedure (SOP):** a written document which details the method of an operation, analysis or action whose techniques and procedures are thoroughly prescribed and which is accepted as the method for performing certain routine or repetitive tasks.

**Storage Blank:** a blank matrix stored with field samples of a similar matrix.

**Systems Audit:** a thorough, systematic, on-site, qualitative review of the facilities, equipment, personnel, training, procedures, record keeping, data validation, data management, and reporting aspects of a total measurement system.

**Test Method:** defined technical procedure for performing a test.

**Toxic Substances Control Act (TSCA):** legislation under 15 USC 2601 et seq., (1976).

**Traceability:** the property of a result of a measurement that can be related to appropriate international or national standards through an unbroken chain of comparisons.

**Trip Blank**: a blank matrix placed in a sealed container at the laboratory that is shipped, held unopened in the field, and returned to the laboratory in the shipping container with the field samples.

**Verification:** confirmation by examination and provision of evidence against specified requirements.

# 4. *Management Requirements*

## 4.1. Organization and Management

### 4.1.1. Organization

STL's organizational structure is presented in Figure 1. Corporate employees are located at various STL facilities as outlined in the organizational structure. A QA Manager shall be designated at each STL facility.

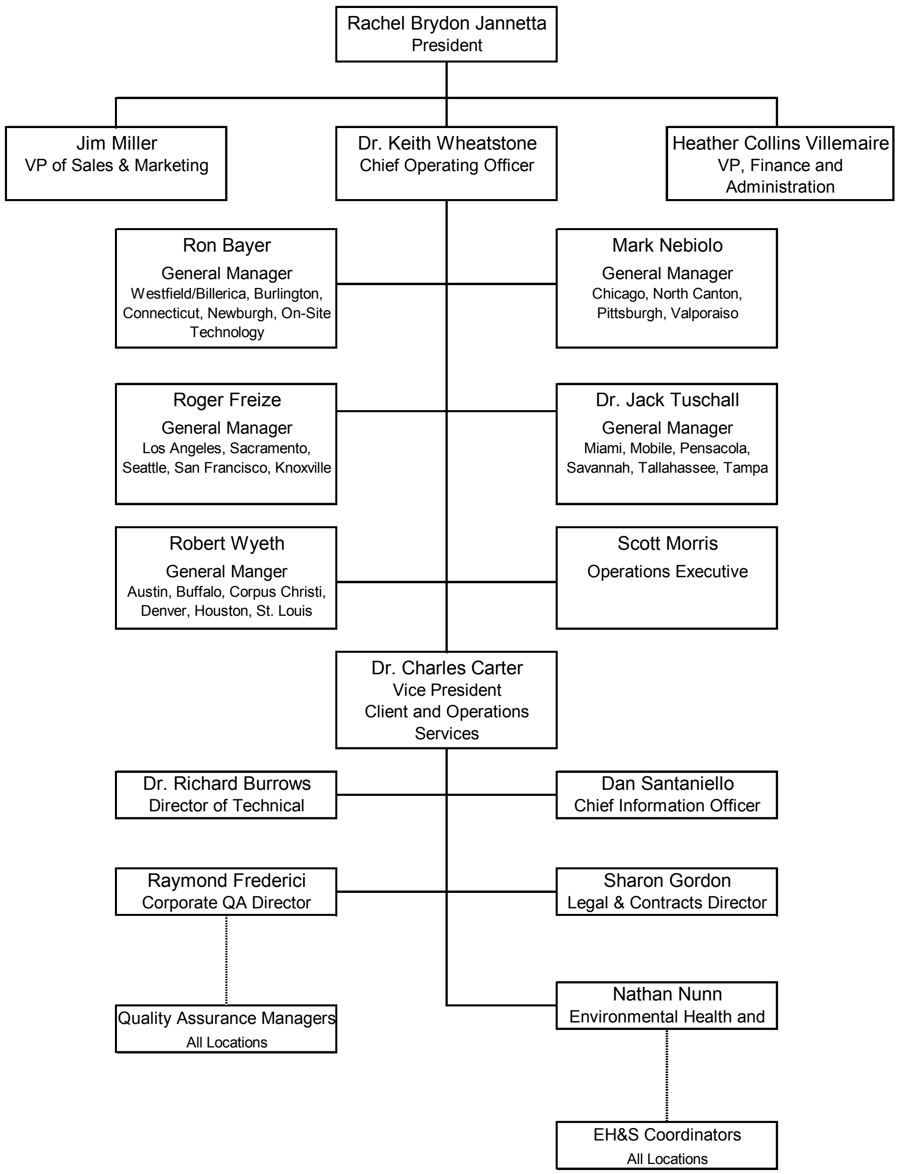
### 4.1.2. Roles and Responsibilities

**President**
The President of STL, Inc. has overall management responsibility and authority for Severn Trent's laboratory division, including responsibility for budgeting, resource allocation, long term planning, sales, marketing, and final approval on all management and administrative policies and management plans. The President authorizes the QMP and as such, sets the standards for the quality system.

**Chief Operating Officer (COO)**
The COO is responsible for daily management of all STL facilities. The COO's responsibilities include allocation of personnel and resources, long term planning, and development of technical policies and management plans. The COO authorizes the QMP and is responsible for ensuring that business and technical operations are conducted in accordance with its requirements.

**Vice President Client and Operations Services (VP COS)**
The VP of Operations Services is responsible for all essential elements of offerings to clients, including risk management, legal compliance and contract administration, quality assurance, information technology, and environmental health and safety. The VP COS authorizes the QMP and responsibilities include authorization of Manuals, Policies and Procedures, providing support and direction to the Managers of these areas, and supporting the COO in decisions regarding long term planning, resource allocation, and capital expenditures

## Figure 1 STL Organizational Chart



**QA Director**
The QA Director is responsible for establishing, implementing and communicating STL's quality system. The QA Director monitors compliance with the QMP, provides regulatory and technical updates to the STL facilities, assists in development of management plans and technical policies to be approved by the COO, and coordinates training within STL. The QA Director is available to any employee in STL to resolve data quality or ethical issues. The QA Director is independent of operational functions.

**Director of Technical Services**
The Director of Technical Services is responsible for establishing, implementing and communicating STL's Technical Policies, Standard Operating Procedures, and Manuals. Other responsibilities include conducting technical assessments as required, acting as a technical resource in national contracts review, coordinating new technologies, establishing best practices throughout STL, advising STL staff on technology advances, innovations, and applications, and organizing and running STL's technical committee.

**Chief Information Officer (CIO)**
The CIO is responsible for establishing, implementing and communicating STL's IT Policies, Standard Operating Procedures, and Manuals. Other responsibilities include coordinating new technologies, development of electronic communication tools such as STL's intranet and internet sites, ensuring data security and documentation of software, ensuring compliance with Good Automated Laboratory Practices (GALP), and assistance in establishing, updating, and maintaining Laboratory Information Management Systems (LIMS) at the various STL facilities.

**Environmental Health and Safety (EH&S) Director**
The EH&S Director is responsible for establishing, implementing and communicating STL's Environmental Health and Safety Policies, Standard Operating Procedures, and Manuals. Other responsibilities include conducting EH&S assessments as required, acting as a resource for all STL facilities to ensure EH&S compliance, coordinating safety committees, providing guidance to the EH&S Coordinator at various STL facilities, and advising STL facilities on new EH&S regulations.

**General Manager (GM)**
The GM is directly responsible for the daily operations of one or more operating facilities within STL. The GM's responsibilities include allocation of personnel and resources, long term planning, setting goals, and achieving the financial, business, and quality objectives of STL. The GM ensures timely compliance with corporate management directives, policies, and management systems reviews.

**Laboratory Director**
The Laboratory Director oversees the daily operations of the laboratory. The Laboratory Director's responsibilities include supervision of staff, setting goals and objectives for both the business and the employees, and achieving the financial, business, technical and quality objectives of the facility. The Laboratory Director ensures timely compliance with audits and corrective actions, and is responsible for maintaining a working environment which encourages open, constructive problem solving and continuous improvement.

**QA Manager**
The QA Manager is responsible for ensuring that the laboratory's quality system and LQM meet the requirements set forth in the QMP, providing quality systems training to all new personnel, maintaining a Laboratory Quality Manual (LQM), and performing or overseeing systems, data, special, and external audits. The QA Manager performs, or supervises, the maintenance of QA records, the maintenance of certifications and accreditations, the submission of monthly QA Reports, and assists in reviewing new work as needed. The QA Manager shall have the final authority to accept or reject data, and to stop work in progress in the event that procedures or practices compromise the validity and integrity of analytical data. The QA Manager is available to any employee at the facility to resolve data quality or ethical issues. The QA Manager shall be independent of laboratory operations. The facility QA Manager has an indirect reporting relationship to the QA Director. Each LQM has further descriptions of roles and responsibilities at the facility level.

**Technical Director**
The Technical Director(s) of a laboratory has overall responsibility for a defined portion of the technical operations of the laboratory, and may or may not be the Laboratory Director. The Technical Director solves day to day technical issues, provides technical training and guidance to staff, project managers, and clients, investigates technical issues identified by QA, and directs evaluation of new methods.

## 4.2. Quality System

### 4.2.1. Objectives of STL Quality System

The goal of the STL quality system is to ensure that business and technical operations are conducted with the highest standards of professionalism in the industry.

To achieve this goal, it is necessary to provide STL clients with not only scientifically sound, well documented, and regulatory compliant data, but also to ensure that STL provides the highest quality service available in the industry. A well-structured and well-communicated quality system is essential in meeting this goal. STL's quality system is designed to minimize systematic error, encourage constructive, documented problem solving, and provide a framework for continuous improvement within the organization.

The QMP is the basis for STL's quality system and contains requirements and general guidelines under which all STL facilities shall conduct their operations. A table listing the minimum quality system policies and procedures is appended to this QMP. The table includes a citation to the applicable QMP section where a procedure or policy is discussed. It also includes a column indicating the document "Reference".

4.2.2. Laboratory Quality Manual (LQM)

Each STL facility shall have an LQM that further describes the specific QA program at the laboratory.

Each STL facility's LQM shall address:

1. Table of Contents, lists of references and glossaries, and appendices.
2. Quality policy statement, including objectives and commitments, by facility management.
3. Organization and management structure of the laboratory, its place in the STL organization and relevant organizational charts.
4. Relationship between management, technical operations, support services and the quality system.
5. Record retention procedure.
6. Document control procedure.
7. Job descriptions of essential staff and reference to job descriptions of other staff.
8. Identification of the laboratory's approved signatories.
9. Procedure for achieving traceability of measurements.
10. List of test methods under which the laboratory performs its testing.
11. Procedure for reviewing new work.
12. Reference to the calibration and/or verification test procedures used.
13. Sample handling procedure.
14. Reference to the major equipment, reference standards, facilities and services used by the laboratory in conducting tests.
15. Reference to procedures for calibration, verification and maintenance of equipment.

16. Reference to verification practices including inter-laboratory comparisons, proficiency testing programs, use of reference materials and internal QC practices.
17. Procedures for feedback and corrective action when testing discrepancies are detected, or departures from policies and procedures occur.
18. Procedure for exceptionally permitting departures from documented policies and procedures or from standard specifications.
19. Procedure for handling client complaints.
20. Procedure for protecting client confidentiality and proprietary rights.
21. Procedure for audits and data review.
22. Procedure for establishing that personnel are adequately experienced and trained.
23. Reference to procedures for reporting analytical results.

## 4.3. Document Control

### 4.3.1. Document Type

The following documents, at a minimum, must be controlled at each STL Facility:

- Laboratory Quality Manual
- Standard Operating Procedures (SOP)
- Quality Management Plan

### 4.3.2. Document Control Procedure

Security and control of documents are necessary to ensure that confidential information is not distributed and that all current copies of a given document are from the latest applicable revision. Unambiguous identification of a controlled document is maintained by identification of the following items in the document header: Document Name, Document Number, Revision Number, Effective Date, Number of Pages. Controlled documents are authorized by Management and/or the QA Department. Controlled documents are marked as such and records of their distribution are kept by the QA Department. Document control maybe achieved by either electronic or hardcopy distribution.

Controlled documents shall be available at all locations where the operational activity described in the document is performed.

### 4.3.3. Document Revision

Quality system policies and procedures will be reviewed at a minimum of every two years and revised as appropriate. Changes to documents occur when a procedural change warrants a revision of the document. When an approved revision of a controlled document is ready for distribution, obsolete copies of the document shall be replaced with the current version of the document. The previous revision of the controlled document must be archived by the QA Department.

#### 4.3.4. Official Documents

The STL Corporate Operations staff issues Corporate Manuals, Standard Operating Procedures, and Policies. These are collectively termed "Official Documents" and encompass the Policies and Procedures that all STL facilities are required to employ. A detailed description of the procedure for issuing, authorizing, controlling, distributing, and archiving Official Documents is found in Corporate SOP S-Q-001.

### 4.4. Request, Tender, and Contract Review

#### 4.4.1. Contract Review

For many environmental sampling and analysis programs, testing design is site or program specific and does not necessarily "fit" into a standard laboratory service or product. It is STL's intent to provide both standard and customized environmental testing services to our clients. To ensure project success, technical staff shall perform a thorough review of technical and QC requirements contained in contracts. Contracts are reviewed for adequately defined requirements and STL's capability to meet those requirements.

Contract review shall include a review of the client's requirements in terms of compound lists, test methodology requested, sensitivity, accuracy, and precision requirements. The STL representative ensures that the laboratory's test methods are suitable to achieve these requirements and must ensure that the laboratory holds the appropriate certifications and approvals to perform the work. The review also includes the laboratory's capabilities in terms of turnaround time, capacity, and resources to provide the services requested, as well the laboratory's ability to provide the documentation, whether hardcopy or electronic. If the laboratory cannot provide all services but intends to subcontract such services, whether to another STL facility or to an outside firm, this must be documented and discussed with the client prior to contract approval.

All contracts entered into by STL shall be reviewed and approved by the appropriate personnel at the facility or facilities performing the work. Any contract requirement or amendment to a contract communicated to STL verbally must be documented and confirmed with the client in writing. Any discrepancy between the client's requirements and STL's capability to meet those requirements is resolved in writing before acceptance of the contract. Contract amendments, initiated by the client and/or STL, are documented in writing for the benefit of both the client and STL.

All contracts, Quality Assurance Project Plans (QAPPs), Sampling and Analysis Plans (SAPs), contract amendments, and documented communications become part of the permanent project record as defined in Section 4.12.1.

### 4.4.2. Project Specific Quality Planning

Communication of contract specific technical and QC criteria is an essential activity in ensuring the success of site specific testing programs. To achieve this goal, STL assigns a Project Manager (PM) to each client. The PM is the first point of contact for the client. It is the PM's responsibility to ensure that project specific technical and QC requirements are effectively communicated to the laboratory personnel before and during the project.

Each STL facility shall have established project planning procedures in order to ensure that communication is inclusive and effective. These include project memos, designation and meetings of project teams, and meetings between the laboratory staff and the client. STL has found it very effective to invite the client into this process. STL strongly encourages our clients to visit the laboratories and hold formal or informal sessions with employees in order to effectively communicate ongoing client needs as well as project specific details for customized testing programs.

### 4.4.3. Data Quality Objectives

Data Quality Objectives (DQO) are qualitative and quantitative statements used to ensure the generation of the type, quantity, and quality of environmental data that will be appropriate for the intended application. Typically, DQOs are identified before project initiation, during the development of QAPPs and SAPs. The analytical DQOs addressed in this section are precision, accuracy, representativeness, completeness, and comparability.

The components of analytical variability (uncertainty) can be estimated when QC samples of the right types and at the appropriate frequency are incorporated into measurement process at the analytical laboratory. STL incorporates numerous QC samples to obtain data for comparison with the analytical DQOs and to ensure that the measurement system is functioning properly. The QC samples and their applications, described in Section 5.8.2, are selected based on regulatory, method- or client-specific requirements. Analytical laboratory QC samples for inorganic,

organic, and radionuclide analyses may include calibration blanks, instrument blanks, method blanks, LCS, calibration standards, MS, MSD, surrogate spikes, and yield monitors.

The DQOs discussed below ensure that data are gathered and presented in accordance with procedures appropriate for its intended use, that the data is of known and documented quality, and are able to withstand scientific and legal scrutiny.

Precision is an estimate of variability. It is an estimate of agreement among individual measurements of the same physical or chemical property, under prescribed similar conditions. Precision is expressed either as Relative Standard Deviation (RSD) for greater than two measurements or as Relative Percent Difference (RPD) for two measurements. Precision is determined, in part, by analyzing data from aggregate LCS results, MS, MSD, and MD. For radiochemical determinations, counting statistics can also provide an estimate of uncertainty.

Precision also refers to the measurement of the variability associated with the entire process, from sampling to analysis. Total precision of the process can be determined by analysis of duplicate or replicate field samples and measures variability introduced by both the laboratory and field operations.

Accuracy is the degree of agreement between a measurement and the true or expected value, or between the average of a number of measurements and the true or expected value. It reflects the total error associated with a measurement.

Both random and systematic errors can affect accuracy. For chemical properties, accuracy is expressed either as a percent recovery (R) or as a percent bias (R - 100). Accuracy is determined, in part, by analyzing data from LCS, MS, and MSD. For radiochemical determinations, counting statistics can also provide an estimate of uncertainty.

Representativeness is the degree to which data accurately and precisely represent a characteristic of a population, a variation in a physical or chemical property at a sampling point, or an environmental condition. Data representativeness is primarily a function of sampling strategy; therefore, the sampling scheme must be designed to maximize representativeness. Representativeness also relates to ensuring that, through sample homogeneity, the sample analysis result is representative of the constituent concentration in the sample matrix. STL makes every effort to analyze an aliquot that is representative of the original sample, and to ensure the homogeneity of the sample before sub-sampling.

Completeness is defined as the percentage of measurements that are judged valid or useable. Factors negatively affecting completeness include the following: sample leakage or breakage in transit or during handling, loss of sample during laboratory analysis through accident or improper handling, improper documentation such that traceability is compromised, or sample result is rejected due to failure to conform to QC specifications. A completeness objective of greater than 90% of the data specified by the statement of work is the goal established for most projects.

Comparability is a measure of the confidence with which one data set can be compared to another. To ensure comparability, all laboratory analysts are required to use uniform procedures (e.g., SOPs) and a uniform set of units and calculations for analyzing and reporting environmental data.

### 4.5. Subcontracting

Subcontracting must be arranged with the documented consent of the client, in a timely response which shall not be unreasonably refused. All QC guidelines specific to the client's analytical program are transmitted to the subcontractor and agreed upon before sending the samples to the subcontract facility. The originating laboratory shall obtain proof of certification from the subcontract facility, and retain in STL records. Where applicable, specific QC guidelines, QAPPs, and/or SAPs are transmitted to the subcontract laboratory. Samples are subcontracted under formal Chain of Custody (COC).

Subcontract laboratories may receive an on-site audit by a representative of STL's QA staff if it is deemed appropriate by the QA Manager. The audit involves a measure of compliance with the required test method, QC requirements, as well as any special client requirements. The originating laboratory may also perform a paper audit of the subcontractor, which would entail reviewing the LQM, the last two PT studies, and a copy of any recent regulatory audits with the laboratory's responses.

Intra-company subcontracting may also occur between STL facilities. Intra-company subcontracting within STL must be arranged with the documented consent of the client, in a timely response which shall not be unreasonably refused. The originating laboratory is responsible for communicating all technical, quality, and deliverable requirements as well as other contract needs.

Project reports from both STL and external subcontractors are discussed in Section 5.9.4.

### 4.6. Purchasing Services and Supplies

Evaluation and selection of suppliers and vendors is done, in part, on the basis of the quality of their products, their ability to meet the demand for their products on a continuous and short term basis, the overall quality of their services, their past history, and competitive pricing. This is achieved through evaluation of objective evidence of quality furnished by the supplier, which can include certificates of analysis, recommendations, and proof of historical compliance with similar programs for other clients. To ensure that quality critical consumables and equipment conform to specified requirements, all purchases from specific vendors are approved by a member of the supervisory or management staff.

Chemical reagents, solvents, glassware, and general supplies are ordered as needed to maintain sufficient quantities on hand. Purchasing guidelines for equipment and reagents meet with the requirements of the specific method and testing procedures for which they are being purchased. Solvents and acids are pre-tested in accordance with the Testing Solvents and Acids procedure S-T-001.

## 4.7. Service to the Client

### 4.7.1. Sample Acceptance Policy

Each STL facility shall maintain a sample acceptance policy that describes compromised sample receipt. Samples shall be considered "compromised" if the following conditions are observed upon sample receipt:

- Cooler and/or samples are received outside of temperature specification.
- Samples are received broken or leaking.
- Samples are received beyond holding time.
- Samples are received without appropriate preservative.
- Samples are received in inappropriate containers.
- COC does not match samples received.
- COC is not properly completed or not received.
- Breakage of any Custody Seal.
- Apparent tampering with cooler and/or samples.
- Headspace in volatiles samples.
- Seepage of extraneous water or materials into samples.
- Inadequate sample volume.
- Illegible, impermanent, or non-unique sample labeling.

When "compromised" samples are received, it must be documented in the project records and the client must be contacted for instructions. If the client decides to proceed with analysis, the project report shall clearly indicate any of the above conditions and the resolution.

### 4.7.2. Client Confidentiality and Proprietary Rights

Data and sample materials provided by the client or at the client's request, and the results obtained by STL, shall be held in confidence (unless such information is generally available to the public or is in the public domain or client has failed to pay STL for all services rendered or is otherwise in breach of the terms and conditions set forth in the STL and client contract) subject to any disclosure required by law or legal process. STL's reports, and the data and information provided therein, are for the exclusive use and benefit of client, and are not released to a third party without written consent from the client.

## 4.8. Complaints

Client complaints shall be documented, communicated to management, and addressed promptly and thoroughly. Client complaints are documented by the employee receiving the complaint. The documentation can take the form of a corrective action report (as described in Section 4.10) or in a format specifically designed for that purpose. The Laboratory Director, PM, Customer Service Manager, and QA Manager are informed of all client complaints, and assist in resolving the complaint.

The nature of the complaint is identified, documented, and investigated, and an appropriate action is determined and taken. In cases where a client complaint indicates that an established policy or procedure was not followed, the QA department is required to conduct a special audit to assist in resolving the issue. A written confirmation, or letter to the client, outlining the issue and response taken is strongly recommended as part of the overall action taken.

The number and nature of client complaints shall be reported to the QA Director in the QA Monthly report submitted by each facility. The overall number of complaints received per facility is tracked and the appropriateness of the response to client complaints is assessed. Monitoring and addressing the overall level and nature of client complaints and the effectiveness of the solutions is part of the Management Systems Review.

## 4.9. Control of Non-conformances

Each STL facility shall have a procedure to control and document non-conformances. Non-conformances include any out of control occurrence. Non-conformances may relate to client specific requirements, procedural requirements, or equipment issues. All non-conformances in the laboratory are documented at the time of their occurrence.

All non-conformances that affect a sample and/or sample data become part of the affected project's permanent record. When appropriate, reanalysis is performed where QC data falls outside of specifications, or where data appears anomalous. If the reanalysis comes back within established tolerances, the results are approved. If the reanalysis is still outside tolerances, further reanalysis or consultation with the Supervisor, Manager, PM, Laboratory Director, or QA Manager for direction may be required. All records of reanalysis are kept with the project files.

Where non-conformances specifically affect a client's sample and/or data, the client shall be informed and action must be taken. Action can take the form of reporting and flagging the data, and including a description of the non-conformance in the project narrative or cover letter.

## 4.10. Corrective Action

### 4.10.1. General

Each STL facility shall maintain an established, documented corrective action process. Each corrective action is thoroughly investigated, and the investigation, outcome of the investigation, action taken, and follow-up is documented. Corrective action reports are reviewed, approved, and maintained by the QA department.

### 4.10.2. Initiation

Any employee in STL shall be authorized to initiate a corrective action. The initial source of corrective action can also be external to STL (i.e. corrective action because of client complaint, regulatory audit, or proficiency test). When a problem that requires corrective action is identified, the following items are identified by the initiator on the corrective action report: the nature of the problem, the name of the initiator, and the date. If the problem effects a specific client project, the name of the client and laboratory project number is recorded, and the PM is informed immediately.

### 4.10.3. Cause Analysis

The corrective action process must be embarked upon as a joint, problem solving, constructive effort. Identification of systematic errors, or errors that are likely to occur repetitively due to a defect or weakness in a system, is particularly valuable in maintaining an environment of continuous improvement in laboratory operations.

When a corrective action report is initiated, the initiator works with the affected employee(s) and/or department(s) to identify the root cause of the problem. An essential part of the corrective action process is to identify whether the problem occurred due to a systematic or isolated error.

If the initiator of the corrective action report is uncertain as to what would constitute appropriate corrective action or is unable to resolve the situation, the problem is identified to the Supervisor, Manager, Laboratory Director or the QA Manager who provides assistance in the corrective action process.

The root cause of the problem and associated cause analysis is documented on the corrective action form.

4.10.4. Corrective Action

Once the root cause of a problem is identified, the initiator and affected employee(s) and/or department(s) examine potential actions that will rectify the present problem to the extent possible, and prevent recurrence of future, similar occurrences. An appropriate corrective action is then recommended. The corrective action must be appropriate for the size and nature of the issue.

If the corrective action concerns a specific project related issue, the PM or Customer Service Manager approves the corrective action before its implementation.

Implementation of the corrective action and the date of implementation are documented on the corrective action report.

If a corrective action is related to a specific project report, it is included in the project file. An essential part of the corrective action process is communication and awareness of the problem, the cause, and the action taken to prevent future occurrences and/or rectify the immediate problem.

4.10.5. Monitoring Corrective Action

All corrective action reports are maintained by the QA Department. The QA department reviews all corrective actions and selects one or more of the more significant corrective actions for inclusion in the annual systems audit. The QA Department also may implement a special audit. The purpose of inclusion of the corrective action process in both routine and special audits is to monitor the implementation of the corrective action and to determine whether the action taken has been effective in overcoming the issue identified.

## 4.11. Preventative Action

Each STL facility shall maintain an established, documented preventative action process. Preventative action is defined as noting and correcting a problem before it happens, because of a weakness in a system, method, or procedure. Preventative action includes analysis of the quality system to detect, analyze, and eliminate potential causes of non-conformances. When potential problems are identified, preventative action is initiated to effectively address the problem to eliminate or reduce the risk identified

## 4.12. Records

### 4.12.1. Record Types

Record types are described in Table 4.

**Table 4 STL Record Types**

| Raw Data | Controlled Documents | QC Records | Project Records | Administrative Records |
|---|---|---|---|---|
| See Section 3. Terms and Definitions | LQM | Audits/ Responses | COC Documentation | Accounting |
| | QMP | Certifications | Contracts and Amendments | EH&S Manual, Permits, Disposal Records |
| | SOPs | Corrective Action | Correspondence | Employee Handbook |
| | | Logbooks* | QAPP | Personnel files, Employee Signature & Initials, Training Records |
| | | Method & Software Validation, Verification data | SAP | |
| | | Standards Certificates | Telephone Logbooks | Technical and Administrative Policies |

*Examples of Logbook types: Maintenance, Instrument Run, Preparation (standard and samples), Standard and Reagent Receipt, Archiving, Balance Calibration, Temperature.

### 4.12.2. Record Retention

Table 5 outlines STL's standard record retention time. For raw data and project records, record retention shall be calculated from the date the project report is issued. For other records, such as Controlled Documents, QC, or Administrative Records, the retention time is calculated from the date the record is formally retired. Records related to the programs listed in Table 6 have lengthier retention requirements and are subject to the requirements in Section 4.12.3.

**Table 5 STL Record Retention**

| Record Type | | Archival Requirement |
|---|---|---|
| Raw Data | All* | 5 Years from project completion |
| Controlled Documents | All* | 5 Years from document retirement date |
| QC | All* | 5 Years from archival |
| Project | All* | 5 Years from project completion |
| Administrative | Personnel/Training | 7 years |
| | Accounting | See Accounting and Control Procedures Manual |

* Exceptions listed in Table 6.

**Table 6 Special Record Retention Requirements**

| Program | Retention Requirement |
|---|---|
| Colorado – Drinking Water | 10 years |
| Commonwealth of MA – All environmental data 310 CMR 42.14 | 10 years |
| FIFRA – 40 CFR Part 160 | Retain for life of research or marketing permit for pesticides regulated by EPA |
| Housing and Urban Development (HUD) Environmental Lead Testing | 10 years |
| Louisiana – All | 10 years |
| Michigan Department of Environmental Quality – all environmental data | 10 years |
| Minnesota – Drinking Water | 10 years |
| Navy Facilities Engineering Service Center (NFESC) | 10 years |
| NY Potable Water NYCRR Part 55-2 | 10 years |
| OSHA - 29 CFR Part 1910 | 30 years |
| Pennsylvania – Drinking Water | 10 years |
| TSCA - 40 CFR Part 792 | 10 years after publication of final test rule or negotiated test agreement |

4.12.3. Programs with Longer Retention Requirements

Some regulatory programs have longer record retention requirements than the STL standard record retention time. These are detailed in Table 6 with their retention requirements. In these cases, the longer retention requirement must be implemented and noted in the archive. If special instructions exist such that client data cannot be destroyed prior to notification of the client, the container or box containing that data is marked as to who to contact for authorization prior to destroying the data.

#### 4.12.4. Archives and Record Transfer

Archives must be indexed such that records are accessible on either a project or temporal basis. Archives are protected against fire, theft, loss, deterioration, and vermin. Electronic records are protected from deterioration caused by magnetic fields and/or electronic deterioration. Access to archives is controlled and documented. On-site and/or off-site facilities may be used.

STL ensures that all records are maintained as required by the regulatory guidelines and per the QMP upon facility location change or ownership transfer. Upon STL facility location change, all archives are retained by STL in accordance with the QMP. Upon ownership transfer, record retention requirements shall be addressed in the ownership transfer agreement and the responsibility for maintaining archives is clearly established.

### 4.13. Internal Audits

#### 4.13.1. Audit Types and Frequency

A number of types of audits shall be performed at STL. Audit type and frequency are categorized in Table 7.

**Table 7 Audit Types and Frequency**

| Audit Type | Performed by | Frequency |
|---|---|---|
| Systems | QA Department or Designee | Annual |
| Data | QA Department | 5% of all projects or as agreed upon with Corporate QA Director |
| Special | QA Department or Designee | As Needed |

#### 4.13.2. Systems Audits

Facility systems audits are technical in nature and are conducted on an ongoing basis by the QA Manager or his/her designee at each facility. Systems audits cover all departments of the facility, both operational and support.

The audit report is issued by internal auditor within 30 calendar days of the audit. The audit report is addressed to the Laboratory Director, and copied to the

General Manager . If the internal audit is performed by someone other than the facility's QA Manager, the report must also be addressed to the QA Manager.

Written audit responses are required within 30 calendar days of audit report issue. The audit response follows the format of the audit report, and corrective actions and time frames for their implementation are included for each deficiency. The audit response is directed to all individuals copied on the audit report. Where a corrective action requires longer than 30 days to complete, the target date for the corrective action implementation is stated and evidence of the corrective action is submitted to the QA Department in the agreed upon time frame.

4.13.3. Data Audits

Data audits are focussed to assess the level of customer service, SOP compliance, regulatory compliance, accuracy and completeness of test results and reports, documentation, and adherence to established QC criteria, laboratory SOPs, technical policy, and project specific QC criteria.

A data auditing frequency target of 5% has been established. The QA Department provides feedback and/or corrections and revisions to project reports where necessary. Data audits must include spot-checking of manual integrations by QA personnel in order to determine that the manual integration is appropriate and documented according to Section 5.3.6.

Records of the data audits shall be kept, and the frequency of data audits shall be included in the monthly QA report. In performing data audits, it is essential that data be assessed in terms of differentiating between systematic and isolated errors. Upon noting anomalous data or occurrences in the data audits, the QA Department is responsible for seeking clarification from the appropriate personnel, ascertaining whether the error is systematic or an isolated error, and overseeing correction and/or revision of the project report if necessary. Errors found in client project reports are revised and the revision sent to the client. The QA Department is also responsible for assisting in the corrective action process where a data audit leads to identification of the need for permanent corrective action.

Where specific clients and regulatory programs require more frequent data auditing, the individual facility must meet the data auditing frequency for that program.

#### 4.13.4. Special Audits

Special audits are conducted on an as needed basis, generally as a follow up to specific issues such as client complaints, corrective actions, proficiency testing results, data audits, systems audits, validation comments, or regulatory audits. Special audits are focussed on a specific issue, and report format, distribution, and timeframes are designed to address the nature of the issue.

### 4.14. External Audits

STL facilities are routinely audited by clients and external regulatory authorities. STL is available for these audits and makes every effort to provide the auditors with the personnel, documentation, and assistance required by the auditors. STL recommends that the audits be scheduled with the QA Department so that all necessary personnel are available on the day of the audit.

### 4.15. Management Reviews

#### 4.15.1. QA Reports to Management

A monthly QA report shall be prepared by the QA Manager or their designee and forwarded to the Laboratory Director and the QA Director. The reports include statistical results that are used to assess the effectiveness of the quality system. At a minimum, the contents of the monthly report is shown in Figure 2.

A Corporate QA Monthly Report containing a compilation of the Facility QA reports statistics, information on progress of the Corporate QA program, and a narrative outlining significant occurrences and/or concerns shall be prepared by the QA Director and forwarded to the General Manager of Operational and Technical Services and the COO.

#### 4.15.2. Management Systems Review

Each STL facility shall perform a management systems review at least annually. The management systems review ensures that the laboratory's quality system is adequate to satisfy the laboratory's policies and practices, regulatory requirements, certification, accreditation, approval requirements, and client expectations. Management systems reviews are accomplished through monthly quality assurance reporting, goal setting and an annual LQM review.

**Figure 2 Monthly QA Report Format**

1. Audits
   Internal systems audits performed.
   External systems audits performed.
   Data audits performed (in percent).
2. Revised Reports/Client Complaints
   Revised reports in percent.
   Total number of client complaints, reason, and resolution.
3. Certifications/Parameters Changes
4. Proficiency Testing
   Score for each PT as a percent.
   Note repeat failures and/or significant problems.
5. Miscellaneous QA and Operational Issues
   Narrative outlining improvements, regulatory compliance issues, general concerns, and assistance required from Corporate QA.
6. SOP Status: Report the percentage of SOPs that have been revised or reviewed within the last 24 months

# 5. *Technical Requirements*

## 5.1. Personnel

### 5.1.1. General

STL management believes that its highly qualified and professional staff is the single most important aspect in assuring the highest level of data quality and service in the industry.

STL staff consists of over two thousand professionals and support personnel that include the following positions:

- General Manager
- Customer Service Manager
- Quality Assurance Manager
- Laboratory Director
- Technical Director
- Laboratory Manager
- Department Supervisor

- Information Technology Manager
- Human Resources Manager
- Project Manager
- Department Manager
- Analyst
- Sample Custodian
- Technician
- Quality Assurance Specialist
- Data Review Specialist
- Information Technology Specialist

5.1.2. Training

STL is committed to furthering the professional and technical development of employees at all levels. Minimum training requirements for STL employees are outlined in Table 8.

**Table 8 STL Employee Minimum Training Requirements**

| Required Training | Time Frame* | Employee Type |
|---|---|---|
| Environmental Health & Safety | Month 1 | All |
| Quality Assurance | Quarter 1 | All |
| Demonstration of Capability (DOC) | Prior to unsupervised method performance | Technical |

*From date of initial employment unless otherwise indicated.

Technical training is accomplished within each laboratory by management to ensure method comprehension. All new personnel shall be required to demonstrate competency in performing a particular method by successfully completing a Demonstration of Capability (DOC) before conducting analysis independently on client samples.

DOCs are performed by analysis of four replicate QC samples. Results of successive LCS analyses can be used to fulfill the DOC requirement. The accuracy and precision, measured as average recovery and standard deviation (using n-1 as the population), of the 4 replicate results are calculated and compared to those in the test method (where available). If the test method does not include accuracy and precision requirements, the results are compared to target criteria set by the laboratory. The laboratory sets the target criteria such that they reflect the DQOs of the specific test method or project. A DOC Certification Statement is recorded and maintained in the employee's training or personnel file. Figure 3 shows an example of a DOC Certification Statement.

The following evidence must be on file at the laboratory for each technical employee:

- DOC.
- The employee has read and understood the latest version of the laboratory's quality documentation.
- The employee has read and understood the latest, approved version of all test methods and/or SOPs for which the employee is responsible.
- Annual evidence of continued DOC that may include successful analysis of a blind sample on the specific test method, or a similar test method, or an annual DOC, or four successive, successful LCS.

Figure 3 Example Demonstration of Capability Certification Statement

Demonstration of Capability
Certification Statement

Date: Matrix:
Laboratory Name: Method:
Laboratory Address:
Analyst Name:

We the undersigned certify that:

1. The analyst identified above, using the cited test method, which is in use at this facility for the analysis of samples under the National Environmental Laboratory Accreditation Program, has met the Demonstration of Capability.
2. The test method was performed by the analyst identified on this certification.
3. Copies of the test method and SOP are available for all personnel on site.
4. The data associated with the DOC are true, complete and representative.
5. All raw data (including a copy of this certification form) necessary to reconstruct and validate these analyses have been retained at the facility, and that the associated information is available for review by authorized inspectors.

| Laboratory Manager/Supervisor | Signature | Date |
|---|---|---|

### 5.1.3. Ethics Policy

Establishing and maintaining a high ethical standard is an important element of a quality system. In order to ensure that all personnel understand the importance the company places on maintaining high ethical standards at all times, STL has established an Ethics Policy P-L-006 and an Ethics Agreement (Figure 4). Each employee shall sign the Ethics Agreement, signifying agreed compliance with its stated purpose.

Violations of this Ethics Policy will not be tolerated. Employees who violate this policy will be subject to disciplinary actions up to and including termination. Criminal violations may also be referred to the Government for prosecution. In addition, such actions could jeopardize the Company's ability to do work on Government contracts, and for that reason, the Company has a Zero Tolerance approach to such violations.

Ethics is also a major component of the STL QA training program. Each employee must be trained in ethics within three months of hire in a QA training program that includes an overview of regulatory programs and program goals, a review of the ethics statement, and group discussions about data integrity and data misrepresentation. Employees must be trained as to the legal and environmental repercussions that result from data misrepresentation. A data integrity hotline is maintained by STL and administered by the QA Director.

## Figure 4 STL Ethics Agreement

I understand that STL is committed to ensuring the highest standard of quality and integrity of the data and services provided to our clients. I have read the Ethics Policy of the Company.

With regard to the duties I perform and the data I report in connection with my employment at the Company, I agree that:

- I will not intentionally report data values that are not the actual values obtained;
- I will not intentionally report the dates, times, sample or QC identifications, or method citations of data analyses that are not the actual dates, times, sample or QC identifications, or method citations;
- I will not intentionally misrepresent another individual's work;
- I will not intentionally report data values that do not meet established quality control criteria as set forth in the Method and/or Standard Operating Procedures, or as defined by Company Policy;
- I agree to inform my Supervisor of any accidental reporting of non-authentic data by me in a timely manner; and I agree to inform my Supervisor of any accidental or intentional reporting of non-authentic data by other employees; and
- If a supervisor or a member of STL management requests me to engage in or perform an activity that I feel is compromising data validity or quality, I will not comply with the request and report this action immediately to a member of senior management, up to and including the President of STL.

As a STL employee, I understand that I have the responsibility to conduct myself with integrity in accordance with the ethical standards described in the Ethics Policy. I will also report any information relating to possible kickbacks or violations of the Procurement Integrity Act, or other questionable conduct in the course of sales or purchasing activities. I will not knowingly participate in any such activity and will report any actual or suspected violation of this policy to management.

The Ethics Policy has been explained to me by my supervisor or at a training session, and I have had the opportunity to ask questions if I did not understand any part of it. I understand that any violation of this policy subjects me to disciplinary action, which can include termination. In addition, I understand that any violation of this policy which relates to work under a government contract or subcontract could also subject me to the potential for prosecution under federal law.

EMPLOYEE SIGNATURE ____________________________ Date _______________

Supervisor/Trainer: __________________________________ Date _________________

## 5.2. Facilities

Each STL facility must be secure and access must be controlled and documented. Access is controlled by various measures including locked doors, passwords, electronic access cards, security codes, and staffed reception areas. All visitors sign in and are escorted by STL personnel while at an STL facility.

STL's facilities are designed for efficient, automated high-quality operations. All laboratories are equipped with Heating, Ventilation, and Air Conditioning (HVAC) systems appropriate to the needs of environmental testing laboratories. Environmental conditions in the facilities, such as hood flow, are routinely monitored and documented. Table 9 summarizes the square footage at each STL facility.

All STL facilities are equipped with structural safety features. Each employee is familiar with the location, use, and capabilities of general and specialized safety features associated with their workplace. STL also provides and requires the use of protective equipment including safety glasses, protective clothing, gloves, respirators, etc.

**Table 9 STL Laboratory Square Footage**

| Facility | Square Footage |
|---|---|
| STL Austin | 43,000 |
| STL Billerica | 10,000 |
| STL Buffalo | 32,000 |
| STL Burlington | 36,000 |
| STL Chicago | 51,000 |
| STL Connecticut | 17,000 |
| STL Corpus Christi | 12,000 |
| STL Denver | 54,000 |
| STL Edison | 30,000 |
| STL Houston | 28,000 |
| STL Knoxville | 29,000 |
| STL Los Angeles | 27,000 |
| STL Miami | 9,000 |
| STL Mobile | 14,000 |

| Facility | Square Footage |
|---|---|
| STL Newburgh | 8,000 |
| STL North Canton | 53,000 |
| STL Pensacola | 18,000 |
| STL Pittsburgh | 30,000 |
| STL Richland | 33,000 |
| STL Sacramento | 66,000 |
| STL Savannah | 55,000 |
| STL San Francisco | 21,000 |
| STL Seattle | 15,000 |
| STL St. Louis | 31,000 |
| STL Tallahassee | 22,000 |
| STL Tampa | 12,000 |
| STL Valparaiso | 7,000 |
| STL Westfield | 10,000 |

## 5.3. Test Methods

### 5.3.1. Method Selection

Most of the test methods performed at STL originate from test methods published by a regulatory agency such as the US EPA and other state and federal regulatory agencies. These include, but are not limited to, the following published compendiums of test methods:

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, US EPA, January 1996.

Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act, and Appendix A-C; 40 CFR Part 136, USEPA Office of Water.

Methods for Chemical Analysis of Water and Wastes, EPA 600 (4-79-020), 1983.

Methods for the Determination of Inorganic Substances in Environmental Samples, EPA-600/R-93/100, August 1993.

Methods for the Determination of Metals in Environmental Samples, EPA/600/4-91/010, June 1991. Supplement I: EPA-600/R-94/111, May 1994.

Methods for the Determination of Organic Compounds in Drinking Water, EPA-600/4-88-039, December 1988, Revised, July 1991, Supplement I, EPA-600-4-90-020, July 1990, Supplement II, EPA-600/R-92-129, August 1992.

NIOSH Manual of Analytical Methods, 4th ed., August 1994.

Statement of Work for Inorganics Analysis, ILM04.1, USEPA Contract Laboratory Program Multi-media, Multi-concentration.

Statement of Work for Organics Analysis, OLM04.2, USEPA Contract Laboratory Program, Multi-media, Multi-concentration.

Statement of Work for Organic Analysis, Multi-Media, Multi-Concentration, OLMO4.1, USEPA Contract Laboratory Program, September 1998.

Standard Methods for the Examination of Water and Wastewater, 18th/19th /20th edition; Eaton, A.D. Clesceri, L.S. Greenberg, A.E. Eds; American Water Works Association, Water Pollution Control Federation, American Public Health Association: Washington, D.C.

Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW846), Third Edition, September 1986, Final Update I, July 1992, Final Update IIA, August 1993, Final Update II, September 1994; Final Update IIB, January 1995; Final Update III, December 1996.

Annual Book of ASTM Standards, American Society for Testing & Materials (ASTM), Philadelphia, PA.

National Status and Trends Program, National Oceanographic and Atmospheric Administration, Volume I-IV, 1985-1994.

5.3.2. SOPs

Each STL facility shall maintain an SOP Index for both Method and Process SOPs. Method SOPs are maintained to describe a specific test method. Process SOPs are maintained to describe function and processes not related to a specific test method.

Method SOPs contain the following information:

| |
|---|
| Title Page with Document Name, Document Number, Revision Number, Effective Date, Page Numbers and Total # of Pages, Authorized Signatures, Dates and Proprietary Information Statement (Figure 5). |

| | |
|---|---|
| 1. Identification of Test Method | 12. Calibration and Standardization |
| 2. Applicable Matrix | 13. Procedure |
| 3. Reporting Limit | 14. Calculations |
| 4. Scope and Application, including test analytes | 15. Method Performance |
| 5. Summary of the Test Method | 16. Pollution Prevention |
| 6. Definitions | 17. Data Assessment and Acceptance Criteria for Quality Control Measures |
| 7. Interferences | 18. Corrective Actions for Out-of-Control Data |
| 8. Safety | 19. Contingencies for Handling Out-of-Control or Unacceptable Data |
| 9. Equipment and Supplies | 20. Waste Management |
| 10. Reagents and Standards | 21. References |
| 11. Sample Collection, Preservation, Shipment and Storage | 22. Tables, Diagrams, Flowcharts and Validation Data |
| 12. Quality Control | |

Process SOPs may contain the following information:

| |
|---|
| Title Page with Document Name, Document Number, Revision Number, Effective Date, Page Numbers and Total # of Pages, Authorized Signatures, Dates and Proprietary Information Statement (Figure 5). |

1. Scope
2. Summary
3. Definitions
4. Responsibilities
5. Safety
6. Procedure
7. References
8. Tables, Diagrams, and Flowcharts

The QA Department is responsible for maintenance of SOPs, archival of SOP historical revisions, maintenance of an SOP index, and records of controlled distribution. SOPs, at a minimum, must undergo periodic review as described the each facility's LQM or SOP. Where an SOP is based on a published method, the laboratory must maintain a copy of the reference method.

**Figure 5 Proprietary Information Statement**

This documentation has been prepared by Severn Trent Laboratories (STL) solely for STL's own use and the use of STL's customers in evaluating its qualifications and capabilities in connection with a particular project. The user of this document agrees by its acceptance to return it to STL upon request and not to reproduce, copy, lend, or otherwise disclose its contents, directly or indirectly, and not to use if for any other purpose other than that for which it was specifically provided. The user also agrees that where consultants or other outside parties are involved in the evaluation process, access to these documents shall not be given to said parties unless those parties also specifically agree to these conditions.

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SOP Appendix

In some cases, a standard laboratory procedure is modified slightly for a specific client or project at the client or regulatory agency's request. In these cases, an Appendix to the SOP may be attached that indicates the modifications to the SOP which are specific to that project. SOP appendices shall not be used to alter test methods required by regulation such that the modifications would result in non-compliance with the regulation.

5.3.3. Method Validation

Laboratory developed methods are validated and documented according to the procedure described in Section 5.3.5.

5.3.4. Method Verification

Method verification is required when a validated standard test method or a method modification is implemented. The level of activity required for method verification is dependent on the type of method being implemented, or on the level of method modification and its affect on a method's robustness. Method modification often takes advantage of a method's robustness, or the ability to make minor changes in a method without affecting the method's outcome. Method verification may require some, but not all, of the activities described in Section 5.3.5.

5.3.5. Method Validation and Verification Activities

Before analyzing samples by a particular method, method validation and/or method verification must occur. A complete validation of the method is required for laboratory developed methods. While method validation can take various courses, the following activities can be required as part of method validation. Method validation records are designated QC records and are archived accordingly.

Determination of Method Selectivity

Method selectivity is demonstrated for the analyte(s) in the specific matrix or matrices. In some cases, to achieve the required selectivity for an analyte, a confirmation analysis is required as part of the method.

Determination of Method Sensitivity

Sensitivity can be both estimated and demonstrated. Whether a study is required to estimate sensitivity depends on the level of method development required when applying a particular measurement system to a specific set of samples. Where estimations and/or demonstrations of sensitivity are required by regulation or client agreement, such as the procedure in 40 CFR Part 136 Appendix B, under the Clean Water Act, these shall be followed. STL Facilities must have an SOP that details their approach to estimation and/or demonstration of sensitivity. Refer to the Method Detection Limits Study Procedure S-Q-003 for additional information.

Relationship of Limit of Detection (LOD) to the Quantitation Limit (QL)

Each laboratory shall have a procedure to relate the QL to the LOD (or MDL if appropriate). An important characteristic of expression of sensitivity is the difference in the LOD and the QL. The LOD is the minimum level at which the presence of an analyte can be reliably concluded. The QL is the minimum level at which both the presence of an analyte and its concentration can be reliably determined. For most instrumental measurement systems, there is a region where semi-quantitative data is generated around the LOD (both above and below the estimated MDL or LOD) and below the QL. In this region, detection of an analyte may be confirmed but quantification of the analyte is unreliable within the accuracy and precision guidelines of the measurement system. When an analyte is detected below the QL, and the presence of the analyte is confirmed by meeting the qualitative identification criteria for the analyte, the analyte can be reliably reported, but the amount of the analyte can only be estimated. If data is to be reported in this region, it must be done so with a qualification that denotes the semi-quantitative nature of the result.

<u>Determination of Interferences</u>
A determination that the method is free from interferences in a blank matrix is performed.

<u>Determination of Range</u>
Where appropriate, a determination of the applicable range of the method may be performed. In most cases, range is determined and demonstrated by comparison of the response of an analyte in a curve to established or targeted criteria. The curve is used to establish the range of quantitation and the lower and upper values of the curve represent upper and lower quantitation limits. Curves are not limited to linear relationships.

<u>Demonstration of Capability</u>
DOCs are performed prior to method performance.

<u>Determination of Accuracy and Precision</u>
Accuracy and precision studies are generally performed using replicate analyses, with a resulting percent recovery and measure of reproducibility (standard

deviation, relative standard deviation) calculated and measured against a set of target criteria.

Documentation of Method
The method is formally documented in an SOP. If the method is a minor modification of a standard laboratory method that is already documented in an SOP, an SOP Appendix describing the specific differences in the new method is acceptable in place of a separate SOP.

Continued Demonstration of Method Performance
Continued demonstration of Method Performance is addressed in the SOP. Continued demonstration of method performance is generally accomplished by batch specific QC samples such as LCS and Method Blanks.

5.3.6. Data Review
All data, regardless of regulatory program or level of reporting, shall be subject to a thorough review which involves a primary, secondary, and completeness review process. All levels of the review must be documented.

Primary Review

The primary review is often referred to as a “bench-level” review. In most cases, the analyst who generates the data (i.e. logs in, prepares and/or runs the samples) is the primary reviewer. In some cases, an analyst may be reducing data for samples run by an auto-sampler set up by a different analyst. In this case, the identity of both the analyst and the primary reviewer is identified in the raw data.

One of the most important aspects of primary review is to make sure that the test instructions are clear, and that all project specific requirements have been understood and followed.

Once an analysis is complete, the primary reviewer must ensure that:

- Sample preparation information is complete, accurate, and documented.
- Calculations have been performed correctly.
- Quantitation has been performed accurately.
- Qualitative identifications are accurate.
- Manual integrations are appropriate.
- Data flags to indicate manual integrations are recorded.
- Manual integrations are authorized by a date and signature or initials of primary analyst.
- Client specific requirements have been followed.
- Method and process SOPs have been followed.

- Method QC criteria have been met.
- QC samples are within established limits.
- Dilution factors are correctly recorded and applied.
- Non-conformances and/or anomalous data have been properly documented and appropriately communicated.
- COC procedures have been followed.
- Primary review is documented by date and initials/signature of primary analyst.

Any anomalous results and/or non-conformances noted during the Primary Review are communicated to the Supervisor and the PM for resolution. Resolution can require sample reanalysis, or it may require that data be reported with a qualification. Non-conformances are documented per Section 4.9.

Secondary Review

The secondary review shall be a complete technical review of a data set. The secondary review must be documented and the secondary reviewer identified. The following items are reviewed:

- Qualitative Identification
- Quantitative Accuracy
- Calibration
- QC Samples
- Method QC Criteria
- Adherence to method and process SOPs
- Accuracy of Final Client Reporting Forms
- Manual Integrations – Minimal requirement is to spot-check raw data files for manual integration, as verified by date and initials or signature of secondary data reviewer. Some regulatory programs require 100% secondary review of manual integrations.
- Completeness
- Special Requirements/Instructions

If problems are found during the secondary review, the reviewer must work with the appropriate personnel to resolve them. If changes are made to the data, such as alternate qualitative identifications, identifications of additional target analytes, re-quantitation, or re-integration, the secondary reviewer must contact the laboratory analyst and/or primary reviewer of the data so that the primary analyst and/or reviewer is aware of the appropriate reporting procedures.

Completeness Review

The completeness review shall include the generation of a project narrative and/or cover letter which outlines anomalous data and non-compliances using project narrative notes and non-compliance reports generated during the primary and secondary review. The completeness review addresses the following items:

- Is the project report complete?
- Does the data meet with the client's expectations?
- Were the data quality objectives of the project met?
- Are QC outages and/or non-conformances approved and appropriately explained in the narrative notes?

5.3.7. Data Integrity and Security

This section details those procedures that are relevant to computer systems that collect, analyze, and process raw instrumental data, and those that manage and report data.

<u>Security and Traceability</u>
Access to computer systems that collect, analyze, and process raw instrumental data, and those that manage and report data must be both controlled and recorded. There are various systems at STL to which this applies, which include the Laboratory Information Management System (LIMS), as well as specific systems such as chromatography data systems.

Control of the system is accomplished through limitation of access to the system by users with the education, training and experience to perform the task knowledgeably and accurately. System users are granted privileges that are commensurate with their experience and responsibilities.

Computer access is tracked by using unique login names and passwords for all employees that have access to the computer system. "General" or "multi-user" account access to computer systems that collect, analyze and process raw instrumental data, and those that manage and report data shall not be permitted. Entries and changes are documented with the identity of the individual making the entry, and the time and date. Where a computer system is processing raw instrumental data, the instrument identification number as described in Section 5.4.1 is recorded. Many of these systems have the capability of maintaining audit trails to track entries and changes to the data. This function is activated on any computer system that has that capability.

Verification

All commercially obtained software shall be verified prior to use and after version upgrade. Verification involves assessing whether the computer system accurately performs its intended function. Verification generally is accomplished by comparing the output of the program with the output of the raw data manually processed, or processed by the software being replaced. The records of the verification are required to contain the following information: software vendor, name of product, version, comparison of program output and manual output, raw data used to verify the program, date, and name of the individual performing the verification. Records of verification are retained as QC records.

Validation

Software validation involves documentation of specifications and coding as well as verification of results. Software validation is performed on all in house programs. Records of validation include original specifications, identity of code, printout of code, software name, software version, name of individual writing the code, comparison of program output with specifications, and verification records as specified above. Records of validation are retained as QC records.

Auditing

The QA Department systems audit includes review of the control, security, and tracking of IT systems and software.

Version Control

The laboratory shall maintain copies of outdated versions of software and associated manuals for all software in use at the laboratory for a period of five years from its retirement date. The associated hardware, required to operate the software, must also be retained for the same time period.

## 5.4. Equipment

### 5.4.1. Equipment Operation

STL is committed to routinely updating and automating instrumentation. STL facilities maintain state of the art instrumentation to perform the analyses within the QC specifications of the test methods. Each STL facility shall maintain an equipment list that must include the following information:

- Identity
- Date Installed or year placed in service
- Manufacturer's Name, Model Number, Serial Number
- Current Location
- Preventative Maintenance Schedule

All equipment is subject to rigorous checks upon its receipt, upgrade, or modification to establish that the equipment meets with the selectivity, accuracy, and precision required by the test method for which it is to be used. All manufacturer's operations and maintenance manuals are kept up to date and accessible for the use of the equipment operator. Documentation of equipment usage is maintained using analytical run and maintenance logbooks.

#### 5.4.2. Equipment Maintenance

Each STL facility must employ a system of preventative maintenance in order to ensure system up time, minimize corrective maintenance costs and ensure data validity. All routine maintenance is performed as recommended by the manufacturer and may be performed by an analyst, instrument specialist or outside technician. Maintenance logbooks are kept on all major pieces of equipment in which both routine and non-routine maintenance is recorded. Notation of the date and maintenance activity is recorded each time service procedures are performed. The return to analytical control following instrument repair is documented. Maintenance logbooks are retained as QA records.

Maintenance contracts are held on specific pieces of equipment where outside service is efficient, cost-effective, and necessary for effective operation of the laboratory.

#### 5.4.3. Equipment Verification and Calibration

All equipment shall be tested upon receipt to establish its ability to meet the QC guidelines contained in the test method for which the instrumentation is to be used. This testing shall be documented. Once an instrument is placed in routine service, ongoing instrument calibration is demonstrated at the appropriate frequency as defined in the test method. Refer to the Selection of Calibration Points SOP, P-T-001 for guidance on using calibration data. Any instrument that is deemed to be malfunctioning is clearly marked and taken out of service. When the instrument is brought back into control, acceptable performance is documented.

### 5.5. Measurement Traceability

#### 5.5.1. General

Traceability of measurements shall be assured using a system of documentation, calibration, and analysis of reference standards. Laboratory equipment that are peripheral to analysis and whose calibration is not necessarily documented in a test method analysis or by analysis of a reference standard shall be subject to ongoing certifications of accuracy. At a minimum, these must include procedures for checking specifications ancillary equipment: balances, thermometers, temperature, Deionized (DI) and Reverse Osmosis (RO) water systems, automatic pipettes and other volumetric measuring devices. With the exception of Class A Glassware (including glass microliter syringes that have a certificate of accuracy), quarterly accuracy checks are performed for all mechanical volumetric devices. Wherever possible, subsidiary or peripheral equipment is checked against standard equipment or standards that are traceable to national or international standards.

An external certified service engineer services laboratory balances on an annual basis. This service is documented on each balance with a signed and dated certification sticker. Balances are calibrated on each day of use. All mercury thermometers are calibrated annually against a traceable reference thermometer. Temperature readings of ovens, refrigerators, and incubators are checked on each day of use.

Laboratory DI and RO water systems have documented preventative maintenance schedules and the conductivity of the water is recorded on each day of use.

5.5.2. Reference Standards Traceability

The receipt of all reference standards must be documented. Reference~~s~~ standards are labeled with a unique Standard Identification Number, date received, and the expiration date. All documentation received with the reference standard is retained as a QC record and references the Standard Identification Number.

All standards should be purchased with an accompanying Certificate of Analysis that documents the standard purity. If a standard cannot be purchased from a vendor that supplies a Certificate of Analysis, the purity of the standard is documented by analysis. The documentation of standard purity is archived, and references the Standard Identification Number.

All efforts are made to purchase standards that are $\geq$ 97.0% purity. If this is not possible, the purity is used in performing standards calculations.

The accuracy of calibration standards is checked by comparison with a standard from a second source. In cases where a second standard manufacturer is not available, a different lot is acceptable for use as a second source. The appropriate Quality Control (QC) criteria for specific standards are defined in laboratory SOPs. In most cases, the analysis of an Initial Calibration Verification (ICV) or Laboratory Control Sample (LCS) is used as the second source confirmation.

#### 5.5.3. Reagents

Reagents are, in general, required to be analytical reagent grade unless otherwise specified in method SOPs. Reagents must be at a minimum the purity required in the test method. The date of reagent receipt and the date the reagent was opened are documented.

### 5.6. Sampling

Sample representativeness and integrity are the foundations upon which meaningful analytical results rely. Where documented and approved SAPs and/or QAPPs are in place, they must be made available to the laboratory before sample receipt, and approved by laboratory management before sample receipt.

### 5.7. Sample Handling, Transport, and Storage

#### 5.7.1. General

Chain of Custody (COC) can be established either when bottles are sent to the field, or at the time of sampling. STL can provide all of the necessary coolers, reagent water, sample containers, preservatives, sample labels, custody seals, COC forms, ice, and packing materials required to properly preserve, pack, and ship samples to the laboratory.

Samples are received at the laboratory by a designated sample custodian and a unique Laboratory Project Identification Number is assigned. The following information is recorded for each sample shipment: Client/Project Name, Date and Time of Laboratory Receipt, Laboratory Project Number, and Signature or initials of the personnel receiving the cooler and making the entries.

Upon inspection of the cooler and custody seals, the sample custodian opens and inspects the contents of the cooler, and records the cooler temperature. If the cooler arrival temperature exceeds the required or method specified temperature range by $\underline{+}2^{o}C$ (for samples with a temperature requirement of $4^{o}C$, a cooler temperature of just above the water freezing temperature to $6^{o}C$ is acceptable); sample receipt is considered “compromised” and the procedure described in Section 4.7.1 is followed. All documents are immediately inspected to assure agreement between the test samples received and the COC.

Any non-conformance, irregularity, or compromised sample receipt as described in Section 4.7.1 must be documented and brought to the immediate attention of the client. The COC, shipping documents, documentation of any non-conformance, irregularity, or compromised sample receipt, record of client contact, and resulting instructions become part of the permanent project record.

Samples that are being tested at another STL facility or by an external subcontractor shall be appropriately packaged, and sent out under COC.

Following sample labeling as described in Section 5.7.2, the sample is placed in storage. Sample storage is required to be access controlled. All samples are stored according to the requirements outlined in the test method and in a manner such that they are not subject to cross contamination or contamination from their environment. Unless specified by method or state regulation, a tolerance range of $4 \pm 2^{o}C$ is used. Sample storage temperatures are monitored daily.

5.7.2. Sample Identification and Traceability

Each sample container shall be assigned a unique Sample Identification Number that is cross-referenced to the client identification number such that traceability of test samples is unambiguous and documented. Each sample container is affixed with a sample identification label.

All unused portions of samples, including empty sample containers, are returned to the secure sample control area.

5.7.3. Sub-sampling

Sample preparation procedures must be referenced in each STL facility's LQM and documented in the laboratory SOPs.

5.7.4. Sample Preparation

Sample preparation procedures must be referenced in each STL facility's LQM and documented in the laboratory SOPs.

5.7.5. Sample Disposal

Each facility shall have an SOP describing sample retention and disposal procedures. Samples should be retained in STL storage facilities for a minimum of 30 days after the project report is sent, however, provisions may be made for earlier disposal of samples once the holding time is exceeded. Some samples are required to be held for longer periods based on regulatory or client requirements (example, 60 days after project report is sent). The laboratory must follow the longer sample retention requirements where required by regulation or client agreement. Samples may be returned to the client per written request. Unused portions of samples found or suspected to be hazardous according to state or federal guidelines may be returned to the client upon completion of the analytical work.

Samples shall be disposed of in accordance with federal, state and local regulations. Each facility must have an SOP detailing the disposal of samples, digestates, and extracts.

## 5.8. Assuring the Quality of Test Results

### 5.8.1. Proficiency Testing

Each STL facility must analyze Proficiency Test (PT) samples as required for accreditation. As required by NELAC, each STL facility participates in the PT program semi-annually for each PT field of testing for which it is accredited, according to the NELAC PT field of testing published guidelines. Under SDWA, the laboratory also analyzes a PT sample by each method once per year, if the laboratory uses more than one method for the analyte.

In addition to the PT program required for NELAC accreditation, STL participates in a number of additional PT programs, as appropriate for the specific facility.

PT samples must be handled and tested in the same manner (procedural, equipment, staff) as environmental samples. PT test sample data is archived using the requirements for project and raw data record retention.

Each STL facility performing chemical analyses also participates in a double blind performance evaluation annually. An external vendor is contracted to submit double blind samples to the STL facility. Both the level of customer service and the accuracy of the test results are assessed objectively by the external contractor, who provides a detailed report to the QA Director and to each of the STL facilities. This is administered as a double blind program in order to assess all facets of STL operations.

### 5.8.2. Control Samples

Control samples are analyzed with each batch of samples to monitor laboratory performance in terms of accuracy, precision, sensitivity, selectivity, and interferences. Each regulatory program and each method within those programs specify the control samples that are prepared and/or analyzed with a specific batch. Control samples must be uniquely identified and correlated to unique batches. There are also a number of QC sample types that monitor field sampling accuracy, precision, representativeness, interferences, and the effect of the matrix on the method performed. Control Sample types and typical frequency of their application are outlined in Table 10. Note that frequency and use of control samples vary with specific regulatory, methodology and project specific criteria. Table 10 does not define STL's approach to application of QC samples for each regulatory program or test method.

5.8.3. Calibration

Each STL Facility must define calibration protocols in STL facility SOPs.

5.8.4. Glassware Cleaning

Glassware cleaning must be described in STL facility SOPs.

5.8.5. Permitting Departures from Documented Procedure

Each STL facility must have a procedure that defines the process, documentation, and level of authorization required to permit departures from documented procedures.

## Table 10 Control Samples

| Laboratory QC Sample Type | Use | Required Frequency |
|---|---|---|
| Laboratory Control Sample (Laboratory Fortified Blank) | Measures accuracy of method in blank matrix | 1 per batch of 20 or less samples per matrix type per sample extraction or preparation method[1] |
| Method Blank | Measures method contribution to any source of contamination | 1 per batch of 20 or less samples per matrix type per sample extraction or preparation method[1] |
| Instrument Blank | Measures instrumental contribution to any source of contamination | As specified in test method |
| Cleanup Blank | Measures clean up step contribution to any source of contamination | As specified in test method |
| Storage Blank | Measures storage contribution to any source of contamination (Volatiles only) | As specified in test method or SOP |
| Control, Brine Control, or Dilution Water | Measures effect of blank water on test organisms (Aquatic toxicology) | As specified in test method and permit |
| Reference Toxicant | Measure sensitivity of test organisms (Aquatic toxicology) | Annually |
| **Field QC Sample Type** | **Use** | Typical Frequency |
| Matrix Duplicate | Measures effect of site matrix on precision of method | Per 20 samples per matrix or per SAP/QAPP[1,2] |
| Matrix Spike | Measures effect of site matrix on accuracy of method | Per 20 samples per matrix or per SAP/QAPP[1] |
| Matrix Spike Duplicate | Measures effect of site matrix on precision of method | Per 20 samples per matrix or per SAP/QAPP[1,2] |
| Equipment Blank (Equipment Rinsate) | Measures field equipment contribution to any source of contamination | Per SAP/QAPP |
| Trip Blank | Measures shipping contribution to any source of contamination (Volatiles only) | Per Cooler |
| Field Blank | Measures field environment contribution to any source of contamination | Per SAP/QAPP |
| Field Duplicate | Measures representativeness of sampling and effect of site matrix on precision | Per SAP/QAPP |

[1] Denotes an STL required frequency
[2] Either an MSD or an MD is required per 20 samples per matrix or per SAP/QAPP.

Where a departure from a documented SOP, test method, or policy is determined to be necessary, or unavoidable, the departure shall be documented and be authorized by the appropriate level of management, which is defined in the policy. In some instances, it is appropriate to inform the client before permitting a departure. Any such occurrence is documented in the cover letter and/or project narrative.

5.8.6. Development of QC Criteria, Non-Specified in Method/Regulation

Where a method or regulation does not specify acceptance and/or rejection criteria, the laboratory must develop a policy for doing so. The policy must address how the laboratory examines the data user's needs and the demonstrated sensitivity, accuracy and precision of the available test methods in determining appropriate QC criteria.

Data users often need the laboratory's best possible sensitivity, accuracy, and precision using a routinely offered test method, or are unsure of their objectives for the data. For routine test methods that are offered as part of STL's standard services, the laboratory bases the QC criteria on statistical information such as determination of sensitivity, historical accuracy and precision data, and method verification data. The method SOP includes QC criteria for ongoing demonstration that the established criteria are met (i.e., acceptable LCS accuracy ranges, precision requirements, method blank requirements, initial and continuing calibration criteria, etc.).

In some cases, a routine test method may be far more stringent than a specific data user's needs for a project. The laboratory may either use the routinely offered test method, or may opt to develop an alternate test method based on the data user's objectives for sensitivity, accuracy, and precision. In this case, it can be appropriate to base the QC criteria on the data user's objectives, and demonstrate through method verification and ongoing QC samples that these objectives are met.

For example, a client may require that the laboratory test for a single analyte with specific DQOs for sensitivity, accuracy, and precision as follows: Reporting Limit of 10 ppm, accuracy $\pm$25%, and RSD of less than 30%. The laboratory may opt to develop a method that meets these criteria and document through the Method blank results, MDL study, and LCS results that the method satisfies those objectives. In this case, both the method and the embedded QC criteria have been based on the client's DQOs.

In some cases, the data user needs more stringent sensitivity, accuracy, and/or precision than the laboratory can provide using a routine test method. In this case, it is appropriate that the laboratory provide documentation of the sensitivity, accuracy, and precision obtainable to the data user and let the data user determine whether to use the best available method offered by the laboratory, or determine whether method development or further research is required.

## 5.9. Project Reports

### 5.9.1. General

All STL Project reports that are generated under NELAC requirements must contain the content as described in Section 5.9.2. The criteria described in Section 5.9.3 and 5.9.4 apply to all Project Reports.

### 5.9.2. Project Report Content

- Title
- Laboratory name, address, telephone number, contact person
- Unique Laboratory Project Number
- Total Number of Pages (report must be paginated)
- Name and address of Client
- Client Project Name (if applicable)
- Laboratory Sample Identification
- Client Sample Identification
- Matrix and/or Description of Sample
- Dates: Sample Receipt, Collection, Preparation and/or Analysis Date
- Definition of Data Qualifiers
- Reporting Units
- Test Method

The following are required where applicable to the specific test method or matrix:

- Solid Samples: Indicate Dry or Wet Weight
- Whole Effluent Toxicity: Statistical package used
- If holding time $\leq$ 48 hours, Sample Collection, Preparation and/or Analysis Time
- Indication by flagging where results are reported below the quantitation limit.

### 5.9.3. Project Narrative

A Project Narrative and/or Cover Letter shall be included with each project report and at a minimum includes an explanation of any and all of the following occurrences:

- Non-conformances
- "Compromised" sample receipt (see Section 4.7.1)
- Method Deviations
- QC criteria failures

Project Release

The Laboratory Director or his/her designee must authorize the release of the project report with a signature.

Where amendments to project reports are required after issue, these shall be in the form of a separate document and/or electronic data deliverable. The revised report is clearly identified as revised with the date of revision and the initials of the person making the revision. Specific pages of a project report may be revised using the above procedure with an accompanying cover letter indicating the page numbers of the project revised. The original version of the project report must be kept intact and the revisions and cover letter included in the project files.

### 5.9.4. Subcontractor Test Results

Project reports from external subcontract shall not be altered, and shall be included in original form in the final project report provided by STL. Data from subcontractors' reports may be added to an STL electronic deliverable.

Subcontracted data shall be clearly identified as such, and the name, address, and telephone number for the laboratory performing the test is included in the project report. If the report is being generated under NELAC requirements, all information outlined in Section 5.9.2 are required for both the originating laboratory and the subcontracting laboratory.

Data subcontracted within STL may be reported on the originating laboratory's report forms provided the following mandatory requirements are met:

- The name, address, and telephone number of the facility are provided.
- Analytical results produced by the STL intra-company subcontractor are clearly identified as being produced by the subcontractor facility.

- The intra-company subcontractor's original report, including the chain of custody is retained by the originating laboratory.
- Proof of certification is retained by the originating laboratory.
- All information as outlined in Section 5.9.2 is included in the final report where the report is required to be compliant with NELAC, for both the originating and subcontracting laboratory.

5.9.5. Electronic Data Deliverables

Electronic Data Deliverables (EDD) are routinely offered as part of STL's services. STL offers a variety of EDD formats including Environmental Restoration Information Management System (ERPIMS), New Agency Standard (NAS), Format A, Excel, Dbase, GISKEY, and Text Files.

EDD specifications are submitted to the IT department by the PM for review and undergo the contract review process in Section 4.4.1. Once the facility has committed to providing diskettes in a specific format, the coding of the format may need to be performed. This coding is documented and validated. The validation of the code is retained as a QC record.

EDDs shall be subject to a review to ensure their accuracy and completeness.

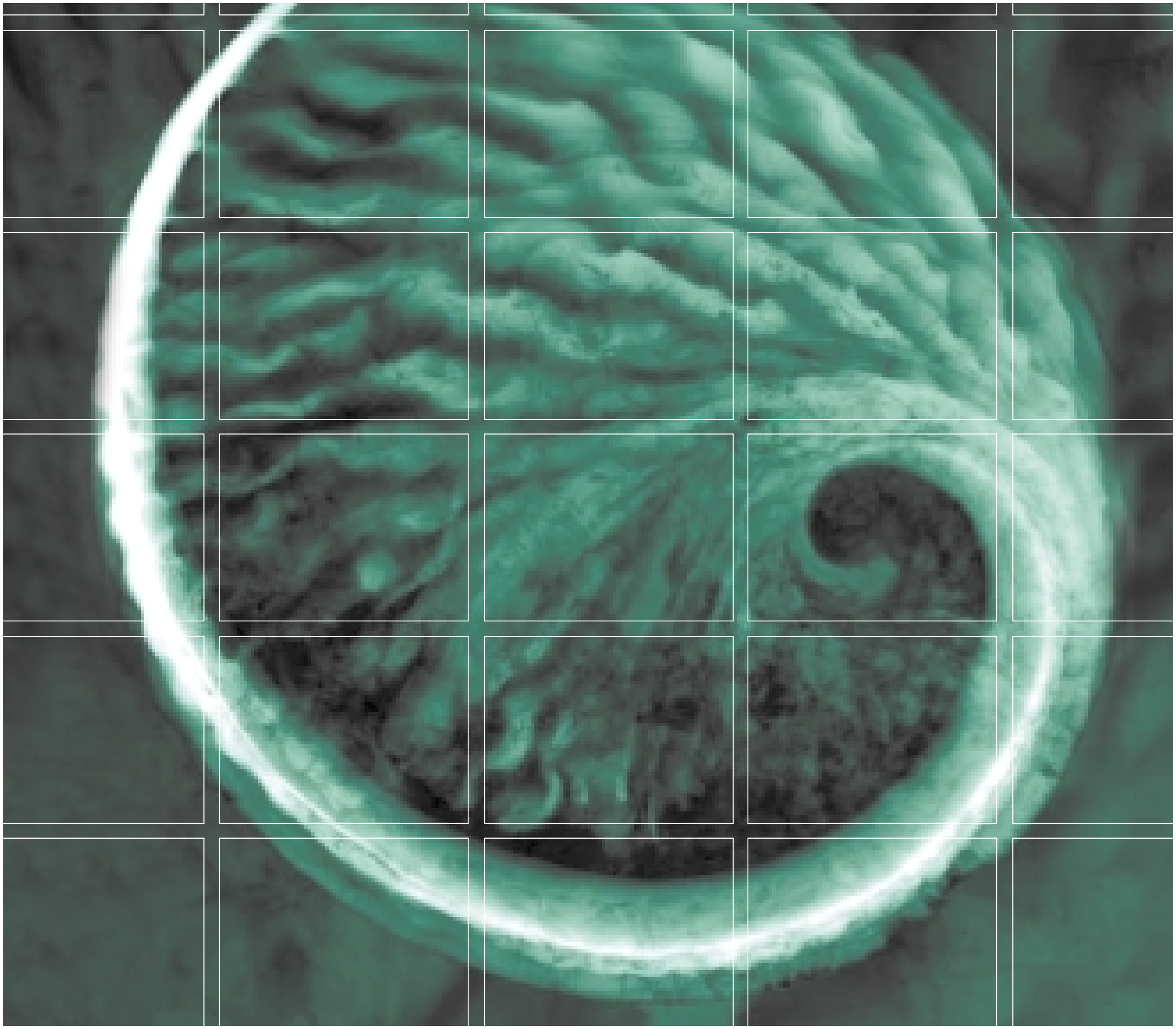
5.9.6. Project Report Format

STL offers a wide range of project reporting formats, including EDDs, short report formats, and complete data deliverable packages modeled on the Contract Laboratory Protocol (CLP) guidelines. More information on the range of project reports available can be obtained by contacting any STL facility. Regardless of the level of reporting, all projects must undergo the levels of review as described in Section 5.3.6.

## Appendix: List of Quality System Policies and Procedures

| QMP Citation | Description | Reference |
|---|---|---|
| 1.2 | Quality Policy | QMP |
| 4.4 | Contract Review | QMP |
| 4.4.2 | Project Planning Process | LAB Procedure |
| 4.7.1 | Sample Acceptance Policy | LAB Procedure |
| 4.5 | Subcontracting | QMP |
| 5.3.2 | Approved SOP Listing | LAB Procedure |
| 4.3.2 | Document Control | S-Q-001 & Lab Procedure |
| 4.12.2 | Record Retention & Purging | QMP |
| 4.6 | Purchasing Services and Supplies | QMP |
| 4.7.2 | Client Confidentiality | QMP |
| 4.8 | Complaints | QMP |
| 4.9 | Document and Control of Non-conformances | LAB Procedure |
| 4.10 | Corrective Action process | LAB Procedure |
| 4.15.2 | Quality Systems Management Review | QMP |
| 4.11 | Preventive Action Process | LAB Procedure |
| 4.12.4 | Archives and Record Transfer | QMP |
| 4.13 | Internal Audits | QMP |
| 4.15 | Management Reviews | QMP |
| 5.1.2 | Training | QMP |
| 5.1.3 | Ethics Policy | P-L-006 |
| 5.3.2 | SOP Index | LAB Procedure |
| 5.3.5 | Method Detection Limit Studies | S-Q-003 |
| 5.3.5 | Relationship of Limit of Detection to Quantitation Limit | LAB Procedure |
| 5.3.7 | Data Integrity and Security | QMP |
| 5.3.6 | Data Review | QMP |
| 5.4.1 | Equipment Operation | QMP |
| 5.4.1 | Equipment Tracking List | LAB Procedure |
| 5.4.2 | Equipment Maintenance | QMP |
| 5.4.3 | Equipment Verification and Calibration | QMP |
| 5.4.3 | Selection of Calibration Points | P-T-001 |
| 5.5 | Measurement Traceability | QMP |
| 5.5.1 | Procedures for Checking Specifications for Ancillary Equipment | LAB Procedure |
| 5.5.2 | Reference Standards Traceability | QMP |
| 5.7 | Sample Handling, Transport and Storage | QMP |
| 5.7.2 | Sample Identification and Traceability | QMP |
| 5.7.3 | Subsampling | QMP |
| 5.7.4 | Sample Preparation | QMP |
| 5.7.5 | Sample Disposal | LAB Procedure |
| 5.8.3 | Calibration | LAB Procedure |
| 5.8.4 | Glassware Cleaning Procedures | LAB Procedure |
| 5.8.5 | Permitting Departures From Documented Procedures | LAB Procedure |
| 5.8.6 | Development of QC Criteria, Non-specified in Methods/Regulations | QMP |
| 5.9 | Reporting Analytical Results | QMP |

Note: Where "QMP" is referenced it indicates the policy or procedure is covered by the QMP and not covered by a corporate procedure, and it does not require a laboratory specific procedure. However, when QMP is listed, the laboratories' may still address it in more detail in their LQM or laboratory quality system procedures. When "LAB Procedure" is indicated, it requires the laboratory to address the item in its LQM or have a have a specific laboratory quality system policy or procedure for that item. Where a procedure number is listed, it refers to a corporate policy or procedure.



# Interim Status Report and CAS Work Plan Revision

**Whirlpool Facility, Ft. Smith, Arkansas**
**Prepared for Whirlpool Corporation**

June 25, 2004

**Volume 2 of 3**

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# Conceptual Site Model and CSM Addendum

*Appendix B*

*June 25, 2004*
*Project No. 0014507*

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Whirlpool Corporation, Inc.

# Conceptual Site Model

*Fort Smith, Arkansas*

August 2, 2002

W.O. #581-007

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Whirlpool Corporation, Inc.

# Conceptual Site Model

*Fort Smith, Arkansas*

August 2, 2002

W.O. #581-007


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## *1.0 INTRODUCTION*

### *1.1 SITE BACKGROUND*

The Whirlpool Fort Smith facility is located at 6400 Jenny Lind Road on the south side of Fort Smith, Arkansas (Figure 1-1). The facility manufactures side-by-side household refrigerators, trash compactors and icemakers. The facility has been operated by Whirlpool for over 30 years.

A series of soil and ground water studies were initiated at the site as part of a project to remove an underground fuel storage tank (UST). That work indicated that there was no evidence of releases of petroleum hydrocarbons from the UST. However, the analytical data showed the presence of trichloroethylene (TCE) and other solvents not related to the UST in the shallow ground water. Subsequent investigations, including a soil investigation to assess the potential source area, have been conducted to delineate the ground water plume.

Whirlpool has implemented a voluntary semi-annual ground water sampling program to monitor ground water conditions at the site. Studies are also currently under way to evaluate options for remediation of the on-site affected ground water.

Data from wells in the northern part of the facility indicate that TCE affected ground water is present near the northern boundary of the facility and may extend off site. In addition, recent site investigations indicate that there may be a limited northerly component to ground water flow. Based on these data, Whirlpool initiated discussions with the Arkansas Department of Environmental Quality (ADEQ) to enter a letter of agreement (LOA) to implement a Corrective Action Strategy (CAS) at the Whirlpool Facility.

### *1.2 OBJECTIVES OF THE CSM*

This Conceptual Site Model (CSM) has been prepared to fulfill the requirements specified in Section II. F. of the LOA dated (June 6). Based on the LOA, a CSM must be submitted at the scoping meeting that has been tentatively scheduled for August 14, 2002

Successful implementation of the CAS relies on the development of a complete, yet concise CSM. To that end, the CSM for the whirlpool facility was developed using readily available data to illustrate the relationship between potential constituents of concern (COCs), potential exposure pathways, and potential receptors. Specifically, this CSM will be used as the framework on which the implementation of the CAS will be based.

## 2.0 FACILITY PROFILE

## 2.1 SITE FEATURES

The facility consists of the main manufacturing building (approximately 1.3 million square feet), and adjoining warehouse and administrative offices (Figure 2-1). Additional buildings located on the north side of the property include a water treatment plant and boiler house. The majority of the property surrounding the buildings is covered with concrete or asphalt for parking. Some gravel parking areas are also present. An outdoor waste storage area is located on the south side of the manufacturing facility. This paved area is enclosed with a chain-link fence topped with razor wire.

As stated in the LOA, the focus of the CAS is the area north and northwest of the facility. The major structures in that portion of the facility are the water treatment plant and boiler house mentioned previously (Figure 2-2). However, historical records indicate that a small building located west of the boiler house was formerly used for degreasing operations. This small building has not been used since the mid 1980's.

## 2.2 FACILITY OPERATIONS

Whirlpool-Fort Smith is a refrigerator manufacturing facility. The manufacturing processes conducted at the site include polyurethane foaming, metal fabrication, plastic thermoforming and assembly operations. All storage of hazardous wastes is limited to 90 days or less in containers, no hazardous waste treatment activities are conducted on site. It is believed that constituents in the soils and groundwater identified in the facility investigation are the result of historical practices prior to 1980.

Dating back to approximately 1967, equipment degreasing operations utilizing trichloroethylene (TCE) were performed in the former degreaser building located near the northwestern corner of the main manufacturing building. The use of TCE was discontinued in the mid 1980's and the degreaser building is not currently used for any cleaning operations.

Based on verbal reports from former workers, the degreasing equipment consisted of a tank and a parts rack. The degreasing operations involved placing parts into the parts rack positioned over the tank. The TCE tank was then heated creating a TCE vapor in the area where the parts were placed. Following degreasing activities, the vapor was condensed and returned to the tank below the parts rack.

## 3.0 LAND USE AND EXPOSURE PROFILE

### 3.1 FACILITY AND ADJACENT PROPERTIES

The Whirlpool facility is a manufacturing and warehousing operation. No other specific land use categories are present on the property.

Surrounding property uses include light industrial/commercial activities to the south and east, residential to the north and undeveloped land to the west (Figure 3-1). Residential properties to the north include single-family homes and two multi-family units. No recreational or agricultural properties are located in the vicinity of the Whirlpool facility. In addition, schools, hospitals, day care centers, etc. are located at least 0.5 miles from the facility.

### 3.2 RESOURCE USE AND LOCATIONS

Based on the EPA ground water classification guidelines Ground water in the vicinity of the Whirlpool facility would be classified as Class IIB ground water (a potential drinking water source). Following EPA guidance, the area near the facility has been evaluated to identify potential groundwater use and ecological receptors.

As is detailed in Section 6.0 of this submittal, there are no ecologically vital areas within a two–mile radius of the Whirlpool facility.

A water well search was performed within a one-mile radius of the Whirlpool facility. No federal, state or public water supply wells were identified within the search distance (Figure 3-2). Drinking water and sanitary sewer services for both commercial/industrial and residential properties in the vicinity of the Whirlpool plant are supplied by the City of Fort Smith. Drinking water supplies include Lake Fort Smith, Lake Shepherd Springs and the Lee Creek Reservoir. These reservoirs are not located near the facility. (http://www.fsark.com/NewsReleases/Archive/2001-07-24SpecialReportWaterSupplyPlanning.html)

Additionally, available literature indicates that the majority of shallow wells in the Fort Smith area are completed in the McAlester Shale. Apparently, the thin alluvial deposits in the Fort Smith area (specifically those not associated with the Arkansas River) yield insufficient quantities of water to justify shallow wells. Most wells completed in the McAlester Shale are completed to depths up to 475 feet and produce poor quality water with yields of 25 to 75 gallons per minute.

### 3.3 APPLICABLE EXPOSURE SCENARIOS AND PATHWAYS

Whirlpool has conducted a survey of the land use and potential exposure scenarios/pathways in the immediate vicinity of the impacted area. Based on this survey, both industrial and residential exposure scenarios are potentially applicable. Industrial exposure pathways may include incidental soil ingestion, dermal contact with soil or inhalation or volatiles by a construction or maintenance worker. Residential pathways appear to be limited to inhalation of volatiles through the use of underground storm shelters at locations immediately north of the plant (across Ingersoll Avenue.).

## 4.0 PHYSICAL PROFILE

### 4.1 TOPOGRAPHY

The facility is situated near the crest of a low hill such that the topography of the Whirlpool facility gently slopes to the east-northeast along the northern portion of the facility, and to the south-southeast along the southern portion of the facility. The location of the site is identified on the USGS 7.5 min. topographic quadrangle for Fort Smith, Arkansas in Figures 3-1 and 3-2). The site is located outside the 100-year and 500-year floodplains.

Drainage ditches are located along Ingersoll Avenue on the north side of the facility and along Jenny Lind Road on the east side of the facility. Surface water generally flows toward the northeast corner of the facility where it enters the city storm sewer system under Jenny Lind Road and flows toward Mill Creek.

### 4.2 GEOLOGY

The geology of the Fort Smith area of Western Arkansas is generally characterized by Pennsylvanian age sediments. The Whirlpool facility, situated on the Northwestern flank of the Massard Prairie Anticline, overlies Quaternary Alluvium and gently dipping Pennsylvanian McAlester Shale.

Quaternary Alluvium is present from ground surface to a depth of 29 to 37 feet at the Whirlpool facility. Site boring logs and previous site literature indicate the alluvium is generally composed of a shallow fine-grained unit, and a coarse-textured basal unit (Figures 4-1 and 4-2).

The Upper Fine-Grained unit exhibits significant variations in lithologic texture throughout the site and with depth, generally varying from fine-grained silt to sandy clay. In general, the central portion of this unit (from 4 to 10 feet below ground surface (bgs)) consists of sandy clay. The thickness of this sandy-clay zone is highly variable; ranging from a maximum thickness of approximately 13 feet to 1 foot or less at many locations. This sandy-clay zone is not recognizable in approximately half of the borings at the site.

The lower unit of the alluvium at the site, commonly referred to as the Basal Aquifer, consists of sands and gravels. The upper portion of the Basal Aquifer unit is typically composed of a fine-grained silty sand to sandy silt. This sandy silt grades to a sandy gravel with depth in the lower portrion. Where present, the silty sand portion of the unit is from 5 to 10 feet thick and forms a gradational transition between the Upper Fine-Grained unit and the Basal Aquifer.

The sandy gravel at the base of the Basal Aquifer is commonly 3 to 6 feet thick and has variable amounts of clay and silt. This sand and gavel layer is present in the majority of the borings at the site and it rests unconformably on either weathered shale or clay associated with the weathered shale.

The alluvial units are underlain by the McAlester Shale. This formation ranges up to 1000 feet thick in the Fort Smith region. In the vicinity of the Whirlpool facility the upper portion has been eroded leaving a thickness of 100 to 500 feet. The full thickness of the McAlester Shale immediately beneath the Whirlpool facility has not been determined.

Based on the site boring logs, the top of the shale is present from 26 to 35 feet bgs (Figure 4-3). The upper portion of the shale is typically silty, black to dark-gray, fissile, micaceous shale. Commonly, there is a thin veneer of friable red-orange to gray-brown clay between the base of the gravel zone and the weathered shale. This clay typically grades to the black or dark gray shale of the McAlester Formation.

Soil boring logs, cone penetrometer test logs and monitoring well completion details are provided in Appendix A.

## *4.3 HYDROGEOLOGY*

The facility has been conducting ground water monitoring activities since 1989. Water level measurements from these sampling events, indicate that the predominate direction of shallow ground water flow during fall is to the south and southwest (Figure 4-4). This dominant flow direction, however, changes during the spring to the southeast (Figure 4-5). In addition, recent information implies that ground water flow in the northern portion of the site may have a limited northerly component.

Based on data from numerous ground water investigations at the site, the Basal Aquifer is semi-confined. Calculated hydraulic conductivity values for the Basal Aquifer unit range from 1.74 x 10-4 cm/s up to 1.0 x 10-2 cm/s. One aquifer pumping test conducted at the facility indicated that the average hydraulic conductivity for the north side of the facility is 4.6 x 10-3 cm/s based on an aquifer thickness of 16 feet. The storage coefficient was estimated at 6.5 x 10-3.

Ground water flow velocity for the northern portion of the facility has been calculated at 24 feet per year. Based on a limited number of borings and piezometers installed north of the site, it appears the basal coarse-grained formation pinches out to the north and, consequently, additional studies are needed to assess the potential and characteristics of off-site, northerly ground water flow.

## 5.0 RELEASE PROFILE

As discussed in Section 3, equipment degreasing operations utilizing TCE were previously performed at the facility. However, the use of TCE was discontinued in the mid 1980's and the degreaser building is no longer used for any cleaning operations.

There are no historical records that document any specific spills or other release incidents from the degreaser building. However, it is possible that historical leaks from the tank may have occurred, resulting in releases to the soil and ground water.

Based on historical process knowledge, and recent analytical data, the major constituent of concern (COC) is TCE. Daughter products (including tetrachloroethene, cis- and trans-1,2 dichloroethylene, 1,1-dichloroethylene, and vinyl chloride) resulting from degredation of TCE have also been periodically detected in site wells.

Analytical data from the monitoring well system show that the majority of the affected ground water has migrated from the apparent source area (near MW-25) in a southerly and southwesterly direction under the northwest corner of the main manufacturing building (Figure 5-1). The extent of affected ground water to the south and southwest appears to be limited to the Whirlpool property; that is, the ground water plume does not extend off site in that direction. However, recent data from wells north of the main building, along the north side of Ingersoll Avenue (MW-23, MW-31 through MW-33), indicate that affected ground water is present near the north boundary of the Whirlpool facility and extends off site in a limited area (Figure 5-1).

## 6.0 *ECOLOGICAL PROFILE*

The Whirlpool Fort Smith facility consists of approximately 153 acres. Approximately 21 acres are undeveloped and consist of open grassy areas on the southwestern portion of the property. As indicated previously, the developed portion of the property consists of a warehouse, manufacturing facility and water treatment plant. Concrete driveways and concrete and asphalt parking areas surround the structures. Residential areas are located to the north and south of the property, and commercial industrial properties are located to the east and west.

City of Fort Smith stormwater drainage ditches are located along the northern and eastern boundaries of the property along Ingersoll Avenue and Jenny Lind Road, respectively.

In accordance with the requirements of the CAS an assessment to identify potential endangered and threatened species habitat in the vicinity of the facility has been requested from the U.S Fish and Wildlife Service.

There are no wetlands or gaining streams located north of the facility. Therefore, off-site migration of affected ground water to the north of the facility does not appear to impact any surface water features. Data collected during limited off-site investigation activities indicate that only off-site ground water is affected. Affected off-site soils have not been encountered.

An intermittent drainage channel is also located on the west side of the property and appears to drain to an unnamed tributary of the Poteau River approximately 1.0 mile to the west. The nearest major surface water body is Mill Creek located approximately 0.25-mile to 0.5-mile east of the property. All of these features are located outside of the limit of affected ground water. Based on this profile, it appears that there are no complete exposure pathways from the affected ground water to any ecological receptors in the vicinity of the facility.

## *7.0 RISK MANAGEMENT PROFILE*

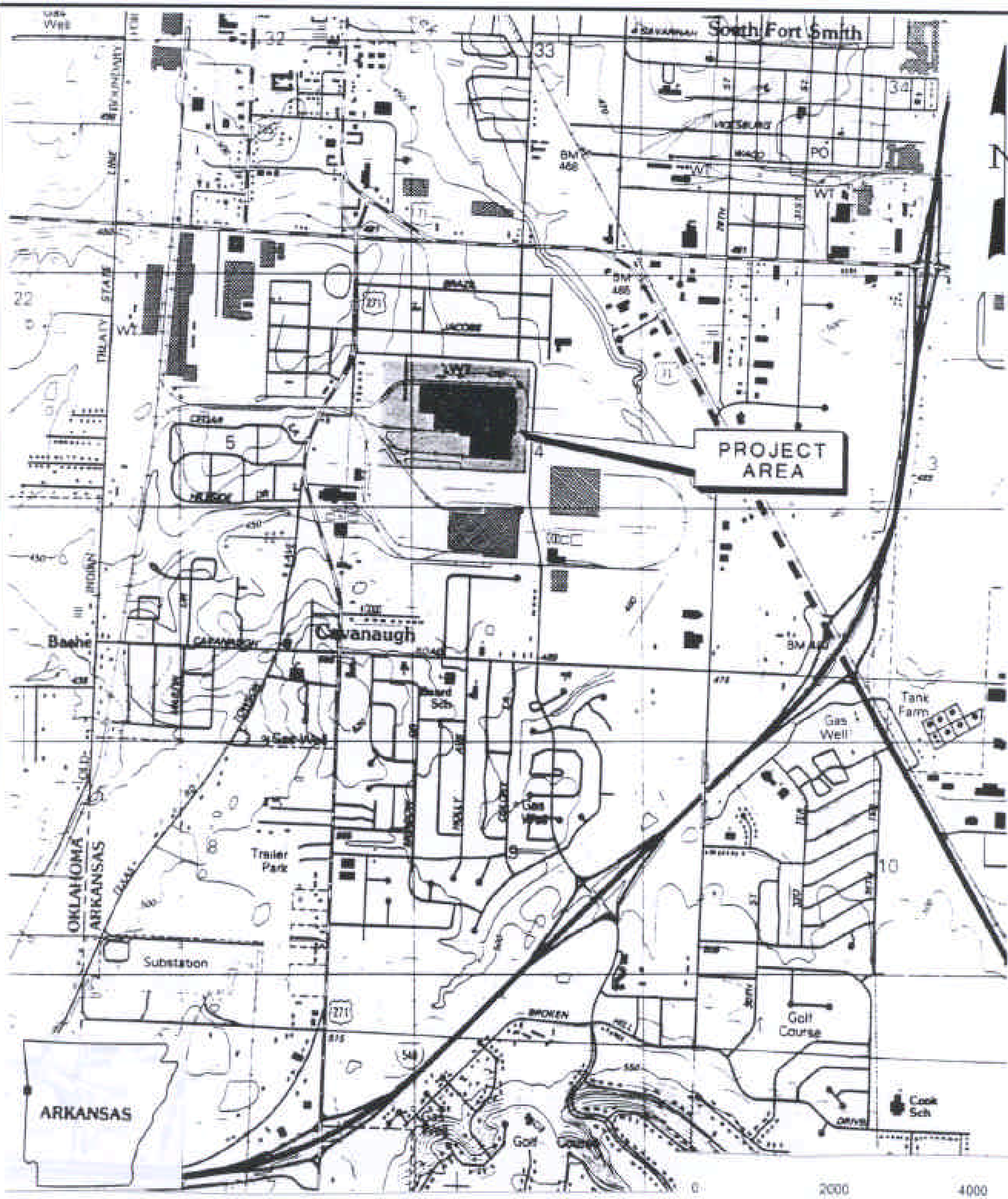
Once additional data is collected and this CSM will be updated. That additional information will then be used to develop a risk management profile for the site. The risk management profile will include the following components:

- Summary of risks
- Impact of a risk management activity on release and exposure characteristics
- Performance monitoring locations and media
- Contingency plans

# Figures

*August 2, 2002*
*W.O. # 581-007*

**Environmental Resources Management**
16300 Katy Freeway, Suite 300
Houston, Texas 77094-1611
(281) 600-1000




SOURCE: U.S.G.S. 7.5' QUADRANGLE, SOUTH FORT SMITH, ARK.-OKLA., 1987.

**ERM-Southwest, Inc.**

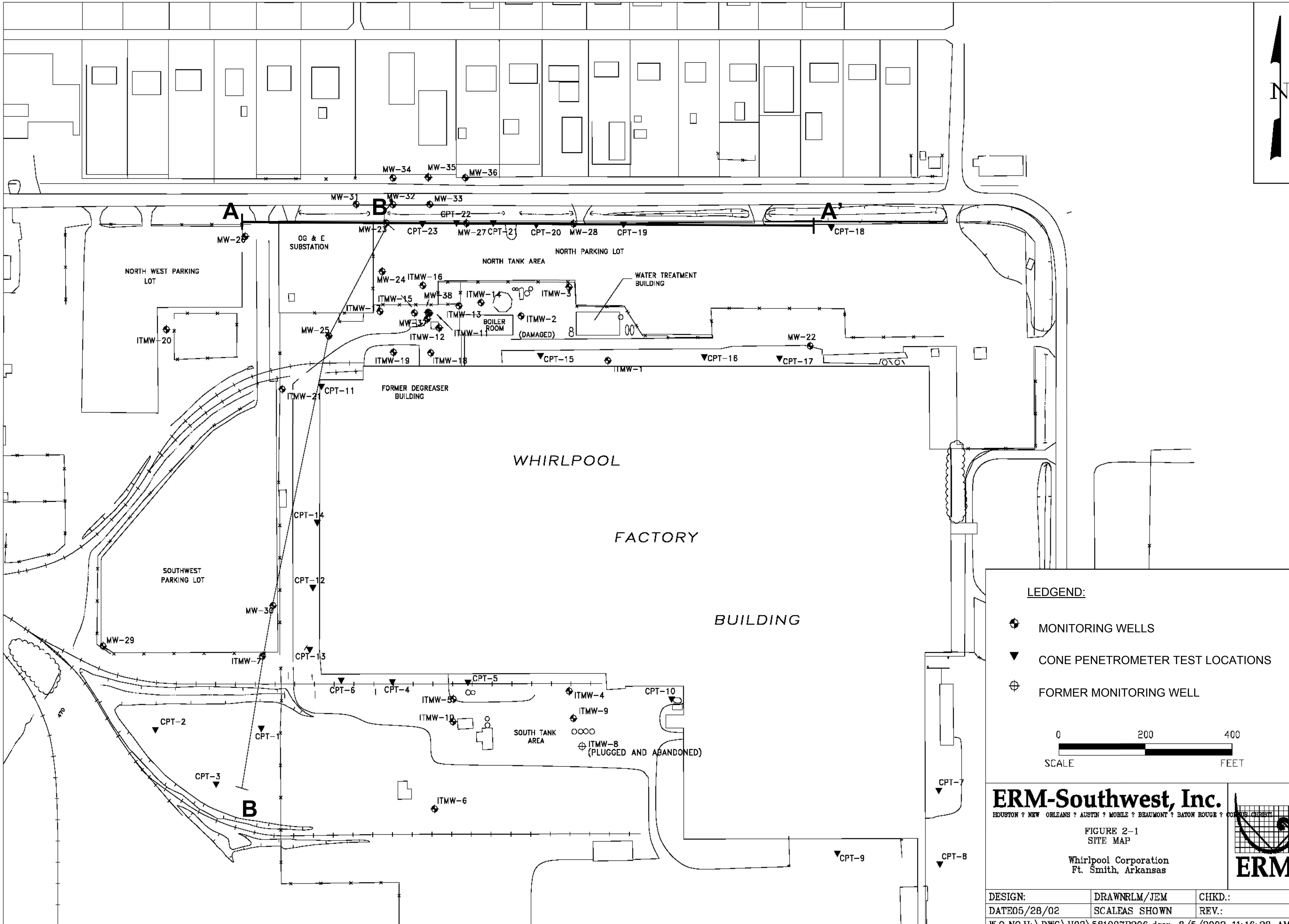
HOUSTON · NEW ORLEANS · AUSTIN · DALLAS · BEAUMONT · BATON ROUGE

FIGURE 1-1
SITE LOCATION MAP
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| | | | |
|---|---|---|---|
| DESIGN: | CHKD.: SK | DATE: 10/23/00 | REV.: |
| DRAWN: EFC | SCALE: AS SHOWN | W.O.NO.: 581002A001 J00 | |

g:\2004\006296\0014507\5578Hfig1-1.pdf




**ERM-Southwest, Inc.**

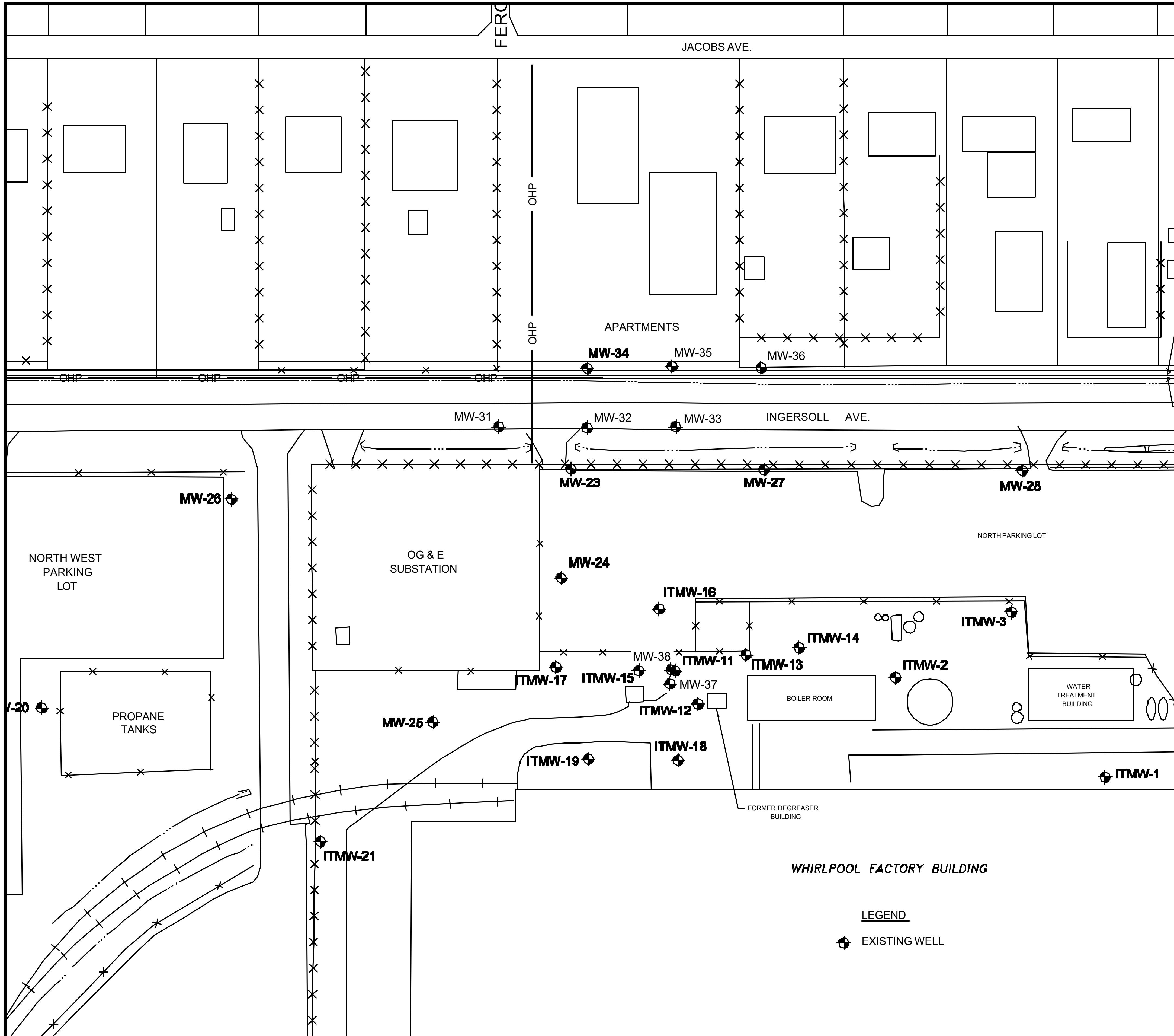
HOUSTON ? NEW ORLEANS ? AUSTIN ? MOBILE ? BEAUMONT ? BATON ROUGE ? CORPUS CHRISTI

FIGURE 2-1
SITE MAP

Whirlpool Corporation
Ft. Smith, Arkansas

ERM

| DESIGN: | DRAWNRLM/JEM | CHKD.: |
| --- | --- | --- |
| DATE05/28/02 | SCALEAS SHOWN | REV.: |
| W.O.NO.H:\DWG\H02\581007B206.dwg, 8/5/2002 11:16:23 AM | | |

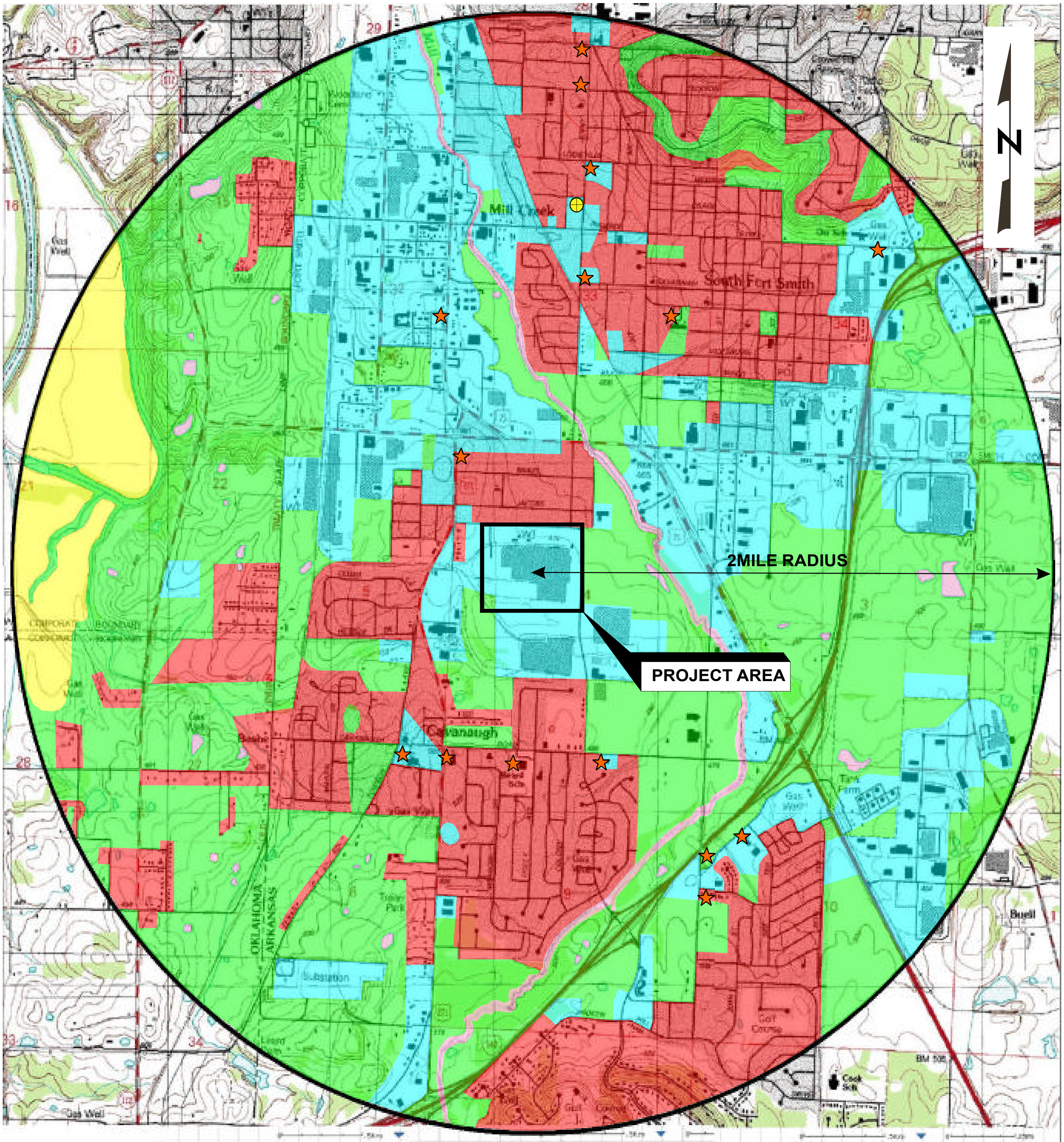



ERM-Southwest, Inc.

FIGURE 2-2
OFFSITE INVESTIGATION LOCATIONS
Whirlpool Corporation
Fort Smith, Arkansas

ERM.

| | | |
|---|---|---|
| DESIGN: JCT | DRAWN: CAK/JEM | CHKD.: |
| DATE: 05/28/02 | SCALE: AS SHOWN | REV.: |
| W.O.NO.: H:\DWG\E02\581007B201.dwg, 8/2/2002 2:40:59 PM | | |




SOURCE: U.S.G.S. 7.5 Minute Quadrangle, South Forth Smith, Arkansas, 1973

LEGEND:

- RESIDENTIAL
- UNDERDEVELOPED
- AGRICULTURAL
- COMMERCIAL / INDUSTRIAL
- SURFACE WATER
- HOSPITAL
- SCHOOL / DAYCARE

0 3000 6000

SCALE FEET

**ERM-Southwest, Inc.**

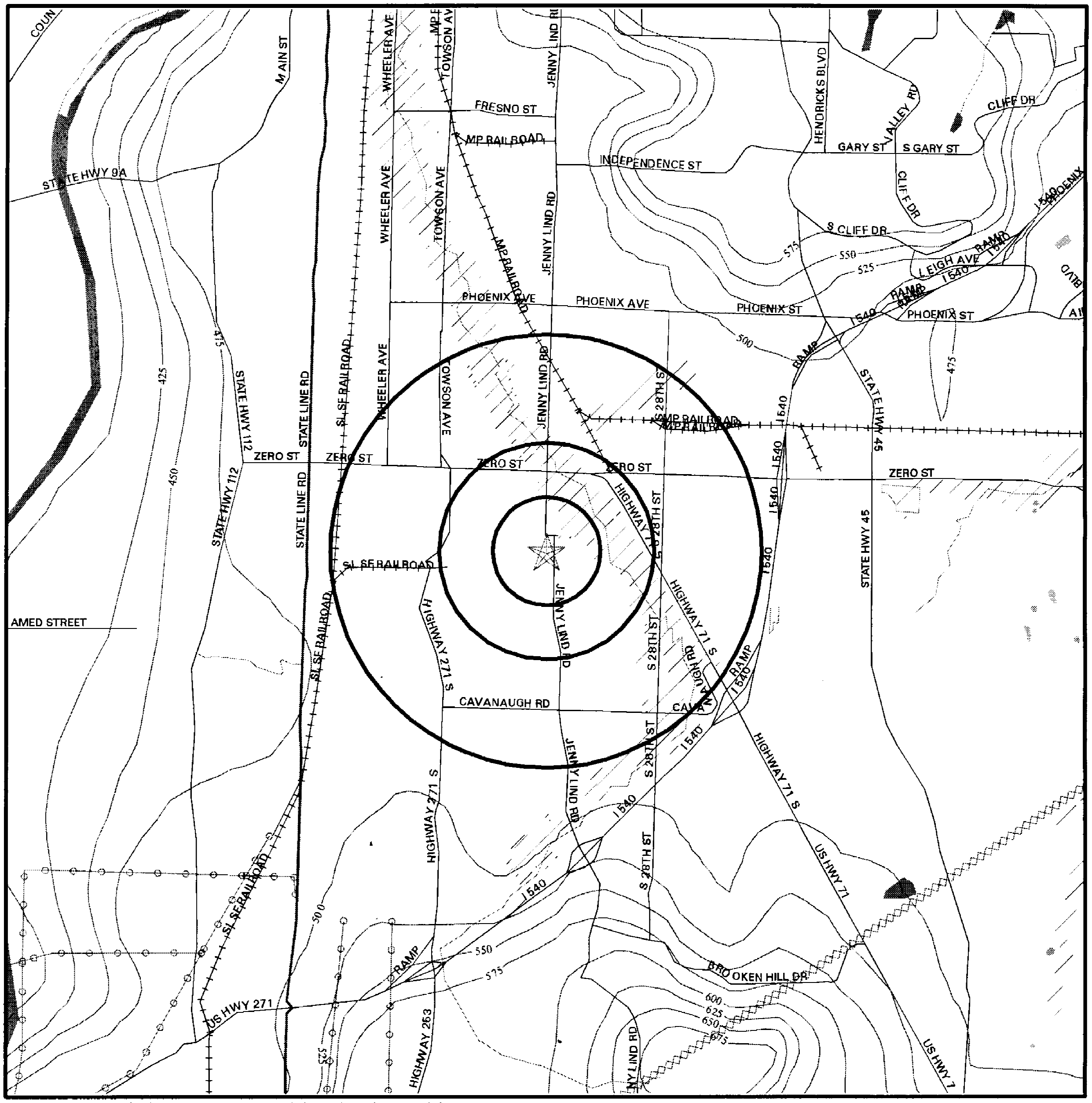
HOUSTON • NEW ORLEANS • AUSTIN • DALLAS • BEAUMONT • BATON ROUGE

FIGURE 3-1
LAND USE MAP
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| | | | |
|---|---|---|---|
| DESIGN: JCT | CHKD.: TM | DATE: 05/31/02 | REV.: 0 |
| DRAWN: JEM | SCALE: AS SHOWN | W.O.NO.: 581007A208 E02 | |

TOPOGRAPHIC MAP –591164.1s –'ERM –Southwest, Inc.'




Source: US Geological Survey 1-Degree Digital Elevation Model
Compiled 09/15/92

0 1/2 1 2

scale in miles

–Major Roads
–Contour lines (25 foot interval unless otherwise shown)
–Waterways
–Wells within search distance to Target Property
–Earthquake Epicenters (Richter 5 or greater)
–Power lines
–Pipe lines
–Fault lines
–Water
–Wetlands
–100-year flood zone
–500-year flood zone

N

| | | | |
|---|---|---|---|
| TARGET PROPERTY: | Whirlpool Corporation | CUSTOMER: | ERM –Southwest, Inc. |
| ADDRESS: | 6400 Jenny Lind Rd | CONTACT: | Roberta Smith |
| CITY/STATE/ZIP: | Fort Smith AR 72908 | INQUIRY #: | 591164.1s |
| LAT/LONG: | 35.3224 / 94.4137 | DATE: | February 02, 2001 |

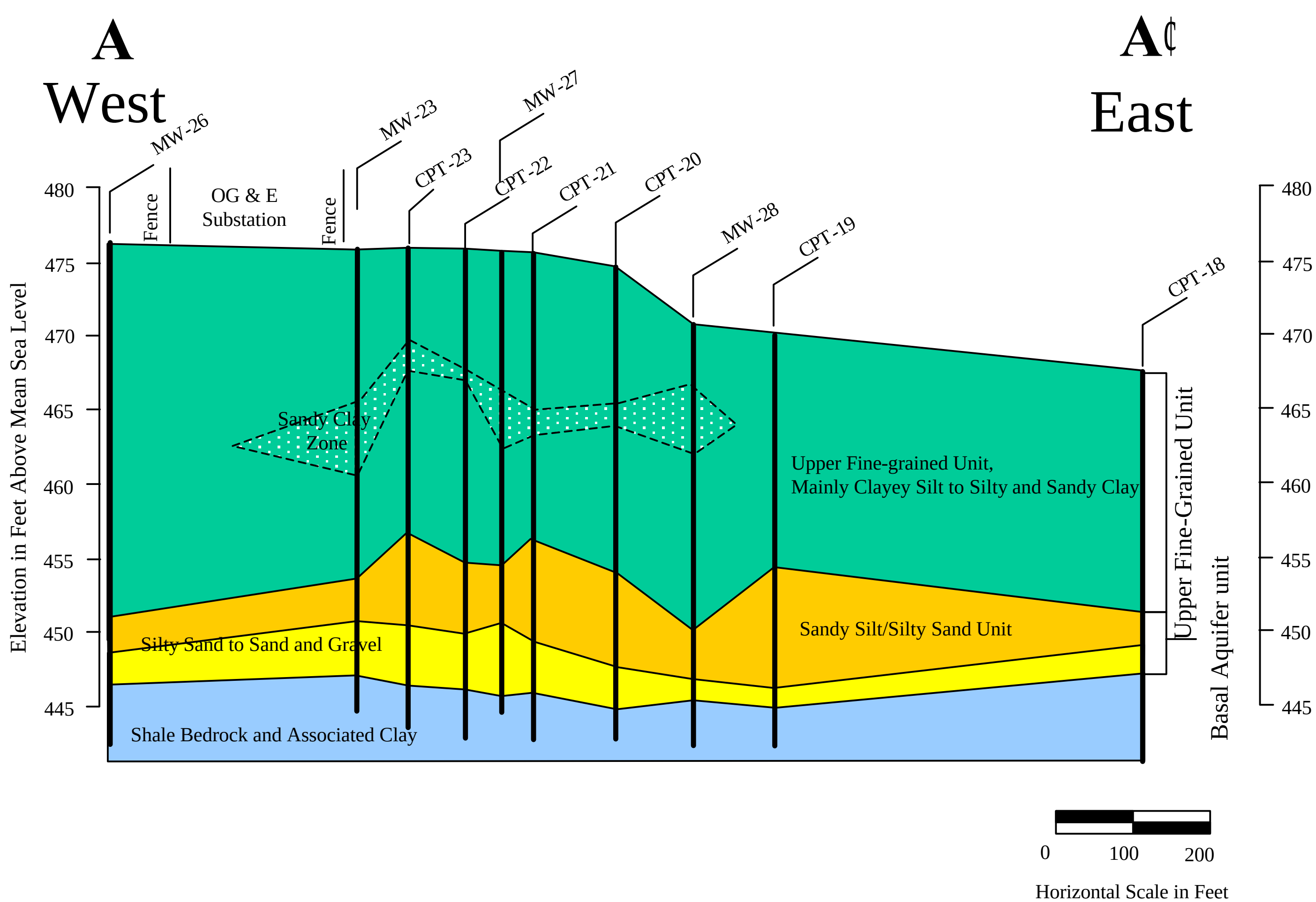
**ERM-Southwest, Inc.**

HOUSTON · NEW ORLEANS · AUSTIN · DALLAS · BEAUMONT · BATON ROUGE · CORPUS CHRISTI

| | | |
|---|---|---|
| DESIGN: | DRAWN: | CHKD.: |
| DATE: 05/23/02 | SCALE: AS SHOWN | REV.: |
| W.O.NO.: H:\DWG\E02\581007A207.dwg, 8/2/2002 2:14:22 PM | | |

FIGURE 3-2
WATER WELL RADIUS SEARCH RESULTS
Whirlpool Corporation
Fort Smith, Arkansas

ERM



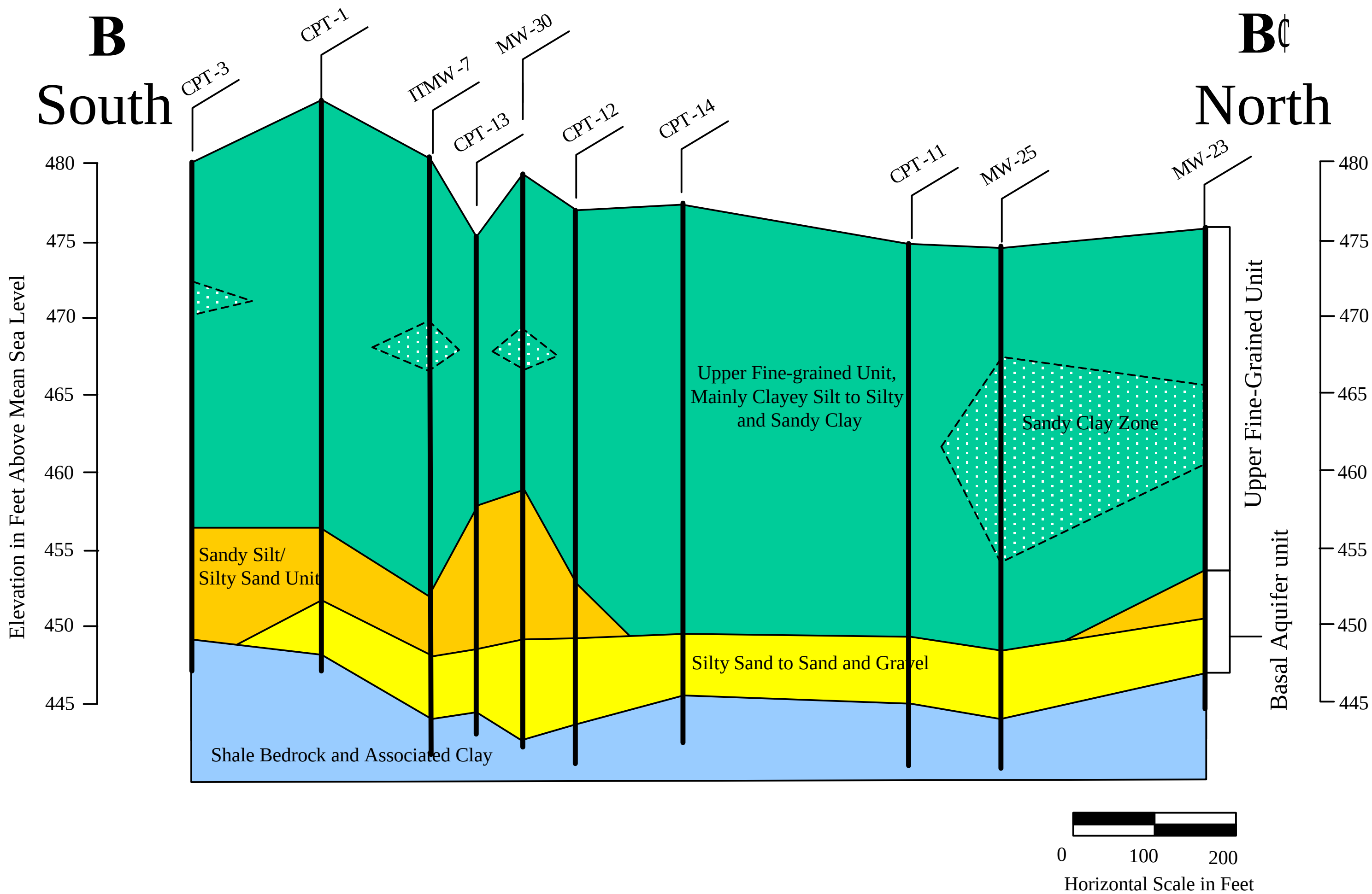

**ERM-Southwest, Inc.**

HOUSTON • NEW ORLEANS • AUSTIN • DALLAS • BEAUMONT • BATON ROUGE

| | | | |
|---|---|---|---|
| DESIGN: | CHKD.: | DATE: 05/21/02 | REV.: |
| DRAWN: | SCALE:AS SHOWN | W.O.NO.: 581007A205 H02 | |

FIGURE 4-1
Cross Section along Ingersoll Avenue
Whirlpool Corporation
Fort Smith, Arkansas

ERM®

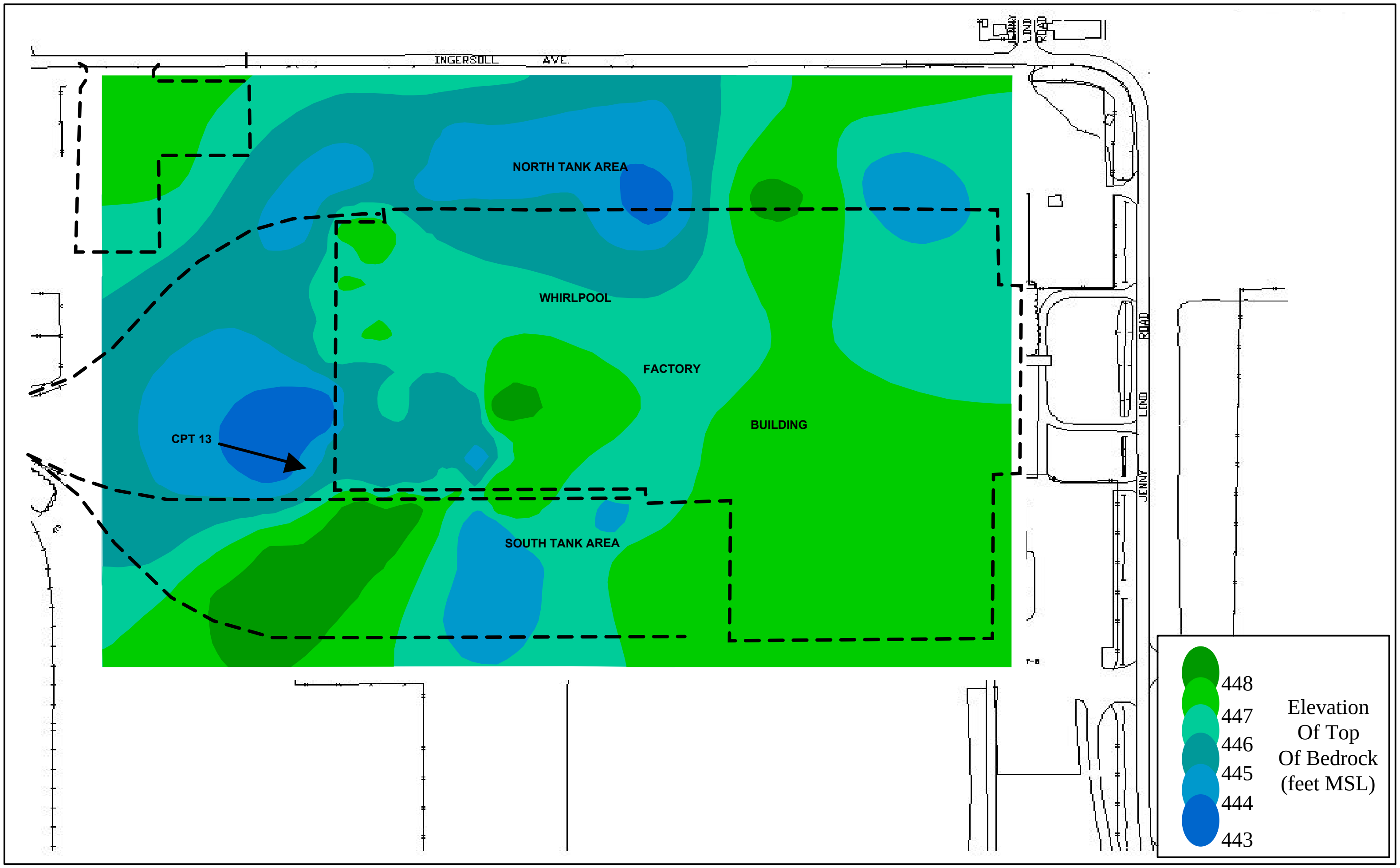



ERM-Southwest, Inc.
HOUSTON • NEW ORLEANS • AUSTIN • DALLAS • BEAUMONT • BATON ROUGE

| DESIGN: | CHKD.: | DATE: 05/21/02 | REV.: |
|---|---|---|---|
| DRAWN: | SCALE:AS SHOWN | W.O.NO.: 581007A205 E02 | |

FIGURE 4-2
Cross Section Along West Side of Building
Whirlpool Corporation
Fort Smith, Arkansas

ERM



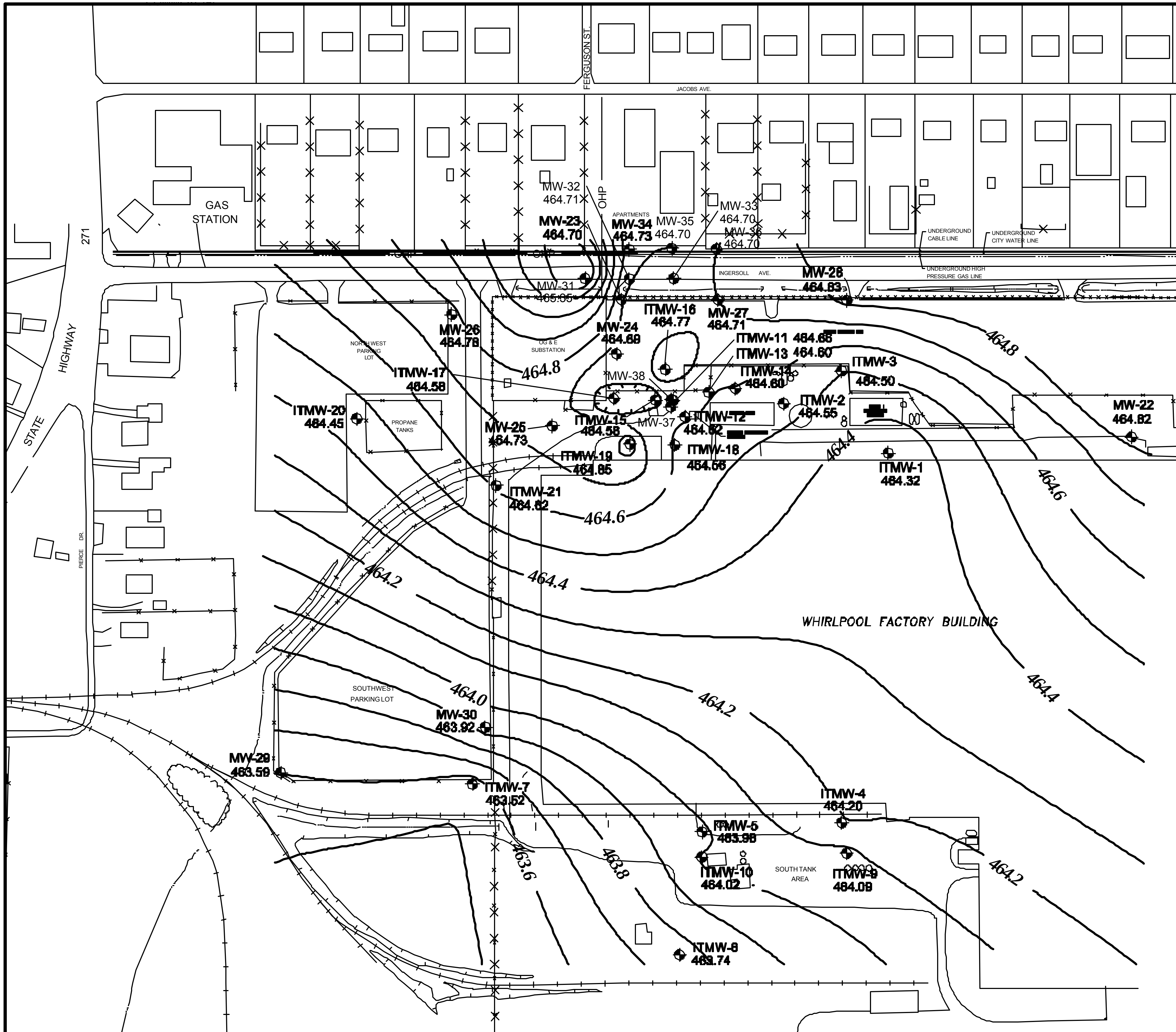

ERM-Southwest, Inc.

HOUSTON • NEW ORLEANS • AUSTIN • DALLAS • BEAUMONT • BATON ROUGE

| DESIGN: | CHKD.: | DATE: 07/31/02 | REV.: |
|---|---|---|---|
| DRAWN: | SCALE: AS SHOWN | W.O.NO.: 581007A210.ppt G02 | |

FIGURE 4-3
Contour Map of McAlester Shale Surface
Whirlpool corporation
Fort Smith, Arkansas

ERM®




LEGEND

MW-26 464.98 — EXISTING MONITORING WELL

464.0 — GROUND WATER CONTOUR LINE (FEET, MSL) (CONTOUR INTERVAL = 0.1 FEET)

NOTES:

1. DATA RECORDED ON SEPTEMBER 10, 2001.
2. CONTOURS UNDER THE FACTORY BUILDING ARE INFERRED.
3. LOCATIONS FOR WELLS ITMW-37 AND ITMW-38 ARE APPROXIMATE AND WILL BE UPDATED WHEN SURVEY DATA ARE RECEIVED.

0 200 400

SCALE FEET

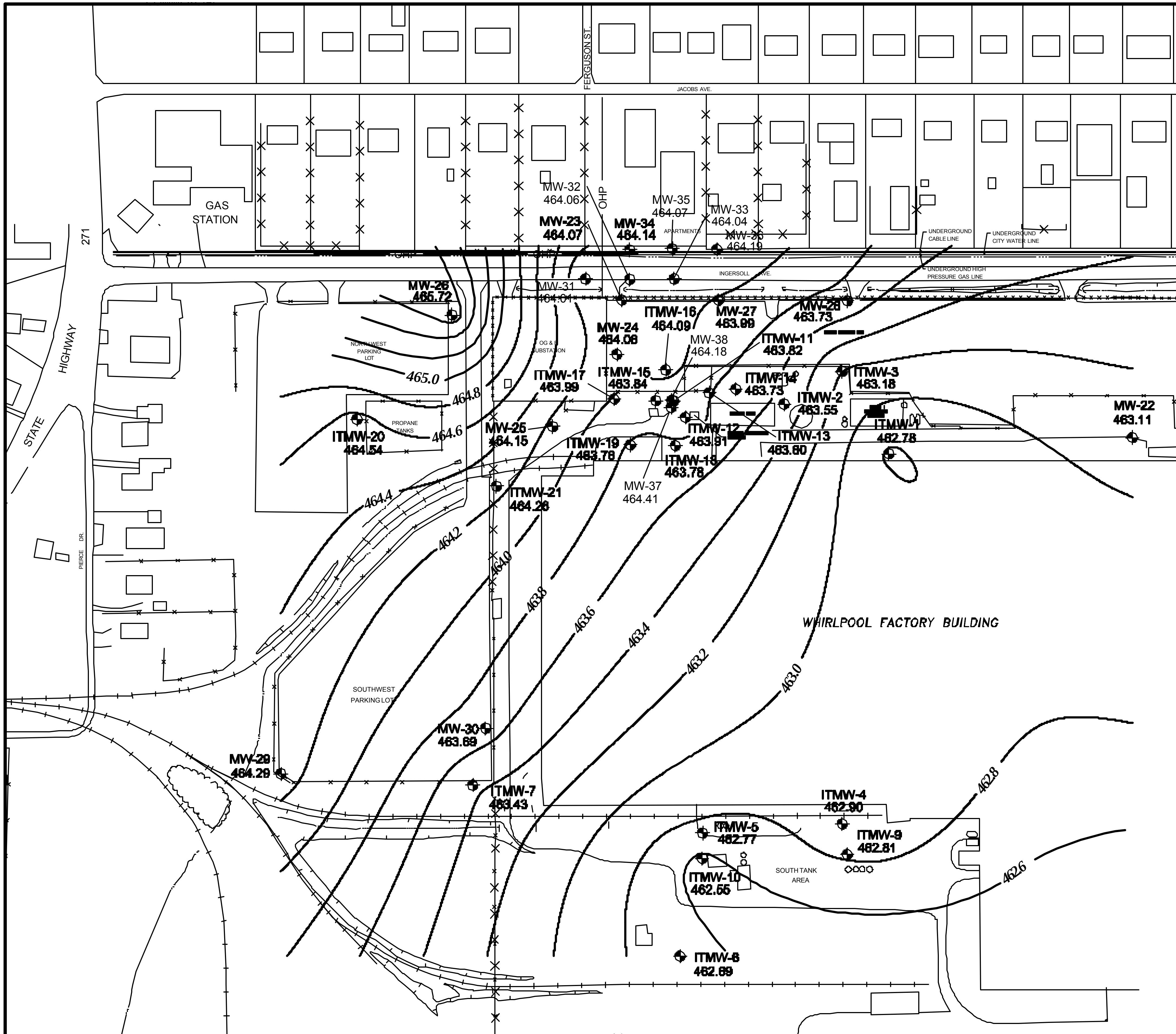
**ERM-Southwest, Inc.**

HOUSTON · NEW ORLEANS · AUSTIN · DALLAS · BEAUMONT · BATON ROUGE

FIGURE 4-4
POTENTIOMETRIC SURFACE MAP
SEPTEMBER 2001
Whirlpool Corporation
Fort Smith, Arkansas

| | | | |
|---|---|---|---|
| DESIGN: JT | CHKD.: | DATE: 05/28/02 | REV.: |
| DRAWN: LMc/JEM | SCALE: AS SHOWN | W.O.NO.: 581007B202 E02 | |

ERM




LEGEND

MW-26 465.72 — EXISTING MONITORING WELL

464.0 — GROUND WATER CONTOUR LINE (FEET, MSL) (CONTOUR INTERVAL = 0.2 FEET)

NOTES:

1. DATA RECORDED ON FEBRUARY 18, 2002.

2. CONTOURS UNDER THE FACTORY BUILDING ARE INFERRED.

3. MW-37 AND MW-38 WATER LEVELS WERE NOT USED TO CONTOUR THIS MAP DUE TO ANOMALOUS READINGS.

0 200 400

SCALE FEET

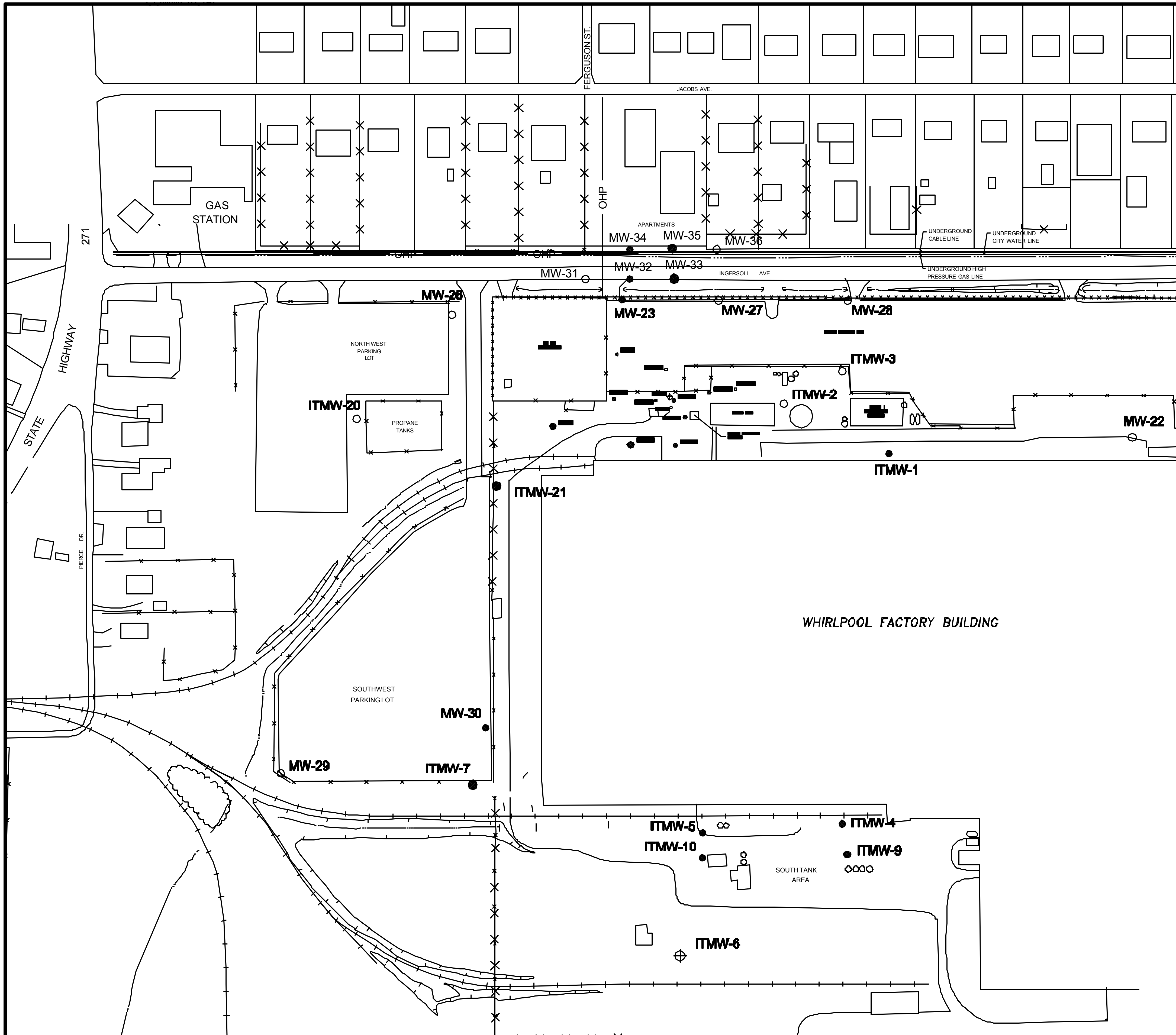
**ERM-Southwest, Inc.**

HOUSTON • NEW ORLEANS • AUSTIN • DALLAS • BEAUMONT • BATON ROUGE

FIGURE 4-5
POTENTIOMETRIC SURFACE MAP
FEBRUARY 2002
Whirlpool Corporation
Fort Smith, Arkansas

| | | | |
|---|---|---|---|
| DESIGN: JT | CHKD.: | DATE: 05/20/02 | REV.: |
| DRAWN: CAK | SCALE: AS SHOWN | W.O.NO.: 581007B203 E02 | |

ERM




N

LEGEND

MW-26 EXISTING MONITORING WELL SAMPLED USING TRADITIONAL PURGE METHOD

EXISTING MONITORING WELL NOT SAMPLED USING TRADITIONAL PURGE METHOD

TCE CONCENTRATION (mg/l)
FEBRUARY 2002

- < 0.005
- 0.005 to 0.10
- 0.10 to 1.00
- 1.00 to 10.0
- > 10.0

NOTE:

1) MW-38 WAS USED AS AN INJECTION WELL FOR THE PILOT STUDY AND WAS NOT SAMPLED IN FEBRUARY 2002.

0 200 400
SCALE FEET

**ERM-Southwest, Inc.**
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FIGURE 5-1
TCE ISOCONCENTRATION MAP
FEBRUARY 2002
TRADITIONAL SAMPLE METHOD
Whirlpool Corporation
Fort Smith, Arkansas

| DESIGN: JT | CHKD.: | DATE: 05/28/02 | REV.: |
|---|---|---|---|
| DRAWN: LMc/JEM | SCALE: AS SHOWN | W.O.NO.: 581009B202 E02 | |

ERM

# Boring Logs

*Appendix A*

*August 2, 2002*
*W.O. # 581-007*

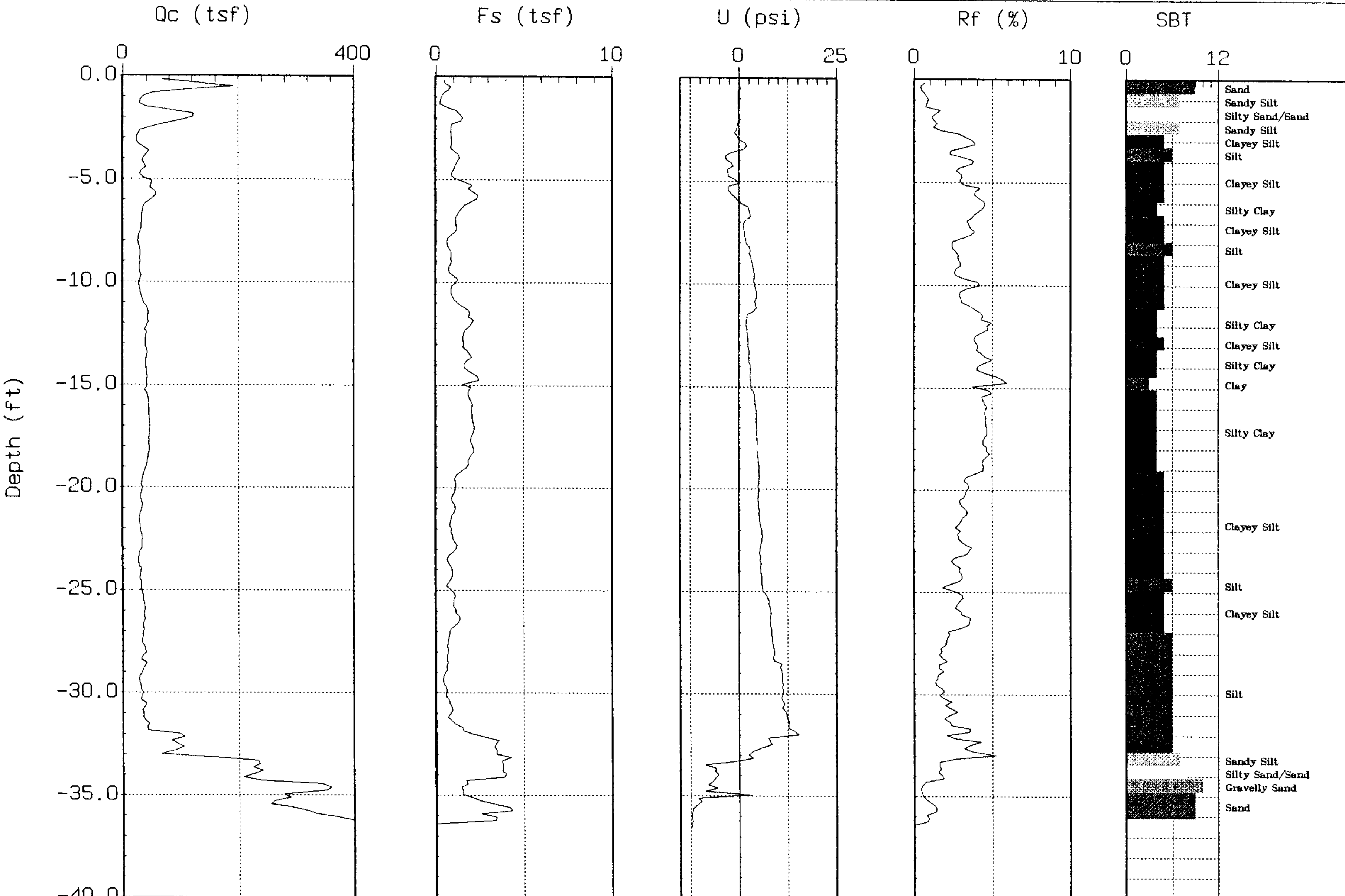
**Environmental Resources Management**
16300 Katy Freeway, Suite 300
Houston, Texas 77094-1611
(281) 600-1000

GREGG

ERM Southwest

Site : WHIRLPOOL
Location : CPT-01

Geologist : Lori Pfeil
Date : 10:25:99 09:57



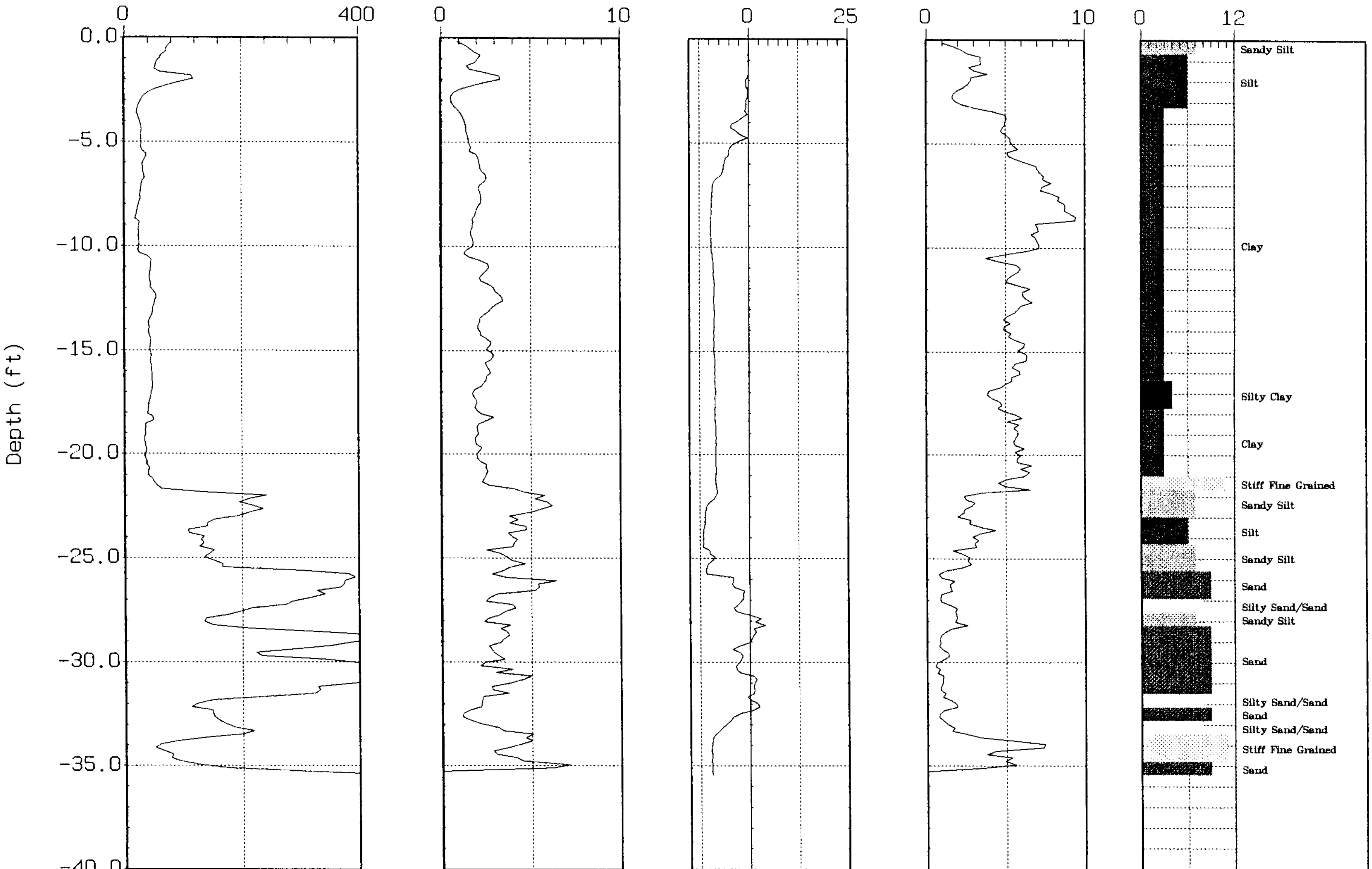

Max. Depth: 36.58 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site : WHIRLPOOL
Location : CPT-02

Geologist: Lori Pfeil
Date : 10:25:99 10:52




Max. Depth: 35.43 (ft)

Depth Inc.: 0.164 (ft)

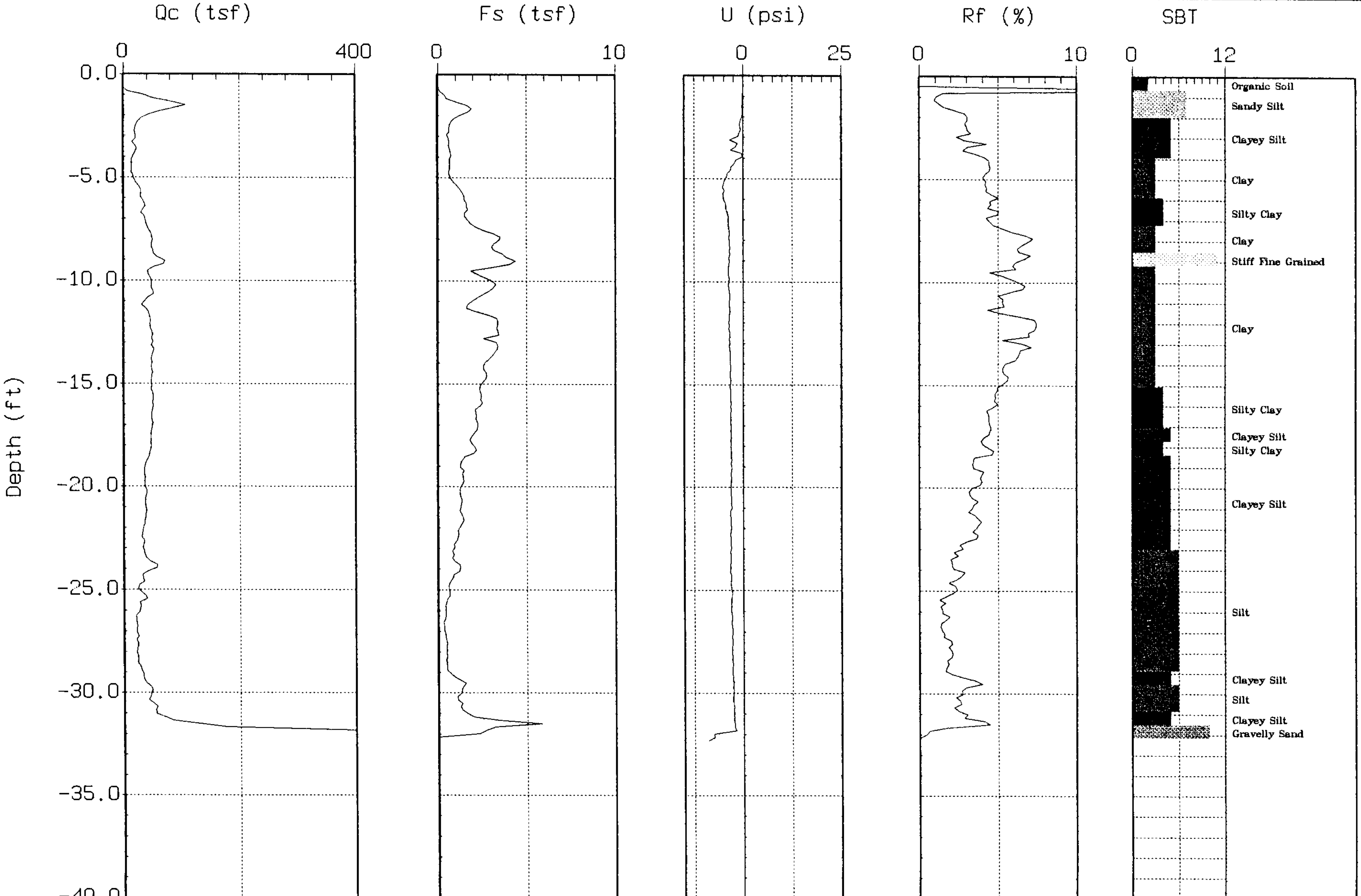
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

# ERM Southwest

Site : WHIRLPOOL
Location : CPT-03

Geologist: Lori Pfeil
Date : 10:25:99 11:35




Max. Depth: 32.32 (ft)

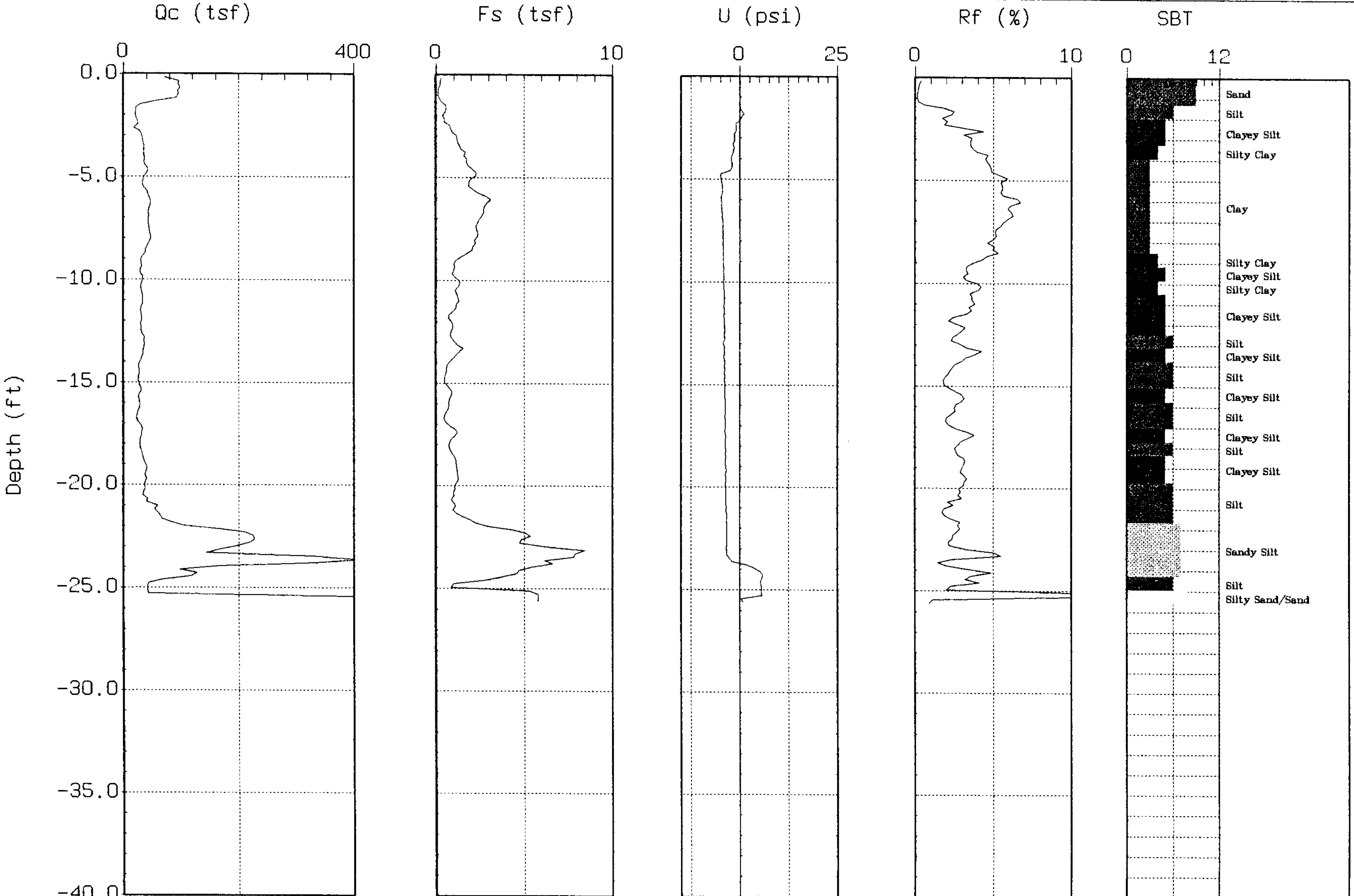
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site : WHIRLPOOL
Location : CPT-04

Geologist: Lori Pfeil
Date : 10:25:99 13:03




Max. Depth: 25.59 (ft)

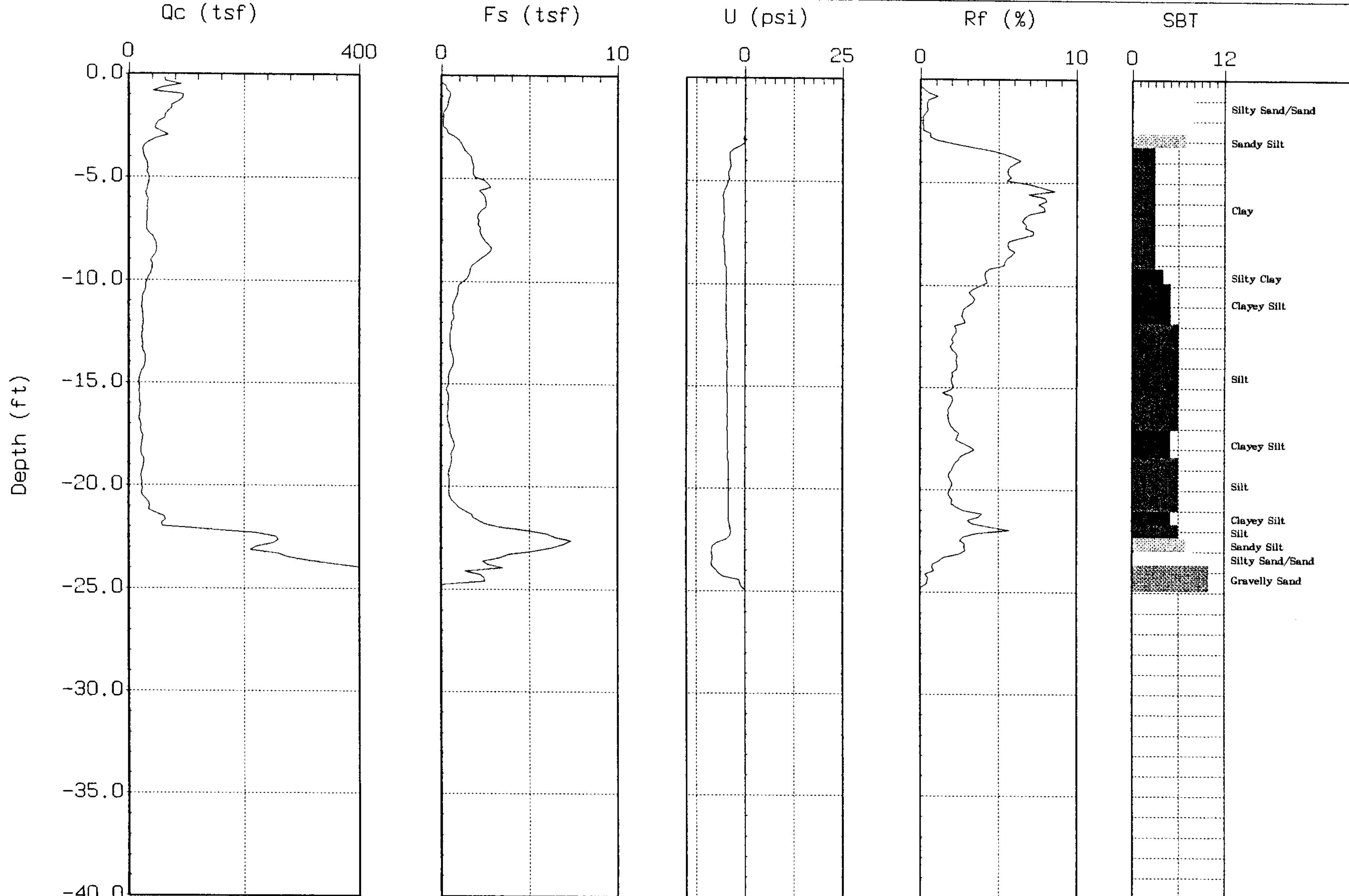
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site : WHIRLPOOL
Location : CPT-05

Geologist: Lori Pfeil
Date : 10:25:99 13:41




Max. Depth: 24.93 (ft)

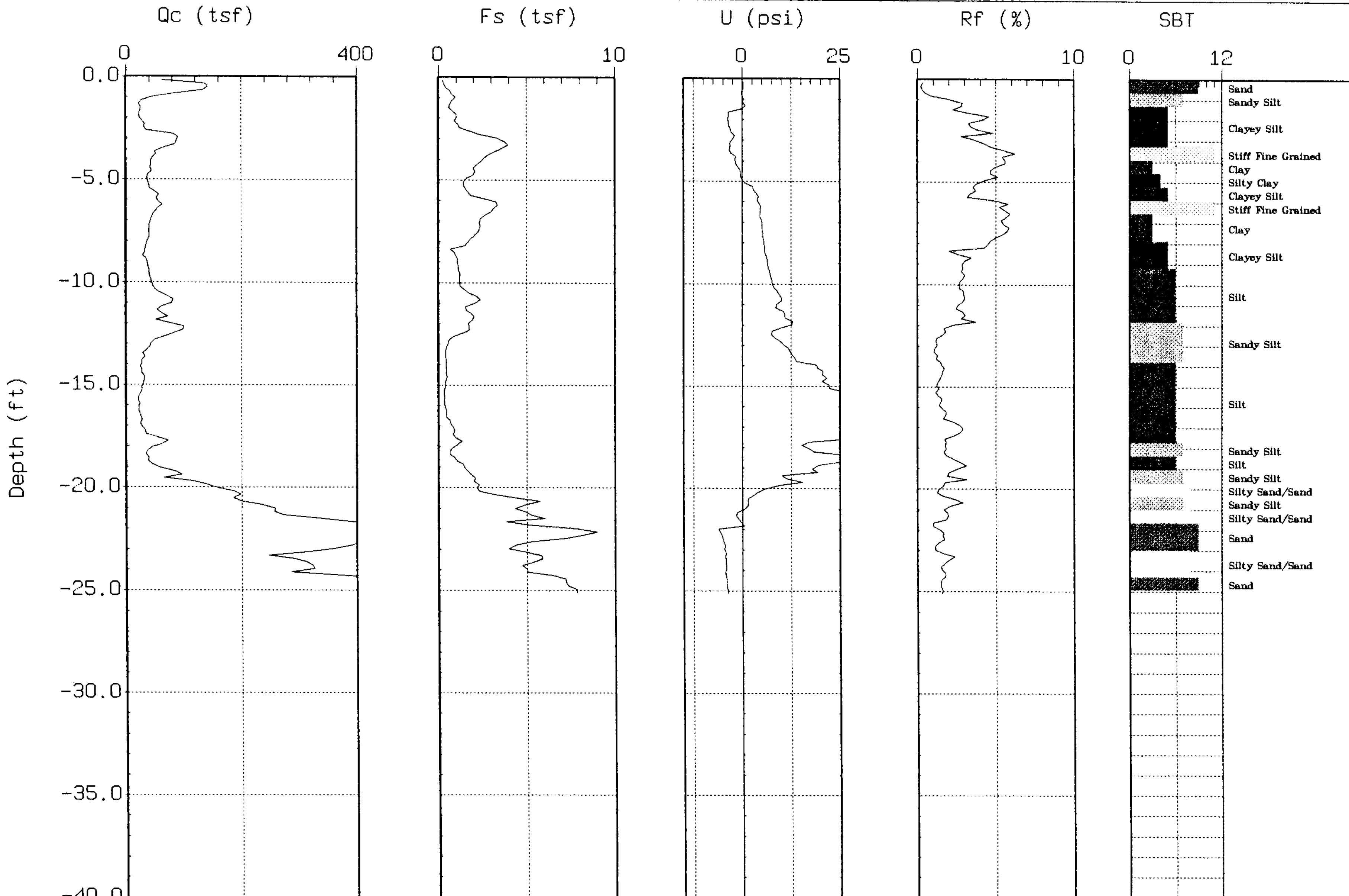
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site :WHIRLPOOL
Location : CPT-06

Geologist:Lori Pfeil
Date : 10:25:99 14:34




Max. Depth: 25.10 (ft)
Depth Inc.: 0.164 (ft)

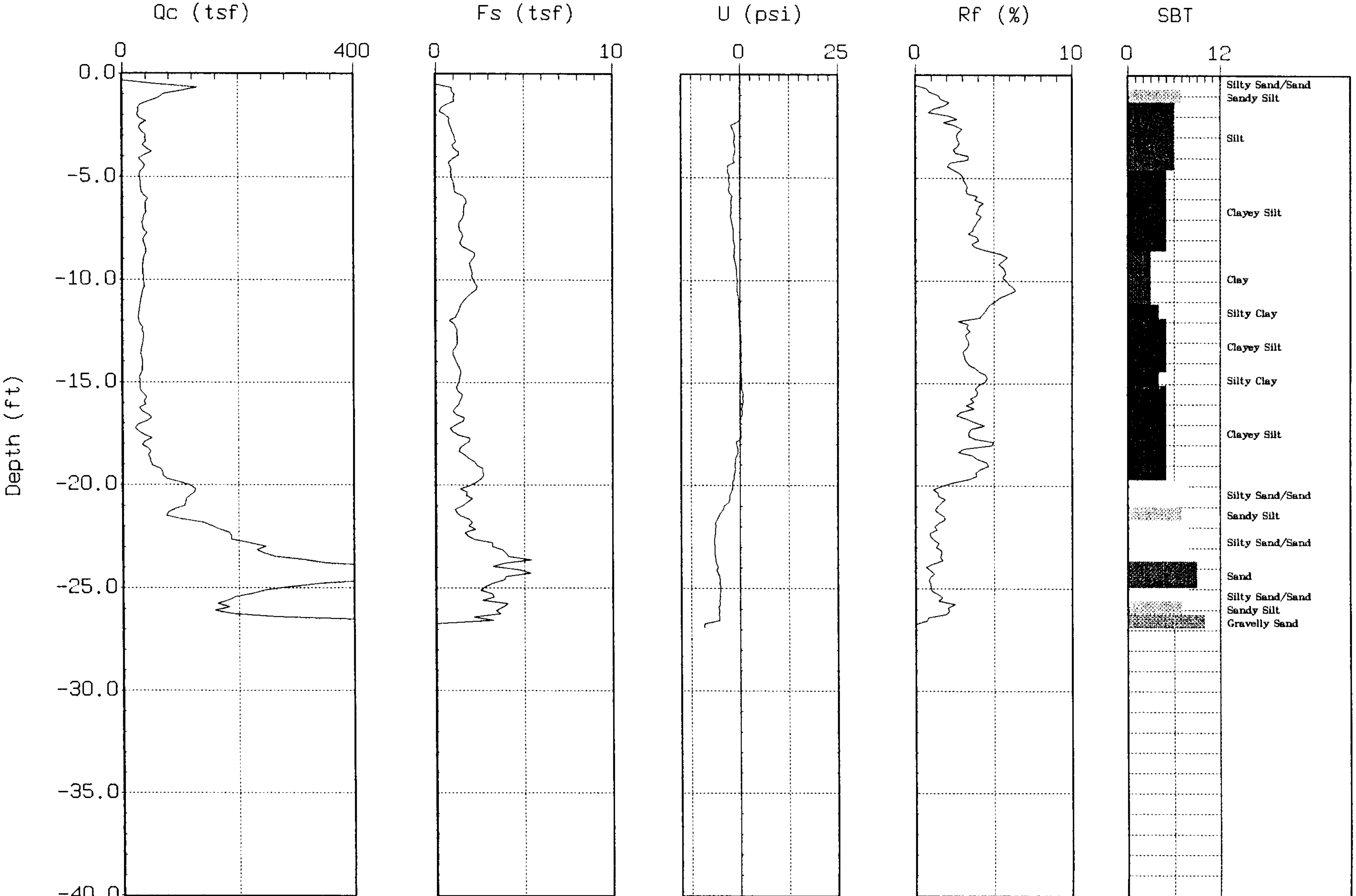
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

# ERM Southwest

Site :WHIRLPOOL
Location : CPT-07

Geologist:Lori Pfeil
Date : 10:25:99 15:28




Max. Depth: 26.90 (ft)

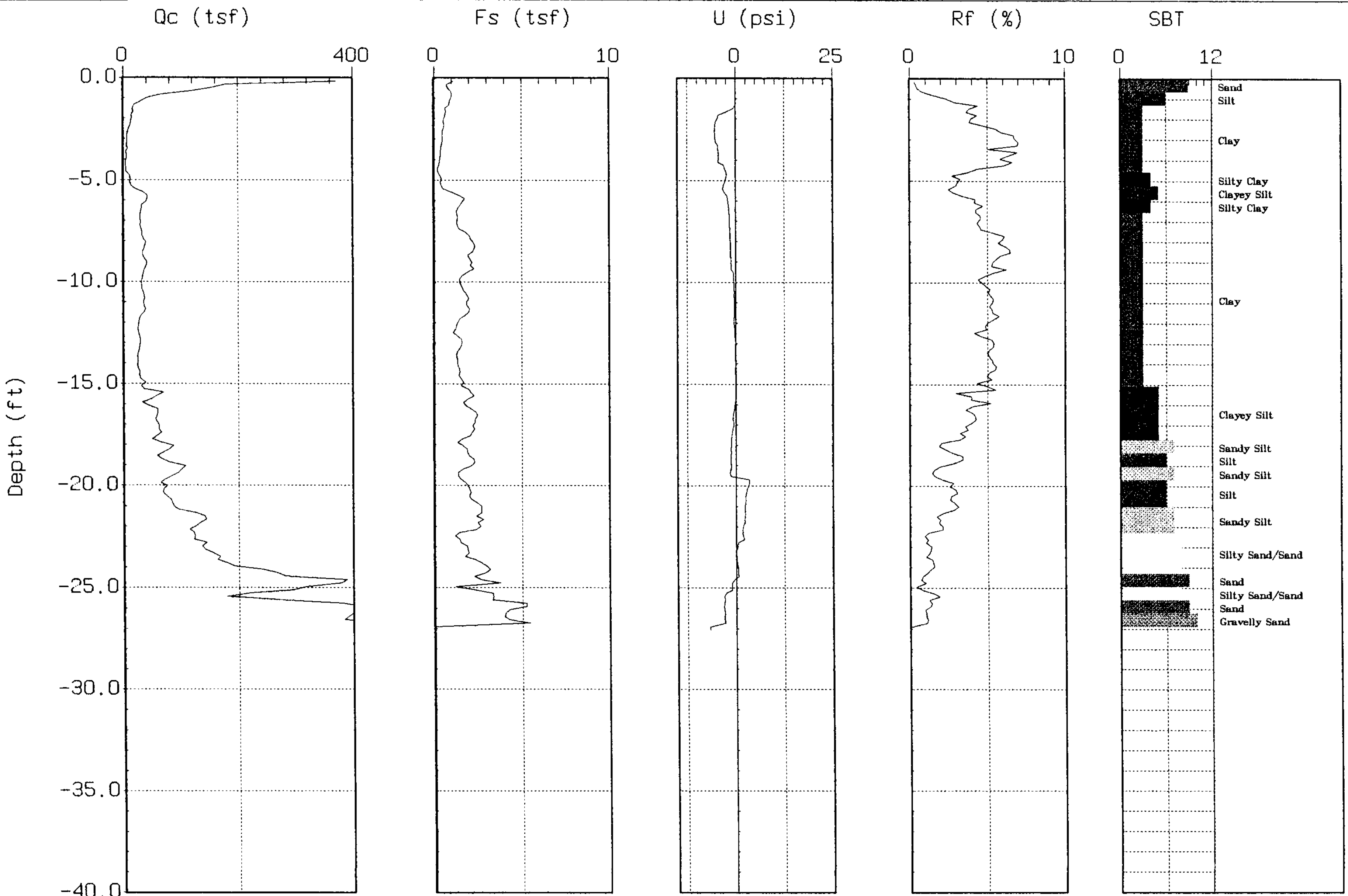
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site : WHIRLPOOL
Location : CPT-08

Geologist: Lori Pfeil
Date : 10:25:99 16:02




Max. Depth: 27.07 (ft)

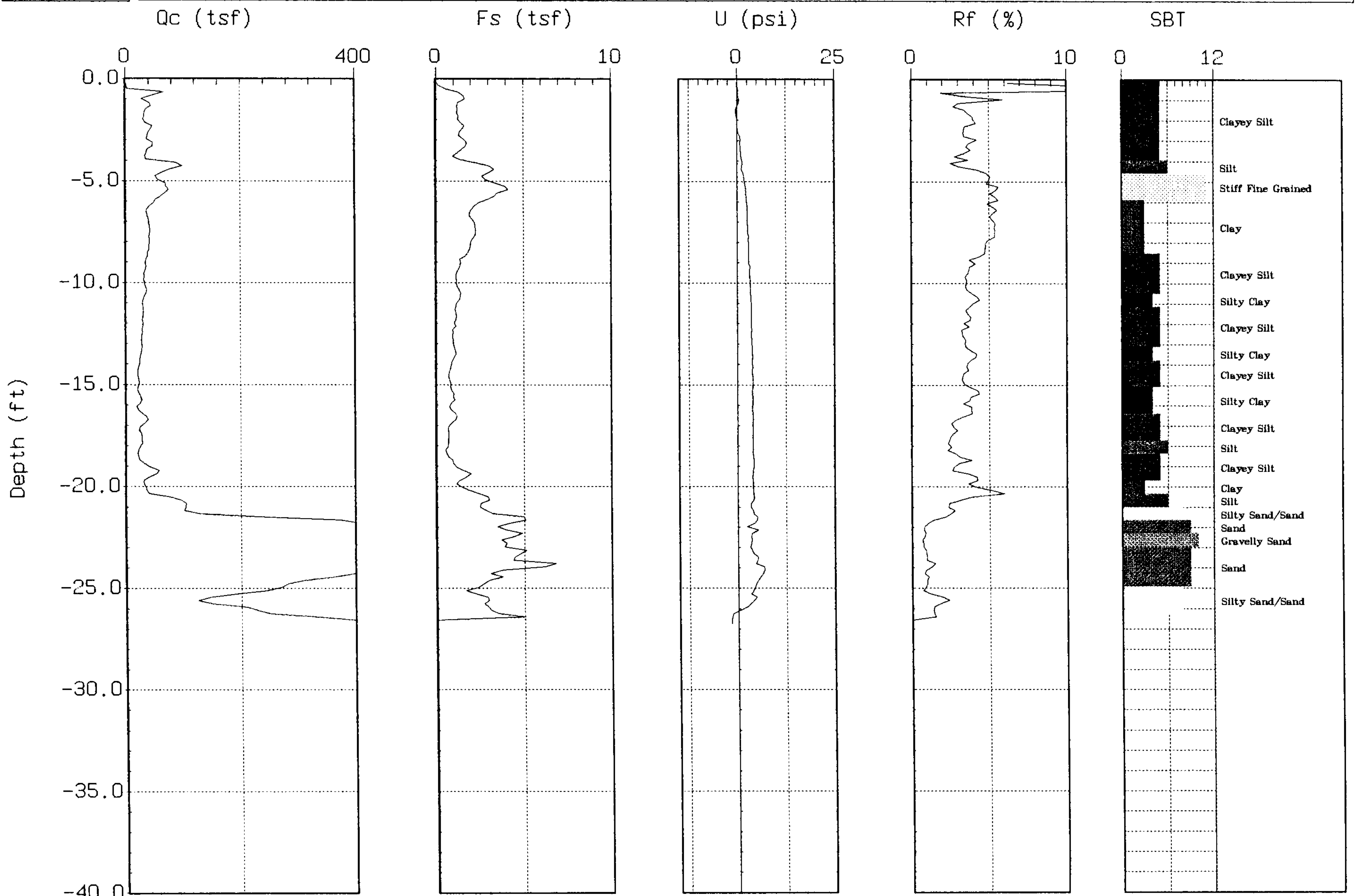
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site : WHIRLPOOL
Location : CPT-09

Geologist: Lori Pfeil
Date : 10:25:99 16:30




Max. Depth: 26.74 (ft)

Depth Inc.: 0.164 (ft)

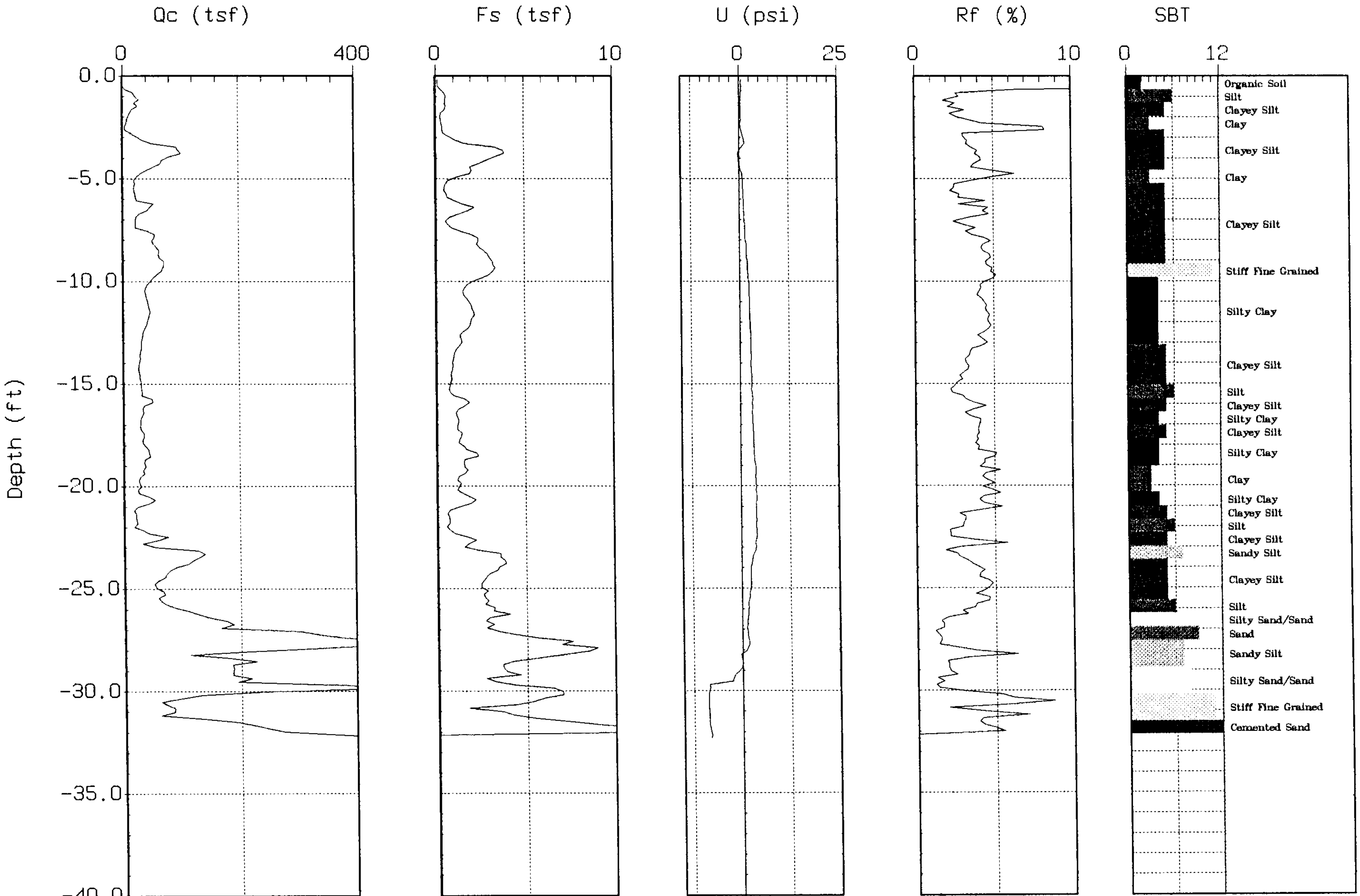
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

# ERM Southwest

Site : WHIRLPOOL
Location : CPT-10

Geologist: Lori Pfeil
Date : 10:25:99 17:01




Max. Depth: 32.32 (ft)

Depth Inc.: 0.164 (ft)

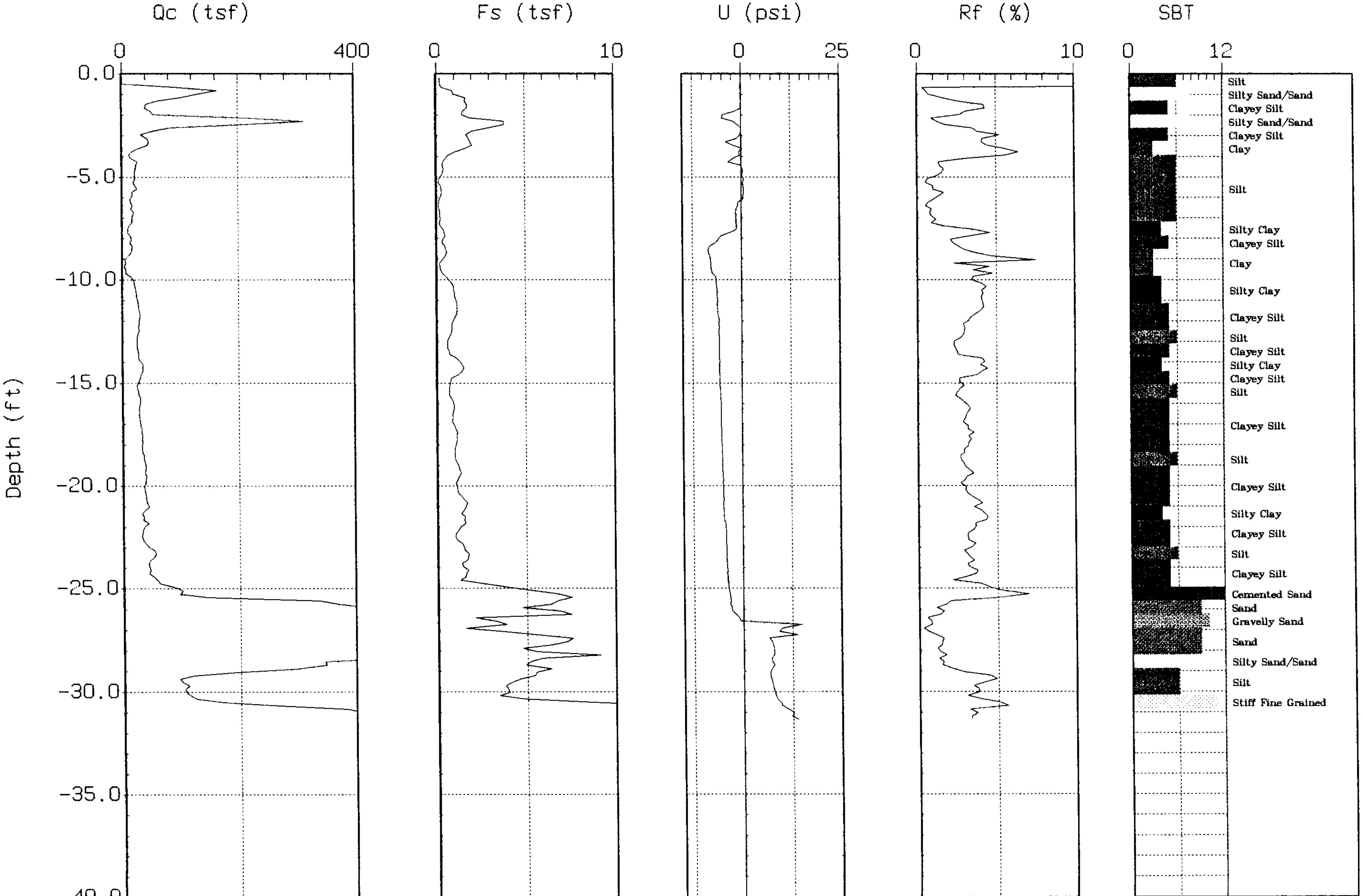
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

ERM Southwest

Site :WHIRLPOOL
Location : CPT-11

Geologist:Lori Pfeil
Date : 10:25:99 17:55




Max. Depth: 31.33 (ft)

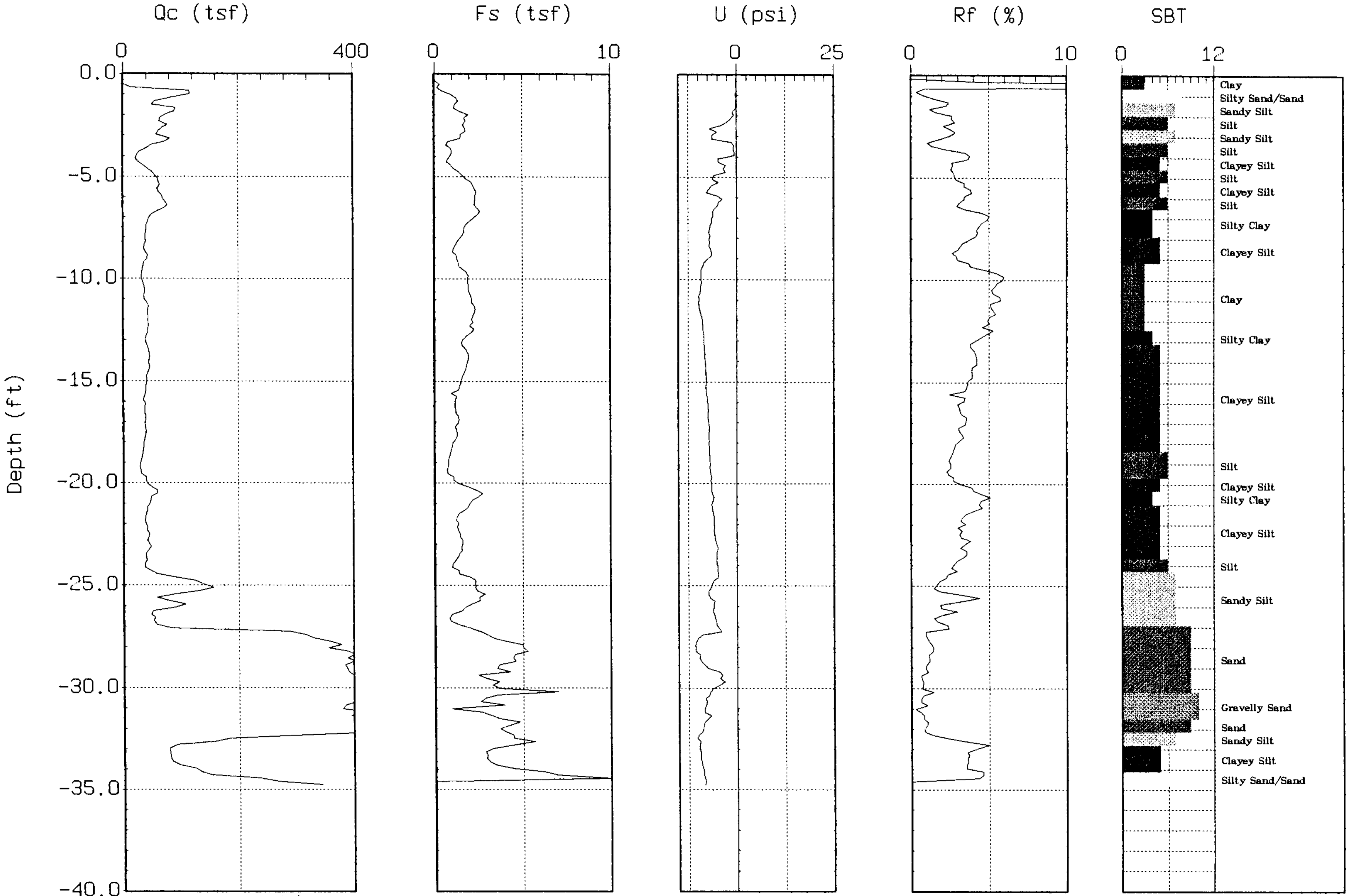
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site : WHIRLPOOL
Location : CPT-12

Geologist: Lori Pfeil
Date : 10:26:99 08:42




Max. Depth: 34.78 (ft)

Depth Inc.: 0.164 (ft)

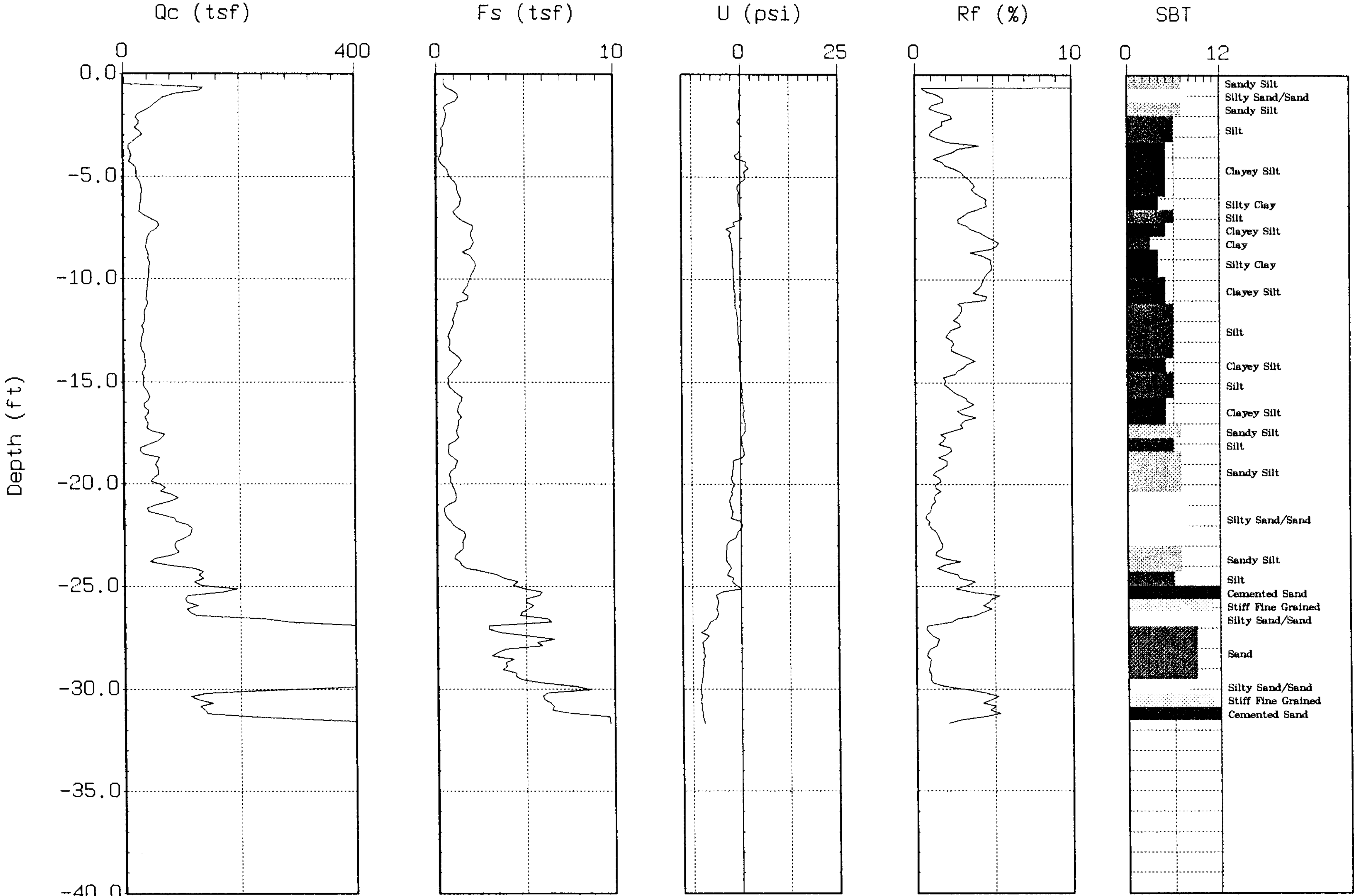
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

# ERM Southwest

Site :WHIRLPOOL
Location : CPT-13

Geologist:Lori Pfeil
Date : 10:26:99 09:24




Max. Depth: 31.66 (ft)

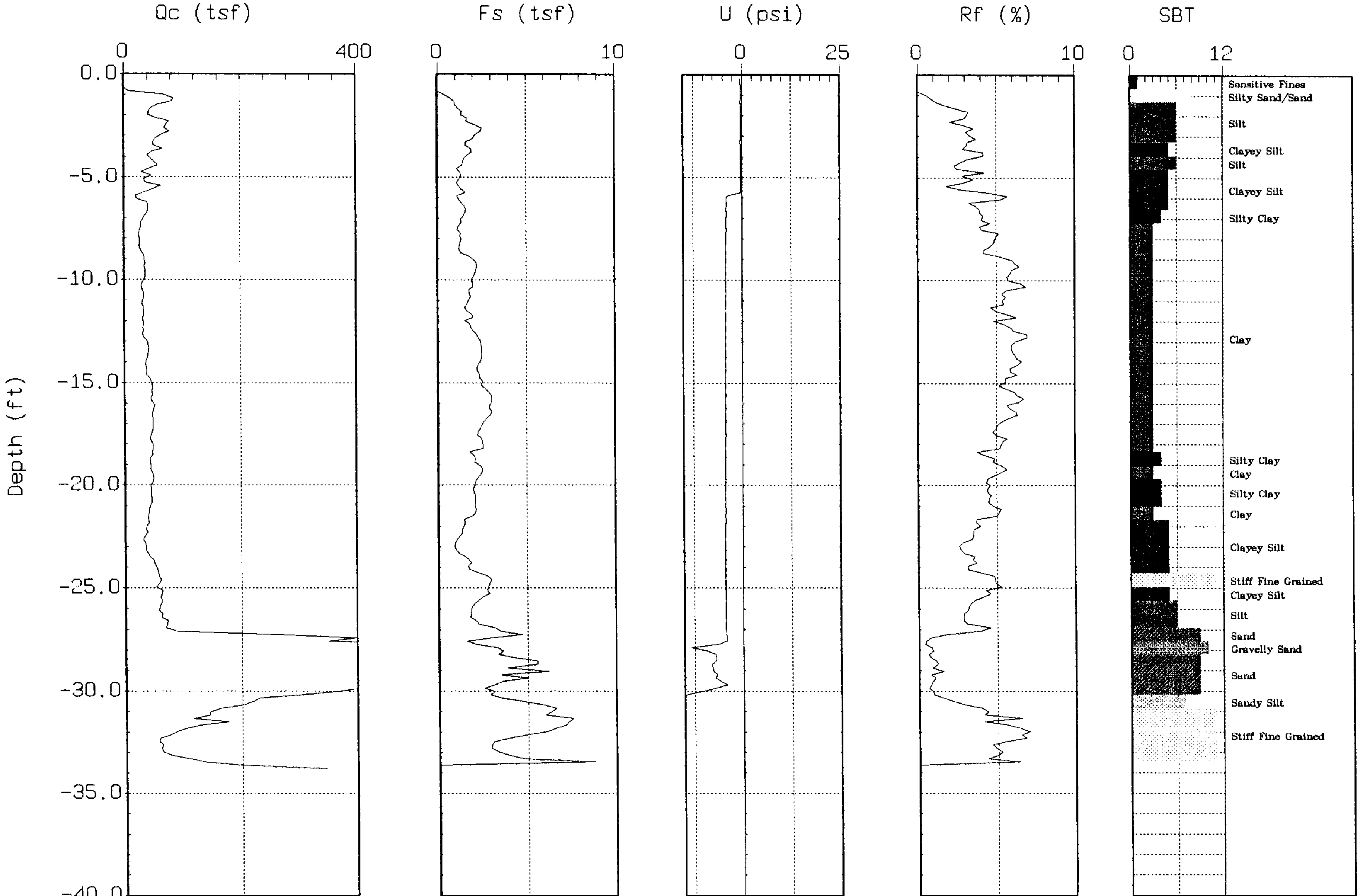
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site : WHIRLPOOL WHIRLPOOL
Location : CPT-14

Geologist: Lori Pfeil 20 TO
Date : 10:26:99 15:58




Max. Depth: 33.79 (ft)

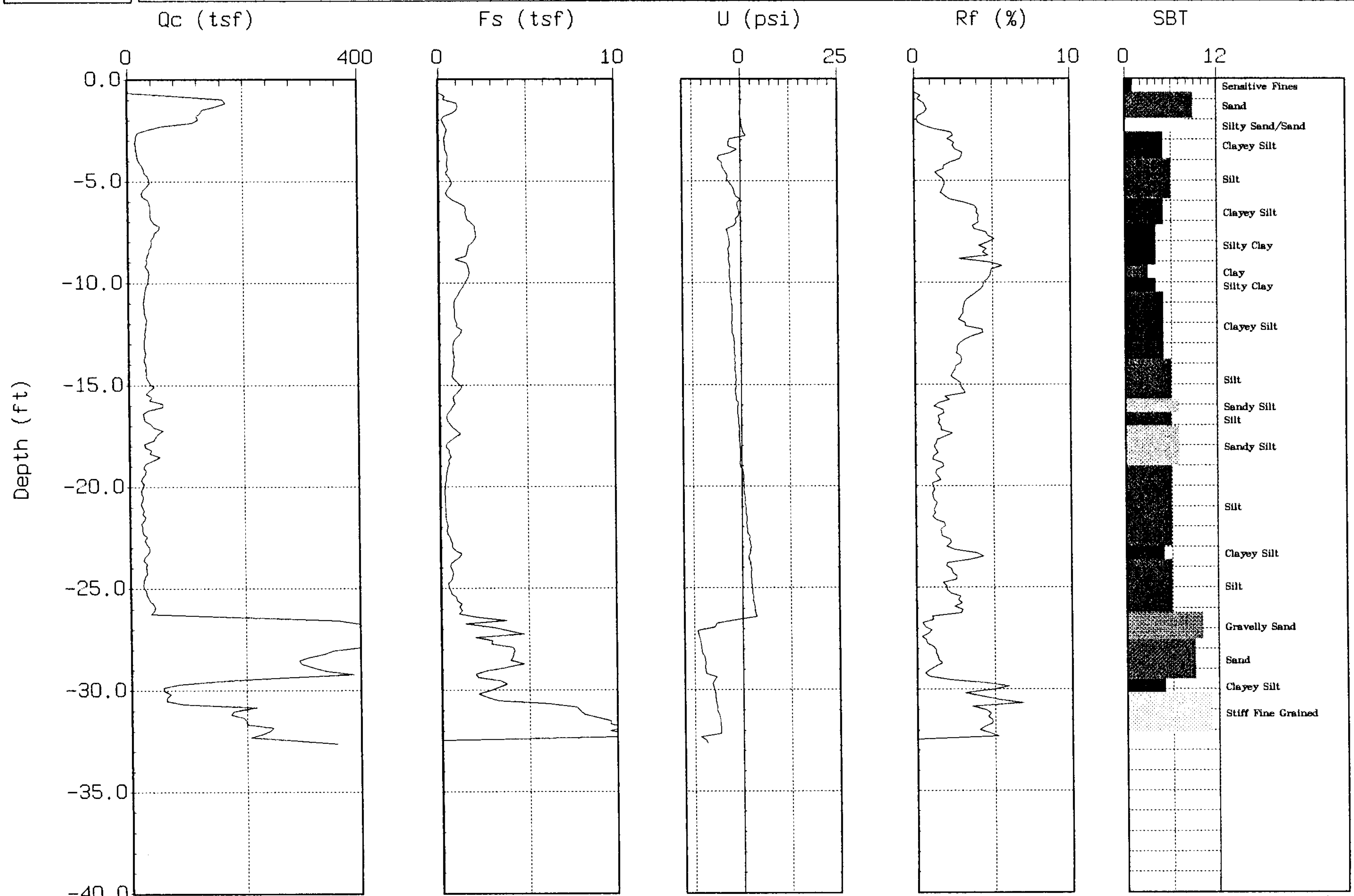
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

**ERM Southwest**

Site : WHIRLPOOL
Location : CPT-15

Geologist: Lori Pfeil
Date : 10:26:99 10:20



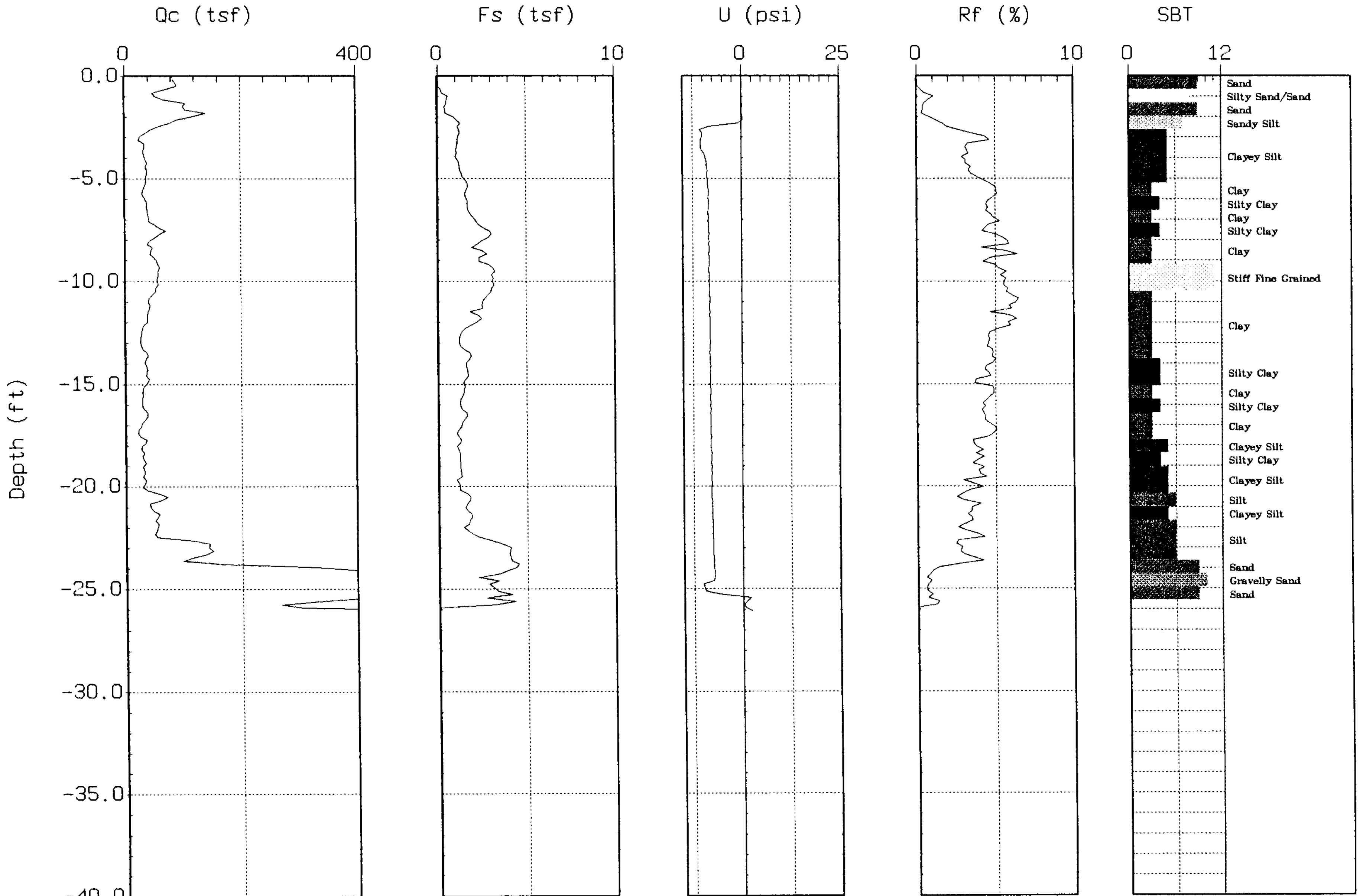

Max. Depth: 32.64 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site : WHIRLPOOL
Location : CPT-16

Geologist: Lori Pfeil
Date : 10:26:99 11:16




Max. Depth: 26.08 (ft)

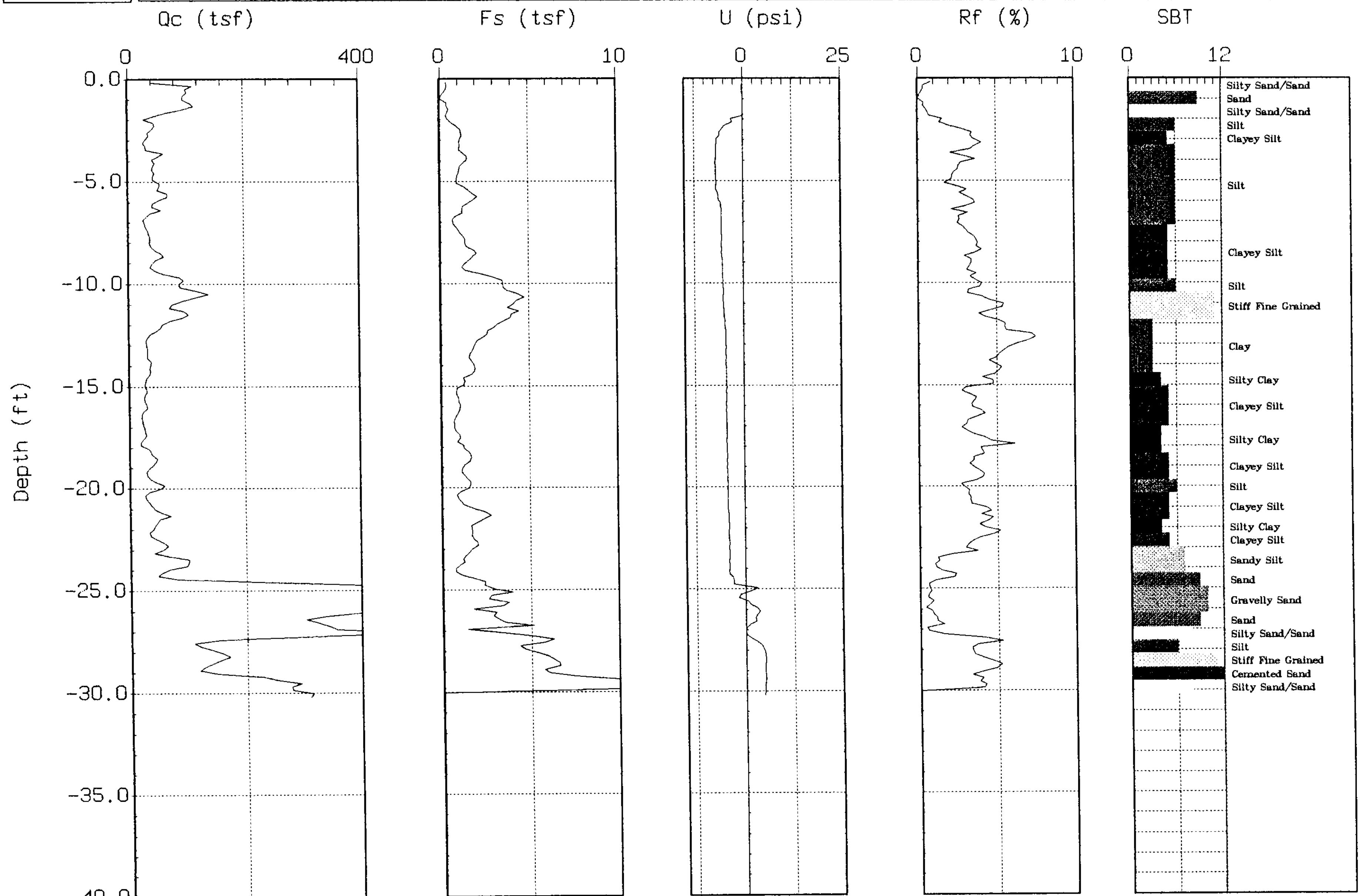
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site : WHIRLPOOL
Location : CPT-17

Geologist: Lori Pfeil
Date : 10:26:99 11:47




Max. Depth: 30.18 (ft)

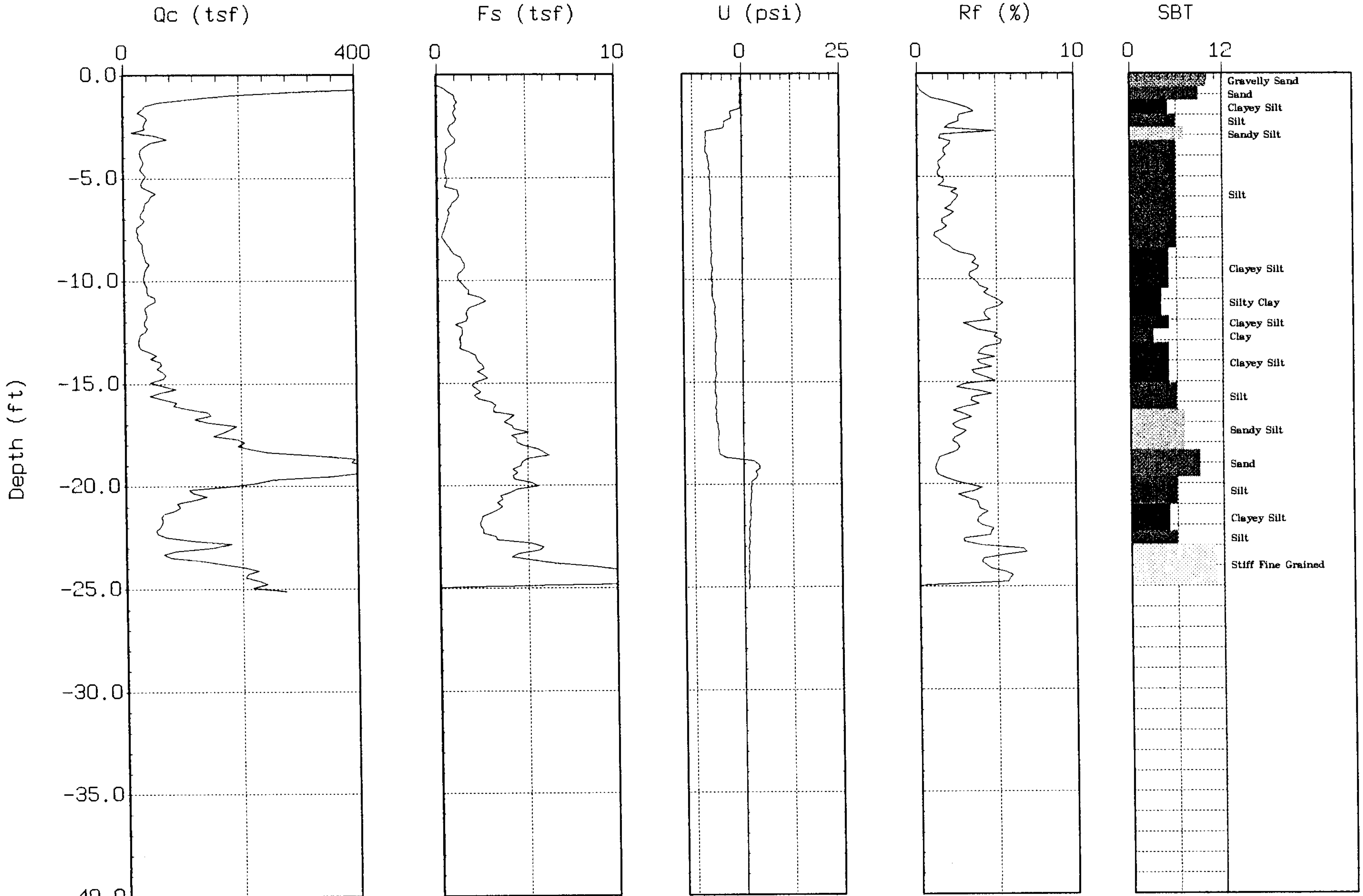
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site : WHIRLPOOL
Location : CPT-18

Geologist: Lori Pfeil
Date : 10:26:99 12:45



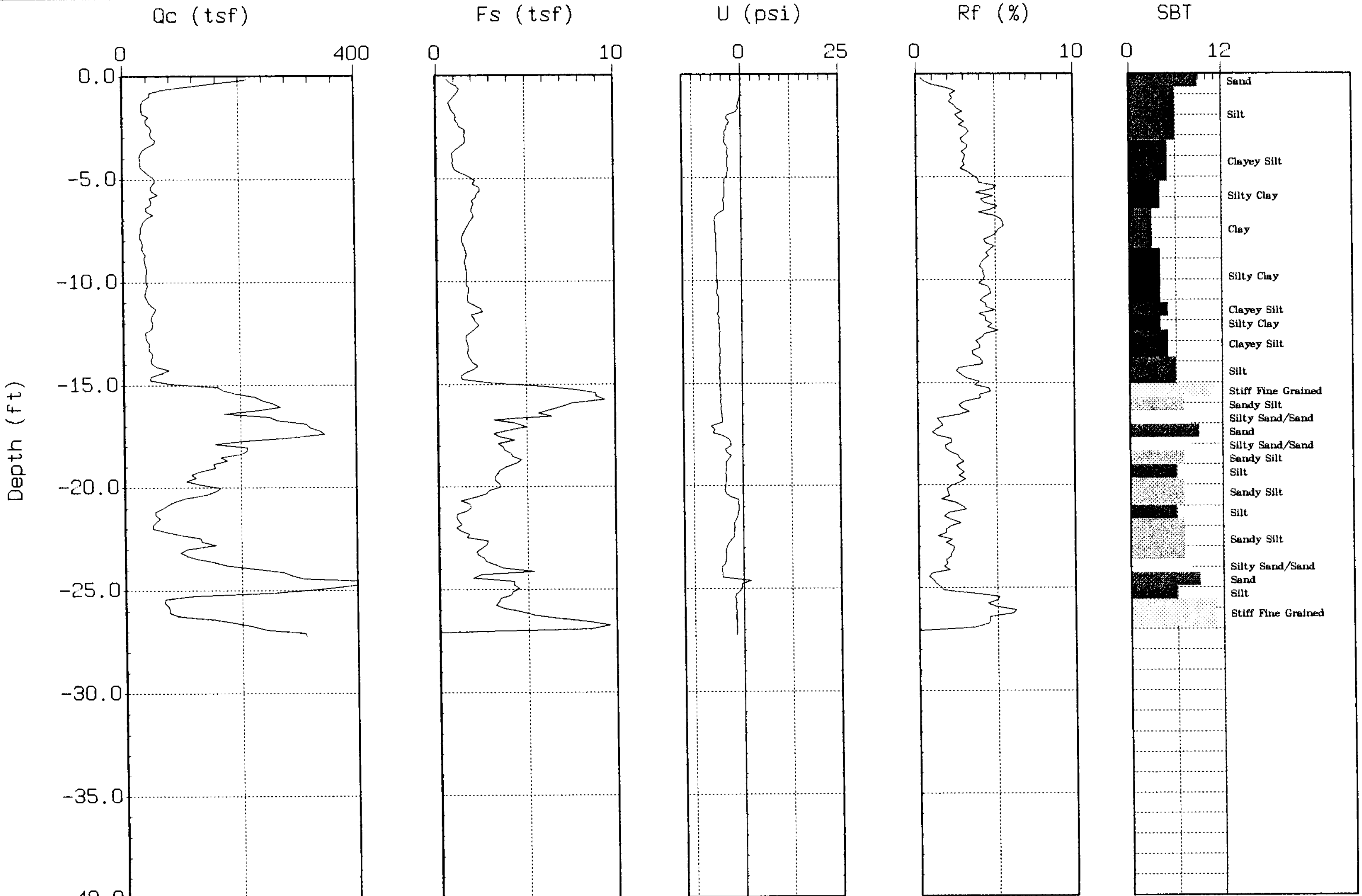

Max. Depth: 25.10 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site :WHIRLPOOL
Location : CPT-19

Geologist:Lori Pfeil
Date : 10:26:99 13:14




Max. Depth: 27.23 (ft)

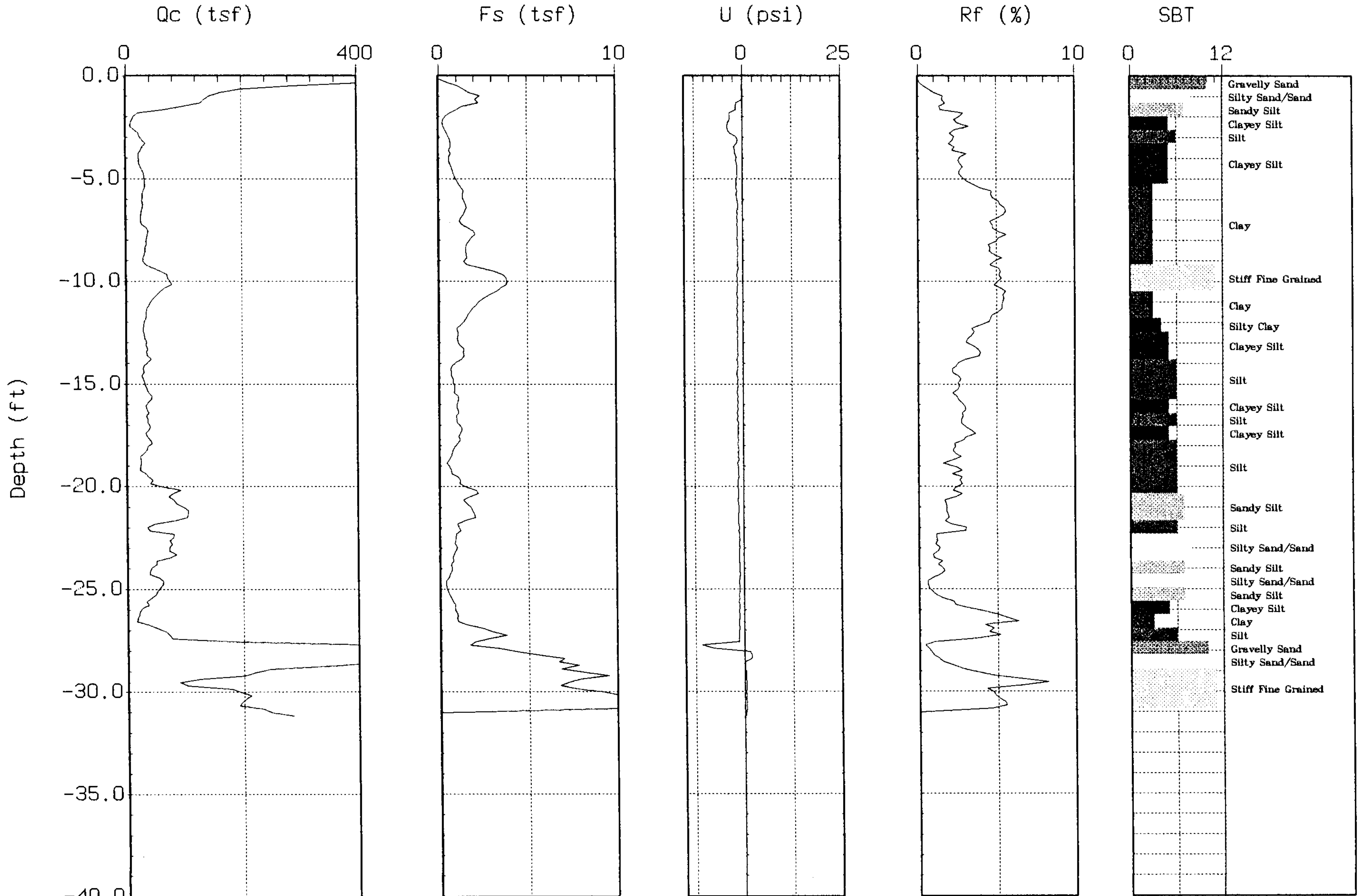
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site : WHIRLPOOL
Location : CPT-20

Geologist: Lori Pfeil
Date : 10:26:99 13:35




Max. Depth: 31.17 (ft)

Depth Inc.: 0.164 (ft)

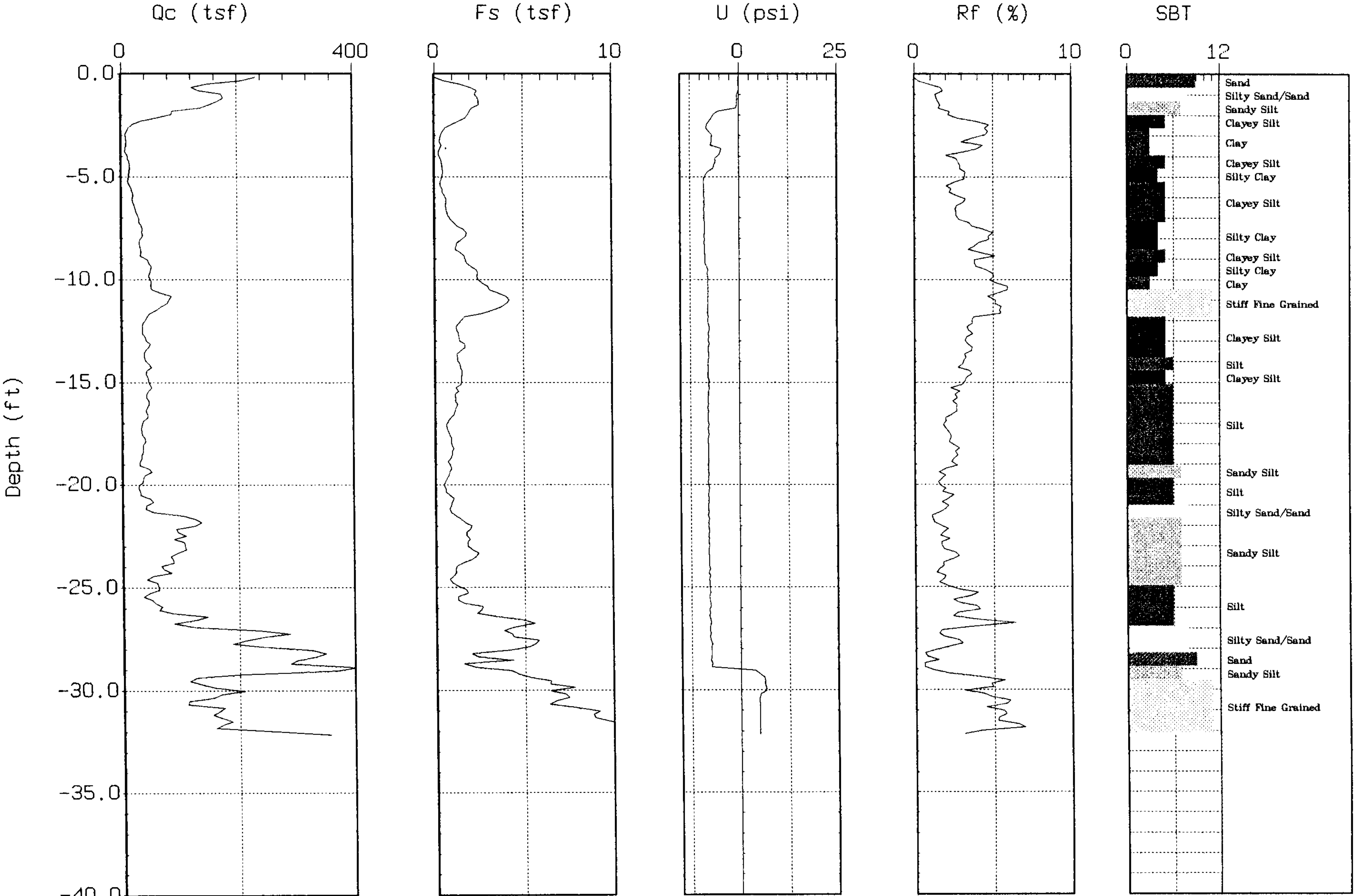
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

# ERM Southwest

Site : WHIRLPOOL
Location : CPT-21

Geologist: Lori Pfeil
Date : 10:26:99 14:05




Max. Depth: 32.15 (ft)

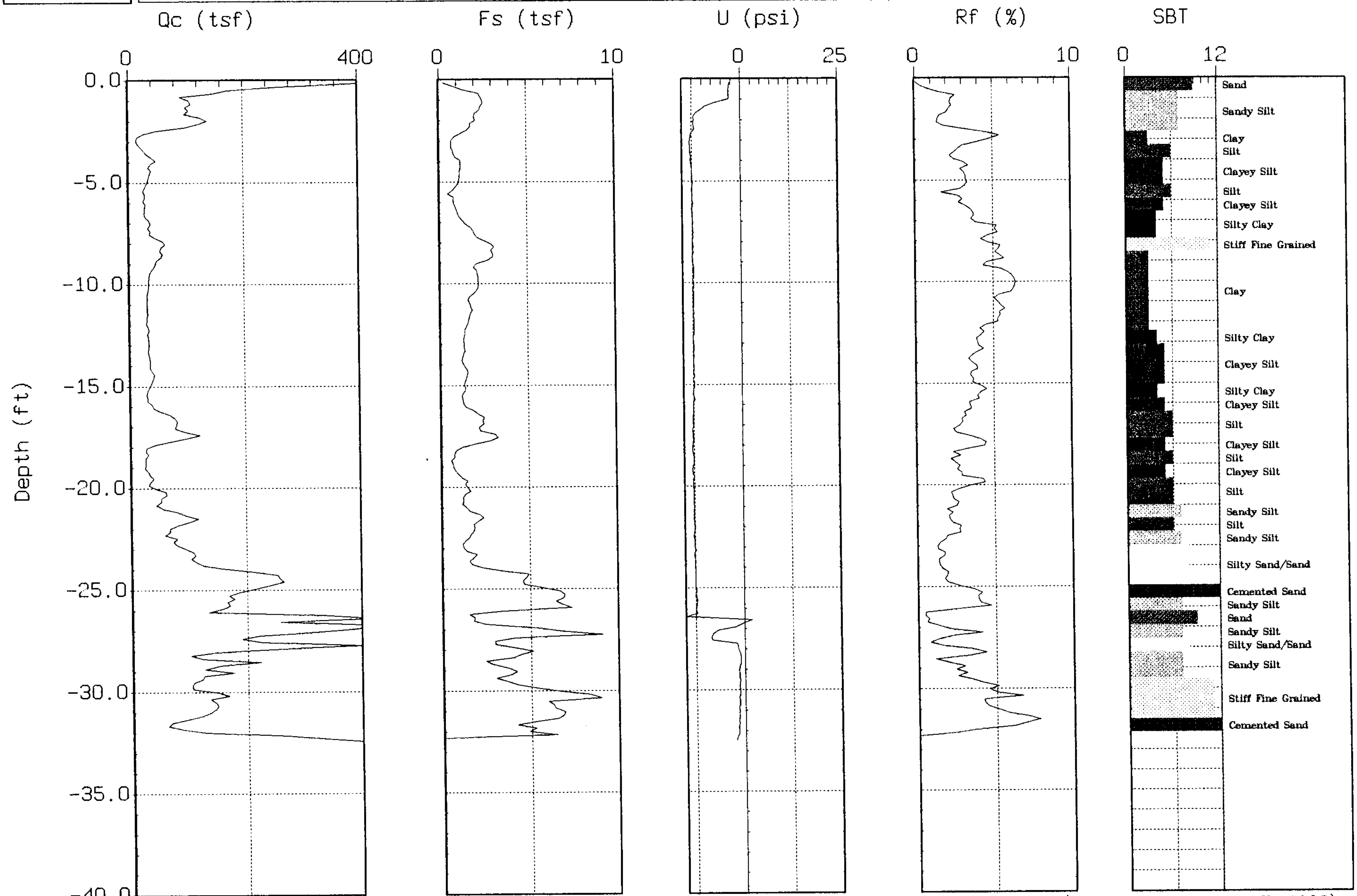
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site : WHIRLPOOL
Location : CPT-22

Geologist: Lori Pfeil
Date : 10:26:99 14:34




Max. Depth: 32.48 (ft)

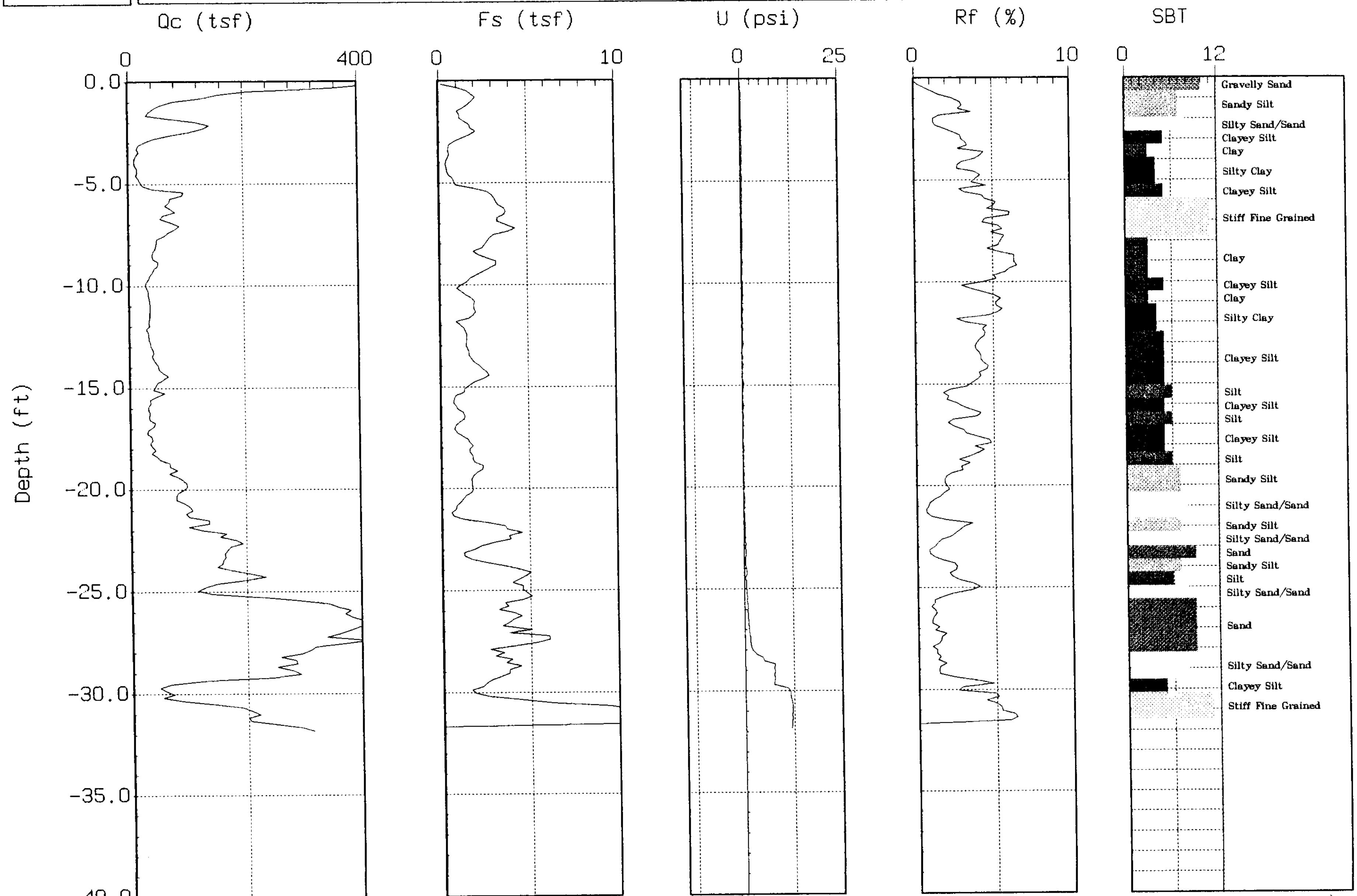
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site : WHIRLPOOL
Location : CPT-23

Geologist: Lori Pfeil
Date : 10:26:99 15:11




Max. Depth: 31.82 (ft)

Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

# DRAFT

INTERNATIONAL TECHNOLOGY CORPORATION

## Monitor Well Installation

JTMW 1

Well No [illegible]

Client [illegible] Job No [illegible] Date Drilled [illegible] 89 Sheet [illegible] of [illegible]

Site FORT SMITH, AR Elevation Pad [illegible] Top of PVC Casing [illegible]

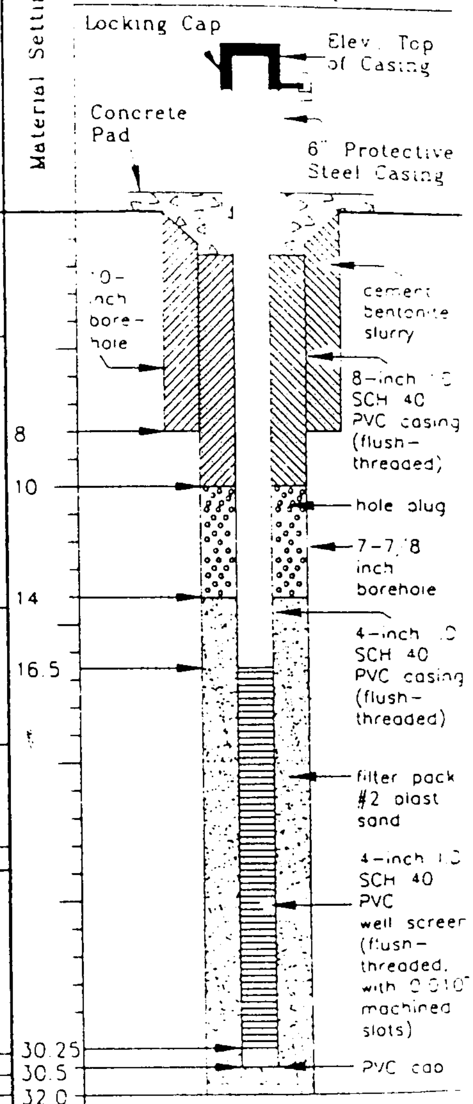
Total Depth [illegible] FEET Casing Size & Type [illegible] INCH [illegible] Screen Size [illegible]

Comments [illegible] HOLLOW STEM AUGER [illegible] HOLLOW STEM AUGER AND [illegible] ROTARY [illegible] SPOON [illegible] 5' CONTINUOUS SAMPLE

| Depth in Feet | PID (ppm) | Symbol | Stratigraphy | Sample Description |
|---|---|---|---|---|
| | | | | GRAVEL FILL, saturated |
| 5 | | ML | | CLAYEY SILT, yellowish brown, silt with clay, low plasticity, firm, moist |
| 10 | | | | |
| | 0.6 | | | CLAYEY SILT, yellowish brown, silt with clay(20-40%) low plasticity, firm,dry |
| 15 | | ML | | SANDY SILT, yellowish brown/light gray, silt with very fine sand(20-30%) moderately firm, moist |
| 20 | | | | SILTY SAND, yellowish brown, very fine-fine sand with silt |
| | 0.1 | SW | | SILTY SAND, yellowish brown, fine-medium sand with silt |
| | | | | SILTY SAND, yellowish brown, medium-coarse sand and silt |
| | 0.2 | ML | | SANDY SILT, silt with very fine sand (10-30%) |
| 25 | | | | SANDY GRAVEL, yellowish-brown, gravel up to 1" diameter with sand, fine-coarse, trace of silt |
| | | GW | | SANDY GRAVEL, strong brown, gravel up to 1" predominately 1/8" with sand, fine-coarse, trace of silt |
| 30 | | | | |
| | | ML | | CLAYEY SILT, strong brown, silt with clay(20-40%) low plasticity |
| | | ML | | SILT, dark gray, silt, slightly-medium lithified fissile |
| | | | | TOTAL DEPTH = 32.0 FEET |

## Completion Data

Material Setting / Material Description



**DRAFT**

INTERNATIONAL TECHNOLOGY CORPORATION

# Monitor Well Installation

ITMW 2

Well No [illegible]

Client [illegible] Job No [illegible] Date Drilled [illegible] 89 Sheet [illegible] of [illegible]

Site [illegible] SMITH, AR Elevation Pad 425.14 Top of PVC Casing [illegible]

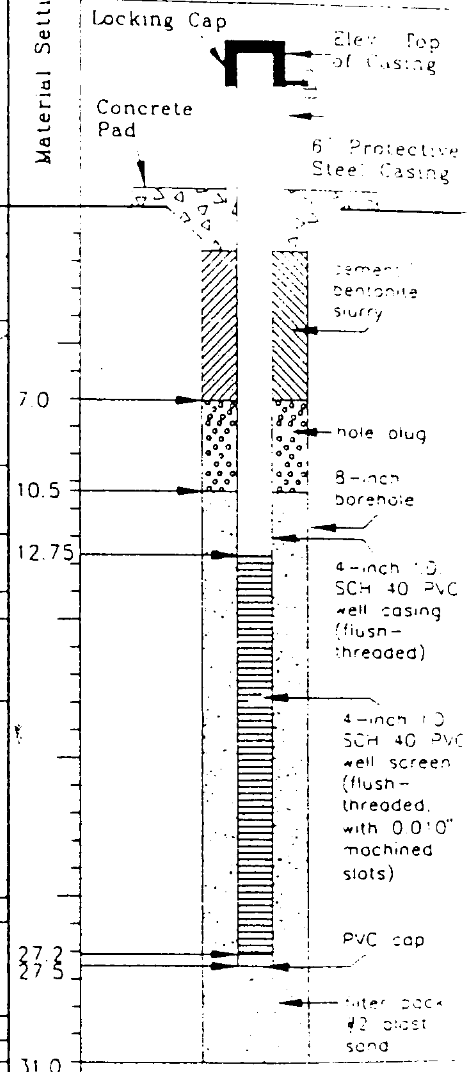
Total Depth 31.0 FEET Casing Size & Type 4-INCH [illegible] Screen Size [illegible]

Comments 8-INCH HOLLOW STEM AUGER

2" SPLIT-SPOON 5' CONTINUOUS SAMPLE

| Depth in Feet | PID (ppm) | Symbol | Sample Description |
|---|---|---|---|
| | | | CONCRETE FILL |
| | 3 | GW | SILTY GRAVEL, yellowish brown, gravel up to 3/8" of decomposing shale and rock, 3" clayey silt, low plasticity, moist |
| | 7.6 | ML | CLAYEY SILT, yellowish brown, silt with clay, low plasticity, moderate-firm moist, mottled in color |
| 5 | | GW | SILTY SANDY GRAVEL, 2" layer of gravel up to 1/2" with medium-coarse sand and silt |
| | 13.0 | ML | CLAYEY SILT, strong brown/light gray, silt with clay(25-45%) low plasticity, moist, slight odor. |
| | 6.1 | | |
| 10 | | ML | GRAVELY CLAYEY SILT, strong brown, silt with clay and gravel sized decomposing shale and rock up to 1/8", moist, mottled in color medium-firm |
| | 3.4 | ML | CLAYEY SILT, silt with clay, low plasticity, moist, moderate, firm |
| | | ML | CLAYEY SANDY SILT, silt with clay and very fine sand, wet saturated,NEOC |
| 15 | | ML | CLAYEY SILT, strong brown/light gray, silt with clay (20-40%) low plasticity, firm, dry |
| | 0.7 | ML | SANDY SILT, silt with very fine sand, moist, wet, low plasticity |
| 20 | | | |
| | 0.7 | | SANDY SILT, strong brown/light gray, silt with very fine sand, wet throughout. AT 24.5' a 1" layer of coarse sand. |
| 25 | | ML | CLAYEY SILT, strong brown. |
| | 0.0 | GW | SILTY SANDY GRAVEL, strong brown, gravel up to 1" diameter with fine-coarse sand and silt, wet, saturated. |
| 30 | | ML | CLAYEY SILT, strong brown, silt with clay (20-40%) laminated |
| | 0.0 | ML | SILT, dark gray, silt moderately lithified, finely laminated, moist |
| | | | TOTAL DEPTH = 31.0 FEET |

Completion Data

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**DRAFT**

INTERNATIONAL TECHNOLOGY CORPORATION

# Monitor Well Installation

ITMW3

Well No [illegible]

Client [illegible] Job No [illegible] Date Drilled [illegible] Sheet [illegible] of

Site [illegible] Elevation Pad [illegible] Top of PVC Casing [illegible]

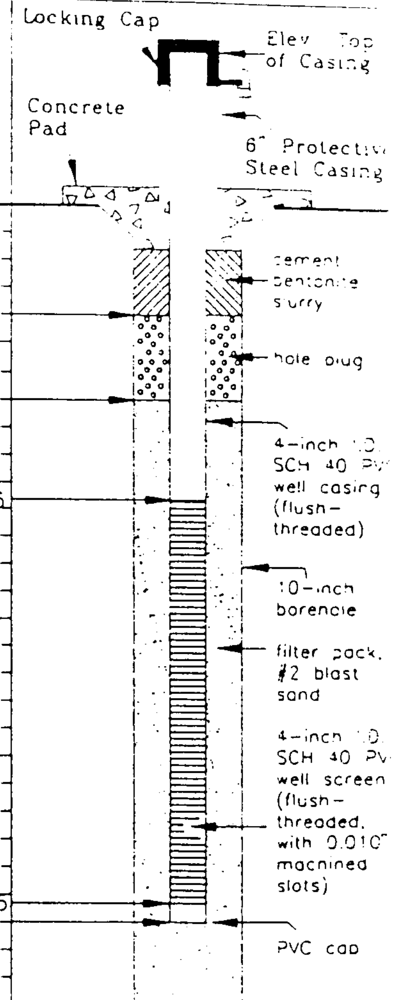
Total Depth [illegible] Casing Size & Type 4-INCH SCH 40 PVC Screen Size [illegible]

Comments [illegible] HOLLOW STEM AUGER AND 10-INCH HOLLOW STEM AUGER [illegible] SPOON [illegible] CONTINUOUS SAMPLE

| Depth in Feet | PID (ppm) | Symbol | Stratigraphy | Sample Description | Material Setting |
|---|---|---|---|---|---|
| | 0.0 | ML | | CLAYEY SILT, brown, silt with clay (10-20%) moist, wet, roots | |
| | 0.0 | ML | | CLAYEY SILT, brownish yellow, silt with clay, low plasticity, some gravel sized decomposing shale, intermittant roots, moist | |
| 5 | 0.0 | ML | | SANDY CLAYEY SILT, silt with clay (20-30%) low plasticity, with very fine sand (10-20%) moist, wet | 4.0 |
| | | ML | | CLAYEY SILT, strong brown/light gray, silt with clay(20-40%) low-moderate plasticity, firm, moist, mottled in color | 7.0 |
| | | ML | | GRAVELY CLAYEY SILT, strong brown, silt with clay (10-30%) and gravel sized shale fragments and rock up to 1/8" | |
| 10 | | ML | | CLAYEY SILT, strong brown/light gray, silt with clay(25-45%) low-moderate plasticity, firm, moist, mottled in color, some black staining | 10.65 |
| 15<br>20 | | ML | | SANDY CLAYEY SILT, strong brown/light gray, silt with clay (10-25%) and very fine sand, moist, wet | |
| | 0.0 | SW | | CLAYEY SAND, sand coarse-very coarse, well graded, with clay (10-20%) saturated | |
| | | GW | | CLAYEY SANDY GRAVEL, strong brown, gravel up to 1" diameter with sand medium-coarse, and clay (10-30%) saturated | |
| 25 | | GW | | SILTY SANDY GRAVEL, strong brown, gravel up to 1 1/2" diameter with fine-coarse sand and silt, wet, saturated | 25.45<br>26.0 |
| | | ML | | SILT, dark gray, silt moderately lithified, finely laminated, dry fissile | 29.0 |
| 30 | | | | TOTAL DEPTH = 29.0 FEET | |

## Completion Data

Material Description



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INTERNATIONAL TECHNOLOGY CORPORATION

# Monitor Well Installation

ITMW4

Well No [illegible]

Client [illegible] Job No [illegible] Date Drilled [illegible]89 Sheet of

Site [illegible] AR Elevation Asphalt [illegible] Top of PVC Casing [illegible]

Total Depth 33.0 FEET Casing Size & Type 4-INCH [illegible] Screen Size [illegible]

Comments 8-INCH HOLLOW STEM AUGER, 10-INCH HOLLOW STEM AUGER AND MUD ROTARY

2" SPLIT-SPOON, 5' CONTINUOUS SAMPLE

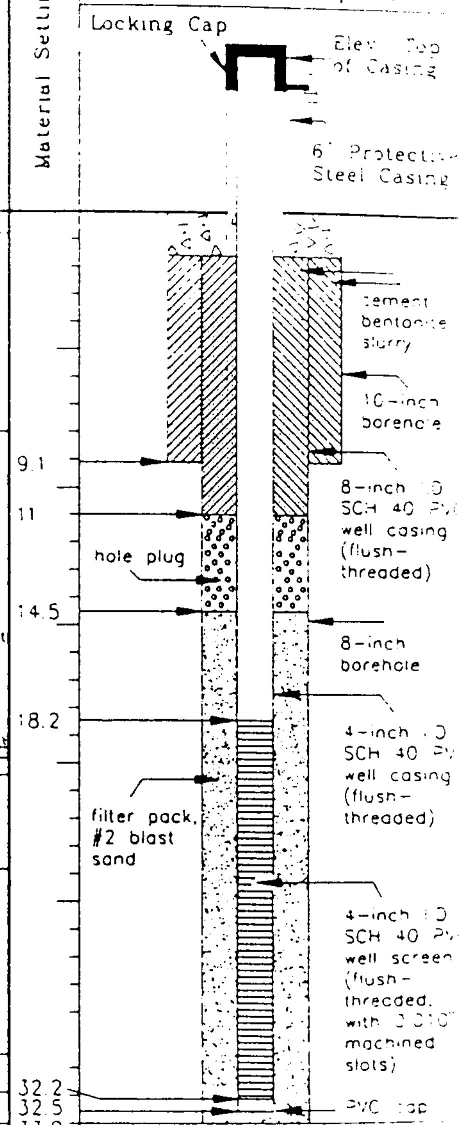
| Depth in Feet | PID (ppm) | Symbol | Stratigraphy | Sample Description |
|---|---|---|---|---|
| | | | | ASPHALT |
| | 1.4 | GW | | GRAVEL FILL, black, gravel [illegible], saturated with oily sheen and odor present |
| | 1.7 | | | |
| 5 | 1.4 | | | |
| | 0.7 | ML | | CLAYEY SILT, strong brown, silt with clay (20-40%) low plasticity moderate-firm, moist |
| 10 | 3.9 | | | CLAYEY SILT, strong brown |
| | 2.7 | | | CLAYEY SILT, olive, silt with clay, low plasticity, moist, odorous |
| | | | | CLAYEY SILT, light olive brown |
| 15 | 3.0 | | | CLAYEY SILT, light gray/light olive brown, silt with clay, low plasticity, moist trace of very fine sand |
| | 2.5 | | | CLAYEY SILT, light gray/yellowish brown, silt with clay, low plasticity, moist trace of fine sand |
| 20 | 1.9 | SW | | SILTY SAND, yellowish brown, medium-coarse sand with silt (15-35%) wet, saturated |
| | | ML | | CLAYEY SILT, yellowish brown, silt with clay (20-40%) moist-wet |
| | 1.1<br>1.3 | SW | | SILTY SAND, yellowish brown, medium-coarse sand with silt (20-40%) saturated, becoming coarse with depth, well graded |
| 25 | 1.1 | GW | | SILTY SANDY GRAVEL, dark yellowish brown, gravel up to 1 1/4" diameter with fine-coarse sand and silt |
| | 0.9 | | | SILTY SANDY GRAVEL, dark yellowish brown, gravel up to 1/2" with fine to coarse sand, mostly medium-coarse and silt (10-15%) gravel becomes much finer than above |
| | 0.7 | | | SILTY SANDY GRAVEL, gravel up to 1/2" thick with fine-coarse sand and silt, increasing in silt with depth, becoming slightly lithified |
| 30 | | | | CLAYEY SILT, yellowish brown, silt with clay (25-45%) laminated, low plasticity, firm |
| | | | | SILT, dark gray, silt moderately lithified, laminated |

TOTAL DEPTH = 33.0 FEET

Material Setting

Completion Data

Material Description

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# DRAFT

**INTERNATIONAL TECHNOLOGY CORPORATION**

# Monitor Well Installation

ITMW 5

Well No ITMW5 [illegible]

Client WHIRLPOOL Job No 446498 Date Drilled [illegible] 89 Sheet [illegible] of [illegible]

Site FORT SMITH AR Elevation Pad 4?6.57 Top of PVC Casing 4?8.93

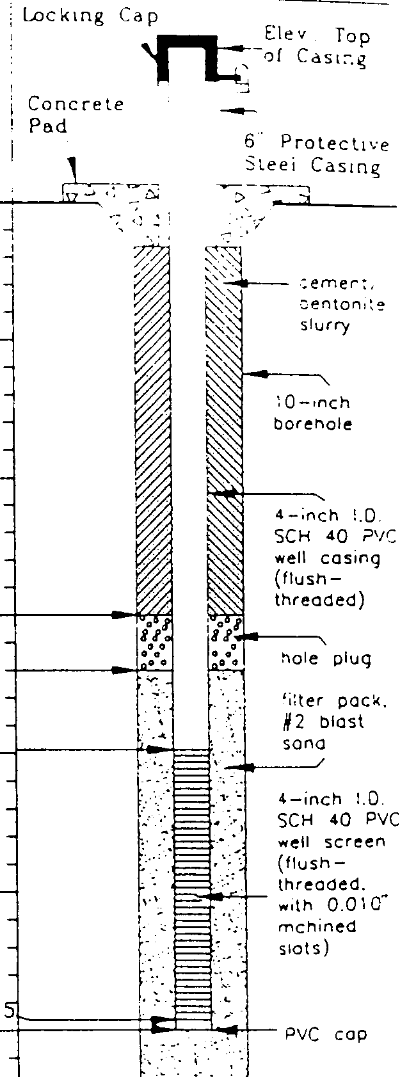
Total Depth 32.0 FEET Casing Size & Type 4-INCH SCH 40 PVC Screen Size 0.010 INCH

Comments: 8-INCH HOLLOW STEM AUGER, 10-INCH HOLLOW STEM AUGER AND MUD ROTARY
2" SPLIT SPOON 5' CONTINUOUS SAMPLE

| Depth in Feet | PID (ppm) | Symbol | Sample Description | Material Setting |
|---|---|---|---|---|
| | | | GRAVEL FILL | |
| | 0.0 | | CLAYEY SILT, light gray/strong brown, silt with clay (20-40%) low plasticity moist-wet, mottled in color | |
| | 0.0 | | CLAYEY SILT, light gray/strong brown, silt with clay (20-40%) low plasticity moist, some gravel sized shale fragments intermittant | |
| 5 | 0.0 | | CLAYEY SILT, strong brown/light gray, silt with clay (20-40%) low plasticity dry, firm, gravel sized shale fragments intermittant | |
| | 0.5 | | CLAYEY SILT, light gray/strong brown, silt with clay (30-45%) low plasticity firm, dry, mottled in color, some black staining | |
| 10 | | | | |
| | 0.7 | ML | CLAYEY SILT, light gray/strong brown, silt with clay (35-45%) low plasticity very firm, dry, slickensides at 13.5', black staining throughout mottled in color | |
| 15 | | | | 15 |
| | | | | 17 |
| | | | CLAYEY SILT, light gray/strong brown, silt with clay (35-45%) low plasticity very firm, dry, mottled in color, black staining | |
| 20 | | | | 19.9 |
| | 0.5 | | | |
| 25 | | GW | CLAYEY SANDY GRAVEL, strong brown, gravel up to 1 1/2" with medium-coarse sand and clay, moist-wet | |
| | | | CLAYEY SANDY GRAVEL, strong brown, gravel with medium-coarse sand and clay, saturated | 29.65 |
| 30 | | | | 30 |
| | | ML | CLAYEY SILT, strong brown, silt finely laminated, crumbly with clay(10-25%) | |
| | 0.0 | ML | SILT, dark gray, silt, finely laminated, medium-well lithified, fissile | 32 |
| | | | TOTAL DEPTH = 32.0 FEET | |

## Completion Data

Material Description

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# DRAFT

INTERNATIONAL TECHNOLOGY CORPORATION

## Monitor Well Installation

ITMW 6

Well No [illegible]

Client [illegible] Job No [illegible] Date Drilled [illegible] 89 Sheet [illegible] of

Site [illegible] AR Elevation Pad 481.05 Top of PVC Casing [illegible]

Total Depth 36.7 FEET Casing Size & Type 4-INCH [illegible] 40 [illegible] Screen Size [illegible]

Comments [illegible] INCH HOLLOW STEM AUGER

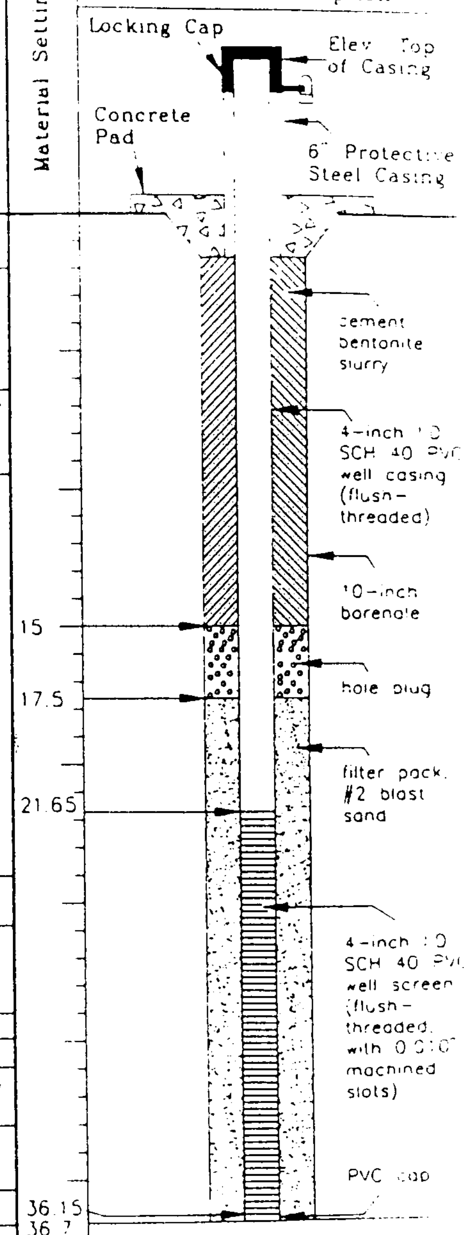
[illegible] SPLIT-SPOON [illegible] CONTINUOUS SAMPLE

| Depth in Feet | PID (ppm) | Symbol | Sample Description |
|---|---|---|---|
| | 0.0 | GW | CLAYEY SILTY GRAVEL, brown, gravel fill with clay and silt |
| | 0.0 | ML | CLAYEY SILT, red/dark yellowish brown, silt with clay (20–40%) firm, dry, roots, mottled in color |
| 5 | 0.0 | | |
| | 0.0 | ML | CLAYEY GRAVELY SILT, silt with clay (30–40%) and gravel (5%) up to 3/8" diameter, firm, dry |
| 10 | | | CLAYEY SILT, yellowish brown, silt with clay (30–40%) firm, dry |
| | 0.0 | ML | CLAYEY SILT, strong brown, silt with clay (30–40%) firm, dry, at 12.5' a 3" layer of clayey gravely silt, with shale fragment, gravel size abundant, mottled in color becoming strong brown at 13' |
| 15 | | | CLAYEY SILT, strong brown, silt with clay (20–30%) moderately firm slightly moist, some decomposed shale intermittant |
| | 0.0 | | |
| 20 | | | |
| | 9 | | CLAYEY SILT, strong brown, silt with clay (30–40%) moderately firm slightly moist |
| 25 | | ML | CLAYEY SANDY SILT, strong brown, silt with clay (20–30%) and very fine sand (10–20%) moist-wet |
| | | SP | SAND, yellowish brown, very fine-fine sand, poorly graded, saturated |
| 30 | | SP | SILTY SAND, light gray, very fine sand with silt(20–30%) wet-saturated |
| | | ML | CLAYEY SILT, strong brown, silt with clay |
| | | GW | CLAYEY GRAVEL, strong brown, gravel up to 1", most 1/8–1/4" with clay (10–20%) saturated |
| | | GW | CLAYEY SANDY GRAVEL, strong brown, gravel 1/8–1/4" with medium-coarse sand and clay (10–20%) |
| 35 | | ML | SILT, dark gray, finely laminated, moderately lithified, fissile silt |
| | | | TOTAL DEPTH = 36.7 FEET |

Completion Data

Material Setting

Material Description

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INTERNATIONAL TECHNOLOGY CORPORATION

# Monitor Well Installation

ITMW8

Client ___ Job No. 446498 Date Drilled ___ 89 Well No. MW8 Sheet ___ of ___

Site ___ Elevation Cover Rim 482.33 Top of PVC Casing 481.79

Total Depth 34.60 FEET Casing Size & Type 4-INCH SCH 40 PVC Screen Size 0.010 ___

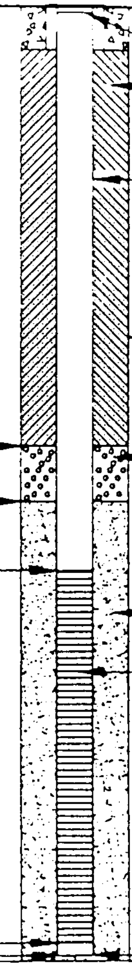
Comments: 8-INCH HOLLOW STEM AUGER 10-INCH HOLLOW STEM AUGER
2' SPLIT-SPOON 5' CONTINUOUS SAMPLE

| Depth in Feet | PID (ppm) | Symbol | Sample Description | Material Setting |
|---|---|---|---|---|
| | | | CONCRETE SLAB | |
| | | ML | SANDY SILT, brown, silt with sand, very fine to fine, moist, odorous | |
| 5 | 1.0 | ML | CLAYEY SILT, yellowish brown/light gray, silt with clay (10-20%), trace very fine sand, roots, rock fragments, moist, odorous | |
| 10 | 0.4<br>0.4 | | CLAYEY SILT, yellowish brown/light gray, silt with clay (10-30%), trace (10%) very fine sand, weathered rock fragments, roots, black staining, moist | |
| | | GW | SILTY SANDY GRAVEL, yellowish brown, gravel with medium to coarse sand and silt, moist | |
| | 0.4 | ML | SANDY SILT, yellowish brown/light gray, silt with very fine sand (30-50%), moist, intermitant rock fragments, black staining | |
| 15 | | ML | SANDY SILT, yellowish brown, silt with sand, fine to medium (30-50%), moist, rock fragments | |
| | | | SANDY SILT, same as above | 16.0<br>18.0 |
| 20 | 0.2 | | CLAYEY SANDY SILT, yellowish brown/light gray, silt with clay (10-20%), fine sand, trace (10%), moist | |
| | | | SANDY SILT, silt with fine to medium sand, moist | 20.45 |
| | 0.4 | ML | SANDY CLAYEY SILT, yellowish brown/light gray, silt with clay and very fine to fine sand, wet | |
| 25 | 0.2 | SW | SILTY SAND, yellowish brown, medium to coarse, sand with silt, saturated | |
| 30 | | GW | SILTY SANDY GRAVEL, yellowish brown, gravel up to 1", angular, with medium to very coarse sand and silt, saturated | |
| | 0.2 | | SILTY SANDY GRAVEL, yellowish brown, same as above | |
| | | ML | CLAYEY SILT, yellowins brown, silt with clay (10-30%), firm, moist | 33.90 |
| | | ML | SHALE, gray, shale | 34.45 |
| 35 | | | TOTAL DEPTH = 35.0 FEET | 34.60 |

## Completion Data

Material Description

Flush Completion

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INTERNATIONAL TECHNOLOGY CORPORATION

# Monitor Well Installation

ITMW9

Client WHIRLPOOL Job No 346498 Date Drilled 12/29/89 Well No MW9 Sheet 1 of 1

Site FORT SMITH, AR Elevation Ground 479.50 Top of PVC Casing 481.90

Total Depth 34.5 FEET Casing Size & Type: 4-INCH SCH 40 PVC Screen Size 0.010 INCH

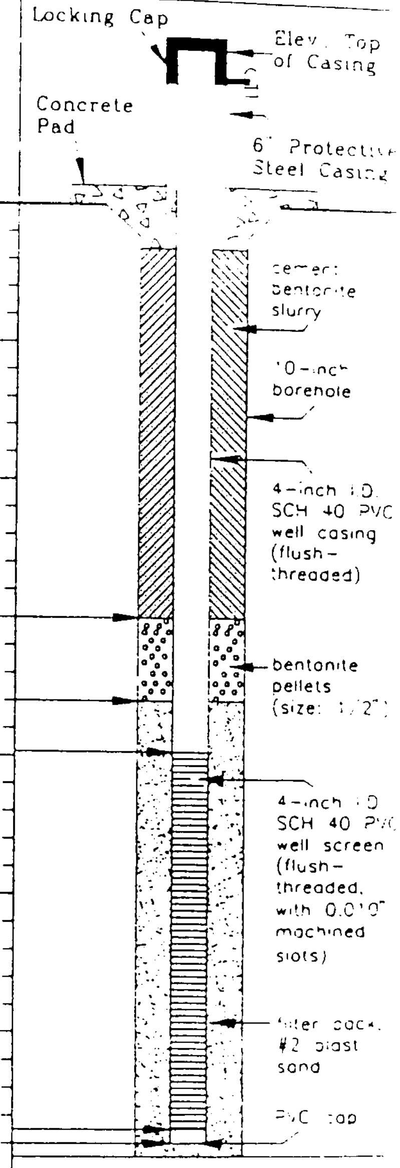
Comments 8-INCH HOLLOW STEM AUGER

2" SPLIT-SPOON 5' CONTINUOUS SAMPLE

| Depth in Feet | PID (ppm) | Symbol | Sample Description | Material Setting |
|---|---|---|---|---|
| | | ML | SANDY SILT, brown, silt with very fine to fine sand, moist | |
| 5 | 30.0 | ML | CLAYEY SILT, yellowish brown/light gray, silt with clay (10–30%), low plasticity, moist, crumbly rock fragments, black staining, slight odor, roots | |
| 10 | 50.0 | | CLAYEY SILT, yellowish brown/light gray, silt with clay (10–30%), low plasticity, becoming more rigid, weathered rock fragments, black staining, moist, slight odor | |
| 15 | 0.0 | ML | SANDY CLAYEY SILT, yellowish brown, silt with clay (10–20%), low plasticity, moderately firm with medium to coarse sand (10–30%), moist | 15.0 |
| | | | SANDY CLAYEY SILT, yellowish brown, same as above | 18.0 |
| 20 | | GW | SILTY SANDY GRAVEL, yellowish brown, gravel with up to 1", angular, with medium to very coarse sand, 30–40% silt, moist to wet | 19.95 |
| | | | SILTY SANDY GRAVEL, yellowish brown | |
| | 0.0 | SW | SAND, yellowish brown, well graded, medium to coarse sand with trace silt, wet to saturated | |
| | | SW | SILTY SAND, yellowish brown, medium to coarse sand with silt (30–40%), moderately firm, cohesive, moist to wet | |
| 25 | | GW | SILTY SANDY GRAVEL, yellowish brown, gravel up to 1", angular, with medium to coarse sand and silt, cohesive, moist to wet | |
| 30 | 0.0 | | SILTY SANDY GRAVEL, yellowish brown, gravel with medium to coarse sand and silt, saturated, beginning at 26.5' BGL | |
| | 0.0 | | SILTY SANDY GRAVEL, yellowish brown, same as above | |
| | | ML | CLAYEY SILT, yellowish brown, silt with clay (10–30%), firm, moist | 33.45 |
| | | ML | SHALE, gray, shale, fissile, dry to moist | 34.0 |
| | | | TOTAL DEPTH = 34.16 FEET | 34.5 |

## Completion Data

Material Description

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INTERNATIONAL TECHNOLOGY CORPORATION

# Monitor Well Installation

ITMW10

Client: WHIRLPOOL Job No: 446498 Date Drilled: 12/20/89 Well No: MW-10 Sheet 1 of 1

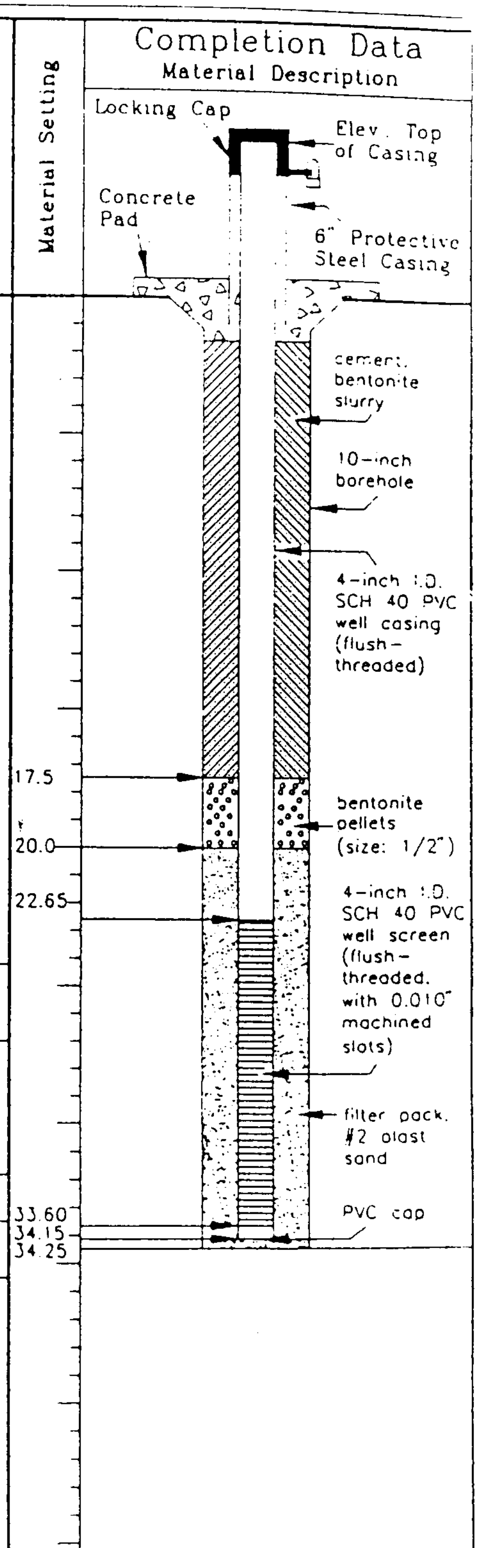
Site: FORT SMITH, AR Elevation: Ground 478.60 Top of PVC Casing 480.84

Total Depth: 35.5 FEET Casing Size & Type: 4-INCH SCH 40 PVC Screen Size: 0.010 INCH

Comments: 8-INCH HOLLOW STEM AUGER
2" SPLIT-SPOON 5' CONTINUOUS SAMPLE

| Depth in Feet | PID (ppm) | Symbol | Stratigraphy | Sample Description |
|---|---|---|---|---|
| | 0.4 | ML | | CLAYEY SILT, yellowish brown/light gray, silt with clay (10-30%), low plasticity, moderately firm, moist, mottled in color, weathered rock fragments, intermitant, roots |
| 5 | | | | |
| | 0.4 | | | CLAYEY SILT, yellowish brown/light gray, silt with clay (10-30%), trace very fine sand, weathered rock fragments, intermitant, roots, moist, mottled in color, moderately firm |
| 10 | | | | |
| | 0.2 | | | CLAYEY SILT, yellowish brown/light gray, silt with clay (10-30%), trace very fine sand, weathered rock fragments, intermitant, black staining from weathering, becoming more firm with depth, moist |
| 15 | | | | |
| | 0.0 | | | CLAYEY SILT, yellowish brown/light gray, silt with clay (10-30%), trace very fine sand, weathered rock fragments, intermitant, black staining, dry to moist, firm |
| 20 | | | | |
| | 0.2 | | | CLAYEY SILT, yellowish brown/light gray, silt with clay (10-30%), trace very fine sand, increasing with depth, moist, black staining, moderately firm |
| 25 | | ML | | CLAYEY SANDY SILT, yellowish brown/light gray, silt with clay (10-20%), very fine sand (10-30%), moist, low to moderately firm, black staining |
| | 0.2 | GW | | SILTY SANDY GRAVEL, yellowish brown, gravel up to 1" diameter, angular, with sand medium to coarse, and silt, cohesive, moist |
| 30 | | | | SILTY SANDY GRAVEL, yellowish brown, gravel up to 1", angular, with sand medium to coarse, and silt, saturated at 31.5'BGL |
| | 0.2 | ML | | CLAYEY SILT, yellowish brown, silt with clay (20-40%), moderately firm, moist to dry |
| 35 | | ML | | SHALE, gray, shale, fissile, dry |

TOTAL DEPTH = 35.5 FEET




DRAWN BY MMH 6/90 | CHECKED BY | APPROVED BY | DRAWING NUMBER 446498-A32

**DRAFT**

INTERNATIONAL TECHNOLOGY CORPORATION

# Monitor Well Installation

ITMW 11

Client: WHIRLPOOL  Job No: 446498  Date Drilled: 12/20/89  Well No: MW-  Sheet 1 of 1

Site: FORT SMITH, AR  Elevation Ground: 474.00  Top of PVC Casing: 476.50

Total Depth: 30.5 FEET  Casing Size & Type: 4-INCH SCH 40 PVC  Screen Size: 0.010 INCH

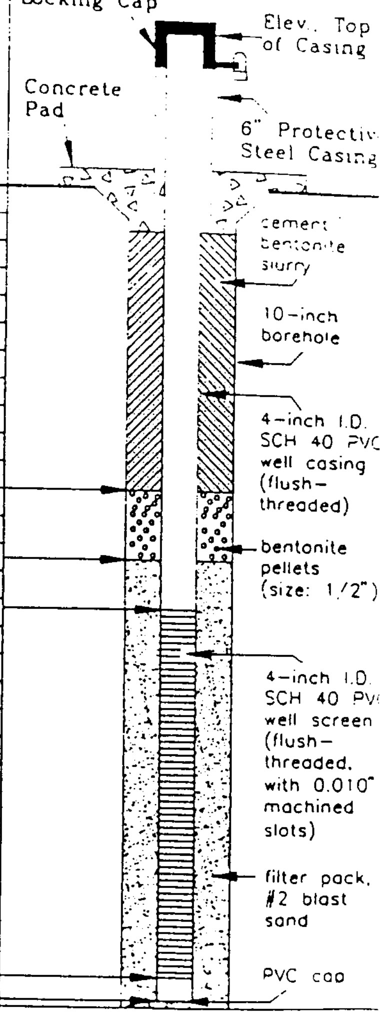
Comments: 8-INCH HOLLOW STEM AUGER
2" SPLIT-SPOON 5' CONTINUOUS SAMPLE

| Depth in Feet | PID (ppm) | Symbol | Sample Description |
|---|---|---|---|
| | | ML | SANDY CLAYEY SILT, yellowish brown/light gray |
| 5 | 700.0 | | SANDY CLAYEY SILT, yellowish brown/light gray, silt with clay (10-30%), moderately firm, and sand very fine grained (10-30%), weathered rock fragments, moist, odorous |
| | 450.0 | | SANDY CLAYEY SILT, yellowish brown/light gray, same as above, but less firm |
| 10 | 400.0 | ML | CLAYEY SILT, yellowish brown/light gray, silt with clay (10-30%), low plasticity, moderately firm, moist, trace very fine sand, odorous |
| 15 | 400.0<br>310.0 | ML | SANDY CLAYEY SILT, yellowish brown/light gray, silt with clay (10-20%), angular, very fine to fine sand (20-40%), moist, odorous, black staining |
| 20 | 75.0<br>65.0 | SW | SILTY SAND, yellowish brown/light gray, fine to medium sand with silt, black staining, slight odor, wet to saturated |
| 25 | 2.6<br>0.0 | GW | SILTY SANDY GRAVEL, yellowish brown, gravel, angular up to 1", with fine to very coarse sand, and silt (10-20%), saturated |
| | 0.0 | | SILTY SANDY GRAVEL, yellowish brown, same as above |
| 30 | | ML | SHALE, gray, shale fossile, slickenslide |

TOTAL DEPTH = 30.5 FEET

Material Setting: 11.0, 13.5, 15.25, 28.7, 29.45, 29.7

Completion Data
Material Description




| DRAWN BY | MMH | 1/6/90 | CHECKED BY | | APPROVED BY | | DRAWING NUMBER | 446498-A11 |
|---|---|---|---|---|---|---|---|---|

# DRAFT

# MONITOR WELL ITMW12

Client: WHIRLPOOL
Project Name: WHIRLPOOL
Project Location: FORT SMITH, ARK.
Project Number: 446498

## DRILLING AND SAMPLING INFORMATION

Boring Location: ITMW12
SURFACE ELEV.(FT): 474.72
TOTAL DEPTH(FT.): 30.5
Logged By: L. JOHNSON
Date Started: 10/30/90
Drilled By: J. LANDEROS
Date Completed: 10/30/90

Drill Rig Type: B-53 MOBILE DRILL
Drilling Method: 8-INCH HOLLOW STEM AUGER, 10-INCH HOLLOW STEM AUGER
Sampling Method: 5-FOOT CONTINUOUS SAMPLE

Notes: –

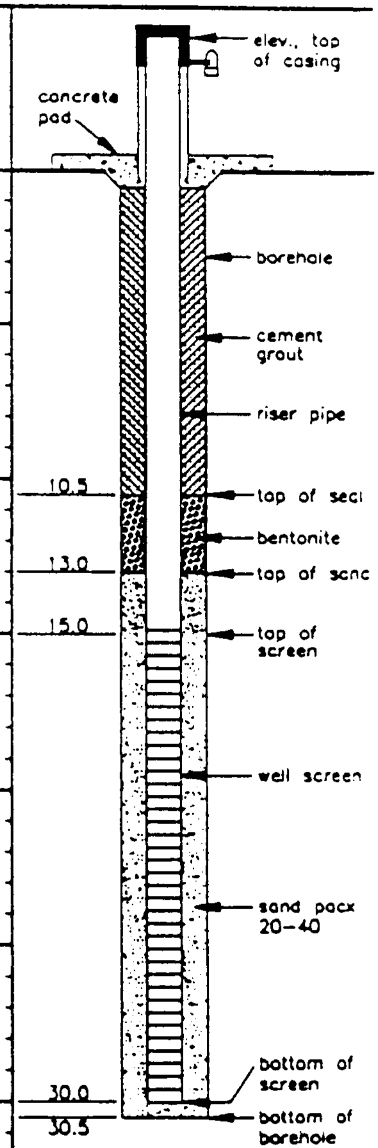
## WELL COMPLETION DATA

Elev-Top of Casing(ft.): 476.67 Ref. Datum: MSL
1. Riser Pipe-Dia(in.): 4 Depth(ft.): 15 Type: Sch 40 PVC
   Centralizers-Type: NA Depths(ft.): NA
2. Screen Dia.(in.): 4 Type: Sch 40 PVC FJT
   Depth Interval(ft.): 15-30 Slot Size(in.): .010
   Centralizers-Type: NA Depths(ft.): NA
3. Filter Pack Type: 20-40 Silica Depth Interval(ft.): 13-30.5
   Conc. Pad Size: 3'x3'x6"

NOTE: All depths are for base of pipe from ground surface.

| DESCRIPTION | SAMPLE TYPE / SAMPLE NO. | IN. DRIVEN / IN. RECOVERED | PID | USCS |
|---|---|---|---|---|
| CONCRETE – 4-inches thick with 2-inch fill sand | | | | |
| SILTY CLAY – reddish orange, some roots | CS | 60 / 24 | 2.5 | cl |
| CLAY – orange, some light gray 1cm thick silt stringers, black iron nodules<br>– orange to light gray, disseminated black spots, light gray<br>– 1-2cm thick silt stringers, iron nodules | CS | 60 / 60 | 2.5, 3.0 | cl |
| – orange, black iron nodules, 1-3cm thick gray silt stringers, some cobbles/gravel | CS | 60 / 31 | 3.0, 2.5 | |
| SILT – light gray, medium dense, slight clay content<br>– wet | CS | 60 / 48 | 2.5 | ml |
| SAND – brown to orange, fine to medium grained, wet | | | | sp |
| | CS | 60 / 48 | 1.9 | |
| SANDY CLAY – alternating silty sand and clay (15-30cm) layers | | | | cl |
| GRAVEL – gray to white, 4-8mm | | | | gp |
| SAND – orange brown, coarse grained, some 2-6mm gravel | CS | 60 / 60 | 1.9, 1.9 | sw |
| CLAY – gray/orange, 1-inch layer of 2-5mm gravel | | | | cl |

DEPTH IN FEET: 5, 10, 15, 20, 25, 30, 35, 40




TOTAL DEPTH = 30.5 FEET

| INTERNATIONAL TECHNOLOGY CORPORATION | DRAFT BY | STF 12/19/90 | DRAFT CHK | GMR 6-7-91 | PROJ. CHK | JBW 6-7-91 | APPRV. BY | JOM 6-7-91 | DWG. NO. | 446498-A47 Sheet 1 of 1 |
|---|---|---|---|---|---|---|---|---|---|---|

**DRAFT**

Client: WHIRLPOOL | Project Location: FORT SMITH, ARK.
Project Name: WHIRLPOOL | Project Number: 446498

# MONITOR WELL ITMW13

## DRILLING AND SAMPLING INFORMATION

Boring Location: ITMW13
SURFACE ELEV.(FT): 475.39
TOTAL DEPTH(FT.): 29.5
Logged By: L. JOHNSON
Drilled By: J. LANDEROS
Date Started: 11/6/90
Date Completed: 11/7/90
Drill Rig Type: DEEP ROCK
Drilling Method: 8-INCH HOLLOW STEM AUGER, 10-INCH HOLLOW STEM AUGER
Sampling Method: 5-FOOT CONTINUOUS SAMPLE

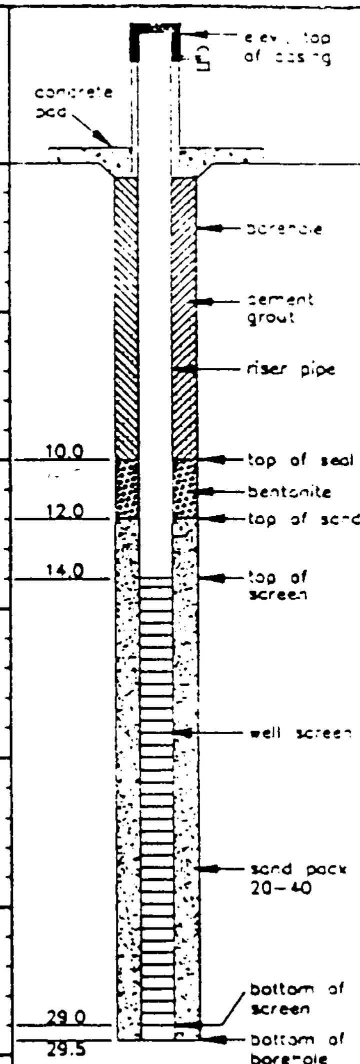
## WELL COMPLETION DATA

Elev-Top of Casing(ft.): 477.79 Ref. Datum: MSL
1. Riser Pipe-Dia(in.): 4 Depth(ft.): 14 Type: Sch 40 PVC
   Centralizers-Type: NA Depths(ft.): NA
2. Screen Dia.(in.): 4 Type: Sch 40 PVC FJT
   Depth Interval(ft.): 14-29 Slot Size(in.): 0.010
   Centralizers-Type: NA Depths(ft.): NA
3. Filter Pack Type: 20-40 Silica Depth Interval(ft.): 12-29.5
   Conc. Pad Size: 3'x3'x6"

Notes:

NOTE: All depths are for base of pipe from ground surface.

| DESCRIPTION | SAMPLE TYPE / SAMPLE NO | IN. DRIVEN / IN. RECOVERED | PID | USCS | DEPTH IN FEET |
|---|---|---|---|---|---|
| GRAVEL - 5-inches thick, large amount of water | | | | | 0 |
| CLAY - orange to gray patches, hard | CS | 36 / 17 | 4.1 | cl | |
| - orange, some gray patches of silty clay | CS | 60 / 8 | 6.4 | | 5 |
| SILTY CLAY - orange to light brown | CS | 60 / 49 | 4.1 | cl | 10 |
| - silty towards lower section | | | 9.1 | | 15 |
| - wet | CS | 60 / 60 | 6.4 | | |
| SAND/SILTY CLAY - very fine grained sand with silty clay interbeds | | | | cl | |
| CLAYEY SILTY SAND - light brown, fine grained, large amount of silts and clays, interbedded sand and clay | CS | 60 / 40 | | sc | 20 |
| SANDY CLAY - light gray brown, fine grained sand, clay interbeds, some gravel, sand, orange clay | | | 5.8 | cl | |
| SAND - orange brown, coarse grained, sub-round fragments up to 3mm in diameter | CS | 55 / 38 | | sp | 25 |
| GRAVEL/SAND - orange brown, coarse grained, some clasts range to 1-inch in diameter | | | 5.8 | sp | |
| SAND - orange brown, very coarse grained to silt size | | | 6.2 | sw | 30 |
| | | | | | 35 |
| | | | | | 40 |




TOTAL DEPTH = 29.5 FEET

| INTERNATIONAL TECHNOLOGY CORPORATION | DRAFT BY | STF 12/20/90 | DRAFT CHK | GWK 6-7-91 | PROJ. CHK | JOM 6-7-91 | APPRV BY | JOM 6-7-91 | DWG. NO. | 446498-A48 Sheet 1 of 1 |
|---|---|---|---|---|---|---|---|---|---|---|

# DRAFT

# MONITOR WELL ITMW14

Client: WHIRLPOOL
Project Name: WHIRLPOOL
Project Location: FORT SMITH, ARK.
Project Number: 446498

## DRILLING AND SAMPLING INFORMATION

Boring Location: ITMW14
SURFACE ELEV.(FT): 475.68
TOTAL DEPTH(FT.): 30
Logged By: L. JOHNSON
Date Started: 10/30/90
Drilled By: J. LANDEROS
Date Completed: 10/31/90

Drill Rig Type: B-53 MOBILE DRILL
Drilling Method: 8-INCH HOLLOW STEM AUGER, 10-INCH HOLLOW STEM AUGER
Sampling Method: 5-FOOT CONTINUOUS SAMPLE

Notes: -

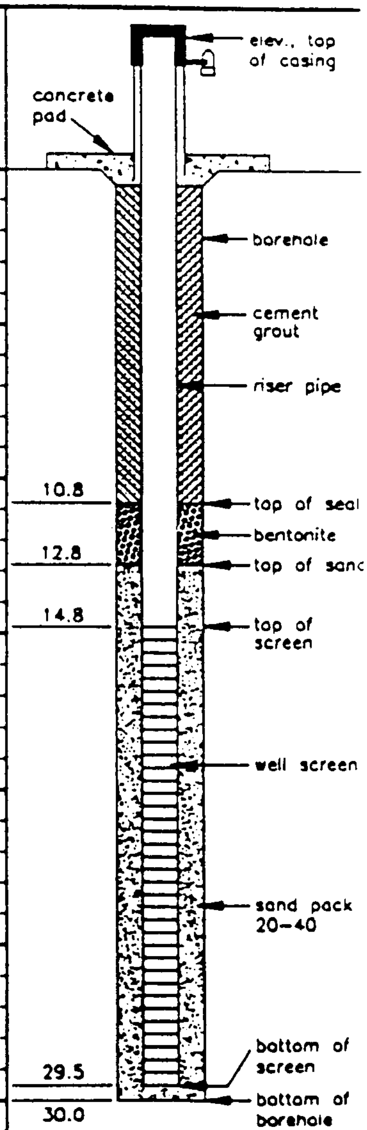
## WELL COMPLETION DATA

Elev-Top of Casing(ft.): 477.30 Ref. Datum: MSL
1. Riser Pipe-Dia(in.): 4 Depth(ft.): 14.8 Type: Sch 40 PV
 Centralizers-Type: NA Depths(ft.): NA
2. Screen Dia.(in.): 4 Type: Sch 40 PVC FJT
 Depth Interval(ft.): 14.8-29.5 Slot Size(in.): .010
 Centralizers-Type: NA Depths(ft.): NA
3. Filter Pack Type: 20-40 Silica Depth Interval(ft.): 12.8-30
 Conc. Pad Size: 3'x3'x6"

NOTE: All depths are for base of pipe from ground surface.

| DESCRIPTION | SAMPLE TYPE / SAMPLE NO. | IN. DRIVEN / IN. RECOVERED | PID | USCS |
|---|---|---|---|---|
| GRAVEL - gravel pack surface, oil stained soil | CS | 60 / 48 | 3.6 | |
| CLAY - orange gray, roots and other organics, some iron nodules, hard, 1cm thick layers of silty clay | | | | ch |
| - alternating orange and gray clay, orange portion well oxidized and not as stiff as gray clay, 4-8mm gravels | CS | 60 / 60 | 5.2, 4.2 | |
| CLAY/SILT - orange gray, more silty with depth, some 4-8mm gravels | CS | 60 / 60 | 6.4 | cl |
| SILT - gray, wet<br>- firm | CS | 60 / 60 | 8.0 | ml |
| SILTY SAND - orange brown, saturated, some 3-6mm gravels | CS | 60 / 18 | 4.1 | sm |
| SAND/GRAVEL - orange brown, top is very fine grained, middle is medium to coarse gravel at bottom (3-5cm grains) | CS | 60 / 12 | 3.0, 4.7 | sp |

DEPTH IN FEET: 5, 10, 15, 20, 25, 30, 35, 40




TOTAL DEPTH = 30.0 FEET

| INTERNATIONAL TECHNOLOGY CORPORATION | DRAFT BY | STF 12/20/90 | DRAFT CHK | 6-7-91 | PROJ. CHK | 6-7-91 | APPRV. BY | 6-7-91 | DWG. NO. | 446498-A49 Sheet 1 of 1 |
|---|---|---|---|---|---|---|---|---|---|---|

# DRAFT

**Client:** WHIRLPOOL
**Project Name:** WHIRLPOOL
**Project Location:** FORT SMITH, ARK.
**Project Number:** 446498

## MONITOR WELL ITMW15

### DRILLING AND SAMPLING INFORMATION

**Boring Location:** ITMW15
**SURFACE ELEV.(FT):** 474.79
**TOTAL DEPTH(FT.):** 30
**Logged By:** L. JOHNSON
**Date Started:** 10/31/90
**Drilled By:** J. LANDEROS
**Date Completed:** 10/31/90

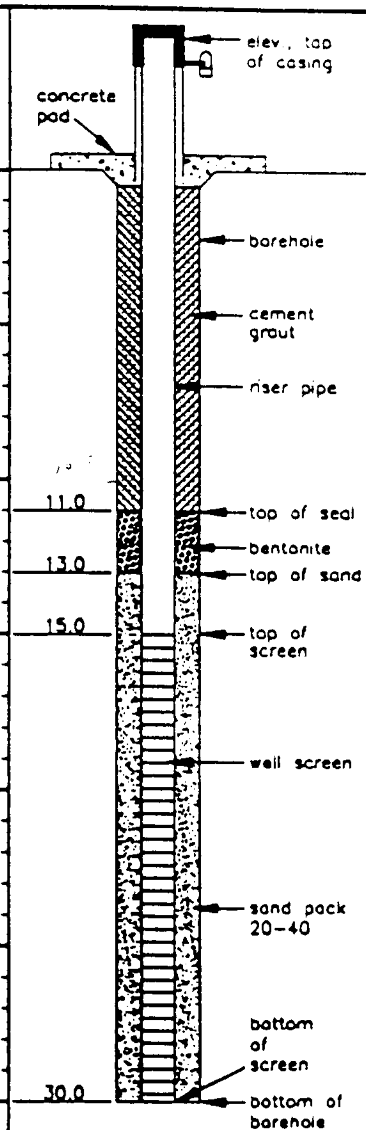
**Drill Rig Type:** B-53 MOBILE DRILL
**Drilling Method:** 8-INCH HOLLOW STEM AUGER, 10-INCH HOLLOW STEM AUGER
**Sampling Method:** 5-FOOT CONTINUOS SAMPLE - CS
2-FOOT SHELBY TUBE - ST
**Notes:** -

### WELL COMPLETION DATA

**Elev-Top of Casing(ft.):** 476.49 **Ref. Datum:** MSL
1. **Riser Pipe-Dia(in.):** 4 **Depth(ft.):** 15 **Type:** Sch 40 PVC
   **Centralizers-Type:** NA **Depths(ft.):** NA
2. **Screen Dia.(in.):** 4 **Type:** Sch 40 PVC FJT
   **Depth Interval(ft.):** 15-30 **Slot Size(in.):** .010
   **Centralizers-Type:** NA **Depths(ft.):** NA
3. **Filter Pack Type:** 20-40 Silica **Depth Interval(ft.):** 13-30
   **Conc. Pad Size:** 3'x3'x6"

**NOTE:** All depths are for base of pipe from ground surface.

| DESCRIPTION | SAMPLE TYPE / SAMPLE NO. | IN. DRIVEN / IN. RECOVERED | PID | USCS | DEPTH IN FEET |
|---|---|---|---|---|---|
| GRAVEL - fill material and soil | CS | 60 / 14 | | | 0 |
| CLAY - orange, roots and other organics, some iron nodules, some silt | ST | | 8.6 | cl | 5 |
| - orange and gray, alternating, orange portion well oxidized and not as stiff as gray, 4-8mm gravels | ST | | 5.2 | | 10 |
| SILTY CLAY - orange gray silty clay turning more silty with depth, some 4-8mm gravels | ST | | 6.2 | cl | |
| - interbeds of clay and silt, soft | CS | 60 / 30 | 10.3 | | 15 |
| - wet | | | | | 20 |
| SILT - orange brown, some gravel and iron nodules | | | 8.0 | ml | |
| SAND - white gray, fine grained, well sorted | | | | sp | 25 |
| - orange brown, medium to coarse grained | | | 12.5 | | |
| GRAVEL - orange to black, with matrix, 10-20mm fragments | | | 5.8 | gm | 30 |
| | | | | | 35 |
| | | | | | 40 |




TOTAL DEPTH = 30.0 FEET

| INTERNATIONAL TECHNOLOGY CORPORATION | DRAFT BY | STF 12/20/90 | DRAFT CHK | CMR 6-7-91 | PROJ. CHK | JDm 6-7-91 | APPRV. BY | JDm 6-7-91 | DWG. NO. | 446498-A50 Sheet 1 of 1 |
|---|---|---|---|---|---|---|---|---|---|---|

# DRAFT

# MONITOR WELL ITMW16

**Client:** WHIRLPOOL
**Project Name:** WHIRLPOOL
**Project Location:** FORT SMITH, ARK.
**Project Number:** 446498

## DRILLING AND SAMPLING INFORMATION

**Boring Location:** ITMW16
**SURFACE ELEV.(FT):** 476.47
**TOTAL DEPTH(FT.):** 32.0
**Logged By:** B. HUEY
**Date Started:** 2/25/91
**Drilled By:** B. HOUSTON
**Date Completed:** 2/25/91

**Drill Rig Type:** B-61 HD TRUCK MOUNTED MOBILE RIG
**Drilling Method:** 8-INCH HOLLOW STEM AUGERS. 10-INCH HOLLOW STEM AUGERS
**Sampling Method:** 2 FOOT SPLIT SPOON (SS)

**Notes:** –

## WELL COMPLETION DATA

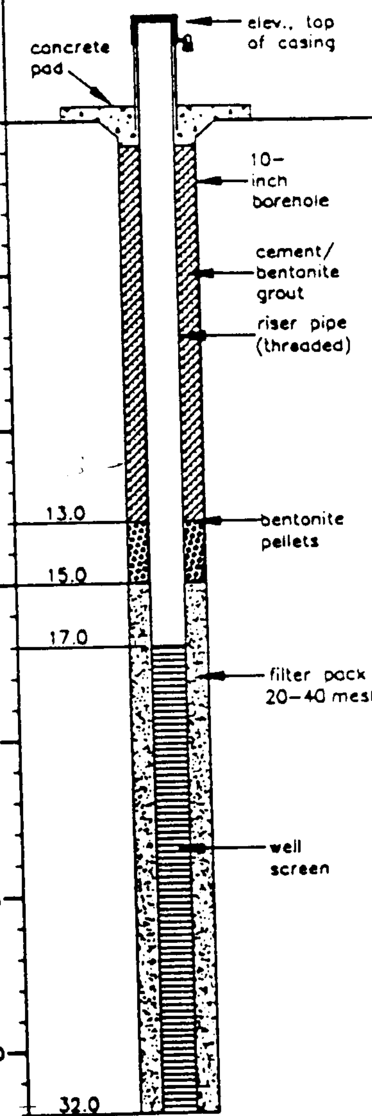
**Elev-Top of Casing(ft.):** 478.79 **Ref. Datum:** MSL
1. **Riser Pipe-I.D.(in.):** 4 **Depth(ft.):** 17 **Type:** Sch 40 PVC
   **Centralizers-Type:** NA **Depths(ft.):** NA
2. **Screen Dia.(in.):** 4 **Type:** Sch 40 PVC FJT
   **Depth Interval(ft.):** 17-32 **Slot Size(in.):** .010
   **Centralizers-Type:** NA **Depths(ft.):** NA
3. **Filter Pack Type:** 20-40 Silica **Depth Interval(ft.):** 15-32
   **Conc. Pad Size:** 3'x3'x6"

| DESCRIPTION | USCS |
|---|---|
| GRAVEL - coarse, 5 inches thick | gp |
| SILTY CLAY - medium plasticity; firm; 10-20% silt; light brown, mottled with red; no odor; no stain; moist | cl |
| CLAY - high plasticity; soft; brown; saturated; no odor; no stain | ch |
| SILTY CLAY - medium plasticity; 10-30% silt; hard; reddish brown; no odor; no stain; moist | cl |
| CLAY - medium plasticity; firm; light brown with 10-20% black mottling; no odor; no stain; moist | ch |
| SANDY CLAY - medium plasticity; 10-20% fine grained; hard; reddish brown; moist; no odor; no stain - reddish brown with gray mottling | cl |
| CLAYEY SAND - low plasticity; fine grained sand with 20-40% clay; reddish brown and gray; moist; no odor; no stain. Unit alternates between very soft; light brown; saturated layers and layers that are hard, reddish brown and moist | sc |
| GRAVELLY SAND - uniform; fine grained with 10-30% 1/2 inch gravel; dense; brown; saturated; no odor; no stain. Contains thin layers of uniform; fine grained sand light brown; dense; saturated; no odor; no stain | sp |
| CLAY - low plasticity; hard; brown ; dry; no odor; no stain | ch |
| SHALE - non plastic; very hard; gray; dry; no odor; no stain | cl |

| SAMPLE TYPE | IN. DRIVEN | IN. RECOVERED |
|---|---|---|
| SS | 19 | 19 |
| SS | 24 | 24 |
| SS | 24 | 18 |
| SS | 24 | 24 |
| SS | 24 | 24 |
| SS | 24 | 15 |
| SS | 24 | 24 |
| SS | 24 | 24 |
| SS | 24 | 23 |
| SS | 24 | 24 |
| SS | 24 | 24 |
| SS | 24 | 24 |
| SS | 24 | 18 |
| SS | 24 | 24 |
| SS | 24 | 24 |

PID: 0.0, 0.0, 0.0, 0.0, 9.4, 2.7, 2.2, 0.5, 1.1, 1.1, 1.1, 1.6, 5.0, 0.0

DEPTH IN FEET: 5, 10, 15, 20, 25, 30, 35, 40




TOTAL DEPTH = 32.0 FEET

| INTERNATIONAL TECHNOLOGY CORPORATION | DRAFT BY | DED 4/2/91 | DRAFT CHK | GMC 6-7-91 | PROJ. CHK | JOM 6-7-91 | APPRV. BY | JOM 6-7-91 | DWG. NO. | 446498-A52 Sheet 1 of 1 |
|---|---|---|---|---|---|---|---|---|---|---|

Client: WHIRLPOOL
Project Name: WHIRLPOOL
Project Location: FORT SMITH, ARK
Project Number: 446498

# DRAFT

# MONITOR WELL ITMW17

## DRILLING AND SAMPLING INFORMATION

Boring Location: ITMW-17
SURFACE ELEV.(FT): 476.14
TOTAL DEPTH(FT.): 31.0
Logged By: B. HUEY
Drilled By: B. HOUSTON
Date Started: 2/27/91
Date Completed: 2/27/91

Drill Rig Type: B-61 HD TRUCK MOUNTED RIG
Drilling Method: 8-INCH HOLLOW STEM AUGER, 10-INCH HOLLOW STEM AUGER
Sampling Method: 2 FOOT SPLIT SPOON (SS)

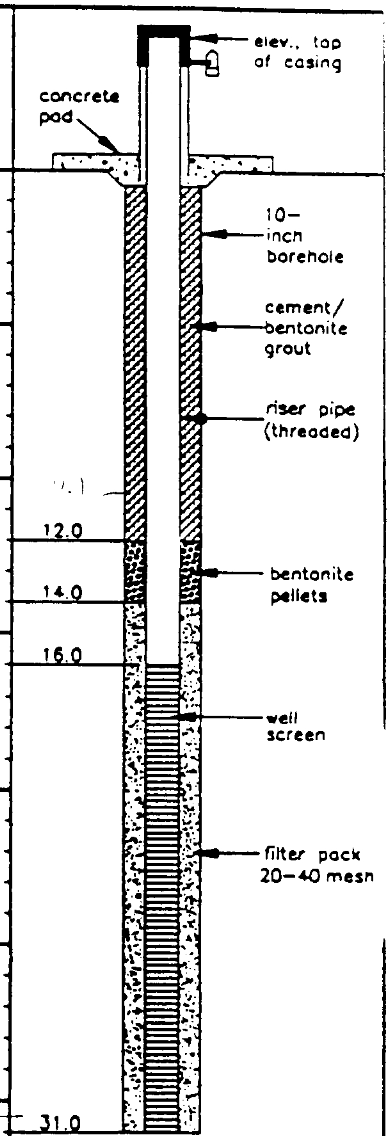
Notes: -

## WELL COMPLETION DATA

Elev-Top of Casing(ft.): 477.90 Ref. Datum: MSL
1. Riser Pipe-I.D.(in.): 4 Depth(ft.): 16 Type: Sch 40 PVC
Centralizers-Type: NA Depths(ft.): NA
2. Screen Dia.(in.): 4 Type: Sch 40 PVC FJT
Depth Interval(ft.): 16-31 Slot Size(in.): .010
Centralizers-Type: NA Depths(ft.): NA
3. Filter Pack Type: 20-40 Silica Depth Interval(ft.): 14-31
Conc. Pad Size: 3'x3'x6"

| DESCRIPTION | USCS |
|---|---|
| GRAVEL | gp |
| CLAY - medium plasticity; hard; reddish brown and gray mottled; moist; no odor ; no stain<br>- clay with 10-30% silt<br>- clay with 10-20% fine grained sand | cl |
| SILTY SAND - uniform; fine grained sand with 20-40% silt; dense light gray; moist, saturated in bottom 2 inches; no odor; no stain<br>- gray and brown; saturated to 18.2 feet then moist | sm |
| SAND - uniform; medium grained sand; loose; brown; saturated | sp |
| SILTY CLAY - uniform; clay with 10-30% silt; firm; brown; moist; no odor | cl |
| SAND - uniform; medium grained sand; loose; brown; saturated | sp |
| SANDY GRAVEL - uniform; 1/2 inch rounded gravel with fine grained sand; loose; brown; saturated; no odor; no stain | gp |
| SILTY CLAY - medium plasticity; clay with 20-40% silt; firm; brown; moist no odor; no stain | cl |
| SHALE - dark gray; moist | cl |

| SAMPLE TYPE | IN. DRIVEN | IN. RECOVERED | PID |
|---|---|---|---|
| SS | 18 | 18 | 0.0 / 0.0 |
| SS | 24 | 24 | 0.0 / 0.0 |
| SS | 24 | 24 | 0.0 / 1.7 |
| SS | 24 | 24 | 0.7 / 0.0 |
| SS | 24 | 24 | 0.0 / 0.0 |
| SS | 24 | 24 | 0.0 / 0.0 |
| SS | 24 | 24 | 0.0 / 0.0 |
| SS | 24 | 24 | 0.0 / 0.6 |
| SS | 24 | 18 | 0.0 / 1.8 |
| SS | 24 | 24 | 1.3 / 2.3 |
| SS | 24 | 24 | 5.5 / 3.9 |
| SS | 24 | 24 | 18.9 / 81.9 |
| SS | 24 | 24 | 5.1 / 11.7 |
| SS | 12 | 12 | 5.8 / 84.9 |
| SS | 24 | 18 | 24.9 / 5.0 |
| SS | 12 | 12 | 0.0 |




TOTAL DEPTH 31.0 FEET

| INTERNATIONAL TECHNOLOGY CORPORATION | DRAFT BY | DED 4/2/91 | DRAFT CHK | 6-7-91 | PROJ. CHK | 6-7-91 | APPRV. BY | 6-7-91 | DWG. NO. | 446498-A53 Sheet 1 of 1 |
|---|---|---|---|---|---|---|---|---|---|---|

**DRAFT**

Client: WHIRLPOOL | Project Location: FORT SMITH, ARK.
Project Name: WHIRLPOOL | Project Number: 446498

# MONITOR WELL ITMW18

## DRILLING AND SAMPLING INFORMATION

Boring Location: ITMW18
SURFACE ELEV.(FT): 473.90
TOTAL DEPTH(FT.): 30.0
Logged By: B. HUEY
Date Started: 2/28/91
Drilled By: B. HOUSTON
Date Completed: 2/28/91

Drill Rig Type: B-61 HD TRUCK MOUNTED RIG
Drilling Method: 8-INCH HOLLOW STEM AUGER, 10-INCH HOLLOW STEM AUGER
Sampling Method: 2 FOOT SPLIT SPOON (SS)

Notes: -

## WELL COMPLETION DATA

Elev-Top of Casing(ft.): 473.55 Ref. Datum: MSL
1. Riser Pipe-I.D.(in.): 4 Depth(ft.): 15 Type: Sch 40 PVC
   Centralizers-Type: NA Depths(ft.): NA
2. Screen Dia.(in.): 4 Type: Sch 40 PVC FJT
   Depth Interval(ft.): 15-30 Slot Size(in.): .010
   Centralizers-Type: NA Depths(ft.): NA
3. Filter Pack Type: 20-40 Silica Depth Interval(ft.): 13-30
   Conc. Pad Size: 3'x3'x6"

## DESCRIPTION

CONCRETE - light gray

CLAYEY SAND - medium plasticity; fine grained sand with 20-40% clay; orange; no odor; no stain

CLAY - medium plasticity; trace gravel; hard; reddish brown; moist; no odor; no stain
- tan/brown
- minor gravel; reddish brown
- increase in gravel; red/brown/tan; black stain
- minor gravel
- firm; no stain

SILTY CLAY - medium plasticity; clay with 10-30% silt; firm; red/brown/gray; moist; no odor; no stain

SILTY SAND - low plasticity; fine grained; firm to soft; red/brown; saturated; no odor; no stain
- very soft
- very fine grained sand with 10-30% silt; soft to firm

SAND - nonplastic; fine to medium grained; firm to soft; red/brown/black; saturated; no odor; no stain

SANDY CLAY - medium to high plasticity; hard; red/brown; moist no odor; no stain

SAND - non plastic; fine grained with trace of large gravel-sized particles firm; red/brown; saturated; no odor; no stain

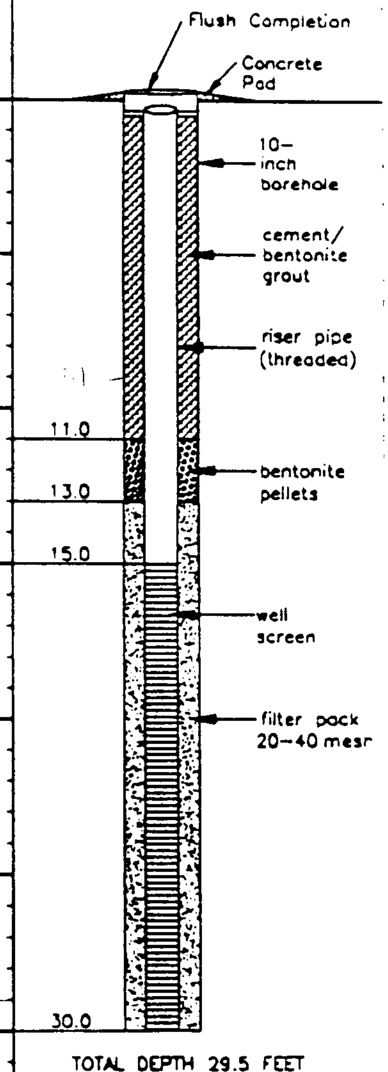
SHALE - medium plasticity; grades to shale; red/brown/black/gray

| SAMPLE TYPE | IN. DRIVEN | IN. RECOVERED |
|---|---|---|
| SS | 12 | 12 |
| SS | 20 | 24 |
| SS | 24 | 24 |
| SS | 24 | 24 |
| SS | 24 | 24 |
| SS | 24 | 24 |
| SS | 24 | 24 |
| SS | 24 | 24 |
| SS | 20 | 24 |
| SS | 24 | 24 |
| SS | 24 | 24 |
| SS | 24 | 24 |
| SS | 12 | 12 |
| SS | 12 | 12 |
| SS | 18 | 18 |

PID: 10.4, 33.5, 36.8, 30.7, 13.2, 9.8, 1.4, 0.0, 0.2, 0.0, 0.2, 2.5, 0.8, 0.8, 3.1, 3.1, 0.0, 1.4, 0.2, 3.1, 0.8, 4.7, 18.8, 5.3, 8.7, 2.5, 0.2, 0.0, 0.0

USCS: sc, cl, cl, sm, sw, cl, sp, cl

DEPTH IN FEET: 5, 10, 15, 20, 25, 30, 35, 40




| INTERNATIONAL TECHNOLOGY CORPORATION | DRAFT BY | DED 4/2/91 | DRAFT CHK | GHR 6-7-91 | PROJ. CHK | JOM 6-7-91 | APPRV. BY | JOM 6-7-91 | DWG. NO. | 446498-A54 Sheet 1 of 1 |
|---|---|---|---|---|---|---|---|---|---|---|

# DRAFT

## MONITOR WELL ITMW19

**Client:** WHIRLPOOL
**Project Name:** WHIRLPOOL
**Project Location:** FORT SMITH, ARK.
**Project Number:** 446498

### DRILLING AND SAMPLING INFORMATION

**Boring Location:** ITMW19
**SURFACE ELEV.(FT):** 474.30
**TOTAL DEPTH(FT.):** 31.0
**Logged By:** B. HUEY
**Date Started:** 2/26/91
**Drilled By:** B. HOUSTON
**Date Completed:** 2/26/91

**Drill Rig Type:** B-61 HD TRUCK MOUNTED RIG
**Drilling Method:** 8-INCH HOLLOW STEM AUGERS. 10-INCH HOLLOW STEM AUGERS
**Sampling Method:** 2 FOOT SPLIT SPOON (SS)

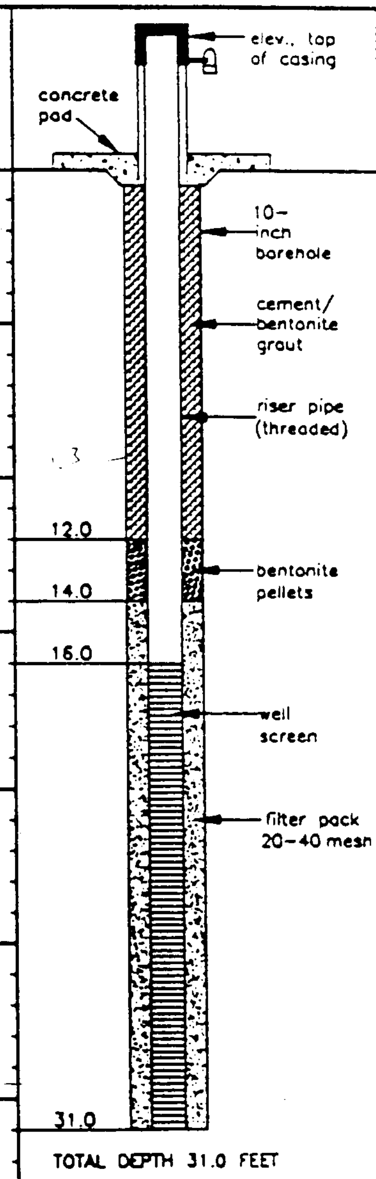
**Notes:** -

### WELL COMPLETION DATA

**Elev-Top of Casing(ft.):** 476.25 **Ref. Datum:** MSL
1. **Riser Pipe-I.D.(in.):** 4 **Depth(ft.):** 16 **Type:** Sch 40 PVC
   **Centralizers-Type:** NA **Depths(ft.):** NA
2. **Screen Dia.(in.):** 4 **Type:** Sch 40 PVC FJT
   **Depth Interval(ft.):** 16-31 **Slot Size(in.):** .010
   **Centralizers-Type:** NA **Depths(ft.):** NA
3. **Filter Pack Type:** 20-40 Silica **Depth Interval(ft.):** 14-31
   **Conc. Pad Size:** 3'x3'x6"

| DESCRIPTION | USCS |
|---|---|
| GRAVEL - coarse gravel | gp |
| GRAVELLY CLAY - medium plasticity; clay with 20-40% 1/2-inch angular gravel; brown; moist; no odor; no stain | cl |
| CLAY - medium plasticity; hard; reddish brown and gray mottled; moist; no odor; no stain | cl |
| GRAVEL - 1/2 inch angular gravel; brown; saturated | gp |
| CLAY - medium plasticity; hard; reddish brown and gray mottled; moist; no odor; no stain | cl |
| CLAYEY SILT - low plasticity; silt with 20-40% clay; firm; reddish brown; moist; no odor; no stain | ml |
| SILTY SAND - uniform; fine grained sand with 30-50% silt; medium dense; reddish brown; moist with 2 inch saturated layers at 17.0, 17.5, 18.5, 19.7 feet; no odor; no stain - 10-20% silt; saturated | sm |
| SANDY GRAVEL - uniform; 1/2 inch angular gravel with 20-40% fine grained sand; medium dense; brown; no odor; no stain | gp |
| SAND - uniform; fine grained; medium dense; brown; saturated; no odor; no stain - medium grained; dense | sp |
| SANDY GRAVEL - uniform; 1/2 inch angular gravel with 40-50% fine grained sand; dense; saturated; brown; no odor; no stain | gp |
| CLAY - medium plasticity; stiff; brown; moist; no odor; no stain | cl |
| SHALE - dark gray | |

| SAMPLE TYPE | IN. DRIVEN | IN. RECOVERED | PID |
|---|---|---|---|
| SS | 18 | 7 | 0.0, 0.0 |
| SS | 24 | 24 | 0.0, 0.0 |
| SS | 24 | 24 | 0.0, 0.0 |
| SS | 24 | 24 | 0.0, 0.0 |
| SS | 24 | 24 | 0.0, 0.0 |
| SS | 24 | 24 | 0.0, 0.0 |
| SS | 24 | 24 | 0.0, 0.0 |
| SS | 24 | 24 | 0.0, 2.2 |
| | | | 6.7, 12.2, 18.9, 10.1 |
| SS | 24 | 24 | 23.4, 9.2 |
| SS | 24 | 24 | 35.9, 11.5 |
| SS | 24 | 12 | 18.8, 15.0 |
| SS | 18 | 18 | 15.0 |
| SS | 12 | 12 | 10.9, 5.7 |
| SS | 24 | 24 | 0.0, 0.0 |




| INTERNATIONAL TECHNOLOGY CORPORATION | DRAFT BY | DED 4/2/91 | DRAFT CHK | [handwritten initials] 6-7-91 | PROJ. CHK | [handwritten initials] 6-7-91 | APPRV. BY | [handwritten initials] 6-7-91 | DWG. NO. | 446498-A55 Sheet 1 of 1 |
|---|---|---|---|---|---|---|---|---|---|---|

# DRAFT

**Client:** WHIRLPOOL
**Project Name:** WHIRLPOOL
**Project Location:** FORT SMITH, ARK.
**Project Number:** 446498

# MONITOR WELL ITMW20

## DRILLING AND SAMPLING INFORMATION

**Boring Location:** ITMW20
**SURFACE ELEV.(FT):** 475.73
**TOTAL DEPTH(FT.):** 29.0
**Logged By:** B. HUEY
**Drilled By:** B. HOUSTON
**Date Started:** 3/5/91
**Date Completed:** 3/6/91

**Drill Rig Type:** B-61 HD TRUCK MOUNTED RIG
**Drilling Method:** 10 INCH O.D. HOLLOW STEM AUGER

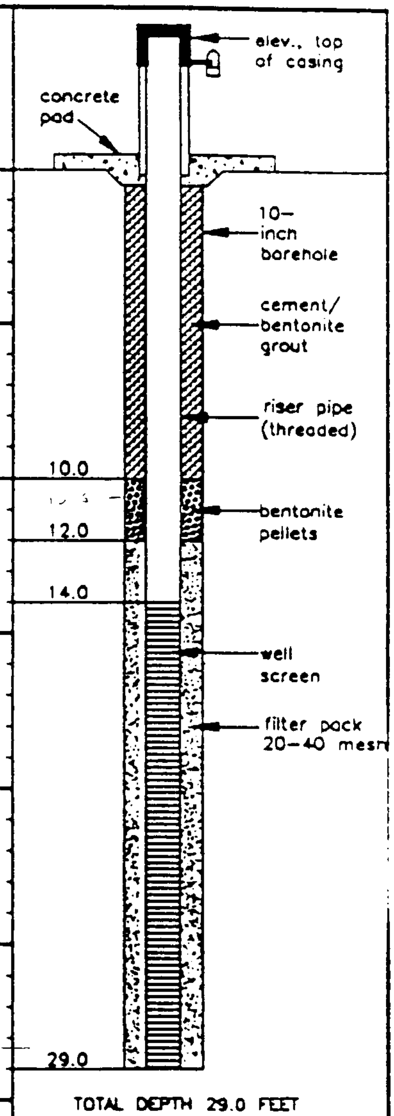
**Sampling Method:** 2 FOOT SPLIT SPOON (SS)

**Notes:** –

## WELL COMPLETION DATA

**Elev–Top of Casing(ft.):** 477.87 **Ref. Datum:** MSL
1. **Riser Pipe–I.D.(in.):** 4 **Depth(ft.):** 14 **Type:** Sch 40 PVC
   **Centralizers–Type:** NA **Depths(ft.):** NA
2. **Screen Dia.(in.):** 4 **Type:** Sch 40 PVC FJT
   **Depth Interval(ft.):** 14–29 **Slot Size(in.):** .010
   **Centralizers–Type:** NA **Depths(ft.):** NA
3. **Filter Pack Type:** 20–40 Silica **Depth Interval(ft.):** 12–29
   **Conc. Pad Size:** 3'x3'x6"

| DESCRIPTION | SAMPLE TYPE / SAMPLE NO. | IN. DRIVEN / IN. RECOVERED | PID | USCS | DEPTH IN FEET |
|---|---|---|---|---|---|
| CLAY – medium plasticity; firm; light brown; moist; no odor; no stain | SS | 24 / 21 | 0.0 | cl | 0 |
| SILTY CLAY – low plasticity; clay with 20–40% silt; hard; light brown; moist; no odor; no stain | SS | 24 / 24 | 0.0 | cl | 5 |
| CLAY – medium plasticity; hard; light brown with light gray mottling; moist; no odor; no stain | SS | 24 / 24 | 0.0 | cl | 10 |
| SILTY CLAY – low plasticity; clay with 10–30% silt; hard; light brown, light gray and black; moist; no odor; no stain | SS | 24 / 24 | 0.0 | cl | 15 |
| – moderately plastic; clay with 20–40% silt; light brown and gray | SS | 24 / 24 | 0.0 | | 20 |
| SANDY SILT – non-plastic; silt with 20–40% fine grained sand; hard; light gray; moist | | | | sm | |
| SANDY GRAVEL – uniform; 1/2 inch angular gravel with 20–40% fine grained sand; firm; light brown; saturated; no odor; no stain | SS | 24 / 24 | | gp | 25 |
| | SS | 12 / 12 | | | |
| SHALE – light gray; moist; weathered | | | | cl | 29 |




| INTERNATIONAL TECHNOLOGY CORPORATION | DRAFT BY | DED 4/2/91 | DRAFT CHK | JMR 6-7-91 | PROJ. CHK | JRm 6-7-91 | APPRV. BY | JOm 6-7-91 | DWG. NO. | 446498–A56 Sheet 1 of 1 |
|---|---|---|---|---|---|---|---|---|---|---|

Client: WHIRLPOOL
Project Name: WHIRLPOOL

Project Location: FORT SMITH, ARK.
Project Number: 446498

# DRAFT
# MONITOR WELL ITMW21

## DRILLING AND SAMPLING INFORMATION

Boring Location: ITMW21
SURFACE ELEV.(FT): 474.37
TOTAL DEPTH(FT.): 31.0

Logged By: B. HUEY
Drilled By: B. HOUSTON
Date Started: 3/7/91
Date Completed: 3/7/91

Drill Rig Type: B-61 HD MOBILE TRUCK MOUNTED RIG
Drilling Method: 10 INCH O.D. HOLLOW STEM AUGERS

Sampling Method: 2 FOOT SPLIT SPOONS

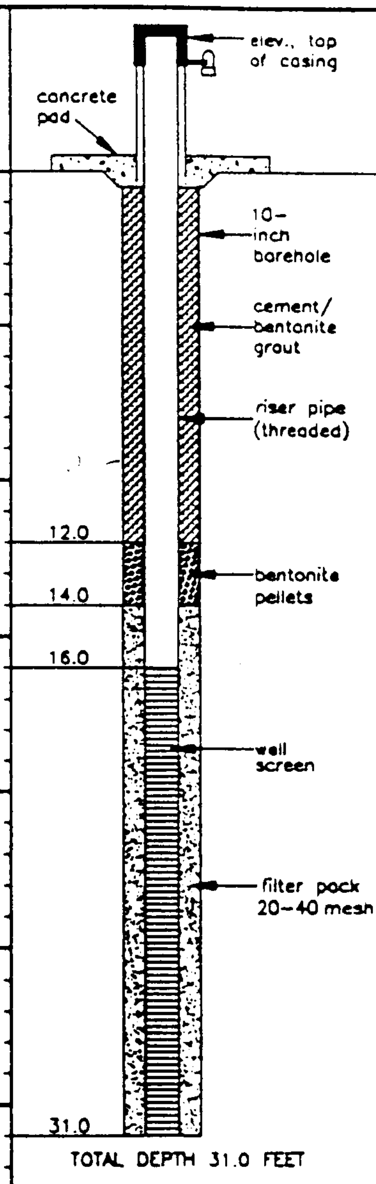
Notes: –

## WELL COMPLETION DATA

Elev–Top of Casing(ft.): 478.52 Ref. Datum: MSL

1. Riser Pipe–I.D.(in.): 4 Depth(ft.): 14 Type: Sch 40 PVC
   Centralizers–Type: NA Depths(ft.): NA
2. Screen Dia.(in.): 4 Type: Sch 40 PVC FJT
   Depth Interval(ft.): 16–31 Slot Size(in.): .010
   Centralizers–Type: NA Depths(ft.): NA
3. Filter Pack Type: 20–40 Silica Depth Interval(ft.): 14–31
   Conc. Pad Size: 3'x3'x6"

| DESCRIPTION | SAMPLE TYPE | IN. DRIVEN / IN. RECOVERED | PID | USCS | DEPTH IN FEET |
|---|---|---|---|---|---|
| SILTY CLAY – low plasticity; clay with 20–40% silt; hard; light gray with light brown; moist; no odor; no stain | SS | 24 / 24 | | cl | |
| CLAY – medium plasticity; clay with 10–20% silt; hard; light brown with light gray; moist; no odor; no stain | SS | 24 / 20 | 0.0 | cl | 5 |
| – clay with no silt | SS | 24 / 24 | 0.0 | | 10 |
| – light brown and light gray with 5% black | SS | 24 / 24 | 0.0 | | 15 |
| – low plastic; light gray, red, brown, and black | SS | 24 / 24 | 0.0 | | 20 |
| SILTY GRAVEL – low plasticity; gravel with 20–30% clay, 10–20% silt; very hard; reddish brown; moist; no odor; no stain | SS | 12 / 11 | 0.0 | gc | 25 |
| CLAY – medium plasticity; hard; light brown and gray; moist; no detectable odor; no stain | SS | 24 / 24 | 4800 5441 1177 | cl | |
| SHALE – dark gray | | | | cl | 30 |




DEPTH IN FEET: 5, 10, 15, 20, 25, 30, 35, 40

| INTERNATIONAL TECHNOLOGY CORPORATION | DRAFT BY | DED 4/2/91 | DRAFT CHK | CMR 6-7-91 | PROJ. CHK | JBM 6-7-91 | APPRV. BY | JBM 6-7-91 | DWG. NO. | 446498-A57 Sheet 1 of 1 |
|---|---|---|---|---|---|---|---|---|---|---|

MALCOLM PIRNIE, INC.

Boring MW - 22

# BORING LOG

| | | | |
|---|---|---|---|
| CLIENT | Whirlpool | PROJECT # | 2172-047-100 |
| PROJECT | Remedial Investigation | CONTRACTOR | MHC |
| LOCATION | Ft. Smith, Ark | DRILLER | Todd Wages |
| START DATE | 12/05/96 | DRILLING METHOD | 6" I.D. H.S. A. |
| FINISH DATE | 12/05/96 | HYDROGEOLOGIST | R.B. Hernandez |

| DEPTH | SAMPLE DESCRIPTION | USCS | PID | Notes |
|---|---|---|---|---|
| | (0' - 2') Very Dark Brown (10 YR, 2/2) Silty Gravel, Very Stiff to Hard, Damp to Very Damp | Fill | 2.7 | |
| 5 | (2' - 5') Dark Yellowish Brown (10YR, 3/6) Silty Slightly Sandy CLAY with some Iron ("Fe") Staining, Very Stiff, Dry to Damp | CH<br>CL | 2.7 | |
| 10 | (5' - 10') Brownish Yellow (10 YR, 6/8) CLAY with Fe Nodules, Very Stiff, Damp | CL | 2.7 | |
| | (10' - 12') Light Grey (7.5 YR, 7/1) to Brownish Yellow (10 YR, 6/8) Silty CLAY, Stiff, Dry to Damp | CL | 2.7 | Silty from (10' - 12') |
| 15 | (12' - 18') Light Grey (7.5 YR, 7/1) to Brownish Yellow (10 YR, 6/8) Slightly Sandy Silty CLAY, Stiff to Very Stiff, Damp | CH<br>CL | 2.7 | |
| 20 | (18' - 23') Light Grey (7.5 YR, 7/1) to Brownish Yellow (10 YR, 6/8) Sandy SILT, Stiff, Damp to Moist | ML | 2.7 | H2O @ 18'<br>(20' - 23') Sticky Clays |
| 25 | (23' - 24') Dark Reddish Brown (5 YR, 3/4) Clayey Gravel, Very Dense, Wet | GC | | |
| | (24' - 28') Brownish Yellow (10 YR, 6/8) Gravelly CLAY, Very Stiff to Hard, Moist | CL<br>GC | 2.7 | |
| 30 | (28' - 29') Brownish Yellow (10 YR, 6/8) Very Silty CLAY, Very Hard, Dry | CL<br>ML | 2.7 | |
| 35 | (29' - 30') Very Dark Grey (7.5 YR, 3/10) to Black (10 YR, 2/1) SILT (McAlester Shale) Very Hard, Dry | ML | 2.7 | |

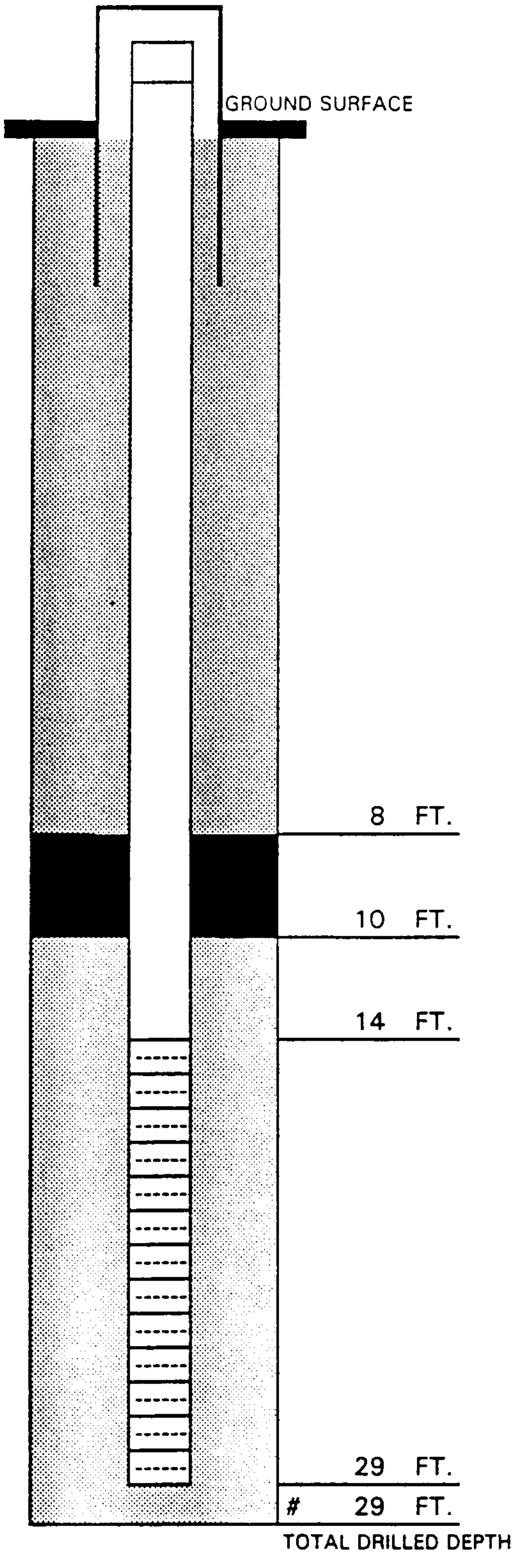
Notes:

Set up on MW-22 at 1515 hrs.
TD boring at 29' below grade at 1835 hrs. construct MW-22

MALCOLM
PIRNIE, INC.

Well ID MW-22

# Monitoring Well Construction Log




| | |
|---|---|
| CLIENT NAME | Whirlpool |
| PROJECT NAME | Remedial Investigation |
| PROJECT # | 2172-047-100 |
| PROJECT LOCATION | Ft. Smith, Arkansas |
| WELL LOCATION | 5' North and 12' East of Hydrant # 7 |
| DRILLING DATE | 12-5-96 |
| COMPLETION DATE | 12-5-96 |
| DRILLING CONT. | MHC |
| DRILLER | Todd Wages |
| BOREHOLE DIA. | 12" |
| DRILLING METHOD | 6" I.D., HSA's |
| DEPTH TO WATER | approximately 18' |
| DEVELOPMENT (date/vol.) | 12-7-96, 110 gallons |

**WELL MATERIALS:**

| | |
|---|---|
| SURFACE CASING | Flush Mount cover |
| **RISER** | |
| LENGTH | 14' |
| DIAMETER | 4" |
| MATERIAL | Sch 40, PVC |
| WELL SEAL | 2' bentonite pellets |
| **SCREEN:** | |
| LENGTH | 15' |
| DIAMETER | 4" |
| MATERIAL | PVC |
| SLOT SIZE | 0.010" |
| SAND PACK | 10 bags , (20-40 ) |
| REMARKS | |
| HYDROGEOLOGIST | R.B. Hernandez |

All measurments are from TOC
Unless noted otherwise noted

# MALCOLM PIRNIE, INC.

Boring MW - 23

## BORING LOG

| | | | |
|---|---|---|---|
| CLIENT | Whirlpool | PROJECT # | 2172-047-100 |
| PROJECT | Remedial Investigation | CONTRACTOR | MHC |
| LOCATION | Ft. Smith, Ark | DRILLER | Todd Wages |
| START DATE | 12/06/96 | DRILLING METHOD | 6" I.D. H.S. A. |
| FINISH DATE | 12/06/96 | HYDROGEOLOGIST | R.B. Hernandez |

| DEPTH | SAMPLE DESCRIPTION | USCS | PID | Notes |
|---|---|---|---|---|
| | (0 - 3") Asphaltic Concrete | | 2.7 | |
| | (3" - 5') Brownish Yellow (10YR, 6/8), Very Silty CLAY, Firm to Stiff, Dry to Damp | CL | | |
| 5 | | | | |
| 10 | (8' - 10') Light Grey (7.5 YR, 7/1) to Brownish Yellow (10 YR, 6/8) Sandy silty CLAY, Stiff to V. Stiff, Moist | CL | | Shelby Tube is wet |
| | (10' - 11') Brownish Yellow (10 YR, 6/8) Sandy CLAY with abundant Iron nodules, Very Stiff, Damp | CL | 2.7 | Wet seam at 10.2 ft. associated w/ drainage ditch north of fence |
| | (11' - 12') Brownish Yellow (10 YR, 6/8) Slightly Sandy CLAY Very Stiff, Damp | CH<br>CL | | |
| 15 | | | | |
| | (15' - 17') Brownish Yellow (10 YR, 6/8) CLAY, Very stiff, Dry to Damp | CH | 2.7 | |
| 20 | | | | H2O @ 19' |
| | (22' - 23.5') Dark Brown (10 YR, 3/3) Sand with Gravel, Very Dense, Wet | GW<br>GC | 2.7 | Chert & FeO2 gravels @ 22' |
| 25 | (23.5' - 28') Dark Reddish Brown (5 YR, 3/4) Clayey Gravel, Very Dense, Wet | GC | 2.7 | |
| 30 | (28' - 29.4') Brownish Yellow (10 YR, 6/8) SILT, Very Hard, Dry | ML | | |
| | (29.4 - 30.5') Very Dark Grey (7.5 YR, 3/10) to Black (10 YR, 2/1) SILT (McAlester Shale) Very Hard, Dry | ML | 2.7 | |
| 35 | | | | |

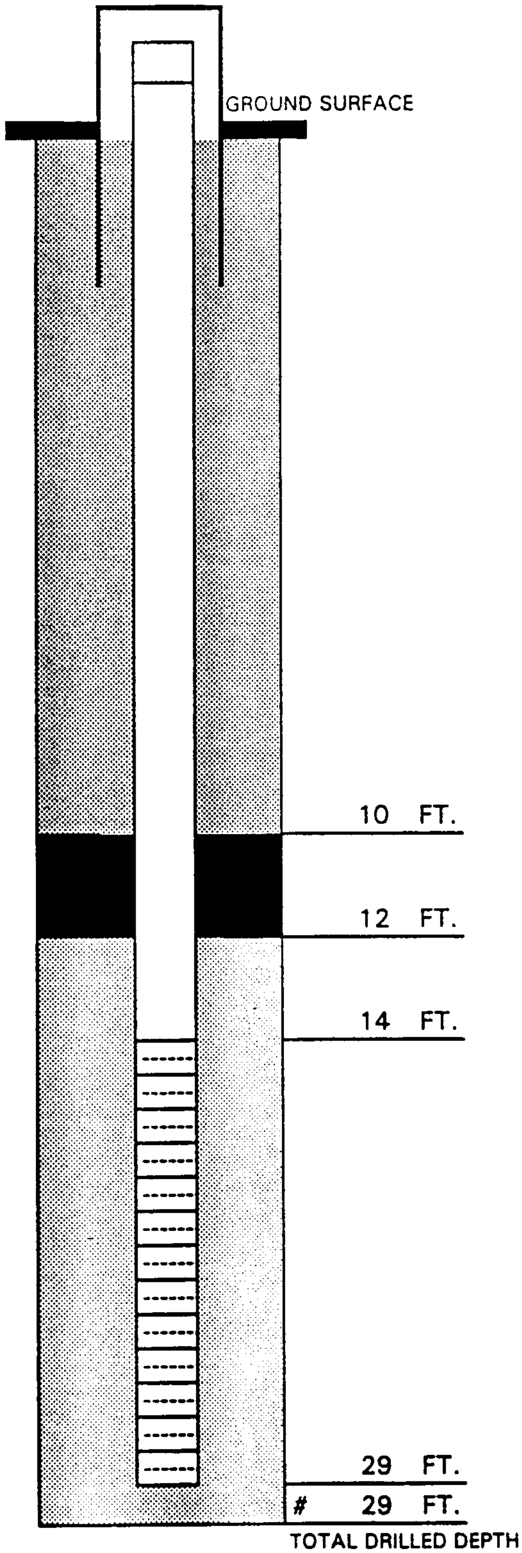
Notes: Set up on MW-23 at 0650 hrs.

TD boring at 30.5 below grade at 0955 hrs. construct MW-23

MALCOLM
PIRNIE, INC.

Well ID MW-23

# Monitoring Well Construction Log




| | |
|---|---|
| CLIENT NAME | Whirlpool |
| PROJECT NAME | Remedial Investigation |
| PROJECT # | 2172-047-100 |
| PROJECT LOCATION | Ft. Smith, Arkansas |
| WELL LOCATION | 5' East and 11' South of Gate # 12 |
| DRILLING DATE | 12-6-96 |
| COMPLETION DATE | 12-6-96 |
| DRILLING CONT. | MHC |
| DRILLER | Todd Wages |
| BOREHOLE DIA. | 12" |
| DRILLING METHOD | 6" I.D., HSA's |
| DEPTH TO WATER | approximately 19' |
| DEVELOPMENT (date/vol.) | 12-7-96, 110 gallons |

**WELL MATERIALS:**

SURFACE CASING: Flush Mount cover

**RISER**

| | |
|---|---|
| LENGTH | 14' |
| DIAMETER | 4" |
| MATERIAL | Sch 40, PVC |

WELL SEAL: 2' bentonite slurry

**SCREEN:**

| | |
|---|---|
| LENGTH | 15' |
| DIAMETER | 4" |
| MATERIAL | PVC |
| SLOT SIZE | 0.010" |

SAND PACK: 10 bags , (20-40 )

REMARKS

HYDROGEOLOGIST: R.B. Hernandez

All measurments are from TOC
Unless noted otherwise noted

Project No: 9808.183

# Log of Borehole: MW24

Project: Fort Smith Groundwater Investigation

Client: Whirlpool Corporation

Location: Fort Smith, Ar

Enclosure:

Engineer: LP

## SUBSURFACE PROFILE

| Description | Elev. |
|---|---|
| Ground Surface | 476.61 |
| ASPHALT | |
| SILTY CLAY, red-orange with grey, black and red staining, plastic, slightly moist, no odour. | 467.44 |
| GRAVELLY SILTY CLAY (fine gravel), reddish orange with grey mottling, moist, no odour. Gravel absent 10.2 - 10.5 feet. | 464.11 |
| GRAVELLY SAND, coarse, very moist, no odour. | |
| SILTY SANDY CLAY, reddish orange with grey mottling and black staining, plastic, moist, no odour. | 459.81 |
| SILTY SAND TO SAND, silty from 16.8 to 18 feet and 18.8 to 19.8 feet, saturated, no odour. | 456.61 |
| SANDY TO SILTY CLAY (silty in lower 0.8 foot), brown with black staining becoming reddish orange with grey mottling, moist. | 453.61 |
| SANDY GRAVEL, coarse sand in lower 0.3 foot, brown, saturated. | 447.11 |
| CLAY, reddish orange with grey and brown, slightly moist, no odour, friable. | 445.61 |
| WEATHERED SHALE (McAlester Formation), black to dark grey. | 443.61 |
| End of Borehole | |

Depth: ft 0, 5, 10, 15, 20, 25, 30, 35; m 0, 5, 10

## SAMPLE

| Number | Volatile Organic Concentration (ppm) |
|---|---|
| 3-4 | 0.2 |
| 4-6 | 1.6 |
| 6-8 | 1.2 |
| 8-10 | 1.4 |
| 10-12 | 1.2 |
| 12-14 | 0.6 |
| 14-16 | 1.4 |
| 16-18 | 0.8 |
| 18-20 | 1.6 |
| 20-22 | 3 |
| 22-24 | 1.6 |
| 24-26 | 5.6 |
| 26-28 | 6.8 |
| 28-30 | 3.8 |
| 30-32 | 1.8 |
| 32-33 | 1 |

Well Data

Drill Method: Hollow Stem Augers

Drill Date: 23 February 1999

Hole Size: 10 in.

ERM
Suite 201
50 Queen Street West
Brampton, Ontario

Datum: Mean Sea Level

Checked by: SJH

Sheet: 1 of 1

**Project No:** 9808.183

# Log of Borehole: MW25

**Project:** Fort Smith Groundwater Investigation

**Client:** Whirlpool Corporation

**Enclosure:**

**Location:** Fort Smith, Ar

**Engineer:** LP

## SUBSURFACE PROFILE

| Depth (ft) | Description | Elev. |
|---|---|---|
| 0 | Ground Surface | 474.65 |
| 0–0.5 | GRAVEL and sub-base. | |
| 0.5–4 | SILTY CLAY, grey, plastic, moist, slight odour. | 470.65 |
| 4–7.2 | SILTY SANDY CLAY, red-brown with grey mottling, plastic, moist, solvent odour. | 467.45 |
| 7.2–19.8 | SANDY CLAY with gravel, red-brown, moist but friable, red and black streaks. Inclusion of grey clay at 12.5 feet, solvent odour. | 454.85 |
| 19.8–20.8 | CLAY, red-brown with grey mottling, black streaks, hard, slightly moist, weak odour. | 453.85 |
| 20.8–25.5 | SILTY CLAY, red-brown with grey mottling, black streaks, slightly moist, weak odour. | 449.15 |
| 25.5–28 | GRAVELLY SANDY CLAY, brown, slightly moist, weak odour. | 446.65 |
| 28–29.7 | GRAVELLY SAND, brown to red-brown, saturated, weak odour. | 444.95 |
| 29.7–32 | CLAY, red-brown, hard, no odour, moist. | 442.65 |
| 32– | WEATHERED SHALE (McAlester Formation), black to dark grey. | |
| 35 | End of Borehole | |

## SAMPLE

| Number | Type | Volatile Organic Concentration (ppm) |
|---|---|---|
| 0-2 | | 3.6 |
| 2-4 | | 2.4 |
| 4-6 | | 348 |
| 6-8 | | 343 |
| 8-10 | | 383 |
| 10-12 | | 356 |
| 12-14 | | 333 |
| 14-16 | | 320 |
| 16-18 | | 319 |
| 18-20 | | 277 |
| 20-22 | | 330 |
| 22-24 | | 352 |
| 24-26 | | 290 |
| 26-28 | | 53.1 |
| 28-30 | | 28.7 |
| 30-32 | | 4.8 |

Well Data

Drill Method: Hollow Stem Augers

Drill Date: 23 February 1999

Hole Size: 10 in.

ERM
Suite 201
50 Queen Street West
Brampton, Ontario

Datum: Mean Sea Level

Checked by: SJH

Sheet: 1 of 1

**Project No:** 9808.183

# *Log of Borehole: MW26*

**Project:** Fort Smith Groundwater Investigation

**Client:** Whirlpool Corporation

**Enclosure:**

**Location:** Fort Smith, Ar

**Engineer:** LP

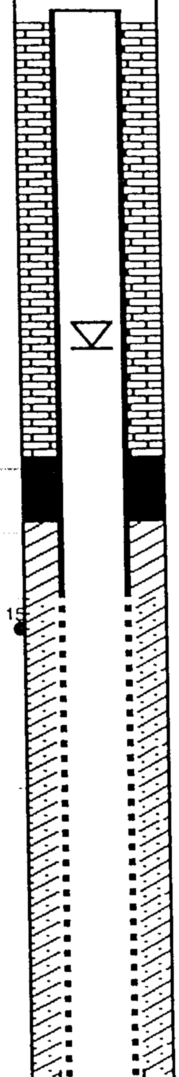
## SUBSURFACE PROFILE

| Depth (ft) | Description | Elev. |
|---|---|---|
| 0 | Ground Surface | 476.11 |
| 0–3 | SILTY CLAY with organic debris, brown, moist to damp, plastic, no odour. | 473.11 |
| 3–14.5 | CLAY, mottled grey/red-brown, slightly plastic, no odour. Reduced grey colour and black staining below 6.5 feet. | 461.61 |
| 14.5–19.8 | SILTY CLAY, reddish orange, minor grey, black staining, slightly moist, slightly plastic, no odour. | 456.31 |
| 19.8–25 | SANDY CLAY, mottled red-orange/grey, some black streaks, moist. Sand content increases with depth. | 451.11 |
| 25–27 | SAND, red-brown, medium-grained, saturated. | 449.11 |
| 27–29.2 | GRAVELLY SAND, red-brown with black staining, saturated. | 446.91 |
| 29.2–33 | WEATHERED SHALE (McAlester Formation) and derived clay, red-brown to black, friable. | 443.11 |
| | End of Borehole | |

## SAMPLE

| Number | Volatile Organic Concentration (ppm) |
|---|---|
| 3-4 | 0.3 |
| 4-6 | 0.5 |
| 6-8 | 0.7 |
| 8-10 | 0.3 |
| 10-12 | 0.5 |
| 12-14 | 2 |
| 14-16 | 1.8 |
| 16-18 | 1.1 |
| 18-20 | 15 |
| 20-22 | 2 |
| 22-24 | 2 |
| 24-26 | 1.1 |
| 26-28 | 1.8 |
| 28-30 | 1.3 |
| 30-32 | 1.3 |
| 32-33 | 1.1 |

Well Data



Drill Method: Hollow Stem Augers

Drill Date: 22 February 1999

Hole Size: 10 in.

ERM
Suite 201
50 Queen Street West
Brampton, Ontario

Datum: Mean Sea Level

Checked by: SJH

Sheet: 1 of 1

Project No: 9908.189

# Log of Borehole: MW-27

Project: Additional Groundwater Investigation

Client: Whirlpool Corporation

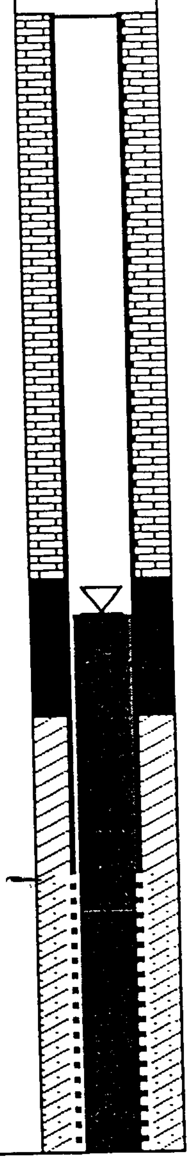
Location: Fort Smith, Ar

Enclosure:

Geologist: LP

| SUBSURFACE PROFILE | | | SAMPLE | | |
|---|---|---|---|---|---|
| Depth (ft) | Description | Elev. | Number | Type | PID Reading (ppm) |
| 0 | Ground Surface | 475.42 | | | |
| | ASPHALT (2") over aggregates. | | | | |
| | SILTY CLAY, reddish brown with frequent red streaks, occasional black nodules, friable. | 473.42 | 0-2 | | 2 |
| | SANDY SILTY CLAY, reddish orange-brown, red streaks, friable, soft, damp. | 469.92 | 2-4 | | 2.5 |
| | | | 4-6 | | 1.6 |
| 5 | CLAY, mottled reddish orange and light gray, frequent red and black streaks, black nodules, hard. | 466.02 | 6-8 | | 1.5 |
| | | | 8-10 | | 3.1 |
| 10 | SILTY SANDY CLAY, inclusions of gravel, reddish orange-brown with black streaks, friable, dry to moist. | 462.42 | 10-12 | | 1.8 |
| | | | 12-14 | | 2.2 |
| | SILTY CLAY with variable sand content (increases with depth), reddish orange-brown with black streaks, moist. | 455.62 | 14-16 | | 1.5 |
| 15 | | | 16-18 | | 0.7 |
| | | | 18-20 | | 0.8 |
| 20 | | | | | |

Well Data



Drill Method: Hollow Stem Augers

Drill Date: 07 December 1999

Hole Size: 8.25 inch

ERM
Suite 201
50 Queen Street West
Brampton, Ontario

Datum: Mean Sea Level

Checked by: SJH

Sheet: 1 of 2

Project No: 9908.189

Project: Additional Groundwater Investigation

Client: Whirlpool Corporation

Location: Fort Smith, Ar

# Log of Borehole: MW-27

Enclosure:

Geologist: LP

| Depth | Description | Elev. | Sample Number | PID Reading (ppm) |
|---|---|---|---|---|
| | SANDY CLAY, reddish brown with black streaks, isolated clay lenses, moist. | 450.92 | 20-22 | 0.3 |
| | | | 22-24 | 0.7 |
| 25 | SAND, coarse, reddish orange-brown, no odor, wet. | 450.22 | 24-26 | 0.5 |
| | GRAVELLY SAND, wet. 27.2-27.4': light gray clay. | 446.92 | 26-28 | 1.4 |
| | GRAVELLY SANDY CLAY, occasional cobbles, reddish orange brown, hard, moist to damp. | 446.02 | 28-30 | 0.2 |
| 30 | CLAY, reddish-orange, hard. | 445.32 | | |
| | WEATHERED SHALE. | 444.92 | | |
| | End of Borehole | | | |

Depth scale: 25, 30, 35 (11), 40

Sandy clay

Sand + gravel

clay/shale

Drill Method: Hollow Stem Augers

Drill Date: 07 December 1999

Hole Size: 8.25 inch

ERM
Suite 201
50 Queen Street West
Brampton, Ontario

Datum: Mean Sea Level

Checked by: SJH

Sheet: 2 of 2

Project No: 9908.189

# Log of Borehole: MW-28

Project: Additional Groundwater Investigation

Client: Whirlpool Corporation

Location: Fort Smith, Ar

Enclosure:

Geologist: LP

| SUBSURFACE PROFILE | | | SAMPLE | | | |
|---|---|---|---|---|---|---|
| Depth (ft) | Description | Elev. | Number | Type | PID Reading (ppm: 0, 2.5, 5, 7.5, 10) | Well Data |
| 0 | Ground Surface | 476.2 | | | | |
| | ASPHALT (2") over aggregates. | | 0-2 | | 0 | |
| | SILTY CLAY, trace gravel, dark brown, damp, no odor. | | | | | |
| | CLAY, brown with red and black streaks, plastic. | 473.7 | 2-4 | | | |
| | SILTY CLAY, reddish orange with red streaks, soft, no odor. | 472.7 | | | | |
| | CLAY, mottled reddish orange and gray, black streaks, hard, damp, no odor. | | 4-6 | | | |
| 5 | SANDY SILTY CLAY, dark reddish orange with frequent black streaks, friable. Sandier zone 6.4-7.0 ft. | 467.7 | 6-8 | | | |
| | SILTY CLAY, mottled reddish orange and gray, friable, hard, damp. | 465 | 8-10 | | | |
| 10 | | | 10-12 | | | |
| | SILTY SANDY CLAY, dark reddish orange with some light gray sandy areas, soft. 14.0-17.0': hard. | 458.2 | 12-14 | | | |
| 15 | | | 14-16 | | | |
| | | | 16-18 | | | |
| | SANDY CLAY, light gray with minor reddish orange, damp. CLAYEY SAND, reddish orange to brown, in lower 0.2 ft. | | 18-20 | | | |
| 20 | | | | | | |

| | | |
|---|---|---|
| Drill Method: Hollow Stem Augers | ERM<br>Suite 201<br>50 Queen Street West<br>Brampton, Ontario | Datum: Mean Sea Level |
| Drill Date: 07 December 1999 | | Checked by: SJH |
| Hole Size: 8.25 inch | | Sheet: 1 of 2 |

Project No: 9908.189

Project: Additional Groundwater Investigation

Client: Whirlpool Corporation

Location: Fort Smith, Ar

# Log of Borehole: MW-28

Enclosure:

Geologist: LP

| Depth | Symbol | Description | Elev. | Sample Number | Type | PID Reading (ppm) | Well Data |
|---|---|---|---|---|---|---|---|
| | | | 455.5 | | | | |
| | | CLAY, reddish orange and light gray, hard, moist. | 454.7 | 20-22 | | 0 | |
| | | CLAYEY SAND, coarse, soft, moist. | 452.7 | 22-24 | | 0 | |
| | | GRAVELLY SAND, coarse, brown to reddish brown, wet. 1" layer of cemented sand and gravel at 24'. | 451.4 | 24-26 | | 0 | |
| 25 | | CLAY, reddish brown to brown, hard, moist, no odor. | 450.7 | | | | |
| | | WEATHERED SHALE over 0.3 ft. competent shale. | 448.4 | 26-28 | | 0 | |
| | | End of Borehole | | | | | |
| 30 | | | | | | | |
| 35 | 11 | | | | | | |
| 40 | | | | | | | |

Drill Method: Hollow Stem Augers

Drill Date: 07 December 1999

Hole Size: 8.25 inch

ERM
Suite 201
50 Queen Street West
Brampton, Ontario

Datum: Mean Sea Level

Checked by: SJH

Sheet: 2 of 2

Project No: 9908.189

# Log of Borehole: MW-29

Project: Additional Groundwater Investigation

Client: Whirlpool Corporation

Location: Fort Smith, Ar

Enclosure:

Geologist: LP

| SUBSURFACE PROFILE | | | SAMPLE | |
|---|---|---|---|---|
| Depth (ft) | Description | Elev. | Number | PID Reading (ppm) |
| 0 | Ground Surface | 474.91 | | |
| 0 | ASPHALT (2") over aggregates. | | | |
| 0–4.8 | SILTY CLAY, brown with isolated red and black streaks, slightly plastic, damp. | | 0-2 | 3.4 |
| | | | 2-4 | 2.7 |
| | | 470.11 | 4-6 | 3.3 |
| 4.8–7.2 | SILTY SANDY CLAY, brown with black streaks, friable, soft, damp. | | | |
| | | 467.71 | 6-8 | 3 |
| 7.2–8.0 | SILTY CLAY, mottled reddish orange and gray, hard. | 466.91 | | |
| 8.0–19.4 | CLAY, mottled reddish orange and gray, blocky texture, hard, dry to moist. | | 8-10 | 2.6 |
| | | | 10-12 | 3 |
| | 8.0-8.2' and 13-16': abundant black and red nodules. | | 12-14 | 3.4 |
| | 15.2-16.0': silty, soft. | | 14-16 | 3.8 |
| | | | 16-18 | 4.3 |
| | | 455.51 | 18-20 | 4 |

Drill Method: Hollow Stem Augers

Drill Date: 06 December 1999

Hole Size: 8.25 inch

ERM
Suite 201
50 Queen Street West
Brampton, Ontario

Datum: Mean Sea Level

Checked by: SJH

Sheet: 1 of 2

Project No: 9908.189

Project: Additional Groundwater Investigation

Client: Whirlpool Corporation

Location: Fort Smith, Ar

# Log of Borehole: MW-29

Enclosure:

Geologist: LP

| Description (Subsurface Profile) | Elev. | Sample Number | PID Reading (ppm) |
|---|---|---|---|
| GRAVELLY SANDY CLAY, isolated coarse gravel, moist. 21.8-22.0': clay, hard. | 451.91 | 20-22 | 2.8 |
| GRAVELLY SAND, coarse, brown to reddish brown, saturated. | 448.91 | 22-24 | 1.7 |
| | | 24-26 | 2.3 |
| CLAY, light gray to white, plastic. | 448.11 | 26-28 | 2.3 |
| GRAVELLY SANDY CLAY, coarse, brown to reddish brown, saturated. | 446.91 | | |
| SAND, coarse, brown. | 445.91 | 28-30 | 3.6 |
| GRAVELLY SANDY CLAY, coarse gravel, brown to reddish brown. | 445.31 | | |
| CLAY, reddish orange becoming dark gray in lower half, compacted. | 444.41 | | |
| WEATHERED SHALE. | 443.91 | | |
| End of Borehole | | | |

Depth scale: 25, 30, 35 — 11, 40

Drill Method: Hollow Stem Augers

Drill Date: 06 December 1999

Hole Size: 8.25 inch

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Suite 201
50 Queen Street West
Brampton, Ontario

Datum: Mean Sea Level

Checked by: SJH

Sheet: 2 of 2

Project No: 9908.189

Project: Additional Groundwater Investigation

Client: Whirlpool Corporation

Location: Fort Smith, Ar

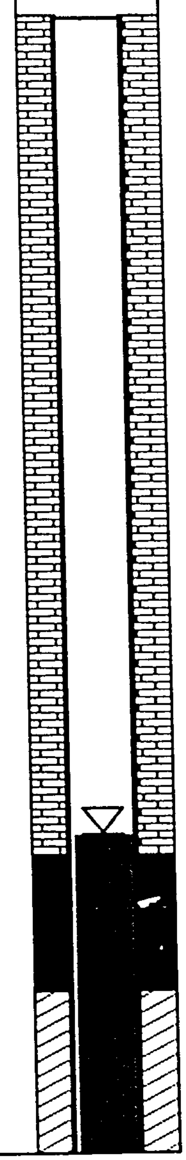
# Log of Borehole: MW-30

Enclosure:

Geologist: LP

| Depth (ft) | Description | Elev. | Sample Number | PID Reading (ppm) |
|---|---|---|---|---|
| 0 | Ground Surface | 478.99 | | |
| | ASPHALT (2") over aggregates. | | | |
| | SILTY CLAY, light brown with red staining and black streaks, moist. | 475.79 | 0-2 | 3.2 |
| | | | 2-4 | 57.1 |
| | CLAY, isolated coarse gravel, mottled reddish brown and gray with large black nodules, friable. | 471.39 | 4-6 | 51.7 |
| | | | 6-8 | 65.4 |
| | SILTY CLAY, mottled reddish brown and gray with black streaks, slightly plastic. | 469.19 | 8-10 | 78.8 |
| 10 | SILTY SANDY CLAY, trace fine gravel, friable, weak odor. | 466.59 | 10-12 | 79.9 |
| | CLAY, mottled reddish orange and gray, isolated black streaks, stiff, weak odor. | 462.49 | 12-14 | 54.7 |
| 15 | | | 14-16 | 49.6 |
| | SILTY CLAY, mottled reddish orange and gray, frequent small black accretions, friable. | 459.49 | 16-18 | 47.7 |
| | | | 18-20 | 42.8 |
| 20 | SANDY CLAY, light brown and orange, black zones, hard. | | | |

Well Data



Drill Method: Hollow Stem Augers

Drill Date: 06 December 1999

Hole Size: 8.25 inch

ERM
Suite 201
50 Queen Street West
Brampton, Ontario

Datum: Mean Sea Level

Checked by: SJH

Sheet: 1 of 2

Project No: 9908.189

Project: Additional Groundwater Investigation

Client: Whirlpool Corporation

Location: Fort Smith, Ar

# Log of Borehole: MW-30

Enclosure:

Geologist: LP

## SUBSURFACE PROFILE

| Description | Elev. |
|---|---|
| SAND, white, moist, no odor. | 457.99 |
| CLAYEY SAND, fine, reddish-orange and gray, friable. | 455.99 |
| SANDY CLAY, reddish orange, moist to damp. | 449.99 |
| SAND, light reddish-orange, soft, damp. | |
| CLAYEY GRAVEL, coarse, reddish orange, moist, weak odor. Light gray to white clay 30.5-31.0 ft. | 447.49 |
| CLAY, isolated gravel, mottled reddish orange and gray, hard, moist. | 446.49 |
| SANDY GRAVEL, brown, wet. | 443.39 |
| CLAY, reddish orange to brown becoming gray with depth, fissile. | 442.79 |
| WEATHERED SHALE. | |
| End of Borehole | |

Depth: 25, 30, 35 (11), 40

## SAMPLE

| Number | PID Reading (ppm) |
|---|---|
| 20-22 | 34.9 |
| 22-24 | 28.4 |
| 24-26 | 37.9 |
| 26-28 | 37 |
| 28-30 | 8.3 |
| 30-32 | 22.5 |
| 32-34 | 12.3 |
| 34-36 | 4.7 |

PID Reading: ppm 0 25 50 75 100

Well Data

Drill Method: Hollow Stem Augers

Drill Date: 06 December 1999

Hole Size: 8.25 inch

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Suite 201
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Brampton, Ontario

Datum: Mean Sea Level

Checked by: SJH

Sheet: 2 of 2

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ERM.

# MW-31
# DRILLING LOG

| | | | | | |
|---|---|---|---|---|---|
| W.O. NO. | 58102 | Boring/Well ID | MW-31 | Date Drilled | 1/4/01 |
| Project | Whirlpool, Ft. Smith | Owner | Whirlpool Corporation | | |
| Location | Fort Smith, Arkansas | Boring T.D. | 30 ' | Boring Diam. | 2.125 " |
| N. Coord. | 9348.48 ' | E. Coord. | 7675.35 ' | Surface Elevation | 476.03 ' MSL Datum |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Screen: | Type Slotted Schedule 40 PVC | Diam. | 0.81 " | Length | 10 ' | Slot Size | 0.010 " |
| Casing: | Type Schedule 40 PVC | Diam. | 0.75 " | Length | 17.6 ' | Sump Length | 0.1 ' |

Top of Casing Elevation 476.03 ' Stickup 0.2 '

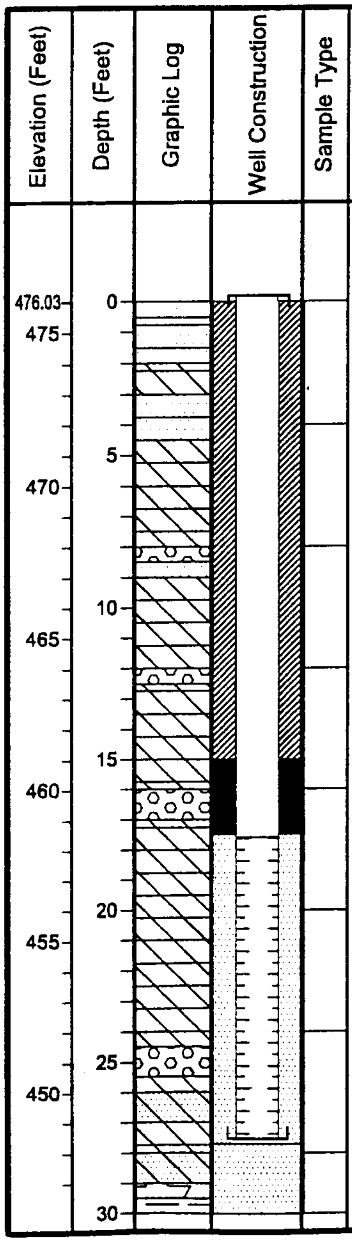
Depth to Water: 1. Ft. 10 ( Boring ) 2. Ft. 3.7 ( Well )

Drilling Company Tri-State Testing Srvcs., Inc. Driller Ken Smith

Drilling Method GeoProbe Log By Roberta Smith

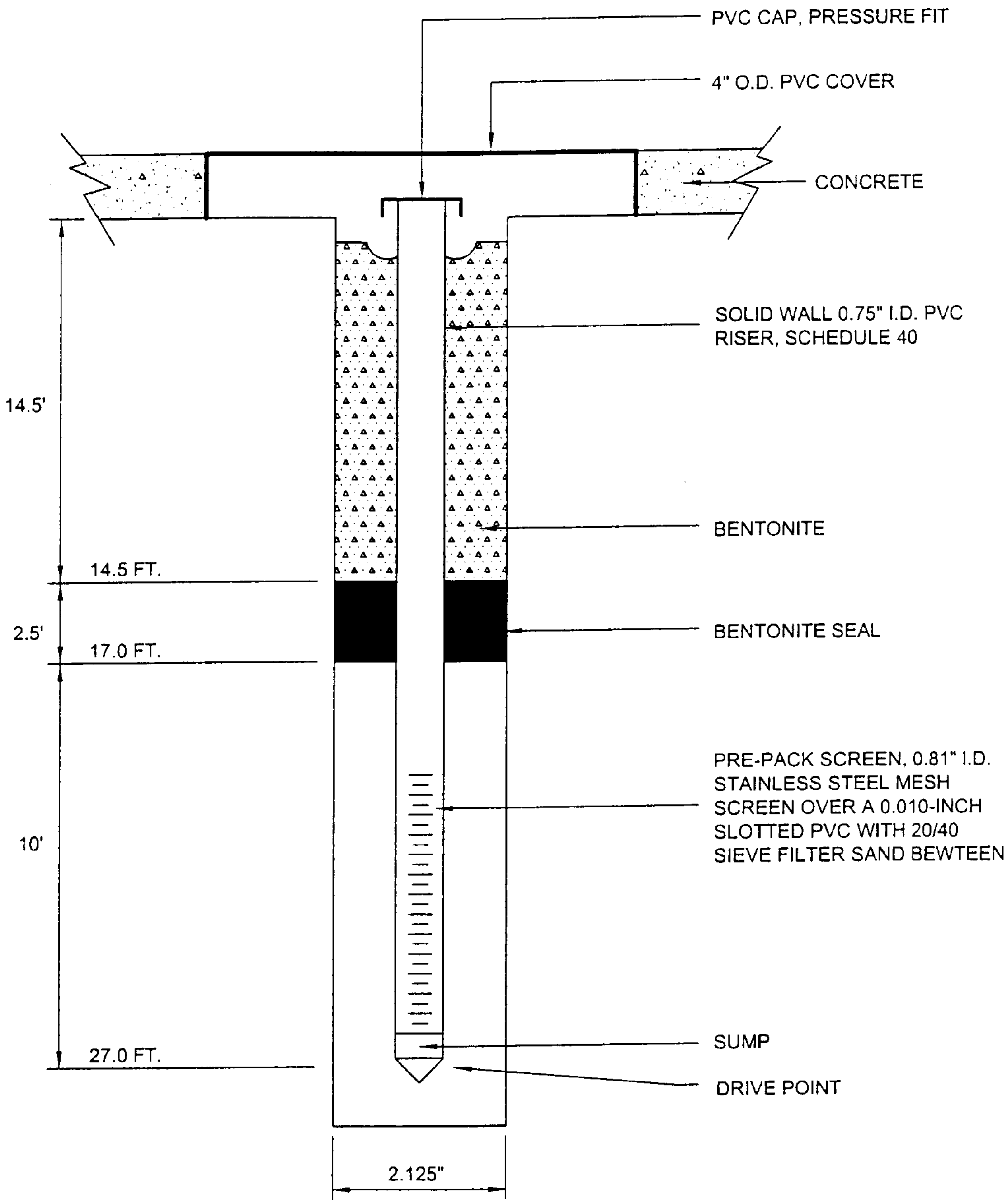
SKETCH MAP

NOTES




| Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|
| 0-4 | 0-0.5 | SILTY SAND: dark brown, slightly moist, soft, organic rich with grass and rootlets |
| | 0.5-2 | SILTY SAND: medium brown, moist, soft, rocks up to 0.75 inches in diameter present |
| | 2-3 | SILTY CLAY: grayish brown, slightly moist, firm, some iron nodules and orange streaking present |
| | 3-4.5 | SILTY SAND: black, dry, gravel and rock inclusions up to 1 inch in diameter are present |
| 4-8 | 4.5-8 | SILTY CLAY: silty clay grading to clay, medium brown, moist, firm, massive |
| 8-12 | 8-8.5 | GRAVEL: medium brown, moist, loose, soft, mixture with rocks up to 1 inch in diameter |
| | 8.5-9 | SILTY SAND: medium brown, moist, loose, soft, rock inclusions up to 1 inch in diameter |
| | 9-12 | SILTY CLAY: medium brown grading to reddish brown at 11 feet, moist, firm, gray and red inclusions present beginning at 11 feet |
| 12-16 | 12-12.5 | GRAVEL: medium brown, loose, wet, with rocks up to 0.5 inches in diameter |
| | 12.5-13.5 | SILTY CLAY: medium brown, wet, fluffy, with rock inclusions up to 0.5 inches in diameter |
| | 13.5-16 | SILTY CLAY: reddish brown with gray and orange streaking, moist, firm, massive |
| 16-20 | 16-17 | GRAVEL: medium brown, loose |
| | 17-24 | SILTY CLAY: medium brown grading to reddish brown and gray, very moist grading to slightly moist, soft from 17 - 18 feet, firm from 18-24 feet |
| 20-24 | | |
| 24-28 | 24-24.5 | SILTY CLAY: medium reddish brown, moist, loose |
| | 24.5-25.5 | GRAVEL: medium brown, moist, loose |
| | 25.5-26 | SILTY CLAY: medium reddish brown, moist, soft, loose |
| | 26-27 | SANDY CLAY: light brown, moist, soft |
| | 27-28 | SILTY CLAY: reddish light brown, firm, with rock inclusions up to 0.5 inches in diameter |
| 28-30 | 28-29 | SANDY CLAY: light brown, wet, soft, some gravel present |
| | 29-29.5 | Other: reddish, dry, brittle, iron-rich material |
| | 29.5-30 | SHALE: gray, slightly moist, firm, weathered |
| | | T.D. = 30 ' |

MW-32

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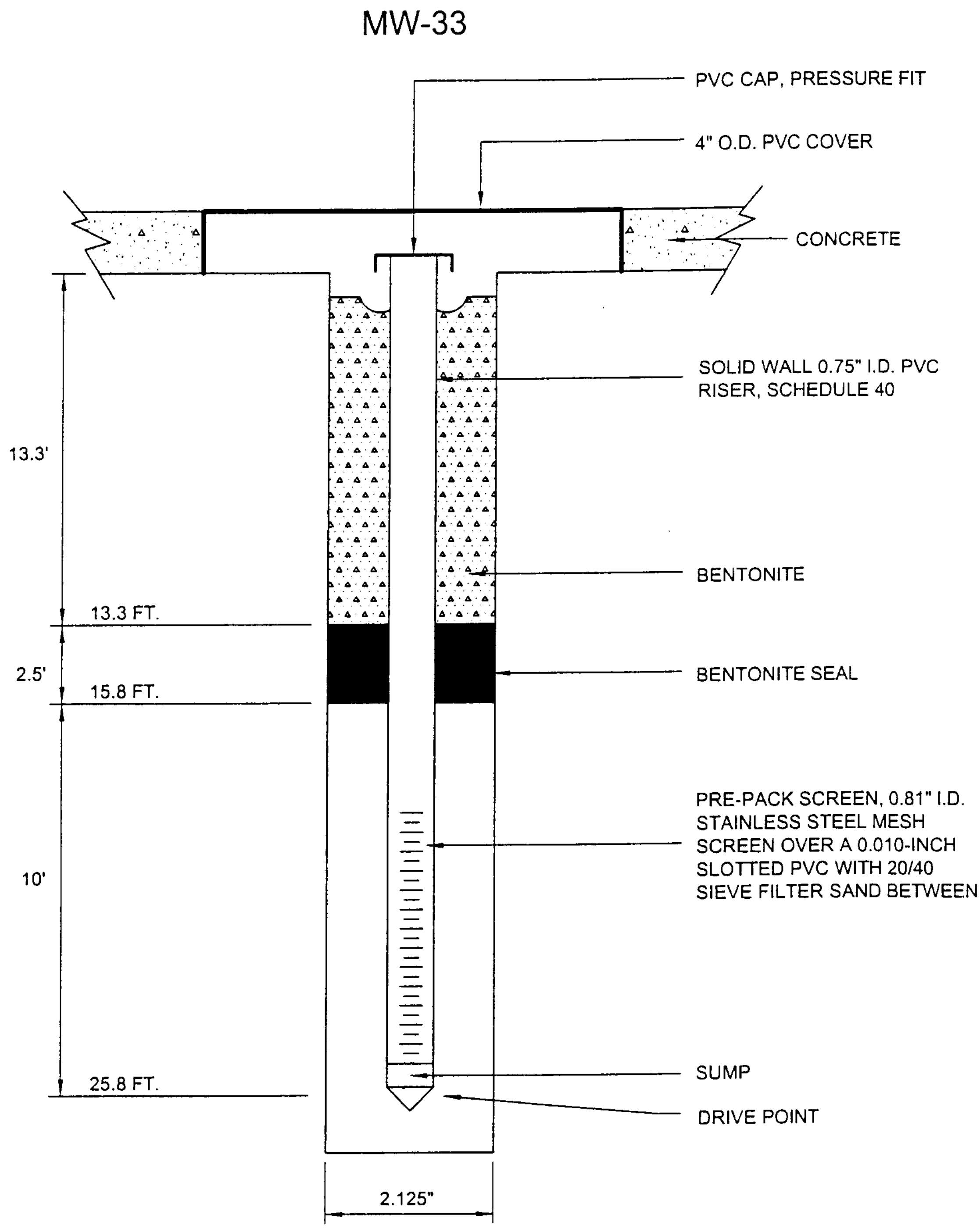
| | | | |
|---|---|---|---|
| DESIGN: RS | CHKD.: | DATE: 01/23/01 | REV.: |
| DRAWN: LMc | SCALE: N.T.S. | W.O.NO.: 581002A020 A01 | |

FIGURE 2
MW-32 CONSTRUCTION DETAIL
OFFSITE INVESTIGATION
Whirlpool Corporation
Fort Smith, Arkansas

ERM

H:\DWG\A01\581002a020.dwg, 01/23/2001 06:09:20 AM

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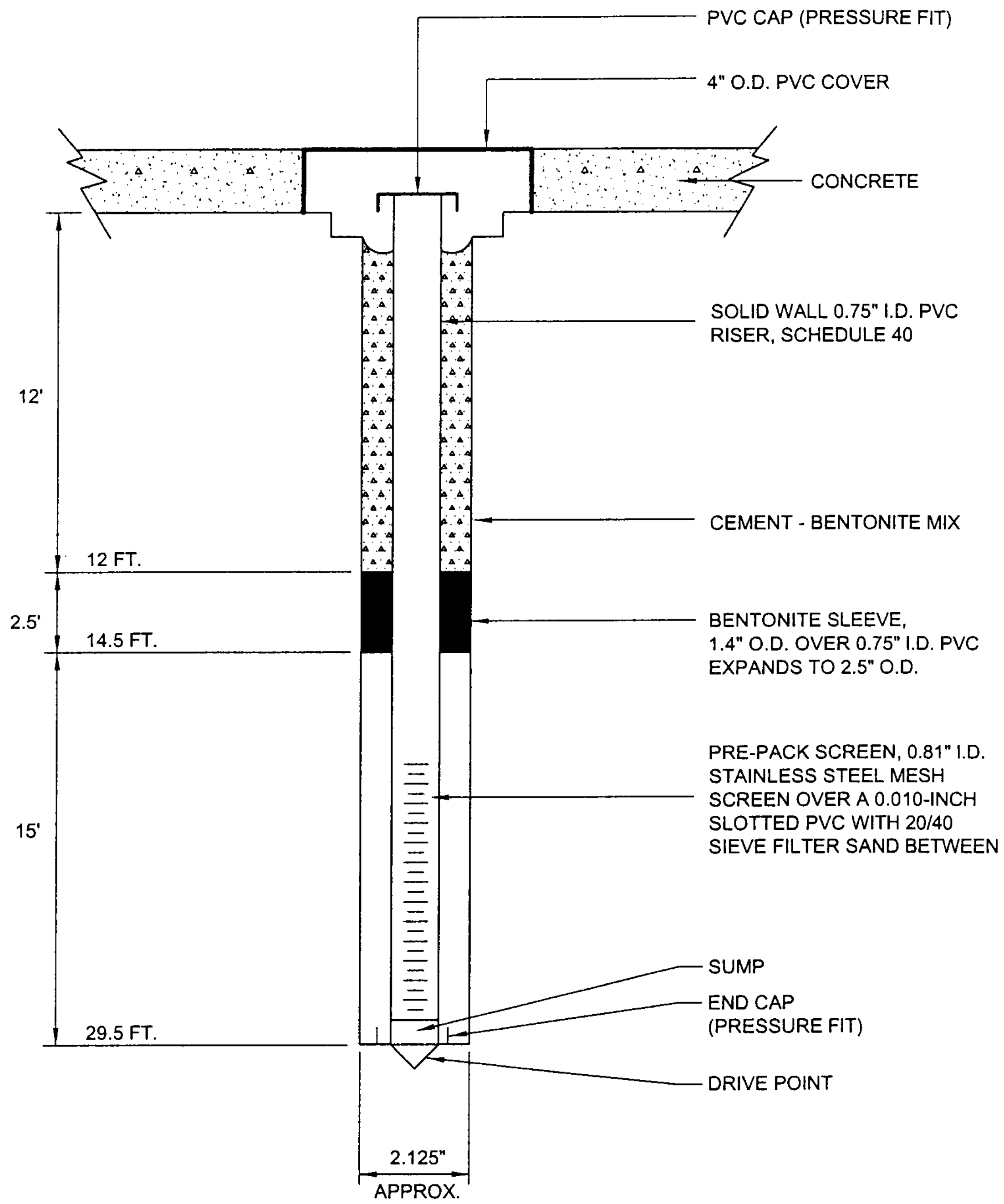
| DESIGN: RS | CHKD.: | DATE: 01/23/01 | REV.: |
|---|---|---|---|
| DRAWN: LMc | SCALE: N.T.S. | W.O.NO.: 581002A021 A01 | |

FIGURE 3
MW-33 CONSTRUCTION DETAIL
OFFSITE INVESTIGATION
Whirlpool Corporation
Fort Smith, Arkansas

ERM

H:\DWG\A01\581002a021.dwg, 01/23/2001 06:12:27 AM

# MW-34

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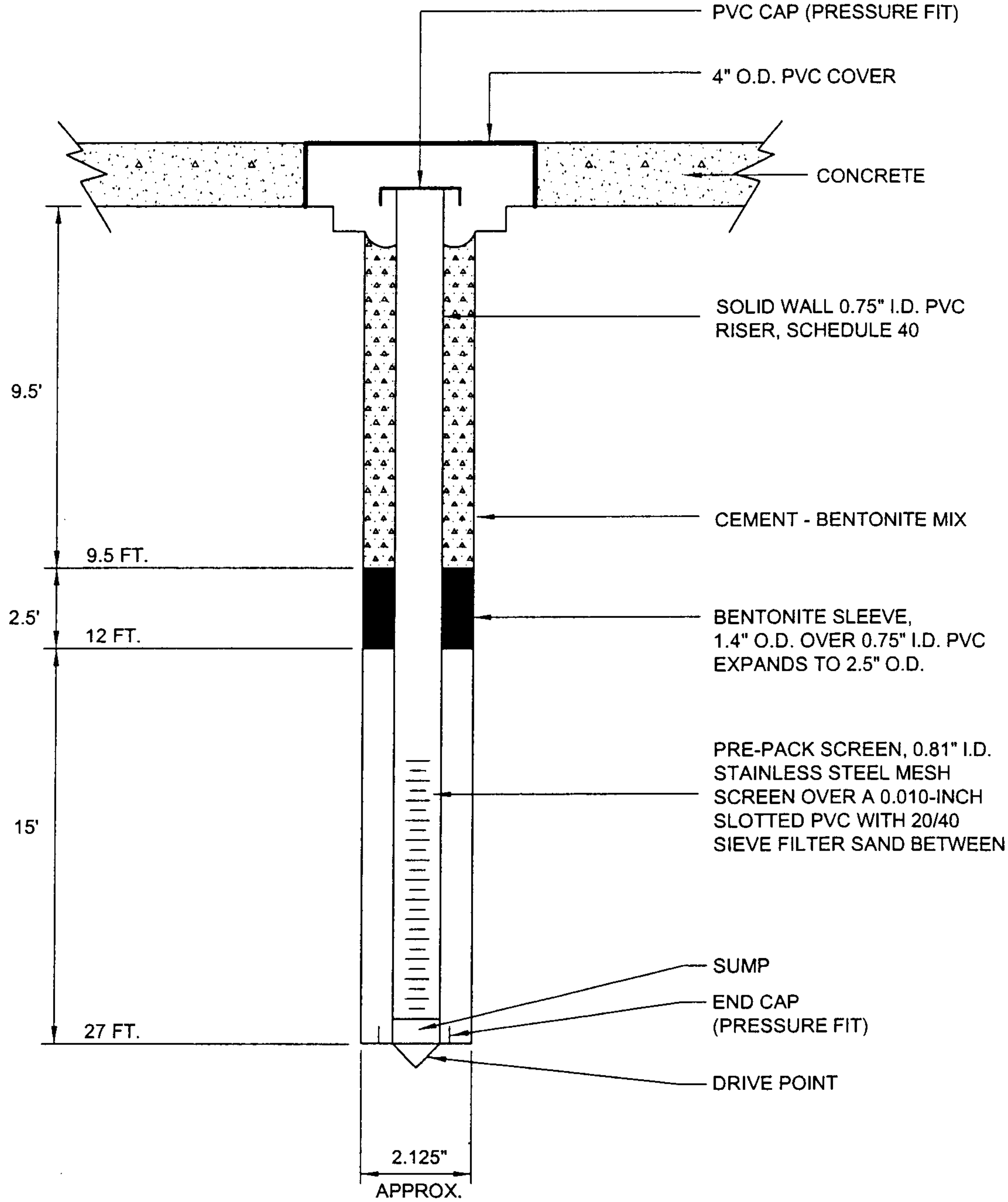
| | | | |
|---|---|---|---|
| DESIGN: RS | CHKD.: | DATE: 04/02/01 | REV.: |
| DRAWN: LMc | SCALE: N.T.S. | W.O.NO.: 581005A203 D01 | |

FIGURE 1
MW-34 CONSTRUCTION DETAIL
OFFSITE INVESTIGATION
Whirlpool Corporation
Fort Smith, Arkansas

ERM

# MW-35

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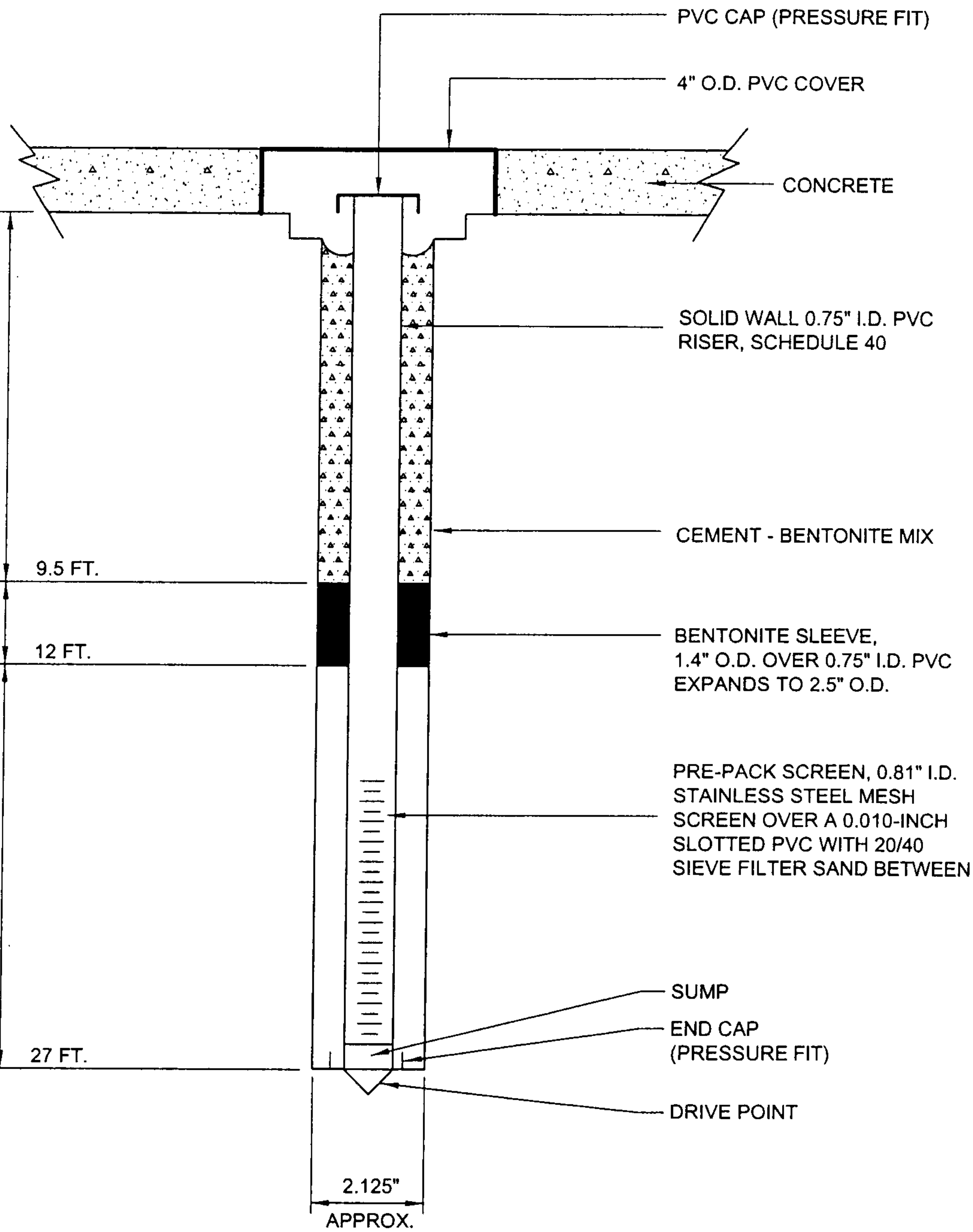
| | | | |
|---|---|---|---|
| DESIGN: RS | CHKD.: | DATE: 03/02/01 | REV.: |
| DRAWN: LMc | SCALE: N.T.S. | W.O.NO.: 581005A201 D01 | |

FIGURE 2
MW-35 CONSTRUCTION DETAIL
OFFSITE INVESTIGATION
Whirlpool Corporation
Fort Smith, Arkansas

ERM

# MW-36

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| | | | |
|---|---|---|---|
| DESIGN: RS | CHKD.: | DATE: 04/02/01 | REV.: |
| DRAWN: LMc | SCALE: N.T.S. | W.O.NO.: 581005A202 D01 | |

FIGURE 3
MW-36 CONSTRUCTION DETAIL
OFFSITE INVESTIGATION
Whirlpool Corporation
Fort Smith, Arkansas

ERM

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ERM

# MW-37 DRILLING LOG

W.O. NO. 581007 Boring/Well ID MW-37 Date Drilled 09/13/01

Project CAS Support Owner Whirlpool

Location Ft. Smith, Arkansas Boring T.D. 30 ' Boring Diam. 5 "

N. Coord. ____ E. Coord. ____ Surface Elevation ____ MSL Datum

Screen: Type Schedule 40 PVC Diam. 2 " Length 15 ' Slot Size 0.010 "

Casing: Type Schedule 40 PVC Diam. 2 " Length 15 ' Sump Length 0 '

Top of Casing Elevation ____ Stickup 0 '

Depth to Water: 1. Ft. ____ ( ____ ) 2. Ft. ____ ( ____ )

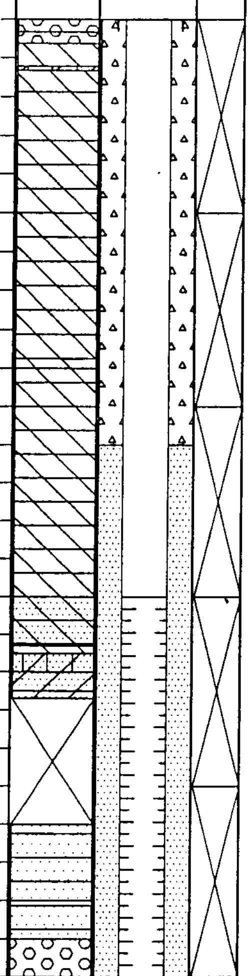
Drilling Company MHC Driller Ken Wages

Drilling Method Split spoon Log By Troy Meinen

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | PID HEADSPACE READINGS (PPM) | Sample Interval (Feet) |
|---|---|---|---|---|---|---|
| | 0 | | | | | 0-5 |
| | 5 | | | | 142 | 5-10 |
| | | | | | 7.0 | |
| | 10 | | | | 24.2 | 10-15 |
| | | | | | 24.2 | |
| | 15 | | | | 1.4 | 15-20 |
| | | | | | 4.2 | |
| | 20 | | | | 4.2 | 20-25 |
| | | | | | 1.4 | |
| | 25 | | | | | |



| Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|
| 0-0.33 | GRAVEL: Sandy silty gravel, 1" diameter quartzite gravel |
| 0.33-0.63 | GRAVEL: Sandy silty gravel, reddish-brown to red, 1" diameter quartzite gravel |
| 0.63-1.21 | CLAYEY SILT: Strong brown and gray, firm to hard, plastic, moist, occasional rootlets |
| 1.21-1.33 | CLAYEY SILT: Gray, soft, crumbly, moist; with plastic and rubber fragments |
| 1.33-2.5 | SILTY CLAY: Pale gray and strong brown, firm to hard, moist occasional calcareous nodules up to .25" in diameter |
| 2.5-5 | SILTY CLAY: Strong brown with occasional gray mottling, stiff to hard, moist, occasional clacareous nodules up to 0.5" diameter |
| 5-9 | SILTY CLAY: Strong brown, slightly crumbly, moist to dry, stiff, occasional pale gray mottling; pale gray silt pocket at 6' (1" diameter), occasional calcareous and iron nodules up to 0.25" diameters, moderate chemical-like odor |
| 9-15 | SILTY CLAY TO CLAY: strong brown to reddish-brown, very plastic, occasional pale gray mottling, moist, hard, moderate chemical-like odor |
| 15-16.3 | SILTY SANDY CLAY: Strong brown and pale gray, soft to firm, occasional dark gray speckles and streaks, mottling appears bedded in 0.5" thick beds |
| 16.3-16.5 | SILTY CLAY: Strong brown and pale gray mottled, moist to dry, stiff |
| 16.5-17 | CLAYEY SILT: Sandy clayey silt to sandy silty clay, soft to firm, occasional dark gray and pale gray mottling, moist to wet |
| 17-17.7 | CLAYEY SILTY SAND to clayey sandy silt: strong brown to brown, slightly plastic, wet to water saturated, soft, occasionl calcareous nodules to 0.25" diameter |
| 17.7-21 | NO RECOVERY: No recovery |
| 21-23 | SILTY SAND: Brown, fine to medium grained sand, loose to dense, mostly quartz, some reddish-brown grains |
| 23-24 | SILTY SAND AND SILT: Brown, loose to dense, moist to wet; with pale gray and strong brown silty clay interclasts up to 0.5" diameter, occasional pale gray sandy clay pockets, stiff crumbly |
| 24-25 | |

# ERM-Southwest, Inc.

HOUSTON · NEW ORLEANS · AUSTIN · DALLAS · BEAUMONT

ERM

MW-37
DRILLING LOG

W.O. NO. 581007 Boring/Well ID MW-37 Date Drilled 09/13/01

Project CAS Support Owner Whirlpool

Location Ft. Smith, Arkansas Boring T.D. 30 ' Boring Diam. 5 "

N. Coord. ______ E. Coord. ______ Surface Elevation ______ MSL Datum

Screen: Type Schedule 40 PVC Diam. 2 " Length 15 ' Slot Size 0.010 "

Casing: Type Schedule 40 PVC Diam. 2 " Length 15 ' Sump Length 0 '

Top of Casing Elevation ______ Stickup 0 '

Depth to Water: 1. Ft. ______ (______) 2. Ft. ______ (______)

Drilling Company MHC Driller Ken Wages

Drilling Method Split spoon Log By Troy Meinen

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | PID HEADSPACE READINGS (PPM) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| | 25 | | | | 0.0 | 25-30 | 25-28.5 | GRAVEL: Dark brown, water saturated; gravel is rounded to sub-angular quartzite < 0.25", coarsens downward to 1" diameter gravel at base. |
| | | | | | 0.0 | | | SILTY SANDY GRAVEL: Dark brown, water saturated; with increasing silt and clay content with depth, gravel up to 2-3" diameter at 27.5', 28' and 28.5' |
| | | | | | | | 28.5-29.5 | SILTY CLAY: Abundant gravel up to 3" diameter, yellowish-brown, stiff to plastic, wet; finely bedded 29.3 to 29.5 |
| | 30 | | | | 0.0 | | 29.5-30 | SHALE: Shale fissile, crumbly, very dark gray, moist to dry, weathered zone from 29.5 to 29.7 |
| | | | | | | | | T.D. = 30 ' |
| | 35 | | | | | | | |
| | 40 | | | | | | | |
| | 45 | | | | | | | |
| | 50 | | | | | | | |

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Environmental
Resources
Management

16300 Katy Freeway
Suite 300
Houston, Texas 77094-1611
(281) 600-1000
(281) 600-1001 (fax)

ERM

August 30, 2002

Mr. Daniel Clanton
Whirlpool Corporation
8001 National Drive
Post Office Box 8913
Little Rock, Arkansas 72219-8913 W.O. #581-007

Subject: February 2002 Semi-Annual Ground Water Monitoring Report

Dear Mr. Clanton:

Environmental Resources Management (ERM) is pleased to provide the historical ground water monitoring data you requested during the Whirlpool Fort Smith facility scoping meeting held on August 13, 2002.

Semi-annual ground water monitoring was initiated at the facility during 1999 with the most recent event occurring in February of 2002. The following documents providing the requested available historical ground water data are attached:

| | |
|---|---|
| Attachment 1: | February 2002 Semi-Annual Ground Water Sampling Report |
| Attachment 2: | TCE Isoconcentration Maps and Potentiometric Surface Maps for Sampling Events in 1999, 2000, and 2001 |
| Attachment 3: | Summary of CPT Grab Ground Water Sample Data conducted October 1999. |

In reviewing the Conceptual Site Model (CSM) in the meeting, we noticed that Figure 5-1 of the CSM was incorrect. Therefore, we are also providing you with a replacement for Figure 5-1 as Attachment 4.

Environmental
Resources
Management

If you have any questions concerning the attached data or other information provided in the conceptual site model, please do not hesitate to call.

Sincerely,

Environmental Resources Management

Troy W. Meinen

TWM/mnt
Attachments

cc: Mr. Michael Hill, Arkansas Department of Environmental Quality
Ms. Linda Hanson, MsC, P.G., Arkansas Department of Environmental Quality
Mr. Benjamin May, Arkansas Department of Environmental Quality
Mr. Scott Horton, Whirlpool Corporation
Mr. Bob Karwowski, Whirlpool Corporation
Mr. Steven P. Willis, Whirlpool Corporation
Mr. Larry Yinger, Whirlpool Corporation
Mr. Andy Huggins, Environmental Resources Management (Exton)
Mr. H. Reiffert Hedgcoxe, P.G., Environmental Resources Management (Houston)

# February 2002 Semi-Annual Ground Water Sampling Report

*Attachment 1*

*August 30, 2002*
*W.O. #481-007*

**Environmental Resources Management**
16300 Katy Freeway, Suite 300
Houston, Texas 77094-1611
(281) 600-1000

Environmental
Resources
Management

3204 Long Prairie Road
Suite C
Flower Mound, TX 75022
(972) 355-2100
(972) 355-7204 (fax)

April 12, 2002

Mr. Scott Horton
Senior Environmental Engineer
Whirlpool Corporation
6400 Jenny Lind Road
P.O. Box 17001
Fort Smith, AR 72917-7001

W.O. #581-009

ERM

Subject: February 2002 Semi-Annual Ground Water Monitoring
Whirlpool Corporation, Fort Smith, Arkansas

Dear Mr. Horton:

Environmental Resources Management (ERM) is pleased to provide this letter report summarizing the subject monitoring event. This work was conducted in accordance with the scope of work authorized under Whirlpool's PAF FTS-109. The purpose of this letter is to document the sampling activities and to present the data. An evaluation of the results from this monitoring event will be conducted with the data analysis after the second semi-annual event is completed.

*Scope of Work*

The first round of semi-annual ground water monitoring at the Whirlpool Fort Smith facility for 2002 was performed on February 18 through February 22, 2002. All wells were sampled for volatile organic compounds (VOCs). Monitoring wells MW-1 through MW-37 were purged and sampled using traditional pump and bail methods. In addition, 17 of those wells were also sampled using low-flow methodology (MW-1, MW-5, MW-7, MW-10, MW-11, MW-12, MW-13, MW-15, MW-16, MW-17, MW-19, MW-20, MW-23, MW-25, MW-26, MW-28 and MW-37). Wells sampled using the traditional method were gauged for pH, specific conductivity (SC) and temperature. Wells sampled using the low-flow method were gauged for pH, SC, temperature, dissolved oxygen (DO) and redox potential (ORP). Samples from the low-flow wells were also sampled for nitrate and sulfate at a local Fort Smith laboratory, and for iron using a field test kit.

### *Well Purging*

Following mobilization to the Site on February 18, 2002, water levels were measured in each well. A summary of the recorded water level measurements is provided as Table 1, Attachment 1. The measurements were then used to calculate the appropriate purge volume for each location. The volume of standing water in each well casing and annular sand pack was calculated based on the static water level and the known depth of the well.

At wells scheduled to be sampled using both traditional and low-flow methods, low-flow sampling was performed first using a peristaltic pump and dedicated polyethylene tubing. The tubing was placed in the middle of the screened interval, or water column depending on depth to water. During low-flow purging, the wells were pumped at a sufficiently low rate (generally less than 0.5 L/min) so that drawdown during purging did not exceed 0.3 ft. The drawdown and flow rate were monitored continuously. The flow rate was checked using a stop-watch and a graduated Pyrex measuring cup. Water quality parameters were monitored using a YSI 650XL multiprobe and flow-thru cell. Readings were recorded approximately every 5 minutes until parameters stabilized. Stabilization parameters include: pH within 0.1 units; SC ± 3%; turbidity ±10%; DO ±10%; ORP ±10 mV; all for three successive readings. In the event all parameters did not stabilize within approximately 45 minutes, low-flow purging was terminated and samples were collected. In general, turbidity and DO were the only parameters that did not reach stabilization in some wells.

For traditional purging methods, three borehole volumes were purged using dedicated inline 12-volt submersible electrical pumps and dedicated polyethylene tubing. Purge water generated during development was placed in drums, provided by Whirlpool, and labeled according to the date and drum contents.

Upon completion of the purging, the pump and associated tubing from each well was individually double-bagged, labeled and stored on-site for use during future semiannual sampling events.

### *Sampling and Analyses*

When using low-flow techniques, wells were sampled using the same flow rate maintained during the purging activities. These samples were labeled with the well ID and "L", indicating they were sampled using the low flow method. Low-flow ground water samples were collected directly from the tubing into laboratory supplied sample jars. Samples for volatile analysis were collected in three 40-ml vials preserved with hydrochloric acid (HCl). Samples collected for nitrate, sulfate, and chloride analysis were collected in a neat 500 ml plastic jar. Samples for potassium analysis were collected in a 250 ml neat plastic jar. Samples for iron analysis were collected in a pyrex beaker and tested in the field.

Wells purged using traditional purge methods were sampled using dedicated, 2-inch disposable polyethylene bailers following removal of the dedicated pump and tubing. A total of three preserved 40-ml vials were filled at each location. These samples were labeled with the well ID and "T", indicating they were sampled using the traditional purging and sampling method.

Four blind duplicate samples, one field blank sample and one trip blank sample were collected during this event. Additional duplicate samples were collected during this event to provide quality assurance data on the samples collected by both traditional and low-flow methods. VOC samples were labeled, stored on ice, and shipped to Severn Trent Laboratory (STL) in Houston, Texas for analyses by SW-846 Method 8260 for trichloroethylene and related chlorinated solvents and degradation products that have been identified in previous sampling events. Potassium, chloride, nitrate and sulfate samples were labeled, stored on ice, and delivered to Data Testing, Inc. in Fort Smith, Arkansas for analyses by EPA water/wastewater methods. Samples for Ferrous iron analysis were analyzed in the field by Hach DR820 colorimeter glass ampule method 8146. Chain of custody procedures were established and followed from the time of sample collection until the analyses were complete.

Upon completion of sampling activities, the 2-inch bailers from each well were individually double-bagged, labeled and stored on-site for use during the next semi-annual sampling event.

All samples were submitted for volatile analysis by GCMS, method SW-846 8260.

*Comparison of Low-Flow vs Traditional Purging/Sampling Methods*

A review of the February 2002 data indicate that, in general, the data obtained via the low-flow metholodgy correlates well with the "traditional" data for most of the wells across the Site (Figures 1 and 2, Attachment 2). The primary exception is that data from wells in the vicinity of the in situ chemical oxidation pilot study area (MW-11, MW-12, MW-15, etc.) are not well correlated. This is not unexpected since ground water in the pilot study area is not in chemical equilibrium with the surrounding ground water. Compared to low-flow, traditional purging method ground water pulls a relatively large volume of water from a larger portion of the aquifer. As a result, the low-flow data are likely to be more representative of the ground water concentrations in the immediate vicinity of each well. Based on this comparison, it appears that switching to low-flow sampling will not prohibit comparison of such data to the substantial historical ground water data set that exists for the Fort Smith Facility.

With a few exceptions, the February 2002 semi-annual sampling data appears similar to historical data.. Concentrations at off-site wells (MW-31 through MW-36) have decreased. The maximum off-site TCE concentration reported is 0.325 mg/L; down from 1.03 mg/L in September 2001. Other results are consistent with previously observed changes related to the seasonal shift in ground water flow direction between the spring and fall sampling events. The TCE concentration reported this period at MW-25 (29.9 mg/L (L) and 24.3 mg/L (T)), is the lowest concentration reported since February 1999. Other notable changes in concentrations observed during this event include the decrease in TCE concentration at MW-20. In September 2001, TCE was reported at MW-20, near the propane tanks on the west side of the property, for the first time since 1996; however, the February 2002 data indicate that MW-20 has no detectable concentrations, suggesting that the September 2001 data may be anomalous.

A summary of the data is provided in Table 2, Attachment 1. A TCE Concentration vs. Time plot is presented as Figure 3, Attachment 2, and demonstrates concentration trends over time in a south-north transect from MW-19 to MW-34. Since not all wells were sampled using low-flow methods, data collected using traditional sampling methods is used in the development of this figure.

*Ground Water Flow Evaluation*

Ground water elevations for the February 2002 (Figure 4, Attachment 2) event appear similar to previous March sampling events (Table 1, Attachment 1). The data continue to suggest that, during the fall time frame, the predominate flow direction in the vicinity of the apparent source area is toward the south-southwest and then predominately to the south-southeast during the spring time frame.

Evaluation of the water level data also continues to show the presence of a ground water divide oriented northwest to southeast in the general area of well MW-26. Flow directions northeast of the apparent divide are toward the east While flow in the vicinity of MW-20 and MW-21 is more toward the southeast. As was apparent in the September 2001 data, February 2002 data shows that there appears to be a flattening of the ground water gradient in the vicinity of MW-33, MW-35 and MW-36. The February data, however, indicates that this area of flattened gradient extends into the area of wells MW-23 and MW-24. As has been indicated previously, this may indicate the presence of a more permeable zone that would trend to the north across Ingersoll

Avenue. However, additional data is needed before reaching any conclusions about flow in this area.

Natural attenuation data (nitrate, sulfate and ferrous iron) will be discussed in the September semi-annual monitoring report after another round of data has been collected using the low-flow sampling method.

We appreciate the opportunity to continue to assist Whirlpool with this important project. If you have any questions concerning the scope of work or need additional information, please do not hesitate to call.

Sincerely,

ENVIRONMENTAL RESOURCES MANAGEMENT

Troy Meinen

Lori D. Pfeil

LDP:vjm

cc: Mr. Bob Karwowski, Whirlpool Corporation
Mr. Steven P. Willis, Whirlpool Corporation
Mr. Larry Yinger, Whirlpool Corporation
Mr. Andy Huggins, ERM, Exton
Mr. H. Reiffert Hedgcoxe, P.G., ERM, Houston

# Tables

*Attachment 1*

*April 12, 2002*
*W.O. #581-009*

Environmental Resources Management
3204 Long Prairie Road, Suite C
Flower Mound, TX 75022
(972) 355-2100

TABLE 1

Water Level Elevations, Conventional Monitoring Wells

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID | Easting (ft) | Northing (ft) | Top of Pipe (ftAMSL) | Depth to Water (ftBTOP) 22 Feb. 1999* | Water Level (ftAMSL) 28 Oct. 1999 | Water Level (ftAMSL) 10 Dec. 1999 | Water Level (ftAMSL) 27 Mar. 2000 | Water Level (ftAMSL) 18 Sept. 2000 | Depth to Water (ftBTOP) 26 Mar. 2001 | Water Level (ftAMSL) 26 Mar. 2001 | Depth to Water (ftBTOP) 10 Sep. 2001 | Water Level (ftAMSL0 10 Sep. 2001 | Depth to Water (ftBTOP) 18 Feb. 2002 | Water Level (ftAMSL) 18 Feb. 2002 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ITMW-1 | 8259.51 | 9007.54 | 476.93 | 12.86 | 469.03 | 464.39 | 463.79 | 464.70 | 14.09 | 462.84 | 12.61 | 464.32 | 14.15 | 462.78 |
| ITMW-2 | 8058.55 | 9103.07 | 477.58 | 12.82 | 465.21 | 464.57 | 464.41 | 464.91 | 13.72 | 463.86 | 13.03 | 464.55 | 14.03 | 463.55 |
| ITMW-3 | 8169.81 | 9165.86 | 474.72 | 10.32 | 465.19 | 464.47 | 464.08 | 464.83 | 11.32 | 463.40 | 10.22 | 464.50 | 11.54 | 463.18 |
| ITMW-4 | 8170.16 | 8296.26 | 478.19 | 13.91 | 465.25 | 464.53 | 463.82 | 464.58 | 15.30 | 462.89 | 13.99 | 464.20 | 15.29 | 462.90 |
| ITMW-5 | 7902.33 | 8278.92 | 478.93 | 14.84 | 465.05 | 464.33 | 463.68 | 464.38 | 16.07 | 462.86 | 14.95 | 463.98 | 16.16 | 462.77 |
| ITMW-6 | 7858.85 | 8042.21 | 483.04 | 19.05 | 464.79 | 464.18 | 463.54 | 464.14 | 20.37 | 462.67 | 19.30 | 463.74 | 20.35 | 462.69 |
| ITMW-7 | 7461.02 | 8370.89 | 481.95 | 17.87 | 464.21 | 463.83 | 463.83 | 463.85 | 18.43 | 463.52 | 18.43 | 463.52 | 18.52 | 463.43 |
| ITMW-9 | 8179.81 | 8237.69 | 481.90 | 17.74 | 465.16 | 464.44 | 463.73 | 464.47 | 19.10 | 462.80 | 17.81 | 464.09 | 19.09 | 462.81 |
| ITMW-10 | 7901.42 | 8230.16 | 480.84 | 16.78 | 465.01 | 464.33 | 463.64 | 464.46 | 18.04 | 462.80 | 16.82 | 464.02 | 18.29 | 462.55 |
| ITMW-11 | 7846.97 | 9109.44 | 476.50 | 11.52 | 465.15 | 465.10 | 464.60 | 464.85 | 12.31 | 464.19 | 11.84 | 464.66 | 12.68 | 463.82 |
| ITMW-12 | 7869.05 | 9077.56 | 476.67 | 11.76 | 465.19 | 464.60 | 464.59 | 464.85 | 12.51 | 464.16 | 12.05 | 464.62 | 12.76 | 463.91 |
| ITMW-13 | 7915.02 | 9124.81 | 477.79 | 12.82 | 465.19 | 464.60 | 464.58 | 464.92 | 13.64 | 464.15 | 13.19 | 464.60 | 13.99 | 463.80 |
| ITMW-14 | 7966.02 | 9131.80 | 477.30 | 12.38 | 465.19 | 464.67 | 464.54 | 464.93 | 13.22 | 464.08 | 12.70 | 464.60 | 13.57 | 463.73 |
| ITMW-15 | 7812.25 | 9109.60 | 476.49 | 11.47 | 465.15 | 464.58 | 464.63 | 464.88 | 12.28 | 464.21 | 11.91 | 464.58 | 12.65 | 463.84 |
| ITMW-16 | 7831.59 | 9168.78 | 478.79 | 13.57 | 465.34 | 464.77 | 464.68 | 465.09 | 14.36 | 464.43 | 14.02 | 464.77 | 14.70 | 464.09 |
| ITMW-17 | 7732.61 | 9112.96 | 477.90 | 12.54 | 465.12 | 464.54 | 464.63 | 464.92 | 14.66 | 463.24 | 13.32 | 464.58 | 13.91 | 463.99 |
| ITMW-18 | 7849.92 | 9023.55 | 473.55 | 8.64 | 465.16 | 464.55 | 464.55 | 464.89 | 9.42 | 464.13 | 8.99 | 464.56 | 9.77 | 463.78 |
| ITMW-19 | 7763.78 | 9024.94 | 476.25 | 11.28 | 465.15 | 464.52 | 464.61 | 464.95 | 11.51 | 464.74 | 11.40 | 464.85 | 12.47 | 463.78 |
| ITMW-20 | 7238.94 | 9074.08 | 477.87 | 12.55 | 464.93 | 464.55 | 464.82 | 464.73 | 13.12 | 464.75 | 13.45 | 464.42 | 13.33 | 464.54 |
| ITMW-21 | 7506.54 | 8945.65 | 476.52 | 11.21 | 464.93 | 464.59 | 464.90 | 464.68 | 11.69 | 464.83 | 11.90 | 464.62 | 12.26 | 464.26 |
| MW-22 | 8726.94 | 9038.96 | 473.93 | 9.64 | 465.64 | 464.91 | 464.23 | 465.20 | 10.71 | 463.22 | 9.11 | 464.82 | 10.82 | 463.11 |
| MW-23 | 7747.16 | 9303.10 | 475.80 | 10.95 | 465.27 | 464.70 | 464.65 | 464.04 | 11.39 | 464.41 | 11.10 | 464.70 | 11.73 | 464.07 |
| MW-24 | 7738.13 | 9198.53 | 476.39 | 11.25 | 465.27 | 464.69 | 464.82 | 465.04 | 12.01 | 464.38 | 11.70 | 464.69 | 12.31 | 464.08 |
| MW-25 | 7614.43 | 9060.33 | 476.89 | 11.68 | 465.28 | 464.77 | 464.86 | 465.09 | 12.41 | 464.48 | 12.16 | 464.73 | 12.74 | 464.15 |
| MW-26 | 7421.64 | 9273.87 | 478.05 | 12.36 | 465.32 | 464.89 | 465.10 | 465.09 | 13.07 | 464.98 | 13.27 | 464.78 | 12.33 | 465.72 |
| MW-27 | 7932.29 | 9302.59 | 475.42 | -- | -- | 464.70 | 464.61 | 465.02 | 11.04 | 464.38 | 10.71 | 464.71 | 11.43 | 463.99 |
| MW-28 | 8180.18 | 9301.14 | 470.49 | -- | -- | 464.39 | 464.41 | 464.92 | 6.25 | 464.24 | 5.66 | 464.83 | 6.76 | 463.73 |
| MW-29 | 7092.87 | 8392.87 | 474.91 | -- | -- | 464.07 | 464.59 | 463.91 | 10.47 | 464.44 | 11.32 | 463.59 | 10.62 | 464.29 |
| MW-30 | 7485.76 | 8480.10 | 478.99 | -- | -- | 464.22 | 464.35 | 464.24 | 14.95 | 464.04 | 15.07 | 463.92 | 15.30 | 463.69 |
| MW-31 | 7675.36 | 9348.43 | 476.03 | -- | -- | -- | -- | -- | 11.25 | 464.78 | 10.68 | 465.35 | 12.02 | 464.01 |
| MW-32 | 7760.17 | 9347.50 | 475.68 | -- | -- | -- | -- | -- | 11.36 | 464.32 | 10.97 | 464.71 | 11.62 | 464.06 |
| MW-33 | 7845.31 | 9348.62 | 474.88 | -- | -- | -- | -- | -- | 10.50 | 464.38 | 10.18 | 464.70 | 10.84 | 464.04 |
| MW-34 | 7760.24 | 9404.60 | 474.29 | -- | -- | -- | -- | -- | 11.90 | 462.39 | 9.56 | 464.73 | 10.15 | 464.14 |
| MW-35 | 7841.74 | 9406.36 | 473.90 | -- | -- | -- | -- | -- | 9.24 | 464.66 | 9.20 | 464.70 | 9.83 | 464.07 |
| MW-36 | 7927.38 | 9405.11 | 473.30 | -- | -- | -- | -- | -- | 8.61 | 464.69 | 8.60 | 464.70 | 9.11 | 464.19 |
| MW-37 | 7839.60 | 9101.64 | 473.57 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9.46 | 464.11 |
| MW-38 | 7840.94 | 9115.29 | 474.60 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 10.62 | 463.98 |

NOTES:

ft = feet

AMSL = above mean sea level

BTOP = below top of pipe

Co-ordinates provided by EDM Consultants, Inc.

Elevations are taken from Table 3-1, "Draft Report, Remedial Investigation, North Side Ground Water", Malcolm Pirnie, Inc., with the exceptions of ITMW-4 and MW-22 through MW-26 (EDM Consultants, Inc.) and MW-27 through MW-30 (Philip J. Leraris, P.E., L.S.).

* = Depth to water measurements for MW-24 through MW-26 were taken on 25 February 1999.

TABLE 2

Historic Analytical Data, Selected VOCs in Ground Water

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Sampler | PCE | TCE | c-1,2-DCE | t-1,2-DCE | 1,1-DCE | VC |
|---|---|---|---|---|---|---|---|---|
| ITMW-1 | Nov-89 | IT | ND | ND | NT | ND | ND | ND |
| | Jan-90 | IT | ND | ND | NT | ND | ND | ND |
| | Nov-93 | MP | ND | 0.01 | NT | ND | ND | ND |
| | Dec-96 | MP | ND | 0.021 | NT | ND | ND | ND |
| | Feb-99 | ERM | ND | 0.037 | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.125 | 0.008 | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.031 | 0.007 | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.03 | 0.006 | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.027 | 0.009 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.026 | 0.006 | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.025 | 0.007 | ND | ND | ND |
| ITMW-2 | Oct-89 | IT | ND | ND | NT | ND | ND | ND |
| | Nov-89 | IT | ND | ND | NT | ND | ND | ND |
| | Jan-90 | IT | ND | ND | NT | ND | ND | ND |
| | Nov-90 | IT | ND | ND | NT | ND | ND | ND |
| | Nov-90 (dupl.) | IT | ND | ND | NT | ND | ND | ND |
| | Mar-91 | IT | ND | ND | NT | ND | ND | ND |
| | Nov-93 | MP | ND | 0.004 | NT | ND | ND | ND |
| | Dec-96 | MP | ND | 0.0034 | NT | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | 0.006 | ND | ND | ND |
| ITMW-3 | Oct-89 | IT | ND | ND | NT | ND | ND | ND |
| | Jan-90 | IT | ND | ND | NT | ND | ND | ND |
| | Nov-93 | MP | ND | 0.003 | NT | ND | ND | ND |
| | Dec-96 | MP | ND | 0.0017 | NT | ND | ND | ND |
| | Feb-99 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-00 (Dup) | ERM | ND | ND * | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND |
| ITMW-4 | Oct-89 | IT | ND | ND | NT | ND | ND | ND |
| | Nov-89 | IT | ND | ND | NT | ND | ND | ND |
| | Jan-90 | IT | ND | ND | NT | ND | ND | ND |
| | Nov-93 | MP | ND | ND | NT | ND | ND | ND |
| | Dec-96 | MP | ND | 0.075 | NT | ND | ND | ND |
| | Feb-99 | ERM | ND | 0.093 | 0.054 | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.022 | 0.016 | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.014 | 0.011 | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.009 | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.006 | 0.008 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.034 | 0.005 | ND | ND | ND |
| ITMW-5 | Oct-89 | IT | ND | ND | NT | ND | ND | ND |
| | Jan-90 | IT | ND | ND | NT | ND | ND | ND |
| | Dec-96 | MP | ND | 0.021 | NT | ND | ND | ND |
| | Feb-99 | ERM | ND | 0.086 | 0.039 | ND | 0.007 | ND |
| | Mar-00 | ERM | ND | 0.073 | 0.059 | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.085 | 0.064 | ND | 0.006 | ND |
| | Mar-01 | ERM | ND | 0.1 | 0.046 | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.072 | 0.064 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.093 | 0.066 | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.081 | 0.068 | ND | ND | ND |

NOTE:

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TABLE 2 (Cont'd)

Historic Analytical Data, Selected VOCs in Ground Water

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Sampler | PCE | TCE | c-1,2-DCE | t-1,2-DCE | 1,1-DCE | VC |
|---|---|---|---|---|---|---|---|---|
| ITMW-6 | Oct-89 | IT | ND | ND | NT | ND | ND | ND |
| | Jan-90 | IT | ND | ND | NT | ND | ND | ND |
| | Dec-96 | MP | ND | 0.0068 | NT | ND | ND | ND |
| | May-97 | MP | ND | 0.007 | ND | ND | ND | ND |
| | Feb-99 | ERM | ND | ND | ND | ND | ND | ND |
| | Feb-99 | ERM (CoreLab) | ND | 0.025 | ND | NT | ND | ND |
| | Feb-99 | ERM (CoreLab Dupl.) | ND | 0.006 | ND | NT | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | ND | ND | ND | ND | ND |
| ITMW-7 | Nov-89 | IT | ND | ND | NT | ND | ND | ND |
| | Jan-90 | IT | ND | ND | NT | ND | ND | ND |
| | Dec-96 | MP | ND | 0.29 | NT | ND | ND | 0.003 |
| | May-97 | MP | ND | 0.38 | 0.18 | ND | ND | ND |
| | Feb-99 | ERM (SPL) | ND | ND | ND | ND | ND | ND |
| | Jun-99 | ERM (SPL) | ND | 0.32 | 0.14 | ND | ND | ND |
| | Jun-99 | ERM (SPL Dupl.) | ND | 0.3 | 0.14 | ND | ND | ND |
| | Jun-99 | ERM (CoreLab) | ND | 0.306 | 0.144 | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.262 | 0.1 | ND | ND | ND |
| | Mar-00 (dup) | ERM | ND | 0.207 | 0.092 | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.207 | 0.1 | ND | ND | ND |
| | Sep-00 (dup) | ERM | ND | 0.109 | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.161 | 0.066 | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.139 | 0.068 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.261 | 0.107 | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.119 | 0.070 | ND | ND | ND |
| ITMW-8 | Jan-90 | IT | ND | ND | NT | ND | ND | ND |
| ITMW-9 | Jan-90 | IT | ND | ND | NT | ND | ND | ND |
| | Dec-96 | MP | ND | 0.23 | NT | ND | 0.015 | ND |
| | May-97 | MP | ND | 0.007 | ND | ND | ND | ND |
| | Feb-99 | ERM | ND | 0.04 | 0.024 | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.069 | 0.045 | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.057 | 0.014 | ND | ND | ND |
| | Sep-00 (dup) | ERM | ND | 0.055 | 0.014 | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.04 | 0.012 | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.04 | 0.012 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.046 | 0.023 | ND | ND | ND |
| ITMW-10 | Jan-90 | IT | ND | ND | NT | ND | ND | ND |
| | Dec-96 | MP | ND | 0.004 | NT | ND | 0.002 | ND |
| | Feb-99 | ERM | ND | 0.025 | 0.013 | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.023 | 0.017 | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.018 | 0.016 | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.04 | 0.021 | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.029 | 0.028 | ND | ND | ND |
| | Sep-01 (dup) | ERM | ND | 0.027 | 0.03 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.056 | 0.048 | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.044 | 0.038 | ND | ND | ND |

NOTE:

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TABLE 2 (Cont'd)

Historic Analytical Data, Selected VOCs in Ground Water

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Sampler | PCE | TCE | c-1,2-DCE | t-1,2-DCE | 1,1-DCE | VC |
|---|---|---|---|---|---|---|---|---|
| ITMW-11 | Jan-90 | IT | 0.015 | 19 | NT | 3.6 | ND | 0.18 |
| | Nov-90 | IT | ND | 4.7 | NT | 1.5 | 0.009 | 0.093 |
| | Feb-91 | IT | 0.0089 | 3.4 | NT | 1 | ND | ND |
| | Nov-93 | MP | 0.001 | 2.3 | NT | ND | ND | 0.043 |
| | Dec-96 | MP | ND | 0.51 | NT | 0.011 | ND | ND |
| | Feb-99 | ERM | ND | 0.65 | 0.01 | ND | ND | ND |
| | Mar-00 | ERM | ND | 3.37 | 0.206 | ND | ND | ND |
| | Sep-00 | ERM | 0.006 | 8 | 0.330 | ND | ND | 0.01 |
| | Mar-01 | ERM | ND | 7 | 0.200 | ND | ND | ND |
| | Sep-01 | ERM | ND | 6 | 0.183 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 6.8 | ND | ND | 0.010 | ND |
| | Feb-02 | ERM (L) | ND | 2.48 | 0.123 | ND | ND | ND |
| ITMW-12 | Nov-90 | IT | ND | 2.4 | NT | 1.3 | 0.0099 | 0.14 |
| | Feb-91 | IT | ND | 2.1 | NT | 1 | ND | ND |
| | Nov-93 | MP | ND | 2.5 | NT | 0.002 | 0.004 | 0.035 |
| | Dec-96 | MP | ND | 1.2 | NT | ND | ND | ND |
| | Feb-99 | ERM | ND | 3.1 | 0.48 | ND | ND | 0.034 |
| | Mar-00 | ERM | ND | 3.11 | 0.32 | ND | ND | 0.019 |
| | Sep-00 | ERM | ND | 3.3 | 0.18 | ND | ND | 0.01 |
| | Mar-01 | ERM | ND | 3.9 | 0.2 | ND | ND | 0.02 |
| | Sep-01 | ERM | ND | 3.1 | 0.159 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 3.51 | 0.275 | ND | 0.007 | 0.023 |
| | Feb-02 | ERM (L) | ND | 3.6 | ND | ND | 0.008 | 0.019 |
| ITMW-13 | Nov-90 | IT | ND | 0.034 | NT | 0.19 | ND | 0.018 |
| | Feb-91 | IT | ND | 0.032 | NT | 0.17 | ND | 0.035 |
| | Nov-93 | MP | ND | NA | NT | NA | NA | 0.029 |
| | Dec-96 | MP | ND | 0.036 | NT | 0.0013 | 0.0016 | 0.036 |
| | Feb-99 | ERM | ND | 0.036 | 0.14 | ND | ND | 0.048 |
| | Mar-00 | ERM | ND | 0.037 | 0.121 | ND | ND | 0.053 |
| | Sep-00 | ERM | ND | 0.022 | 0.112 | ND | ND | 0.05 |
| | Mar-01 | ERM | ND | 0.044 | 0.092 | ND | ND | 0.04 |
| | Sep-01 | ERM | ND | 0.035 | 0.111 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.129 | 0.195 | ND | ND | 0.035 |
| | Feb-02 | ERM (L) | ND | 0.048 | 0.080 | ND | ND | ND |
| ITMW-14 | Nov-90 | IT | ND | ND | NT | 0.03 | ND | 0.013 |
| | Feb-91 | IT | ND | ND | NT | ND | ND | ND |
| | Nov-93 | MP | ND | 0.006 | NT | ND | ND | ND |
| | Dec-96 | MP | ND | ND | NT | ND | ND | ND |
| | Feb-99 | ERM | ND | ND | 0.029 | ND | ND | 0.02 |
| | Mar-00 | ERM | ND | ND | 0.024 | ND | ND | 0.012 |
| | Sep-00 | ERM | ND | ND | 0.014 | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | 0.024 | ND | ND | 0.01 |
| | Sep-01 | ERM | ND | ND | 0.005 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | 0.023 | ND | ND | ND |
| ITMW-15 | Nov-90 | IT | ND | 2.5 | NT | 1.5 | 0.0081 | 0.055 |
| | Feb-91 | IT | ND | 1.7 | NT | 0.87 | ND | ND |
| | 15-Apr-91 | IT | ND | 2 | NT | 0.6 | ND | ND |
| | 19-Apr-91 | IT | ND | 2.1 | NT | 1 | ND | ND |
| | 20-Apr-91 | IT | ND | 2.4 | NT | 1.1 | ND | ND |
| | Nov-93 | MP | ND | 4.3 | NT | 0.001 | ND | 0.01 |
| | Dec-96 | MP | ND | 0.24 | NT | ND | ND | ND |
| | Feb-99 | ERM | ND | 0.4 | 0.12 | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.339 | 0.097 | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.36 | 0.093 | ND | ND | ND |
| | Sep-00 (dup) | ERM | ND | 0.38 | 0.091 | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.29 | 0.057 | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.38 | 0.087 | ND | ND | ND |
| | Sep-01 (dup) | ERM | ND | 0.37 | 0.08 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.186 | 0.064 | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.311 | 0.108 | ND | ND | ND |

NOTE:

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TABLE 2 (Cont'd)

**Historic Analytical Data, Selected VOCs in Ground Water**

**Whirlpool Corporation**
**Fort Smith, Arkansas**

| Well | Date | Sampler | PCE | TCE | c-1,2-DCE | t-1,2-DCE | 1,1-DCE | VC |
|---|---|---|---|---|---|---|---|---|
| ITMW-16 | Feb-91 | IT | ND | 0.031 | NT | 0.06 | ND | ND |
| | Nov-93 | MP | ND | 0.041 | NT | ND | ND | 0.007 |
| | Dec-96 | MP | ND | ND | NT | ND | ND | ND |
| | Feb-99 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.007 | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | ND | ND | ND | ND | ND |
| ITMW-17 | Feb-91 | IT | ND | 21 | NT | ND | ND | ND |
| | 15-Apr-91 | IT | ND | 18 | NT | 0.76 | ND | ND |
| | 24-Apr-91 | IT | ND | 21 | NT | 0.58 | ND | ND |
| | Nov-93 | MP | 0.004 | 18 | NT | 0.003 | ND | 0.015 |
| | Dec-96 | MP | ND | 9.3 | NT | ND | ND | ND |
| | Feb-99 | ERM | ND | 11 | 0.24 | ND | 0.013 | ND |
| | Mar-00 | ERM | ND | 6.78 | 0.171 | ND | ND | ND |
| | Sep-00 | ERM | ND | 5.5 | 0.18 | ND | 0.009 | ND |
| | Jan-01 | ERM | ND | 8.3 | 0.179 | ND | ND | ND |
| | Mar-01 | ERM | ND | 6.7 | 0.134 | ND | 0.007 | ND |
| | Sep-01 | ERM | ND | 6.3 | 0.158 | ND | 0.007 | ND |
| | Feb-02 | ERM (T) | ND | 6.07 | 0.149 | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 6.29 | 0.174 | ND | 0.011 | ND |
| ITMW-18 | Feb-91 | IT | ND | 3.7 | NT | 0.33 | ND | ND |
| | Nov-93 | MP | ND | 4.5 | NT | ND | 0.009 | 0.006 |
| | Dec-96 | MP | ND | 1.6 | NT | ND | ND | ND |
| | Feb-99 | ERM | ND | 6.3 | 0.48 | ND | ND | ND |
| | Mar-00 | ERM | ND | 3.56 | 0.401 | ND | ND | ND |
| | Sep-00 | ERM | ND | 4.1 | 0.4 | ND | 0.007 | ND |
| | Mar-01 | ERM | ND | 4 | 0.4 | ND | 0.006 | ND |
| | Sep-01 | ERM | ND | 4.1 | 0.3 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 5.26 | 0.426 | ND | ND | ND |
| ITMW-19 | Feb-91 | IT | ND | 9.9 | NT | ND | ND | ND |
| | Nov-93 | MP | 0.005 | 27 | NT | ND | NA | 0.007 |
| | Dec-96 | MP | ND | 25 | NT | ND | ND | ND |
| | Feb-99 | ERM | 0.008 | 33 | 0.15 | ND | 0.04 | ND |
| | Mar-00 | ERM | 0.007 | 33.1 | 0.128 | ND | 0.029 | ND |
| | Sep-00 | ERM | 0.01 | 36 | 0.197 | ND | 0.056 | ND |
| | Jan-01 | ERM | 0.01 | 34 | 0.166 | ND | 0.04 | ND |
| | Mar-01 | ERM | 0.01 | 38 | 0.119 | ND | 0.037 | ND |
| | Sep-01 | ERM | ND | 19 | 0.132 | ND | 0.034 | ND |
| | Feb-02 | ERM (T) | 0.0062 | 26.1 | ND | 0.006 | 0.047 | ND |
| | Feb-02 | ERM (L) | 0.0051 | 24.6 | 0.192 | ND | 0.065 | ND |
| ITMW-20 | Mar-91 | IT | ND | ND | NT | ND | ND | ND |
| | Nov-93 | MP | ND | ND | NT | ND | ND | ND |
| | Dec-96 | MP | ND | 0.29 | NT | ND | ND | ND |
| | May-97 | MP | ND | ND | ND | ND | ND | ND |
| | Feb-99 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.021 | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | ND | ND | ND | ND | ND |

NOTE:

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TABLE 2 (Cont'd)

Historic Analytical Data, Selected VOCs in Ground Water

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Sampler | PCE | TCE | c-1,2-DCE | t-1,2-DCE | 1,1-DCE | VC |
|---|---|---|---|---|---|---|---|---|
| ITMW-21 | Mar-91 | IT | ND | 0.021 | NT | ND | ND | ND |
| | Nov-93 | MP | ND | 0.037 | NT | ND | ND | ND |
| | Dec-96 | MP | ND | 0.15 | NT | ND | ND | ND |
| | Feb-99 | ERM | ND | 0.19 | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.196 | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.192 | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.123 | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.116 | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.152 | ND | ND | ND | ND |
| MW-22 | Dec-96 | MP | ND | ND | NT | ND | ND | ND |
| | May-97 | MP | ND | ND | 0.005 | ND | ND | ND |
| | Feb-99 | ERM | ND | ND | 0.005 | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND |
| MW-23 | Dec-96 | MP | ND | 0.21 | NT | ND | ND | ND |
| | May-97 | MP | ND | 2.4 | NT | ND | ND | ND |
| | Feb-99 | ERM | ND | 0.35 | 0.01 | ND | ND | ND |
| | Feb-99 (dup) | ERM | ND | 0.44 | 0.01 | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.147 | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.067 | ND | ND | ND | ND |
| | Jan-01 | ERM | ND | 0.137 | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.087 | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.023 | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.063 | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.098 | ND | ND | ND | ND |
| MW-24 | Feb-99 | ERM | ND | 1.4 | 0.049 | ND | ND | ND |
| | Mar-00 | ERM | ND | **0.403*** | **0.025*** | ND | ND | ND |
| | Mar-00 (dup) | ERM | ND | **0.595*** | **0.024*** | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.128 | 0.011 | ND | ND | ND |
| | Jan-01 | ERM | ND | 0.25 | 0.012 | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.33 | 0.011 | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.124 | 0.006 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.204 | 0.006 | ND | ND | ND |
| MW-25 | Feb-99 | ERM | 0.011 | 29 | 0.17 | ND | 0.069 | 0.1 |
| | Feb-99 (dupl.) | ERM | 0.012 | 27 | 0.18 | ND | 0.074 | 0.11 |
| | Feb-99 | ERM (CoreLab) | 0.009 | 24.8 | 0.149 | ND | 0.057 | 0.074 |
| | Dec-99 | ERM (ERM) | ND | 94.5 | ND | ND | ND | ND |
| | Mar-00 | ERM | 0.011 | 35.9 | 0.245 | ND | 0.066 | 0.063 |
| | Sep-00 | ERM | 0.014 | 59 | 0.3 | ND | 0.092 | 0.05 |
| | Mar-01 | ERM | 0.012 | 34 | 0.117 | ND | 0.047 | 0.06 |
| | Sep-01 | ERM | 0.011 | 60 | 0.3 | ND | 0.101 | ND |
| | Feb-02 | ERM (T) | ND | 24.3 | 0.326 | ND | ND | ND |
| | Feb-02 | ERM (L) | 0.007 | 29.9 | 0.369 | 0.005 | 0.052 | 0.052 |
| MW-26 | Feb-99 | ERM (SPL) | ND | 0.36 | 0.15 | ND | ND | ND |
| | Jun-99 | ERM (SPL) | ND | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 (dup) | ERM | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | ND | ND | ND | ND | ND |

NOTE:

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TABLE 2 (Cont'd)

Historic Analytical Data, Selected VOCs in Ground Water

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Sampler | PCE | TCE | c-1,2-DCE | t-1,2-DCE | 1,1-DCE | VC |
|---|---|---|---|---|---|---|---|---|
| MW-27 | Dec-99 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Jan-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND |
| MW-28 | Dec-99 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | ND | ND | ND | ND | ND |
| MW-29 | Dec-99 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND |
| MW-30 | Dec-99 | ERM | ND | 0.115 | 0.034 | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.086 | 0.025 | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.102 | 0.025 | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.043 | 0.011 | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.063 | 0.018 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.067 | 0.021 | ND | ND | ND |
| MW-31 | Jan-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | ND | ND | ND | ND | ND |
| MW-32 | Jan-01 | ERM | ND | 0.108 | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.174 | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.095 | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.0536 | ND | ND | ND | ND |

NOTE:

Footnotes on last page of table.

TABLE 2 (Cont'd)

Historic Analytical Data, Selected VOCs in Ground Water

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Sampler | PCE | TCE | c-1,2-DCE | t-1,2-DCE | 1,1-DCE | VC |
|---|---|---|---|---|---|---|---|---|
| MW-33 | Jan-01 | ERM | ND | 0.12 | 0.034 | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.26 | 0.007 | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.31 | 0.008 | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.115 | ND | ND | ND | ND |
| MW-34 | Mar-01 | ERM | ND | 0.083 | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.061 | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.0214 | ND | ND | ND | ND |
| MW-35 | Mar-01 | ERM | ND | 0.91 | 0.034 | ND | ND | ND |
| | May-01 | ERM | ND | 0.86 | 0.036 | ND | ND | ND |
| | Sep-01 | ERM | ND | 1.03 | 0.04 | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.325 | 0.0133 | ND | ND | ND |
| MW-36 | Mar-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | ND | ND | ND | ND | ND |
| MW-37 | Sep-01 | ERM | ND | 5 | 0.34 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.773 | 3.25 | 0.052 | 0.01 | ND |
| MW-38 | Sep-01 | ERM | ND | 0.62 | 0.09 | ND | ND | ND |
| | MW-38 was used as an injection well for the pilot study and was not sampled in February 2002. | | | | | | | |

NOTES:

Units used are mg/L. ND = not detected NT = not tested NA = not available
(L) = Sample collected using low-flow sampling methods.
(T) = Sample collected using traditional purge and sample methods.
IT = International Technology Corporation, Inc.
ERM = Environmental Resources Management
MP = Malcolm Pirnie, Inc.
PCE = perchloroethylene (tetrachloroethene) TCE = trichloroethylene
c-1,2-DCE = cis-1,2-dichloroethylene (not an analytical parameter until May 1997)
t-1,2-DCE = trans-1,2-dichloroethylene
1,1-DCE = 1,1-dichloroethylene VC = vinyl chloride
* = Analysis was re-run due to QA/QC concerns. Data reported is for the second run.
SPL was used as the subcontract laboratory from 1996 to June 1999. ChemLab was used for earlier MP sampling events. The current laboratory is STL in Houston, Texas.
Pre-1999 data reproduced from "Remedial Investigation, North Side Ground Water, Whirlpool Corporation", Malcolm Pirnie, Inc., January 1997, (revised entry for MW-11, Jan-90) and SPL Certificates of Analysis, May 1997, supplied by Whirlpool Corporation.

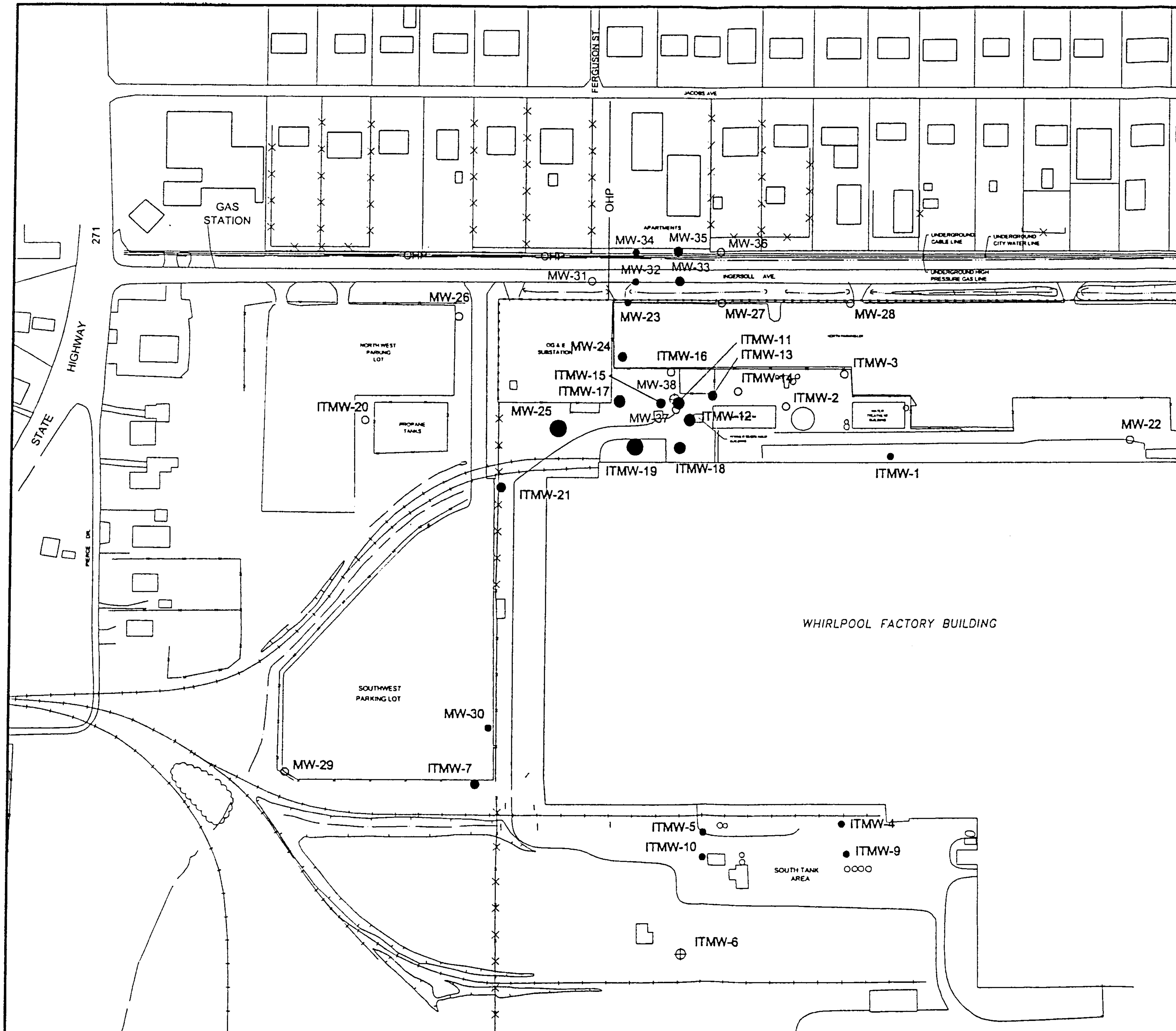
**Figures**

*Attachment 2*

*April 12, 2002*

*W.O. # 581-009*

Environmental Resources Management
3204 Long Prairie Road, Suite C
Flower Mound, TX 75022
(972) 355-2100




LEGEND

MW-26 ● EXISTING MONITORING WELL SAMPLED USING TRADITIONAL PURGE METHOD

⊕ EXISTING MONITORING WELL NOT SAMPLED USING TRADITIONAL PURGE METHOD

TCE CONCENTRATION (mg/l)
FEBRUARY 2002

| | |
|---|---|
| ○ | < 0.005 |
| • | 0.005 to 0.10 |
| ● | 0.10 to 1.00 |
| ● | 1.00 to 10.0 |
| ● | > 10.0 |

NOTE:

1) MW-38 WAS USED AS AN INJECTION WELL FOR THE PILOT STUDY AND WAS NOT SAMPLED IN FEBRUARY 2002.

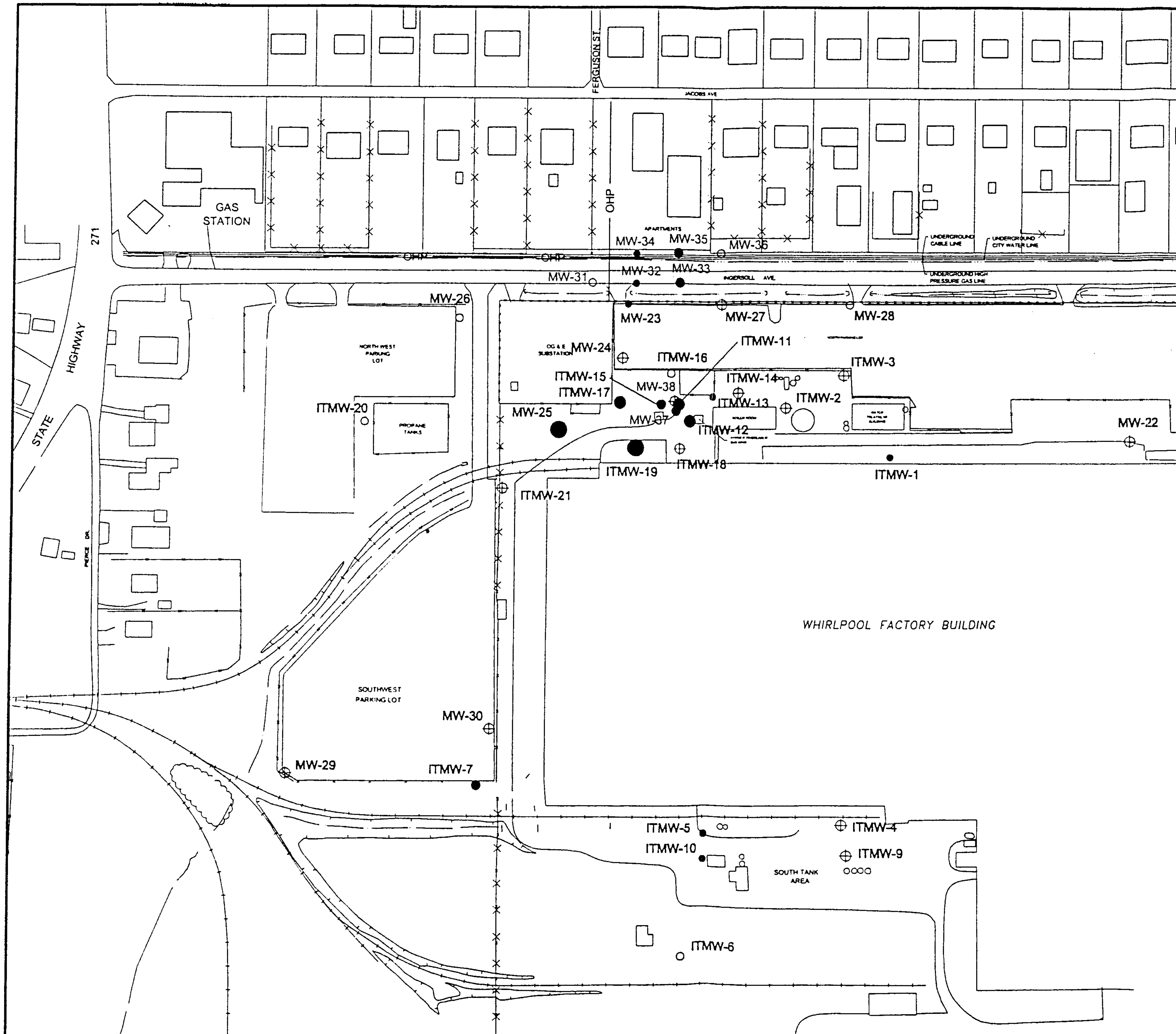
0 200 400
SCALE FEET

**ERM-Southwest, Inc.**
HOUSTON · NEW ORLEANS · AUSTIN · DALLAS · BEAUMONT · BATON ROUGE

FIGURE 1
TCE ISOCONCENTRATION MAP
FEBRUARY 2002
TRADITIONAL SAMPLE METHOD
Whirlpool Corporation
Fort Smith, Arkansas

ERM.

| DESIGN: JT | CHKD.: | DATE: 04/10/02 | REV.: |
|---|---|---|---|
| DRAWN: LMc | SCALE: AS SHOWN | W.O NO.: 581009B202.D02 | |




LEGEND

MW-26 ● EXISTING MONITORING WELL SAMPLED USING LOW-FLOW METHOD

⊕ EXISTING MONITORING WELL NOT SAMPLED USING LOW-FLOW METHOD

TCE CONCENTRATION (mg/l)
FEBRUARY 2002

- ○ < 0.005
- • 0.005 to 0.10
- ● 0.10 to 1.00
- ● 1.00 to 10.0
- ● > 10.0

NOTE:

1) MW-38 WAS USED AS AN INJECTION WELL FOR THE PILOT STUDY AND WAS NOT SAMPLED IN FEBRUARY 2002.

2) MW-31 THROUGH MW-36 ARE LOW YIELD WELLS AND PURGED DRY WHILE ATTEMPTING LOW-FLOW TECHNIQUES. CONSEQUENTLY, DATA FOR THESE WELLS ARE INDICATED ON BOTH TRADITIONAL AND LOW-FLOW TECHNIQUE MAPS.

0 200 400
SCALE FEET

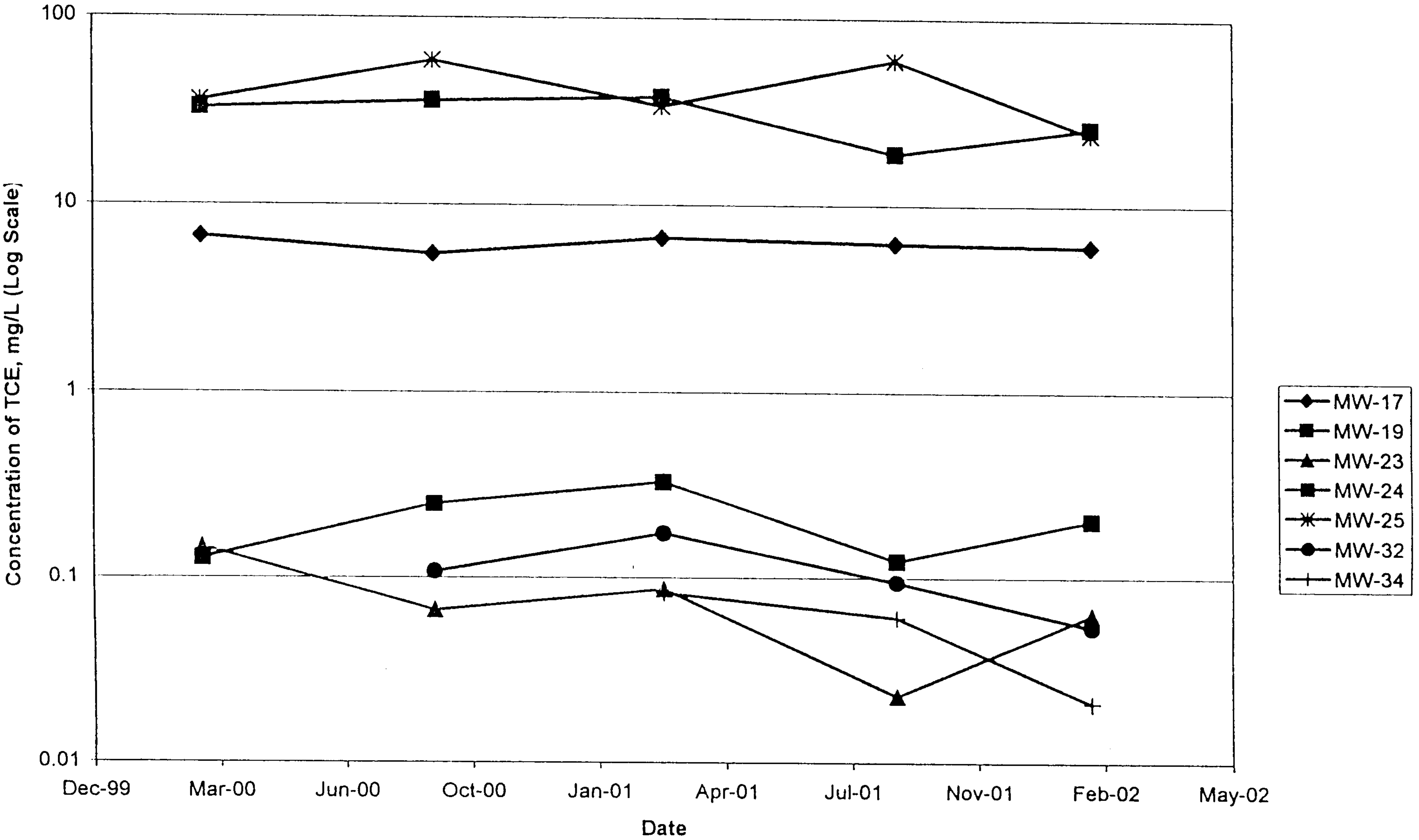
**ERM-Southwest, Inc.**
HOUSTON · NEW ORLEANS · AUSTIN · DALLAS · BEAUMONT · BATON ROUGE

FIGURE 2
TCE ISOCONCENTRATION MAP
FEBRUARY 2002
LOW-FLOW SAMPLE METHOD
Whirlpool Corporation
Fort Smith, Arkansas

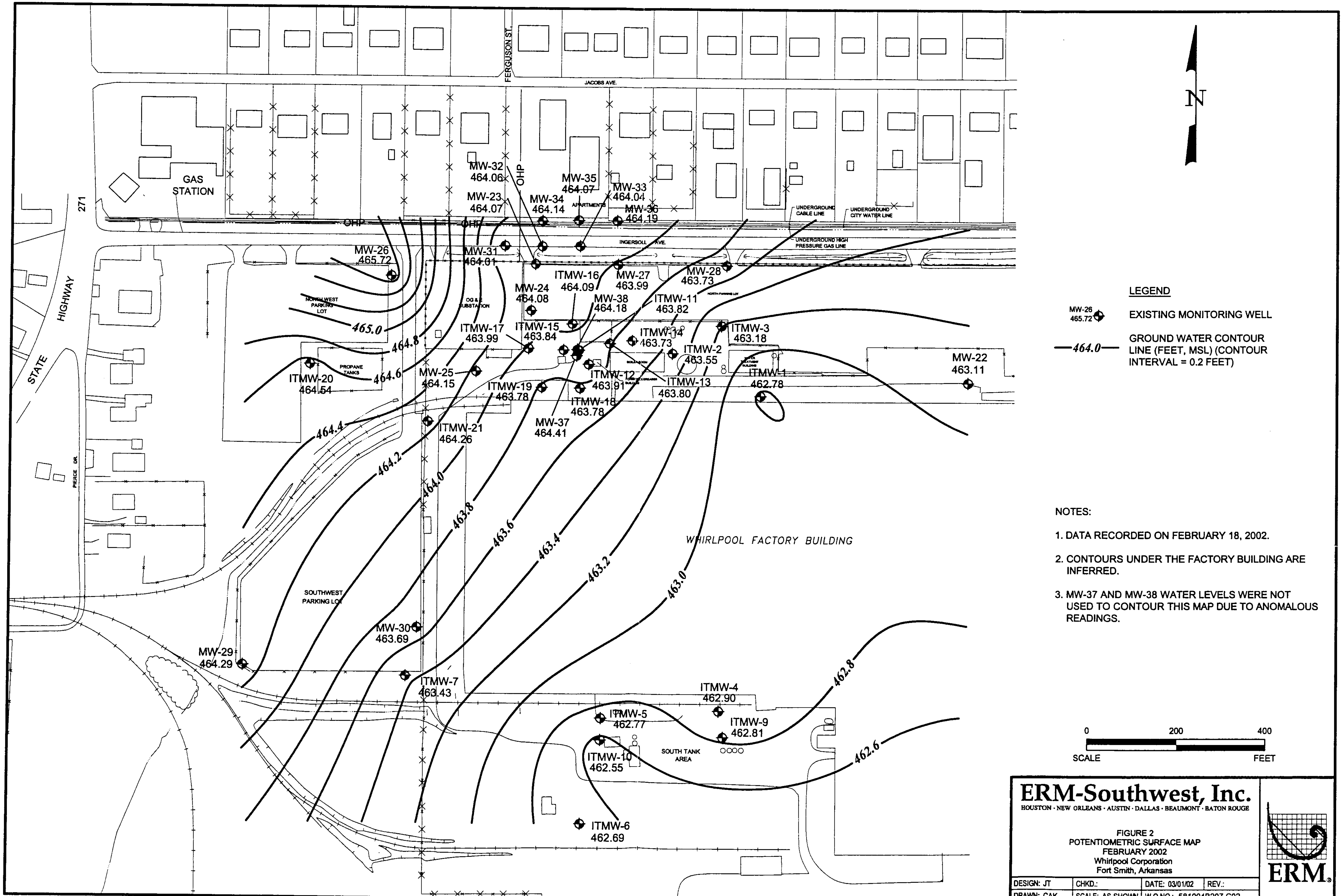
ERM

| DESIGN: JT | CHKD.: | DATE: 04/10/02 | REV.: |
|---|---|---|---|
| DRAWN: LMc | SCALE: AS SHOWN | W.O.NO.: 581009B203.D02 | |

**Figure 3**
**TCE Concentrations vs. Time of MW-19 to MW-34 Transect**
Whirlpool Corporation
Fort Smith, Arkansas




581-009/D0906grph.xls

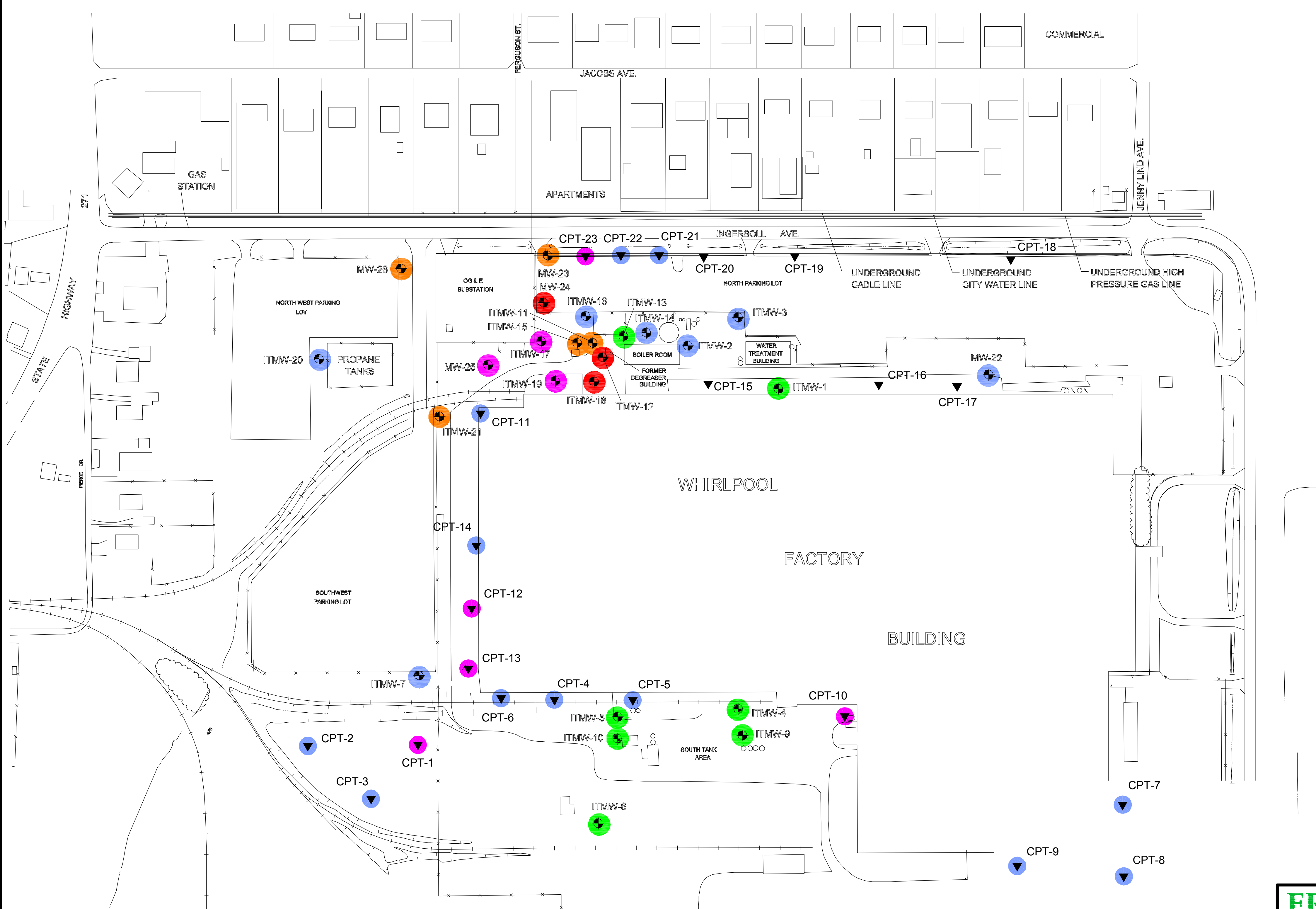

LEGEND
MW-26 465.72 EXISTING MONITORING WELL
464.0 GROUND WATER CONTOUR LINE (FEET, MSL) (CONTOUR INTERVAL = 0.2 FEET)
NOTES:
1. DATA RECORDED ON FEBRUARY 18, 2002.
2. CONTOURS UNDER THE FACTORY BUILDING ARE INFERRED.
3. MW-37 AND MW-38 WATER LEVELS WERE NOT USED TO CONTOUR THIS MAP DUE TO ANOMALOUS READINGS.
0 200 400
SCALE FEET
N
WHIRLPOOL FACTORY BUILDING
STATE HIGHWAY 271
GAS STATION
JACOBS AVE.
FERGUSON ST.
INGERSOLL AVE.
OHP
APARTMENTS
SOUTHWEST PARKING LOT
PROPANE TANKS
SOUTH TANK AREA
MW-32 464.06
MW-23 464.07
MW-34 464.14
MW-35 464.07
MW-33 464.04
MW-36 464.19
MW-26 465.72
MW-31 464.01
MW-24 464.08
ITMW-16 464.09
MW-27 463.99
MW-28 463.73
MW-38 464.18
ITMW-11 463.82
ITMW-17 463.99
ITMW-15 463.84
ITMW-14 463.73
ITMW-3 463.18
ITMW-2 463.55
ITMW-1 462.78
MW-22 463.11
ITMW-20 464.54
MW-25 464.15
ITMW-19 463.78
ITMW-12 463.91
ITMW-13 463.80
ITMW-18 463.78
ITMW-21 464.26
MW-37 464.41
MW-30 463.69
MW-29 464.29
ITMW-7 463.43
ITMW-4 462.90
ITMW-5 462.77
ITMW-9 462.81
ITMW-10 462.55
ITMW-6 462.69
465.0
464.8
464.6
464.4
464.2
464.0
463.8
463.6
463.4
463.2
463.0
462.8
462.6
ERM-Southwest, Inc.
HOUSTON · NEW ORLEANS · AUSTIN · DALLAS · BEAUMONT · BATON ROUGE
FIGURE 2
POTENTIOMETRIC SURFACE MAP
FEBRUARY 2002
Whirlpool Corporation
Fort Smith, Arkansas
DESIGN: JT
CHKD.:
DATE: 03/01/02
REV.:
DRAWN: CAK
SCALE: AS SHOWN
W.O.NO.: 581004B207 C02
ERM

**TCE Isoconcentration Maps and Potentiometric Surface Maps from 1999, 2000, and 2001 Semi-Annual Ground Water Sampling Reports**

*Attachment 2*

*August 30, 2002*
*W.O. #481-007*

**Environmental Resources Management**
16300 Katy Freeway, Suite 300
Houston, Texas 77094-1611
(281) 600-1000




LEGEND

CPT-16 ▼ CPT LOCATIONS

MW-26 EXISTING MONITOR WELL

TCE CONCENTRATION (mg/l)
FEBRUARY 1999

- < 0.005
- 0.005 to 0.10
- 0.10 to 1.00
- 1.00 to 10.0
- > 10.0

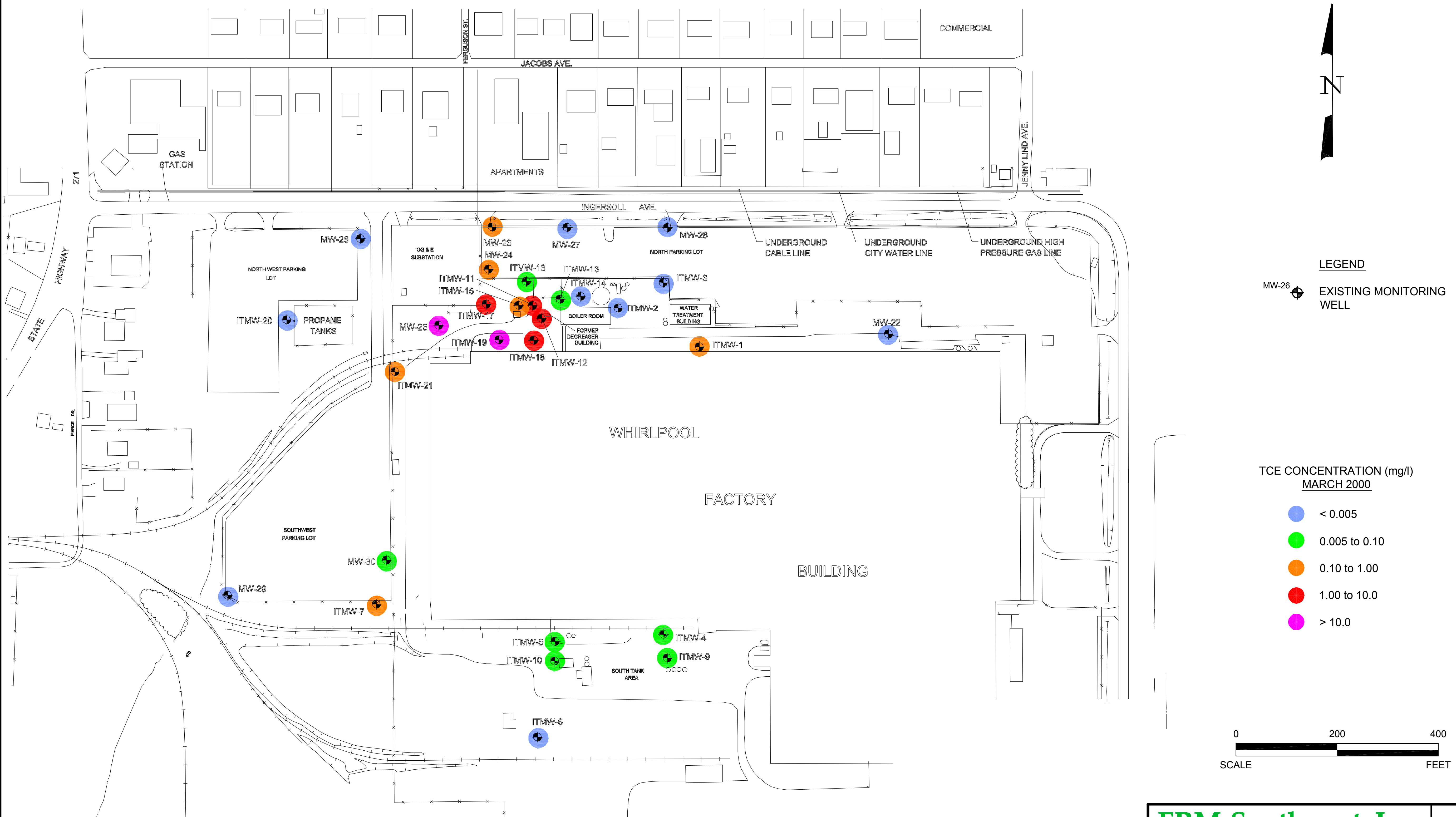
NOTE: MAP REPRESENTS A COMPILATION OF DATA COLLECTED DURING 1999. MONITOR WELLS WERE SAMPLED DURING FEBRUARY 1999. CPT POINTS WERE SAMPLED DURING OCTOBER 1999.

0 200 400
SCALE FEET

**ERM-Southwest, Inc.**
HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE · CORPUS CHRISTI

FIGURE 3
TCE ISOCONCENTRATION MAP
1999
Whirlpool Corporation
Fort Smith, Arkansas

| | | |
|---|---|---|
| DESIGN: L.PFEIL | DRAWN: EFC | CHKD.: |
| DATE: 08/23/02 | SCALE: AS SHOWN | REV.: |
| W.O.NO.: H:\DWG\H02\581007B220.dwg, 8/30/2002 10:16:24 AM | | |



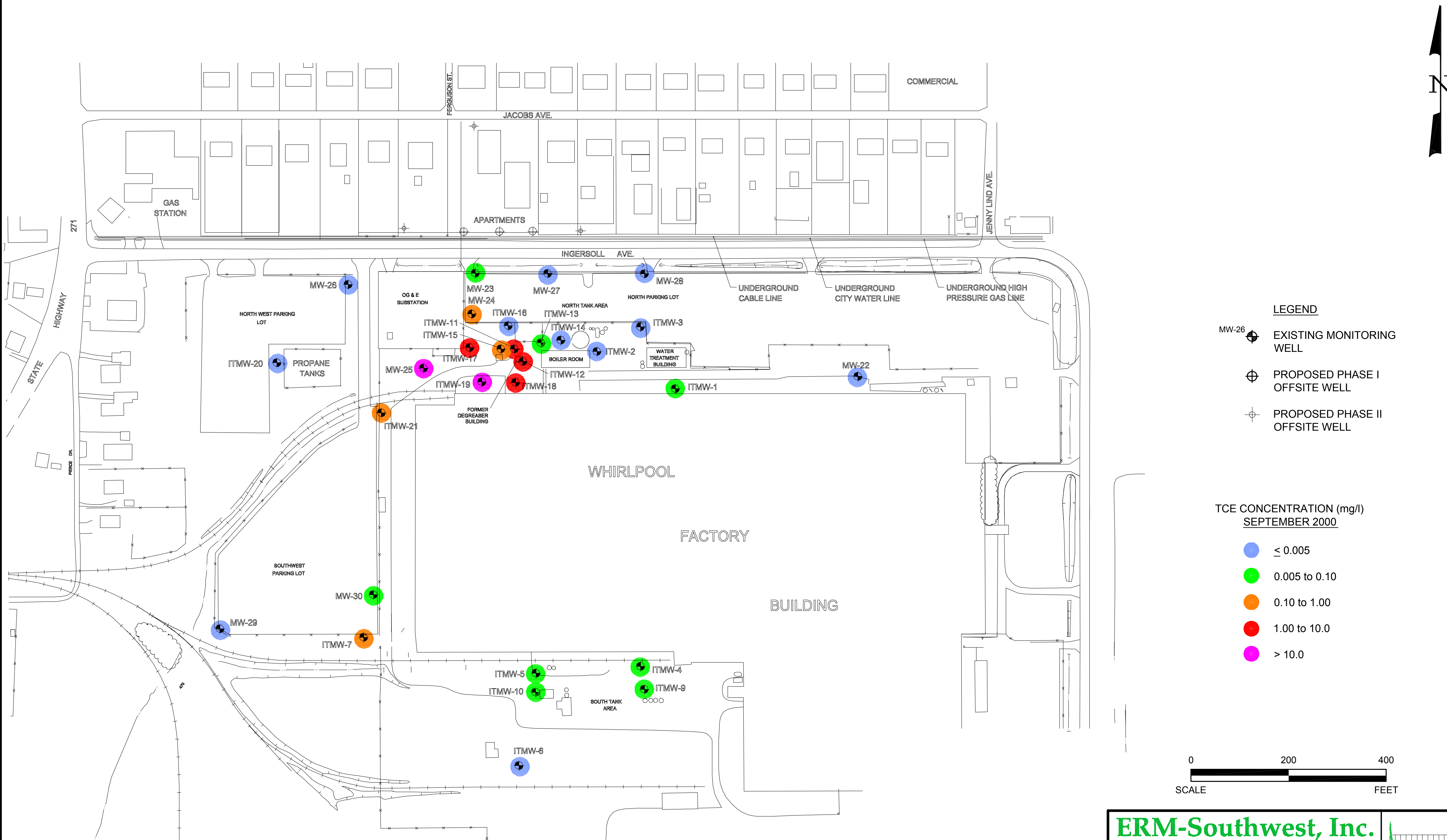

**ERM-Southwest, Inc.**

HOUSTON · NEW ORLEANS · AUSTIN · DALLAS · BEAUMONT · BATON ROUGE

FIGURE 3
TCE ISOCONCENTRATION MAP
MARCH 2000
Whirlpool Corporation
Fort Smith, Arkansas

| DESIGN: L.PFEIL | CHKD.: | DATE: 08/15/02 | REV.: |
|---|---|---|---|
| DRAWN: EFC | SCALE: AS SHOWN | W.O.NO.: 581002B018 H02 | |

ERM®




**ERM-Southwest, Inc.**

HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE · CORPUS CHRISTI

ERM

FIGURE 4
TCE ISOCONCENTRATION MAP
SEPTEMBER 2000
Whirlpool Corporation
Fort Smith, Arkansas

| | | |
|---|---|---|
| DESIGN: L.PFEIL | DRAWN: EFC | CHKD.: |
| DATE: 08/21/02 | SCALE: AS SHOWN | REV.: |

W.O.NO.: H:\DWG\H02\581007B218.dwg, 8/30/2002 10:18:38 AM

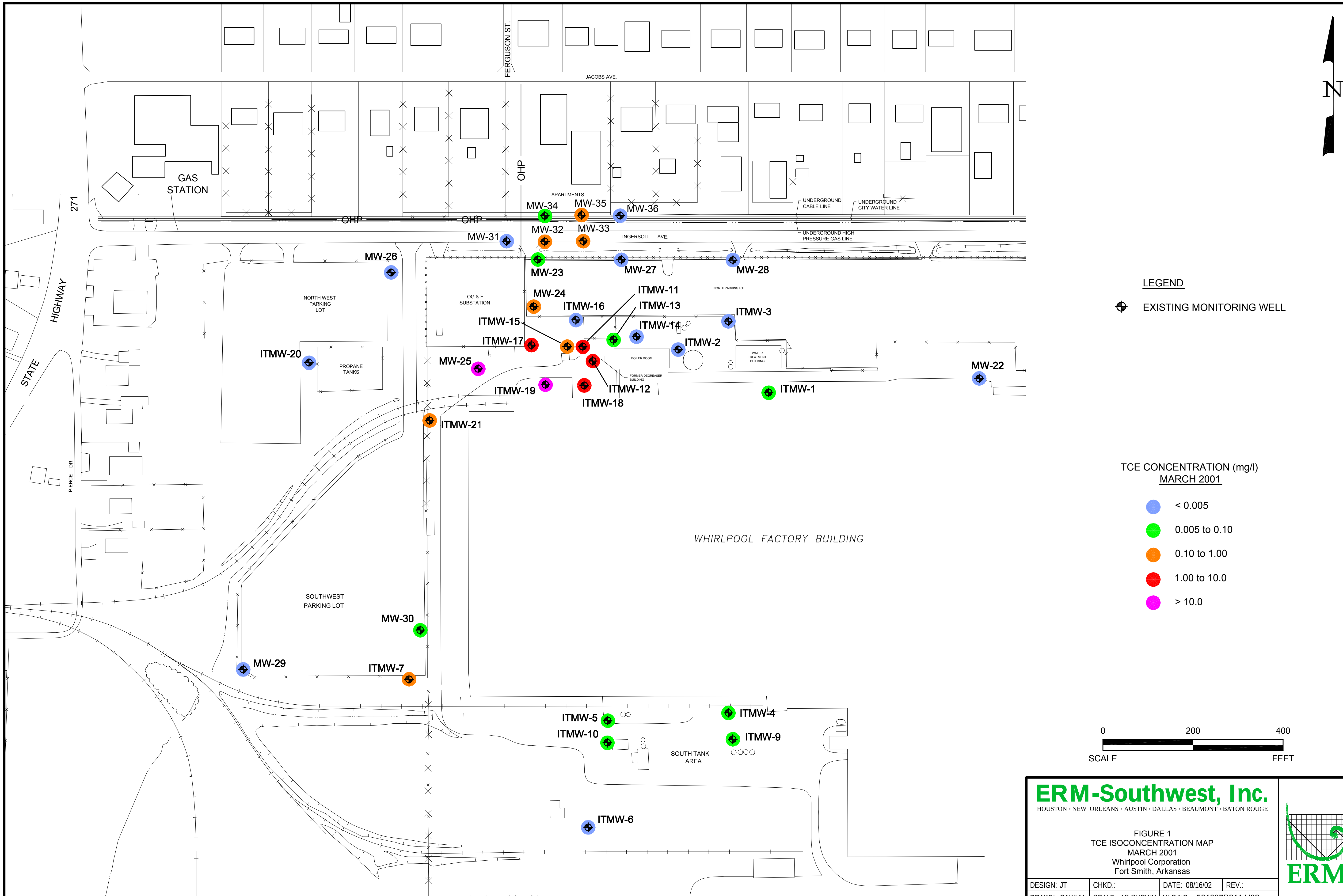
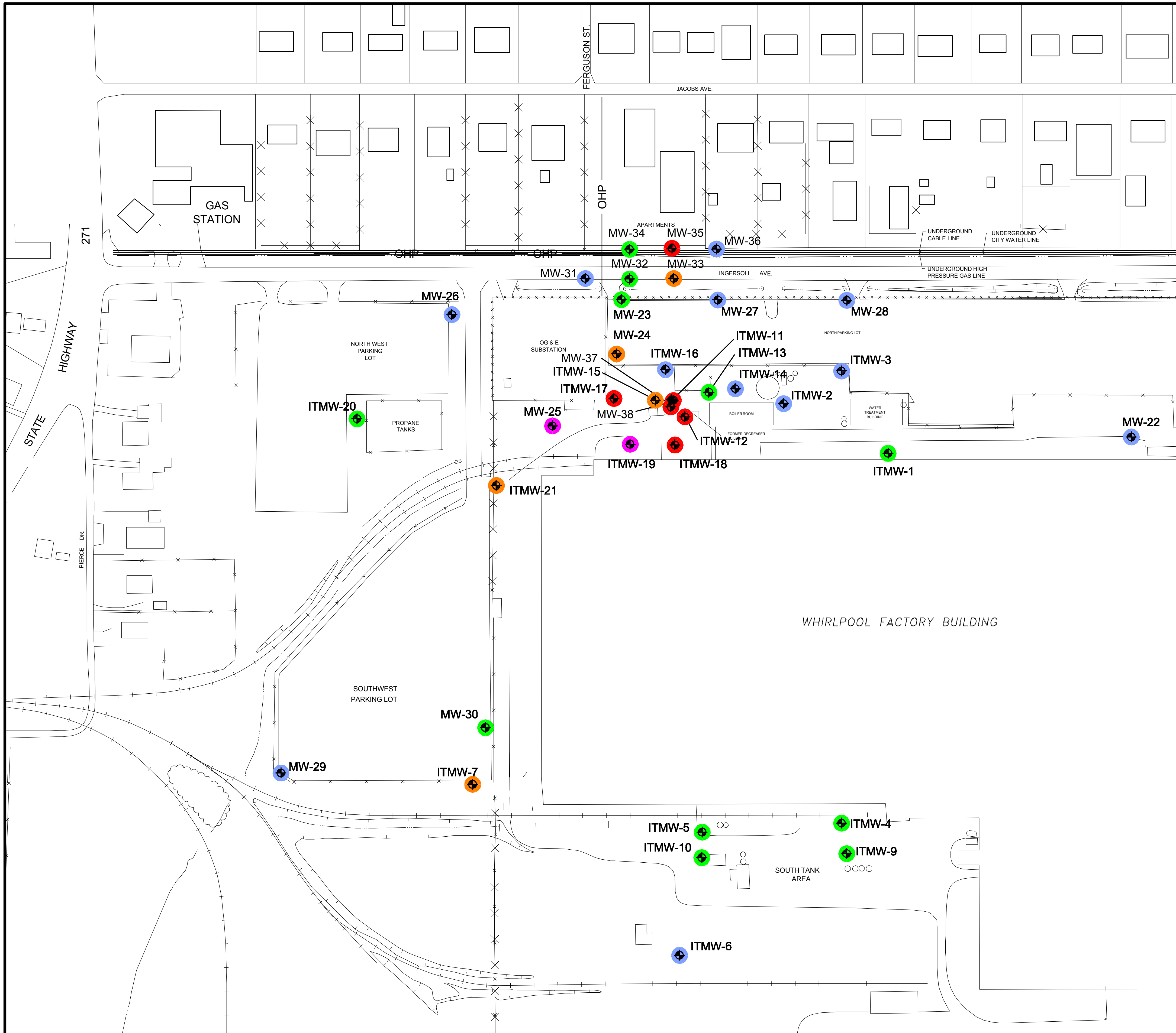



FIGURE 1
TCE ISOCONCENTRATION MAP
MARCH 2001
Whirlpool Corporation
Fort Smith, Arkansas




LEGEND

MW-26 EXISTING MONITORING WELL

TCE CONCENTRATION (mg/l)
SEPTEMBER 2001

- < 0.005
- 0.005 to 0.10
- 0.10 to 1.00
- 1.00 to 10.0
- > 10.0

NOTES:

1. LOCATIONS FOR WELLS ITMW-37 AND ITMW-38 ARE APPROXIMATE AND WILL BE UPDATED WHEN SURVEY DATA ARE RECEIVED.

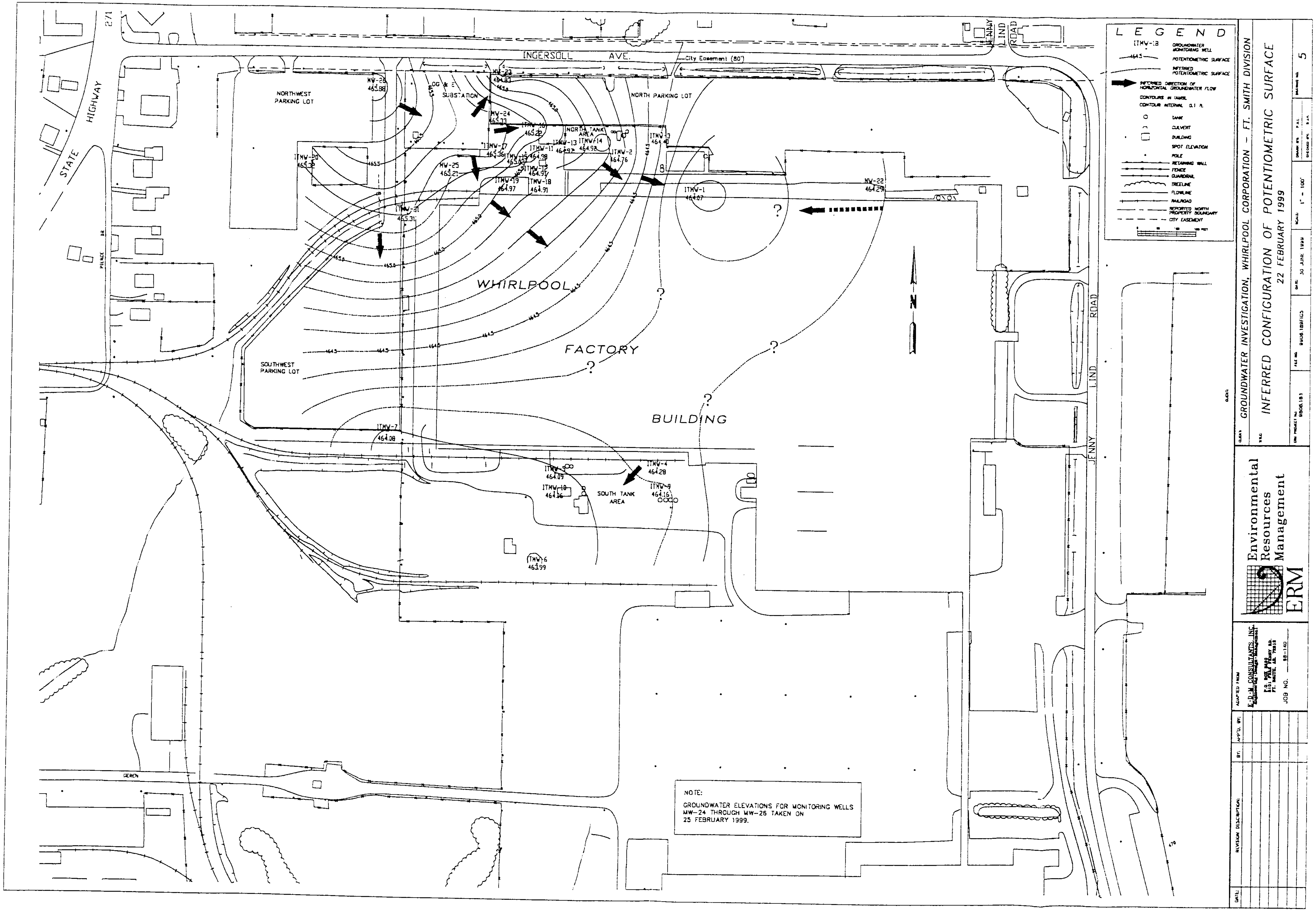
0 200 400
SCALE FEET

**ERM-Southwest, Inc.**
HOUSTON • NEW ORLEANS • AUSTIN • DALLAS • BEAUMONT • BATON ROUGE

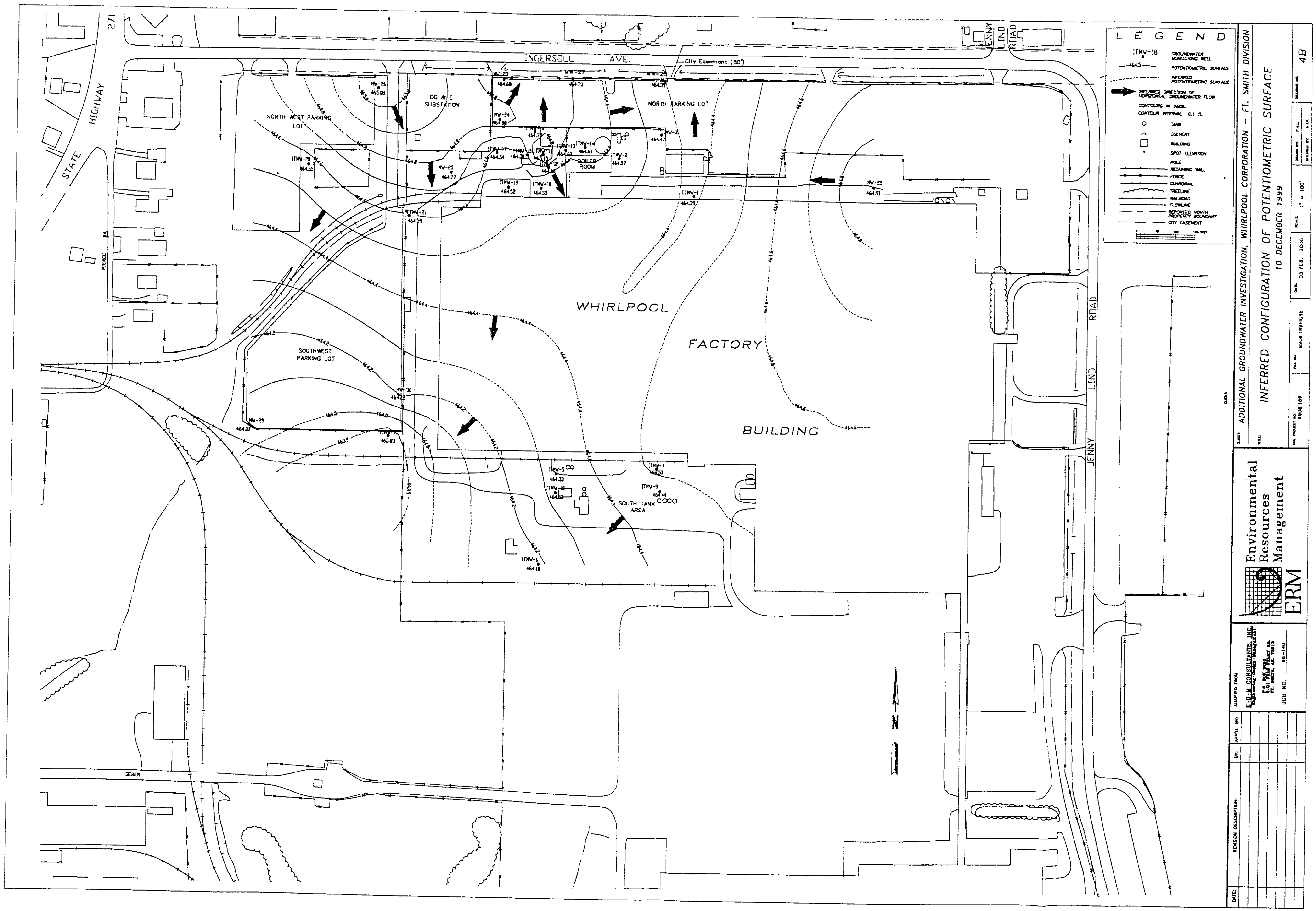
FIGURE 1
TCE ISOCONCENTRATION MAP
SEPTEMBER 2001
Whirlpool Corporation
Fort Smith, Arkansas

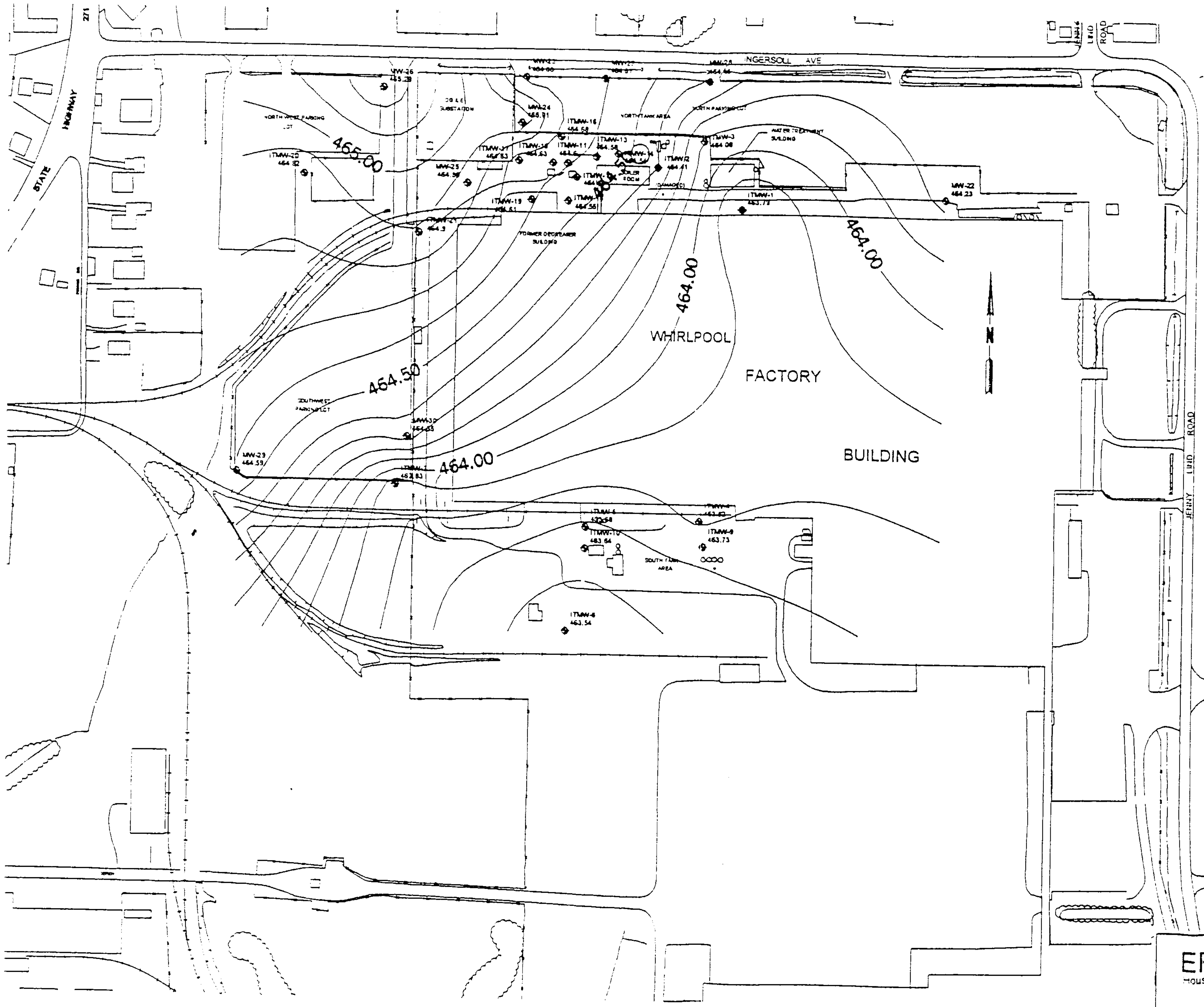
| | | | |
|---|---|---|---|
| DESIGN: JT | CHKD.: | DATE: 08/21/02 | REV.: |
| DRAWN: CAK/LMc | SCALE: AS SHOWN | W.O.NO.: 581007B212 H02 | |

ERM




H:\DWG\J00\9906.189FIG5.dwg


INGERSOLL AVE.
City Easement (80')
STATE HIGHWAY 271
NORTH WEST PARKING LOT
OG & E SUBSTATION
NORTH PARKING LOT
BOILER ROOM
WHIRLPOOL
FACTORY
BUILDING
SOUTHWEST PARKING LOT
SOUTH TANK AREA
JENNY LIND ROAD
PIERCE DR.
L E G E N D
GROUNDWATER MONITORING WELL
POTENTIOMETRIC SURFACE
INFERRED POTENTIOMETRIC SURFACE
INFERRED DIRECTION OF HORIZONTAL GROUNDWATER FLOW
CONTOURS IN MSL
CONTOUR INTERVAL 0.1 ft.
TANK
CULVERT
BUILDING
SPOT ELEVATION
POLE
RETAINING WALL
FENCE
GUARDRAIL
TREELINE
RAILROAD
FLOWLINE
REPORTED NORTH PROPERTY BOUNDARY
CITY EASEMENT
ADDITIONAL GROUNDWATER INVESTIGATION, WHIRLPOOL CORPORATION - FT. SMITH DIVISION
INFERRED CONFIGURATION OF POTENTIOMETRIC SURFACE
10 DECEMBER 1999
03 FEB. 2000
1" = 100'
9806.189
4B
Environmental Resources Management
ERM
E-D-M CONSULTANTS, INC.
JOB NO. 96-140
N




NOTES:

1. Base Drawing was provided by Whirlpool Corporation.

2. Grid Line was previously established by Others, with the north face of Whirlpool Factory Building being on N9000.00 Grid Line.

3. Coordinates for Monitor Wells and Soil Borings were calculated from provided coordinate @ Northwest Corner of Factory: N9000.00, E7691.30.

4. Benchmark utilized was the east edge of pipe casing (4" diameter PVC) for Monitor Well No. 25–Elevation 478.89 MSL, as provided by Whirlpool Corporation.

Legend

ITMW-1
463.73
MONITOR WELL

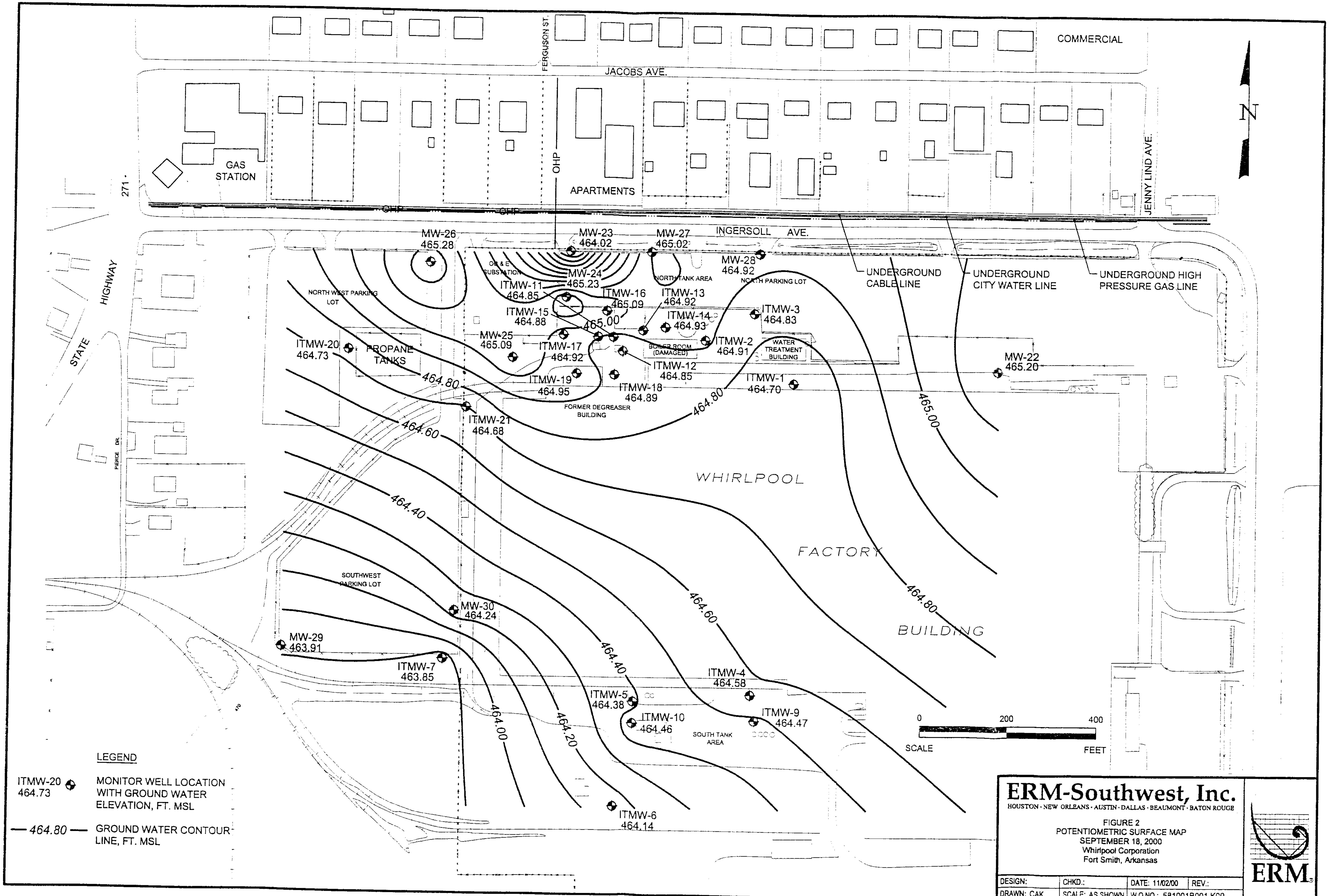
0 250 500
SCALE FEET

**ERM-Southwest, Inc.**
Houston - New Orleans - Austin - Dallas - Beaumont

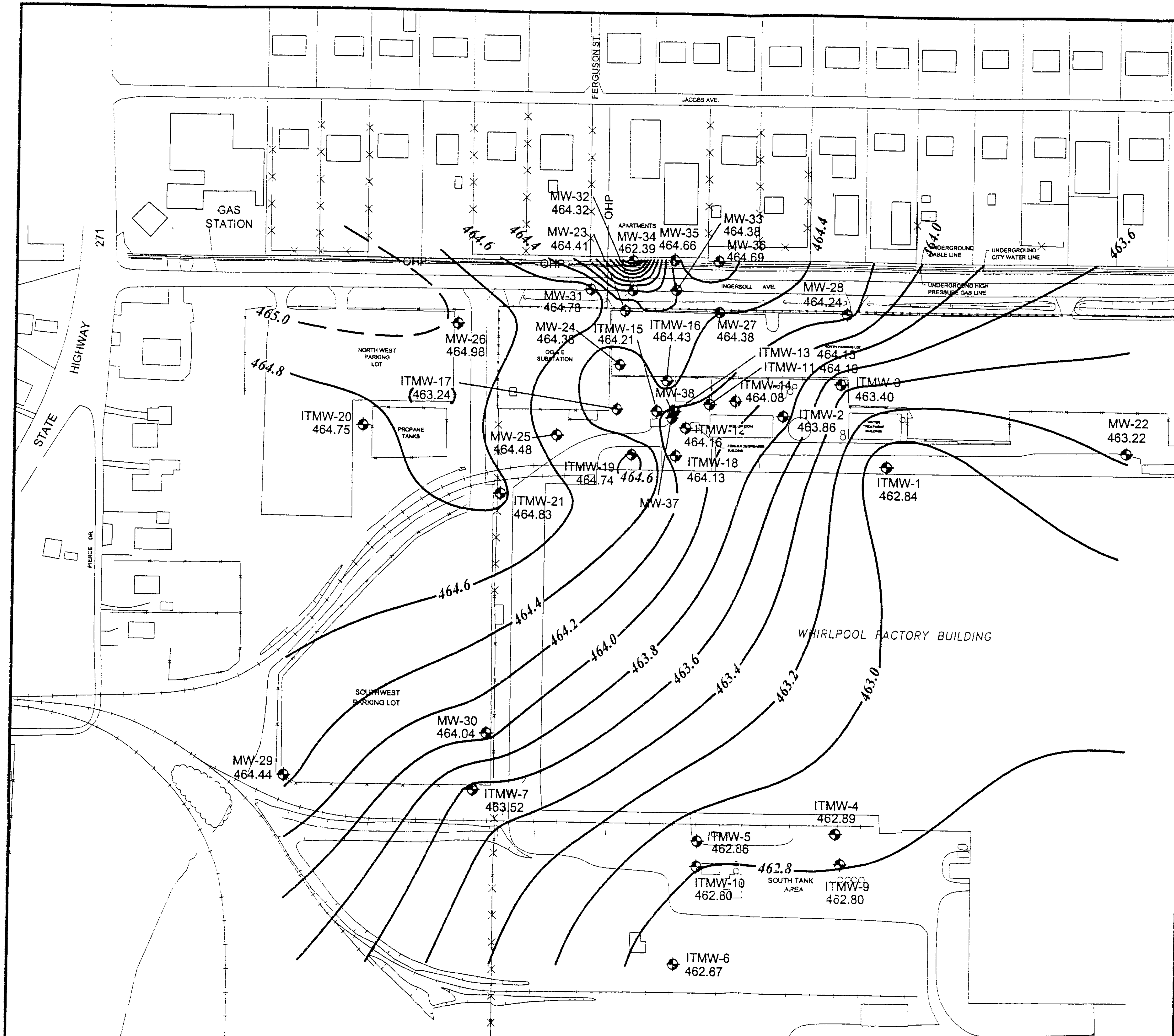
Figure 1
Potentiometric Surface Map
March 2000
Whirlpool Corporation
Fort Smith Arkansas

ERM

| | | | |
|---|---|---|---|
| DESIGN: TM | CHKD.: TM | DATE: 06/16/00 | REV.: |
| DRAWN: R.M | SCALE: AS SHOWN | W.O.NO.: 581001801F00 | |



COMMERCIAL
JACOBS AVE.
FERGUSON ST.
N
GAS STATION
271
OHP
APARTMENTS
JENNY LIND AVE.
INGERSOLL AVE.
STATE HIGHWAY
PIERCE DR.
MW-26 465.28
MW-23 464.02
MW-27 465.02
MW-28 464.92
OG & E SUBSTATION
MW-24 465.23
NORTH TANK AREA
NORTH PARKING LOT
UNDERGROUND CABLE LINE
UNDERGROUND CITY WATER LINE
UNDERGROUND HIGH PRESSURE GAS LINE
NORTH WEST PARKING LOT
ITMW-11 464.85
ITMW-16 465.09
ITMW-13 464.92
ITMW-3 464.83
ITMW-15 464.88
465.00
ITMW-14 464.93
MW-25 465.09
ITMW-20 464.73
PROPANE TANKS
ITMW-17 464.92
BOILER ROOM (DAMAGED)
ITMW-2 464.91
WATER TREATMENT BUILDING
MW-22 465.20
ITMW-12 464.85
464.80
ITMW-19 464.95
ITMW-18 464.89
ITMW-1 464.70
FORMER DEGREASER BUILDING
ITMW-21 464.68
464.60
465.00
WHIRLPOOL
464.40
FACTORY
SOUTHWEST PARKING LOT
464.60
464.80
MW-30 464.24
BUILDING
MW-29 463.91
ITMW-7 463.85
464.40
ITMW-4 464.58
ITMW-5 464.38
ITMW-10 464.46
ITMW-9 464.47
SOUTH TANK AREA
464.00
464.20
0 200 400
SCALE
FEET
ITMW-6 464.14
LEGEND
ITMW-20 464.73 MONITOR WELL LOCATION WITH GROUND WATER ELEVATION, FT. MSL
464.80 GROUND WATER CONTOUR LINE, FT. MSL
ERM-Southwest, Inc.
HOUSTON · NEW ORLEANS · AUSTIN · DALLAS · BEAUMONT · BATON ROUGE
FIGURE 2
POTENTIOMETRIC SURFACE MAP
SEPTEMBER 18, 2000
Whirlpool Corporation
Fort Smith, Arkansas
DESIGN:
CHKD.:
DATE: 11/02/00
REV.:
DRAWN: CAK
SCALE: AS SHOWN
W.O.NO.: 581001B001 K00
ERM




LEGEND

MW-26 464.98 — EXISTING MONITORING WELL

464.0 — GROUND WATER CONTOUR LINE (FEET, MSL) (CONTOUR INTERVAL = 0.2 FEET)

NOTES:

1. DATA RECORDED ON MARCH 26, 2001.
2. ELEVATIONS FOR MW-17, MW-34, MW-35, AND MW-36 WERE RECHECKED ON MAY 1, 2001 TO CONFIRM THE MARCH DATA.
3. CONTOURS UNDER THE FACTORY BUILDING ARE INFERRED.
4. ELEVATION FOR MW-17 WAS NOT USED FOR CONTOURING.

SCALE: 0 — 200 — 400 FEET

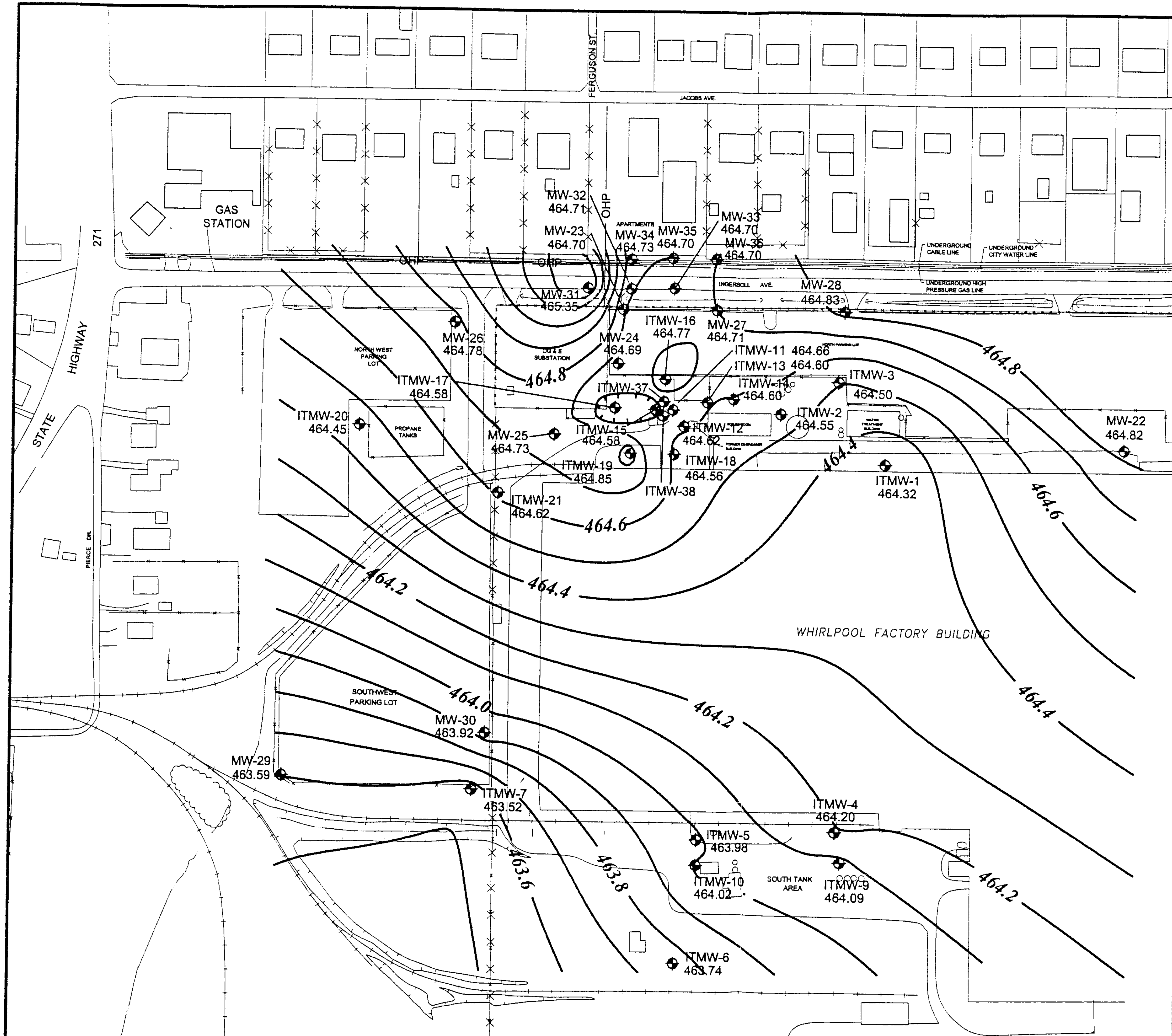
**ERM-Southwest, Inc.**

HOUSTON · NEW ORLEANS · AUSTIN · DALLAS · BEAUMONT · BATON ROUGE

FIGURE 3
POTENTIOMETRIC SURFACE MAP
MARCH 2001
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| | | | |
|---|---|---|---|
| DESIGN: JT | CHKD.: | DATE: 08/21/02 | REV.: |
| DRAWN: JEM/LMc | SCALE: AS SHOWN | W.O.NO.: 581007B217 H02 | |




N

LEGEND

MW-26 464.38 EXISTING MONITORING WELL

464.0 GROUND WATER CONTOUR LINE (FEET, MSL) (CONTOUR INTERVAL = 0.1 FEET)

NOTES:

1. DATA RECORDED ON SEPTEMBER 10, 2001.
2. CONTOURS UNDER THE FACTORY BUILDING ARE INFERRED.
3. LOCATIONS FOR WELLS ITMW-37 AND ITMW-38 ARE APPROXIMATE AND WILL BE UPDATED WHEN SURVEY DATA ARE RECEIVED.

0 200 400
SCALE FEET

**ERM-Southwest, Inc.**
HOUSTON · NEW ORLEANS · AUSTIN · DALLAS · BEAUMONT · BATON ROUGE

FIGURE 4
POTENTIOMETRIC SURFACE MAP
SEPTEMBER 2001
Whirlpool Corporation
Fort Smith, Arkansas

| | | | |
|---|---|---|---|
| DESIGN: JT | CHKD.: | DATE: 10/31/01 | REV.: |
| DRAWN: LMc | SCALE: AS SHOWN | W.O.NO.: 581004B206 J01 | |

ERM

# Summary of CPT Grab Ground Water Sample Data

*Attachment 3*

*August 30, 2002*
*W.O. #481-007*

**Environmental Resources Management**
16300 Katy Freeway, Suite 300
Houston, Texas 77094-1611
(281) 600-1000

**TABLE 4**

**ANALYTICAL RESULTS, VOCs DETECTED IN GROUNDWATER SAMPLES**

| Parameter | LOQ | CPT-1 | CPT-2 | CPT-3 | CPT-4 | CPT-5 | CPT-6 | CPT-7 | CPT-8 | CPT-9 |
|---|---|---|---|---|---|---|---|---|---|---|
| Tetrachloroethene | 5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| Trichloroethene | 5 | 66 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| cis-1,2-Dichloroethene | 5 | 10 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| trans-1,2-Dichloroethene | 5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| Total 1,2-Dichloroethene | 10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 |
| 1,1-Dichloroethene | 5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| Vinyl Chloride | 10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 |

| Parameter | LOQ | CPT-10 | CPT-11 | Dup-1 (Dupl. of CPT-11) | Dup-1A (Chemron CPT-11) | CPT-12 | CPT-13 | CPT-14 | CPT-21 | CPT-22 |
|---|---|---|---|---|---|---|---|---|---|---|
| Tetrachloroethene | 5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| Trichloroethene | 5 | 32 | <5 | <5 | <5 | 41 | 5,900 | <5 | <5 | <5 |
| cis-1,2-Dichloroethene | 5 | <5 | <5 | <5 | <5 | 16 | <5 | <5 | <5 | <5 |
| trans-1,2-Dichloroethene | 5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| Total 1,2-Dichloroethene | 10 | <10 | <10 | <10 | <10 | 20 | <10 | <10 | <10 | <10 |
| 1,1-Dichloroethene | 5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| Vinyl Chloride | 10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 |

| Parameter | LOQ | CPT-23 | "FB" (Field Blank) | Travel Blank | MW-27 | MW28 | Duplicate (Dupl. MW-28) | Duplicate (Chemron, MW-28) | MW-29 | MW-30 |
|---|---|---|---|---|---|---|---|---|---|---|
| Tetrachloroethene | 5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| Trichloroethene | 5 | 340 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | 115 |
| cis-1,2-Dichloroethene | 5 | 16 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | 34 |
| trans-1,2-Dichloroethene | 5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| Total 1,2-Dichloroethene | 10 | 20 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | 30 |
| 1,1-Dichloroethene | 5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| Vinyl Chloride | 10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 |

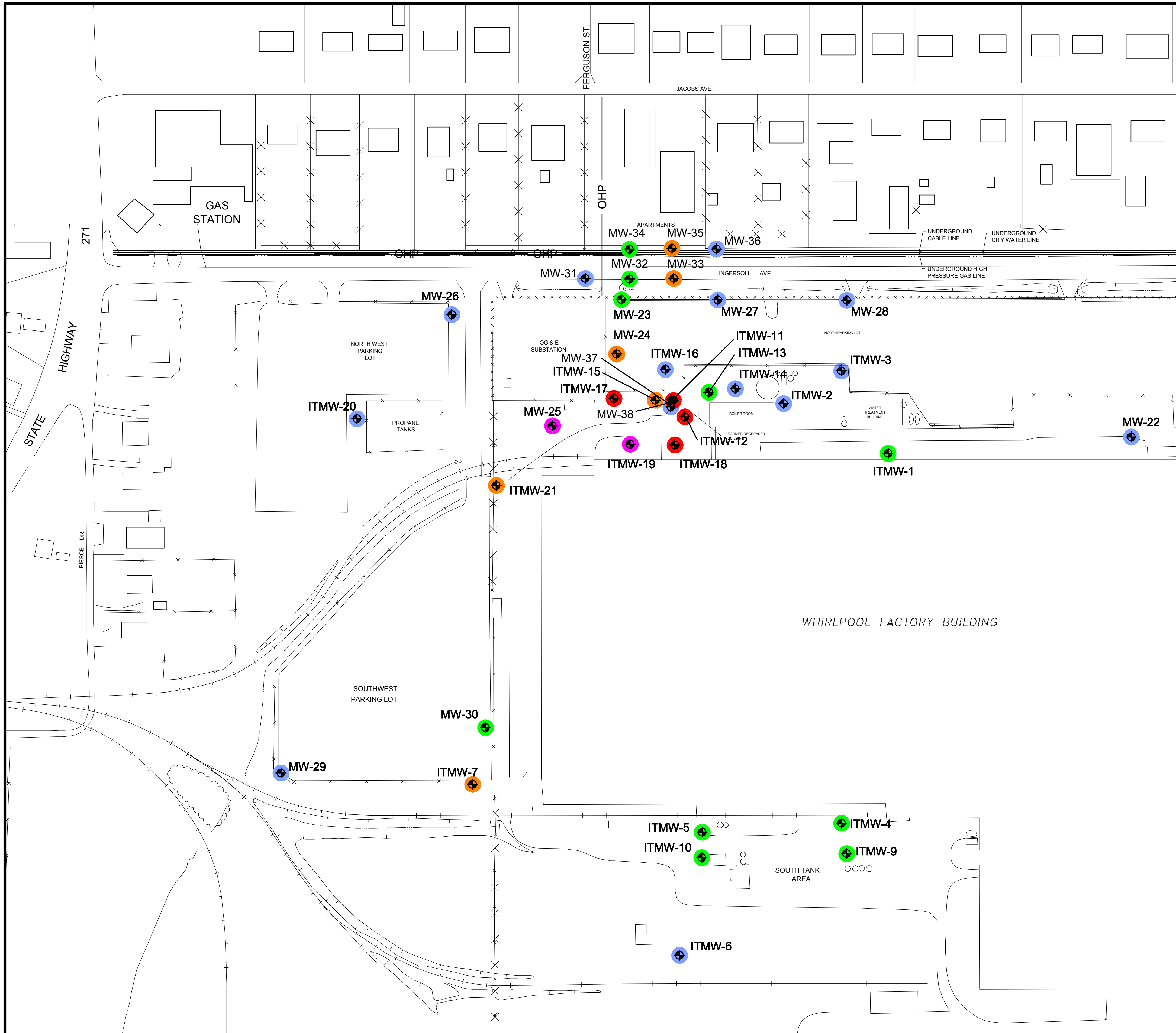
Analysis by US EPA Method SW-846 8260B.
Units used are mg/L.
LOQ = laboratory Limit of Quantitation
Samples from CPT wells collected 27 October 1999. Samples from MW-series wells collected 09 December 1999.
Chemron = Chemron Incorporated (secondary subcontract laboratory).

# Replacement Figure 5-1 for Conceptual Site Model

*Attachment 4*

*August 30, 2002*
*W.O. #481-007*

**Environmental Resources Management**
16300 Katy Freeway, Suite 300
Houston, Texas 77094-1611
(281) 600-1000




N

LEGEND

MW-26 EXISTING MONITORING WELL

TCE CONCENTRATION (mg/l)
FEBRUARY 2002

- < 0.005
- 0.005 to 0.10
- 0.10 to 1.00
- 1.00 to 10.0
- > 10.0

NOTES:

1. LOCATIONS FOR WELLS ITMW-37 AND ITMW-38 ARE APPROXIMATE AND WILL BE UPDATED WHEN SURVEY DATA ARE RECEIVED.

0 200 400

SCALE FEET

**ERM-Southwest, Inc.**

HOUSTON • NEW ORLEANS • AUSTIN • DALLAS • BEAUMONT • BATON ROUGE

FIGURE 5-1
TCE ISOCONCENTRATION MAP
FEBRUARY 2002
Whirlpool Corporation
Fort Smith, Arkansas

| DESIGN: JT | CHKD.: | DATE: 08/27/02 | REV.: |
|---|---|---|---|
| DRAWN: CAK/LMc | SCALE: AS SHOWN | W.O.NO.: 581007B215 H02 | |

ERM

# Boring Logs and Well Completion Details
*Appendix C*

*June 25, 2004*
*Project No. 0014507*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

ERM

# MW-39
# DRILLING LOG

W.O. NO. 58113 Boring/Well ID MW-39 Date Drilled 7/14/03

Project Off-site delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 29.5 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' MSL Datum

Screen: Type Stainless prepak Diam. 0.75 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 19.5 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. ______ ( ______ ) 2. Ft. ______ ( ______ )

Drilling Company TWF Drilling Driller Sammy Smith

Drilling Method Geoprobe Log By Troy Meinen

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | OVM HEADSPACE (PPM) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| 0 | 0 | | 0-4 | 0-0.5 | SILTY CLAY: Grayish-brown, dry, hard, occasional rootlets, occuring 1/2" diameter pieces of black shale. |
| | | 0.0 | | 0.5-2.8 | SILTY SAND to SANDY SILT: pale brown, moist to dry, crumbly, stiff, abundant rootlets. |
| | | 0.0 | | 2.8-4.5 | SILTY SANDY CLAY: Pale brown with reddish-brown mottling, moist, slightly plastic to crumbly, occasional rootlets, occuring 1/4" diameter iron nodules. |
| | | | 4-8 | 4.5-5.7 | SILTY SANDY CLAY: Strong brown to orange with dark brown mottling, moist to dry, firm, abundant iron nodules and dark brown mottling large occasional pockets of pale brown, soft, silty clay. |
| -5 | 5 | 0.0 | | 5.7-7.5 | SILTY CLAY: Strong brown, dark brown, and orange mottled, moist, stiff to firm, occasional 1/2" diameter iron nodules, occasional 1/2" diameter to 1" diameter calcareous nodules. |
| | | 0.0 | | 7.5-8 | SILTY CLAY: Pale brown, dark brown, and orange mottled, moist, stiff to soft,occasional 1/2" to 1" diameter calcareous nodules. |
| | | | 8-10 | 8-9 | SILTY CLAY: Strong brown with pale brown and minor dark brown mottling, moist, firm to hard, crumbly to plastic. |
| | | 0.0 | | 9-11.1 | SILTY CLAY: Strong brown with minor pale gray and abundant dark brown mottling, moist, hard, crumbly, abundant 1/4" diameter calcareous nodules and iron nodules. |
| -10 | 10 | | 10-12 | | |
| | | 0.0 | | 11.1-11.6 | SILTY SANDY CLAY: Strong brown with pale brown mottling and minor dark brown mottling, moist, stiff to firm, plastic. |
| | | | 12-14 | 11.6-12.2 | CLAYEY SILTY SAND: Strong brown with abundant dark brown mottling, moist, stiff, crumbly, abundant 1/4"-1/2" calcareous and iron nodules. |
| | | 0.0 | | 12.2-15.5 | SILTY SANDY CLAY: Strong brown with pale brown and minor dark brown mottling, moist, stiff, slightly plastic. |
| | | | 14-16 | | |
| -15 | 15 | | | | |

ERM

# MW-39
# DRILLING LOG

W.O. NO. 58113 Boring/Well ID MW-39 Date Drilled 7/14/03

Project Off-site delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 29.5 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' MSL Datum

Screen: Type Stainless prepak Diam. 0.75 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 19.5 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. ______ (______) 2. Ft. ______ (______)

Drilling Company TWF Drilling Driller Sammy Smith

Drilling Method Geoprobe Log By Troy Meinen

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM HEADSPACE (PPM) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -15 | 15 | | | | 0.0 | | | |
| | | | | | | | 15.5-16 | SILTY CLAYEY SAND: Brown to strong brown with minor dark brown mottling, moist to wet, soft to firm, slightly crumbly. |
| | | | | | | 16-20 | 16-18.7 | SILTY CLAYEY SAND TO SILTY SANDY CLAY: strong brown to brown with occasional dark brown mottling, moist to wet, soft to firm, slightly crumbly to slightly plastic (clay content high but varies). |
| | | | | | 0.0 | | | |
| | | | | | 0.0 | | 18.7-19 | SILTY CLAY: Reddish-brown with occasional dark brown mottling, moist, hard, plastic. |
| | | | | | | | 19-20 | SILTY CLAYEY SAND TO SILTY SANDY CLAY: strong brown to brown with occasional dark brown mottling, moist to wet, soft to firm, slightly crumbly to slightly plastic (clay content high but varies), with silty sand pocket with medium-grained sand at base, bro |
| -20 | 20 | | | | | 20-24 | 20-24 | SILTY SANDY CLAY: Strong brown, moist, stiff to firm, plastic. |
| | | | | | 0.0 | | | |
| | | | | | 0.0 | | | |
| | | | | | | 24-25.5 | 24-24.5 | CLAYEY SILTY SAND: Strong brown with dark brown mottling, moist to wet, stiff, occasional 1/4" quartzite gravel, sand grain size increases with depth to medium-grained at 24.5'. |
| | | | | | 0.0 | | 24.5-25.5 | GRAVELLY SANDY CLAY to CLAYEY SAND: strong brown with pale gray mottling, moist, hard, crumbly 1/4" to 1/2" diameter quartzite gravel. |
| -25 | 25 | | | | | | | |
| | | | | | | 25.5-27 | 25.5-26 | SILTY GRAVELLY CLAYEY SAND: brown, water-saturated, 1/4" to 1/2" diameter quartzite gravel. |
| | | | | | | | 26-27.5 | GRAVELLY SANDY CLAY to CLAYEY SAND: strong brown with pale gray mottling, wet to water-saturated, hard, crumbly 1/4" to 1/2" diameter quartzite gravel. |
| | | | | | 0.0 | | | |
| | | | | | | 27-28 | | |
| | | | | | 0.0 | | 27.5-28 | GRAVELLY SAND: Strong brown, water-saturated, dense, medium to coarse-grained with 1/2" to 1" diameter quartzite gravel. |
| | | | | | | 28-29.5 | 28-29 | SILTY CLAY: Brown to brownish-gray, moist to wet, stiff to hard, plastic, grades to fissil gray shale at base. |
| | | | | | 0.0 | | 29-29.5 | SHALE: Gray with occasional brown mottling along fractures, fissil, weathered. |
| -30 | 30 | | | | | | | |

ERM

# MW-39
# DRILLING LOG

W.O. NO. 58113 Boring/Well ID MW-39 Date Drilled 7/14/03

Project Off-site delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 29.5 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' MSL Datum

Screen: Type Stainless prepak Diam. 0.75 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 19.5 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. ______ (______) 2. Ft. ______ (______)

Drilling Company TWF Drilling Driller Sammy Smith

Drilling Method Geoprobe Log By Troy Meinen

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM HEADSPACE (PPM) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -30 | 30 | | | | | | | |
| | | | | | | | | T.D. = 29.5 ' |
| -35 | 35 | | | | | | | |
| -40 | 40 | | | | | | | |
| -45 | 45 | | | | | | | |

ERM

# MW-40
# DRILLING LOG

W.O. NO. 58113 | Boring/Well ID MW-40 | Date Drilled 7/14/03

Project Off-site delineation | Owner Whirlpool Corporation

Location Fort Smith, AR | Boring T.D. 28.5' | Boring Diam. 3"

N. Coord. ____ E. Coord. ____ | Surface Elevation 0' | MSL Datum

Screen: Type Stainless prepak | Diam. 0.75" | Length 10' | Slot Size 0.01"

Casing: Type Schedule 40 PVC | Diam. 0.75" | Length 17.8' | Sump Length 0'

Top of Casing Elevation 0' | Stickup 0'

Depth to Water: 1. Ft. ____ (____) 2. Ft. ____ (____)

Drilling Company TWF Drilling | Driller Sammy Smith

Drilling Method Geoprobe | Log By Troy Meinen

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | 0-4 | 0-0.3 | SILTY SANDY CLAY: Gray, dry to damp, soft, crumbly, abundant rootlets. |
| | | | | | 0.0 | | 0.3-0.8 | WEATHERED SHALE MIXED WITH SILT: black to dark gray, soft, crumbly, fissil (fill material). |
| | | | | | | | 0.8-2 | SILTY SANDY CLAY: Strong brown, black, and gray mottled, moist to wet, firm, plastic, abundant rootlets. |
| | | | | | 0.0 | | 2-3.5 | SANDY SILT: Brown with occasional dark brown mottling, water-saturated, soft, crumbly. (Boring is at edge of a 2 ft deep wet drainage ditch). |
| | | | | | | | 3.5-4 | SILTY CLAY: Brown with occasional dark brown mottling, water-saturated, soft, crumbly. |
| | | | | | | 4-8 | 4-6.2 | SANDY CLAYEY SILT: Brown and strong brown with occasional dark brown mottling, wet to water-saturated, soft. |
| -5 | 5 | | | | 0.0 | | | |
| | | | | | | | 6.2-8.5 | SILTY SANDY CLAY: Strong brown with gray mottling, moist, stiff to hard, plastic. |
| | | | | | 0.0 | | | |
| | | | | | | 8-10 | 8.5-9.5 | SILTY SANDY CLAY: Strong brown with occasional pale gray mottling, moist, stiff to hard. |
| | | | | | 0.0 | | 9.5-10.8 | SILTY SANDY CLAY: Strong brown with gray mottling, moist, stiff to hard, plastic. |
| -10 | 10 | | | | | 10-12 | | |
| | | | | | 0.0 | | 10.8-11 | SILTY CLAY: Pale brown, wet, soft, fine-grained. |
| | | | | | | | 11-11.5 | SILTY CLAY: Gray with occasional strong brown mottling, moist, stiff, plastic. |
| | | | | | | 12-14 | 11.5-14 | SILTY CLAY: Strong brown with occasional gray to pale gray mottling, moist, stiff, plastic. At 12.5ft dark brown to very dark gray mottling |
| | | | | | 0.0 | | | |
| | | | | | | 14-16 | 14-14.5 | SILTY SANDY CLAY: Strong brown with occasional dark brown mottling, moist, firm, plastic. |
| -15 | 15 | | | | | | 14.5-15.5 | CLAYEY SANDY SILT: Strong brown, wet to water-saturated, soft, loose, with coarse-grained sand to small gravel. |

ERM

# MW-40 DRILLING LOG

W.O. NO. 58113 | Boring/Well ID MW-40 | Date Drilled 7/14/03

Project Off-site delineation | Owner Whirlpool Corporation

Location Fort Smith, AR | Boring T.D. 28.5' | Boring Diam. 3"

N. Coord. ____ E. Coord. ____ | Surface Elevation 0' | MSL Datum

Screen: Type Stainless prepak | Diam. 0.75" | Length 10' | Slot Size 0.01"

Casing: Type Schedule 40 PVC | Diam. 0.75" | Length 17.8' | Sump Length 0'

Top of Casing Elevation 0' | Stickup 0'

Depth to Water: 1. Ft. ____ ( ____ ) 2. Ft. ____ ( ____ )

Drilling Company TWF Drilling | Driller Sammy Smith

Drilling Method Geoprobe | Log By Troy Meinen

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| -15 | 15 | 0.0 | | | |
| | | | | 15.5-16 | SILTY CLAY: Strong brown and pale gray, stiff to hard. |
| | | | 16-18 | 16-18 | SILTY SANDY CLAY: Strong brown with occasional pale gray mottling, moist, stiff, slightly crumbly to plastic. At 15.6ft occasional 1/2" diameter iron nodules. |
| | | 0.0 | | | |
| | | | 18-20 | 18-19.2 | SILTY SANDY CLAY: Strong brown with occasional pale gray mottling, moist, stiff, slightly crumbly to plastic, with occasional dark brown 1/4" to 1/2" diameter nodules, grades to sand at base. |
| | | 0.0 | | 19.2-20 | SILTY CLAYEY SAND WITH GRAVEL: strong brown to brown, wet to water-saturated, dense, gravel is 1/8" to 1/4" diameter quartzite. |
| -20 | 20 | | 20-24 | 20-21.5 | SILTY SANDY CLAY: Strong brown with gray mottling, wet, stiff, plastic. |
| | | 0.0 | | | |
| | | | | 21.5-23.3 | SILTY SANDY GRAVEL: water-saturated, loose to flowing, 1/8"-1/4" diameter quartzite gravel, grades to clayey gravel. |
| | | 0.0 | | | |
| | | | | 23.3-23.9 | CLAYEY GRAVEL: wet to water-saturated, stiff, crumbly. |
| | | | 24-26 | 23.9-24 | GRAVELLY CLAY: Strong brown, wet to moist, hard, plastic, gravel is 1/4" to 1/2" diameter quartzite. |
| | | | | 24-25 | SILTY SANDY GRAVEL: strong brown to brown, water-saturated, dense, 1/8" to 1/4" quartzite gravel. |
| -25 | 25 | 0.0 | | 25-25.8 | GRAVELY SILTY SAND: strong brown, water-saturated, dense, crumbly, 1/4" to 1/2" diameter quartzite gravel. |
| | | | 26-28.5 | 25.8-26.2 | SANDY CLAY: Strong brown with very pale grey mottling, moist to wet, hard, crumbly, occasional quartzite gravel (1/2" to 1" diameter). |
| | | | | 26.2-26.3 | SANDY GRAVEL: brown to strong brown, wet, hard, dense, gravel is 1/2" diameter quartzite. |
| | | 0.0 | | 26.3-26.7 | SANDY SILTY CLAY: Pale gray with strong brown mottling, moist, stiff to hard, plastic. |
| | | | | 26.7-28 | SILTY CLAY: Strong brown to orange with occasional gray mottling, fissil to slightly blocky texture, (weathered shale). |
| | | | | 28-28.5 | SHALE: Gray, moist, hard, slightly crumbly, fissil. |
| -30 | 30 | | | | |

ERM

# MW-40
# DRILLING LOG

| | | | | | |
|---|---|---|---|---|---|
| W.O. NO. | 58113 | Boring/Well ID | MW-40 | Date Drilled | 7/14/03 |
| Project | Off-site delineation | Owner | Whirlpool Corporation | | |
| Location | Fort Smith, AR | Boring T.D. | 28.5 ' | Boring Diam. | 3 " |
| N. Coord. | | E. Coord. | | Surface Elevation | 0 ' MSL Datum |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Screen: Type | Stainless prepak | Diam. | 0.75 " | Length | 10 ' | Slot Size | 0.01 " |
| Casing: Type | Schedule 40 PVC | Diam. | 0.75 " | Length | 17.8 ' | Sump Length | 0 ' |

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. ______ (______) 2. Ft. ______ (______)

Drilling Company TWF Drilling Driller Sammy Smith

Drilling Method Geoprobe Log By Troy Meinen

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -30 | 30 | | | | | | | T.D. = 28.5 ' |
| -35 | 35 | | | | | | | |
| -40 | 40 | | | | | | | |
| -45 | 45 | | | | | | | |

ERM

# MW-41
# DRILLING LOG

W.O. NO. 58113 Boring/Well ID MW-41 Date Drilled 7/15/03

Project Off-site delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 29' Boring Diam. 8"

N. Coord. ______ E. Coord. ______ Surface Elevation 0' MSL Datum

Screen: Type Stainless prepak Diam. 0.75" Length 10' Slot Size 0.01"

Casing: Type Schedule 40 PVC Diam. 0.75" Length 18.7' Sump Length 0'

Top of Casing Elevation 0' Stickup 0'

Depth to Water: 1. Ft. ______ (______) 2. Ft. ______ (______)

Drilling Company TWF Drilling Driller Sammy Smith

Drilling Method Geoprobe Log By Troy Meinen

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | OVM HEADSPACE (PPM) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| 0 | 0 | | 0-4 | 0-0.5 | SILTY CLAY: Gray, moist, firm, plastic to slightly crumbly, abundant rootlets, occasional iron nodules. |
| | | 0.0 | | 0.5-3 | SILTY CLAY: Gray with orange mottling, moist, firm to stiff, plastic, abundant rootlets, occasional iron nodules to 1/4" diameter. At 2.6' to 3' no orange mottling. |
| | | 0.0 | | 3-4.3 | SILTY SANDY CLAY: Brown with gray mottling, moist, slightly plastic to slightly crumbly. |
| | | | 4-8 | 4.3-5.5 | SILTY CLAY: Brown to pale brown with minor dark brown and orange mottling, moist, hard, crumbly, blocky, abundant 1/4" to 1/2" calcareous nodules and occasional 1/4" diameter iron nodules. |
| -5 | 5 | 0.0 | | 5.5-6.5 | SILTY CLAY: Strong brown and pale gray mottled, moist, stiff to hard, plastic, occasional calcareous nodules to 1" diameter, occasional iron nodules to 1/2" diameter. |
| | | 0.0 | | 6.5-8.2 | SILTY CLAY: Pale brown with minor strong brown and gray mottling, moist, hard, plastic. At 7' sandy and softer. |
| | | | 8-12 | 8.2-9 | SILTY CLAY: Gray and strong brown mottled, wet, soft, plastic. |
| | | 0.0 | | 9-9.2 | SILTY SAND: Brown, water-saturated, loose to flowing, medium-grained, abundant dark gray grains. |
| -10 | 10 | | | 9.2-12 | SILTY SANDY CLAY: Strong brown to orange with pale gray mottling and minor dark brown mottling, moist, hard, plastic, occasional iron nodules to 1/2" diameter. |
| | | 0.0 | | | |
| | | | 12-16 | 12-19 | SILTY CLAY: Pale gray with occasional orange to strong brown mottling, moist, hard, plastic. At 16' to 18' ornage to strong brown with occasional iron nodules to 1/8" diameter. At 18' to 19' pale gray and sandy. |
| | | 0.0 | | | |
| -15 | 15 | | | | |

ERM

# MW-41 DRILLING LOG

W.O. NO. 58113 | Boring/Well ID MW-41 | Date Drilled 7/15/03

Project Off-site delineation | Owner Whirlpool Corporation

Location Fort Smith, AR | Boring T.D. 29 ' | Boring Diam. 8 "

N. Coord. ______ E. Coord. ______ | Surface Elevation 0 ' | MSL Datum

Screen: Type Stainless prepak | Diam. 0.75 " | Length 10 ' | Slot Size 0.01 "

Casing: Type Schedule 40 PVC | Diam. 0.75 " | Length 18.7 ' | Sump Length 0 '

Top of Casing Elevation 0 ' | Stickup 0 '

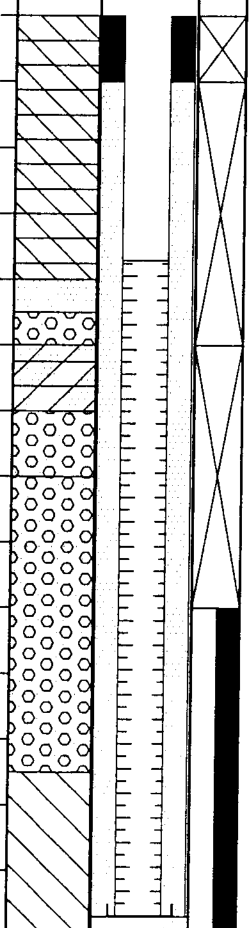
Depth to Water: 1. Ft. ______ ( ______ ) 2. Ft. ______ ( ______ )

Drilling Company TWF Drilling | Driller Sammy Smith

Drilling Method Geoprobe | Log By Troy Meinen

SKETCH MAP

NOTES



| Elevation (Feet) | Depth (Feet) | OVM HEADSPACE (PPM) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| -15 | 15 | 0.0 | | | |
| | | | 16-20 | | |
| | | 0.0 | | | |
| | | 0.0 | | 19-19.5 | SAND TO SILTY SAND: strong brown with minor pale brown mottling, water-saturated, dense, medium-grained quartz. |
| | | | | 19.5-20 | GRAVELY SILTY SANDY CLAY: strong brown, moist to wet, hard, crumbly, 1/2"-1" diameter quartzite gravel. |
| -20 | 20 | | 20-24 | 20-21 | SILTY SANDY CLAYEY GRAVEL: strong brown, water-saturated, dense, crumbly, 1/2"-1" diameter quartzite gravel, 1/8" gravel and medium and coarse-grained sand. |
| | | 0.0 | | 21-22 | SILTY SANDY GRAVEL, strong brown, water-saturated, dense, crumbly, 1/2"-1" diameter quartzite gravel, 1/8" diameter quartzite gravel and medium and coarse-grained quartz sand. |
| | | | | 22-26.5 | SILTY SANDY GRAVEL: strong brown, water-saturated, dense, 1/4"-1/8" diameter quartzite gravel. |
| | | 0.0 | | | |
| | | | 24-29 | | |
| -25 | 25 | | | | |
| | | | | 26.5-29 | SILTY CLAY AND SHALE: strong brown to orange grading to dark gray to black, moist, fissil (zone describes cuttings). |
| | | | | | T.D. = 29 ' |
| -30 | 30 | | | | |

ERM

# MW-42B DRILLING LOG

| | | | |
|---|---|---|---|
| W.O. NO. 581-013 | Boring/Well ID MW-42B | Date Drilled 11/10/2003 | |
| Project Off-Site Delineation | Owner Whirlpool Corporation | | |
| Location Fort Smith, AR | Boring T.D. 27 ' | Boring Diam. 3 " | |
| N. Coord. ______ E. Coord. ______ | Surface Elevation 0 ' | Ft. MSL Datum | |
| Screen: Type 65 Mesh stainless steel | Diam. 0.75 " | Length 5 ' | Slot Size 0.01 " |
| Casing: Type Schedule 40 PVC | Diam. 0.75 " | Length 22 ' | Sump Length 0 ' |
| Top of Casing Elevation 0 ' | | Stickup 0 ' | |
| Depth to Water: 1. Ft. 0 ( ) | 2. Ft. 0 ( ) | | |
| Drilling Company TWF Drilling | Driller Ed Wilson | | |
| Drilling Method Geoprobe/Hollow Stem Auger | Log By Karin Shultz | | |

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | 0-4 | 0-0.7 | FILL: Clayey Asphalt, dark gray and black mottled, dry, coarse-grained, gravel (up to 1/2"-diameter), brittle. |
| | | | | | | | 0.7-1.55 | CLAYEY SILT: Medium brown, dry, nonplastic, very loose, very fine-grained, trace of rootlets. From 1'-1.55' medium and pale brown mottled. |
| | | | | | | | 1.55-1.7 | CLAYEY SILT: Reddish-yellow, dry, nonplastic, medium dense, very fine-grained, crumbly, pockets of silty clay, dark brown. |
| -2 | 2 | | | | 0.0 | | 1.7-3.6 | SILTY CLAY: Yellowish-red with some red, wet, slightly plastic, soft, with trace of up to 1/16"-diameter hard black nodules, trace of black burrowing. |
| | | | | | | | 3.6-4 | CLAYEY SILT: Red and yellowish-red mottled, dry to moist, nonplastic, medium dense, crumbly, with some black nodules. |
| -4 | 4 | | | | | 4-8 | 4-6.8 | SILTY CLAY: Yellowish-red and red mottled, dry, nonplastic, soft, very fine-grained, pockets of clayey silt, dark brown and gray mottled, very fine-grained, loose to medium dense, crumbly. From 4.3'-4.6' trace of black silty clay material, hard, with slight luster. From 4.6'-5.4' slightly plastic, stiff, slightly crumbly, layer of yellowish-red throughout. From 5.4'-6.8' becomes hard, crumbly, with clay seam, gray, hard, traces of black nodules. |
| -6 | 6 | | | | 0.0 | | | |
| | | | | | | | 6.8-8.9 | GRAVELLY CLAY INTERMIXED WITH SANDY CLAY, reddish-brown, with trace of red, light gray, black mottled, dry, plastic, hard coarse-grained, intermixed with silty sand with black calcareous nodules. |
| -8 | 8 | | | | | 8-12 | 8.9-14.8 | CLAY: Yellowish-brown and light gray mottled, moist, hard, plastic, trace of black burrowing at 8.9'-9.1', 11.3'-11.4', and 9.8'-10.4'. From 12'-12.7' trace of dark brown mottled From 12'-12.5' trace of light gray From 12.5'-12.7', moist, stiff. From 12.7'-12.9' layer of silty clay, yellowish-brown and dark gray, moist, nonplastic, soft, loose, with trace of hard nodules (1/16"-1/8" diameter). From 12.9'-14.8' yellowish-brown with some light gray and black burrowing throughout, moist, very stiff, plastic. |
| -10 | 10 | | | | | | | |

ERM

# MW-42B
# DRILLING LOG

W.O. NO. 581-013 Boring/Well ID MW-42B Date Drilled 11/10/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 27 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type 65 Mesh stainless steel Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 22 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 0 ( ______ ) 2. Ft. 0 ( ______ )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -10 | 10 | | | | 0.0 | | | |
| -12 | 12 | | | | | 12-16 | | |
| -14 | 14 | | | | 0.0 | | | |
| | | | | | | | 14.8-16 | CLAY WITH SILT, yellowish-brown with some light gray, moist, plastic, very stiff, black burrowing throughout. |
| -16 | 16 | | | | | 16-20 | 16-18 | NO RECOVERY: Cuttings indicate sandy clay. |
| -18 | 18 | | | | 0.0 | | 18-20 | NO RECOVERY: Cuttings incated clayey sand. |
| -20 | 20 | | | | | | | |

ERM

# MW-42B DRILLING LOG

W.O. NO. 581-013 Boring/Well ID MW-42B Date Drilled 11/10/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 27 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type 65 Mesh stainless steel Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 22 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 0 ( ______ ) 2. Ft. 0 ( ______ )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -20 | 20 | | | | | 20-22 | 20-20.4 | CLAYEY SAND: Pale brown with some light gray mottled, very wet, very loose to loose, medium-grained, with seam of sandy clay throughout, slightly plastic, firm to very soft. |
| | | | | | | | 20.4-20.8 | SANDY CLAY: Yellowish-brown and reddish-brown, wet to moist, slightly plastic, stiff, laminations of clayey sand, loose, fine-grained. |
| | | | | | 0.0 | | 20.8-21 | SANDY CLAY: Gray with some yellowish-brown, moist to damp, very stiff, trace of greenish-gray calcareous nodules (up to 1/4"-diameter). |
| | | | | | | | 21-22 | GRAVELLY CLAY: Reddish-brown with a trace of dark brown and red., dry, nonplastic, coarse-grained, very crumbly, gravel (up to 1/2"-diameter) increases towards base. |
| -22 | 22 | | | | | 22-24 | 22-23.3 | GRAVEL: CLAYEY GRAVEL, yellow, brown, and reddish-brown mottled, water-saturated, gravel nodules (up to 1/8"-diameter), very coarse-grained. |
| | | | | | 0.0 | | 23.3-24 | GRAVELLY CLAY: Yellowish-brown and reddish-brown mottled, very wet, slightly plastic, hard, abundant gravel nodules. |
| -24 | 24 | | | | | 24-26 | 24-25.5 | CLAYEY SAND: dark brown and dark gray mottled with some loose gravel, water-saturated, gravel nodules (up to 1/8"-diameter), very coarse-grained. |
| | | | | | 0.0 | | 25.5-26 | GRAVELLY SANDY CLAY: dark brown and yellowish-brown mottled, wet to moist, slightly plastic, soft, loose, coarse-grained. |
| -26 | 26 | | | | | 26-27 | 26-27 | CLAY: Dark brownish-gray, damp, plastic, hard, blocky towards base with layers of light gray with fractures throughout. |
| | | | | | | | | T.D. = 27 ' |
| -28 | 28 | | | | | | | |
| -30 | 30 | | | | | | | |

ERM

# MW-43
# DRILLING LOG

W.O. NO. 581-013 Boring/Well ID MW-43 Date Drilled 11/11/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 26.2' Boring Diam. 3"

N. Coord. ______ E. Coord. ______ Surface Elevation 0' Ft. MSL Datum

Screen: Type 65 Mesh stainless steel Diam. 0.75" Length 5' Slot Size 0.01"

Casing: Type Schedule 40 PVC Diam. 0.75" Length 21' Sump Length 0'

Top of Casing Elevation 0' Stickup 0'

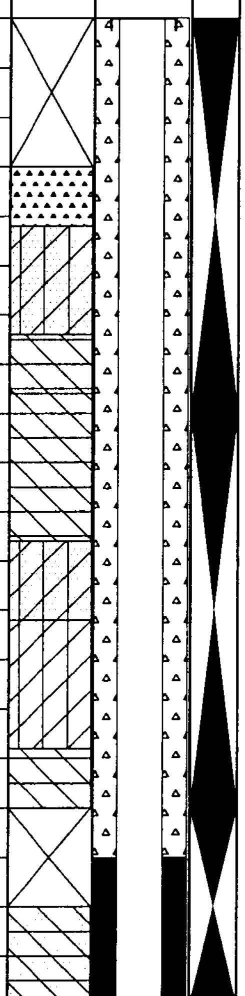
Depth to Water: 1. Ft. 0 ( ) 2. Ft. 0 ( )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES



| Elevation (Feet) | Depth (Feet) | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| 0 | 0 | | 0-4 | 0-1.5 | NO RECOVERY, sediment too soft. |
| | | | | 1.5-2.1 | CONCRETE |
| -2 | 2 | 0.0 | | 2.1-3.2 | CLAYEY SANDY SILT: Medium brown with a trace of yellowish-red, and dark gray, damp, nonplastic, medium dense, fine-grained with occasional black asphalt nodules (1/8"-diameter). From 3.0'-3.2' pocket of asphalt, black, luster, hard coarse-grained nodules (up to 1/2"-diameter), intermixed with coarse-grained sand, loose. |
| | | | | 3.2-3.8 | SILTY CLAY: Medium brown with some dark gray mottled, wet, slightly plastic, soft, with occasional calcareous nodules (up to 1/8"-diameter). At 3.5' trace of reddish-yellow. |
| -4 | 4 | | 4-8 | 3.8-4.5 | SILTY CLAY AND CLAYEY SILT INTERMIXED, medium brown and yellowish-red mottled, damp, nonplastic, stiff to firm. |
| | | | | 4.5-5.3 | SILTY CLAY: Medium brown with some yellowish-brown and gray mottled, moist, firm, slightly plastic. From 4.5'-4.7' trace of black and brownish-gray mottled, wet, very soft. From 4.85'-5.10' clayey silt parting, gray. |
| | | | | 5.3-6.1 | SANDY CLAYEY SILT: Yellowish-brown with some reddish-yellow mottled, dry, medium dense to loose, very crumbly, fine-grained, well-sorted, with occasional black calcareous nodules (up to 1/4" diameter), very crumbly. |
| -6 | 6 | 0.0 | | 6.1-7.4 | CLAYEY SILT: Yellowish-brown and reddish-yellow mottled, dry, medium dense to loose, fine-grained, crumbly, with occasional dark gray and black burrowing. |
| | | | | 7.4-8 | SILTY CLAY: Yellowish-brown with trace of gray and red, damp, slightly plastic, stiff to very stiff, with trace of black nodules (up to 1/16"-diameter), caliche. |
| -8 | 8 | | 8-12 | 8-9 | NO RECOVERY |
| | | | | 9-11.3 | SILTY SANDY CLAY: Yellowish-brown and gray with occasional reddish-yellow mottling, dry, plastic, hard, slightly crumbly. |
| -10 | 10 | | | | |

ERM

# MW-43
# DRILLING LOG

W.O. NO. 581-013 Boring/Well ID MW-43 Date Drilled 11/11/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 26.2' Boring Diam. 3"

N. Coord. ______ E. Coord. ______ Surface Elevation 0' Ft. MSL Datum

Screen: Type 65 Mesh stainless steel Diam. 0.75" Length 5' Slot Size 0.01"

Casing: Type Schedule 40 PVC Diam. 0.75" Length 21' Sump Length 0'

Top of Casing Elevation 0' Stickup 0'

Depth to Water: 1. Ft. 0 ( ) 2. Ft. 0 ( )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -10 | 10 | | | | 0.0 | | | |
| | | | | | | | 11.3-12 | CLAYEY SILT: Gray with some yellowish-brown mottled, dry, medium dense to dense, very fine-grained, well-sorted. |
| -12 | 12 | | | | | 12-14 | 12-12.8 | SILTY CLAY: Yellowish-brown and medium brown mottled with some gray, very wet, nonplastic to slightly plastic, very soft, slightly flowing, with parting of clayey silt, gray. |
| | | | | | | | 12.8-13.1 | CLAYEY SILTY SAND: Gray, dry, hard, nonplastic, fine-grained, black burrowing. |
| | | | | | 0.0 | | 13.1-14 | SILTY SAND: Yellowish-brown, dark gray, and black mottled, moist, loose, with occassional black calcareous nodules. At 13.6' dense. |
| -14 | 14 | | | | | 14-16 | 14-14.4 | SILTY CLAY: Yellowish-brown and gray mottled, wet, very soft, nonplastic, very fine-grained, well-sorted.From 14.3'-14.4' pocket of black, brownish-gray, and yellowish-brown mottling. |
| | | | | | 0.0 | | 14.4-17 | SILTY SAND: Yellowish-brown, wet, medium-grained, moderately sorted, quartz grains visibile of various colors, loose to medium dense. From 15.6'-16' fining downward. |
| -16 | 16 | | | | | 16-18 | | |
| | | | | | 0.0 | | 17-17.5 | SILTY CLAY: Gray with trace of yellowish-brown, moist to damp, slightly plastic, stiff. |
| | | | | | | | 17.5-18 | SILTY CLAYEY SAND: Reddish-brown, moist, medium to fine-grained, loose to medium dense, well-sorted. |
| -18 | 18 | | | | | 18-20 | 18-18.5 | GRAVELLY CLAYEY SAND: reddish-brown, very wet, loose, medium to coarse-grained, poorly sorted, abundant gravel (up to 3/4"-diameter). |
| | | | | | | | 18.5-19.5 | CLAYEY SILTY SAND: Reddish-brown, moist to wet, medium dense, medium-grained, poorly sorted, with occassional gravel (up to 1/4"-diameter). |
| | | | | | 0.0 | | 19.5-19.8 | SILTY CLAY: Bluish-gray with trace of yellowish-brown mottling, damp to dry, slightly plastic, hard. |
| -20 | 20 | | | | | | 19.8-20 | CLAYEY SILTY SAND: Pale brown, yellowish-red, and gray mottled, damp to dry, medium dense, very fine-grained, well sorted to medium sorted, with trace of iron staining throughout. |

ERM

# MW-43
# DRILLING LOG

W.O. NO. 581-013 Boring/Well ID MW-43 Date Drilled 11/11/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 26.2 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type 65 Mesh stainless steel Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 21 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 0 ( ______ ) 2. Ft. 0 ( ______ )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -20 | 20 | | | | | 20-22 | 20-20.1 | SILTY CLAYEY GRAVEL, reddish and reddish-brown mottling, wet, poorly graded, abundant gravels (up to 3/4"-diameter), semi-angular, coarse, sand and clay mixtures, hard, nonplastic, stiff. From 20.6'-20.10' some pink mottling. |
| | | | | | 0.0 | | 20.1-22 | CLAYEY SILTY SANDY GRAVEL: abundant gravels (up to 1"-diameter), wet, hard, nonplastic, semi-rounded, coarse-grained, with clayey silty sandy mixtures that are dark gray and black mottled. |
| -22 | 22 | | | | | 22-24 | 22-23.3 | CLAYEY SANDY GRAVEL: water, saturated, well graded, gravel makes up 95% of matrix (up to 1"-diameter), with traces of gravel-clayey and mixtures. |
| | | | | | 0.0 | | 23.3-23.9 | CLAYEY GRAVELLY SAND, yellowish-brown, dry to damp, nonplastic, fine-grained, occasional gravels (up to 1/4"-diameter) semi-rounded . |
| -24 | 24 | | | | | 24-26.2 | 23.9-24 | SANDY GRAVELLY CLAY, medium brown, brownish-gray, and yellowish-brown mottled, dry, occasional gravel (up to 1"-diameter). |
| | | | | | | | 24-24.11 | SILTY SAND WITH GRAVEL: light brown, pale brown, dark gray, and black mottled, dry to moist, medium dense, fine-grained, angular gravel nodules (up to 1/2"-diameter). |
| | | | | | | | 24.11-24.7 | CLAYEY SILTY GRAVEL, wet, well graded, (up to 1/2"-diameter), angular, yellowish-brown clayey silt, nonplastic, fine-grained. |
| | | | | | 0.0 | | 24.7-25.11 | CLAY: Brownish with some black, dark gray and gray mottling, moist, hard, plastic, becomining dominantly dark gray and brownish-gray mottling at 25.6', grades to a fissile shale. |
| | | | | | | | 25.11-26.2 | SHALE: Dark gray, hard, weathered, fissiles, occassional brown mottling along fractures. |
| -26 | 26 | | | | | | | T.D. = 26.2 ' |
| -28 | 28 | | | | | | | |
| -30 | 30 | | | | | | | |

ERM

# SB-45 DRILLING LOG

W.O. NO. 581-013 Boring/Well ID SB-45 Date Drilled 11/12/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 24 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type ______ Diam. 2 " Length 0 ' Slot Size 0 "

Casing: Type ______ Diam. 0 " Length 0 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

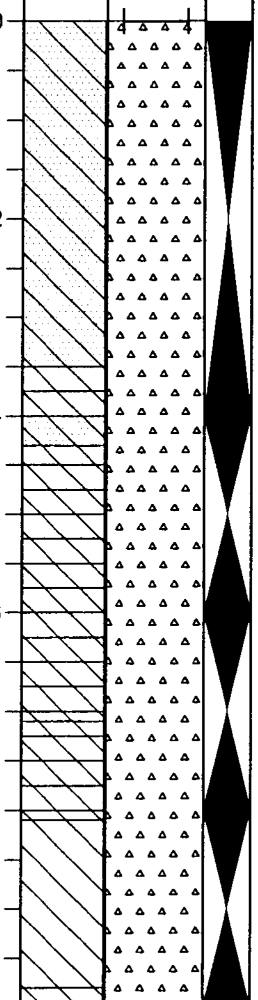
Depth to Water: 1. Ft. 0 ( ______ ) 2. Ft. 0 ( ______ )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES



| Elevation (Feet) | Depth (Feet) | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| 0 | 0 | | 0-4 | 0-3.5 | SANDY CLAY: Dark brown and brown mottled, damp, slightly plastic, soft, trace of asphalt nodules (1/8"-diameter). From 0.8'-3.5' becomes medium and pale brown mottled, damp to dry, higher sand content. |
| -2 | 2 | 0.0 | | | |
| | | | | 3.5-4 | SILTY CLAY: Yellowish-brown and brown mottled, damp, slightly plastic, firm, pockets of gray clayey silt, very fine-grained, nonplastic, medium dense to dense. |
| -4 | 4 | | 4-6 | 4-4.3 | SANDY CLAY: Reddish-yellow with traces of brown, pale brown and light gray, slightly plastic, damp, firm to soft. |
| | | 0.0 | | 4.3-6 | SILTY CLAY: Brown and yellowish-brown mottled, damp, slightly plastic, firm, trace of roolets at 4.11', seam of sandy clay, gray, nonplastic, loose to medium dense, fine-grained. From 5.2'-5.6' silty clay becomes reddish-yellow with pockets of clayey silt, loose to medium dense, crumbly. |
| -6 | 6 | | 6-8 | 6-7.1 | SILTY CLAY: Brown, yellowish-brown, and gray mottled, moist, slightly plastic, firm to stiff, pockets of sandy clay, reddish-yellow, slightly plastic. |
| | | 0.0 | | 7.1-8.1 | SILTY CLAY: Gray and brown mottled with some reddish-yellow that are pockets of sandy clay, damp, slightly plastic. From 7.7'-8' seam of reddish-yellow silty clay, stiff. |
| -8 | 8 | | 8-12 | 8.1-9.8 | CLAY WITH SILT, gray with trace of reddish-yellow, dry, hard, plastic. From 9.0'-9.8' becomes gray and reddish-yellow mottled, no silt. |
| -10 | 10 | | | 9.8-14 | SILTY CLAY: Reddish-yellow with some gray mottled, dry, plastic, hard, trace of black burrowing throughout and iron staining, becoming harder towards base. From 10.9'-12.10' becomes brown with trace of gray and yellowish-brown mottling, damp to moist, plastic to slightly plastic, soft. From 12.10'-14' becomes firm intermixed with plastic and slightly plastic. From 13.6'-14' pockets of silty clay, gray and sandy clay, red, slightly plastic to nonplastic, medium dense, very fine-grained. |

ERM

# SB-45
# DRILLING LOG

W.O. NO. 581-013 Boring/Well ID SB-45 Date Drilled 11/12/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 24 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type ______ Diam. 2 " Length 0 ' Slot Size 0 "

Casing: Type ______ Diam. 0 " Length 0 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 0 ( ______ ) 2. Ft. 0 ( ______ )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | OVM Headspace (ppm) | Sample Interval (Feet) |
|---|---|---|---|
| -10 | 10 | 0.0 | |
| -12 | 12 | | 12-14 |
| | | 0.0 | |
| -14 | 14 | | 14-16 |
| | | 0.0 | |
| -16 | 16 | | 16-18 |
| | | 0.0 | |
| -18 | 18 | | 18-20 |
| | | 0.0 | |
| -20 | 20 | | |

| Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|
| 14.0-14.7 | SANDY CLAY: Red with trace of gray, damp to dry, soft, crumbly, equal amounts of sand and clay. At 14.2' and 14.5' pocket of silty clay, gray, loose to medium dense, very soft. |
| 14.7-14.9 | CLAY: Light greenish-gray with trace of red mottled, damp to dry, plastic, hard. |
| 14.9-14.10 | CLAYEY SILT: Gray, damp, soft, loose, nonplastic, very fine-grained. |
| 14.10-15.8 | CLAYEY SAND: Yellowish-red and red mottled, wet, well sorted, rounded, fine-grained, pockets of clayey silt, pale brown, throughout. From 14.10'-15' black burrowing. |
| 15.8-15.10 | SILTY SAND: Red, wet to very wet, medium dense, fine-grained, abundant iron staining, black burrowing. |
| 15.10-17 | SILTY GRAVELLY SAND: red and yellowish-red mottled, very wet, poorly to medium sorted, gravel (up to 1/8"-diameter), semi-rounded, increase gravel towards base. At 16' water-saturated. At 16.7' pocket of silty sand, greenish-gray and bluish-gray, very wet, loose, with some calcareous nodules (up to 1/16"-diameter). From 16.9'-17' trace of clay content in mixture so clayey silty sand. Decrease in gravel content to trace. |
| 17-18 | CLAYEY GRAVELLY SAND: red and reddish-brown mottled, water-saturated, abundant gravel (up to 3/4"-diameter), semi-rounded, fine-grained to medium-grained, loose to very loose. |
| 18-18.9 | SILTY GRAVEL: water-saturated, abundant gravels (up to 3/4"-diameter), rounded to semi-angular, medium-graded to well graded, with silt and sand mixtures, yellowish-red and yellowish-brown mottled. |
| 18.9-19.9 | GRAVELLY SILTY SAND: moist, medium-grained, very loose, trace of gravel (up to 1/16"-diameter), abundant iron staining. |
| 19.9-19.11 | SILTY GRAVELLY SAND: wet to moist, medium-grained, poorly sorted, very loose, abundant gravel (up to 1/8"-diameter). |
| 19.11-20 | SILTY CLAYEY SAND: Yellowish-brown, damp, fine-grained, medium dense to dense, slightly plastic to nonplastic. |

ERM

# SB-45
# DRILLING LOG

W.O. NO. 581-013 Boring/Well ID SB-45 Date Drilled 11/12/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 24 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type ______ Diam. 2 " Length 0 ' Slot Size 0 "

Casing: Type ______ Diam. 0 " Length 0 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 0 ( ______ ) 2. Ft. 0 ( ______ )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -20 | 20 | | | | 0.0 | 20-22 | 20-21.6 | CLAYEY GRAVELLY SAND: yellowish-brown, very wet, rounded gravel (up to 1/16"-diameter), clayey sand mixture, increases clay content towards base. From 20.9'-21.6' abundant gravel. |
| | | | | | | | 21.6-22 | CLAYEY SAND: Dark brown and yellowish-brown mottled, moist, nonplastic, fine-grained, medium dense, with some gravel (up to 3/4"-diameter), becoming dense towards base. |
| -22 | 22 | | | | 0.0 | 22-24 | 22-23.9 | SILTY SAND: Yellowish-brown and medium brown mottled with some black and dark gray mottling, damp, very loose. |
| -24 | 24 | | | | | | 23.9-24 | CLAY: Dark brown with some black, dark gray, and red mottling, damp, plastic, hard, weathered, fissles towards base with iron staining along fractures. T.D. = 24 ' |
| -26 | 26 | | | | | | | |
| -28 | 28 | | | | | | | |
| -30 | 30 | | | | | | | |

ERM

# MW-46
# DRILLING LOG

W.O. NO. 581-013 Boring/Well ID MW-46 Date Drilled 11/13/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 22 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type 65 Mesh stainless steel Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 21 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

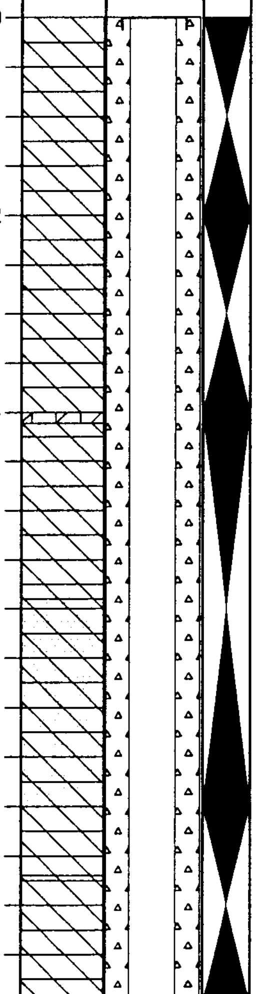
Depth to Water: 1. Ft. 0 ( ______ ) 2. Ft. 0 ( ______ )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES



| Elevation (Feet) | Depth (Feet) | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| 0 | 0 | | 0-2 | 0-4 | SILTY CLAY: Gray and dark gray mottled, moist, nonplastic, soft, with some iron nodules (1/8"-diameter). From 0.8'-1.1' with some black hard clay nodules (1/8"-diameter). From 1.1'-1.10' slightly plastic, with pockets of sandy silty clay, brown.At 0.7'-1.1' firm, plastic. From 1.10'-2' brownish-gray, plastic to slightly plastic, with seam of clayey sand, reddish-yellow, medium dense, very fine-grained. From 2'-2.3' gray and dark gray with trace of brown mottled, moist, soft, slightly plastic. At 2.2' pocket of black silty clay, plastic. From 2.3'-2.11' brown with gray mottled, damp to dry, stiff, plastic. From 2.11'-3.4' moist, soft,slightly plastic. From 3.4'-3.7' red, yellowish-brown, gray, and light gray mottled, moist, very stiff, plastic. From 3.7'-4' Gray with some yellowish-red mottled, damp, plastic, very stiff to stiff, with iron concretions mottled (1/8"-diameter). |
| | | 0.0 | | | |
| -2 | 2 | | 2-4 | | |
| | | 0.0 | | | |
| -4 | 4 | | 4-8 | 4-4.11 | CLAYEY SILT: Gray, damp, nonplastic, loose to medium dense, very fine-grained. |
| | | | | 4.11-5.9 | SILTY CLAY: Brownish-gray with trace of pale yellow mottled, damp, plastic, soft. From 5.4'-5.5' pocket of sandy clayey silt mottling, brownish-gray with some dark gray, loose to medium dense, nonplastic. From 5.6'-5.7' pocket of reddish-yellow clayey sand, loose to medium dense, very fine-grained. |
| -6 | 6 | 0.0 | | 5.9-6.5 | SANDY SILTY CLAY: Brown with some yellowish-red mottled, dry to damp, slightly plastic, stiff, very fine-grained. |
| | | | | 6.5-8 | SILTY SANDY CLAY: Pale brown and medium brown mottled, dry to damp, nonplastic, soft. At 6.8' pocket of very fine silty clay, gray, plastic, very soft. From 7.6'-8' gray and pale brown with some yellowish-red and black mottling, nonplastic, firm. |
| -8 | 8 | | 8-12 | 8-8.7 | SILTY CLAY: Gray and medium brown mottled, moist, plastic, soft to firm, becomes softer towards base. At 8.5' pocket of clay, gray, with trace of silt, stiff, plastic. |
| | | | | 8.7-10.11 | SILTY CLAY: Gray, damp to dry, firm to stiff, slightly plastic. From 8.10'-8.11' red burrowing, rootlets, seam of sandy silty clay, yellowish-red, nonplastic, firm. From 10'-10.1' and 10.4' pocket of red and black iron resude and concretions, clayey silt, loose. At 10.6'-10.8' caliche. |
| -10 | 10 | | | | |

ERM

# MW-46
# DRILLING LOG

W.O. NO. 581-013 Boring/Well ID MW-46 Date Drilled 11/13/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 22 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type 65 Mesh stainless steel Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 21 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 0 ( ______ ) 2. Ft. 0 ( ______ )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -10 | 10 | | | | 0.0 | | 10.11-12 | SANDY CLAY: Yellowish-red, damp to dry, hard, slightly plastic. From 10.11'-11' trace of black burrowing, rootlets. From 11.5'-12' seam of clay, gray, plastic, hard. |
| -12 | 12 | | | | | 12-14 | 12-12.11 | SILTY CLAY: Gray and light gray, damp to dry, slightly plastic, very stiff, high clay content, with some black burrowing throughout, with sandy silty clay parting, yellowish-red, slightly plastic, stiff. From 12.8'-12.11' increase in black clayey silt. |
| | | | | | 0.0 | | 12.11-13.8 | CLAYEY SILTY SAND: Yellowish-red, damp, loose, very fine-grained, with black mottling. From 13.5'-13.8, black iron-stained concretions abundant. |
| -14 | 14 | | | | | 14-16 | 13.8-14.8 | SILTY CLAYEY SAND: Yellowish-red, dense, abundant black nodules, silty clay pocket, gray, trace of gravel towards base. |
| | | | | | 0.0 | | 14.8-15 | GRAVELLY SAND: CLAYEY GRAVELLY SAND, brown and yellowish-red mottled, wet to moist, nonplastic, dense, medium sorted, rounded grains, abundant gravel (up to 1/8"-diameter) increase towards base. |
| | | | | | | | 15-15.8 | CLAYEY SILTY SAND: Yellowish-red with trace of brown and pale brown mottled, moist, medium dense, fine-grained, pocket of clayey silty sand, gray, loose at 15.3'. |
| -16 | 16 | | | | | 16-18 | 15.8-16 | CLAYEY SAND: GRAVELLY CLAYEY SAND, yellowish-red, dry, dense, abundant gravel towards base (up to 1/16"-diameter), semi-rounded, fine-grained, with trace of black concretions towards base. |
| | | | | | 0.0 | | 16-20 | CLAYEY SILTY SAND: CLAYEY SILTY GRAVELLY SAND, yellowish-red, water-saturated, loose, with abundant gravel (up to 3/4"-diameter), poorly sorted, angular grains, medium to fine-grained clayey silty sand matrix with gravels that are well graded. At 18' changes to clayey gravelly silty sand, medium to coarse grained matrix silty sandy material. |
| -18 | 18 | | | | | 18-20 | | |
| | | | | | 0.0 | | | |
| -20 | 20 | | | | | | | |

ERM

# MW-46
# DRILLING LOG

W.O. NO. 581-013 | Boring/Well ID MW-46 | Date Drilled 11/13/2003

Project Off-Site Delineation | Owner Whirlpool Corporation

Location Fort Smith, AR | Boring T.D. 22 ' | Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type 65 Mesh stainless steel | Diam. 0.75 " | Length 5 ' | Slot Size 0.01 "

Casing: Type Schedule 40 PVC | Diam. 0.75 " | Length 21 ' | Sump Length 0 '

Top of Casing Elevation 0 ' | Stickup 0 '

Depth to Water: 1. Ft. 0 ( ______ ) 2. Ft. 0 ( ______ )

Drilling Company TWF Drilling | Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger | Log By Karin Shultz

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -20 | 20 | | | | | 20-22 | 20-20.7 | SILTY SANDY CLAY: Yellowish-red, very wet, slightly plastic, firm. |
| | | | | | 0.0 | | 20.7-21.10 | SANDY SILTY CLAY: Yellowish-brown, damp, slightly plastic, with some black burrowing. At 21.6' plasticity and hardness increase towards base. |
| | | | | | | | 21.10-22 | CLAY: Brown with some gray layers, plastic, hard, fissiles towards base to shale. |
| -22 | 22 | | | | | | | T.D. = 22 ' |
| -24 | 24 | | | | | | | |
| -26 | 26 | | | | | | | |
| -28 | 28 | | | | | | | |
| -30 | 30 | | | | | | | |

ERM

# SB-49
# DRILLING LOG

W.O. NO. 581-013 | Boring/Well ID SB-49 | Date Drilled 11/13/2003

Project Off-Site Delineation | Owner Whirlpool Corporation

Location Fort Smith, AR | Boring T.D. 20.6' | Boring Diam. 3"

N. Coord. ____ E. Coord. ____ | Surface Elevation 0' Ft. MSL Datum

Screen: Type ____ Diam. 0" Length 0' Slot Size 0"

Casing: Type ____ Diam. 0" Length 0' Sump Length 0'

Top of Casing Elevation 0' | Stickup 0'

Depth to Water: 1. Ft. 0 ( ____ ) 2. Ft. 0 ( ____ )

Drilling Company TWF Drilling | Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger | Log By Karin Shultz

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | 0-0.10 | FILL: CLAYEY SILT with trace of gravel, dark brown, dry, very fine-grained, very loose, rootlets. |
| 0 | 0 | | | | | 0-4 | 0.10-1.5 | CLAYEY SILT: Medium brown, dry to damp, very fine-grained, loose, trace of rootlets. |
| | | | | | | | 1.5-2.1 | SILTY CLAY: Pale brown, dry, nonplastic, loose to medium dense, firm to soft, crumbly, with occasional gravel pieces, angular (up to 1/2"-diameter), with trace of yellowish-red iron concretions. |
| -2 | 2 | | | | 0.0 | | 2.1-2.8 | CLAYEY SILT: Pale brown and light brown, dry, crumbly, very loose, very fine-grained, blocky with trace of yellowish-red clayey sand. |
| | | | | | | | 2.8-3.5 | SILTY SANDY CLAY: Yellowish-red and pale brown mottled, dry, nonplastic, loose to medium dense, very fine-grained. With a parting of silty clay, gray, slightly plastic, soft. |
| | | | | | | | 3.5-4 | INTERMIXED SANDY CLAYEY SILT AND SILTY CLAY, yellowish-red, dry, loose to medium dense, fine-grained, silty clay is brown and reddish-brown mottled, stiff, slightly plastic, with some black clayey silt pockets throughout, nonplastic, stiff, increasing towards base. |
| -4 | 4 | | | | | 4-8 | 4-4.8 | SILTY SANDY CLAY: Medium brown, pale brown, and gray mottled with some yellowish-brown, dry, slightly plastic, very loose, crumbly, trace of rootlets, trace of black clayey silt layering. From 4.6'-4.8' pocket of black layering and yellowish-red clayey silt, medium dense. |
| | | | | | | | 4.8-5.2 | SILTY CLAY: Brown, moist, slightly plastic to plastic, very soft. |
| | | | | | | | 5.2-6.3 | CLAY: Gray and yellowish-red mottled, damp, plastic, very stiff, with a parting of silty clay, yellowish-red, plastic, very stiff. From 6.9'-6.12' some black and iron staining pockets, loose, nodules (up to 1/16"-diameter). |
| -6 | 6 | | | | 0.0 | | 6.3-7.4 | SILTY CLAY: Yellowish-red, dry, slightly plastic, very stiff, with black nodules and staining at 6.9'. |
| | | | | | | | 7.4-8 | CLAYEY SILT: Yellowish-red, dry, nonplastic, medium dense to loose, nonplastic, with trace of black and red (iron) nodules and stain at 7.10'. |
| -8 | 8 | | | | | 8-12 | 8-8.11 | SILTY CLAY: Yellowish-brown and dark brown mottled, moist, plastic to slightly plastic, very soft. From 8.7'-8.11' becomes yellowish-brown, dry to damp, very stiff, with seam of clayey silt, deep brown, loose to medium dense, rootlets, with some black and iron staining. |
| | | | | | | | 8.11-9.5 | SANDY SILTY CLAY: Gray, brown, and yellowish-red mottled, dry to damp, slightly plastic to nonplastic, very stiff, slightly crumbly. |
| | | | | | | | 9.5-9.10 | SANDY CLAYEY SILT: Yellow and gray mottled, dry to damp, very loose to loose, very fine-grained. From 9.9'-9.10' pocket of clay, brown, plastic, soft to firm. |
| -10 | 10 | | | | | | 9.10-10.4 | SANDY SILT: Yellowish-red, dry, nonplastic, soft, very loose, very fine-grained. |

ERM

# SB-49
# DRILLING LOG

W.O. NO. 581-013 Boring/Well ID SB-49 Date Drilled 11/13/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 20.6 ' Boring Diam. 3 "

N. Coord. ____ E. Coord. ____ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type ____ Diam. 0 " Length 0 ' Slot Size 0 "

Casing: Type ____ Diam. 0 " Length 0 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 0 ( ____ ) 2. Ft. 0 ( ____ )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| -10 | 10 | 0.0 | | | |
| | | | | 10.4-11.5 | SANDY SILTY CLAY: Yellowish-red with some pale brown and gray, dry to damp, nonplastic, soft to firm, very fine-grained. From 11'-11.2' pockets of clay, gray and yellowish-red mottled, plastic, firm to soft. |
| | | | | 11.5-12 | From 11.2'-1..5' yellowish-red silty clay with loose sandy silt, slightly plastic, firm. |
| -12 | 12 | | 12-14 | 12-12.3 | SILTY CLAY: Gray and yellowish-red and red, dry to damp, slightly plastic, stiff, with black burrowing and iron staining. |
| | | | | 12.3-12.8 | SILTY SANDY CLAY: Yellowish-brown, brown, and gray mottled, dry, slightly plastic, stiff, with dark gray laminations, slightly loose sediment. |
| | | 0.0 | | 12.8-13.10 | SILTY CLAY: Brown with some yellowish-red, moist, slightly plastic, soft. |
| | | | | 13.10-14.5 | SANDY CLAYEY SILT: Yellowish-brown and pale brown mottled, dry, nonplastic, loose, blocky, crumbly. |
| -14 | 14 | | 14-16 | 14.5-14.11 | CLAYEY SILT: Gray with some yellowish-red, dry, dense to loose, very fine-grained. |
| | | | | 14.5-16 | SILTY SAND: Red and yellowish-red mottled, dry, loose, fine-grained, with some hard iron nodules (up to 1/4"-diameter). CLAYEY SILTY SAND INTERLAYERED WITH CLAYEY SILT, clayey silty sand is red and yellowish-red, damp, loose to medium dense, fine-grained, clayey silt is gray, medium dense to loose, very fine-grained. |
| -16 | 16 | | 16-20 | 16-17.3 | SILTY CLAY AND CLAYEY SILT, medium brown, damp to dry, very loose to medium dense, very crumbly, fine-grained, blocky. |
| | | | | 17.3-19.8 | SILTY CLAY TO CLAYEY SILT, brown and dark brown mottled, dry, medium dense to loose, blocky, very fine-grained, nonplastic, very crumbly. |
| -18 | 18 | 0.0 | | | |
| -20 | 20 | | | 19.8-20.6 | CLAY: Brown and gray mottled, dry, plastic, very stiff, crumbly. From 19.10'-20.6' hard, turns dark gray, fissiles down to weathered shale. T.D. = 20.6 ' |

ERM

# MW-50
# DRILLING LOG

W.O. NO. 581-013    Boring/Well ID MW-50    Date Drilled 11/13/2003

Project Off-Site Delineation    Owner Whirlpool Corporation

Location Fort Smith, AR    Boring T.D. 18.6 '    Boring Diam. 3 "

N. Coord. ____    E. Coord. ____    Surface Elevation 0 '    Ft. MSL Datum

Screen: Type 65 Mesh stainless steel    Diam. 0.75 "    Length 10 '    Slot Size 0.01 "

Casing: Type Schedule 40 PVC    Diam. 0.75 "    Length 8 '    Sump Length 0 '

Top of Casing Elevation 0 '    Stickup 0 '

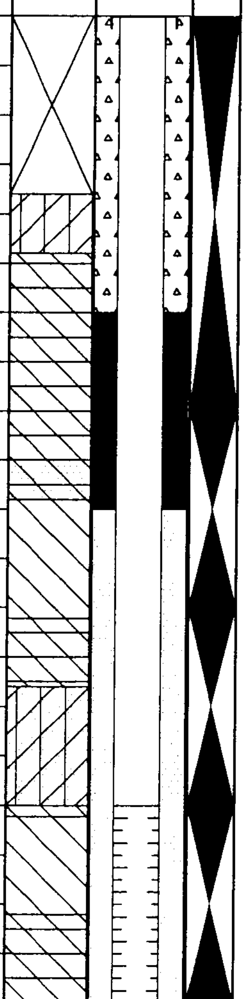
Depth to Water: 1. Ft. 0 (____) 2. Ft. 0 (____)

Drilling Company TWF Drilling    Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger    Log By Karin Shultz

SKETCH MAP

NOTES



| Elevation (Feet) | Depth (Feet) | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| 0 | 0 | | 0-4 | 0-1.8 | NO RECOVERY: Sediment too soft. |
| -2 | 2 | 0.0 | | 1.8-2.4 | CLAYEY SILT: Dark brown, damp, nonplastic, very fine-grained, abundant rootlets, trace of gravel (up to 1/4"-diameter). |
| | | | | 2.4-4.5 | SILTY CLAY: Brown, red, and pale brown mottled with some yelloiwsh-red, damp, stiff, slightly plastic, rootlets. From 4'-4.3' becomes brown with trace of gray and dark brown mottling, moist, plastic to slightly plastic, soft. From 4.3'-4.5' damp, plastic, firm. |
| -4 | 4 | | 4-6 | 4.5-4.9 | SANDY SILTY CLAY INTERMIXED WITH CLAYEY SAND, dark brown with some pale brown and yellowish-red mottled, damp, slightly plastic, stiff, with a parting of silty clay, gray, slightly plastic, soft, with some loose silt. |
| | | 0.0 | | 4.9-6.8 | SILTY CLAY: Brown and pale brown mottled, dry to damp, plastic, soft to firm, with a parting of clayey silt, yellowish-red, loose. From 5.8'-6' becomes slightly plastic to nonplastic, firm, moist. From 6'-6.8' becomes pale brown, damp, slightly plastic, stiff, with a seam of clayey silt, gray, nonplastic, medium dense, with trace of yellowish-red mottled. |
| -6 | 6 | | 6-8 | 6.8-6.10 | CLAY: Light gray with trace of yellowish-red mottled, damp, plastic, soft to firm, with trace of silt. |
| | | 0.0 | | 6.8-8 | SANDY CLAYEY SILT: Yellowish-red with some gray mottling, dry, dense to medium dense, nonplastic, crumbly, very fine-grained, black clayey burrowing, luster, nodules (up to 1/4"-diameter), becomes looser towards base. |
| -8 | 8 | | 8-12 | 8-8.11 | SILTY CLAY: Brown with trace of yellowish-red mottled, wet, plastic. |
| | | | | 8.11-9.1 | CLAY: Reddish-brown, damp, stiff, plastic. |
| | | | | 9.1-11.2 | SILTY CLAY: Gray, damp, slightly plastic, stiff to firm, with lamination of silty clayey sand, yellowish-red, nonplastic, trace of iron concretions. |
| -10 | 10 | | | | |

ERM

# MW-50 DRILLING LOG

W.O. NO. 581-013 Boring/Well ID MW-50 Date Drilled 11/13/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 18.6 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type 65 Mesh stainless steel Diam. 0.75 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 8 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 0 ( ______ ) 2. Ft. 0 ( ______ )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -10 | 10 | | | | 0.0 | | | |
| | | | | | | | 11.2-11.8 | CLAY: Yellowish-red, damp to moist, plastic, very stiff, becoming hard towards base, decreasing moisture towards base. |
| | | | | | | | 11.8-12 | GRAVELLY CLAY: Red and dark brown mottled, damp to moist, with abundant gravel (up to 1/2"-diameter), very dense, hard, with abundant iron and black staining. |
| -12 | 12 | | | | | 12-14 | 12-14 | SANDY CLAY: GRAVELLY SANDY CLAY, red and yellowish-brown mottled, wet, abundant gravel (poorly sorted, up to 1"-diameter), in a sandy clayey matrix, dense, nonplastic, hard. Increasing gravelly clayey sand towards base. |
| | | | | | 0.0 | | | |
| -14 | 14 | | | | | 14-16 | 14-15.3 | CLAYEY SILTY SAND: GRAVELLY CLAYEY SILTY SAND, wet, abundant gravels (up to 1"-diameter), dense to loose, semirounded and angular. |
| | | | | | 0.0 | | 15.3-17.6 | CLAYEY SILTY SAND: Gray and yellowish-brown, wet, medium dense to very loose, fine-grained. |
| -16 | 16 | | | | | 16-18.6 | | |
| | | | | | 0.0 | | | |
| | | | | | | | 17.6-18.6 | CLAY: Dark gray, plastic, hard, weathered, fissile to shale at 17.8'. |
| -18 | 18 | | | | | | | |
| | | | | | | | | T.D. = 18.6 ' |
| -20 | 20 | | | | | | | |

ERM

# SB-51
# DRILLING LOG

W.O. NO. 581-013 | Boring/Well ID SB-51 | Date Drilled 11/14/2003

Project Off-Site Delineation | Owner Whirlpool Corporation

Location Fort Smith, AR | Boring T.D. 16 ' | Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ | Surface Elevation 0 ' Ft. MSL Datum

Screen: Type ______ Diam. 0 " Length 0 ' Slot Size 0 "

Casing: Type ______ Diam. 0 " Length 0 ' Sump Length 0 '

Top of Casing Elevation 0 ' | Stickup 0 '

Depth to Water: 1. Ft. 0 ( ______ ) 2. Ft. 0 ( ______ )

Drilling Company TWF Drilling | Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger | Log By Karin Shultz

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | NO RECOVERY: Sediment too soft. |
| 0 | 0 | | | | | 0-4 | 0-0.8 | FILL: CLAYEY SILT, dark brown and brown, damp, very loose, nonplastic, abundant rootlets. From 1.2'-1.5' becomes dark brown and gray mottling, slightly plastic, soft, loose, with large pieces of bark. |
| | | | | | | | 0.8-1.5 | SILTY CLAY: Medium brown, moist, slightly plastic to plastic, with trace of yellowish-red nodules, trace of rootlets, coarsening down to a silty clay with equal silt and clay amounts at 1.9'. |
| | | | | | | | 1.5-2.1 | SANDY CLAYEY SILT: Reddish-yellow, brown, and pale brown mottled, dry, nonplastic, very loose, crumbly, with occassional gravel (up to 1/8"-diameter), trace of dark brown and black mottled towards base. |
| -2 | 2 | | | | 0.0 | | 2.1-2.8 | SANDY SILTY CLAY: Gray, light gray, reddish-yellow, brown, and pale brown mottled, dry, slightly plastic, stiff, with some black burrowing towards base. |
| | | | | | | | 2.8-2.11 | |
| | | | | | | | 2.11-3.5 | SILTY SANDY CLAY: Yellowish-red and black with trace of light gray mottled, dry, very stiff, very crumbly, loose to dense, with abundant black mottling throughout. |
| | | | | | | | 3.5-3.7 | SANDY CLAYEY SILT: Gray, yellowish-red, and black mottled, dry, nonplastic, loose to very loose, very fine-grained. |
| | | | | | | | 3.7-4.3 | SILTY SANDY CLAY: Deep yellowish-red and some black mottled, dry, hard, nonplastic, with some pockets of iron staining with some gravel (up to 1/4"-diameter). |
| -4 | 4 | | | | | 4-8 | 4.8-4.10 | |
| | | | | | | | 4.3-4.8 | GRAVEL: with clayey sandy silt mixture, dry, gravels up to 1/4"-diameter, loose, poorly sorted, well graded, angular, clayey sand crumbles easily. |
| | | | | | | | 4.10-7.2 | GRAVELLY SILTY SAND, with clay parting, silty clay parting is gray, hard, plastic, gravelly silty sand is red and deep orange yellowish-red and black mottled, silty sand is matrix with abundant gravel (up to 1/8"-diameter), nonplastic, loose, angular to semi-rounded. |
| -6 | 6 | | | | 0.0 | | | SANDY CLAYEY GRAVELS INTERMIXES WITH CLAYEY SANDY GRAVELS, abundant gravels (up to 3/4"-diameter), angular to semi-angular, dry, well graded gravels, with a sandy clay matrix, dense, dry. |
| | | | | | | | 7.2-8.11 | GRAVELLY SILTY CLAY, yellowish-red, dry, with gravels (up to 3/4"-diameter), very hard, plastic, with trace of iron staining and black mottling. |
| -8 | 8 | | | | | 8-10 | 8.11-9.8 | CLAY: Yellowish-red, moist, plastic, stiff, with seam of silty clay, slightly plastic, yellowish-red.From 9.3'-9.5' pocket of silty sand intermixed with gravelly clay, very loose, nonplastic, gravel and nodules up to 1/4"-diameter, poorly sorted.From 9.5'-9.8' clay becomes gray, hard, plastic. |
| | | | | | 0.0 | | | |
| -10 | 10 | | | | | | 9.8-11.5 | SEE PAGE 2 |

ERM

# SB-51
# DRILLING LOG

W.O. NO. 581-013 Boring/Well ID SB-51 Date Drilled 11/14/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 16 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type ______ Diam. 0 " Length 0 ' Slot Size 0 "

Casing: Type ______ Diam. 0 " Length 0 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 0 ( ______ ) 2. Ft. 0 ( ______ )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -10 | 10 | | | | | 10-12 | 9.8-11.5 | SILTY GRAVELLY SAND, dry, red and yellowish-red mottled, nonplastic, fine-grained, poorly sorted, gravel is up to 3/4"-diameter) in a silty sand matrix.From 10'-11.5' matrix changes to a silty sandy clay, dense, slightly plastic, with some loose silty sand throughout, deeper red and yellowish-red mottled, gravel up to 1"-diameter. |
| | | | | | 0.0 | | | |
| | | | | | | | 11.5-12 | CLAYEY GRAVEL, abundant gravel (gray and light gray, angular, well sorted gravel) in a clay matrix (yellowish-red, slightly plastic, hard). |
| -12 | 12 | | | | | 12-14 | 12-12.11 | SILTY SANDY CLAY: Yellowish-red and gray mottled, damp, slightly plastic, soft. |
| | | | | | | | 12.11-12.3 | CLAYEY SILT: Yellowish-red, loose, very fine-grained, with some occasional gravel up to 1/2"-diameter, angular. |
| | | | | | | | 12.3-12.45 | GRAVELLY CLAY: Dark brown, fractures, breaks easily, weathered, gravel up to 1/4"-diameter with some loose silt. |
| | | | | | | | 12.45-13.4 | GRAVELLY CLAYEY SAND, yellowish-red, moist, abundant gravel from 12.10'-13.2' up to 1"-diameter, with clayey sand mixture, medium-grained, nonplastic. |
| | | | | | 0.0 | | | |
| | | | | | | | 13.4-14 | SAND: Yellowish-red, moist, medium-grained, loose with occasional gravel (up to 1/4"-diameter). |
| -14 | 14 | | | | | 14-16 | 14-15.7 | CLAY: Yellowish-red, damp to dry, very stiff to stiff, plastic, with occasional pockets of sandy clay throughout, hardening towards base. |
| | | | | | 0.0 | | | |
| | | | | | | | 15.7-16 | CLAY: Dark gray, weathered into shale, very hard, plastic, fractures throughout. T.D. = 16 ' |
| -16 | 16 | | | | | | | |
| -18 | 18 | | | | | | | |
| -20 | 20 | | | | | | | |

# Well Development Records

*Appendix D*

*June 25, 2004*
*Project No. 0014507*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

**Environmental Resources Management**
MONITOR WELL DEVELOPMENT RECORD

Area: Whirlpool
Well No.: MW-39

Client: Whirlpool
Location: Fort Smith
W.O. # 581-013
Developer(s):Lance Harbinson

Date: 7/14/2003
Well Casing Diameter ($d_{wc}$): 0.75 in.
Borehole Diameter ($d_b$): 3 in.
Measuring Point: GND
Measuring Point Elevation: ft.

Total Well Depth **TD**: 29.5 ft.
Depth to Water **DTW**: 10.9 ft.
Well Volume $V_w$=3.14 x $(d_{wc}/24)^2$ x $h_{wc}$ x 7.5 gal/ft$^3$
$V_w$ = 0.42 gal.
Height of Water Column $h_{wc}$=TD - DTW 18.6 ft.
Depth to Product, if present, **DTP** --- ft. Use DTP=DTW to calculate $h_{wc}$, if product is present.
Height of Filter Sand Above Sump $h_{fs}$ 14.5 ft.
Volume of Water in Filter Sand $V_{fs}$ = 3.14 x $((d_b/24)^2 - (d_{wc}/24)^2)$ x 0.3 x $h_{fs}$ x 7.5 gal/ft$^3$ = 1.54 gal.
Assumed 30% porosity for filter sand.
Borehole Volume $V_b = V_{wc} + V_{fs}$ = 1.96 gal.

**Minimum** volume to be purged for well development:
Eight borehole volumes 8 x $V_b$ = 15.68 gal.
Volume of water added during well installation + 0 gal.
Minimum volume to be removed 16 gal.
**Maximum** volume not to exceed if water parameters do not stabilize. Check with **ERM** project manager.
Ten borehole volume 10 x $V_b$ = 19.6 gal.
Volume of water added during well installation + 0 gal.
Maximum volume to be removed 20 gal.

MONITOR WELL DEVELOPMENT RECORD Date: 7/15/2003 Page 1 of 1

Method: watera pump/peristaltic
Field Instruments:

Area: Whirlpool
Well No.: MW-41

| Time | Depth (ft) | Volume Removed (gal) | Volume Cumulative (gal) | pH (std units) | temp. (°C) | SC (µS/cm) | turbidity (NTU / FTU) | Color | Comments | Date |
|---|---|---|---|---|---|---|---|---|---|---|
| 1641 | 10.9 | | | | | | Turbid/silty | Brown | Watera | 7/14/03 |
| 1810 | | 5 | 5 | | | | Turbid/silty | Brown | Watera | 7/14/03 |
| 825 | 10.9 | | | | | | Turbid/silty | Brown | Peristaltic | 7/15/03 |
| 845 | | | | | | | Turbid/silty | Brown | Watera | 7/15/03 |
| 905 | | | | | | | Turbid/silty | Brown | Watera | 7/15/03 |
| 922 | | 6 | 6 | | | | Turbid/silty | Brown | Watera | 7/15/03 |
| 1008 | 10.88 | 5 | 11 | 5.95 | 23.06 | 0.995 | Turbid/silty | Brown | Watera | 7/16/03 |
| 1058 | | | | 7.10 | 28.86 | 0.008 | Turbid/silty | Brown | Peristaltic | 7/16/03 |
| 1103 | | | | 7.10 | 28.86 | 0.008 | Milky/silty | Clear | Peristaltic | 7/16/03 |
| 1108 | | | | 7.10 | 28.86 | 0.008 | Milky/silty | Clear | Peristaltic | 7/16/03 |
| 1120 | | | | 7.10 | 28.86 | 0.008 | --- | Clear | Peristaltic | 7/16/03 |
| 1130 | | | | 7.10 | 28.86 | 0.008 | --- | Clear | Peristaltic | 7/16/03 |
| 1140 | | | | 7.10 | 28.86 | 0.008 | --- | Clear | Peristaltic | 7/16/03 |
| 1150 | | 5 | 16 | 7.10 | 28.86 | 0.008 | --- | Clear | Peristaltic | 7/16/03 |

**Environmental Resources Management**
MONITOR WELL DEVELOPMENT RECORD

Area: Whirlpool
Well No.: MW-40

Client: Whirlpool
Location: Fort Smith
W.O. # 581-013
Developer(s):Lance Harbinson

Date: 7/15/2003
Well Casing Diameter ($d_{wc}$): 0.75 in.
Borehole Diameter ($d_b$): 3 in.
Measuring Point: GND
Measuring Point Elevation: ft.

Total Well Depth **TD**: 27.8 ft.
Depth to Water **DTW**: 9.11 ft.
Height of Water Column $h_{wc}$=TD - DTW 18.6 ft.
Depth to Product, if present, **DTP** --- ft. Use DTP=DTW to calculate $h_{wc}$, if product is present.
Height of Filter Sand Above Sump $h_s$ 14.5 ft.

Well Volume $V_w = 3.14 \times (d_{wc}/24)^2 \times h_{wc} \times 7.5$ gal/ft$^3$
$V_w$ = 0.43 gal.

Volume of Water in Filter Sand $V_{fs} = 3.14 \times ((d_b/24)^2 - (d_{wc}/24)^2) \times 0.3 \times h_{fs} \times 7.5$ gal/ft$^3$ = 1.56 gal.
Assumed 30% porosity for filter sand.

Borehole Volume $V_b = V_{wc} + V_{fs}$ = 2 gal.

**Minimum** volume to be purged for well development:

Eight borehole volumes 8 x $V_b$ = 16 gal.
Volume of water added during well installation + 0 gal.
Minimum volume to be removed 16 gal.

**Maximum** volume not to exceed if water parameters do not stabilize. Check with **ERM** project manager.

Ten borehole volume: 10 x $V_b$ = 20 gal.
Volume of water added during well installation + 0 gal.
Maximum volume to be removed 20 gal.

MONITOR WELL DEVELOPMENT RECORD Date: 7/15/2003 Page 1 of 1

Method: Watera/peristaltic pump
Field Instruments:

Area: Whirlpool
Well No.: MW-40

| Time | Depth (ft) | Volume Removed (gal) | Volume Cumulative (gal) | pH (std units) | temp. (°C) | SC (µS/cm) | turbidity (NTU / FTU) | Color | Comments | Date |
|---|---|---|---|---|---|---|---|---|---|---|
| 1000 | 9.11 | | | | | | Turbid/silty | Brown | Watera | 7/15/03 |
| 1015 | | | | | | | Turbid/silty | Brown | Watera | 7/15/03 |
| 1045 | | | | | | | Turbid/silty | Brown | Watera | 7/15/03 |
| 1115 | | 2.5 | 2.5 | 5.55 | 24 | 0.621 | Turbid/silty | Light brown | Peristaltic | 7/15/03 |
| 1305 | 9.81 | | | | | | Turbid/silty | Brown | Watera | 7/16/03 |
| 1450 | | 5 | 7.5 | | | | Turbid/silty | Brown | Peristaltic | 7/16/03 |
| 1505 | | | | 5.15 | 24.19 | 0.632 | --- | Clear | Peristaltic | 7/16/03 |
| 1515 | | | | 5.35 | 24.70 | 0.631 | --- | Clear | Peristaltic | 7/16/03 |
| 1525 | | | | 5.40 | 24.41 | 0.631 | --- | Clear | Peristaltic | 7/16/03 |
| 1535 | | | | 5.44 | 24.42 | 0.63 | --- | Clear | Peristaltic | 7/16/03 |
| 1545 | | | | 5.43 | 29.39 | 0.629 | --- | Clear | Peristaltic | 7/16/03 |
| 1555 | | | | 5.41 | 24.20 | 0.629 | --- | Clear | Peristaltic | 7/16/03 |
| 1605 | | | | 5.40 | 24.10 | 0.629 | --- | Clear | Peristaltic | 7/16/03 |
| 1615 | | | | 5.39 | 24.21 | 0.629 | --- | Clear | Peristaltic | 7/16/03 |
| 1625 | | | | 5.35 | 24.10 | 0.629 | --- | Clear | Peristaltic | 7/16/03 |
| 1635 | | | | 5.33 | 23.99 | 0.629 | --- | Clear | Peristaltic | 7/16/03 |
| 1645 | | | | 5.30 | 23.94 | 0.628 | --- | Clear | Peristaltic | 7/16/03 |
| 1655 | | 10 | 17.5 | 5.28 | 23.92 | 0.629 | --- | Clear | Peristaltic | 7/16/03 |

**Environmental Resources Management**
MONITOR WELL DEVELOPMENT RECORD

Area: Whirlpool
Well No.: MW-41

Client: Whirlpool
Location: Fort Smith
W.O. # 581-013
Developer(s): Troy Meinen and Lance Harbinson

Date: 7/15/2003
Well Casing Diameter ($d_{wc}$): 0.75 in.
Borehole Diameter ($d_b$): 8 in.
Measuring Point: GND
Measuring Point Elevation: ft.

Total Well Depth **TD**: 28.7 ft.
Well Volume $V_w = 3.14 \times (d_{wc}/24)^2 \times h_{wc} \times 7.5$ gal/ft$^3$
Depth to Water **DTW**: 7.95 ft.
$V_w =$ 0.47 gal.
Height of Water Column $h_{wc}$=TD - DTW 20.75 ft.
Depth to Product, if present, **DTP** --- ft. Use DTP=DTW to calculate $h_{wc}$, if product is present.
Height of Filter Sand Above Sump $h_s$ 12.7 ft.
Volume of Water in Filter Sand $V_{fs} = 3.14 \times ((d_b/24)^2 - (d_{wc}/24)^2) \times 0.3 \times h_{fs} \times 7.5$ gal/ft$^3$ = 9.78 gal.
Assumed 30% porosity for filter sand.
Borehole Volume $V_b = V_{wc} + V_{fs} =$ 10.25 gal.

**Minimum** volume to be purged for well development:

Eight borehole volumes $8 \times V_b =$ 82 gal.
Volume of water added during well installatio + 0 gal.
Minimum volume to be removed 82 gal.

**Maximum** volume not to exceed if water parameters do not stabilize. Check with **ERM** project manager.

Ten borehole volume: $10 \times V_b =$ 102 gal.
Volume of water added during well installatio + 0 gal.
Maximum volume to be removed 102 gal.

MONITOR WELL DEVELOPMENT RECORD

Date: 7/15/2003



Method: Watera/peristaltic pump
Field Instruments:

Area: Whirlpool
Well No.: MW-41

| Time | Depth (ft) | Volume Removed (gal) | Volume Cumulative (gal) | pH (std units) | temp. (°C) | SC (µS/cm) | turbidity (NTU / FTU) | Color | Comments | Date |
|---|---|---|---|---|---|---|---|---|---|---|
| 815 | 7.5 | 2.5 | | | | | Turbid | Brown | Watera | 7/15/03 |
| 845 | 7.5 | | 5 | | | | Turbid | Brown | Watera | 7/16/03 |
| 845 | 28 | 2.5 | 5 | | | | Turbid | Brown | Watera | 7/16/03 |
| 855 | 8.5 | | | | | | Turbid | Brown | Watera | 7/16/03 |
| 905 | 22 | 1.5 | | | | | Turbid | Brown | Watera | 7/16/03 |
| 920 | 22 | 3 | 8 | 6.66 | 24.92 | 522 | Turbid | Brown | Watera | 7/16/03 |
| 945 | 22 | 2 | 10 | | | | Turbid | Brown | Watera | 7/16/03 |
| 1715 | 7.65 | | | | | | Turbid | Brown | Watera | 7/16/03 |
| 1755 | | 5 | 15 | 5.55 | 26.23 | 0.757 | Turbid | Brown | Watera | 7/16/03 |
| 1810 | | 5 | 20 | 5.21 | 22.61 | 0.749 | Turbid | Brown | Watera | 7/16/03 |
| 1822 | | 5 | 25 | 5.07 | 20.69 | 0.741 | Turbid | Brown | Watera | 7/16/03 |
| 1253 | 7.62 | 5 | 30 | 4.89 | 19.67 | 0.717 | --- | Clear | Peristaltic | 7/17/03 |
| 1300 | | | | 4.96 | 19.74 | 0.705 | --- | Clear | Peristaltic | 7/17/03 |
| 1310 | | 5 | 35 | 4.99 | 19.80 | 0.698 | --- | Clear | Peristaltic | 7/17/03 |
| 1320 | | | | 4.91 | 19.80 | 0.691 | --- | Clear | Peristaltic | 7/17/03 |
| 1330 | | 5 | 40 | 4.92 | 20.04 | 0.690 | --- | Clear | Peristaltic | 7/17/03 |
| 1400 | | 5 | 45 | 4.8 | 19.25 | 0.685 | --- | Clear | Peristaltic | 7/17/03 |
| 1410 | | | | 4.76 | 19.57 | 0.682 | --- | Clear | Peristaltic | 7/17/03 |
| 1420 | | 5 | 50 | 4.79 | 19.26 | 0.682 | --- | Clear | Peristaltic | 7/17/03 |

Date:7/15/2003



Area: Whirlpool
Well No.: MW-41

| Time | Depth (ft) | Volume Removed (gal) | Volume Cumulative (gal) | pH (std units) | temp. (°C) | SC (μS/cm) | turbidity (NTU / FTU) | Color | Comments | Date |
|---|---|---|---|---|---|---|---|---|---|---|
| 1440 | | 5 | 55 | 4.75 | 19.37 | 0.680 | --- | Clear | Peristaltic | 7/17/03 |
| 1500 | | 5 | 60 | 4.70 | 19.26 | 0.679 | --- | Clear | Peristaltic | 7/17/03 |
| 1520 | | 5 | 65 | 4.80 | 19.77 | 0.679 | --- | Clear | Peristaltic | 7/17/03 |
| 1525 | | 5 | 70 | 4.73 | 19.52 | 0.678 | --- | Clear | Peristaltic | 7/17/03 |
| 1545 | | 5 | 75 | 4.53 | 19.41 | 0.680 | Turbid | Brown | Watera | 7/17/03 |
| 1615 | | 5 | 80 | 4.70 | 20.55 | 0.678 | Turbid | Brown | Watera | 7/17/03 |
| 1640 | | 5 | 85 | 4.59 | 19.79 | 0.680 | --- | Clear | Peristaltic | 7/17/03 |

**Environmental Resources Management**
MONITOR WELL DEVELOPMENT RECORD

Area: Whirlpool- Fort Smith, AK
Well No.: MW-42B

Client: Whirlpool
Location: Fort Smith, AK
W.O. #581-013/ 0014507
Developer(s):

Date: 11/13/2004, 11/14/2004, 11/15/2004
Well Casing Diameter ($d_{wc}$): 3/4 in.
Borehole Diameter ($d_b$): 3 in.
Measuring Point: Ground Surface
Measuring Point Elevation: ft.

Total Well Depth **TD**: 27 ft.
Depth to Water **DTW**: 7.2 ft.
Well Volume $\mathbf{V_w}$=3.14 x ($d_{wc}$/24)$^2$ x $h_{wc}$ x 7.5 gal/ft$^3$
$V_w$ = 0.5 gal.
Height of Water Column $\mathbf{h_{wc}}$=TD - DTW 19.8 ft.
Depth to Product, if present, **DTP** ft. Use DTP=DTW to calculate $h_{wc}$, if product is present.
Height of Filter Sand Above Sump $\mathbf{h_{fs}}$ 4 ft.
Volume of Water in Filter Sand $\mathbf{V_{fs}}$ = 3.14 x (($d_b$/24)$^2$ - ($d_{wc}$/24)$^2$) x 0.3 x $h_{fs}$ x 7.5 gal/ft$^3$ = 0.4 gal.
Assumed 30% porosity for filter sand.
Borehole Volume $\mathbf{V_b}$ = $V_{wc}$ + $V_{fs}$ = 0.9 gal.

**Minimum** volume to be purged for well development:
Five borehole volume 5 x $V_b$ = 4 gal.
Volume of water added during well installatio + gal.
Minimum volume to be removed 4 gal.
**Maximum** volume not to exceed if water parameters do not stabilize. Check with **ERM** project manager.
Ten borehole volumes 10 x $V_b$ = 9 gal.
Volume of water added during well installatio + gal.
Maximum volume to be removed 9 gal.

MONITOR WELL DEVELOPMENT RECORD



Method:
Field Instruments: peristaltic pump, YSI

Area: Whirlpool- Fort Smith, AK
Well No.: MW-42B

| Time | Depth (ft) | Volume Removed (gal) | Volume Cumulative (gal) | pH (std units) | temp. (°C) | SC (µS/cm) | turbidity (NTU / FTU) | Color | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 11/13/2003 | | | | | | | | | |
| ~1200 | | | | | | | | | begin pumping |
| 1205 | | 0.67 | 0.67 | | | | | | pumped dry |
| ~1420 | | | | | | | | | still dry |
| ~1535 | | | | | | | | | insufficient head |
| 11/14/2003 | | | | | | | | | |
| 855 | | | | | | | | | collect sample, dry |
| 11/15/2003 | | | | | | | | | |
| ~1328 | | | | | | | | | begin pumping |
| ~1328 | | 0.125 | 0.795 | | | | | | pumped dry |
| 4/15/2004 | | | | | | | | | |
| 1432 | | | | | | | | | begin pumping |
| 1436 | | 0.5 | 1.295 | 5.41 | 19.9 | 1046 | 530 | | |
| 1441 | | 0.5 | 1.795 | 5.42 | 20.4 | 1036 | 1000 | | |
| 1446 | | 0.5 | 2.295 | 5.17 | 20.36 | 1059 | 1000 | | |
| 1448 | | | | | | | | | pumped dry |
| 1615 | | | | | | | | | collect sample |

**Environmental Resources Management**
MONITOR WELL DEVELOPMENT RECORD

Area: Whirlpool- Fort Smith, AK
Well No.: MW-43

Client: Whirlpool
Location: Fort Smith, AK
W.O. #581-013/ 0014507
Developer(s): Tristram Dodds

Date: 11/13/2004, 11/14/2004, 11/15/2004
Well Casing Diameter ($d_{wc}$): 3/4 in.
Borehole Diameter ($d_b$): 3 in.
Measuring Point: Ground Surface
Measuring Point Elevation: ft.

Total Well Depth **TD**: 26 ft.
Depth to Water **DTW**: 10.68 ft.
Well Volume $V_w = 3.14 \times (d_{wc}/24)^2 \times h_{wc} \times 7.5$ gal/ft$^3$
$V_w$ = 0.4 gal.
Height of Water Column $h_{wc}$=TD - DTW 15.32 ft.
Depth to Product, if present, **DTP** ft. Use DTP=DTW to calculate $h_{wc}$, if product is present.
Height of Filter Sand Above Sump $h_{fs}$ 11 ft.
Volume of Water in Filter Sand $V_{fs} = 3.14 \times ((d_b/24)^2 - (d_{wc}/24)^2) \times 0.3 \times h_{fs} \times 7.5$ gal/ft$^3$ = 1.1 gal.
Assumed 30% porosity for filter sand.
Borehole Volume $V_b = V_{wc} + V_{fs}$ = 1.5 gal.

**Minimum** volume to be purged for well development:
Five borehole volume 5 x $V_b$ = 7 gal.
Volume of water added during well installatio + gal.
Minimum volume to be removed 7 gal.
**Maximum** volume not to exceed if water parameters do not stabilize. Check with **ERM** project manager.
Ten borehole volumes 10 x $V_b$ = 15 gal.
Volume of water added during well installatio + gal.
Maximum volume to be removed 15 gal.

MONITOR WELL DEVELOPMENT RECORD


Method:
Field Instruments: peristaltic pump, YSI

Area: Whirlpool- Fort Smith, AK
Well No.: MW-43

| Time | Depth (ft) | Volume Removed (gal) | Volume Cumulative (gal) | pH (std units) | temp. (°C) | SC (µS/cm) | turbidity (NTU / FTU) | Color | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 11/13/2003 | | | | | | | | | |
| ~1300 | | | | | | | | | begin pumping |
| 1306 | | 0.5 | 0.5 | | | | | | pumped dry |
| 1429 | | | | | | | | | still dry |
| 1535 | | | | | | | | | insufficient head |
| 11/14/2003 | | | | | | | | | |
| 915 | | | | | | | | | collect sample, dry |
| 11/15/2003 | | | | | | | | | |
| ~1331 | | | | | | | | | begin pumping |
| ~1340 | | 0.125 | 0.625 | | | | | | pumped dry |
| 4/15/2004 | | | | | | | | | |
| 1507 | | | | | | | | | begin pumping |
| 1512 | | 0.5 | 1.125 | 9.48 | 19.53 | 381 | 234 | | |
| 1517 | | 0.5 | 1.625 | 7.13 | 19.28 | 388 | 1000 | | |
| 1522 | | 0.5 | 2.125 | 6.97 | 19.41 | 414 | 1000 | | |
| 1526 | | | | | | | | | pumped dry |
| 1625 | | | | | | | | | collect sample |

**Environmental Resources Management**
MONITOR WELL DEVELOPMENT RECORD

Area: Whirlpool- Fort Smith, AK
Well No.: MW-46

Client: Whirlpool
Location: Fort Smith, AK
W.O. #581-013/ 0014507
Developer(s):

Date: 11/13/2004, 11/14/2004, 11/15/2004
Well Casing Diameter ($d_{wc}$): 3/4 in.
Borehole Diameter ($d_b$): 3 in.
Measuring Point: Ground Surface
Measuring Point Elevation: ft.

Total Well Depth **TD**: 22 ft.
Depth to Water **DTW**: 8.55 ft.

Well Volume $V_w = 3.14 \times (d_{wc}/24)^2 \times h_{wc} \times 7.5\ gal/ft^3$

$V_w$ = 0.3 gal.

Height of Water Column $h_{wc}$=TD - DTW 13.45 ft.
Depth to Product, if present, **DTP** ft. Use DTP=DTW to calculate $h_{wc}$, if product is present.
Height of Filter Sand Above Sump $h_{fs}$ 7 ft.
Volume of Water in Filter Sand $V_{fs} = 3.14 \times ((d_b/24)^2 - (d_{wc}/24)^2) \times 0.3 \times h_{fs} \times 7.5\ gal/ft^3$ = 0.7 gal.
Assumed 30% porosity for filter sand.

Borehole Volume $V_b = V_{wc} + V_{fs}$ = 1.0 gal.

**Minimum** volume to be purged for well development:

Five borehole volume: 5 x $V_b$ = 5 gal.
Volume of water added during well installatic + gal.
Minimum volume to be removed 5 gal.

**Maximum** volume not to exceed if water parameters do not stabilize. Check with **ERM** project manager.

Ten borehole volumes 10 x $V_b$ = 10 gal.
Volume of water added during well installatic + gal.
Maximum volume to be removed 10 gal.

MONITOR WELL DEVELOPMENT RECORD

Page 1 of 1

Method:
Field Instruments: peristaltic pump, YSI

Area: Whirlpool- Fort Smith, AK
Well No.: MW-46

| Time | Depth (ft) | Volume Removed (gal) | Volume Cumulative (gal) | pH (std units) | temp. (°C) | SC (µS/cm) | turbidity (NTU / FTU) | Color | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 11/13/2003 | | | | | | | | | |
| ~1400 | | | | | | | | | begin pumping |
| 1412 | | 0.5 | 0.5 | | | | | | pumped dry |
| 1550 | | | | | | | | | insufficient head |
| 11/14/2003 | | | | | | | | | |
| 950 | | | | | | | | | collect sample, dry |
| 11/15/2003 | | | | | | | | | |
| ~1342 | | | | | | | | | begin pumping |
| ~1347 | | 0.25 | 0.75 | | | | | | pumped dry |
| 4/15/2004 | | | | | | | | | |
| 1537 | | | | | | | | | begin pumping |
| 1541 | | 0.5 | 1.25 | 7.29 | 19.5 | 4.2 | 424 | | |
| 1546 | | 0.5 | 1.75 | 7.01 | 19.59 | 421 | 929 | | |
| 1551 | | 0.5 | 2.25 | 6.92 | 19.63 | 425 | 1000 | | pumped dry |
| 1635 | | | | | | | | | collect sample |

**Environmental Resources Management**
MONITOR WELL DEVELOPMENT RECORD

Area: Whirlpool- Fort Smith, AK
Well No.: MW-50

Client: Whirlpool
Location: Fort Smith, AK
W.O. #581-013/ 0014507
Developer(s):

Date: 11/15/2004
Well Casing Diameter ($d_{wc}$): 3/4 in.
Borehole Diameter ($d_b$): 3 in.
Measuring Point: Ground Surface
Measuring Point Elevation: ft.

Total Well Depth **TD**: 18.6 ft.
Depth to Water **DTW**: 11.75 ft.

Well Volume $\mathbf{V_w}$=3.14 x $(d_{wc}/24)^2$ x $h_{wc}$ x 7.5 gal/ft$^3$
$V_w$ = 0.2 gal.

Height of Water Column $\mathbf{h_{wc}}$=TD - DTW 6.85 ft.
Depth to Product, if present, **DTP** ft. Use DTP=DTW to calculate $h_{wc}$, if product is present.
Height of Filter Sand Above Sump $\mathbf{h_{fs}}$ 13.6 ft.
Volume of Water in Filter Sand $\mathbf{V_{fs}}$ = 3.14 x $((d_b/24)^2 - (d_{wc}/24)^2)$ x 0.3 x $h_{fs}$ x 7.5 gal/ft$^3$ = 1.4 gal.
Assumed 30% porosity for filter sand.

Borehole Volume $\mathbf{V_b}$ = $V_{wc}$ + $V_{fs}$ = 1.6 gal.

**Minimum** volume to be purged for well development:

Five borehole volume: 5 x $V_b$ = 8 gal.
Volume of water added during well installatio + gal.
Minimum volume to be removed 8 gal.

**Maximum** volume not to exceed if water parameters do not stabilize. Check with **ERM** project manager.

Ten borehole volumes 10 x $V_b$ = 16 gal.
Volume of water added during well installatio + gal.
Maximum volume to be removed 16 gal.

MONITOR WELL DEVELOPMENT RECORD



Method:
Field Instruments: peristaltic pump, YSI

Area: Whirlpool- Fort Smith, AK
Well No.: MW-50

| Time | Depth (ft) | Volume Removed (gal) | Volume Cumulative (gal) | pH (std units) | temp. ($^oC$) | SC (µS/cm) | turbidity (NTU / FTU) | Color | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 4/15/2004 | | | | | | | | | |
| 1603 | | | | | | | | | begin pumping |
| 1606 | | | | 6.33 | 19.51 | 426 | 510 | | |
| 1609 | | | | | | | | | pumped dry |
| | | | | | | | | | |
| | | | | | | | | | |
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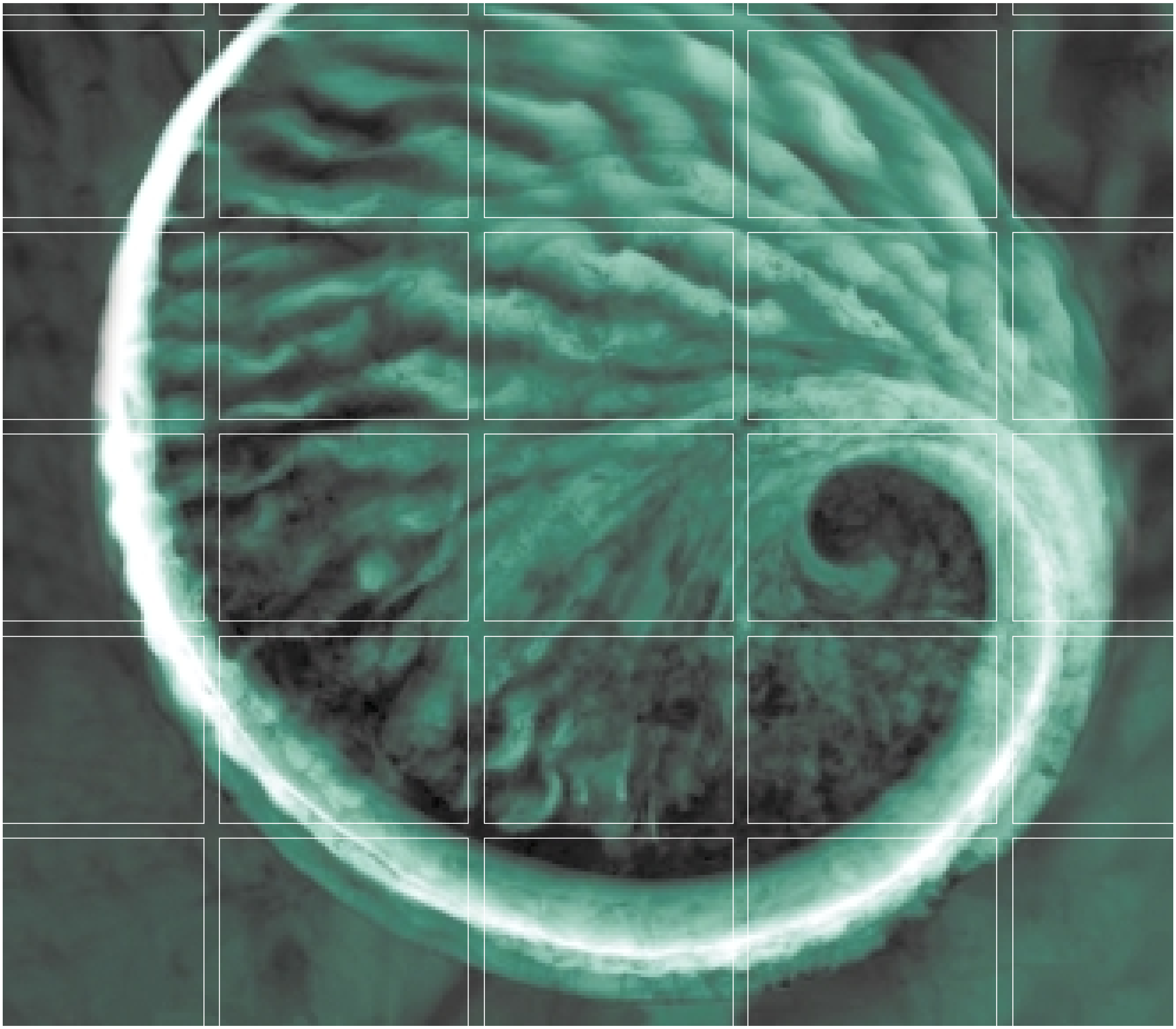

# Interim Status Report and CAS Work Plan Revision

**Whirlpool Facility, Ft. Smith, Arkansas**
**Prepared for Whirlpool Corporation**

June 25, 2004

**Volume 3 of 3**

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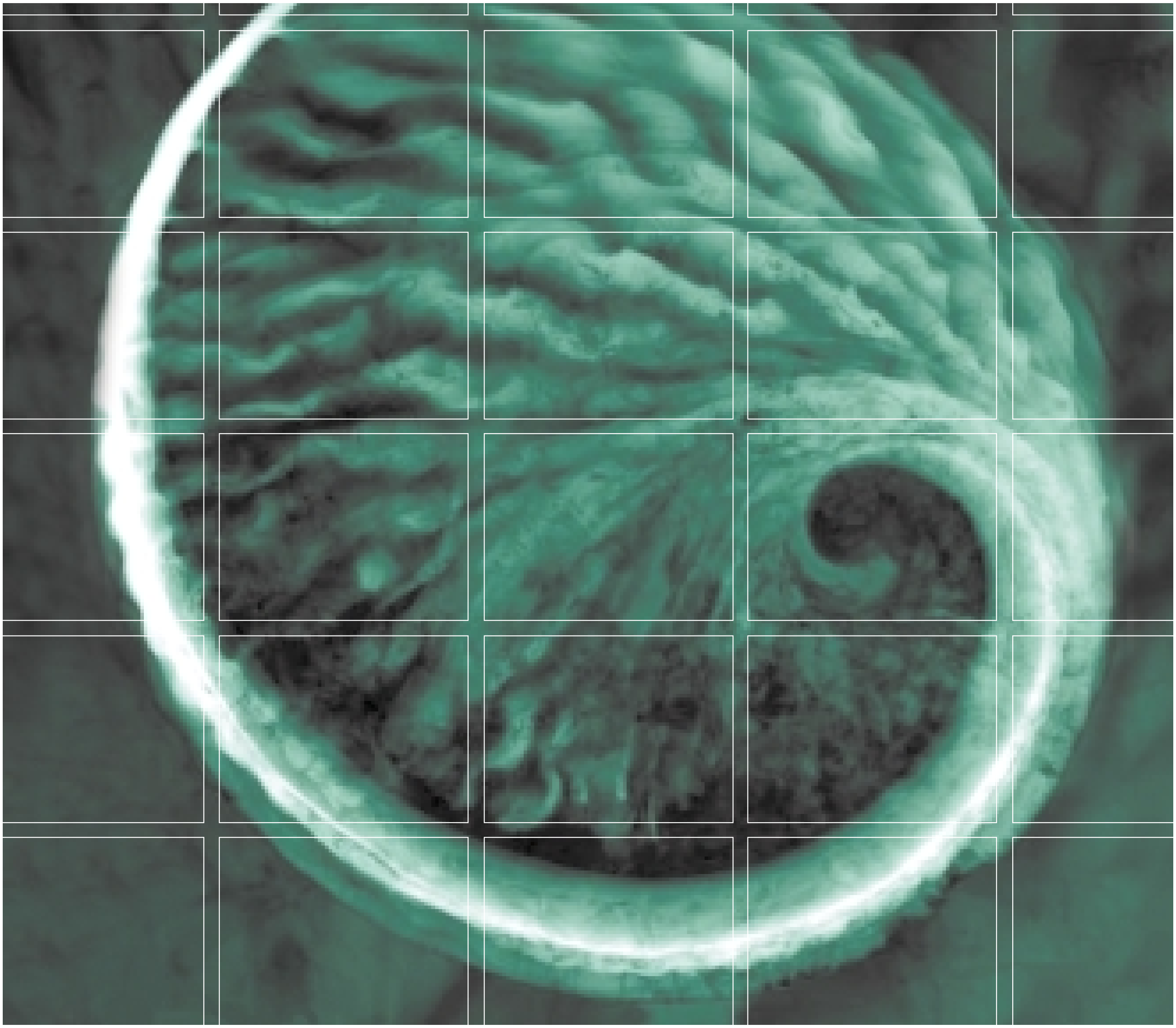
# Site Health & Safety Plan

*Appendix E*

*June 25, 2004*
*Project No. 0014507*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000



# Site-Specific Health and Safety Plan

**Corrective Action Strategy Implementation Field Activities**
**Whirlpool Facility, Fort Smith, Arkansas**

**Prepared for Whirlpool Corporation**

August 15, 2003

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Whirlpool Corporation

# Site-Specific Health and Safety Plan: *Corrective Action Strategy Implementation Field Activities Whirlpool Facility, Fort Smith Arkansas*

August 15, 2003

W.O. # 581-013

H. Reiffert Hedgcoxe, P.G
*Partner-in-Charge*

Troy Meinen, P.G.
*Project Manager*

Jan Simon Clark
Jan Simon Clark, CIH, CSP
*Project H&S Consultant*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
T: 281-600-1000
F: 281-600-1001

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*LIST OF ATTACHMENTS*

**SITE-SPECIFIC HEALTH AND SAFETY PLAN**

Environmental Resources Management (ERM) developed the following Health and Safety Plan (HASP) for use by ERM personnel and by ERM contractors (individually, an "ERM Contractor" and collectively, "ERM Contractors"). ERM personnel must adhere to the practices and procedures specified in the HASP. Each ERM Contractor must review the HASP and agree to accept and abide by the HASP, subject to any modifications to the HASP (to address the ERM Contractor's more stringent practices and procedures) agreed upon in writing by ERM and the ERM Contractor. The ERM Contractor shall indicate such acceptance by signing Section 20 of this document prior to commencing work at the Site. However, if any ERM Contractor commences work at the Site, the ERM Contractor shall be deemed to have accepted the HASP and the terms hereof and the failure to execute and return to ERM a copy of this notice shall not be relevant to such interpretation.

If a contractor or a person other than the Client, ERM employees and ERM Contractors (individually, a "Third Party" and collectively, "Third Parties") receives a copy of the HASP, such Third Party should not assume that the HASP is appropriate for the activities being conducted by the Third Party.

**NO THIRD PARTY HAS THE RIGHT TO RELY ON THE HASP. EACH THIRD PARTY SHOULD ABIDE BY ITS OWN SITE-SPECIFIC HEALTH AND SAFETY PLAN IN ACCORDANCE WITH ITS OWN PROFESSIONAL JUDGMENT AND ESTABLISHED PRACTICES.**

ERM shall not be responsible for the implementation of any Third Party safety program(s), except to the extent otherwise expressly agreed upon by ERM and a Third Party in writing. The services performed by ERM for the Client and any right of the client and/or an ERM Contractor to rely on the HASP shall in no way inure to the benefit of any Third Party, including, but not limited to, employees, agents, or consultants and subcontractors of ERM Contractors, so as to give rise to any cause of action by such Third Party against ERM.

The HASP generated by ERM in connection with the Project is for use on a specific site and in connection with a specific project. ERM makes no representation or warranty as to the suitability of the HASP for reuse on another site or as to the suitability of the HASP for reuse on another project or for modifications made by the Client or a Third Party to the HASP.

## 1. Site Name and Address

Whirlpool Corporation
6400 Jenny Lind Rd.
Fort Smith, Arkansas 72917

## 2. ERM Project Personnel and Responsibilities

ERM Partner-in-Charge (PIC): H. Reiffert Hedgcoxe, P.G.
*Responsible for all work and conducts ultimate Quality Assurance/Quality Control (QA/QC) overview.*

ERM Project Manager (PM): Troy Meinen, P.G.
*Manages day-to-day activities; reports to PIC.*

ERM Project Health and Safety Consultant: Jan Simon Clark, CIH, CSP
*Directs development of HASP; provides technical advice on health and safety issues.*

ERM Site Safety Officer (SSO): Troy Meinen, P.G. and Karin W. Shultz or Designee
*Responsible for implementation of HASP; reports to PIC and PM.*

## 3. Site Description

The Whirlpool Fort Smith facility is located at 6400 Jenny Lind Road on the south side of Fort Smith, Arkansas (Figure 1). The facility manufactures side-by-side household refrigerators, trash compactors and icemakers. The facility has been operated by Whirlpool for over 30 years.

Surrounding property uses include light industrial/commercial activities to the south and east, residential to the north and undeveloped land to the west (Figure 3-1). Residential properties to the north include single-family homes and two multi-family units. No recreational or agricultural properties are located in the vicinity of the Whirlpool facility. In addition, schools, hospitals, day care centers, etc. are located at least 0.5 miles from the facility.

Data from a series of soil and ground water investigations at the site indicate the presence of trichloroethylene (TCE) and other related solvents in the shallow ground water.

## 4. Field Activities

Example 2: In addition to routine ground water monitoring activities, planned work activities in and near the facility include the implementation of off-site ground water plume delineation, which is described in the Corrective Action Strategy Work Plan:

Major tasks to be performed by ERM personnel and/or ERM subcontractors include the following:

- Boring/monitoring well drilling;
- Monitor well installation;
- Monitor well development;
- Environmental media (soil/ground water) sampling; and
- Ground water level measurements.

## 5. Hazard Identification and Control

### Hazard Identification Process

Prior to initiating any new project activity or when there is a change in site conditions, the Site Safety Officer (SSO) will assist project team members in completing a Job Hazard Analysis (JHA). A copy of the JHA form is located in Attachment 1. The SSO or designee will review the JHA with all ERM personnel and/or ERM subcontractors daily prior to starting work.

### Chemical Hazards

Chemicals may be introduced into the body by ingestion, inhalation, or absorption through the skin. Since not all chemicals have the same level of toxicity, the length of time for the exposure and the concentration of the chemical are important in determining the risk. Inhalation and skin contact are the most common routes of entry. Chemicals can be introduced into the body by ingestion when chemicals present on the hands are transferred to food or cigarettes.

Based on historical soil and ground water sampling, the following chemicals of concern may be encountered at the site. Material Safety Data Sheets for chemicals of concern are available from the client contact or can be accessed using the computerized MSDS System found on the plantwide computer system. Pertinent health and safety information for the following chemicals of concern are summarized in Table 5-1.

| | |
|---|---|
| Trichloroethene | 1,1-Dichloroethene |
| trans-1,2-Dichloroethene | Vinyl Chloride |
| cis-1,2-Dichloroethene | |

## TABLE 5-1: Summary of Chemical Hazards for Chemicals of Concern

| | ***Published Exposure Limit (8-hour TWA ²)*** | ***Routes of Exposure*** | ***Target Organs*** | ***Signs/Symptoms of Exposure (Acute versus Chronic Effects)*** | ***First Aid &Emergency Response*** |
|---|---|---|---|---|---|
| Chemical Name<br>Trichloroethylene<br>(Trichloroethene, TCE)<br>CAS<br>79-01-6<br><br>Vapor Pressure<br>58 mm Hg at 25 °C<br><br>Ionization Potential<br>9.45 eV | 50 ppm (ACGIH TLV) | Inhalation<br>Skin contact<br>Ingestion | Eyes, skin, respiratory tract, heart, liver, CNS | Acute<br>Eye irritation; skin irritation including dermatitis; headache; vertigo; visual disturbance; fatigue; giddiness; tremors; sleepiness; unnatural drowsiness; nausea; vomiting; pulmonary edema<br><br>Chronic<br>Cardiac arrhythmias; liver injury | Flush eyes/skin with water<br><br>Move to fresh air, administer artificial respiration if not breathing<br><br>If ingested do NOT induce vomiting.<br><br>Seek medical attention |
| Vinylidene chloride<br>(1,1 Dichloroethene)<br><br>CAS:<br>75-35-4<br><br>Vapor Pressure:<br>600 mm Hg at 25 °C<br><br>Ionization Potential:<br>9.6 eV | 5 ppm<br>(ACGIH TLV) | Inhalation<br>Skin contact<br>Ingestion | Eyes, skin, respiratory tract, liver, kidneys, CNS | Irritation of eyes; conjunctivitis, transit corneal injury; skin irritation including dermatitis, drowsiness, dizziness; unconsciousness; CNS depressant; liver and kidney dysfunction | Flush eyes/skin with water<br><br>Move to fresh air, administer artificial respiration if not breathing<br><br>If ingested rinse mouth, DO NOT induce vomiting, give plenty of water to drink<br><br>Seek medical attention |
| cis 1,2-Dichloroethene<br><br>CAS: 156-59-2<br><br>Vapor Pressure:<br>175 mm Hg at 25°C<br><br>Ionization Potential:<br>9.80 eV | 200 ppm<br>(OSHA PEL and ACGIH TLV) | Inhalation<br>Ingestion<br>Skin contact | Eyes, respiratory system, CNS | Acute: Irritation of eyes and respiratory system; CNS depression. | Flush eyes/skin with water<br><br>Move to fresh air, administer artificial respiration if not breathing<br><br>If ingested, rinse mouth<br><br>Seek medical attention |

## TABLE 5-1 (Cont'd): Summary of Chemical Hazards for Chemicals of Concern

| *Chemical* | *Published Exposure Limit [1] (8-hour TWA [2])* | *Routes of Exposure* | *Target Organs* | *Signs/Symptoms of Exposure (Acute versus Chronic Effects)* | *First Aid &Emergency Response* |
|---|---|---|---|---|---|
| Vinyl chloride<br><br>CAS: 75-01-4<br><br>Vapor Pressure:<br>2800 mm Hg at 25 °C<br><br>Ionization Potential:<br>10.00 eV | 1 ppm (OSHA PEL)<br>5 ppm (15-minute OSHA STEL[5]) | Inhalation<br>Skin contact | Eyes, skin, CNS, liver, spleen, blood | Acute: Eye irritation; frostbite on skin; CNS effects; and, lowering of consciousness.<br>Chronic: Effects the liver, spleen, blood, peripheral blood vessels, tissue and bones of the fingers; and, carcinogenic. | Flush eyes/skin with water<br><br>Move to fresh air, administer artificial respiration if not breathing<br><br>Seek medical attention |
| trans 1,2-Dichloroethene<br><br>CAS: 156-60-5<br><br>Vapor Pressure:<br>352 mm Hg at 25°C<br><br>Ionization Potential:<br>9.80 eV | 200 ppm<br>(OSHA PEL and ACGIH TLV) | Inhalation<br>Ingestion<br>Skin contact | Eyes, respiratory system, CNS | Acute: Irritation of eyes and respiratory system; CNS depression. | Flush eyes/skin with water<br><br>Move to fresh air, administer artificial respiration if not breathing<br><br>If ingested, rinse mouth<br><br>Seek medical attention |

NOTES:

1. The most conservative published occupational exposure limit is listed. Sources for occupational exposure limits were OSHA and ACGIH.
2. TWA = time weighted average
3. $mg/m^3$ = milligrams of contaminant per cubic meter of air
4. ACGIH TLV = American Conference of Governmental Industrial Hygienists Threshold Limit Value
5. ppm = parts of contaminant per million parts of air
6. OSHA PEL = Occupational Safety and Health Administration Permissible Exposure Limit

Sources of information include published exposure limits in 29 CFR 1910.1000 or the 2002 TLV Booklet published by ACGIH, NIOSH pocket guide, Chemical/Physical Properties from Texas Risk Reduction Program, International Chemical Safety Cards, MSDSs, and the HNU listing of Photoionization Characteristics of Selected Compounds.

The following chemicals are routinely used by ERM at the site. The MSDS for these chemicals are located in Attachment 2. Pertinent health and safety information for these chemicals is summarized in Table 5-2.

- Portland Cement
- Liquinox
- Gasoline
- Isobutylene Balance Air
- Bentonite
- Silica Sand

**Ambient Air Monitoring**

Ambient air monitoring should be conducted by the SSO when there is a question of employee exposure to hazardous concentrations of substances to assure the proper selection of engineering controls, work practices, and PPE. Additional monitoring should be conducted under any of the following circumstances.

- Work begins on a different portion of the site;
- Change in job tasks;
- Change in weather;
- Change in ambient levels of hazardous constituents as indicated by the sense of smell or changes in the physical appearance of the soil or ground water;
- When new hazardous substances are encountered; and
- During high-risk operations (e.g. drum opening, or handling of leaking drums, or when working in areas with obvious liquid contamination).

Ambient air monitoring will be conducted using direct-reading real-time instruments as indicated in Table 5-3. If more that one instrument is listed, either instrument may be chosen. Not all work at the site will require ambient air monitoring for all contaminants. During the mobilization phase of a particular project task or activity, either the Project Manager or the SSO will determine what contaminants may be encountered in order to have the appropriate instrumentation on-site. The Project Health and Safety Consultant is available to assist the Project Manager or the SSO in determining the appropriate instrumentation.

**TABLE 5.3: Ambient Air Monitoring Instruments**

| ***Contaminant*** | ***Instrument*** |
|---|---|
| Organics | OVM Model 580B with 11.8 eV lamp |

Direct reading instrumentation will be calibrated daily per manufacturer's instructions. Cylinders of the appropriate calibration gas will be required for fieldwork lasting longer than one day.

Under stable site conditions, ambient air monitoring will be conducted at least once every two hours in the workers' breathing zone and at other locations based on the

## TABLE 5-2: Summary of Chemical Hazards for Chemicals Routinely Used by ERM

| | *Exposure Limit )* *(8-hr TWA (2))* | *Routes of Exposure* | *Target Organs* | *Signs/Symptoms of Exposure (Acute versus Chronic Effects)* | *First Aid & Emergency Response* |
|---|---|---|---|---|---|
| Chemical Name:<br>Gasoline<br><br>CAS:<br>86290-81-5<br><br>Vapor Pressure:<br>5-15 psi at 100°F<br><br>Ionization Potential:<br>N/A, mixture | 300 ppm (5)<br>(ACGIH TLV) | Inhalation<br>Skin contact<br>Ingestion | Skin, CNS, respiratory system | Acute<br>Irritation of eyes and skin; CNS effects include headache, nausea, dizziness, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, disorientation, tremors, convulsions, loss of consciousness<br><br>Chronic<br>Dermatitis; may effect the CNS and liver; possible carcinogen | Flush eyes/skin with water<br><br>Move to fresh air, administer artificial respiration if not breathing<br><br>If ingested, do not induce vomiting, drink water or milk<br><br>Seek medical attention |
| Chemical Name:<br>Portland Cement<br><br>Vapor Pressure:<br>N/A, solid<br><br>Ionization Potential:<br>N/A, solid | 10 mg/m$^3$<br>(ACGIH TLV) | Inhalation<br>Skin contact<br>Ingestion | Eyes, skin, respiratory system | Acute<br>Irritation of eyes, skin and respiratory system; skin burns<br><br>Chronic<br>Contains trace amounts of crystalline silica which cause silicosis and may be carcinogenic | Flush eyes/skin with water<br><br>Administer artificial respiration if not breathing<br><br>Seek medical attention immediately if ingested |
| Chemical Name:<br>Bentonite<br><br>Vapor Pressure:<br>N/A, solid<br><br>Ionization Potential:<br>N/A, solid | 0.05 mg/m$^3$<br>(ACGIH TLV for crystalline silica) | Inhalation<br>Skin contact<br>Ingestion | Eyes, skin, respiratory system | Acute<br>Irritation of eyes, skin and respiratory system<br><br>Chronic<br>Contains trace amounts of crystalline silica which may cause silicosis; potential carcinogenic | Flush eyes/skin with water<br><br>Administer artificial respiration if not breathing<br><br>Seek medical attention immediately if ingested |

## TABLE 5-2 (Cont'd): Summary of Chemical Hazards for Chemicals Routinely Used by ERM

| *Chemical* | *Exposure Limit (1) (8-hr TWA (2))* | *Routes of Exposure* | *Target Organs* | *Signs/Symptoms of Exposure (Acute versus Chronic Effects)* | *First Aid & Emergency Response* |
|---|---|---|---|---|---|
| Chemical Name: Silica sand<br><br>Vapor Pressure: N/A, solid<br><br>Ionization Potential: N/A, solid | 0.05 mg/m$^3$ (ACGIH TLV) | Inhalation<br>Skin contact<br>Ingestion | Eyes, respiratory system | Acute<br>Irritation of eyes; coughing<br><br>Chronic<br>Silicosis; lung carcinogen | Flush eyes with water<br><br>Move to fresh air<br><br>Seek medical attention |
| Chemical Name: Isobutylene Balance Air<br><br>CAS: N/A, mixture<br><br>Vapor Pressure: N/A, gas at ambient conditions<br><br>Ionization Potential: N/A, mixture | None established | Inhalation | Respiratory system | Acute:<br>Simple asphyxiant, difficulty breathing, cyanosis, rapid pulse, impairment of senses, mental disturbances, and convulsions<br><br>Chronic:<br>None known | Move to fresh air, administer artificial respiration if not breathing<br><br>See medical attention |

NOTES:

7. The most conservative published occupational exposure limit is listed. Sources for occupational exposure limits were OSHA and ACGIH.
8. TWA = time weighted average
9. mg/m$^3$ = milligrams of contaminant per cubic meter of air
10. ACGIH TLV = American Conference of Governmental Industrial Hygienists Threshold Limit Value
11. ppm = parts of contaminant per million parts of air
12. OSHA PEL = Occupational Safety and Health Administration Permissible Exposure Limit

Sources of information include published exposure limits in 29 CFR 1910.1000 or the 2002 TLV Booklet published by ACGIH, NIOSH pocket guide, Chemical/Physical Properties from Texas Risk Reduction Program, International Chemical Safety Cards, MSDSs, and the HNU listing of Photoionization Characteristics of Selected Compounds.

professional judgment of the SSO or the Project Health and Safety Consultant. Ambient air monitoring results will be record on the Ambient Air Monitoring Form found in Attachment 3. If site conditions become unstable or change dramatically ambient air monitoring will be conducted more frequently based on the professional judgment of the SSO or the Project Health and Safety Consultant.

Table 5-4 outlines the steps to be taken by the SSO when the action levels of the various contaminants are exceeded. Respiratory protection is selected based on occupational exposure limits of the constituents at the site and the potential for exposure to vapors and dust from site activities.

**TABLE 5-4: Action Levels and Response Actions Requirements**

| *Chemical* | *Action Level* | *Response Actions* |
|---|---|---|
| Organics | PID reads 5 ppm sustained in the breathing zone for 1 minute | • Stop work and workers leave immediate area<br>• SSO evaluates need for Tyvek coveralls, dons half-face respirator with organic vapor cartridges and monitors again after allowing vapors to dissipate<br>• If readings are less than 5 ppm, resume work<br>• If readings are 5 ppm or greater, resume work wearing half-face respirators with organic vapor cartridges and Tyvek coveralls if required. |
| | PID reads 10 ppm sustained in the breathing zone for 1 minute | • Stop work and workers leave immediate area<br>• Contact Project Manager and Project Health and Safety Consultant<br>• Evaluation work practices and assess engineering controls to reduce airborne concentrations.<br>• SSO waits 15 minutes, evaluates need for Tyvek covers, dons half-face respirator with organic vapor cartridges, approaches work area slowly, if PID reaches 5 ppm, back out and wait an additional 15 minutes before repeating monitoring |

**Site-Specific and Task-Specific Hazards and Control Strategies**

The hazards and control strategies associated with planned work activities are summarized in Table 5-5. During the mobilization phase of a specific work task, the project team can quickly review the hazards and control strategies by locating the task or activity to be performed on the table. Hazards that are common to all activities performed at the site at listed first. The hazards listed for a particular task or activity includes the common hazards.

However prior to initiating any new project activity or when there is a change in site conditions, an additional JHA will be completed. A copy of the JHA form is located in Attachment 1.

## TABLE 5-5: Site-Specific and Task-Specific Hazards and Control Strategies

| | *Hazards* | *Control Strategy* |
|---|---|---|
| All activities in project area or associated with project<br><br>Level D PPE | Biological - poisonous plants, insects, animals | • Appropriate protective clothing where needed (e.g., snake guards in high grass)<br>• Wash exposed body parts and equipment thoroughly after work in highly-vegetated areas<br>• Pant bottoms and sleeve cuffs can be taped closed to prevent skin contact<br>• Insect repellent<br>• Awareness training - what poisonous plants look like and location (if any) of poisonous plants at the site (Attachment 4) |
| | Foreign matter in eye | • Eye wash stations |
| | Heat Stress | • Awareness training – signs/symptoms of heat stress disorders<br>• Scheduling of work/rest periods<br>• Replacement fluids<br>• Shaded area for rest breaks<br>• Cool vests or bandanas |
| | Cold Stress | • Scheduling of work/rest periods<br>• Replacement fluids<br>• Heated area for rest breaks |
| | Ultraviolet Radiation | • Apply sunscreen frequently to exposed skin (wash hands before re-application) |
| | Walking working surfaces – uneven terrain, steep grades, slippery surfaces, ditches | • Awareness of terrain and footing |
| | Overhead hazards or potential for objects to fall from elevated surfaces | • Awareness of surroundings<br>• Toe boards on elevated surfaces |

## TABLE 5-5 (Cont'd): Site-Specific and Task-Specific Hazards and Control Strategies

| *Task/Activity* | *Hazards* | *Control Strategy* |
|---|---|---|
| All activities in project area or associated with project<br><br>Level D PPE | Operation of heavy equipment such as dozers/back holes | • Operator performs and documents daily equipment inspection<br>• Use of high visibility clothing for personnel working near heavy equipment<br>• Limit access to areas around heavy equipment<br>• Only trained personnel to operate heavy equipment<br>• Employees working around heavy equipment should maintain eye contact with heavy equipment operator |
| Moving drill rig and associated equipment to/from the site<br><br>Level D PPE | Moving equipment over uneven terrain<br><br>Electrical hazards – overhead electrical lines | • Inspect path of travel for ruts, soft spots or other hazards<br>• Use mats or boards if necessary<br><br>• Awareness of overhead lines<br>• Lower equipment prior to moving<br>• Set rig at least 20 feet away from overhead electrical lines |
| Rigging-up/down drill rig and associated equipment<br><br>Level D PPE | Electrical hazards – overhead electrical lines, electrically powered equipment<br><br>Lifting strain<br><br>Pinch points | • Use low-voltage equipment with ground fault interrupters (GFCI)<br>• Properly ground equipment<br>• Awareness of overhead lines<br>• Lower equipment prior to moving<br>• Set rig at least 20 feet away from overhead electrical lines<br>• Monitor weather for approaching thunderstorms/lightning<br><br>• Use equipment designed for the job<br>• Use proper lifting techniques<br>• Lift smaller, lighter loads<br>• Move feet with load, don't twist the back<br>• Avoid awkward postures<br><br>• Awareness and use correct tool for the job |

## TABLE 5-5 (Cont'd): Site-Specific and Task-Specific Hazards and Control Strategies

| *Task/Activity* | *Hazards* | *Control Strategy* |
|---|---|---|
| Rigging-up/down drill rig and associated equipment<br><br>Level D PPE | Rotating equipment | • Verify appropriate guarding installed and functional<br>• Prohibit wearing of loose clothing/jewelry that could become caught in rotating equipment |
| | Heavy equipment being used | • Awareness of location of heavy equipment and operator's blind spots<br>• Make eye contact with heavy equipment operator |
| | Subsurface hazards | • Locate utility lines and pipelines prior to drilling by either contacting One Call<br>• Client verify existence/absence of any subsurface hazards<br>• Clear location in accordance with approved Pre-drilling protocol |
| Cementing activities<br><br>Level D PPE<br>Modified Level D PPE | Inhalation of or skin contact with cement | • Stand upwind<br>• Wear thin latex or nitrile gloves<br>• Heavy duty nitrile gloves may be necessary if activities are likely to tear or puncture thin nitrile gloves<br>• Tyvek © coveralls if a splash hazard exists<br>• Goggles if a splash hazard exists |
| | Lifting strain | • Use equipment designed for the job<br>• Use proper lifting techniques<br>• Lift smaller, lighter loads<br>• Move feet with load, don't twist the back<br>• Avoid awkward postures |
| Concrete coring<br><br>Level D PPE<br>Modified Level D PPE | Electrical hazards | • Use low-voltage equipment with ground-fault interrupters<br>• Properly ground equipment<br>• Inspect electrical cords or wires for frayed or cracked insulation |
| | Slippery, wet work surfaces | • Safe work practices |
| | Noise | • Hearing protection required within 20 feet of generator |
| | Rotating equipment | • Verify appropriate guarding installed and functional<br>• Prohibit loose clothing, jewelry around rotating equipment<br>• Daily equipment inspections |

**TABLE 5-5 (Cont'd): Site-Specific and Task-Specific Hazards and Control Strategies**

| *Task/Activity* | *Hazards* | *Control Strategy* |
|---|---|---|
| Clean-up and restore location<br><br>Level D PPE<br>Modified Level D PPE | Operation of heavy equipment such as dozer/back holes | • Operator performs and documents daily equipment inspection<br>• Use of high visibility clothing for personnel working near heavy equipment<br>• Limit access to areas around heavy equipment<br>• Only trained personnel to operate heavy equipment<br>• Employees working around heavy equipment should maintain eye contact with heavy equipment operator |
| | Lifting strain | • Use equipment designed for the job<br>• Use proper lifting techniques<br>• Lift smaller, lighter loads<br>• Move feet with load, don't twist the back<br>• Avoid awkward postures |
| | Inhalation of or skin contact with drilling fluids/cuttings | • Stand upwind<br>• Wear thin latex or nitrile gloves<br>• Heavy duty nitrile gloves may be necessary if activities are likely to tear or puncture thin nitrile gloves<br>• Tyvek© coveralls if a splash hazard exists<br>• Goggles if a splash hazard exists |
| Sampling disposal soils and water from containers<br><br>Modified Level D PPE | Inhalation/skin contact with constituents in soil and water and skin contact with preservatives in laboratory supplied jars | • Ambient air monitoring per project plan<br>• Stand upwind<br>• Surgical latex or nitrile gloves if handling soil or sampling water<br>• Wear goggles when sampling water |

## TABLE 5-5 (Cont'd): Site-Specific and Task-Specific Hazards and Control Strategies

| | *Hazards* | *Control Strategy* |
|---|---|---|
| Monitor well installation and development<br><br>Level D PPE<br>Modified Level D PPE<br>Level C PPE | Electrical hazards from electrically powered submersible pump | • Use low-voltage equipment with ground-fault interrupters<br>• Properly ground equipment<br>• Inspect electrical cords or wires for frayed or cracked insulation |
| | Lifting pumps, boring and well installation materials, and handling drums of development water | • Proper lifting techniques<br>• Two person lifts where necessary<br>• Mechanical aids like fork lifts or cranes where necessary |
| | Inhalation of/or skin contact with constituents in development water | • Ambient air monitoring per project plan<br>• Stand upwind of well<br>• Wear thin latex or nitrile gloves<br>• Heavy duty nitrile gloves may be necessary if activities are likely to tear or puncture thin latex or nitrile gloves<br>• Tyvek® coveralls |
| | Inhalation or skin contact with Bentonite, Portland cement, sand during cementing activities | • Ambient air monitoring per project plan<br>• Stand upwind |
| | Muscle strain or overexertion from bailing well | • Stretch before beginning to bail the well<br>• Take breaks or alternate bailing with a second person |
| Gauging water level in existing monitoring wells<br><br>Level D PPE | Skin contact with constituents in ground water | • Ambient air monitoring per project plan<br>• Stand upwind<br>• Wear surgical latex or nitrile gloves<br>• Heavy duty nitrile gloves may be necessary if activities are likely to tear or puncture surgical nitrile gloves |

## TABLE 5-5 (Cont'd): Site-Specific and Task-Specific Hazards and Control Strategies

| *Task/Activity* | *Hazards* | *Control Strategy* |
|---|---|---|
| Environmental media sampling (soil/sludge)<br><br>Level D PPE<br>Modified Level D PPE<br>Level C PPE | Muscle strain or overexertion from hand augering | • Stretch before beginning to auger<br>• Take breaks or alternate hand augering with a second person |
| | Inhalation of/or skin contact with constituents in soil | • Ambient air monitoring per project plan<br>• Stand upwind<br>• Wear thin latex or nitrile gloves if handling soil<br>• Tyvek® coveralls (when within exclusion zone) |
| | Cutting hand with knife while slicing open sample sleeve | • Sharpen knife or cutting tool<br>• Slice away from body<br>• Keep hands out of path of travel of knife or cutting tool |
| | Subsurface Hazards | • Locate utility lines and pipelines prior to drilling by either contacting One Call<br>• Client verify existence/absence of any subsurface hazards<br>• Clear location in accordance with approved Pre-drilling protocol |
| Environmental media sampling (ground water/ LNAPL)<br><br>Level D PPE<br>Modified Level D PPE | Inhalation of/or skin contact with constituents in ground water | • Ambient air monitoring per project plan<br>• Stand upwind<br>• Wear thin latex or nitrile gloves<br>• Heavy duty nitrile gloves may be necessary if activities are likely to tear or puncture thin latex or nitrile gloves<br>• Tyvek® coveralls (when within exclusion zone) |
| | Muscle strain or overexertion from bailing well | • Stretch before beginning to bail the well<br>• Take breaks or alternate bailing with a second person |
| | Electrical hazards from electrically powered pump | • Use low-voltage equipment with ground-fault interrupters<br>• Properly ground equipment<br>• Inspect electrical cords or wires for frayed or cracked insulation |

## TABLE 5-5 (Cont'd): Site-Specific and Task-Specific Hazards and Control Strategies

| *Task/Activity* | *Hazards* | *Control Strategy* |
|---|---|---|
| Decontamination of Heavy Equipment<br><br>Modified Level D PPE | Inhalation of/or skin contact with constituents in soil/water adhered to equipment | • Ambient air monitoring per project plan<br>• Stand upwind<br>• Wear thin latex or nitrile gloves<br>• Heavy duty nitrile gloves may be necessary if activities are likely to tear or puncture thin latex or nitrile gloves<br>• Tyvek® coveralls<br>• Rubber boots if potential to significantly splash feet |
| | Accidents from equipment operations, tools and rotating parts (i.e., pressure washer) | • Verify appropriate guarding installed and functional<br>• Prohibit loose clothing and jewelry around rotating equipment<br>• Inspect hoses prior to use<br>• Bleed lines prior to disconnecting hoses |
| Decontamination of sampling equipment<br><br>Modified Level D PPE | Inhalation of/or skin contact with constituents in soil/water adhered to sampling equipment | • Ambient air monitoring per project plan<br>• Stand upwind<br>• Latex or nitrile gloves<br>• Heavy duty nitrile gloves may be necessary if activities are likely to tear or puncture latex or nitrile gloves<br>• Coated Tyvek® coveralls if potential for splashing onto clothing<br>• Rubber boots if potential to significantly splash feet |
| Personnel decontamination<br><br>Level D PPE<br>Modified Level D PPE | Inhalation of/or skin contact with constituents in soil/water | • Ambient air monitoring per project plan<br>• Stand upwind<br>• Wear thin latex or nitrile gloves<br>• Heavy duty nitrile gloves may be necessary if activities are likely to tear or puncture thin latex or nitrile gloves<br>• Tyvek® coveralls<br>• Rubber boots if potential to significantly splash feet |

## TABLE 5-5 (Cont'd): Site-Specific and Task-Specific Hazards and Control Strategies

| *Task/Activity* | *Hazards* | *Control Strategy* |
|---|---|---|
| Boring/Well drilling<br>Well plugging & abandonment | Accidents from equipment operations, tools and rotating parts | • Verify appropriate guarding installed and functional<br>• Prohibit loose clothing and, jewelry around rotating equipment |
| Level D PPE<br>Modified Level D PPE | Electrical hazards – overhead electrical lines, electrically powered equipm ent | • Use low-voltage equipment with ground-fault interrupters<br>• Properly ground equipment<br>• Awareness of overhead electrical lines<br>• Lower drill rig boom prior to moving rig<br>• Erect rig at least 20 feet away from overhead electrical lines (to work closer than 20 feet to overhead electrical lines, contact HSO) |
| | Subsurface hazards | • Locate utility lines and pipelines prior to drilling<br>• Probe proposed drilling site with 5-foot steel rod prior to drilling<br>• Visually inspect proposed drilling site |
| | Lifting drill pipe, augers, bags of sand/cement/ bentonite | • Use proper lifting techniques<br>• Use two person lifts when necessary<br>• Use mechanical aids like fork lifts or cranes when necessary |
| | Noise | • Hearing protection for all personnel in areas > 85 dBA |
| | Moving drill rig over uneven terrain | • Inspect path of travel for ruts, soft spots or other hazards<br>• Use mats if necessary<br>• Lower drill rig boom prior to movement |
| | Rupture of high pressure hydraulic or air lines | • Inspect high pressure hydraulic or air lines prior to use |
| | Inhalation or skin contact with constituents in soil cuttings/cores | • Ambient air monitoring per project plan<br>• Stand upwind during drilling<br>• Wear thin latex or nitrile gloves when handling soil<br>• Wear Tyvek® coveralls if drilling using a mud-based system |

## 6. Personal Protective Equipment

The level of PPE selected for a task is based on the following.

- Type and measured concentration of the chemical substance in the ambient atmosphere and its toxicity;
- Potential for exposure to substances in air, splashes of liquids, or other direct contact with material due to work being done; and
- Knowledge of chemicals on-site along with properties such as toxicity, route of exposure, and contaminant matrix.

In situations where the type of chemical, concentration, and possibilities of contact are not known, the appropriate level of protection must be selected based on professional experience and judgment until the hazards can be better identified.

In addition to summarizing the general PPE requirements for tasks performed at the site, Table 6-1 also serves as the written certification that the PPE Hazard Assessment has been conducted. The signature page containing the client's name, project name and number, date and signatures of the parties responsible for the development of the HASP also serve as part of the written certification.

**Respiratory Protection**

The type of respiratory protection required will be based on the results of ambient air monitoring, the results of any models used to predict ambient air concentrations, and the professional judgment of either the SSO or the Project Health and Safety Consultant. Respiratory protection requirements are outlined on Table 5-4.

As required by 29 CFR 1910.134, *Respiratory Protection*, a cartridge change-out schedule will be developed based on either the results of ambient air monitoring, the results of any models used to predict ambient air concentration or the professional judgment of the Project Health and Safety Consultant and the results of the 3M Respirator Service Life Software. Although 3M respiratory protection devices may not be worn, the results generated by the Respirator Service Life Software serve as a point of reference in determining the cartridge change-out schedule.

At a minimum, new respirator cartridges must be placed on the respirator at the beginning of the shift and after lunch.

| TABLE 6-1: Personal Protection Equipment Requirements | | |
|---|---|---|
| **PPE Level** | **Ensemble Components** | **Anticipated Use** |
| **Level D**<br><br>Should be worn only as a work uniform and not in any area with respiratory or skin hazards. It provides minimal protection against chemical hazards. | • Long pants and shirt with sleeves<br>• Steel-toed footwear (during drilling activities)<br>• Safety glasses with molded side shields<br>• Hard hat (during drilling activities)<br>• General purpose work gloves if task does not involve water or wet materials<br>• Hearing protection<br>• High visibility traffic vest (when near traffic) | Moving and rigging up drill rig<br>Clean up and restoration of Site<br>Monitor well installation<br>Environmental media sampling<br>Disposal soils/liquids sampling<br>Gauging water levels |
| **Modified Level D** | Level D and the following:<br>• Disposal Tyvek coveralls<br>• Steel-toed rubber boots or disposal boot covers over shoes<br>• Thin latex or nitrile gloves<br>• Green nitrile gloves over thin latex or nitrile gloves when primary gloves may tear or puncture | Any of the above-referenced tasks in which there is moderate potential for skin contact<br><br>Cementing activities<br>Monitor well development<br>Decontamination activities |
| **Level C**<br><br>Should be worn when the criteria for using air-purifying respirators are met, and a lesser level of skin prot1ection is needed. | Level D or Modified Level D and the following:<br>• Half-face air purifying respirator with combination organic vapor/high efficiency particular air (HEPA) cartridges | Any of the above-referenced tasks in which there is moderate potential for skin contact with constituents and data indicating need for respiratory protection |
| **Level B**<br><br>Should be worn when the highest level of respiratory protection is needed, but a lesser level of skin protection is needed. | Not anticipated to be required | Tasks requiring Level B PPE are not anticipated during this project. If Level B PPE is needed, as determined by the SSO and/or the Project Health and Safety Consultant, the HASP will be revised. |
| **Level A**<br><br>Should be worn when the highest level of respiratory, skin, and eye protection is needed. | Not anticipated to be required | Tasks requiring Level A PPE are not anticipated during this project. If Level A PPE is needed, as determined by the SSO and/or the Project Health and Safety Consultant, the HASP will be revised |

## 7. Heat Stress

Heat stress is caused by a combination of factors such as temperature, humidity, type of work being performed, and use of personal protective equipment including protective clothing. Heat stress tends to increase body temperature, heart rate, and sweating. The key to preventing heat stress is education of personnel relative to the hazards associated with working in the heat and implementation of proper controls and work practices. Table 7-1 summarizes heat stress disorders and prevention/first aid issues.

When the temperature is above 80 degrees Fahrenheit, the SSO will monitor both the temperature and the humidity throughout the day in order to determine the Heat Index. The National Weather Service has developed a Heat Index that combines the ambient temperature and humidity into value that reflects how hot it really feels. This Heat Index can be used to determine the risk associated with working outdoors during the hot months of the year. To use the chart (Table 7-2), read the temperature at the left and humidity across the top, the Heat Index is where the two intersect. For example, with a temperature of 96 and a humidity of 50%, the Heat Index is 108.

The SSO will also inform site workers when the Heat Index Risk Level, as defined on Table 7-3, reaches Danger and/or Extreme Danger, the following additional precautions may be implemented at the discretion of the SSO based on factors such as use of Tyvek coveralls and the physical activity associated with each task. The following actions or work practices will be implemented, as practical, as part of the Heat Stress Management Program.

- Designated areas will be used for site workers to take breaks and for eating.
- If possible, physically demanding and strenuous tasks may be scheduled for the cooler parts of the day.
- Site workers will be required to drink 6-8 ounces of cool water or electrolyte replacement drinks every 60 minutes. Diabetics should use caution when using electrolyte replacement drinks to replenish fluids. Electrolyte replacement drinks may have high sugar content.
- Site workers taking prescription medications should check with their doctor or other medical professional regarding the interaction between working in hot environments and their medications.
- SSO will more closely observe site workers, especially those working in Tyvek coveralls or performing strenuous job tasks.
- Implement worker rotation during strenuous or physically demanding job tasks.
- SSO will implement a work-rest cycle.

The work-rest cycle outlined below may be implemented based on the professional judgment of the SSO and/or the Project Health and Safety Consultant.

| ***Heat Index*** | ***Risk Level*** | ***Work-Rest Cycle*** |
|---|---|---|
| > 130 | Extreme Danger | 15 minute break every 30 minutes |
| 105-130 | Danger | 15 minute break every 60 minutes |
| 90-105 | Extreme Caution | 15 minute break every 90 minutes |
| 80-90 | Caution | 15 minute break every 120 minutes |

## TABLE 7-1: Heat Stress Disorders

| ***Disorder*** | ***Symptoms*** | ***Cause*** | ***Prevention/First Aid*** |
|---|---|---|---|
| Heat Rash or Prickly Heat | ♦ Rash<br>♦ Itching | ♦ Hot, humid conditions<br>♦ Sweat doesn't evaporate easily<br>♦ Sweat ducts become clogged | ♦ Ointments<br>♦ Keep skin clean and dry<br>♦ Good daily personal hygiene |
| Heat Cramps | ♦ Sudden onset of muscle cramps usually in legs or arms<br>♦ Hot, moist skin<br>♦ Normal pulse<br>♦ Normal or slightly elevated temperature | ♦ Loss of water (sweating)<br>♦ Loss of electrolytes<br>♦ Replacing water but not electrolytes | ♦ Move into shade<br>♦ Loosen clothing<br>♦ Drink tepid electrolyte drinks or water<br>♦ Seek medical assistance if conditions persist |
| Heat Exhaustion | ♦ Pale, clammy skin<br>♦ Profuse perspiration<br>♦ Thirst from dehydration<br>♦ Weakness<br>♦ Headache<br>♦ Nausea<br>♦ Loss of coordination | ♦ Overexertion<br>♦ Excessive loss of water and electrolytes | ♦ Move into shade<br>♦ Remove PPE<br>♦ Loosen street clothing<br>♦ Cool by applying damp cool compresses or ice packs<br>♦ Drink tepid electrolyte drinks or water<br>♦ Summon medical assistance |
| Heat Stroke | ♦ Elevated temperature (>103F)<br>♦ Flushed, hot, dry skin<br>♦ Absence of sweating<br>♦ Delirious<br>♦ Rapid pulse<br>♦ Nausea<br>♦ Headache<br>♦ Dizziness<br>♦ Unconsciousness | ♦ Failure of body's cooling (sweating) mechanism | ♦ Summon medical assistance<br>♦ Move to shade<br>♦ Remove PPE<br>♦ Loosen street clothing<br>♦ Cool by fanning or applying damp compress or ice packs |

## TABLE 7-2: Heat Index Chart

| | Relative Humidity (%) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Temperature (F)** | **40** | **45** | **50** | **55** | **60** | **65** | **70** | **75** | **80** | **85** | **90** | **95** | **100** |
| **110** | 136 | | | | | | | | | | | | |
| **108** | 130 | 137 | | | | | | | | | | | |
| **106** | 124 | 130 | 137 | | | | | | | | | | |
| **104** | 119 | 124 | 131 | 137 | | | | | | | | | |
| **102** | 114 | 119 | 124 | 130 | 137 | | | | | | | | |
| **100** | 109 | 114 | 118 | 124 | 129 | 136 | | | | | | | |
| **98** | 105 | 109 | 113 | 117 | 123 | 128 | 134 | | | | | | |
| **96** | 101 | 104 | 108 | 112 | 116 | 121 | 126 | 132 | | | | | |
| **94** | 97 | 100 | 102 | 106 | 110 | 114 | 119 | 124 | 129 | 136 | | | |
| **92** | 94 | 96 | 99 | 101 | 105 | 108 | 112 | 116 | 121 | 126 | 131 | | |
| **90** | 91 | 93 | 95 | 97 | 100 | 103 | 106 | 109 | 113 | 117 | 122 | 127 | 132 |
| **88** | 88 | 89 | 91 | 93 | 95 | 98 | 100 | 103 | 106 | 110 | 113 | 117 | 121 |
| **86** | 85 | 87 | 88 | 89 | 91 | 93 | 95 | 97 | 100 | 102 | 106 | 108 | 112 |
| **84** | 83 | 84 | 85 | 86 | 88 | 89 | 90 | 92 | 94 | 96 | 98 | 100 | 103 |
| **82** | 81 | 82 | 83 | 84 | 84 | 85 | 86 | 88 | 89 | 90 | 91 | 93 | 95 |
| **80** | 80 | 80 | 81 | 81 | 82 | 82 | 83 | 84 | 84 | 85 | 86 | 86 | 87 |

## TABLE 7-3: Heat Index Risk Level and Associated Health Effects

| Heat Index | Associated Risk |
|---|---|
| >130 | **Extreme Danger**<br>Heat stroke highly likely with continued exposure |
| 105-130 | **Danger**<br>Heat exhaustion and heat cramps likely and heat stroke possible with prolonged exposure and/or physical activity |
| 90-105 | **Extreme Caution**<br>Heat cramps and heat exhaustion possible with prolonged exposure and/or physical activity |
| 80-90 | **Caution**<br>Fatigue possible with prolonged exposure and/or physical activity |

NOTES:

- Heat Index values were devised for shady, light wind conditions. Exposure to full sun may increase these values by up to 15 degrees.
- Heat Index values were devised for the general public wearing typical lightweight summer clothing. Acclimatized workers may be able to work under conditions with a slightly higher Heat Index.
- The use of personal protective equipment, including clothing increases the heat stress load on the body.

## 8. Client Specific Requirements

Client specific requirements for the work governed by this HASP are included in "Safety Standards for Contractors" included as Attachment 9.

## 9. Safe Work Practices and Standard Operating Procedures

### General Site Provisions

*Smoking and Eating Areas*
Smoking will only be allowed in designated areas. Upon mobilization at the site, the SSO will establish smoking areas per site-specific or client-specific requirements. Individuals caught smoking outside the designated smoking areas will be subject to disciplinary action up to and including immediate termination.

Upon mobilization at the site, the SSO will establish eating and break areas per site-specific or client-specific requirements. Eating will only be allowed in the designated areas and the areas will be maintained in a clean and sanitary condition.

*Sanitation and Potable Water*
Restrooms and hand washing facilities are available in the Manufacturing Building and other site buildings.

Containers used for drinking water will be equipped with a tap and capable of being tightly closed. In addition, the container will be labeled as "Drinking Water" or "Potable Water." Disposal cups will be stored in a sanitary condition and a receptacle for disposing of the cups will be near-by.

*Temporary Facilities*
This project will not require any temporary facilities.

### Standard Operating Procedures

The following standard operating procedures will be adhered to at all times.

- All personnel entering the site must check in with the SSO.
- All individuals entering the site must demonstrate to the SSO that they have been adequately trained as defined in Section 10.
- All individuals must be familiar with emergency communication methods and how to summon emergency assistance.
- Use of alcoholic beverages before, during operations, or immediately after hours is absolutely forbidden. Alcohol can reduce the ability to detoxify compounds absorbed into the body as the result of minor exposures and may have negative effects with exposure to other chemicals. In addition, alcoholic beverages will dehydrate the body and intensify the effects of heat stress.
- Horseplay of any type is forbidden.

- All unsafe conditions will be immediately reported to the SSO, who will document such conditions in the field log. The SSO will be responsible for ensuring that the unsafe condition is correctly as quickly as possible.
- Smoking, matches, and lighters are only allowed in the designated smoking area.
- Avoid contact with potentially contaminated substances. Avoid, whenever possible, kneeling on the ground, or leaning or sitting on trucks, equipment or the ground. Do not place equipment on potentially contaminated surfaces.
- If PPE becomes torn or saturated with contaminated material, immediately leave work area, and replace the affected PPE. Additionally, wash any exposed skin thoroughly with soap and water.

**Safe Work Practices**

*Ergonomics*

Ergonomic risk factors include repetitive motion, force, awkward posture and vibration. The key to preventing ergonomic injuries is education of personnel relative to the hazards and risk factors and implementation of proper controls and work practices. When completing JHAs the Project Health and Safety Consultant will assist project team members in identifying ergonomic risk factors and appropriate control methods.

Several tasks associated with this project have the potential to cause back injuries, if proper lifting techniques are not followed. Site workers should not lift objects that are beyond their physical capabilities and the use of mechanical devices such as forklifts is encouraged. Also, when shoveling site workers should not twist their backs while moving materials with the shovel. The proper technique is to move the feet.

Proper lifting techniques are summarized below.

- Place feet shoulder width apart with toes pointing slightly out;
- Bend at your knees keeping back straight;
- Get a good grip on the object and pull object close to your body;
- Tighten abdominal muscles;
- Keep your head up, looking forward, and lift with your legs while maintaining a straight back;
- Keep load close to your body and ensure your view is not obstructed;
- If one end of the load is heavier than the other, the heavier end should be closest to your body;
- Move your feet to relocate the object as opposed to twisting your back; and
- When placing the object down, bend your knees and use your leg muscles while keeping your back straight.

*Pre-Drilling/Pre-Excavation and Probing Protocol*
Prior to mobilizing to the field, the Project Manger will be responsible for ensuring the following issues have been adequately addressed.

- Verifying the Client has contacted the local one call service or equivalent to identify underground pipelines, utility lines, and fiber optic cable;
- Verifying the Client has contacted the appropriate municipality to identify underground water and sewer lines;
- Verifying the Client has contacted posted pipeline companies; and
- Contacting client to identify underground pipelines or other obstructions.

Prior to commencing drilling or excavating activities, the intended path will be hand-probed to a depth to ensure that the drilling or excavating activity will not hit an underground obstruction. Under no circumstances should drilling or excavating activities be conducted in an area that has not been probed. The probing rod will be pushed into the ground by hand and will not be struck with a hammer or other similar tool.

*Fall Protection*
This project does not involve working from heights more than six feet above grade.

In the event that a problem develops with the drill rig mast, the mast will be lowered to provide access below six feet above grade. The distance above grade is measured from the employee's feet to the grade or approved work surface.

*Weather Related Events*
Weather related events that may impact field work include, but are not limited to, rain, thunder, lightning, flash flooding and tornados. The SSO will be responsible for determining what site work can be performed safely in the rain and at what point work will cease due to either quality or safety issues. In the event of thunder and/or lightning, all work will be suspended until 15 minutes have elapsed from the last clap of thunder or flash of lightning.

During rain, lightning and/or thunder events, site workers should seek shelter in either a building or vehicle. In the event of a tornado, site workers should proceed to the closest shelter location as identified in Attachment 10 "Evacuation and Emergency Plan".

*Night Work*
This project will not involve activities being performed at night.

*Noise*
Employees performing any noisy task regardless of duration of the task, or employees working within 20 feet of the person performing the task will wear hearing protection consisting of either earplugs or earmuffs. Noisy tasks include, but are not limited to, operating heavy equipment, using power tools, and operation of a drill rig or geoprobe.

Personnel operating a drilling rig/geoprobe or standing within 20 feet of a drilling rig/geoprobe during operation will also wear hearing protection.

## 10. Employee Training

All employees and subcontractors working on-site, who may be exposed to hazardous substances, health hazards, or safety hazards and their supervisors and management responsible for the site will receive training meeting the requirements of 29 CFR 1910.120, *Hazardous Waste Operations and Emergency Response* (HAZWOPER) before they are permitted to engage in any job task. Employees will not be permitted to participate in or supervise field activities until they have been trained to a level required by their job function and responsibility. Once on-site all site workers will receive training covering at a minimum the following.

- Names of personnel and alternates responsible for site safety and health;
- Safety, health and other hazards present on the site;
- Use of PPE;
- Work practices by which the employee can minimize risks from hazards;
- Safe use of engineering controls and equipment on the site; and
- Medical surveillance requirements including recognition of symptoms and signs which might indicate overexposure to hazards.

In addition, all site workers are required to be trained on Whirlpool "Safety Standards for Contractors" (Attachment 9) and this HASP.

**Subcontractor Training**
The SSO will verify that subcontractor personnel have received all appropriate training as required by this HASP prior to their arriving on-site. Verification will consist of reviewing written training documentation such as copies of training certificates or cards issued be a Contractor Safety Council provided by the subcontractor. Copies of the written training documentation will be retained in the project file. Subcontractor personnel will not be allowed to work at the site unless said training documentation is available.

**Daily Tailgate Safety Meeting**
A tailgate safety meeting will be conducted each morning. The daily safety meeting meetings will include awareness concerns such as special concerns regarding health and safety, pollution prevention or a discussion of recent incidents or safety observations. Issues such as any changes to the HASP or JHAs and comments from the project personnel will be addressed daily. The meetings will include a discussion of what tasks will be completed that day and how those tasks will be conducted safely. The meetings will be documented on the Daily Safety Meeting form found in Attachment 5.

## 11. Medical Surveillance

All ERM employees are enrolled in a medical surveillance program. All employees receive an initial medical examination and consultation prior to assignment to any job site. In addition, employees receive an annual medical examination, a medical examination upon termination of employment, and a medical examination when the employee exhibits signs or symptoms relating to possible overexposure to hazardous substances or when an injury or exposure above published exposure limits has occurred in an emergency situation.

Additional medical surveillance should be provided for employees who:

- Are or may be exposed to hazardous substances or health hazards at or above published exposure levels for these substances for 30 days or more a year;
- Wear a respirator for 30 days or more a year or as required by 29 CFR 1910.134, *Respiratory Protection*; and
- Are injured, become ill or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation.

## 12. Site Control Measures

All ERM personnel and/or ERM subcontractors must sign in at the Whirlpool Contractor Gate when arriving on-site and must sign out when leaving the site at the end of the day. In addition, the SSO or designee shall check in with the Site contact on the first day of field activities.

For drilling and or excavation projects the work area shall be identified with flagging and a specific decontamination area shall be designated. Access to the work area shall be monitored by the SSO to keep unauthorized individuals away from the drilling and excavation activities.

## 13. Decontamination Procedures

Decontamination involves the orderly controlled removal of contaminants from both personnel and equipment. The purpose of decontamination procedures is to prevent the spreading of contaminated materials into uncontaminated areas. All site personnel should limit contact with contaminated soil, ground water or equipment in order to reduce the need for extensive decontamination.

Equipment and materials used in the decontamination process may include the following.

- High pressure/hot water cleaning using only potable water/fire water;
- Phosphate-free detergent;
- Five-gallon bucket;
- Potable water;

- Distilled water;
- Paper towels; and
- Brushes.

**Personnel Decontamination**
The following decontamination procedures will be utilized.

- Clean shoes with phosphate-free detergent and water;
- Remove all PPE and dispose of the PPE in the designated drums; and
- Wash hands and any skin that may have come in contact with affected soil or ground water with moistened disposable towels, such as baby wipes, or soap and water.

Spent PPE and decontamination water shall be stored in sealed containers for disposal by the Client.

**Equipment Decontamination**
The following decontamination procedures will be utilized for small equipment.

- Clean small equipment with phosphate-free detergent and water;
- Clean large equipment (drilling rig, track hole, front end loader, bobcat, bull dozer) using a high pressure/hot water cleaner with only potable water/fire water; and
- The decontamination of large equipment shall be conducted in a decontamination pad or pad designated by the Client and all wash water must be collected and stored for disposal by the Client.

Contaminated disposable equipment and decontamination water shall be stored in sealed containers for disposal by the Client.

## 14. Confined Space Entry Procedures

Entry into permit-required confined spaces is not anticipated. If a project task or activity would involve entry into a permit-required confined space or if there is a question as to whether or not a job task or activity involves a permit-required confined space, the Project Manager or SSO will contact the Project Health and Safety Consultant for assistance.

## 15. Spill Containment Program

The spill contamination program for this project will involve the use of preventative measures in order to reduce the potential for environmental releases. These preventative measures will include the following.

- Equipment inspection; and
- General housekeeping practices.

If project activities involve the use of drums or other containers, the drums or containers will meet the appropriate DOT regulations and will be inspected and their integrity assured prior to being moved. Operations will be organized so as to minimize drum or container movement. Drums or containers that cannot be moved without failure will be overpacked into an appropriate container.

**Hydraulic Fluid/Engine Oil/Fuel Spills**
In the event of an unexpected release of hydraulic fluid, engine oil, gasoline or diesel fuel, the release material will be absorbed with sorbent pads, which will be placed in a designated drum for disposal. Impacted soil will be excavated and placed on plastic sheeting and covered until characterization and/or disposal can be arranged.

## 16. Site Communication

Telephones will be used for communication between the project team and the client. Cell phones may be used as part of the communication method. However, cell phones cannot be used in operating process units or while driving any type of vehicle.

## 17. Communication and Review of Site-Specific Health and Safety Plan

An initial review of the site-specific HASP will be held either prior to mobilization or after mobilization but prior to commencing work at the site to communicate HASP details and answer questions to individuals working at the site. Daily tailgate safety meetings will be held each morning to review work practices for the day and to discuss safety issues. Any new hazard or safety information will be disseminated at the daily tailgate safety meeting or as needed throughout the day.

## 18. Emergency Repsonse Plan

This section describes possible contingencies and emergency procedures to be implemented at the site. Additionally, the Whirlpool "Evacuation/Emergency Plan is included as Attachment 10.

**Personnel Roles and Lines of Authority**
The SSO has primary responsibility for site evacuation and notification in the event of an emergency situation. This includes taking appropriate measures to ensure the safety of site personnel and the public. Possible actions may involve the evacuation of personnel from the site area and ensuring that corrective measures have been implemented, appropriate authorities notified, and follow-up reports completed. If the SSO is not available, the ERM Project Geologist/Engineer will assume these responsibilities. Subcontractors are responsible for assisting the SSO in their mission within the parameters of their scope of work.

**Emergency Alarms, Evacuation Routes and Procedures**
In the event of an emergency, it is important to be aware of the prevailing wind direction and evacuate upwind or crosswind. For drilling and excavation activities, the SSO shall designate at least two evacuation routes and muster points for each specific

work area. These routes and muster points shall be sketched on a site map and attached to the JHA and reviewed during the job safety meeting prior to starting work.

In the event of a tornado proceed to the nearest Whirlpool indoor shelter location as specified in Attachment 10. In the event of facility emergency while on Whirlpool property, proceed to the nearest outdoor muster point as specified in Attachment 10. If off-site during a facility emergency, remain off-site and move across wind away from the facility. The SSO shall notify the site contact of the location of all ERM personnel and subcontractors.

**Facility Requirements**

The following actions will be taken in the event of a plant evacuation or severe weather.

- The shelter areas and evacuation routes are posted at locations throughout the plant. A copy is included in Attachment 10;
- An intermittent siren means to proceed to shelter areas. Contractor will proceed to the location closest to their work area;
- A constant siren means to evacuate the Plant. The contractor will proceed to the exit closest to their work area;
- All persons, Whirlpool and Contractor personnel will remain in Shelter or out of the Plant until all clear is announced; and
- Contractor must make sure all potential danger is eliminated to the best of their ability before proceeding to shelter or evacuation. ( Machines, Lifts, lowered and turned off, torches and gases to torches turned off, electricity to welders and machines turned off.) It is recommended that someone be designated ahead of time to make sure these things are done, that everyone has left the area and following instructions.

**Assembly Points**

As work tasks outlined in this HASP may occur throughout the facility, primary assembly points and evacuation routes will vary. For drilling and excavation tasks, assembly points and evacuation routes will be designated by the SSO for each specific work area prior to starting work. The Assembly Points and evacuation routes will be illustrated on a site map and attached to the JHA.

In the event of an emergency requiring evacuation to an Assembly Point, the SSO will be responsible to account for the presence of all project team members and subcontractors on-site at the time of the emergency.

**Reporting Emergencies**

All, including any late developing or aggravated injuries, must receive prompt medical attention. For non-life threatening injuries or illnesses site workers should be transported to the hospital. For life threatening injuries or illnesses, the local emergency responders should be contacted via 911.

The SSO is responsible for reporting all injuries, illnesses, fires, spills/releases, property damage or near-misses to the following individuals.

- Injured/involved employee's supervisor;
- ERM Project Manager;
- ERM Partner-In-Charge;
- ERM Project Health and Safety Consultant; and
- Client Contact.

In the event of a chemical spill the SSO will contact the client contact and provide necessary assistance to aid the client contact in completing the steps outlined in Attachment 10.

The Project Health and Safety Consultant will be responsible for notifying the ERM Southwest Corporate Health and Safety Director of the incident. In addition, the Project Health and Safety Consultant will assist in completing any incident forms and assisting with the incident investigation.

**Emergency Contacts**
In the event of an emergency, the SSO will contact the following as appropriate.

This list must be completed at the Project Kick-off Meeting.

| ***Title/Name*** | ***Phone Numbers*** |
|---|---|
| ERM-Southwest, Inc., Partner-in-Charge<br>H. Reifert Hedgcoxe, P.G | Work: 281-600-1083<br>Home: 713-467-2838<br>Mobile: 713-248-8897 |
| Project Manager<br>Troy Meinen, P.G. | Work: 281-600-1027<br>Home: 713-839-8974<br>Mobile: 713-962-5495 |
| Site Safety Officer<br>TBD: Project Specific | Work:<br>Home:<br>Mobile: |
| Project Geologist/Engineer<br>TBD: Project Specific | Work:<br>Mobile: |
| Project Health and Safety Consultant<br>Jan Simon Clark, CIH, CSP | Work: 281-600-1029<br>Home: 281-225-9738<br>Mobile: 281-744-3250 |
| Primary Client Contact<br>Scott Horton | Work: 479-648-2698<br>Pager: 479-648-2737-495 |
| Secondary Client Contact<br>Rick Moore | Work: 479-648-7506<br>Pager: 479-648-2737-248 |
| Local Emergency Responders<br>Plant First Aid<br>Plant Ambulance<br>Off-Site Emergency | Phone:<br>479-648-2484<br>479-648-2277<br>911 |
| Hospital<br>St. Edward Mercy Medical Center<br>7301 Rogers Ave<br>Fort Smith, AR 72903<br><br>Sparks regional Medical Center<br>1311 South I Street<br>Fort Smith, AR 72901 | Phone: 479-484-6000<br><br><br><br><br>Phone: 479-441-4999 |

### Incident Investigations

An ERM Incident Form (Attachment 6) will be completed and forwarded to the Project Manager within 24 hours of an incident. All incidents will be investigated in a timely manner. The SSO and/or the Project Manager will schedule the investigation and include project supervision (ERM, subcontractors, and client), the injured/involved employee(s) and the Project Health and Safety Consultant. Root cause analysis will be performed to assess the apparent cause and identify corrective measures to be implemented to prevent re-occurrence. The last page of the Incident Form is used to document the investigation.

### Directions to Nearest Hospital

The nearest hospitals are St. Edward Mercy Medical Center and Sparks Regional Medical Center. A map and written directions to both medical facilities are located in Attachment 7.

### Emergency Drills

In accordance with the HAZWOPER Standard emergency response plans will be rehearsed regularly as part of the overall training program for site operations. The frequency of this drill (rehearsal) is outlined on Table 18-1. All drills will be documented on the Emergency Drill Evaluation Form found in Attachment 8. Drills do not need to be elaborate. A table-top scenario during the daily safety meeting is an adequate drill.

**TABLE 18-1: Emergency Drill Frequency**

| ***Project Duration*** | ***Drill Frequency*** |
|---|---|
| Less than 30 days | None, cover during review/sign-off of HASP |
| Greater than one month but less than one year | Once |
| Greater than one year | Annually |

## 19. Safety Equipment

A first aid kit containing first aid items for minor incidents only is maintained in each ERM Southwest vehicle. Drill rigs/geoprobes, if on site, will have a fire extinguisher on board.

Eye wash stations will be located in each ERM vehicle and will be staged in front of the drill rig/geoprobe during drilling operations.

## 20. Certification of Familiarity with Plan by Site Personnel

By signing below, signee certifies that they have read, understand and will abide by the contents of this HASP.

| Name | Signature | Company | Date |
|---|---|---|---|
| | | | |
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# Job Hazard Analysis Forms

*Attachment 1*

*August 15, 2003*

*W.O. #581-013*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

# Generic Job Hazard Analysis Form

*August 15, 2003*
*W.O. #581-013*

ERM

# Generic Job Hazard Analysis

## (Fill Out As Needed for New Activities if Not Covered Under Other JHA)

Required for those projects that don't require a HASP (see Project Safety Evaluation Checklist).

Prior to conducting fieldwork a Job Hazard Analysis must be completed and reviewed with all members of the Project Team. At the time of site mobilization, the Job Hazard Analysis will be verified and reviewed again with the Project Team at the beginning of each day as fieldwork continues.

| | |
|---|---|
| Client: | W.O. # |
| Project Name: | |
| Location: | |
| ERM Principal-in-Charge: | Date: |
| ERM Project Manager: | Revision No.: |
| ERM Project Team: | |
| Subcontractors: | |

**Field Work Description**

NOTE: For any hazards that are not applicable for your task, mark the left hand column with N/A. Do not leave any hazards blank.

| Hazard Identification | Describe Hazard Control (appropriate for site) |
|---|---|
| Job Location/Setting: | ☐ Industrial area on navigable water bodies<br>☐ Commercial area<br>☐ Urban area<br>☐ Residential area<br>☐ Undeveloped/vacant<br>☐ Lone worker |
| ☐ Chemicals at site<br>List or attach separate page | ☐ MSDS location ________________________<br>☐ PPE (see PPE Section)<br>☐ Exposure monitoring<br>☐ Decontamination: Circle method:<br>Liquinox w/distilled water rinse<br>High-pressure water rinse<br>Water rinse<br>Other (specify) ________________________ |
| ☐ Chemicals ERM will take to site | ☐ Attach copies of MSDSs for all chemicals taken to client's site. |
| ☐ Dust –Describe source | ☐ PPE (see PPE Section)<br>☐ Exposure monitoring (see monitoring section)<br>☐ Dust suppression |

| **Hazard Identification** | **Describe Hazard Control (appropriate for site)** |
| --- | --- |
| ☐ Underground Utilities | ☐ Texas One Call or equivalent contacted at least 48 hours but no sooner than 14 days in advance of drilling?<br>☐ Have posted pipeline or other companies been contacted?<br>☐ Has Principal-in-Charge been notified and approved working within 10 feet of a fiber optic line?<br>☐ Have the municipal utilities (gas, water and sewer) been contacted?<br>☐ Have utilities been marked within entire work area?<br>☐ Has client identified any underground piping ?<br>☐ Has each drilling location been probed to at least 10 feet or to the drilling depth (whichever is shallower)?<br>☐ Has client approved drilling locations and utility clearance? |
| ☐ Overhead Lines | ☐ Have lines been deactivated and locked out if drilling or equipment operation is within 20 feet of overhead lines?<br>☐ Spotter for overhead lines during rig/equipment movement |
| ☐ Confined Space | Contact ERM Health and Safety for assistance |
| ☐ Combustible materials, Fire, Explosion | ☐ Remove combustible materials<br>☐ Relocate work<br>☐ Isolation/Lock-out Tag-out (LOTO)<br>☐ Area air monitoring<br>☐ PPE/Flame Retardant Clothing (FRC) (See PPE Section)<br>☐ Fire watch<br>☐ Fire extinguisher available |
| ☐ Heat/Cold Stress | ☐ Work/Rest regimen<br>☐ Task rotation, shared tasks<br>☐ Source of cool water/electrolyte replacement drinks<br>☐ Ventilation<br>☐ Wear appropriate clothing for the weather |
| ☐ Lightning/Thunder | ☐ Suspend all work until 15 minutes after last thunder or lightning<br>☐ Take shelter in vehicle or building<br>☐ Do not stand under trees or near drilling rig |
| ☐ Rain | ☐ Determine what work can be performed safely in rain<br>☐ Determine what point work will be stopped due to quality/safety issues |
| ☐ Biting/Stinging Insects | ☐ Use insect repellent<br>☐ Survey work location for presence of stinging insect nests (ant mounds, wasp nests, bee hives, etc.) |
| ☐ Poisonous Plants (Ivy, Oak, Sumac, etc.)<br><br>NOTE: Use of weed killing herbicides not allowed unless applied by client | ☐ Review plant identification information<br>☐ Remove/maintain plant material (mowing, weed-eating)<br>☐ Use Poisonous Plant Protection<br>    ☐ Barrier Cream<br>    ☐ Personal protective equipment (disposable coveralls, gloves, disposable boots, tape at wrists and ankles) |
| ☐ Snakes | ☐ Remove/maintain plant material (mowing, weed-eating)<br>☐ Survey work locations for presence of snakes<br>☐ Use snake guards to protect legs |
| ☐ Noise – Describe source | ☐ PPE (see PPE Section)<br>☐ Relocate work<br>☐ Control noise source |
| ☐ Lighting/Visibility | ☐ Adequate for task<br>☐ Nighttime considerations<br>☐ PPE (see PPE Section)<br>☐ Safety cones |

| Hazard Identification | Describe Hazard Control (appropriate for site) |
|---|---|
| ☐ Lifting, Pulling, Pushing, Repetitive Motion | ☐ Get equipment designed for the job<br>☐ Proper technique<br>☐ Smaller, lighter loads<br>☐ Prepare for "unexpected release"<br>☐ Move feet to turn with load |
| ☐ Airborne/Flying Material | ☐ Cover/Shield source<br>☐ PPE (see PPE Section)<br>☐ Positioning |
| ☐ Rotating/Moving Equipment and Pinch Points | ☐ Energy isolation, Lock-out/Tag-out (LOTO)<br>☐ Guarding, barricading<br>☐ No loose clothing<br>☐ Positioning |
| ☐ Sharp Objects | ☐ Guarding<br>☐ PPE (see PPE Section)<br>☐ Positioning |
| ☐ Falling Objects | ☐ Secure objects<br>☐ Guarding, covers<br>☐ PPE (see PPE Section)<br>☐ Barricading |
| ☐Hazards from others working in vicinity | ☐ Communication: Specify Method |
| ☐ Environmental Spill | ☐ Containment<br>☐ Waste Plan<br>☐ Waste containers<br>☐ Other |
| ☐ Site-specific training required | ☐ Specify training requirement: |
| ☐ Client-specific safety procedure/policy required? | ☐ Specify client specific safety procedure or policy (attach a copy) |
| ☐ Client permit required? | ☐ Specify method for obtaining permit: |
| ☐ Subcontractor on -site | ☐ Obtain proof of required (including site-specific) training<br>☐ Obtain proof of required (including site-specific) medical surveillance |
| ☐ Other Hazards | ☐ Description: |

**Exposure Monitoring**

The following equipment will be used to monitor personal exposure:

____________________________________________________________

____________________________________________________________

____________________________________________________________

____________________________________________________________

**Emergency Plan (required for every site job)**

| | |
|---|---|
| Method of obtaining assistance | |
| Evacuation Route | |

| | |
|---|---|
| Prevailing wind direction | |
| Emergency call list | 911 or Other emergency #:<br>ERM Project Manager:<br>ERM Principal In-Charge:<br>Client Contact:<br>Subcontractor Contact: |
| Emergency assembly area | |

**Emergency Plan**

| | |
|---|---|
| First aid equipment availability | First Aid kit is available in each ERM vehicle.<br>Eye-wash bottles available |
| Nearest Medical Assistance<br>Address:<br><br>Phone Number: | |

**Personal Protective Equipment Required** (Check boxes to indicate PPE requirements)

- ☐ Field clothes (long or short sleeve shirt, long pants)
- ☐ Disposable coveralls: specify type:
- ☐ High visibility or reflective vests
- ☐ Flame Retardant Clothing
- ☐ Hard-hat
- ☐ Steel toe boots/shoes
- ☐ Disposable shoe covers
- ☐ Respiratory Protection
  - ☐ Half-face cartridge respirator, cartridge type:
  - ☐ Cartridge change frequency
  - ☐ Other respirator type
- ☐ Gloves: specify type(s) ______________________________________________
- ☐ Hearing protection: specify type(s) ________________________________________
- ☐ Eye Protection: Safety glasses with side shields

- ☐ Additional eye protection (specify)

_____________________________________________

PPE Hazard Assessment Certified by: ______________________________________________
(Note: PPE can be certified by any knowledgeable staff member)
Date: ____________

Project team (including subcontractors) has seen, been briefed and understand the contents of this Job Hazard Analysis.

| Name | Signature | Date |
|---|---|---|
| | | |
| | | |
| | | |
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| | | |

# Job Hazard Analysis Form
# Geoprobe/Drilling Activities

*August 15, 2003*
*W.O. #581-013*

ERM

# Job Hazard Analysis
## Geoprobe/Drilling Activities

Required for those projects that don't require a HASP (see Project Safety Evaluation Checklist).

Prior to conducting fieldwork a Job Hazard Analysis must be completed and reviewed with all members of the Project Team. At the time of site mobilization, the Job Hazard Analysis will be verified and reviewed again with the Project Team at the beginning of each day as fieldwork continues.

| | |
|---|---|
| Client: Whirlpool Corporation | W.O. # |
| Project Name: | |
| Location: Fort Smith, Arkansas | |
| ERM Principal-in-Charge: Reiffert Hedgcoxe | Date: |
| ERM Project Manager: Troy Meinen | Revision No.: |
| ERM Project Team: | |
| Subcontractors: | |

**Field Work Description**

Conduct soil borings or monitor well installation using geoprobes or hollow-stem auger drill rig.

NOTE: For any hazards that are not applicable for your task, mark the left hand column with N/A. Do not leave any hazards blank.

| Hazard Identification | Describe Hazard Control (appropriate for site) |
|---|---|
| Job Location/Setting: | ☐ Industrial area on navigable water bodies<br>☐ Commercial area<br>☐ Urban area<br>☐ Residential area<br>☐ Undeveloped/vacant<br>☐ Lone worker |
| ■ Chemicals at site<br>List or attach separate page<br><br>See HASP | ■ MSDS location See HASP/WHR Contact<br>■ PPE (see PPE Section)<br>■ Exposure monitoring<br>■ Decontamination: Circle method:<br>Liquinox w/distilled water rinse<br>High-pressure water rinse<br>Water rinse<br>Other (specify) ______________________ |
| ■ Chemicals ERM will take to site | ■ See HASP for MSDSs for all chemicals taken to client's site. |
| ☐ Dust –Describe source | ☐ PPE (see PPE Section)<br>☐ Exposure monitoring (see monitoring section)<br>☐ Dust suppression |

| Hazard Identification | Describe Hazard Control (appropriate for site) |
|---|---|
| ■ Underground Utilities | ☐ Utility Locator Service contacted at least 48 hours but no sooner than 14 days in advance of drilling?<br>☐ Have posted pipeline or other companies been contacted?<br>☐ Has Principal-in-Charge been notified and approved working within 10 feet of a fiber optic line?<br>☐ Have the municipal utilities (gas, water and sewer) been contacted?<br>☐ Have utilities been marked within entire work area?<br>☐ Has client identified any underground piping ?<br>☐ Has each drilling location been probed to at least 10 feet or to the drilling depth (whichever is shallower)?<br>☐ Has client approved drilling locations and utility clearance? |
| ■ Overhead Lines | ☐ Have lines been deactivated and locked out if drilling or equipment operation is within 20 feet of overhead lines?<br>☐ Spotter for overhead lines during rig/equipment movement |
| ☐ Confined Space | Contact ERM Health and Safety for assistance |
| ■ Combustible materials, Fire, Explosion | ■ Remove combustible materials<br>☐ Relocate work<br>☐ Isolation/Lock-out Tag-out (LOTO)<br>☐ Area air monitoring<br>☐ PPE/Flame Retardant Clothing (FRC) (See PPE Section)<br>☐ Fire watch<br>■ Fire extinguisher available |
| ■ Heat/Cold Stress | ■ Work/Rest regimen<br>■ Task rotation, shared tasks<br>■ Source of cool water/electrolyte replacement drinks<br>☐ Ventilation<br>■ Wear appropriate clothing for the weather |
| ■ Lightning/Thunder | ■ Suspend all work until 15 minutes after last thunder or lightning<br>■ Take shelter in vehicle or building<br>■ Do not stand under trees or near drilling rig |
| ■ Rain | ■ Determine what work can be performed safely in rain<br>■ Determine what point work will be stopped due to quality/safety issues |
| ■ Biting/Stinging Insects | ☐ Use insect repellent<br>■ Survey work location for presence of stinging insect nests (ant mounds, wasp nests, bee hives, etc.) |
| ■ Poisonous Plants (Ivy, Oak, Sumac, etc.)<br><br>NOTE: Use of weed killing herbicides not allowed unless applied by client | ■ Review plant identification information<br>☐ Remove/maintain plant material (mowing, weed-eating)<br>☐ Use Poisonous Plant Protection<br>  ☐ Barrier Cream<br>  ☐ Personal protective equipment (disposable coveralls, gloves, disposable boots, tape at wrists and ankles) |
| ■ Snakes | ☐ Remove/maintain plant material (mowing, weed-eating)<br>■ Survey work locations for presence of snakes<br>☐ Use snake guards to protect legs |
| ■ Noise – Describe source | ■ PPE (see PPE Section)<br>☐ Relocate work<br>☐ Control noise source |
| ☐ Lighting/Visibility | ☐ Adequate for task<br>☐ Nighttime considerations<br>☐ PPE (see PPE Section)<br>☐ Safety cones |

| Hazard Identification | Describe Hazard Control (appropriate for site) |
|---|---|
| ■ Lifting, Pulling, Pushing, Repetitive Motion | ■ Get equipment designed for the job<br>■ Proper technique<br>■ Smaller, lighter loads<br>■ Prepare for "unexpected release"<br>■ Move feet to turn with load |
| ■ Airborne/Flying Material | ☐ Cover/Shield source<br>■ PPE (see PPE Section)<br>■ Positioning |
| ■ Rotating/Moving Equipment and Pinch Points | ☐ Energy isolation, Lock-out/Tag-out (LOTO)<br>■ Guarding, barricading<br>■ No loose clothing<br>■ Positioning |
| ■ Sharp Objects | ■ Guarding<br>■ PPE (see PPE Section)<br>■ Positioning |
| ☐ Falling Objects | ☐ Secure objects<br>☐ Guarding, covers<br>☐ PPE (see PPE Section)<br>☐ Barricading |
| ☐Hazards from others working in vicinity | ☐ Communication: Specify Method |
| ■ Environmental Spill | ■ Containment<br>■ Waste Plan<br>■ Waste containers<br>☐ Other |
| ☐ Site-specific training required | ☐ Specify training requirement: |
| ☐ Client-specific safety procedure/policy required? | ☐ Specify client specific safety procedure or policy (attach a copy) |
| ☐ Client permit required? | ☐ Specify method for obtaining permit: |
| ■ Subcontractor on -site | ■ Obtain proof of required (including site-specific) training<br>■ Obtain proof of required (including site-specific) medical surveillance |
| ☐ Other Hazards | ☐ Description: |

**Exposure Monitoring**

The following equipment will be used to monitor personal exposure:

OVM 580B with 11.8 bulb

**Emergency Plan (required for every site job)**

| | |
|---|---|
| Method of obtaining assistance | 911 |
| Evacuation Route | |

| | |
|---|---|
| Prevailing wind direction | |
| Emergency call list | 911 or Other emergency #: 911<br>ERM Project Manager: Troy Meinen, (713) 962-5495<br>ERM Principal In-Charge: Reif Hedgcoxe, (281) 600-1083<br>Client Contact: Scott Horton, (479) 648-2737, x495<br>Subcontractor Contact: |
| Emergency assembly area | |

**Emergency Plan**

| | |
|---|---|
| First aid equipment availability | First Aid kit is available in each ERM vehicle and drill rig.<br>Eye-wash bottles available in ERM vehicle |
| Nearest Medical Assistance<br>Address:<br><br>Phone Number: | <br>See HASP<br><br>See HASP |

**Personal Protective Equipment Required** (Check boxes to indicate PPE requirements)

■ Field clothes (long or short sleeve shirt, long pants)
☐ Disposable coveralls: specify type:
☐ High visibility or reflective vests
☐ Flame Retardant Clothing
■ Hard-hat when within 20 feet of drill rig/geoprobe
■ Steel toe boots/shoes when within 20 feet of drill rig
☐ Disposable shoe covers
☐ Respiratory Protection
  ☐ Half-face cartridge respirator, cartridge type:
  ☐ Cartridge change frequency
  ☐ Other respirator type
■ Gloves: specify type(s) surgical latex or nitrile or general work gloves depending on task
■ Hearing protection: specify type(s) ear plugs within 20 ft of drill rig
■ Eye Protection: Safety glasses with side shields

☐ Additional eye protection (specify)
______________________________________________________________

PPE Hazard Assessment Certified by: ____________________________________________________________
(Note: PPE can be certified by any knowledgeable staff member)
Date: ____________

Project team (including subcontractors) has seen, been briefed and understand the contents of this Job Hazard Analysis.

| Name | Signature | Date |
|---|---|---|
| | | |
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# Job Hazard Analysis Form
# Ground Water Sampling/Well Development

*August 15, 2003*
*W.O. #581-013*

# Job Hazard Analysis
## Ground Water Sampling/Well Development

Required for those projects that don't require a HASP (see Project Safety Evaluation Checklist).

Prior to conducting fieldwork a Job Hazard Analysis must be completed and reviewed with all members of the Project Team. At the time of site mobilization, the Job Hazard Analysis will be verified and reviewed again with the Project Team at the beginning of each day as fieldwork continues.

| | |
|---|---|
| Client: Whirlpool Corporation | W.O. # |
| Project Name: | |
| Location: Fort Smith, Arkansas | |
| ERM Principal-in-Charge: Reiffert Hedgcoxe | Date: |
| ERM Project Manager: Troy Meinen | Revision No.: |
| ERM Project Team: | |
| Subcontractors: | |

**Field Work Description**

| |
|---|
| Gauge water levels in wells. Purge water from wells using pumps or bailers. Collect samples from monitor wells. |

NOTE: For any hazards that are not applicable for your task, mark the left hand column with N/A. Do not leave any hazards blank.

| **Hazard Identification** | **Describe Hazard Control (appropriate for site)** |
|---|---|
| Job Location/Setting: | ☐ Industrial area on navigable water bodies<br>☐ Commercial area<br>☐ Urban area<br>☐ Residential area<br>☐ Undeveloped/vacant<br>☐ Lone worker |
| ■ Chemicals at site<br>List or attach separate page<br><br>See HASP | ■ MSDS location <u>See HASP/WHR Contact</u><br>■ PPE (see PPE Section)<br>☐ Exposure monitoring<br>■ Decontamination: Circle method:<br><u>Liquinox w/distilled water rinse</u><br>High-pressure water rinse<br>Water rinse<br>Other (specify) ______________ |
| ■ Chemicals ERM will take to site | ■ See HASP for MSDSs for all chemicals taken to client's site. |
| ☐ Dust –Describe source | ☐ PPE (see PPE Section)<br>☐ Exposure monitoring (see monitoring section)<br>☐ Dust suppression |

| Hazard Identification | Describe Hazard Control (appropriate for site) |
|---|---|
| ☐ Underground Utilities | ☐ Utility Locator Service contacted at least 48 hours but no sooner than 14 days in advance of drilling?<br>☐ Have posted pipeline or other companies been contacted?<br>☐ Has Principal-in-Charge been notified and approved working within 10 feet of a fiber optic line?<br>☐ Have the municipal utilities (gas, water and sewer) been contacted?<br>☐ Have utilities been marked within entire work area?<br>☐ Has client identified any underground piping ?<br>☐ Has each drilling location been probed to at least 10 feet or to the drilling depth (whichever is shallower)?<br>☐ Has client approved drilling locations and utility clearance? |
| ☐ Overhead Lines | ☐ Have lines been deactivated and locked out if drilling or equipment operation is within 20 feet of overhead lines?<br>☐ Spotter for overhead lines during rig/equipment movement |
| ☐ Confined Space | Contact ERM Health and Safety for assistance |
| ☐ Combustible materials, Fire, Explosion | ☐ Remove combustible materials<br>☐ Relocate work<br>☐ Isolation/Lock-out Tag-out (LOTO)<br>☐ Area air monitoring<br>☐ PPE/Flame Retardant Clothing (FRC) (See PPE Section)<br>☐ Fire watch<br>☐ Fire extinguisher available |
| ■ Heat/Cold Stress | ■ Work/Rest regimen<br>■ Task rotation, shared tasks<br>■ Source of cool water/electrolyte replacement drinks<br>☐ Ventilation<br>■ Wear appropriate clothing for the weather |
| ■ Lightning/Thunder | ■ Suspend all work until 15 minutes after last thunder or lightning<br>■ Take shelter in vehicle or building<br>■ Do not stand under trees or near drilling rig |
| ■ Rain | ■ Determine what work can be performed safely in rain<br>■ Determine what point work will be stopped due to quality/safety issues |
| ■ Biting/Stinging Insects | ☐ Use insect repellent<br>■ Survey work location for presence of stinging insect nests (ant mounds, wasp nests, bee hives, etc.) |
| ■ Poisonous Plants (Ivy, Oak, Sumac, etc.)<br><br>NOTE: Use of weed killing herbicides not allowed unless applied by client | ■ Review plant identification information<br>☐ Remove/maintain plant material (mowing, weed-eating)<br>☐ Use Poisonous Plant Protection<br>  ☐ Barrier Cream<br>  ☐ Personal protective equipment (disposable coveralls, gloves, disposable boots, tape at wrists and ankles) |
| ■ Snakes | ☐ Remove/maintain plant material (mowing, weed-eating)<br>■ Survey work locations for presence of snakes<br>☐ Use snake guards to protect legs |
| ■ Noise – Describe source | ■ PPE (see PPE Section)<br>☐ Relocate work<br>☐ Control noise source |
| ☐ Lighting/Visibility | ☐ Adequate for task<br>☐ Nighttime considerations<br>☐ PPE (see PPE Section)<br>☐ Safety cones |

| Hazard Identification | Describe Hazard Control (appropriate for site) |
|---|---|
| ■ Lifting, Pulling, Pushing, Repetitive Motion | ■ Get equipment designed for the job<br>■ Proper technique<br>■ Smaller, lighter loads<br>■ Prepare for "unexpected release"<br>■ Move feet to turn with load |
| ☐ Airborne/Flying Material | ☐ Cover/Shield source<br>☐ PPE (see PPE Section)<br>☐ Positioning |
| ☐ Rotating/Moving Equipment and Pinch Points | ☐ Energy isolation, Lock-out/Tag-out (LOTO)<br>☐ Guarding, barricading<br>☐ No loose clothing<br>☐ Positioning |
| ■ Sharp Objects | ☐ Guarding<br>■ PPE (see PPE Section)<br>■ Positioning |
| ☐ Falling Objects | ☐ Secure objects<br>☐ Guarding, covers<br>☐ PPE (see PPE Section)<br>☐ Barricading |
| ■ Hazards from others working in vicinity | ■ Communication: Specify Method |
| ■ Environmental Spill | ■ Containment<br>■ Waste Plan<br>■ Waste containers<br>☐ Other |
| ☐ Site-specific training required | ☐ Specify training requirement: |
| ☐ Client-specific safety procedure/policy required? | ☐ Specify client specific safety procedure or policy (attach a copy) |
| ☐ Client permit required? | ☐ Specify method for obtaining permit: |
| ☐ Subcontractor on -site | ☐ Obtain proof of required (including site-specific) training<br>☐ Obtain proof of required (including site-specific) medical surveillance |
| ☐ Other Hazards | ☐ Description: |

**Exposure Monitoring**

The following equipment will be used to monitor personal exposure:

None

**Emergency Plan (required for every site job)**

| | |
|---|---|
| Method of obtaining assistance | 911 |
| Evacuation Route | See HASP for evacuation/shelter instructions and maps |
| Prevailing wind direction | |

| | |
|---|---|
| Emergency call list | 911 or Other emergency #: 911<br>ERM Project Manager: Troy Meinen, (713) 962-5495<br>ERM Principal In-Charge: Reif Hedgcoxe, (281) 600-1083<br>Client Contact: Scott Horton, (479) 648-2737, x495<br>Subcontractor Contact: |
| Emergency assembly area | See HASP for evacuation/shelter assembly area maps |

**Emergency Plan**

| | |
|---|---|
| First aid equipment availability | First Aid kit is available in each ERM vehicle<br>Eye-wash bottles available in ERM vehicle |
| Nearest Medical Assistance<br>Address:<br><br>Phone Number: | <br>See HASP<br><br>See HASP |

**Personal Protective Equipment Required** (Check boxes to indicate PPE requirements)

■ Field clothes (long or short sleeve shirt, long pants)
☐ Disposable coveralls: specify type:
☐ High visibility or reflective vests
☐ Flame Retardant Clothing
☐ Hard-hat when within 20 feet of drill rig/geoprobe
☐ Steel toe boots/shoes when within 20 feet of drill rig
☐ Disposable shoe covers
☐ Respiratory Protection
    ☐ Half-face cartridge respirator, cartridge type:
    ☐ Cartridge change frequency
    ☐ Other respirator type
■ Gloves: specify type(s) surgical latex or nitrile or general work gloves depending on task
■ Hearing protection: specify type(s) ear plugs within 20 ft of generator if used
■ Eye Protection: Safety glasses with side shields

☐ Additional eye protection (specify)
________________________________________

PPE Hazard Assessment Certified by: ________________________________
(Note: PPE can be certified by any knowledgeable staff member)
Date: __________

Project team (including subcontractors) has seen, been briefed and understand the contents of this Job Hazard Analysis.

| Name | Signature | Date |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

# Material Safety Data Sheets

*Attachment 2*

*August 11, 2003*
*W.O. #581-013*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

**MSDS** *Material Safety Data Sheet*

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# SODIUM HYDROXIDE, 0.01 to 0.1 NORMAL VOLUMETRIC SOLUTIONS

**MSDS Number: S4038 --- *Effective Date: 05/17/01***

## 1. Product Identification

**Synonyms:** None
**CAS No.:** 1310-73-2
**Molecular Weight:** 40.00
**Chemical Formula:** NaOH in water
**Product Codes:**
J.T. Baker: 5653, 5663, 5664
Mallinckrodt: 6146, H350, H373

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Sodium Hydroxide | 1310-73-2 | 0 - 0.4% | No |
| Water | 7732-18-5 | > 99% | No |

# 3. Hazards Identification

**Emergency Overview**
--------------------------
**WARNING! HARMFUL IF SWALLOWED. MAY CAUSE IRRITATION TO SKIN, EYES, RESPIRATORY TRACT AND GASTROINTESTINAL TRACT.**

**J.T. Baker SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

-----------------------------------------------------------------------------------------------------------

Health Rating: 2 - Moderate
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Orange (General Storage)

-----------------------------------------------------------------------------------------------------------

**Potential Health Effects**
----------------------------------

The health effects from exposure to diluted forms of this chemical are not well documented. They are expected to be less severe than those for concentrated forms which are referenced in the descriptions below.

**Inhalation:**
Mists are irritants to respiratory tract.
**Ingestion:**
Corrosive. Swallowing may cause burns of the mouth, throat and stomach.
**Skin Contact:**
Can be corrosive to skin. May cause irritation.
**Eye Contact:**
Sodium Hydroxide: Corrosive! May cause irritation of eyes, and with greater exposures, severe burns with possibly blindness resulting.
**Chronic Exposure:**
Prolonged contact can dehydrate and remove oils from skin.
**Aggravation of Pre-existing Conditions:**
Persons with pre-existing skin disorders may be susceptible to these solutions.

## 4. First Aid Measures

**Inhalation:**
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
**Ingestion:**
DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Call a physician immediately.
**Skin Contact:**
Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician, immediately. Wash clothing before reuse.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

**Note to Physician:**
Perform endoscopy in all cases of suspected sodium hydroxide ingestion. In cases of severe esophageal corrosion, the use of therapeutic doses of steroids should be considered. General supportive measures with continual monitoring of gas exchange, acid-base balance, electrolytes, and fluid intake are also required.

---

## 5. Fire Fighting Measures

**Fire:**
Not considered to be a fire hazard.
**Explosion:**
Not considered to be an explosion hazard.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire.
**Special Information:**
Use protective clothing and breathing equipment appropriate for the surrounding fire.

---

## 6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer!

J. T. Baker NEUTRACIT(R)-2 or BuCAIM(R) caustic neutralizers are recommended for spills of this product.

---

## 7. Handling and Storage

Keep in a tightly closed container. Store in a cool, dry, ventilated area. Protect against physical damage. Separate from acids and alkalis. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. Protect from freezing.

---

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
Sodium hydroxide:
-OSHA Permissible Exposure Limit (PEL):
2 mg/m3 Ceiling
-ACGIH Threshold Limit Value (TLV):
2 mg/m3 Ceiling
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
Not expected to require personal respirator usage. If the exposure limit is exceeded, a half-face dust/mist respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece dust/mist respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING:

Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
**Eye Protection:**
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

---

## 9. Physical and Chemical Properties

**Appearance:**
Clear, colorless solution.
**Odor:**
Odorless.
**Solubility:**
Miscible in water.
**Density:**
1.0-1.05
**pH:**
12 - 13 (0.01N-0.2N)
**% Volatiles by volume @ 21C (70F):**
> 90 (as water)
**Boiling Point:**
ca. 100C (ca. 212F)
**Melting Point:**
ca. 0C (ca. 32F)
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**
No information found.

---

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
No hazardous decomposition products.
**Hazardous Polymerization:**

Will not occur.
**Incompatibilities:**
Sodium hydroxide in contact with acids and organic halogen compounds, especially trichloroethylene, may causes violent reactions. Contact with nitromethane and other similar nitro compounds causes formation of shock-sensitive salts. Contact with metals such as aluminum, magnesium, tin, and zinc cause formation of flammable hydrogen gas. Sodium hydroxide, even in fairly dilute solution, reacts readily with various sugars to produce carbon monoxide. Precautions should be taken including monitoring the tank atmosphere for carbon monoxide to ensure safety of personnel before vessel entry.
**Conditions to Avoid:**
Heat, incompatibles.

---

# 11. Toxicological Information

Sodium hydroxide: irritation data: skin, rabbit: 500 mg/24H severe; eye rabbit: 50 ug/24H severe. Investigated as a mutagen.

--------\Cancer Lists\------------------------------------------------------

| | ---NTP Carcinogen--- | | |
|---|---|---|---|
| Ingredient | Known | Anticipated | IARC Category |
| ----------------------------------- | ----- | ----------- | ------------- |
| Sodium Hydroxide (1310-73-2) | No | No | None |
| Water (7732-18-5) | No | No | None |

---

# 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

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# 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

Not regulated.

## 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Sodium Hydroxide (1310-73-2) | Yes | Yes | Yes | Yes |
| Water (7732-18-5) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\---------------------------------

| | | --Canada-- | | |
|---|---|---|---|---|
| Ingredient | Korea | DSL | NDSL | Phil. |
| Sodium Hydroxide (1310-73-2) | Yes | Yes | No | Yes |
| Water (7732-18-5) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------------

| | -SARA 302- | | ------SARA 313------ | |
|---|---|---|---|---|
| Ingredient | RQ | TPQ | List | Chemical Catg. |
| Sodium Hydroxide (1310-73-2) | No | No | No | No |
| Water (7732-18-5) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------------

-RCRA- -TSCA-

| Ingredient | CERCLA | 261.33 | 8(d) |
|---|---|---|---|
| Sodium Hydroxide (1310-73-2) | 1000 | No | No |
| Water (7732-18-5) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Liquid)

**Australian Hazchem Code:** No information found.
**Poison Schedule:** No information found.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

# 16. Other Information

**NFPA Ratings:** Health: **1** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
WARNING! HARMFUL IF SWALLOWED. MAY CAUSE IRRITATION TO SKIN, EYES, RESPIRATORY TRACT AND GASTROINTESTINAL TRACT.
**Label Precautions:**
Avoid breathing mist.
Avoid contact with eyes, skin and clothing.
Wash thoroughly after handling.
Keep container closed.
Use with adequate ventilation.
**Label First Aid:**
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. In all cases get medical attention immediately.
**Product Use:**
Laboratory Reagent.
**Revision Information:**

No changes.

**Disclaimer:**

************************************************************************************************

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**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

**MSDS** *Material Safety Data Sheet*

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# SULFURIC ACID, 52 - 100 %

**MSDS Number: S8234 --- *Effective Date: 02/18/02***

## 1. Product Identification

**Synonyms:** Oil of vitriol; Babcock acid; sulphuric acid
**CAS No.:** 7664-93-9
**Molecular Weight:** 98.08
**Chemical Formula:** H2SO4 in H2O
**Product Codes:**
J.T. Baker: 5030, 5137, 5374, 5802, 5815, 5889, 5897, 5960, 5961, 5971, 5997, 6902, 9673, 9674, 9675, 9676, 9679, 9680, 9681, 9682, 9684, 9687, 9691, 9693, 9694
Mallinckrodt: 2468, 2876, 2878, 2900, 2904, 3780, 4222, 5524, 5557, H644, H976, H996, V344, V651, XL003

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Sulfuric Acid | 7664-93-9 | 52 - 100% | Yes |
| Water | 7732-18-5 | 0 - 48% | No |

# 3. Hazards Identification

**Emergency Overview**
--------------------------
**POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR CONTACTED WITH SKIN. HARMFUL IF INHALED. AFFECTS TEETH. WATER REACTIVE. CANCER HAZARD. STRONG INORGANIC ACID MISTS CONTAINING SULFURIC ACID CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.**

**SAF-T-DATA$^{(tm)}$** Ratings (Provided here for your convenience)
-----------------------------------------------------------------------------------------------------------
Health Rating: 4 - Extreme (Poison)
Flammability Rating: 0 - None
Reactivity Rating: 2 - Moderate
Contact Rating: 4 - Extreme (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White (Corrosive)
-----------------------------------------------------------------------------------------------------------

**Potential Health Effects**
----------------------------------

**Inhalation:**
Inhalation produces damaging effects on the mucous membranes and upper respiratory tract. Symptoms may include irritation of the nose and throat, and labored breathing. May cause lung edema, a medical emergency.
**Ingestion:**
Corrosive. Swallowing can cause severe burns of the mouth, throat, and stomach, leading to death. Can cause sore throat, vomiting, diarrhea. Circulatory collapse with clammy skin, weak and rapid pulse, shallow respirations, and scanty urine may follow ingestion or skin contact. Circulatory shock is often the immediate cause of death.
**Skin Contact:**
Corrosive. Symptoms of redness, pain, and severe burn can occur. Circulatory collapse with clammy skin, weak and rapid pulse, shallow respirations, and scanty urine may follow skin contact or ingestion. Circulatory shock is often the immediate cause of death.

**Eye Contact:**
Corrosive. Contact can cause blurred vision, redness, pain and severe tissue burns. Can cause blindness.
**Chronic Exposure:**
Long-term exposure to mist or vapors may cause damage to teeth. Chronic exposure to mists containing sulfuric acid is a cancer hazard.
**Aggravation of Pre-existing Conditions:**
Persons with pre-existing skin disorders or eye problems or impaired respiratory function may be more susceptible to the effects of the substance.

---

## 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.
**Ingestion:**
DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Call a physician immediately.
**Skin Contact:**
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Excess acid on skin can be neutralized with a 2% solution of bicarbonate of soda. Call a physician immediately.
**Eye Contact:**
Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Call a physician immediately.

---

## 5. Fire Fighting Measures

**Fire:**
Concentrated material is a strong dehydrating agent. Reacts with organic materials and may cause ignition of finely divided materials on contact.
**Explosion:**
Contact with most metals causes formation of flammable and explosive hydrogen gas.
**Fire Extinguishing Media:**
Dry chemical, foam or carbon dioxide. Do not use water on material. However, water spray may be used to keep fire exposed containers cool.

**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Structural firefighter's protective clothing is ineffective for fires involving this material. Stay away from sealed containers.

## 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRASORB® or TEAM® 'Low Na+' acid neutralizers are recommended for spills of this product.

## 7. Handling and Storage

Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect from physical damage. Keep out of direct sunlight and away from heat, water, and incompatible materials. Do not wash out container and use it for other purposes. When diluting, always add the acid to water; never add water to the acid. When opening metal containers, use non-sparking tools because of the possibility of hydrogen gas being present. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

# 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
For Sulfuric Acid:
- OSHA Permissible Exposure Limit (PEL) -
1 mg/m3 (TWA)
- ACGIH Threshold Limit Value (TLV) -
1 mg/m3(TWA), 3 mg/m3 (STEL), A2 - suspected human carcinogen for sulfuric acid contained in strong inorganic acid mists.

**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece respirator with an acid gas cartridge and particulate filter (NIOSH type N100 filter) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P particulate filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres. Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.

**Skin Protection:**
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

**Eye Protection:**
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

---

# 9. Physical and Chemical Properties

**Appearance:**
Clear oily liquid.

**Odor:**
Odorless.
**Solubility:**
Miscible with water, liberates much heat.
**Specific Gravity:**
1.84 (98%), 1.40 (50%), 1.07 (10%)
**pH:**
1 N solution (ca. 5% w/w) = 0.3; 0.1 N solution (ca. 0.5% w/w) = 1.2; 0.01 N solution (ca. 0.05% w/w) = 2.1.
**% Volatiles by volume @ 21C (70F):**
No information found.
**Boiling Point:**
ca. 290C (ca. 554F) (decomposes at 340C)
**Melting Point:**
3C (100%), -32C (93%), -38C (78%), -64C (65%).
**Vapor Density (Air=1):**
3.4
**Vapor Pressure (mm Hg):**
1 @ 145.8C (295F)
**Evaporation Rate (BuAc=1):**
No information found.

---

# 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage. Concentrated solutions react violently with water, spattering and liberating heat.
**Hazardous Decomposition Products:**
Toxic fumes of oxides of sulfur when heated to decomposition. Will react with water or steam to produce toxic and corrosive fumes. Reacts with carbonates to generate carbon dioxide gas, and with cyanides and sulfides to form poisonous hydrogen cyanide and hydrogen sulfide respectively.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Water, potassium chlorate, potassium perchlorate, potassium permanganate, sodium, lithium, bases, organic material, halogens, metal acetylides, oxides and hydrides, metals (yields hydrogen gas), strong oxidizing and reducing agents and many other reactive substances.
**Conditions to Avoid:**
Heat, moisture, incompatibles.

---

# 11. Toxicological Information

**Toxicological Data:**
Oral rat LD50: 2140 mg/kg; inhalation rat LC50: 510 mg/m3/2H; standard Draize, eye rabbit, 250 ug (severe); investigated as a tumorigen, mutagen, reproductive effector.
**Carcinogenicity:**
Cancer Status: The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mists containing sulfuric acid" as a known human carcinogen, (IARC category 1). This classification applies only to mists containing sulfuric acid and not to sulfuric acid or sulfuric acid solutions.

--------\Cancer Lists\------------------------------------------------------

| | ---NTP Carcinogen--- | | |
|---|---|---|---|
| Ingredient | Known | Anticipated | IARC Category |
| Sulfuric Acid (7664-93-9) | No | No | None |
| Water (7732-18-5) | No | No | None |

# 12. Ecological Information

**Environmental Fate:**
When released into the soil, this material may leach into groundwater. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition. When released into the air, this material may be removed from the atmosphere to a moderate extent by dry deposition.
**Environmental Toxicity:**
LC50 Flounder 100 to 330 mg/l/48 hr aerated water/Conditions of bioassay not specified; LC50 Shrimp 80 to 90 mg/l/48 hr aerated water /Conditions of bioassay not specified; LC50 Prawn 42.5 ppm/48 hr salt water /Conditions of bioassay not specified.
This material may be toxic to aquatic life.

# 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

# 14. Transport Information

**Domestic (Land, D.O.T.)**
-----------------------
**Proper Shipping Name:** SULFURIC ACID (WITH MORE THAN 51% ACID)
**Hazard Class:** 8
**UN/NA:** UN1830
Packing Group: II
**Information reported for product/size:** 440LB

**International (Water, I.M.O.)**
-----------------------------
**Proper Shipping Name:** SULPHURIC ACID (WITH MORE THAN 51% ACID)
**Hazard Class:** 8
**UN/NA:** UN1830
Packing Group: II
**Information reported for product/size:** 440LB

---

# 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Sulfuric Acid (7664-93-9) | Yes | Yes | Yes | Yes |
| Water (7732-18-5) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\---------------------------------

| | | --Canada-- | | |
|---|---|---|---|---|
| Ingredient | Korea | DSL | NDSL | Phil. |
| Sulfuric Acid (7664-93-9) | Yes | Yes | No | Yes |
| Water (7732-18-5) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
| --- | --- | --- | --- | --- |
| Sulfuric Acid (7664-93-9) | 1000 | 1000 | Yes | No |
| Water (7732-18-5) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
| --- | --- | --- | --- |
| Sulfuric Acid (7664-93-9) | 1000 | No | No |
| Water (7732-18-5) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: Yes
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: Yes (Pure / Liquid)

**Australian Hazchem Code:** 2P
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

# 16. Other Information

**NFPA Ratings:** Health: **3** Flammability: **0** Reactivity: **2** Other: **Water reactive**
**Label Hazard Warning:**
POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR CONTACTED WITH SKIN. HARMFUL IF INHALED. AFFECTS TEETH. WATER REACTIVE. CANCER HAZARD. STRONG INORGANIC ACID MISTS CONTAINING SULFURIC ACID CAN CAUSE CANCER. Risk of cancer depends on

duration and level of exposure.

**Label Precautions:**

Do not get in eyes, on skin, or on clothing.
Do not breathe mist.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Do not contact with water.

**Label First Aid:**

In all cases call a physician immediately. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before re-use. Excess acid on skin can be neutralized with a 2% bicarbonate of soda solution. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

**Product Use:**

Laboratory Reagent.

**Revision Information:**

MSDS Section(s) changed since last revision of document include: 3.

**Disclaimer:**



**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

Oglebay Norton

Industrial Sands, Inc.

# MATERIAL SAFETY DATA SHEET
# Oglebay Norton Industrial Sands, Inc.

Date Prepared: February 14, 2001

## SECTION I – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product Names/Trade Names:**
**Silica Sand sold under various names: Oglebay Norton Industrial Sands, Inc., Colorado Silica Sand ®, Glass Sand, Flint**

**Synonyms/Common Names: Sand, Silica Sand, Quartz, Crystalline Silica, Flint, Ground Silica, Foundry Sand, Engine Sand, Frac Sand, Filtration Sand, Bunker Sand, Turf Sand, Glass Sand**

**Manufacturer's Name: Oglebay Norton Industrial Sands, Inc.**

**OGLEBAY NORTON INDUSTRIAL SANDS, INC.**
**1000 Oglebay Norton Drive**
**Brady, TX 76825-0429**
**Telephone Number for Information: 915-597-0721**
**Toll Free Telephone Number: 800-858-4123**

## SECTION II – COMPOSITION/INFORMATION ON INGREDIENTS

**Hazardous Ingredient: Crystalline silica (quartz), typically 90.0% to 99.9%**

**Chemical Formula: $SiO_2$**
**CAS#: 14808-60-7**

**OSHA PEL: Exposure to airborne crystalline silica shall not exceed an 8-hour time-weighted average limit as stated in 29 CFR §1910.1000 Table Z-1-A, Air Contaminants, specifically:**

$$\frac{10\ \text{mg/m}^3}{\text{SiO}_2+2}$$

**ACGIH TLV: Crystalline Silica (quartz)**
**TLV-TWA = 0.1 mg/m$^3$ Respirable Crystalline Silica (quartz)**

See Threshold Limit Value and Biological Exposure Indices for American Conference of Governmental Industrial Hygienists (latest edition).

**Other Recommended Limits:**
National Institute for Occupational Safety and Health (NIOSH). Recommended standard maximum permissible concentration=0.05 $mg/m^3$ (respirable free silica) as determined by a full-shift sample up to 10-hour working day, 40-hour work week. See NIOSH Criteria for a Recommended Standard Occupational Exposure to Crystalline Silica.

**CAUTION:**
Crystalline silica exists in several forms, the most common of which is quartz. If crystalline silica (quartz) is heated to more than 870°C it can change to a form of crystalline silica known as trydimite, and if crystalline silica (quartz) is heated to more than 1470°C, it can change to a form of crystalline silica known as cristobalite. Crystalline silica as trydimite and cristobalite are more fibrogenic than crystalline silica as quartz. The OSHA PEL for crystalline silica as trydimite and cristobalite is one-half the PEL for crystalline silica (quartz); the ACGIH TLV for crystalline silica as trydimite and cristobalite is one-half the TLV for crystalline silica as quartz.

## SECTION III – HAZARD IDENTIFICATION

**EMERGENCY OVERVIEW:**

Oglebay Norton Industrial Sands, Inc. material is a white or tan sand, or ground sand. It is not flammable, combustible or explosive. Crystalline silica (quartz) is not known to be an environmental hazard.

Crystalline silica (quartz) is incompatible with hydrofluoric acid, fluorine, chlorine trifluoride or oxygen difluoride.

**POTENTIAL HEALTH EFFECTS:**

Inhalation:

a. Silicosis Respirable crystalline silica (quartz) can cause silicosis, a fibrosis (scarring) of the lungs. Silicosis may be progressive; it may lead to disability and death.
b. Cancer Respirable crystalline silica (quartz) inhaled from occupational sources is classified as carcinogenic to humans.
c. Scleroderma There is evidence that exposure to respirable crystalline silica or that the disease silicosis is associated with the increased incidence of scleroderma, an autoimmune disorder manifested by a fibrosis (scarring) of the skin and internal organs.
d. Tuberculosis Silicosis increases the risk of tuberculosis.
e. Nephrotoxicity There are several studies suggesting that exposure to respirable crystalline silica or that the disease silicosis is associated with the increased incidence of kidney disorders.
f. Arthritis There is evidence that exposure to respirable crystalline silica is associated with the increased incidence of crippling arthritis.

**Eye Contact**: Crystalline silica (quartz) may cause abrasion of the cornea.

**Skin Contact**: May cause skin irritation. See Section VII.

**Ingestion:** Not applicable.

**Chronic Effects**: The adverse health effects—silicosis, cancer, scleroderma, tuberculosis, nephrotoxicity and arthritis —are chronic effects.

**Signs and Symptoms of Exposure**: There are generally no signs or symptoms of exposure to crystalline silica (quartz). Often, chronic silicosis has no symptoms. The symptoms of chronic silicosis, if present, are shortness of breath, wheezing, cough and sputum production. The symptoms of acute silicosis are the same; additionally, weight loss and fever are associated with acute silicosis. The symptoms of scleroderma include thickening and stiffness of the skin, particularly in the fingers, shortness of breath, difficulty swallowing and joint problems.

**Medical Conditions Generally Aggravated by Exposure**: The condition of individuals with lung disease (e.g., bronchitis, emphysema, chronic obstructive pulmonary disease) can be aggravated by exposure.

See Section XI, Toxicological Information, for additional detail on potential adverse health effects.

## SECTION IV – FIRST-AID MEASURES

**Inhalation**: No specific first-aid is necessary since the adverse health effects associated with exposure to crystalline silica (quartz) result from chronic exposures. If there is a gross inhalation of crystalline silica (quartz), remove the person immediately to fresh air, give artificial respiration as needed, seek medical attention as needed.

**Eye Contact**: Wash immediately with water. If irritation persists, seek medical attention.

**Skin Contact**: Not applicable.

**Ingestion**: Not applicable.

## SECTION V – FIRE FIGHTING MEASURES

**Flammability:** Crystalline silica (quartz) is non-flammable and non-explosive
**Extinguishing Media:** None required
**Flash Point:** None
**Special Fire Fighting Procedures:** N/A
**Flammable Limits:** None
**Unusual Fire and Explosion Hazards:** None

## SECTION VI – ACCIDENTAL RELEASE MEASURES

**Spills:** Use dustless methods (vacuum) and place into closable container for disposal, or flush with water. Do not dry sweep. Wear protective equipment specified below.

**Waste Disposal Method:** See Section XIII.

## SECTION VII – HANDLING AND STORAGE

**WARNING LABEL**
**DO NOT BREATHE THIS MATERIAL**
**Never Use This Material For Sand Blasting**

Silica sand material contains fine dust. If you breathe this dust you can suffer severe, irreversible lunge damage and death. Some medical reports state inhalation of silica dust may cause lung cancer. Medical reports also link breathing silica dust to crippling arthritis and skin and eye irritation.

You must never use this material without having a government-approved respirator. The work area must also be thoroughly ventilated by the use of forced air ventilation during and after use of this material.

Prior to use or handling, you are advised to review and thoroughly understand all health precautions outlined in the Material Safety Data Sheet (MSDS) provided to you by your employer by the supplier of this material.

**Respirator Protection**
It is a violation of federal safety laws (OSHA) for employers to require workers to use this material without full respiratory protection. The federal laws that apply are: 29CFR 1910.134; 29CFR 1910.1000; 29CFR 1910.94.

**Ventilation**

Finely divided silica dust is nearly invisible. Work areas must be thoroughly ventilated with forced ventilation fans sufficient to exhaust all silica dust and provide a complete air exchange every five minutes. Continue ventilation even after operations have been completed.

**Other Protective Equipment**
Dust can be harmful to skin and eyes. You need to wear tight goggles, heavy rubber gloves. Clothing should be tight fitting at the cuffs, neck and ankles to prevent dust from contacting your body. Clothing should be regularly washed to prevent dust accumulation.

**Warning Symptoms and First Aid**
If you experience shortness of breath, coughing, lung and/or throat irritation these may be early warning signs that silica dust is causing a medical condition such as silicosis. Avoid further contact with the material and see your doctor at once if such symptoms occur. Swelling of joints, and joint pain, may signal the start of arthritis, which is also reported to be aggravated by silica exposure. Again, if such symptoms occur seek immediate medical attention.
If eye contact and irritation take place, flush your eyes continuously with clear cold water for at least 15 minutes and then see your doctor for an examination and possible treatment.

**Precautions During Storage**
Avoid breakage of bagged material or spills of bulk material. See control measures in Section VIII.

Safety Notes: Federal safety regulations require that employers train workers in the safe use of this material and that they hold periodic safety meetings to assure that safety precautions are being maintained. Report any concerns about these issues to OSHA, at (202)999-OSHA.

The OSHA Hazard Communication Standard, 29 CFR Sections 1910.1200, 1915.99, 1917.28, 1918.90, 1926.59, and 1928.21, and state and local worker or community "right to know" laws and regulations should be strictly followed.

WARN YOUR EMPLOYEES (AND YOUR CUSTOMERS IN CASE OF RESALE) BY POSTING AND OTHER MEANS OF THE HAZARDS AND THE REQUIRED OSHA PRECAUTIONS. PROVIDE TRAINING FOR YOUR EMPLOYEES ABOUT THE OSHA PRECAUTIONS FOR HANDLING CRYSTALLINE SILICA.
See also American Society for Testing and Materials (ASTM) standard practice E 1132-86, "Standard Practice for Health Requirements Relating to Occupational Exposure to Quartz Dust."

**For Additional Health and Safety Information, Call OSHA, at (202) 999-OSHA**

## SECTION VIII – EXPOSURE CONTROLS/PERSONAL PROTECTION

**Local Exhaust**
Use sufficient local exhaust to reduce the level of respirable crystalline silica to below the PEL. See ACGIH "Industrial Ventilation, A Manual of Recommended Practice" (latest edition).

**Respiratory Protection**
The following chart specifies the types of respirators that may provide respiratory protection for crystalline silica.

| CONDITION<br>Particulate Concentration | MINIMUM RESPIRATORY PROTECTION* |
|---|---|
| 10 x PEL or less | Any particulate respirator, except single-use or quarter-mask respirator.<br>Any fume respirator or high efficiency particulate filter respirator.<br>Any supplied-air respirator.<br>Any self-contained breathing apparatus. |
| 50 x PEL or less | A high efficiency particulate filter respirator with a full facepiece.<br>Any supplied-air respirator with a full facepiece, helmet, or hood.<br>Any self-contained breathing apparatus with a full facepiece. |
| 500 x PEL or less | A powered air-purifying respirator with a high efficiency particulate filter.<br>A Type C supplied-air respirator operated in pressure-demand or other positive pressure or continuous-flow mode. |
| Greater than 500 x PEL or entry and escape from unknown concentrations | A type C, supplied-air respirator with a full facepiece, hood, or helmet, operated in a positive pressure mode (see 29 CFR1910.94(a)) (iii) )<br>Also see 30 CFR Part 11. |
| ***Use only NIOSH-approved or MSHA-approved equipment. See 29 CFR §1910.134 and 42 CFR §84.** | |
| See also ANSI standard Z88.2 (latest revision) "American National Standard for Respiratory Protection" | |

Silica Sand (Brady, Colorado Springs, Riverside, Bakersfield)

**Permissible Exposure Levels:**

| Component | CAS Number | Percentage (by weight) |
|---|---|---|
| Crystalline Silica (Quartz) | 14808-60-7 | 90.0 – 99.9 |

| Exposure Guidelines | | | | | | |
|---|---|---|---|---|---|---|
| **OSHA** | | **ACGIH** | | **NIOSH** | | |
| **TWA** | **STEL** | **TWA** | **STEL** | **TWA** | **STEL** | **Unit** |
| 10 % Si02+2 | None | .1 | None | .05 | None | $mg/m^3$ |

## SECTION IX – PHYSICAL AND CHEMICAL PROPERTIES

**Appearance:** White or tan sand; granular, crushed, or ground

**Odor:** None

Boiling Point: 4046°F
Vapor Pressure (mm Hg.): None
Specific Gravity (Water = 1): 2.65
Vapor Density (Air = 1): None
Melting Point: 3110°F

**Solubility in Water:** Insoluble in water
Evaporation Rate (Butyl Acetate = 1): None

## SECTION X – STABILITY AND REACTIVITY

**Stability:** Crystalline silica (quartz) is stable.

**Incompatibility (Materials to Avoid):** Contact with powerful oxidizing agents such as fluorine, chlorine trifluoride, oxygen difluoride, may cause fires.

**Hazardous Decomposition or Byproducts:** Silica will dissolve in hydrofluoric acid and produce a corrosive gas - silicon tetrafluoride.

**Hazardous Polymerization:** Will not occur.

## SECTION XI – TOXICOLOGICAL INFORMATION

### A. SILICOSIS

The major concern is silicosis, caused by the inhalation and retention of respirable crystalline silica dust. Silicosis can exist in several forms, chronic (or ordinary), accelerated, or acute.

Chronic or Ordinary Silicosis is the most common form of silicosis, and can occur after many years of exposure to relatively low levels of airborne respirable crystalline silica dust. It is further defined as either simple or complicated silicosis.

Simple silicosis is characterized by lung lesions (shown as radiographic opacities) less than 1 centimeter in diameter, primarily in the upper lung zones. Often, simple silicosis is not associated with symptoms, detectable changes in lung function or disability.

Simple silicosis may be progressive and may develop into complicated silicosis or progressive massive fibrosis (PMF). Complicated silicosis or PMF is characterized by lung lesions (shown as radiographic opacities) greater than 1 centimeter in diameter. Although there may be no symptoms associated with complicated silicosis or PMF, the symptoms, if present, are shortness of breath, wheezing, cough and sputum production. Complicated silicosis or PMF may be associated with decreased lung function and may be disabling. Advanced complicated silicosis or PMF may lead to death. Advanced complicated silicosis or PMF can result in heart disease secondary to the lung disease (cor pumonale).

Accelerated Silicosis can occur with exposure to high concentrations of respirable crystalline silica over a relatively short period; the lung lesions can appear within five (5) years of the initial exposure. The progression can be rapid. Accelerated silicosis is similar to chronic or ordinary silicosis, except that the lung lesions appear earlier and the progression is more rapid.

Acute Silicosis can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as a few months. The symptoms of acute silicosis include progressive shortness of breath, fever, cough and weight loss. Acute silicosis is fatal.

### B. CANCER

IARC - The International Agency for Research on Cancer ("IARC") concluded that there was "*sufficient evidence* in humans for the carcinogenicity of crystalline silica in the forms of quartz or cristobalite from occupational sources", and that there is "*sufficient evidence* in experimental animals for the carcinogenicity of quartz and cristobalite." The overall IARC evaluation was that "crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is *carcinogenic to humans* (*Group 1*)." The IARC evaluation noted that "carcinogenicity was not detected in all industrial circumstances studies. Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs." For further information on the IARC evaluation, see IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 68, "Silica, Some Silicates..." (1997). (Emphasis added)

NTP - The National Toxicology Program, in its Sixth Annual Report on Carcinogens, concluded that "silica, crystalline (respirable)" may reasonably be anticipated to be a carcinogen, based on sufficient evidence in experimental animals and limited evidence in humans.

OSHA - Crystalline silica (quartz) is not regulated by the U. S. Occupational Safety and Health Administration as a carcinogen.

There is substantial literature on the issues of the carcinogenicity of crystalline silica, which the reader should consult for additional information. A summary of the literature is set forth in "Exposure to crystalline silica and risk of lung cancer; the epidemiological evidence", Thorax, Volume 51, pp. 97-102 (1996). The official statement of the American Thoracic Society on the issue of silica carcinogenicity was published in "Adverse Effects of Crystalline Silica Exposure", American Journal of Respiratory and Critical Care Medicine, Volume 155, pp. 761-765 (1997). The official statement concluded that "The available data support the conclusion that silicosis produces increased risk for bronchogenic carcinoma. The cancer risk may also be increased by smoking and other carcinogens in the workplace. Epidemiologic studies provide convincing evidence for increased cancer risk among tobacco smokers with silicosis. Less information is available for never-smokers and for workers exposed to silica but who do not have silicosis. For workers with silicosis, the risks for lung cancer are relatively high and consistent among various countries and investigators. Silicosis should be considered a condition that predisposes workers to an increased risk of lung cancer." Id. at 763.

## C. SCLERODERMA

There is evidence that exposure to respirable crystalline silica or that the disease silicosis is associated with the increased incidence of scleroderma, an immune system disorder manifested by a fibrosis (scarring) of the lungs, skin and other internal organs. Recently, the American Thoracic Society noted that "there is persuasive evidence relating scleroderma to occupational silica exposures in setting where there is appreciable silicosis risk." The following may be consulted for additional information on silica, silicosis and scleroderma (also known as progressive systemic sclerosis): Occupational Lung Disorders, Third Edition, Chapter 12, entitled "Silicosis and Related Diseases", Parkes, W. Raymond (1994). "Adverse Effects of Crystalline Silica Exposure", American Journal of Respiratory and Critical Care Medicine, Volume 155, pp. 761-765 (1997).

## D. TUBERCULOSIS

Individuals with silicosis are at increased risk to develop tuberculosis, if exposed to persons with tuberculosis. The following may be consulted for further information: Occupational Lung Disorders, Third Edition, Chapter 12, entitled "Silicosis and Related Diseases", Parkes, W. Raymond (1994). "Adverse Effects of Crystalline Silica Exposure", American Journal of Respiratory and Critical Care Medicine, Volume 155, pp. 761-765 (1997).

### E. NEPHROTOXICITY

There are several recent studies suggesting that exposure to respirable crystalline silica or that the disease silicosis is associated with the increased incidence of kidney disorders. The following may be consulted for additional information on silica, silicosis and nephrotoxicity: Occupational Lung Disorders, Third Edition, Chapter 12, entitled "Silicosis and Related Diseases", Parkes, W. Raymond (1994). "Further evidence of human silica nephrotoxicity in occupationally exposed workers", British Journal of Industrial Medicine, Vol. 50, No. 10, pp. 907-912 (1993). "Adverse Effects of Crystalline Silica Exposure", American Journal of Respiratory and Critical Care Medicine, Volume 155, pp. 761-765 (1997).

### F. ARTHRITIS

There are recent studies suggesting that exposure to respirable crystalline silica or that the disease silicosis is associated with the increased incidence of arthritis. The following may be consulted for additional information on silica exposure and arthritis: American Journal of Industrial Medicine, Volume 35, pp. 375-381 "Connective Tissue Disease and Silicosis", Rosenman KD; Moore-Fuller M.; Reilly MJ. (1999). Environmental Health Perspective, Volume 107, pp. 793-802 "Occupational Exposure to Crystalline Silica and Autoimmune Disease", Parks CG; Conrad K; Cooper GS. (1999).

## SECTION XII – ECOLOGICAL INFORMATION

Crystalline silica (quartz) is not known to be ecotoxic; i.e., no data suggests that crystalline silica (quartz) is toxic to birds, fish, invertebrates, microorganisms or plants. For additional information on crystalline silica (quartz), see Sections IX (physical and chemical properties) and X (stability and reactivity) of this MSDS.

## SECTION XIII – DISPOSAL CONSIDERATIONS

**General:** The material may be landfilled; however, used material may contain materials derived from other sources that because of contamination may not be disposed of in landfills. Disposed material should be covered to minimize generation of airborne dust.

**RCRA:** Crystalline silica (quartz) is not classified as a hazardous waste under the Resource Conservation and Recovery Act, or its regulations, 40 CFR §261 et seq.

The above applies to materials as sold by Oglebay Norton Industrial Sands, Inc. The material may be contaminated during use, and it is the responsibility of the user to assess the appropriate disposal of the used material.

## SECTION XIV – TRANSPORT INFORMATION

Crystalline silica (quartz) is not a hazardous material for purposes of transportation under the U.S. Department of Transportation Table of Hazardous Materials, 49 CFR §172.101.

## SECTION XV – REGULATORY INFORMATION

**UNITED STATES (FEDERAL AND STATE)**

**RCRA:** Crystalline silica (quartz) is not classified as a hazardous waste under the Resource Conservation and Recovery Act, or its regulations, 40 CFR §261 et seq.

**CERCLA:** Crystalline silica (quartz) is not classified as a hazardous substance under regulations of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), 40 CFR §302.

**Emergency Planning and Community Right to Know Act:** Crystalline silica (quartz) is not an extremely hazardous substance under Section 302 and is not a toxic chemical subject to the requirements of Section 313.

**Clean Air Act:** Crystalline silica (quartz) mined and processed by Oglebay Norton Industrial Sands, Inc. was not processed with or does not contain any Class I or Class II ozone depleting substances.

**TSCA No.:** Crystalline silica (quartz) appears on the EPA TSCA inventory under the CAS No. 14808-60-7.

**FDA:** Silica is included in the list of substances that may be included in coatings used in food contact surfaces, 21 CFR §175.300(b)(3)(xxvi).

**NTP:** Respirable crystalline silica (quartz) is classified as a probable carcinogen.

**OSHA Carcinogen:** Respirable crystalline silica (quartz) is not listed.

**California Proposition 65:** Respirable crystalline silica (quartz) is classified as a substance known to the state of California to be a carcinogen.

**WHMIS Classification: D-2A**

**OTHER**

**EINECS No.: 231-545-4**

**EEC Label (Risk/Safety Phrases): R 48/20, R 40/20, S22, S38**

**IARC:** Crystalline silica (quartz) is classified in IARC Group 1.

National, state, city, county or local emergency planning, community right to know or other laws, regulations or ordinances may be applicable—consult applicable national, state, provincial or local laws.

## SECTION XVI – OTHER INFORMATION

**Hazardous Material Information System (HMIS):**

| | |
|---|---|
| **Health** | * |
| **Flammability** | **0** |
| Reactivity | **0** |
| **Protective Equipment** | **E** |

*** For further information on health effects, see Sections III and XI of this MSDS.**

**National Fire Protection Association (NFPA):**

| | |
|---|---|
| **Health** | **0** |
| **Flammability** | **0** |
| **Reactivity** | **0** |

http://www.msha.gov - The Mine Safety Health Administration Home Page, which contains general (not mining specific) information on silicosis. Click on "Silicosis Prevention".
http://www.cdc.gov/niosh/silicpag.html - NIOSH Hotlinks to Silicosis Prevention.

**OGLEBAY NORTON INDUSTRIAL SANDS, INC. DISCLAIMER**

**THE INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN ARE BASED UPON DATA BELIEVED TO BE CORRECT. HOWEVER, NO GUARANTEE OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, IS MADE WITH RESPECT TO THE INFORMATION CONTAINED HEREIN. WE ACCEPT NO RESPONSIBILITY AND DISCLAIM ALL LIABILITY FOR ANY HARMFUL EFFECTS WHICH MAY BE CAUSED BY EXPOSURE TO OUR SILICA. CUSTOMER-USERS OF SILICA MUST COMPLY WITH ALL APPLICABLE HEALTH AND SAFETY LAWS, REGULATIONS, AND ORDERS, INCLUDING THE OSHA HAZARDOUS COMMUNICATION STANDARD.**

# MATERIAL SAFETY DATA SHEET (MSDS) FOR PORTLAND CEMENT

(Complies with OSHA's Hazard Communication Standard, 29 CFR 1910.1200)

**CEMEX CEMENT OF TEXAS, L.P.**
**BLACONES CEMENT PLANT**
**2880 WALD ROAD**
**NEW BRAUNFELS, TEXAS 78132**

## Section 1 - IDENTIFICATION

| Supplier/Manufacturer | Emergency Contact Information |
|---|---|
| CEMEX Cement of Texas, L.P.<br>Balcones Cement Plant<br>2880 Wald Road<br>New Braunfels, Texas 78132 | (210) 250-4100 |

| Chemical name and synonyms | Product name |
|---|---|
| Portland Cement (CAS #65997-15-1) | "CEMEX Type I"<br>"CEMEX Type II"<br>"CEMEX Type I/II" |

Chemical family

Calcium salts.

Formula

| | |
|---|---|
| $3CaO.SiO_2$ | (CAS #12168-85-3) |
| $2CaO.SiO_2$ | (CAS #10034-77-2) |
| $3CaO.Al_2O_3$ | (CAS #12042-78-3) |
| $4CaO.Al_2O_3.Fe_2O_3$ | (CAS #12068-35-8) |
| $CaSO_4.2H_2O$ | (CAS #13397-24-5) |

Other salts: Small amounts of MgO, and trace amounts of $K_2SO_4$ and $Na_2SO_4$ may also be present.

## Section 2 - COMPONENTS

Hazardous Ingredients

Portland cement clinker (CAS# 65997-15- 1) - approximately - 93.5-96.0 % by weight
ACGIH TLV-TWA (2000) = 10 mg total dust/$m^3$
OSHA PEL (8-hour TWA) = 50 million particles/$ft^3$

Gypsum/Calcium Sulfate Dihydrate (CAS# 7778-18-9) - approximately - 4.0-6.5 % by weight
ACGIH TLV-TWA (2000) = 10 mg total dust/$m^3$
OSHA PEL (8-hour TWA) = 15 mg total dust/$m^3$
OSHA PEL (8-hour TWA) = 5 mg respirable dust/$m^3$

Respirable quartz (CAS# 14808-60-7) - approximately - 0.01-0.06 % by weight
ACGIH TLV-TWA (2000) = 0.05 mg respirable quartz dust/$m^3$
OSHA PEL (8-hour TWA) = (10 mg respirable dust/$m^{3)}$/(percent silica + 2)

Trace Ingredients

Trace amounts of naturally occurring chemicals might be detected during chemical analysis. Trace constituents may include up to 0.75% insoluble residue, some of which may be free crystalline silica, calcium oxide (Also known as lime or quick lime), magnesium oxide, potassium sulfate, sodium sulfate, chromium compounds, and nickel compounds.

## Section 3 - HAZARD IDENTIFICATION

Emergency Overview

Portland cement is a light gray powder that poses little immediate hazard. A single short-term exposure to the dry powder is not likely to cause serious harm. However, exposure of sufficient duration to wet portland cement can cause serious, potentially irreversible tissue (skin or eye) destruction in the form of chemical (caustic) burns. The same type of tissue destruction can occur if wet or moist areas of the body are exposed for sufficient duration to dry portland cement.

Potential Health Effects

**Relevant Routes of Exposure:**
Eye contact, skin contact, inhalation, and ingestion.

**Effects Resulting from Eye Contact:**
Exposure to airborne dust may cause immediate or delayed irritation or inflammation. Eye contact by large amounts of dry powder or splashes of wet portland cement may cause effects ranging from moderate eye irritation to chemical burns or blindness. Such exposures require immediate first aid (see Section 4) and medical attention to prevent significant damage to the eye.

**Effects Resulting from Skin Contact:**
Discomfort or pain cannot be relied upon to alert a person to hazardous skin exposure. Consequently, the only effective means of avoiding skin injury or illness involves minimizing skin contact, particularly with wet cement. Exposed persons may not feel discomfort until hours after the exposure has ended and significant injury has occurred.

Dry portland cement contacting wet skin or exposure to moist or wet portland cement may cause more severe skin effects including thickening, cracking or fissuring of the skin. Prolonged exposure can cause severe skin damage in the form of (alkali) chemical burns.

Some individuals may exhibit an allergic response upon exposure to portland cement, possibly due to trace elements of chromium. The response may appear in a variety of forms ranging from a mild rash to severe skin ulcers. Persons already sensitized may react to their first contact with the product. Other persons may first experience this effect after years of contact with portland cement products.

**Effects Resulting from Inhalation:**
Portland cement may contain trace amounts of free crystalline silica. Prolonged exposure to respirable free silica can aggravate other lung conditions and cause silicosis, a disabling and potentially fatal lung disease.

Exposure to portland cement may cause irritation to the moist mucous membranes of the nose, throat, and upper respiratory system. It may also leave unpleasant deposits in the nose.

**Effects Resulting from Ingestion:**
Although small quantities of dust are not known to be harmful, ill effects are possible if larger quantities are consumed. Portland cement should not be eaten.

**Carcinogenic potential:**
Portland cement is **not** listed as a carcinogen by NTP, OSHA, or IARC. It may however, contain trace amounts of substances listed as carcinogens by these organizations.

Crystalline silica, a contaminate in Portland cement, is now classified by IARC as known human carcinogen (Group I). NTP has characterized respirable silica as "reasonably anticipated to be [a] carcinogen".

**Medical conditions which may be aggravated be, inhalation or dermal exposure:**
Pre-existing upper respiratory and lung diseases.
Unusual (hyper) sensitivity to hexavalent chromium (chromium$^{+6}$) salts.

## Section 4 - FIRST AID

Eyes

Immediately flush eyes thoroughly with water. Continue flushing eye for at least 15 minutes, including under lids, to remove all particles. Call physician immediately.

Skin

Wash skin with cool water and pH-neutral soap or a mild detergent. Seek medical treatment in all cases of prolonged exposure to wet cement, cement mixtures, liquids from fresh cement products, or prolonged wet skin exposure to dry cement.

Inhalation of Airborne Dust

Remove to fresh air. Seek medical help if coughing and other symptoms do not subside.

Ingestion

Do not induce vomiting. If conscious, have the victim drink plenty of water and call a physician immediately.

---

**Section 5 - FIRE AND EXPLOSION DATA**

Flash point ............................None
Upper Explosive Limit.............None
Extinguishing media.........Not Combustible
Hazardous combustion products....None
Lower Explosive Limit......................None
Auto ignition temperature.................Not Combustible
Special fire fighting Procedures.........None
Unusual fire and explosion hazards...None

---

**Section 6 - ACCIDENTAL RELEASE MEASURES**

Collect dry material using a scoop. Avoid actions that cause dust to become airborne. Avoid inhalation of dust and contact with skin. Wear appropriate personal protective equipment as described in Section 8.

Scrape up wet material and place in an appropriate container. Allow the material to "dry" before disposal. Do not attempt to wash portland cement down drains.

Dispose of waste material according to local, state and federal regulations.

---

**Section 7 - HANDLING AND STORAGE**

Keep portland cement dry until used. Normal temperatures and pressures do not affect the material.

Promptly remove dusty clothing or clothing which is wet with cement fluids and launder before reuse. Wash thoroughly after exposure to dust or wet cement mixtures or fluids.

---

**Section 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION**

Skin Protection

Prevention is essential to avoiding potentially severe skin injury. Avoid contact with unhardened portland cement. If contact occurs, promptly wash affected area with soap and water. Where prolonged exposure to unhardened portland cement products might occur, wear impervious clothing and gloves to eliminate skin contact. Wear sturdy boots that are impervious to water to eliminate foot and ankle exposure.

Do not rely on barrier creams: barrier creams should not be used in place of gloves.

Periodically wash areas contacted by dry portland cement or by wet cement or concrete fluids with a pH neutral soap. Wash again at the end of work. If irritation occurs, immediately wash the affected area and seek treatment. If clothing becomes saturated with wet concrete, it should be removed and replaced with clean dry clothing.

Respiratory Protection

Avoid actions that cause dust to become airborne. Use local or general exhaust ventilation to control exposures below applicable exposure limits.

Use NIOSH/MSHA approved (under 30 CFR 11) or NIOSH approved (under 42 CFR 84) respirators in poorly ventilated areas, if an applicable exposure limit is exceeded, or when dust causes discomfort or irritation. (Advisory: Respirators and filters purchased after June 10, 1998 must be certified under 42 CFR 84.)

Ventilation

Use local exhaust or general dilution ventilation to control exposure within applicable limits.

Eye Protection

Where potentially subject to splashes or puffs of cement, wear safety glasses with side shields or goggles. In extremely dusty environments and unpredictable environments wear unvented or indirectly vented goggles to avoid eye irritation or injury. Contact lenses should not be worn when working with portland cement or fresh cement products.

## Section 9 - PHYSICAL AND CHEMICAL, PROPERTIES

Appearance............Gray Powder
Physical state...........Solid (powder)
Solubility in water...Slightly soluble (0.1 to 1.0%)
Vapor density..........Not applicable
Melting point...........Not applicable
Evaporation rate......Not applicable

Odor............................No distinct odor
pH (in water)................12 to 13
Vapor pressure............Not applicable
Boiling point..................Not applicable (i.e., > 1000C)
Specific gravity (H20 = 1.0).......3.15

## Section 10 - STABILITY AND REACTIVITY

Stability

Stable.

Conditions to avoid

Unintentional contact with water.

Incompatibility

Wet portland cement is alkaline. As such it is incompatible with acids, ammonium salts and phosphorous.

Hazardous decomposition

Will not spontaneously occur. Adding water produces (caustic) calcium hydroxide

Hazardous Polymerization

Will not occur.

## Section 11 - TOXICOLOGICAL INFORMATION

For a description of available, more detailed toxicological information contact the supplier or manufacturer.

## Section 12 - ECOLOGICAL INFORMATION

Ecotoxicity

No recognized unusual toxicity to plants or animals

Relevant physical and chemical properties

(See Sections 9 and 10.)

## Section 13 - DISPOSAL

Dispose of waste material according to local, state and federal regulations. (Since portland cement is stable, uncontaminated material may be saved for future use).

Dispose of bags in an approved landfill or incinerator.

## Section 14 - TRANSPORTATION DATA

Hazardous materials description/proper shipping name

Portland is cement is not hazardous under U.S. Department of Transportation (DOT) regulations.

Hazard class

Not applicable

Identification number
Not applicable.

Required label text
Not applicable.

Hazardous substances/reportable quantities (RQ)
Not applicable.

## Section 15 - OTHER REGULATORY INFORMATION

Status under USDOL-OSHA Hazard Communication Rule, 29 CFR 1910.1200
Portland cement is considered a "hazardous chemical" under this regulation, and should be part of any hazard communication program.

Status under CERCLA/SUPERFUND 40 CFR 117 and 302
Not listed.

Hazard Category under SARA(Title III), Sections 311 and 312
Portland cement qualifies as a "hazardous substance" with delayed health effects.

Status under SARA (Title III), Section 313
Not subject to reporting requirements under Section 313.

Status under TSCA (as of May 1997)
Some substances in portland cement are on the TSCA inventory list.

Status under the Federal Hazardous Substances Act
Portland cement is a "hazardous substance" subject to statutes promulgated under the subject act.

Status under California Proposition 65
This product contains up to 0.05 percent of chemicals (trace elements) known to the State of California to cause cancer, birth defects or other reproductive harm. California law requires the manufacturer to give the above warning in the absence of definitive testing to prove that the defined risks do not exist.

## Section 16 - OTHER INFORMATION

Prepared by

Kevin Keegan
Director - Health and Safety
CEMEX, Inc.
Houston, Texas

Approval date or Revision date

Approved: December, 2001

Other important information

Portland cement should only be used by knowledgeable persons. A key to using the product safely requires the user to recognize that portland cement chemically reacts with water, and that some of the intermediate products of this reaction (that is those present while a portland cement product is "setting") pose a more severe hazard than does dry portland cement itself.

While the information provided in this material safety data sheet is believed to provide a useful summary of the hazards of portland cement as it is commonly used, the sheet cannot anticipate and provide the all of the information that might be needed in every situation. Inexperienced product users should obtain proper training before using this product.

SELLER MAKES NO WARRANTY, EXPRESSED OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE OR CONCERNING THE ACCURACY OF ANY INFORMATION PROVIDED BY CEMEX, Inc. except that the product shall conform to contracted specifications. The information provided herein was believed by CEMEX, Inc. to be accurate at the time of preparation or prepared from sources believed to be reliable, but it is the responsibility of the user to investigate and understand other pertinent sources of information to comply with all laws and procedures applicable to the safe handling and use of product and to determine the suitability of the product for its intended use. Buyer's exclusive remedy shall be for damages and no claim of any kind, whether as to product delivered or for non-delivery of product, and whether based on contract, breach of warranty, negligence, or otherwise shall be greater in amount than the purchase price of the quantity of product in respect of which damages are claimed. In no event shall Seller be liable for incidental or consequential damages, whether Buyer's claim is based on contract, breach of warranty, negligence or otherwise.

In particular, the data furnished in this sheet do not address hazards that may be posed by other materials mixed with portland cement to produce portland cement products. Users should review other relevant material safety data sheets before working with this portland cement or working on portland cement products, for example, portland cement concrete.

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

**MSDS** Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# HYDROCHLORIC ACID, 33 - 40%

**MSDS Number: H3880 --- *Effective Date: 05/10/01***

## 1. Product Identification

**Synonyms:** Muriatic acid; hydrogen chloride, aqueous
**CAS No.:** 7647-01-0
**Molecular Weight:** 36.46
**Chemical Formula:** $HCl$
**Product Codes:**
J.T. Baker: 5367, 5537, 5575, 5800, 5814, 5839, 5894, 5994, 6900, 7831, 9529, 9530, 9534, 9535, 9536, 9537, 9538, 9539, 9540, 9544, 9548
Mallinckrodt: 2062, 2612, 2624, 2626, 5587, H611, H613, H987, H992, H999, V078, V628

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Hydrogen Chloride | 7647-01-0 | 33 - 40% | Yes |
| Water | 7732-18-5 | 60 - 67% | No |

# 3. Hazards Identification

**Emergency Overview**
--------------------------
**POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. INHALATION MAY CAUSE LUNG DAMAGE.**

**J.T. Baker SAF-T-DATA(tm)** Ratings (Provided here for your convenience)
-----------------------------------------------------------------------------------------------------------
Health Rating: 3 - Severe (Poison)
Flammability Rating: 0 - None
Reactivity Rating: 2 - Moderate
Contact Rating: 3 - Severe (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White (Corrosive)
-----------------------------------------------------------------------------------------------------------

**Potential Health Effects**
----------------------------------

**Inhalation:**
Corrosive! Inhalation of vapors can cause coughing, choking, inflammation of the nose, throat, and upper respiratory tract, and in severe cases, pulmonary edema, circulatory failure, and death.
**Ingestion:**
Corrosive! Swallowing hydrochloric acid can cause immediate pain and burns of the mouth, throat, esophagus and gastrointestinal tract. May cause nausea, vomiting, and diarrhea. Swallowing may be fatal.
**Skin Contact:**
Corrosive! Can cause redness, pain, and severe skin burns. Concentrated solutions cause deep ulcers and discolor skin.
**Eye Contact:**
Corrosive! Vapors are irritating and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.
**Chronic Exposure:**
Long-term exposure to concentrated vapors may cause erosion of teeth.

Long term exposures seldom occur due to the corrosive properties of the acid.
**Aggravation of Pre-existing Conditions:**
Persons with pre-existing skin disorders or eye disease may be more susceptible to the effects of this substance.

---

# 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
**Ingestion:**
DO NOT INDUCE VOMITING! Give large quantities of water or milk if available. Never give anything by mouth to an unconscious person. Get medical attention immediately.
**Skin Contact:**
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

---

# 5. Fire Fighting Measures

**Fire:**
Extreme heat or contact with metals can release flammable hydrogen gas.
**Explosion:**
Not considered to be an explosion hazard.
**Fire Extinguishing Media:**
If involved in a fire, use water spray. Neutralize with soda ash or slaked lime.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Structural firefighter's protective clothing is ineffective for fires involving hydrochloric acid. Stay away from ends of tanks. Cool tanks with water spray until well after fire is out.

## 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRASORB® or TEAM® 'Low Na+' acid neutralizers are recommended for spills of this product.

## 7. Handling and Storage

Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect from physical damage. Keep out of direct sunlight and away from heat, water, and incompatible materials. Do not wash out container and use it for other purposes. When diluting, the acid should always be added slowly to water and in small amounts. Never use hot water and never add water to the acid. Water added to acid can cause uncontrolled boiling and splashing. When opening metal containers, use non-sparking tools because of the possibility of hydrogen gas being present. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
-OSHA Permissible Exposure Limit (PEL):
5 ppm Ceiling
-ACGIH Threshold Limit Value (TLV):
5 ppm Ceiling

**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded, a full facepiece respirator with an acid gas cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Rubber or neoprene gloves and additional protection including impervious boots, apron, or coveralls, as needed in areas of unusual exposure to prevent skin contact.
**Eye Protection:**
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

---

## 9. Physical and Chemical Properties

**Appearance:**
Colorless, fuming liquid.
**Odor:**
Pungent odor of hydrogen chloride.
**Solubility:**
Infinite in water with slight evolution of heat.
**Density:**
1.18
**pH:**
For HCL solutions: 0.1 (1.0 N), 1.1 (0.1 N), 2.02 (0.01 N)
**% Volatiles by volume @ 21C (70F):**
100
**Boiling Point:**
53C (127F) Azeotrope (20.2%) boils at 109C (228F)
**Melting Point:**
-74C (-101F)

**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
190 @ 25C (77F)
**Evaporation Rate (BuAc=1):**
No information found.

---

# 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage. Containers may burst when heated.
**Hazardous Decomposition Products:**
When heated to decomposition, emits toxic hydrogen chloride fumes and will react with water or steam to produce heat and toxic and corrosive fumes. Thermal oxidative decomposition produces toxic chlorine fumes and explosive hydrogen gas.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
A strong mineral acid, concentrated hydrochloric acid is incompatible with many substances and highly reactive with strong bases, metals, metal oxides, hydroxides, amines, carbonates and other alkaline materials. Incompatible with materials such as cyanides, sulfides, sulfites, and formaldehyde.
**Conditions to Avoid:**
Heat, direct sunlight.

---

# 11. Toxicological Information

Inhalation rat LC50: 3124 ppm/1H; oral rabbit LD50: 900 mg/kg (Hydrochloric acid concentrated); investigated as a tumorigen, mutagen, reproductive effector.

```
--------\Cancer Lists\------------------------------------------------------
                              ---NTP Carcinogen---
Ingredient                         Known    Anticipated    IARC Category
-----------------------------------  -----   -----------   -------------
```

| | | | |
|---|---|---|---|
| Hydrogen Chloride (7647-01-0) | No | No | 3 |
| Water (7732-18-5) | No | No | None |

## 12. Ecological Information

**Environmental Fate:**
When released into the soil, this material is not expected to biodegrade. When released into the soil, this material may leach into groundwater.
**Environmental Toxicity:**
This material is expected to be toxic to aquatic life.

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

**Domestic (Land, D.O.T.)**
-----------------------
**Proper Shipping Name:** HYDROCHLORIC ACID
**Hazard Class:** 8
**UN/NA:** UN1789
Packing Group: II
**Information reported for product/size:** 475LB

**International (Water, I.M.O.)**
-----------------------------
**Proper Shipping Name:** HYDROCHLORIC ACID
**Hazard Class:** 8
**UN/NA:** UN1789
Packing Group: II
**Information reported for product/size:** 475LB

# 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Hydrogen Chloride (7647-01-0) | Yes | Yes | Yes | Yes |
| Water (7732-18-5) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\---------------------------------

| | | --Canada-- | | |
|---|---|---|---|---|
| Ingredient | Korea | DSL | NDSL | Phil. |
| Hydrogen Chloride (7647-01-0) | Yes | Yes | No | Yes |
| Water (7732-18-5) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------------

| | -SARA 302- | | ------SARA 313------ | |
|---|---|---|---|---|
| Ingredient | RQ | TPQ | List | Chemical Catg. |
| Hydrogen Chloride (7647-01-0) | 5000 | 500* | Yes | No |
| Water (7732-18-5) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------------

| | | -RCRA- | -TSCA- |
|---|---|---|---|
| Ingredient | CERCLA | 261.33 | 8(d) |
| Hydrogen Chloride (7647-01-0) | 5000 | No | No |
| Water (7732-18-5) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: Yes
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Mixture / Liquid)

**Australian Hazchem Code:** 2R
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

# 16. Other Information

**NFPA Ratings:** Health: **3** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. INHALATION MAY CAUSE LUNG DAMAGE.
**Label Precautions:**
Do not get in eyes, on skin, or on clothing.
Do not breathe vapor or mist.
Use only with adequate ventilation.
Wash thoroughly after handling.
Store in a tightly closed container.
Remove and wash contaminated clothing promptly.
**Label First Aid:**
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases get medical attention immediately.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
MSDS Section(s) changed since last revision of document include: 16.
**Disclaimer:**
************************************************************************************************

**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly**

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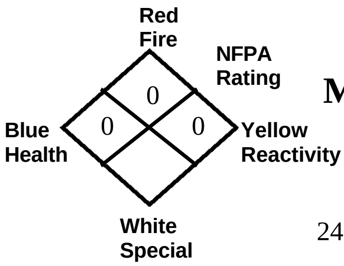
************************************************************************************************

**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)




# Liqui-Nox ®

## MATERIAL SAFETY DATA SHEET

**Alconox, Inc.**
30 Glenn Street
White Plains, NY 10603
24 Hour Emergency Number – Chem-Tel (800) 255-3924

### I. IDENTIFICATION

| | |
|---|---|
| Product Name (as appears on label) | LIQUI-NOX |
| CAS Registry Number: | Not Applicable |
| Effective Date: | January 1, 2001 |
| Chemical Family: | Anionic Liquid Detergent |
| Manufacturer Catalog Numbers for sizes | 1232, 1201, 1215 and 1255 |

### II. HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

There are no hazardous ingredients in LIQUI-NOX¨ as defined by the OSHA Standard and Hazardous Substance List 29 CFR 1910 Subpart Z.

### III. PHYSICAL/CHEMICAL CHARACTERISTICS

| | |
|---|---|
| Boiling Point (F): | 214°F |
| Vapor Pressure (mm Hg): | No Data |
| Vapor Density (AIR=1): | No Data |
| Specific Gravity (Water=1): | 1.075 |
| Melting Point: | Not Applicable |
| Evaporation Rate (Butyl Acetate=1): | Slower |
| Solubility in Water: | Completely soluble in all proportions. |
| Appearance: | Yellow liquid, nearly odorless |
| pH: | 8.5 (1%) |

### IV. FIRE AND EXPLOSION DATA

| | |
|---|---|
| Flash Point: | None (Cleveland Open Cup) |
| Flammable Limits: | LEL: No Data<br>UEL: No Data |
| Extinguishing Media: | Water, dry chemical, $CO_2$, foam |
| Special Fire fighting Procedures: | Self-contained positive pressure breathing apparatus and protective clothing should be worn when fighting fires involving chemicals. |
| Unusual Fire and Explosion Hazards: | None |

### V. REACTIVITY DATA

| | |
|---|---|
| Stability: | Stable |
| Conditions To Avoid: | None |
| Incompatibility (Materials To Avoid): | Oxidizing agents. |
| Hazardous Decomposition or Byproducts: | May release $SO_2$ on burning |

**VI. HEALTH HAZARD DATA**

| | |
|---|---|
| Route(s) of Entry: | Inhalation? No<br>Skin? Yes<br>Ingestion? Yes |
| Health Hazards (Acute and Chronic): | Skin contact may prove locally irritating, causing drying and/or chapping. Ingestion may cause discomfort and/or diarrhea. |
| Carcinogenicity: | NTP? No<br>IARC Monographs? No<br>OSHA Regulated? No |
| Signs and Symptoms of Exposure: | Prolonged skin contact may cause drying and/or chapping. |
| Medical Conditions Generally Aggravated by Exposure: | Not established. Unnecessary exposure to this product or any industrial chemical should be avoided. |
| Emergency and First Aid Procedures: | Eyes: Immediately flush eyes with water for at least 15 minutes. Call a physician.<br>Skin: Flush with plenty of water.<br>Ingestion: Drink large quantities of water or milk. Do not induce vomiting. If vomiting occurs administer fluids. See a physician for discomfort. |

**VII. PRECAUTIONS FOR SAFE HANDLING AND USE**

| | |
|---|---|
| Steps to be Taken if Material is Released or Spilled: | Material foams profusely. For small spills recover as much as possible with absorbent material and flush remainder to sewer. Material is biodegradable. |
| Waste Disposal Method: | Small quantities may be disposed of in sewer. Large quantities should be disposed of in accordance with local ordinances for detergent products. |
| Precautions to be Taken in Storing and Handling: | No special precautions in storing. Use protective equipment when handling undiluted material. |
| Other Precautions: | No special requirements other than the good industrial hygiene and safety practices employed with any industrial chemical. |

**VIII. CONTROL MEASURES**

| | |
|---|---|
| Respiratory Protection (Specify Type): | Not Required |
| Ventilation: | Local Exhaust-Normal<br>Special-Not Required<br>Mechanical-Not Required<br>Other-Not Required |
| Protective Gloves: | Impervious gloves are recommended. |
| Eye Protection: | Goggles and/or splash shields are recommended. |
| Other Protective Clothing or Equipment: | Not required |
| Work/Hygienic Practices: | No special practices required |

---

THE INFORMATION HEREIN IS GIVEN IN GOOD FAITH BUT NO WARRANTY IS EXPRESSED OR IMPLIED.

# FUELS, AUTOMOTIVE GASOLINE, UNLEADED

## 1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: FUELS, AUTOMOTIVE GASOLINE, UNLEADED
SUPPLIER: EXXONMOBIL OIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA 22037

24 - Hour Health and Safety Emergency (call collect): 609-737-4411
24 - Hour Transportation Emergency (Primary) CHEMTREC: 800-424-9300
(Secondary) 281-834-3296
Product and Technical Information: 800-662-4525 703-846-6693
MSDS Fax on Demand: 613-228-1467, other MSDS information: 856-224-4644

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: GASOLINE AND PROPRIETARY ADDITIVES

GLOBALLY REPORTABLE MSDS INGREDIENTS:

| Substance Name | Approx. Wt% |
|---|---|
| GASOLINE | 80-90 |
| METHYL-TERT-BUTYL ETHER (1634-04-4) | 10-20 |

COMPONENT(S) OF PRODUCT INGREDIENTS INCLUDE:

| | |
|---|---|
| XYLENE (1330-20-7) | 10 |
| TRIMETHYL BENZENE (25551-13-7) | 8 |
| TOLUENE (108-88-3) | 6 |
| ETHYL BENZENE (100-41-4) | 3 |
| N-HEXANE (110-54-3) | 3 |
| BENZENE (71-43-2) | 2 |

NOTE: The concentration of the components shown above may vary substantially. In certain countries benzene content may be limited to

(Section continued next page)

lower levels (eg. US reformulated gasoline). Oxygenates such as tertiary-amyl-methyl ether, ethanol, di-isopropyl ether, and ethyl-tertiary-butyl ether may be present (eg. concentration to provide a minimum oxygen content of 1.5 Wt% in the US). Because of volatility considerations, gasoline vapor may have concentrations of components very different from those of liquid gasoline. The major components of gasoline vapor are: butane, isobutane, pentane and isopentane. The reportable component percentages, shown in the Regulatory Information section, are based on API's evaluation of a typical gasoline mixture.

See Section 8 for exposure limits (if applicable).

## 3. HAZARDS IDENTIFICATION

This product is considered hazardous according to regulatory guidelines (See Section 15).

EMERGENCY OVERVIEW: Clear (May Be Dyed) Liquid. EXTREMELY FLAMMABLE, HIGH HAZARD. Liquid can release considerable vapor at temperatures below ambient which readily form flammable mixtures. Vapors settle to ground level and may reach, via drains and other underground passages, ignition sources remote from the point of escape. Product can accumulate a static charge which may cause a fire or explosion. DOT ERG No. : 128

POTENTIAL HEALTH EFFECTS: Skin irritation. May cause eye and respiratory irritation, dizziness, nausea, loss of consciousness, and in cases of extreme exposure, possibly death. Low viscosity material-if swallowed may enter the lungs and cause lung damage. Overexposure to benzene may result in cancer, blood disorders and damage to the bone marrow. Long-term exposure to gasoline vapor has caused kidney and liver cancer in laboratory animals. Case reports of chronic gasoline abuse (such as sniffing) and chronic misuse as a solvent or as a cleaning agent have shown a range of nervous system effects, sudden deaths from heart attacks, blood effects and leukemia. These effects are not expected to occur at exposure levels encountered in the distribution and use of gasoline as a motor fuel.

For further health effects/toxicological data, see Section 11.

## 4. FIRST AID MEASURES

EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a physician.
SKIN CONTACT: Wash contact areas with soap and water. Immediately remove contaminated clothing, including shoes. (See Section 16 - Injection Injury)
INHALATION: Remove from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with mechanical device or use mouth-to-mouth resuscitation.
INGESTION: Seek immediate medical attention. Do not induce vomiting.
NOTE TO PHYSICIANS: Material if ingested may be aspirated into the lungs and can cause chemical pneumonitis. PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE: Skin contact may aggravate an existing dermatitis. Benzene- Individuals with liver disease may be more susceptible to toxic effects. Hexane- Individuals with neurological disease should avoid exposure.

## 5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon Dioxide, Foam, Dry Chemical, Water Fog.
SPECIAL FIRE FIGHTING PROCEDURES: Evacuate area. For large spills, fire fighting foam is the preferred agent and should be applied in sufficient quantities to blanket the product surface. Water may be ineffective, but water should be used to keep fire-exposed containers cool. Water spray may be used to flush spill away from exposures, but good judgement should be practiced to prevent spreading of the product into sewers, streams or drinking water supplies. If a leak or spill has not ignited, apply a foam blanket to suppress the release of vapors. If foam is not available, a water spray curtain can be used to disperse vapors and to protect personnel attempting to stop the leak.
SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.
UNUSUAL FIRE AND EXPLOSION HAZARDS: EXTREMELY FLAMMABLE, HIGH HAZARD. Liquid can release considerable vapor at temperatures below ambient which readily form flammable mixtures. Vapors settle to ground level and may reach, via drains and other underground passages, ignition sources remote from the point of escape. Product can accumulate a static charge which may cause a fire or explosion.
COMBUSTION PRODUCTS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.
Flash Point C(F): < -40(-40) (ASTM D-56).
Flammable Limits (approx.% vol.in air) - LEL: 1.4%, UEL: 7.6%
NFPA HAZARD ID: Health: 1, Flammability: 3, Reactivity: 0

## 6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills/releases as required to appropriate authorities. U.S. Coast Guard and EPA regulations require immediate reporting of spills/releases that could reach any waterway including intermittent dry creeks. Report spill/release to Coast Guard National Response Center toll free number (800)424-8802. In case of accident or road spill notify CHEMTREC (800) 424-9300.
PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:
LAND SPILL: Eliminate sources of ignition. Warn occupants in downwind areas of fire and explosion hazard. Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping using explosion-proof equipment or contain spilled liquid with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.
WATER SPILL: Eliminate sources of ignition. Advise occupants and ships in the vicinity in downwind areas of fire and explosion hazard and warn them to stay clear. Notify port and other relevant authorities. Do not confine in area of leakage. Allow liquid to evaporate from the surface. Do not use dispersants.
ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewers, water sources or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation.
PERSONAL PRECAUTIONS: See Section 8

## 7. HANDLING AND STORAGE

HANDLING: USE NON-SPARKING TOOLS AND EXPLOSION-PROOF EQUIPMENT. NEVER SIPHON GASOLINE BY MOUTH. GASOLINE SHOULD NOT BE USED AS A SOLVENT OR AS A CLEANING AGENT. Avoid contact with skin. Avoid inhalation of vapors or mists. Use in well ventilated area away from all ignition sources. This liquid is volatile and gives off invisible vapors. Either the liquid or vapor may settle in low areas or travel some distance along the ground or surface to ignition sources where they may ignite or explode. Use product with caution around heat, sparks, pilot lights, static electricity, and open flames. It is unlawful and dangerous to put gasoline into unapproved containers. Do not fill container in or on a vehicle. Static electricity may ignite vapors and cause fire. Place container on ground when filling and keep nozzle in contact with container. See Section 8 for additional personal protection advice when handling this product.
STORAGE: Drums must be grounded and bonded and equipped with self-closing valves, pressure vacuum bungs and flame arresters. Store away from all ignition sources in a cool, well ventilated area equipped with an automatic sprinkling system. Outside or detached storage preferred. Storage containers should be grounded and bonded.
SPECIAL PRECAUTIONS: To prevent and minimize fire or explosion risk

**(Section continued next page)**

from static accumulation and discharge, effectively bond and/or ground product transfer system. Do not use electronic devices (including but not limited to cellular phones, computers, calculators, pagers, etc.) in or around any fueling operation or storage area unless the devices are certified intrinsically safe by an approved national testing agency and to the safety standards required by national and/or local laws and regulations. Electrical equipment and fittings must comply with local fire prevention regulations for this class of product. Use the correct grounding procedures. Refer to national or local regulations covering safety at petroleum handling and storage areas for this product.
EMPTY CONTAINER WARNING: Empty containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS:

ExxonMobil recommends an 8-hour time-weighted average (TWA) exposure of 300 mg/m3 (100 ppm vapor).

| | | ---TWA--- | | ----STEL--- | | NOTE |
|---|---|---|---|---|---|---|
| Substance Name (CAS-No.) | Source | ppm | mg/m3 | ppm | mg/m3 | |
| GASOLINE | | | | | | |
| | OSHA | 300 | 900 | 500 | 1500 | |
| | ACGIH | 300 | 890 | 500 | 1480 | |
| METHYL-TERT-BUTYL ETHER (1634-04-4) | | | | | | |
| | ACGIH | 40 | 144 | | | |
| | XOM | 25 | | 75 | | |
| XYLENE (1330-20-7) | | | | | | |
| O, M, P, -Isomers | OSHA | 100 | 435 | 150 | 655 | |
| O, M, P, -Isomers | ACGIH | 100 | 434 | 150 | 651 | |
| TRIMETHYL BENZENE (25551-13-7) | | | | | | |
| | OSHA | 25 | 125 | | | |

(Section continued next page)

| | | | | | |
|---|---|---|---|---|---|
| | ACGIH | 25 | 123 | | |
| TOLUENE (108-88-3) | | | | | |
| | OSHA | 100 | 375 | 150 | 560 |
| Skin | ACGIH | 50 | 188 | | |
| | XOM | | 200 | | |
| ETHYL BENZENE (100-41-4) | | | | | |
| | OSHA | 100 | 435 | 125 | 545 |
| | ACGIH | 100 | 434 | 125 | 543 |
| N-HEXANE (110-54-3) | | | | | |
| | OSHA | 50 | 180 | | |
| Other Isomers | OSHA | 500 | 1800 | 1000 | 3600 |
| N-Hexane Skin | ACGIH | 50 | 176 | | |
| Other Isomers | ACGIH | 500 | 1760 | 1000 | 3500 |
| BENZENE (71-43-2) | | | | | |
| | OSHA | 1 | | 5 | |
| Skin | ACGIH | 0.5 | 1.6 | 2.5 | 8 |
| Skin | XOM | 1 | | | |

NOTE: Limits shown for guidance only. Follow applicable regulations.

VENTILATION: Ventilation equipment must be explosion proof.
RESPIRATORY PROTECTION: Approved respiratory equipment must be used when airborne concentrations are unknown or exceed the recommended exposure limit. Self-contained breathing apparatus may be required for use in confined or enclosed spaces.
EYE PROTECTION: If splash with liquid is possible, chemical type goggles should be worn.
SKIN PROTECTION: Impervious gloves should be worn. Good personal hygiene practices should always be followed.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical properties are given below. Consult Product Data Sheet for specific details.

APPEARANCE: Liquid
COLOR: Clear (May Be Dyed)
ODOR: Gasoline
ODOR THRESHOLD-ppm: NE
pH: NA
BOILING POINT C(F): > 20(68)
MELTING POINT C(F): NA
FLASH POINT C(F): < -40(-40) (ASTM D-56)
FLAMMABILITY (solids): NE
AUTO FLAMMABILITY C(F): NE
EXPLOSIVE PROPERTIES: NA
OXIDIZING PROPERTIES: NA

**(Section continued next page)**

VAPOR PRESSURE-mmHg 20 C: > 200.0
VAPOR DENSITY: 3.0
EVAPORATION RATE: NE
RELATIVE DENSITY, 15/4 C: 0.79
SOLUBILITY IN WATER: Negligible
PARTITION COEFFICIENT: > 1
VISCOSITY AT 40 C, cSt: < 1.0
VISCOSITY AT 100 C, cSt: NA
POUR POINT C(F): NA
FREEZING POINT C(F): NE
VOLATILE ORGANIC COMPOUND: NE
DMSO EXTRACT, IP-346 (WT.%): NA
NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES

FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

## 10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Stable.
CONDITIONS TO AVOID: Heat, sparks, flame and build up of static electricity.
INCOMPATIBILITY (MATERIALS TO AVOID): Halogens, strong acids, alkalies, and oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS: Product does not decompose at ambient temperatures.
HAZARDOUS POLYMERIZATION: Will not occur.

## 11. TOXICOLOGICAL DATA

---ACUTE TOXICOLOGY---

ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
INHALATION TOXICITY (RATS): Practically non-toxic (LC50: greater than 5 mg/l). ---Based on testing of similar products and/or the components.
EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score: greater than 6 but 15 or less). ---Based on testing of similar products and/or the components.
SKIN IRRITATION (RABBITS): Irritant. (Primary Irritation Index: 3 or greater but less than 5). ---Based on testing of similar products and/or the components.
OTHER ACUTE TOXICITY DATA: Inhalation of high concentrations of vapors or aerosols/mists, especially deliberate or abuse exposure, may cause respiratory system irritation and damage. These exposures may also result in central nervous system depression and damage, possibly leading to death. Prolonged skin contact with gasoline may cause severe skin irritation similar to a chemical burn. The

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above effects, which may result from the whole gasoline or some of the gasoline components, are well documented in the medical literature. HAZARDS OF COMBUSTION PRODUCTS: Exposure to high concentrations of carbon monoxide can cause loss of consciousness, heart damage, brain damage and death.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---

Two dermal studies resulted in significant irritation in rabbits but no significant systemic toxicity. 90-day inhalation exposures (approximately 1500 ppm vapor) in rats and monkeys produced light hydrocarbon nephropathy in male rats, but no other significant systemic toxicity.

---NEUROTOXICOLOGY (SUMMARY)---

Exposure to high concentrations of unleaded gasoline in rodents caused reversible central nervous system depression, however, no persistent neurotoxic effects were observed in subchronic inhalation studies of gasoline blending streams. No neurotoxic effects, as measured by a functional observation battery, motor activity, and neuropathology, were observed in rats exposed to light alkylate naphtha for 13 weeks at concentrations up to 6600 ppm. The medical literature clearly documents neurotoxic effects in humans from abusive gasoline inhalation (sniffing).

---REPRODUCTIVE TOXICOLOGY (SUMMARY)---

Two separate inhalation teratology studies of unleaded gasoline vapor at exposures up to 1600 ppm and 9000 ppm for 6 hours/day on days 6-20 did not result in any significant developmental effects in rats. No significant effects were observed in the mothers or offspring. A two-generation inhalation reproductive study (CONCAWE) of unleaded gasoline showed no reproductive or developmental effects in rats exposed to concentrations up to 20, 000 mg/m3 (approx. 8000 ppm).

---CHRONIC TOXICOLOGY (SUMMARY)---

A lifetime mouse skin painting study of unleaded gasoline applied at 50 microliters, three times weekly, resulted in some severe skin irritation and changes, but no statistically significant increase in skin cancer or cancer to any other organ. A lifetime inhalation study of vaporized unleaded gasoline at up to 2000 ppm caused liver tumors in female mice and increased kidney tumors in male rats. The kidney tumors resulted from the formation of a compound unique to male rats, and are not considered relevant to humans. The U.S. EPA Risk Assessment Forum concluded that the male rat kidney tumor results are not relevant for human risk assessment. The implications for the female mice liver tumor data for human risk assessment have not been fully determined. Multiple short-term cancer predicative tests (Ames Test, etc.) have routinely been negative (no cancer or mutagenic potential) for unleaded gasoline.

---SENSITIZATION (SUMMARY)---

Unleaded gasoline was not a skin sensitizer in tests in a Buehler

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Guinea Pig Sensitization Assay.

---OTHER TOXICOLOGY DATA---

Gasoline and Refinery Streams: Isolated constituents of gasoline may display these or other potential hazards in laboratory tests. Gasoline consists of a complex blend of petroleum/processing derived paraffinic, olefinic, naphthenic and aromatic hydrocarbons which include up to 5% benzene (with 1-2 % typical in the U.S.), n-hexane, mixed xylenes, toluene, ethylbenzene and trimethyl benzene. Benzene has also caused damage to the fetus of test animals in developmental studies. Benzene has tested positive (mutagenic) in a number of short-term cancer/mutation predicative tests. Repeated exposures to low levels of benzene (50-500 ppm) have been reported to result in blood abnormalities including anemia and, in rare cases, leukemia in both animals and humans. Prolonged exposure to n-hexane may result in a condition known as peripheral neuropathy. This is nervous system damage and is characterized by numbness of the extremities and, in extreme cases, paralysis. This product contains ethylbenzene. The International Agency for Research on Cancer (IARC) has evaluated ethylbenzene and classified it as possibly carcinogenic to humans (Group 2B) based on sufficient evidence for carcinogenicity in experimental animals, but inadequate evidence for cancer in exposed humans. Methyl Tertiary Butyl Ether (MTBE) was tested for carcinogenicity, neurotoxicity, chronic, reproductive, and developmental toxicity. The NOAEL for all end points evaluated in three animal species was 400 ppm or greater. An increase in kidney tumors/damage and liver tumors was observed in animals exposed to high concentrations of MTBE. Some embryo/fetal toxicity and birth defects were observed in the offspring of pregnant mice exposed to maternally toxic doses of MTBE, however the offspring of exposed pregnant rabbits were unaffected. The significance of the animal findings at high exposures are not believed to be directly related to potential human health hazards in the workplace.

## 12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS:

In the absence of specific environmental data for this product, this assessment is based on information for representative substances. When released into the environment, some of the constituents of gasoline will volatilize and be photodegraded in the atmosphere. The less volatile, more water-soluble components which are aromatic hydrocarbons will also undergo aqueous photodegradation. Dissolution of the higher molecular weight hydrocarbon components in water will be limited, but losses through sediment adsorption may be significant. Based on test results for similar products, this substance may be toxic to aquatic organisms such as algae and daphnia (EL50/ IrL50 =1-10 mg/L). This substance has also been shown to be toxic to fish

**(Section continued next page)**

(LL50 = 1-10 mg/L). The majority of the components in this product would be expected to be inherently biodegradable.

## 13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning for fuel value in compliance with applicable laws and regulations and consideration of product characteristics at time of disposal.

RCRA INFORMATION: Disposal of unused product may be subject to RCRA regulations (40 CFR 261). Disposal of the used product may also be regulated due to ignitability, corrosivity, reactivity, or toxicity as determined by the Toxicity Characteristic Leaching Procedure (TCLP).

BENZENE: 2.0000 PCT (TCLP)
FLASH: < -40(-40) C(F)

## 14. TRANSPORT INFORMATION

USA DOT:

| | |
|---|---|
| SHIPPING NAME: | Gasoline |
| HAZARD CLASS & DIV: | 3 |
| ID NUMBER: | UN1203 |
| ERG NUMBER: | 128 |
| PACKING GROUP: | PG II |
| STCC: | NE |
| DANGEROUS WHEN WET: | No |
| POISON: | No |
| LABEL(s): | Flammable Liquid |
| PLACARD(s): | Flammable |
| PRODUCT RQ: | NA |
| MARPOL III STATUS: | NA |

RID/ADR:

| | |
|---|---|
| HAZARD CLASS: | 3 |
| HAZARD SUB-CLASS: | 3(b) |
| LABEL: | 3 |
| DANGER NUMBER: | 33 |
| UN NUMBER: | 1203 |
| SHIPPING NAME: | Motor Spirit |
| REMARKS: | NA |

IMO:

| | |
|---|---|
| HAZARD CLASS & DIV: | 3 |
| UN NUMBER: | 1203 |
| PACKING GROUP: | PG II |
| SHIPPING NAME: | Gasoline |
| LABEL(s): | Flammable Liquid |
| MARPOL III STATUS: | NA |

**(Section continued next page)**

ICAO/IATA:

| | |
|---|---|
| HAZARD CLASS & DIV: | 3 |
| ID/UN Number: | 1203 |
| PACKING GROUP: | PG II |
| SHIPPING NAME: | Gasoline |
| SUBSIDIARY RISK: | NA |
| LABEL(s): | Flammable Liquid |

STATIC ACCUMULATOR (50 picosiemens or less): YES

## 15. REGULATORY INFORMATION

US OSHA HAZARD COMMUNICATION STANDARD: Product assessed in accordance with OSHA 29 CFR 1910.1200 and determined to be hazardous.

EU Labeling: Product is dangerous as defined by the European Union Dangerous Substances/Preparations Directives.

Symbol: F+ T Extremely flammable, Toxic.

Risk Phrase(s): R12-45-38-65-67.
Extremely flammable. May cause cancer. Irritating to skin. Harmful: may cause lung damage if swallowed. Vapors may cause drowsiness and dizziness.

Safety Phrase(s): S16-53-45-2-23-24-29-43-62.
Keep away from sources of ignition - No smoking. Avoid exposure - obtain special instructions before use. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Keep out of the reach of children. Do not breathe vapor. Avoid contact with skin. Do not empty into drains. In case of fire use foam/drypowder/CO2. If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

Contains: Low Boiling Point Naphtha.

Governmental Inventory Status: All components comply with TSCA, EINECS/ELINCS, AICS, METI, DSL, KOREA, and PHILIPPINES.

U.S. Superfund Amendments and Reauthorization Act (SARA) Title III: This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (311/312) REPORTABLE HAZARD CATEGORIES:
FIRE CHRONIC ACUTE

This product contains the following SARA (313) Toxic Release Chemicals:

| CHEMICAL NAME | CAS NUMBER | CONC. |
|---|---|---|

**(Section continued next page)**

| | | |
|---|---|---|
| BENZENE(COMPONENT ANALYSIS) | 71-43-2 | 2% |
| PSEUDOCUMENE (1,2, 4-TRIMETHYLBENZENE)(COMPONENT ANALYSIS) | 95-63-6 | 3% |
| ETHYL BENZENE(COMPONENT ANALYSIS) | 100-41-4 | 3% |
| TOLUENE(COMPONENT ANALYSIS) | 108-88-3 | 6% |
| N-HEXANE(COMPONENT ANALYSIS) | 110-54-3 | 3% |
| XYLENES(COMPONENT ANALYSIS) | 1330-20-7 | 10% |
| METHYL-TERT-BUTYL ETHER | 1634-04-4 | <15% |

The following product ingredients are cited on the lists below:

| CHEMICAL NAME | CAS NUMBER | LIST CITATIONS |
|---|---|---|
| GASOLINE | | 1, 8, 19, 20, 21, 23, 25 |
| BENZENE (COMPONENT ANALYSIS) (2.00%) | 71-43-2 | 1, 2, 4, 6, 9, 10, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26 |
| NAPHTHALENE (COMPONENT ANALYSIS) (0.50%) | 91-20-3 | 16, 22 |
| PSEUDOCUMENE (1,2, 4-TRIMETHYLBENZENE) (COMPONENT ANALYSIS) | 95-63-6 | 1, 20, 24, 25 |
| ETHYL BENZENE (COMPONENT ANALYSIS) | 100-41-4 | 1, 8, 10, 18, 19, 20, 21, 23, 24, 25, 26 |
| TOLUENE (COMPONENT ANALYSIS) (6.00%) | 108-88-3 | 1, 10, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26 |
| N-HEXANE (COMPONENT ANALYSIS) | 110-54-3 | 1, 10, 18, 19, 20, 21, 23, 24, 25, 26 |
| TERT-AMYL METHYL ETHER | 994-05-8 | 11, 15 |
| XYLENES (COMPONENT ANALYSIS) (10.00%) | 1330-20-7 | 1, 10, 18, 19, 20, 21, 22, 23, 24, 25, 26 |
| METHYL-TERT-BUTYL ETHER | 1634-04-4 | 1, 21, 24, 25 |
| TRIMETHYL BENZENE (COMPONENT ANALYSIS) | 25551-13-7 | 1, 10, 18, 19, 20, 21, 23, 25, 26 |

--- REGULATORY LISTS SEARCHED ---

| | | | | |
|---|---|---|---|---|
| 1=ACGIH ALL | 6=IARC 1 | 11=TSCA 4 | 16=CA P65 CARC | 21=LA RTK |
| 2=ACGIH A1 | 7=IARC 2A | 12=TSCA 5a2 | 17=CA P65 REPRO | 22=MI 293 |
| 3=ACGIH A2 | 8=IARC 2B | 13=TSCA 5e | 18=CA RTK | 23=MN RTK |
| 4=NTP CARC | 9=OSHA CARC | 14=TSCA 6 | 19=FL RTK | 24=NJ RTK |
| 5=NTP SUS | 10=OSHA Z | 15=TSCA 12b | 20=IL RTK | 25=PA RTK |

**(Section continued next page)**

26=RI RTK

Code key: CARC=Carcinogen; SUS=Suspected Carcinogen; REPRO=Reproductive

## 16. OTHER INFORMATION

USE: UNLEADED MOTOR FUEL

NOTE: PRODUCTS OF EXXON MOBIL CORPORATION AND ITS AFFILIATED COMPANIES ARE NOT FORMULATED TO CONTAIN PCBS.

Health studies have shown that many hydrocarbons pose potential human health risks which may vary from person to person. Information provided on this MSDS reflects intended use. This product should not be used for other applications. In any case, the following advice should be considered:

INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

Precautionary Label Text:

CONTAINS GASOLINE, BENZENE, AND ETHYLBENZENE

DANGER!

EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. CAUSES SKIN IRRITATION. RESPIRATORY IRRITATION, DIZZINESS, NAUSEA, LOSS OF CONSCIOUSNESS, AND IN CASES OF EXTREME EXPOSURE, POSSIBLY DEATH. LOW VISCOSITY MATERIAL-IF SWALLOWED, MAY BE ASPIRATED AND CAN CAUSE SERIOUS OR FATAL LUNG DAMAGE.

OVEREXPOSURE TO BENZENE MAY RESULT IN CANCER, BLOOD DISORDERS, AND DAMAGE TO THE BONE MARROW. LONG-TERM EXPOSURE TO GASOLINE VAPOR HAS CAUSED KIDNEY AND LIVER CANCER IN LABORATORY ANIMIALS, BLOOD EFFECTS, AND NERVOUS SYSTEM DAMAGE.

Keep away from heat, sparks, and flame. Avoid all personal contact. Avoid prolonged breathing of vapor. Use with adequate ventilation. Keep container closed. Approved portable containers must be properly grounded when transferring fuel. For use as a motor fuel only. Misuse of gasoline may cause serious injury or illness. Never siphon by mouth. Not to be used as a solvent or skin cleaning agent.

FIRST AID: In case of contact, wash skin with soap and water. Immediately remove contaminated clothing, including shoes. Destroy or

**(Section continued next page)**

wash clothing before reuse. If swallowed, seek immediate medical attention. Do not induce vomiting. Only induce vomiting at the instruction of a physician.

This warning is given to comply with California Health and Safety Code 25249.6 and does not constitute an admission or a waiver of rights. This product contains a chemical known to the State of California to cause cancer, birth defects, or other reproductive harm. Chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm are created by the combustion of this product. Refer to product Material Safety Data Sheet for further safety and health information.

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For Internal Use Only: MHC: 1* 1* 1* 1* 2*, MPPEC: CF, TRN: 123455-20, CMCS97: EMGF20, REQ: PS+C, SAFE USE: G
EHS Approval Date: 01MAR2002

DRILLING PRODUCTS GROUP — Material Safety Data Sheet

drilling fluids • grouts & sealants • polymers & additives • well rehabilitation chemicals

**MATERIAL SAFETY DATA SHEET** — May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.



**PRODUCT NAME: PUREGOLD® MEDIUM CHIPS**

## Section I MANUFACTURER'S INFORMATION

**MANUFACTURER'S NAME & ADDRESS:**

**Date Prepared: February 1, 2002**

**CETCO** – ***Drilling Products Group***
**1500 West Shure Drive**
**Arlington Heights, IL 60004**

**Telephone: 847-392-5800 / Fax: 847-577-5571**
**EMERGENCY CONTACT:** ***CHEMTREC*** **800-424-9300**
**E-mail: www.cetco.com**

## Section II HAZARDOUS INGREDIENTS / IDENTITY INFORMATION

**PRODUCT IDENTIFICATION:**

**Chemical Name:** Bentonite Clay
**Chemical Family:** Natural Mineral, Montmorillonite
**CAS No:** 1302-78-9 (Bentonite is on the TSCA inventory)
**Formula:** Naturally occurring hydrated aluminosilicate of sodium, calcium, magnesium, and iron
**NFPA/HMIS:** Health – 1*, Fire - 0, Reactivity - 0, Specific Hazard - *See Section VI.*
**DOT Class:** Not Regulated (49 CFR, IMDG, ICAO, IATA)

| **HAZARDOUS COMPONENTS:** (Specific Chemical Identity: Common Name(s)) | OSHA PEL (TWA) | ACGIH TLV (TWA) | NIOSH REL (TWA) | % (optional) |
|---|---|---|---|---|
| **Quartz: CAS# 14808-60-7** (naturally occurring constituent) | – | – | – | – |
| **Respirable Quartz:** | 0.1 mg/m$^3$ | 50 µg/m$^3$ | 50 µg/m$^3$ | <1- 2% |
| **Nuisance Dust - Respirable:** | 5 mg/m$^3$ | 3 mg/m$^3$ | – | – |
| **Total Dust:** | 15 mg/m$^3$ | 10 mg/m$^3$ | _ | _ |

**OSHA PEL** - OSHA Permissible Exposure Limit, 8 hour Time-Weighted Average
**ACGIH TLV** - American Conference of Governmental Industrial Hygienists Threshold Limit Value, 8 hr. TWA, 40 hr. week
**NIOSH REL** - National Institute for Occupational Safety and Health, Recommended Exposure Limit, 10 hr. TWA, 40 hr. week

*** WARNING:** This product contains a small amount of quartz that may cause delayed respiratory disease if inhaled over a prolonged period of time. Avoid breathing dust. Use NIOSH/MSHA approved respirator where TLV for quartz may be exceeded. IARC Monographs on the evaluation of the Carcinogenic Risk of Chemicals to Humans (volume 68, 1997) concludes that quartz is carcinogenic to humans (IARC classification 1).

**Note:** The Permissible Exposure Limits (PELs) reported above are the pre-1989 limits that were reinstated by OSHA June 30, 1993 following a decision by the United States Circuit Court of Appeals for the 11th Circuit. Federal OSHA is now enforcing these PELs. More restrictive exposure limits may be enforced by some other jurisdictions.

National Institute for Occupational Safety and Health (NIOSH) has recommended that the permissible exposure limit be changed to 50 micrograms respirable free silica per cubic meter of air (0.05 mg/ m$^3$) as determined by a full shift sample up to a 10 hour working day, 40 hours per week. *See*: 1974 NIOSH criteria for a recommended Standard for Occupational Exposure to Crystalline Silica for more detailed information.

## Section III PHYSICAL/CHEMICAL CHARACTERISTICS

| | | | |
|---|---|---|---|
| **Boiling Point** | - Not Applicable | **Specific Gravity** (Water = 1.0) | - 2.5 |
| **Vapor Pressure** (mm Hg.) | - Not Applicable | **Melting Point** | - Not Applicable |
| **Vapor Density** (Air = 1.0) | - Not Applicable | **Evaporation Rate** (Butyl Acetate = 1.0) | - Not Applicable |
| **Solubility in Water** | - Negligible | | |
| **Appearance and Odor** | - Pale gray to buff chips, odorless | | |

## Section IV FIRE AND EXPLOSION HAZARD DATA

**Flash Point** (*Method Used*) - Not Applicable

**Extinguishing Media** - This product is not considered flammable, nor will it support combustion. Use extinguishing media appropriate to the surrounding fire.

**Flammable Limits** - Not Applicable **LEL** - Not Applicable **UEL** - Not Applicable

**Special Fire Fighting Procedure** - Not Applicable

**Unusual Fire/Explosion Hazards** - None known

## Section V REACTIVITY DATA

**Stability:** Stable - X **Conditions to Avoid** - None Known

**Incompatibility** (*Materials to Avoid*)**:** None Known

**Hazardous Decomposition or By-products:** None Known

**Hazardous Polymerization:** Will Not Occur - X **Conditions to Avoid** - None Known

## Section VI HEALTH HAZARD DATA

This product is a chemically inert, non-combustible mineral. A single exposure will not result in serious adverse effects. Excessive occupational, uncontrolled inhalation of dust may cause lung disease, silicosis, with symptoms of shortness of breath and reduced pulmonary function.

**Route(s) of Entry:** Inhalation? Yes Skin? No Ingestion? No

**Health Hazards (Acute and Chronic):** May cause delayed respiratory disease if dust inhaled over a prolonged period of time.

**Inhalation:** Breathing silica dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may cause irritation of the nose, throat and respiratory passages. Inhalation of dust may have the following serious chronic health effects:

**Silicosis:** Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness and reduced pulmonary function. This disease is exacerbated by smoking. Individuals with silicosis are predisposed to develop tuberculosis.

**Cancer Status:** The International Agency for Research on Cancer has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1 - carcinogenic to humans). Refer to *IARC Monograph 68, Silica, Some Silicates and Organic Fibers* (published in June 1997) in conjunction with the use of these materials.

The National Toxicology Program classifies respirable crystalline silica as a known human carcinogen. For further information *See*: "Adverse effects of Crystalline Silica Exposure" published by the American Thoracic Society Medical Section of the American Lung Association, American Journal of Respiratory and Critical Care Medicine, Volume 155, page 761-765, 1997.

## Section VI HEALTH HAZARD DATA (continued)

**Skin Contact:** No adverse effects expected

**Eye Contact:** Contact may cause mechanical irritation and possible injury

**Ingestion:** No adverse effects expected for normal, incidental ingestion

**Chronic Health Effects:** See "Inhalation" subsection above with respect to silicosis, cancer status and other data with possible relevance to human health.

**Signs and Symptoms of Exposure:** There are generally no signs or symptoms of exposure to crystalline silica. See "Inhalation" subsection above for symptoms of silicosis.

**Medical Conditions Generally Aggravated by Exposure:** Individuals with respiratory disease, including but not limited to asthma and bronchitis, or subject to eye irritation should not be exposed to crystalline silica dust.

**Emergency and First Aid Procedures:**

**Eye Contact** – Flush the eyes immediately with large amounts of water, lifting the upper and lower lids occasionally. If irritation persists or for imbedded foreign body, get immediate medical attention.

**Gross Inhalation –** Remove to fresh air. If breathing has stopped, perform artificial respiration. If breathing is difficult have qualified personnel administer oxygen. Get prompt medical attention.

**Skin Contact -** No first aid should be needed since this product does not affect the skin. Wash exposed skin with soap and water before breaks and at the end of the shift.

**Ingestion -** If large amounts are swallowed, get immediate medical attention.

## Section VII PRECAUTIONS FOR SAFE HANDLING AND USE

**Steps to be Taken in Case Material is Released or Spilled:** Vacuum if possible to avoid generating airborne dust. Avoid breathing dust. Wear an approved respirator. Avoid adding water; product will become slippery when wet. Waste Disposal Method – Follow federal, state and local regulations for solid waste.

**Handling and Storing Precautions:** Do not breathe dust. Use normal precautions against bag breakage or spills of bulk material. Avoid creation of respirable dust. Use good housekeeping in storage and use areas to prevent accumulation of dust in work areas. Use adequate ventilation and dust collection. Maintain and use proper, clean respiratory equipment. Launder clothing that has become dusty. Empty containers (bags, bulk containers, storage tanks, etc.) retain silica residue and must be handled in accordance with provisions of this Material Safety Data Sheet. Warn and Train employees in accordance with state and federal regulations.

**Other Precautions:** Slippery when wet.

**WARN YOUR EMPLOYEES (AND YOUR CUSTOMERS – USERS IN CASE OF RESALE) BY POSTING AND OTHER MEANS OF THE HAZARDS AND OSHA PRECAUTIONS TO BE USED. PROVIDE TRAINING FOR YOUR EMPLOYEES ABOUT OSHA PRECAUTIONS.**

## Section VIII CONTROL MEASURES

**Respiratory Protection:** Use appropriate respiratory protection for respirable particulate based on consideration of airborne workplace concentration and duration of exposure arising from intended end use. Refer to the most recent standards of ANSI (Z88.2) OSHA (29 CFR 1910.134), MSHA (30 CFR Parts 56 and 57) and NIOSH Respirator Decision Logic.

**Ventilation:** Use local exhaust as required to maintain exposures below applicable occupational exposure limits (*See Section II*). See also ACGIH "Industrial Ventilation – A Manual for Recommend Practice", (*current edition*).

**Protective Gloves:** Recommended.

**Eye Protection:** Safety glasses or goggles recommended.

**Other Protective Clothing or Equipment:** As appropriate for work environment. Dusty clothing should be laundered before reuse.

## Section VIII CONTROL MEASURES (continued)

**Transportation Data:** **U.S. DOT Hazard Classification**

| | |
|---|---|
| **Proper Shipping Name:** | **Not regulated** |
| **Technical Name:** | **N/A** |
| **UN Number:** | **N/A** |
| **Hazard Class/Packing Group:** | **N/A** |
| **Labels Required:** | **None** |
| **DOT Packaging Requirements:** | **N/A** |
| **Exceptions:** | **N/A** |

## Section IX OTHER REGULATORY INFORMATION

**SARA 311/312:** Hazard Categories for SARA Section 311/312 Reporting: Chronic Health

**SARA 313:** This product contains the following chemicals subject to annual release reporting requirements under the SARA section 313 (40 CFR 372): None

**CERCLA Section 103 Reportable Quantity:** None

**California Proposition 65:** This product contains the following substances known to the state of California to cause cancer and/or reproductive harm: crystalline silica (respirable).

**Toxic Substances Control Act:** All of the components of this product are listed on the EPA TSCA Inventory or are exempt from notification requirements.

**European Inventory of Commercial Chemical Substances:** All the components of this product are listed on the EINECS Inventory or exempt from notification requirements. (The EINECS number for Quartz: 231-545-5)

**Canadian Environmental Protection Act:** All the components of this product are listed on the Canadian Domestic Substances List or exempt from notification requirements.

**Japan MITI:** All the components of this product are existing chemical substances as defined in the Chemical Substance Control Law

**Australian Inventory of Chemical Substances:** All the components of this product are listed on the AICS Inventory or exempt from notification requirements.

**Canadian WHMIS Classification:** This product contains crystalline silica (respirable), classified as a Class D, Division 2, Subdivision A substance.

**European Community Labeling Classification:** Harmful (Xn)

**European Community Risk and Safety Phrases:** R40, R48, S22

**REFERENCES:**

Registry for Toxic Effects of Chemical Substances (RTECS), 1995.

Patty's Industrial Hygiene and Toxicology.

NTP Ninth Annual Report on Carcinogens, 1997.

IARC Monograph Volume 68, Silica, Some Silicates and Organic Fibers, 1997.

# MATERIAL SAFETY DATA SHEET

Date Prepared: May 1, 2002

## 1. PRODUCT/COMPANY IDENTIFICATION

**SAKRETE® Products:**
High Strength Concrete Mix
Glass Block Mortar
Mortar Mix
Sand Mix
Type S Mortar

**American Stone-Mix Products:**
Amspec Type S Mortar
B-Dry Waterproofers Sand Mix
Block -Fill Grout
Evercrete Sand Mix
General Purpose Concrete
GFG-210
Metro Mix 240
Metro Mix 240 AE
Metro Mix 240 MS
Metro Mix 240 MS AE
Rip Rap
Waterproofers Sand Mix

**Emergency Telephone:**
800-424-9300 (Chemtrec) or
703-527-3887 (Outside USA)

**Manufacturer's Name & Address:**
American Stone-Mix, Inc.
8320 Bellona Ave.
Towson, MD 21204

**Telephone Number for Information:** 800-354-8609

## 2. EMERGENCY AND FIRST AID

**EMERGENCY INFORMATION:** This product is a gray cementitious mixture of cement, sand and or stone. When in contact with moisture in eyes or on skin, or when mixed with water, it becomes highly caustic (pH > 12) and will damage or burn (as severely as third-degree) the eyes or skin. Inhalation may cause irritation to the moist mucous membranes of the nose, throat and upper respiratory system or may cause or may aggravate certain lung diseases or conditions. Use exposure controls or personal protection methods described in Section 12.

**EYES:** Immediately flush eye thoroughly with water. Continue flushing eye for at least 15 minutes, including under lids, to remove all particles. Call physician immediately.

**SKIN:** Wash skin with cool water and pH-neutral soap or a mild detergent. Seek medical treatment if irritation or inflammation develops or persists. Seek immediate medical treatment in the event of burns.

**INHALATION:** Remove person to fresh air. If breathing is difficult, administer oxygen. If not breathing, give artificial respiration. Seek medical help if coughing and other symptoms do not subside. Inhalation of large amounts of Concrete requires immediate medical attention.

**INGESTION:** Do not induce vomiting. If conscious, have the victim drink plenty of water and call a physician immediately.

## 3. COMPOSITION INFORMATION

**DESCRIPTION:**

This product consists of a heterogeneous mixture of hydraulic cement, sand and rock. The major compounds are:

| | | |
|---|---|---|
| $3CaO \cdot SiO_2$ | Tricalcium Silicate | CAS #12168-85-3 |
| $2CaO \cdot SiO_2$ | Dicalcium Silicate | CAS #10034-77-2 |
| $3CaO \cdot Al_2O_3$ | Tricalcium Aluminate | CAS #12042-78-3 |
| $4CaO \cdot Al_2O_3 \cdot Fe_2O_3$ | Tetracalcium aluminoferrite | CAS #12068-35-8 |
| $CaSO_4 \cdot 2H_2O$ | Calcium Sulfate dihydrate (Gypsum) | CAS #7778-18-9 (CAS #13397-24-5) |
| $SiO_2$ | Silica Sand | CAS #14808-60-7 |

## 4. HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

| COMPONENT | OSHA PEL | ACGIH TLV-TWA | NIOSH REL |
|---|---|---|---|
| -------------------- | ------------------------- | ------------------------ | ------------------------ |
| **Hydraulic Cement** | 5 mg respirable dust/$m^3$<br>15 mg total dust/$m^3$ | 10 mg total dust/$m^3$ | |
| **Calcium sulfate** (CAS #7778-18-9) [Gypsum (CAS #13397-24-5)] | 5 mg respirable dust/$m^3$<br>15 mg total dust/$m^3$ | 10 mg total dust/$m^3$ | |
| **Iron oxide** (CAS #1309-37-1) | 10 mg/$m^3$ | 5 mg/$m^3$ | |
| **Calcium carbonate** (CAS #1317-65-3) | 5 mg respirable dust/$m^3$<br>15 mg total dust/$m^3$ | 10 mg total dust/$m^3$ | |
| **Magnesium oxide** (CAS #1309-48-4) | 15 mg total dust/$m^3$ | 10 mg total dust/$m^3$ | |
| **Calcium oxide** (CAS #1306-78-8) | 5 mg/$m^3$ | 2 mg/$m^3$ | |

**MAY CONTAIN:**

| | | | |
|---|---|---|---|
| **Amorphous Silica** (CAS #7631-86-9 | $\frac{80\ mg/m^3}{SiO_2}$ | 10 mg/$m^3$ | |
| **Aluminum Oxide** (CAS #1344-28-1 | 5 mg respirable dust/$m^3$<br>15 mg total dust/$m^3$ | 10 mg/$m^3$ | |

**TRACE INGREDIENTS:**

Due to the use of substances mined from the earth's crust, trace amounts of naturally occurring, potentially harmful constituents may be detected during chemical analysis.

## 5. HAZARD IDENTIFICATION

**POTENTIAL HEALTH EFFECTS:** NOTE: Potential health effects may vary depending upon the duration and degree of exposure. To reduce or eliminate health hazards associated with this product, use exposure controls or personal protection methods as described in Section 12.

**EYE CONTACT:** (Acute/Chronic) Exposure to airborne dust may cause immediate or delayed irritation or inflammation of the cornea. Eye contact by larger amounts of dry powder or splashes of wet material may cause effects ranging from moderate eye irritation to chemical burns and blindness.

**SKIN CONTACT:** (Acute) Exposure may cause drying of the skin with consequent mild irritation or more significant effects attributable to aggravation of other conditions. Discomfort or pain cannot be relied upon to alert a person to a hazardous skin exposure.

(Chronic) Dry material coming in contact with wet skin or exposure to wet material may cause more severe skin effects, including thickening, cracking or fissuring of the skin. Prolonged exposure can cause severe skin damage in the form of chemical (caustic) burns.

(Acute/Chronic) Some individuals may exhibit an allergic response upon exposure. The response may appear in a variety of forms ranging from a mild rash to severe skin ulcers.

**INHALATION:** (Acute) Exposure may cause irritation to the moist mucous membranes of the nose, throat and upper respiratory system. Pre-existing upper respiratory and lung diseases may be aggravated by inhalation.

(Chronic) Inhalation exposure to free crystalline silica may cause delayed lung injury including silicosis, a disabling and potentially fatal lung disease, and/or cause or aggravate other lung diseases or conditions.

**INGESTION:** (Acute/Chronic) Internal discomfort or ill effects are possible if large quantities are swallowed.

**CARCINOGENIC POTENTIAL:** This product is not recognized as a carcinogen by NTP, OSHA, or IARC. However, it may contain trace amounts of heavy metals recognized as carcinogens by these organizations. In addition, it also contains crystalline silica, which IARC classifies as a known human carcinogen (Group I). The NTP, in it's ninth Annual Report on Carcinogens, classified "silica, crystalline (respirable)" as a known carcinogen. (See also Sections 4 and 12.)

## 6. ACCIDENTAL RELEASE MEASURES
**(See Section for Regulatory Information)**

Contain material to prevent contamination of soil, surface water or ground water. Use dry clean-up methods that do not disperse dust into the air or entry into surface water. Material can be used if not contaminated. Place in an appropriate labeled container for disposal or use. Avoid inhalation of dust and contact with skin and eyes. Use exposure control and personal protection methods as described in Section 12.

## 7. PHYSICAL/CHEMICAL DATA

| | | | |
|---|---|---|---|
| **APPEARANCE/ODOR:** | Gray, odorless | **PHYSICAL STATE:** | Solid (Powder mixed with sand and rock.) |
| **BOILING POINT:** | > 1000°C | **MELTING POINT:** | > 1000°C |
| **VAPOR PRESSURE:** | Not applicable | **VAPOR DENSITY:** | Not applicable |
| **pH (IN WATER) (ASTM D 1293-95)** | 12 to 13 | **SOLUBILITY IN WATER:** | Slightly soluble (0.1% to 1.0%) |
| **SPECIFIC GRAVITY ($H_2O$ = 1.0):** | 2.5 – 2.8 | **EVAPORATION RATE:** | None |

## 8. FIRE AND EXPLOSION

| | | | |
|---|---|---|---|
| **FLASH POINT:** | None | **LOWER EXPLOSIVE LIMIT:** | None |
| **AUTO IGNITION TEMPERATURE:** | Not combustible | **UPPER EXPLOSIVE LIMIT:** | None |
| **FLAMMABLE LIMITS** | Not applicable | **SPECIAL FIRE FIGHTING PROCEDURES:** | None |
| **EXTINGUISHING MEDIA:** | Not combustible | **UNUSUAL FIRE AND EXPLOSION HAZARDS:** | None |
| **HAZARDOUS COMBUSTION PRODUCTS:** | None | | |

## 9. STABILITY AND REACTIVITY DATA

| | |
|---|---|
| **STABILITY:** | Product is stable. Keep dry until used. |
| **CONDITIONS TO AVOID:** | Unintentional contact with water. Contact with water will result in hydration and produces (caustic) calcium hydroxide. |
| **INCOMPATIBILITY:** | Wet material is alkaline. As such, it is incompatible with acids, ammonium salts and aluminum metal. |
| **HAZARDOUS DECOMPOSITION:** | Will not occur. |
| **HAZARDOUS POLYMERIZATION:** | Will not occur. |

## 10. PRECAUTIONS FOR HANDLING AND STORAGE

**HANDLING AND STORAGE**

Keep dry until used. Handle and store in a manner so that airborne dust does not exceed applicable exposure limits. Use adequate ventilation and dust collection. Use exposure control and personal protection methods as described in Section 12.

## 11. TOXICOLOGICAL INFORMATION

See Section 5 for Hazard Identification. No recognized unusual toxicity to plants and animals.

Conditions aggravated by exposure: Eye disease, Skin disorders and Chronic Respiratory conditions.

## 12. EXPOSURE CONTROLS/PERSONAL PROTECTION

**RESPIRATORY PROTECTION:**

Use local exhaust or general dilution ventilation to control dust levels below applicable exposure limits. Minimize dispersal of dust into the air.

If local or general ventilation is not adequate to control dust levels below applicable exposure limits or when dust causes irritation or discomfort, use MSHA/NIOSH approved respirators.

**EYE PROTECTION:**

Wear safety glasses with side shields or goggles to avoid contact with the eyes. In extremely dusty environments and unpredictable environments, wear tight-fitting unvented or indirectly vented goggles to avoid eye irritation or injury. Contact lenses should not be worn when handling cement or cement containing products.

**SKIN PROTECTION:**

Wear impervious abrasion- and alkali-resistant gloves, boots, long-sleeved shirt, long pants or other protective clothing to prevent skin contact. Promptly remove clothing dusty with dry material or clothing dampened with moisture mixed with material, and launder before re-use. If contact occurs, wash areas contacted by material with pH neutral soap and water.

## 13. DISPOSAL CONSIDERATIONS

**DISPOSAL:**

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal methods must be in compliance with all Federal, State/ Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

**IF THIS MATERIAL AS PACKAGED, BECOMES A WASTE, IT DOES NOT MEET THE CRITERIA FOR A HAZARDOUS WASTE AS DEFINED BY THE ENVIRONMENTAL PROTECTION AGENCY UNDER THE AUTHORITY OF THE RESOURCE CONSERVATION AND RECOVER ACT (40CFR 261), DISPOSE OF IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.**

Comply with all applicable local, state and federal regulations for disposal of unusable or contaminated materials. Dispose of packaging/containers according to local, state and federal regulations.

## 14. TRANSPORTATION DATA

Not hazardous under U.S. DOT or TDG regulations.

## 15. OTHER REGULATORY INFORMATION

| | |
|---|---|
| **Status under US OSHA Hazard Communication Rule 29 CFR 1910.1200:** | Considered a hazardous chemical under this regulation and should be included in the employer's hazard communication program. |
| **Status under CERCLA/Superfund, 40 CFR 117 and 302:** | Not listed. |
| **Hazard Category under SARA (Title III), Sections 311 and 312:** | Qualifies as a hazardous substance with delayed health effects. |
| **Status under SARA (Title III), Section 313:** | Not subject to reporting requirements under Section 313. |
| **Status under TSCA (as of May 1997):** | Some substances are on the TSCA inventory list. |
| **Status under the Federal Hazardous Substances Act:** | Hazardous substance subject to statutes promulgated under the subject act. |
| **Status under California Proposition 65:** | This product contains crystalline silica, a substance known to the State of California to cause cancer. This product also may contain trace amounts of heavy metals known to the State of California to cause cancer, birth defects or other reproductive harm. |
| **Status under Canadian Environmental Protection Act:** | Not listed. |
| **Status under Canadian WHMIS:** | Considered to be a hazardous material under the Hazardous Products Act as defined by the Controlled Products Regulations (Class D2A, E - Corrosive Material) and subject to the requirements of WHMIS. |

## 16. OTHER INFORMATION

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, express or implied, is made with respect to the information contained herein. It is the user's obligation to determine the conditions of safe use of this product.

# Ambient Air Monitoring Form

*Attachment 3*

*August 11, 2003*
*W.O. #581-013*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

# *Ambient Air Monitoring Form*

| Date | Time | Ambient Air Monitoring Location | Results |
|---|---|---|---|
| | | | |
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# Identification of Poisonous Plants

*Attachment 4*

*August 11, 2003*
*W.O. #581-013*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

# Identifying Poisonous Plants

Most species of poison ivy, oak, and sumac have three leaflets; hence the saying, "Leaves of three, let it be." These plants vary significantly in appearance in different regions of the country, but in most species the flower and fruit structures arise in the angle between the leaf and the twig, the flowers are greenish in spring, and the plant's mature fruit is off-white or pale yellow-green.

Several varieties, including two species each of poison ivy, poison oak, and poison sumac and six subspecies of poison ivy (*Toxicodendron radicans*), are found in the United States. Poison ivy (see figure A below) generally grows east of the Rocky Mountains and poison oak in the West. Both poison ivy and poison sumac are found along the Gulf Coast. Poison oak prefers swampy areas in the Southeast.

Figures A1, A2: Courtesy of Lisa A. Garner, MD; figure A3: staff photo; figure A4: Janet Robidoux

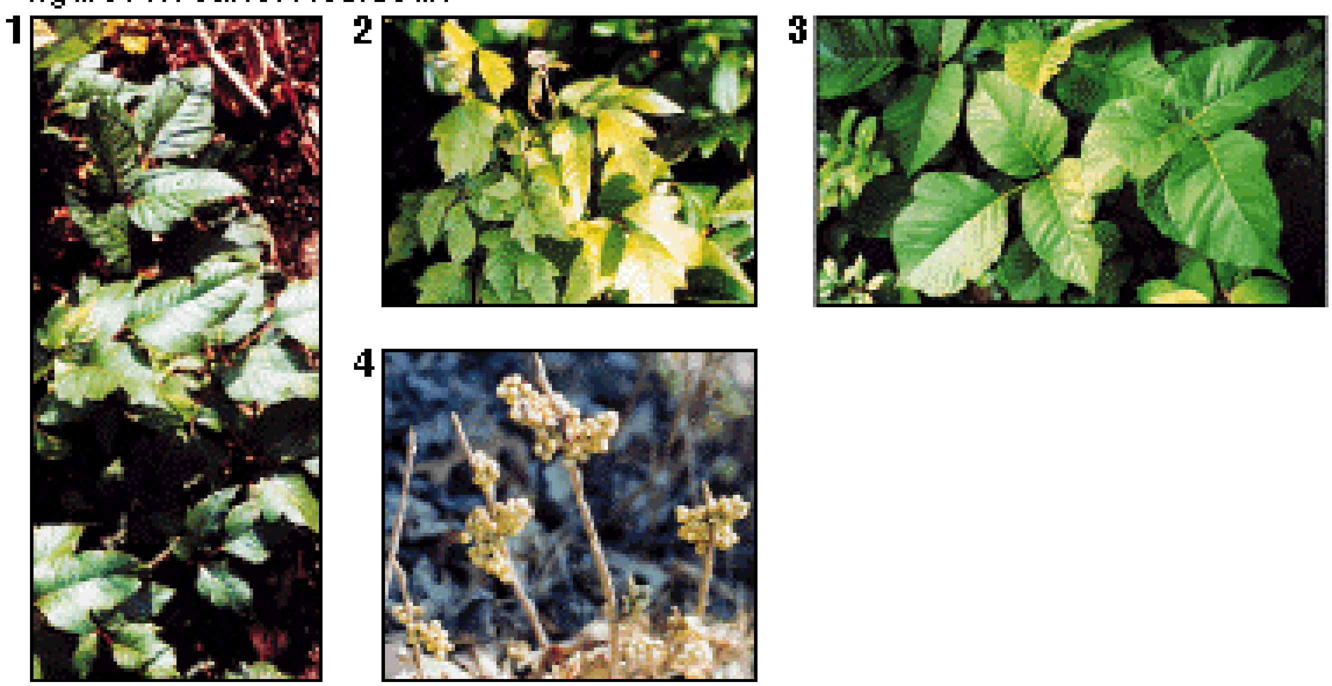



Figure A. Poison ivy (Toxicodendron radicans) can grow as a shrub or vine, but all varieties are characterized by glossy leaves that grow in clusters of three leaflets. The varieties shown here are found in Texas (1,2) and Minnesota (3). The off-white or pale yellow-green berries of poison ivy (4) often remain on the plant through the winter.

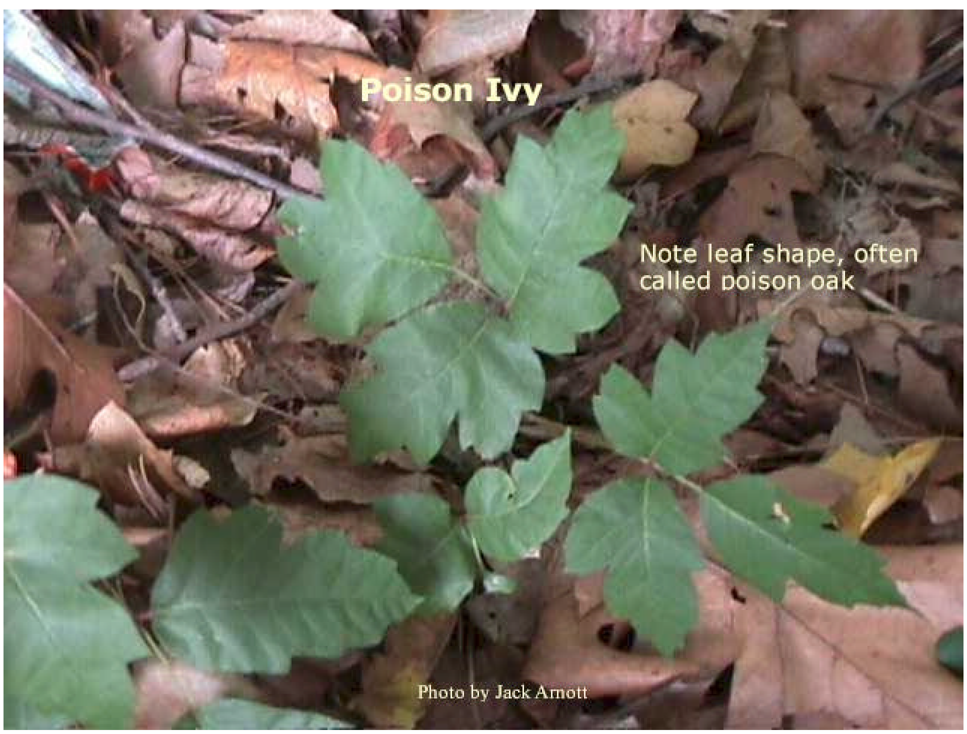
## Poison Ivy

A climbing vine with three serrated-edge, pointed leaves grows in the East, Midwest and South. In the northern and western states, poison ivy grows as a non-climbing shrub.

The appearance of these plants is variable. Leaves are alternate and normally consist of three leaflets with the stalk of the central leaflet being longer than those of the other two but can be found with five or even seven leaflets. The leaflets are two to four inches long, dull or glossy green with pointed tips. The middle leaflet is generally larger than the two laterals. The edges of the leaflets may be toothed, lobed, or smooth. Virginia Creeper (*Parthenocissus quinquefolia*) is non-poisonous vine with five leaflets that is often mistaken for poison ivy.

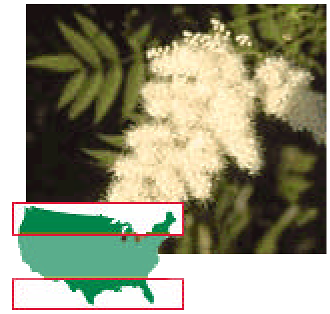
Poison ivy can be a shrub or a woody vine. Yellowish-green flowers occur in compact clusters in leaf axils, in June or July followed by waxy, gray-white berries about three-sixteenths of an inch in diameter in late summer.

# Identifying Poisonous Plants

# Identifying Poisonous Plants

## Poison Sumac



A shrub or bush with two rows of 7-13 leaflets, most common in the peat bogs of the Northern United States and in swampy Southern regions of the country. A water loving swamp shrub (dendritic) or bush with two rows of 7-13 leaflets; growing from 6 to 20 feet in height, the Poison Sumac is found in the east from Quebec to Florida and westward along the coast to far west Texas between Shelby and Hardin counties.


## Poison Oak

Poison oak also has three leaves. It grows in the sandy soil of the Southeast as a small shrub. In the western United States poison oak is a very large plant that grows as a standing shrub or climbing vine. Eastern poison oak has the most "oak-looking" leaves of any of the species. It usually has multi-lobed leaves, no aerial roots on the stems, and fuzzy fruits and leaves. It loves sandy soils. Western poison oak is found only along the Pacific coast and into the mountains and it usually has aerial roots extending from the main stem.

# Daily Safety Meeting Form

*Attachment 5*

*August 11, 2003*
*W.O. #581-013*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

# Daily Safety Meeting
# Whirlpool Facility, Fort Smith, Arkansas

| **Date:** | **Meeting Facilitator:** |
|---|---|
| **AWARENESS ISSUES** (special EHS concerns, pollution prevention, recent incidents) | |
| **OTHER ISSUES** (HASP changes, new JHAs, attendee comments) | |
| **DISCUSSION OF DAILY ACTIVITIES/TASKS AND SAFETY MEASURES** | |

**ATTENDEES** (Print name and initial)

| | |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |

# ERM Incident Form

*Attachment 6*

*August 11, 2003*
*W.O. #581-013*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

# Incident Report

**Case Number from OSHA 300 Log ___________**

**Instructions:** Complete form, route to Project Manager, and route to Medical Recordkeeping Coordinator within 24 hours of incident. If a piece of information does not apply, put N/A in the block. Forms from all incidents involving any injury will be routed to Corporate Health and Safety Manager for OSHA recordability determination.
**Note:** This form can be used in lieu of OSHA Form 301 Injuries and Illnesses Incident Report

| | | |
|---|---|---|
| **Date and time of incident**<br>Date: Time: | **Location of incident** (Name and address) | |
| **Time injured employee started work on day of incident** | | |
| **Reported by** | **Date reported** | **List any witnesses** |
| **Project Number** | **Project Manager** | **PIC** |
| **Injured employee name** | **Injured employee's home address** | |
| **Injured employee's date of birth** | **Injured employee's sex**<br>Male Female | **Injured employee's date of hire at ERM** |

**Type of Incident** (circle one)

First aid/minor injury — All other injuries
Vehicle accident — Property damage — Near miss

**What activity/task was taking place just prior to the incident?** (Describe the activity/task as well as tools, equipment and material involved and what workers were doing.)

**What happened to cause incident?** (Describe in detail the incident.)

**Immediate actions taken** (Describe actions taken and by whom immediately after the incident occurred.)

# Incident Report

**Case Number from OSHA 300 Log ___________**

| | | |
|---|---|---|
| **If incident involved an injury, describe injury**. (eg. Cut to left ring finger, sprained right ankle, snake bit to left shin, pulled muscles in back) | | |
| **What object or substance directly harmed the employee?** (Examples, concrete floor, chlorine, H2S, manhole cover. If this question does not apply to the incident, write N/A.) | | |
| **If medial treatment was given away from worksite, state name and mailing address of both the facility and treating health care professional.** | | |
| **Was employee treated in an emergency room? Yes No** | **Was employee hospitalized overnight as an in-patient? Yes No** | |
| **Consequences of incident** (Describe damage to property/equipment and/or injury. If incident was near miss, describe what could have happened.) | | |
| **If the employee died, give date of death** | | |
| **Is injury an OSHA recordable?** (To be completed by Corporate Health and Safety Manager)<br>Yes No Name of person making determination | | |
| **Name of person completing form** | **Signature of person completely form** | |
| **Title of person completing form** | **Phone number of person completing form** | **Date form completed** |

# Incident Report

**Case Number from OSHA 300 Log ___________**

**Instructions:** This side of the form will be completed as directed by the Corporate Health and Safety Manager.

**Actions leading to incident. Circle all that apply and explain.**

| | | | |
|---|---|---|---|
| Failure to observe warning | Failure to use PPE | Failure to warn | Other |
| Delayed discovery | Procedure not followed | Abuse/misuse of equipment | |

**Conditions leading to incident. Circle all that apply and explain.**

| | | |
|---|---|---|
| Temperature/weather | Inadequate maintenance | Nature (animal, insects, plants) |
| Lack of PPE | Lack of proper instructions | Construction deficiencies |
| Improper design/engineering | Improper/defective tools/ equipment | Other |

**Job factors leading to incident. Circle all that apply and explain.**

| | | |
|---|---|---|
| Leadership/supervision | Work practices | Defective tools/equipment |
| Inadequate communication | Inadequate training | Inadequate inspections |
| Inadequate work procedures/practices | | Other |

**Personal factors leading to incident. Circle all that apply and explain.**

| | | |
|---|---|---|
| Physical capability | Physical stress/fatigue | Mental stress |
| Knowledge of task | Employee skills | Attention to details |
| Other | | |

| Corrective Action | Person responsible | Date completed |
|---|---|---|
| | | |

# Map to Hospital

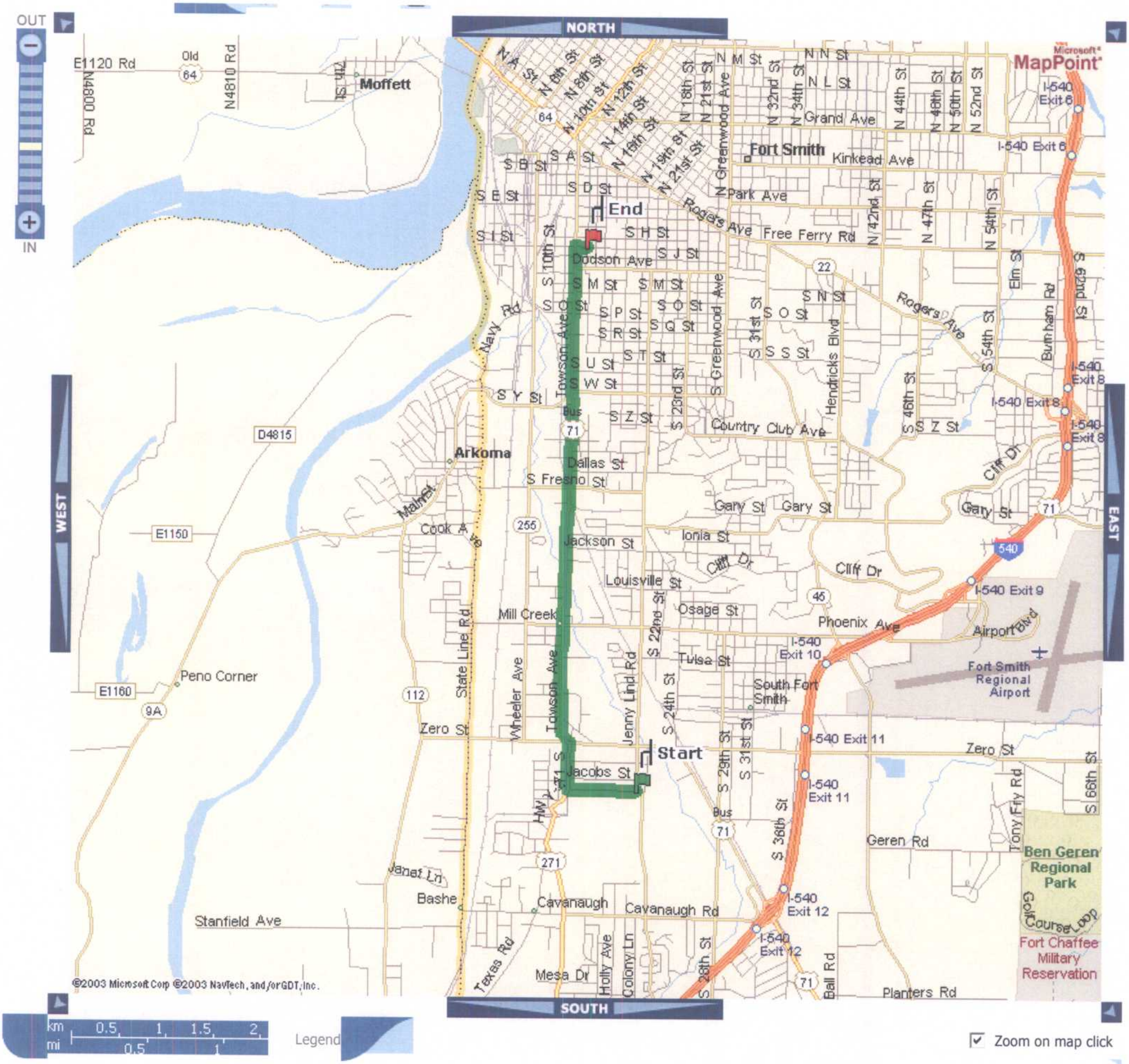
*Attachment 7*

*August 11, 2003*
*W.O. #581-013*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000


**Start:** 6400 Jenny Lind Ave, Fort Smith, AR 72908
**End:** St Edward Mercy Medical Center (hospital), Arkansas
**Total Distance:** 5.3 Miles
**Estimated Total Time:** 9 minutes

| Directions | Miles | Map |
|---|---|---|
| **Start:** Depart 6400 Jenny Lind Ave, Fort Smith, AR 72908 on Jenny Lind Ave (North) | 0.1 | ☐ |
| **1:** Turn LEFT (West) onto Norge Blvd [Ingersoll Ave], then immediately turn RIGHT (North) onto Jenny Lind Rd | 0.1 | |
| **2:** Road name changes to Jenny Lind Ave | 0.2 | |
| **3:** Turn RIGHT (East) onto SR-255 [Zero St] | 1.1 | ☐ |
| **4:** Take Ramp (LEFT) onto I-540 [US-71] | 2.8 | |
| **5:** At I-540 Exit 8, turn RIGHT onto Ramp | 0.2 | ☐ |
| **6:** Take Ramp (RIGHT) onto SR-22 [Rogers Ave] | 0.7 | |
| **End:** Arrive St Edward Mercy Medical Center (hospital), Arkansas | | ☐ |




**Start:** Jenny Lind Rd, Fort Smith, AR 72908
**End:** Sparks Regional Medical Center (hospital), Arkansas
**Total Distance:** 4.1 Miles
**Estimated Total Time:** 9 minutes

| Directions | Miles | Map |
|---|---|---|
| Start: Depart Jenny Lind Rd, Fort Smith, AR 72908 on Norge Blvd [Ingersol Ave] (West) | 0.4 | ☐ |
| 1: Turn RIGHT (North) onto US-271 [HWY-271 S] | 0.3 | |
| 2: Bear LEFT (North-West) onto US-71 Bus | 0.1 | |
| 3: Bear RIGHT (North) onto US-71 Bus [Towson Ave] | 3.2 | ☐ |
| 4: Turn RIGHT (East) onto S I St | 0.1 | ☐ |
| End: Arrive Sparks Regional Medical Center (hospital), Arkansas | | |

# Emergency Drill Evaluation Form

*Attachment 8*

*August 11, 2003*
*W.O. #581-013*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

# Emergency Drill Evaluation Form

| Date of Drill | Date of Evaluation |
|---|---|
| **Name of Person Conducting Drill (print)** | **Signature of Person Conducting Drill** |

| Briefly describe the drill scenario |
|---|
| |

| List the positive attributes of the drill |
|---|
| |

| List the opportunities for improvement |
|---|
| |

| Action Items | Assigned To | Estimated Completion Date |
|---|---|---|
| | | |

| Drill Evaluation Team Members (print names) |
|---|
| |

# Whirlpool Safety Standards for Contractors

*Attachment 9*

*August 11, 2003*
*W.O. #581-013*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

# SAFETY STANDARDS FOR CONTRACTORS

## I. PURPOSE:

**The Whirlpool Fort Smith Division has established both consistent and safe practice guidelines which apply to all at the division, whether they are contract personnel or our own employees. These specific standards and guidelines are necessary for the general health and safety of people working or present within the confines of our property.**

## II. WHIRLPOOL CONTRACT STANDARDS:

**On all written contracts with Whirlpool Corporation, Fort Smith Division located at 6400 JennyLind Rd., Fort Smith, AR., a Delaware Corporation. Having its principal place of business at 2000 - M-63, Benton Harbor, Michigan 49022. This will be required of all contractors.**

**Property Damage, Safety, and Health**

**Contractor shall take all necessary precautions to prevent damage of equipment or the material owned by Whirlpool or equipment to be installed as a part of this or any contract project. If deemed necessary by Whirlpool, temporary curtains or walls will be constructed by contractor to permit continuation of the work. The safety of workers shall be considered in the design of all equipment included in this job. It is the contractors responsibility to insure that no construction activity takes place which could damage or endanger the health and safety of any employee. Either of Whirlpool or that of the contractor. In both design and installation of all equipment <u>and</u> the equipment and process used to install such equipment shall adhere to all current requirements of the <u>O</u>ccupational <u>S</u>afety and <u>H</u>ealth <u>A</u>ct.**

**NOTE: Contractor must have current contract liability insurance. Total dollar amount to be set by Whirlpool. Proof of insurance must be on file in Maintenance Dept.**

### LEGAL REQUIREMENTS

## III. EMPLOYER'S REQUIREMENTS UNDER OSHA

**Each contractor\ employer - shall furnish to each of his\her employees employment which is free of recognized hazards causing or are likely to cause death or serious physical harm to his\her employees.**
**All shall comply with OSHA standards promulgated under this act.**

**REFERENCES: General Industry Standards 29 CFR 1910**
**OSHA Hazard Communication Standard 29 CFR 1910. 1200**

## IV. CONTRACTOR'S GENERAL SAFETY AND HEALTH PROVISION

1. **1910.12 <u>Construction Work.</u>**
   a. **<u>Standards:</u> The standards adopted are <u>O</u>ccupational <u>S</u>afety and <u>H</u>ealth <u>A</u>dministration standards. According to the provisions thereof, to every employment and place of employment of every empl oyee engaged in construction work by complying with the appropriate standards prescribed.**

   b. **<u>Definition:</u> For the purpose of, "construction work" means work for construction, alteration, and/or repair, including painting and decorating.**

   c. **<u>Construction Safety Act distinguished :</u> Whirlpool adopts as Occupational Safety and Health Administration standards those which are prescribed in the OSHA guidelines.**

2. **<u>Accident Prevention Responsibilities</u>**

   a. **It shall be the responsibility of the contractor to initiate and maintain such programs as may be necessary to comply with this part.**

   b. **The contractor shall provide for the frequent and regular inspections of the job sites, materials and equipment to be made by competent persons designated by the contractor.**

   c. **The use of any machinery, tools, materials or equipment which are not in compliance to applicable requirements of this part is prohibited. Such machine, tool(s), material, or equipment shall either be identified as unsafe by tagging or locking the controls to render them inoperable or such item be physically removed from its place of operation.**

   d. **The contractor shall permit only those employees qualified by training to operate equipment and machinery.**

## V. CONTRACTOR'S PERSONAL PROTECTIVE EQUIPMENT REQUIREMENT

1. **1910. 94, 95 <u>Personal Protective Equipment</u>**

   a. **The contractor is responsible for requiring the wearing of appropriate <u>P</u>ersonal <u>P</u>rotective <u>E</u>quipment in all operations where there is an exposure to hazardous conditions or where this part indicates the need for using such equipment to reduce the hazards to the employee(s).**

   b. **Regulations governing the use, selection, and maintenance of personal protective and lifesaving equipment are described on, and should be applied, the manufactures instructions for such equipment.**

2. **EYE PROTECTION:**

a. **All Whirlpool employees and contractor personnel are\ will be required to have ANSI approved safety glasses, (prescription or non- prescription) on at all times when they are inside Whirlpool facilities, (except office areas and restrooms). For contractor work, side shields are recommended.**

b. **Eye / face protection meeting ANSI standards required in performing any of the following: 1. Any welding, cutting or brazing operations.**
**2. When using any chemical agents which could cause eye damage.**
**3. While performing carpentry.**
**4. Any chipping or grinding operations.**
**5. Any general metal fabrication.**

3. **HEAD PROTECTION:**

a. **All contractor personnel will be required to wear non-conductive, high impact protective safety hats when entering / working in an area where contractor, maintenance work is being done overhead.**

**NOTE: <u>Head protection must be worn when performing work off the floor, using scaffolding or any type of motorized carrier to lift person(s) off the floor to perform overhead work.</u>**

4. **EAR PROTECTION:**

a. **Ear protection will be required by contractor personnel when performing any work <u>causing or working in</u> an area where the noise level exceeds 85 decibels. This rule will be adhered to no matter the duration of the exposure. Areas requiring hearing protection are identified.**

5. **FOOT PROTECTION:**

a. **All contractor personnel will wear shoes with leather or synthetic leather tops and hard soles. Steel toed safety shoes are recommended.**

## VI. LIFTS, SCAFFOLDING, LADDERS, FOR OVERHEAD CONSTRUCTION

1. **FORK LIFTS**

a. **All lifts used by contractor personnel will be by OSHA standards, having proper safety rails, lanyards attached and toe boards when the lift exceeds the capability of <u>four (4) feet</u>. 1910.67**

b. **Fork lift trucks will not be used for lifting personnel under any conditions unless the lifting device is an approved personnel carrier. Carrier must be equipped with proper shut off controls, body harness, lanyards (both to be worn by occupant in personnel carrier) ect.. Fork lift must be operated by trained operator, with clear communication between operator and person in carrier.**

**2. SCAFFOLDING**

**a. Scaffolding will have appropriate safety rails of 42 inches with an intermediate rail and a 4 inch toe board. 1910.28**

**3. LADDERS**

**a. All ladders used shall be in good condition and meet all OSHA standards. 1910.25 Contractors will supply their own ladders.**
**NOTE: <u>FIBERGLASS LADDERS ONLY</u> ARE TO BE USED ON WHIRLPOOL PROPERTY. USE OF WOOD OR ALUMINUM LADDERS IS FORBIDDEN (with the exception of allowing aluminum ladders to be used in order to provide a grounding path for static discharge only in the paint dept. when cleaning/servicing the spray bells).**

**VII. REQUIRED SAFETY STANDARDS FOR CONTRACT WORK AT WHIRLPOOL CORPORATION, FORT SMITH DIVISION.**

**1. GENERAL CONSTRUCTION**

**a. <u>All floor holes/excavations will have appropriate shoring to assure them against cave in</u>.**

**b. All excavations shall be provided with suitable solid barriers or railings, plus adequate warning lights or other devices to indicate the danger present.**

**c. All necessary precautions shall be taken to protect all persons in any area when work is being performed either over head or at floor level (in the case of excavations). Guards or other adequate protection must be provided whenever parts, bolts, tools or other potential hazards are left, around excavations, or above the floor level.**

**d. Areas in which work is being performed must be kept clean, orderly and safe. Combustible materials must be properly stored. Debris must be removed from the project area at the end of each working day by the contractor.**

**e. Loose materials such as bolts, nuts, hand tools, ect:, must not be left lying on beams, ledges, or any place from where they could fall or be knocked down to cause damage or injury. They must be immediately removed to the floor level or in case of tools, must be returned to a proper tool belt.**

**f. Guards removed while making alterations or repairs on equipment, (lockout\tagout also applies) must be replaced before the equipment is turned back on.**

**g. A flame resistant shield / barrier must be used to protect all persons from the flash of electric welding or hot slag / splatter from torch work.**

**h. Written approval of the Safety Department must be obtained before <u>any</u> explosives or tools utilizing a power cartridge can be used on Whirlpool property.**
**Note: <u>Contractor assumes sole responsibility for bodily injury and property damage caused by the use/possession of such explosives or power cartridges.</u> 1910.243 <u>*All loads not discharging properly*</u> are to be disposed of by the contractor. These can not be placed in general trash or offall removal. These loads can not to be left on the floor or machines.**

i. All slippery materials such as grease, oil or paint, ect:, which are spilled shall be removed from the floor or other surface immediately.

j. When an opening is made in the roof or walls of a building, the inside must be protected from weather until the opening is re-closed.

k. When it is necessary to leave a job before completion, all materials, rigging, boards, loose nails, and other debris must be carefully removed from the floor. There shall be no materials or equipment left overhead or on the roof unless it is secured in place. Adequate barricades and warnings must be erected at all openings, excavations and obstructions. If a crane or lifting device is being used, the boom/ lift must be lowered to the ground or home position prior to leaving the job.

**2. FIRE PROTECTION / SAFETY : ELECTRIC - ACETYLENE WELDERS**

**A. Electric 1910.254**

a. During welding, brazing, cutting operations fire equipment will be in the area at all times. A person qualified as Fire Guard will also be on duty ( see: Contractor Fire Guard Prevention and Safety Rules). For Fire Guard contact Whirlpool Security.

b. A cutting and welding permit is required by all contractors for all construction requiring cutting, brazing or welding operations. Maintenance, Project Engineer or Security is responsible for issuing the permit.

c. Hand protection must be provided to welding/cutting operator that is a insulator from heat and electricity.

d. Welding/cutting should not be done directly on concrete floors or on used drums, barrels, tanks or other containers until they have been cleaned to meet OSHA specs. 1910.252(C). If cutting or welding above pits, insure pits are free of grease, oil or debris that could cause a fire. Areas where welding/cutting is to be done must be kept orderly safe and as clean as possible. All debris from area must be removed at the end of each working day by personnel working on the project.

e. All electric welding machines are to be equipped with standard electrical equipment to fit outlets existing on Whirlpools premises. Temporary electrical hookups will not be permitted unless made by a qualified electrician. All portable motor generators with rubber tires, shall be equipped and grounded with proper ground wires while generator is in use. Shields/barriers will be in place to prevent weld flash or sparks from reaching operators/people in vicinity. Dipping hot Electrode Holders in water is prohibited.

**B. Acetylene 1910.253**

a. Never leave a burning Torch unattained. A Torch should never be put down until the gases have been completely shut off. Hose leaks must repaired at once or replaced by the approved means. NOTE: All Acetylene/Oxygen weld/cutting equipment are to have flash back arrests to prevent internal ignition of gasses.

NOTE: See (a.) (b.) (c.) under Oxygen-fuel gas welding and cutting

b. Acetylene and Oxygen cylinders shall be protected against tipping by use of standard portable welding carts with cylinders secured in place. If portable welding carts are not available, the cylinders shall be secured to a stationary object of sufficient strength to hold the cylinders. Unless the valve is protected by a recess in the cylinder, a metal cap must be used to protect valve against damage when cylinder is not connected for use.

Each set-up must be accompanied by the proper equipment to shut off the valves in case of an emergency. When not in use, acetylene and oxygen cylinders must be removed to an approved outside storage area.

## VIII. POWER VEHICLE OPERATION

1. All power vehicles operated by contractor will comply with OSHA standards of operation for vehicle operation on the premises.

a. All operators will wear proper seat belts while operating a power vehicle.

b. Operators are prohibited from carrying passengers at all times.

c. All power vehicles are required to have flashing lights attached and working.
   * Road vehicles entering and moving through the plant must have head lights on or emergency flashers operating.

d. Operators leaving a Forklift bearing a load, and moving outside a 25 ft radius from the lift must set control at neutral, shut off power, set the brake, and remove the key. If the lift is on an incline, the above applies but also BOTH WHEELS MUST BE CHOKED.

e. When refueling propane powered vehicles, close the valve on the propane bottle and allow the engine to stop before removing the bottle from the vehicle. All fork lifts must have 2 straps attached to the lift to secure propane bottles.
   * DO NOT LEAVE PROPANE BOTTLES SETTING UNATTENDED IN THE PLANT

d. Keep vehicles under control and operate at a safe speed and manner. Maintain a safe distance of approximately three truck lengths from the vehicle ahead.

e. Give pedestrians the right of way.

f. Yield right of way to emergency vehicles - ambulances, fire trucks, etc.

g. Park or place loads so that aisles, marked areas, fire doors, plant ambulance, fire extinguishers and safety equipment are clear.

h. Safely stack and/or secure all material before moving it.

i. Comply with rated load capacity of the power vehicle.

j. Always lower forks when traveling, with or without a load, allowing enough space to clear floor or yard obstructions.

k. When traveling with a load that limits the line of sight to the front, the lift operator must travel in reverse to maintain an unobstructed view in the direction of travel.

l. When traveling down a ramp, have the load in a trailing position. When going up a ramp, have the load in the forward position.

m. Do not alter or deface a power vehicle in any way, as to make it unsafe. This includes adjustment or interference with speed settings, governors ect..

n. Slow down at all cross aisles. Stop and sound horn before entering main aisles or any location where view is obstructed.

o. At the end of the shift each day turn off propane fuel supply at the tank valve.

## IX. NEW CHEMICAL INTRODUCTION PROCEDURE

SCOPE: This policy applies to all contract personnel and covers the selection and ordering of new chemicals or chemicals to be brought in that have not yet been approved by Environmental, Health and Safety Department.

PROCEDURE:

a. All new chemical compounds must be approved before being brought onto the premises by anyone in purchasing, engineering, production, or contract work. This applies to samples coming in on a trial basis, One-Shot items as well as materials which are to be used on a regular basis.

b. The person who wants to use a chemical or chemical(s) for the first time in the plant, must request a current Material Safety Data Sheet from the supplier. The requester must fill out the New Approval Form (Attachment 1) as completely as possible and submit both to the Safety Engineer.

c. The Material Safety Data Sheet and the New Material Approval Form will be reviewed by the Safety and Environmental Engineers.

d. After the new material has been tentatively approved, it must go through the Materials Lab Process before it has full approval for use at the Fort Smith Division.

e. Further instructions are contained on the enclosed “Chemical Introduction” form.

**X. DIVISION EMERGENCY EVACUATIONS / SEVERE WEATHER SHELTER PROCEDURES.**

a. **The shelter areas and evacuation routes are posted at locations through out the plant. A copy is included in the Whirlpool to contractor communication information.**

b. **An intermittent siren means to proceed to shelter areas. Contractor will proceed to the location closest to their work area.**

c. **A constant siren means to evacuate the Plant. The contractor will proceed to the exit closest to their work area.**

d. **All persons, Whirlpool and Contractor personnel will remain in Shelter or out of the Plant until all clear is announced.**

e. **Contractor must make sure all potential danger is eliminated to the best of their ability before proceeding to shelter or evacuation. ( Machines, Lifts, lowered and turned off, torches and gases to torches turned off, electricity to welders and machines turned off.) It is recommended that someone be designated ahead of time to make sure these things are done, that everyone has left the area and following instructions.**

**XI. CONTRACTOR REQUIREMENTS FOR TILE REMOVAL FROM OFFICE AREA**

**(1) Contractor will not cut, sand, or cause tile or mastic to become "friable" (airborne).**
**(2) Contractor is to wear "HEPA" filter respirator while in the room.**
**(3) Contractor will seal door and ceiling vents with plastic sheeting and masking tape.**
**(4) Contractor will remove tile from carpet backing and deposit in 55 gallon drums.**
**(5) Contractor will dispose of carpet, but tile will remain on Whirlpool property, for proper disposal.**

**XII. ALL CONTRACTOR PERSONNEL WILL COMPLY WITH THE FORT SMITH PLANT RULES AND DRESS CODE STANDARDS. (SEE INCLOSED "REMINDER" SHEET AND "FORT SMITH DIVISION: PLANT RULES").**

**XIII. CONTROL PROCEDURES**

**When an unsafe condition is found, or observed, which is determined to have a high hazard capability to either personnel or to the loss of material. Someone in supervision in the area, engineering staff, safety dept., or security will immediately contact the superintendent, supervisor or lead person of the project, requesting that all operations be stopped until the hazard is eliminated. If one of the above cannot be located, the work will be stopped by someone in a Whirlpool management position. When any work stoppage is required, a call will be placed to the management of the contractor and the project engineer. A report will be made to the proper persons involved with the project. A form will be signed as proof that all information has been read and understood.**

## CONCLUSION

**The intent of this document is to provide the contractor with the safety guidelines Whirlpool expects to be followed on this project. This document is not intended to cover all aspects of a safety program or guarantee compliance with federal, state, and local regulation. Whirlpool reserves the right to modify these guidelines without prior notice to the contractor.**

**Katrina Cheshire**
**Safety Engineer**
**Whirlpool Fort Smith Division**

**Revised 09-14-03**

# Whirlpool Evacuation/Emergency Plan

*Attachment 10*

*August 11, 2003*
*W.O. #581-013*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

***Notice: Changes must be approved by the Safety Department.***

## 1.0 Purpose:

This procedure is designed to identify and establish policies/procedures and responsibility for employee protection during evacuation/emergency situations at the Fort Smith Division of Whirlpool Corporation.

## 2.0 Scope:

This procedure is applicable to all employees of the Fort Smith Division.

## 3.0 Emergency Telephone Numbers:

A) Whirlpool Locations:

- Medical Department - Ext. 2485 or Pager 481
- Plant First Aid - Ext. 2484 or Pager 114
- Plant Ambulance - Ext. 2277

B) Whirlpool Security

- Site Supervisor - Jerry Snook - Ext. 2462 or Pager 427
- Shift Captain - Ext. 2006 or Pager 427
- South Office - Ext. 2005
- North Office - Ext. 2002
- Northwest Office - Ext. 2003
- West Office - Ext. 2007
- PD Center Office - Ext. 2716

C) Company Doctors

Sparks Family Medicine
8600 South 36th Terrace
Fort Smith, AR. 72908

- Dr. Carson - 709-7465
- Dr. Cheyne - 709-7465

## 3.0 Emergency Telephone Numbers: (Con't)

D) Local Hospitals

- St. Edward Mercy Medical Center - 484-6000 - ER - 484-6241
- Sparks Regional Medical Center - 441-4999 - ER - 441-6011

E) Miscellaneous

- Fort Smith Fire Department - 911 or 782-9131
- EMS Ambulance - 911
- Fort Smith Police - 911 or 785-4221

F) Staff Directors

- Brian Gahr - Ext. 2400
- Jennifer Karber - Ext. 2403
- Chuck Knapp - Ext. 2473
- Randy Reed - Ext. 2405

G) In case of severe injury (injuries requiring hospitalization) contact:

- Scott Horton - Ext. 2698 or Pager 495
- Joe Keith - Ext. 2624 or Pager 880
- Chuck Knapp - Ext. 2473
- Allen Carmichael - Ext. 2465

## 4.0 Procedure for Tornado Warning, Watch or Drill:

A) Security will continually monitor (24 hours) area weather conditions; all weather watches and warnings issued by the National Weather Service will be recorded.

B) Definitions:

1) Tornado Watch: Prevailing weather conditions could possibly produce a tornado.

2) Tornado Warning: Either a visual or radar sighting of a tornado in the area.

C) Adviser Responsibilities:

1) Before Emergency Conditions:

## 4.0 Procedure for Tornado Warning, Watch or Drill: (Con't)

A) Explain this procedure to all employees, be sure to include:

1) Emergency Siren ***(Intermittent sound means take shelter)***.

2) Evacuation route and location of assigned shelter area.

***Evacuation map is located at T:\Safety Maps\Evacuation - Manuafacturing Facility.tif; Shelter Map is located at T:\Safety Maps\Shelter - Manufacturing Facility.tif, Maps for PD Center are located at T:\Safety Maps\Evacuation-Shelter PD Center.tif.***

3) Arrange for responsible employee(s), set-up or utility person to check work area and machinery, then report to you at the shelter area.

B) Security will announce over the public address system the following:

***Your attention please, Your attention please, This is a tornado alert, shut off your equipment and go to your assigned shelter area. (This will be repeated twice.)***

2) During an alert:

A) Advisers will lead their employees in an orderly manner (walk) to the designated shelter area.

B) All employees (salaried and hourly) will move to their designated shelter area.

C) Advisers are responsible for accountability of their employees.

D) Request that everyone assume a low-crouched position and cover their heads with their arms (Prone position).

E) Advisers should move through their employees and assure them of their safety and calm anyone who is creating a disturbance.

F) Enforce the ***"No Smoking"*** policy.

G) Advisers and employees will remain at the designated shelter area until ***"All Clear"*** is announced.

***Evacuation/Emergency Maps are displayed throughout the facility and Advisers should post a copy in the work area for all employees to view and personally go over this procedure with each employee on an annual basis.***

## 5.0 Procedure for Evacuation:

A) Advisers Responsibilities:

1) ***Before emergency conditions***: Explain this procedure to all employees, be sure to include:

   A) Emergency Siren

      1) Constant sound: means ***evacuate***.
      2) Intermittent sound: means ***take shelter***.

   B) Evacuation route and location of outside assembly area.

      ***Evacuation map located at T:\Safety Maps\Evacuation - Manufacturing Facility.tif for the manufacturing facility and T:\Safety Maps\Evacuation-Shelter PD Center.tif for the PD Center.***

   C) Arrange for responsible employee(s), set-up or utility person to check work area and machinery, then report to you at the outside assembly area.

2) During an alert or drill:

   A) Advisers/Stewards will lead their employees in an orderly manner (walk) to the designated outside assembly area.

   B) All employees (salaried and hourly) will move to a safe distance (500 feet) from any building structure.

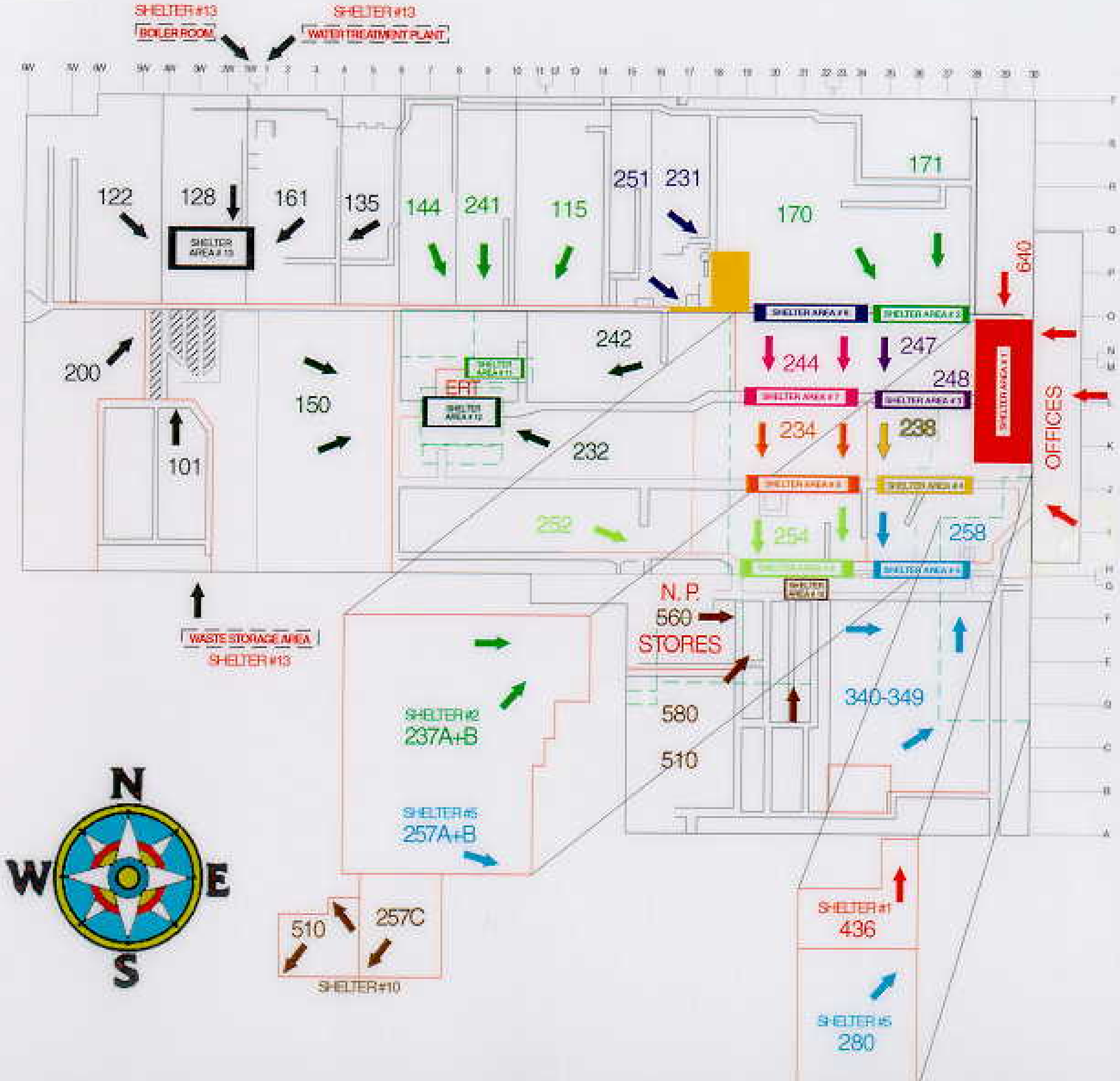
   C) Advisers/Stewards are responsible for accountability of their employees.

   D) Advisers/Stewards should move through their employees and assure them of their safety and calm anyone who is creating a disturbance.

   E) Enforce the ***"No Smoking"*** policy.

   F) Advisers and employees will remain outside at the designated assembly area until ***"All Clear"*** is announced.

   ***Evacuation/Emergency Maps are displayed throughout the facility and Advisers should post a copy in the work area for all employees to view and personally go over this procedure with each employee on an annual basis.***




| SHELTER | BUSINESS UNITS |
|---|---|
| AREA#1 | OFFICE EMPLOYEES, 436, 640 |
| AREA#2 | 170, 171, 237A+B |
| AREA#3 | 247, 248 |
| AREA#4 | 238 |
| AREA#5 | 257A+B, 258, 340-349, 280 |
| AREA#6 | 231, 251 |
| AREA#7 | 244 |
| AREA#8 | 234 |
| AREA#9 | 252, 254 |
| AREA#10 | 257C, 510, 580, 560 |
| AREA#11 | 115, 144, 241 |
| AREA#12 | 150, 232, 242 |
| AREA#13 | 101, 122, 128, 135, 161, 200<br>Boiler Room, Water Treatment Plant,<br>Waste Storage Area ("hill") |

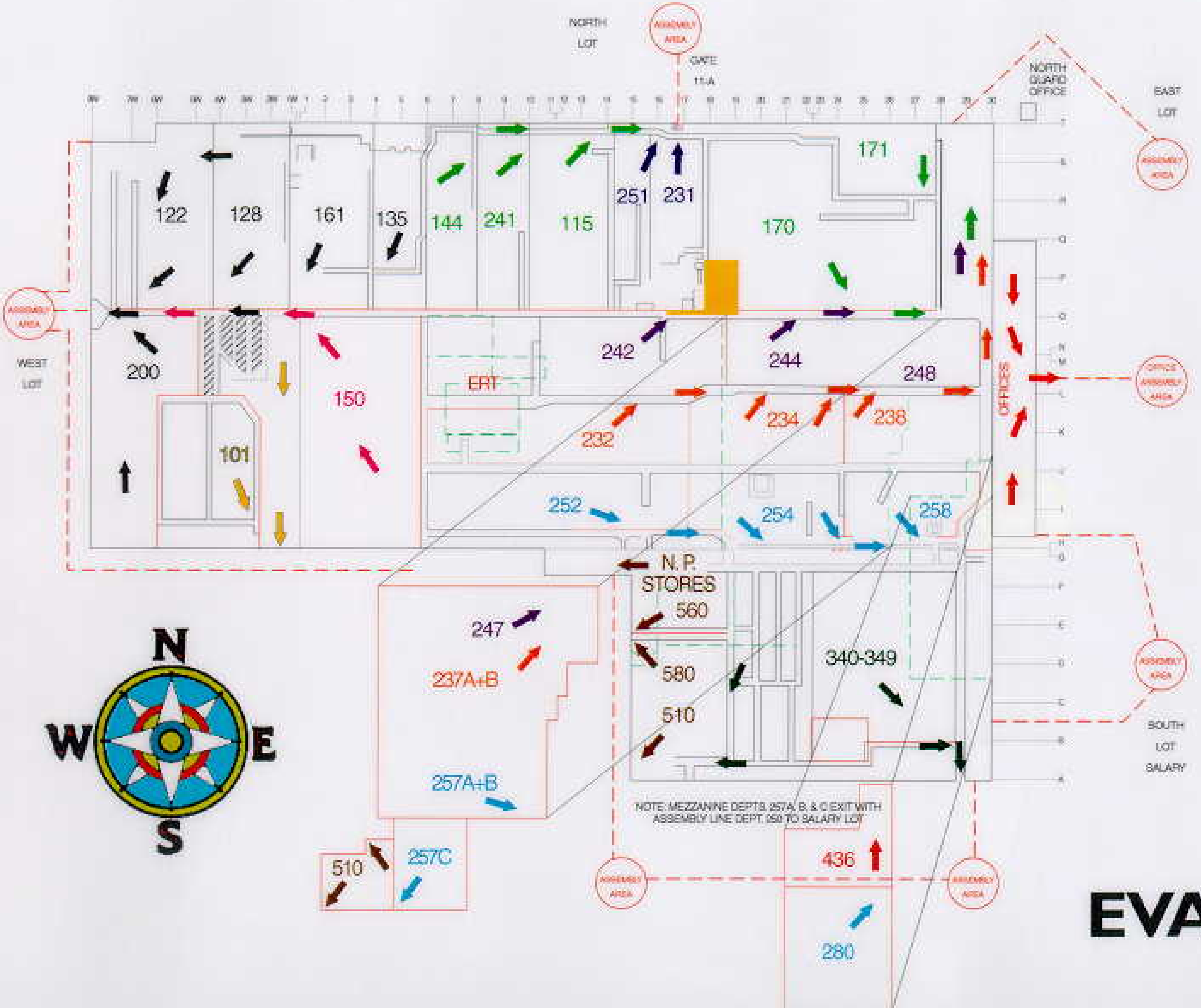
ERT — EMERGENCY RESPONSE TEAM EQUIPMENT STORAGE AREA

MEZZANINE

AMBULANCE TURNAROUND

-WARNING SIGNAL-
INTERMITTENT SIGNAL - INTERMITTENT SIREN (PROCEED TO SHELTER AREA)
REMAIN UNTIL THE "ALL CLEAR" ANNOUNCEMENT IS GIVEN.
ALL MEZZANINE EMPLOYEES EXIT TO GROUND FLOOR AT NEAREST STAIRWAY AND GROUP WITH YOUR DESIGNATED ASSEMBLY LINE B.U.

# SHELTER LOCATIONS




## EVACUATION PROCEDURES

**A CONSTANT SIREN MEANS TO EVACUATE**

EVACUATION PROCEDURES FOR THE FORT SMITH DIVISION HAVE BEEN DESIGNED IN PREPARATION OF A FIRE, EXPLOSION OR OTHER INCIDENT WHICH COULD BE HAZARDOUS TO THE HEALTH AND SAFETY OF DIVISION EMPLOYEES. IF SUCH AN INCIDENT SHOULD EVER OCCUR, AND THE DECISION IS MADE TO EVACUATE, IT IS ESSENTIAL FOR EVERYONE TO IMMEDIATELY FOLLOW THESE STEPS:

### EMERGENCY EGRESS PROCEDURES

1. PROCEED TO THE NEAREST EMERGENCY EXIT IN THE DIRECTION IDENTIFIED.
2. PROCEED AT LEAST 500 FT. AWAY FROM THE BUILDING AND GATHER IN DEPARTMENT GROUPS.
3. RETURN TO YOUR WORKSTATION WHEN THE "ALL CLEAR" ANNOUNCEMENT IS MADE.

BY LOOKING AT THE DRAWING, LOCATE YOUR EVACUATION ASSEMBLY AREA. IF YOU HAVE ANY QUESTIONS ABOUT THE ASSEMBLY AREAS OR ROUTES, PLEASE ASK YOUR ADVISER / SHOP STEWARD.

# EVACUATION

## 6.0 Railroad Tracks North Side of Building

A.) Security is notified and brings the railroad into the plant.
B.) Security turns on the red lights and puts up the stop sign at the exit doors on the North side of the building to inform employees that a train is outside.
C.) Security informs railroad engineer of not blocking the exit walkway and ensures the emergency walkway is clear at all times.
D.) Security to notify Safety at any time the railroad blocks the walkway.
E.) Security takes stop sign down and turns red light off after railroad leaves.
F.) A permanent sign informing railroad: DO NOT BLOCK WALKWAY was installed.

## 7.0 Bomb Incident Procedure:

***Located at S:\Safety Procedures\Bomb Incident Procedure.doc***

## 8.0 Chemical Spill or Fire Procedure:

***Located at S:\Safety Procedures\Spill Procedure.doc***

## 9.0 "Off Shift" Chemical Spill Procedure:

***Located at T:\Safety Procedures\OFFSHIFT - Spill Procedure.doc***

*Notice: Changes must be approved by the Safety Department.*

## 1.0 Purpose:

This procedure is designed to identify and establish polices/procedure and the responsibility for employee protection during a fire at the Fort Smith Division of Whirlpool Corporation.

## 2.0 Scope:

This policy and procedure is applicable to all employees of the Fort Smith Division.

## 3.0 Procedure:

I) **When a fire is spotted, *"Dial 2222"*,** on any telephone immediately. **Security will answer the telephone, and ask the following:** (be prepared to give the following information calmly and accurately).

1) **Your name and clock number.**

2) **Location, (Inside Plant - Post location; Outside Plant - geographical location, i.e., South side of plant, Masterbatch facility, West Parking lot, etc.)**

A) **Security will respond immediately to the area.**

B) **Security will page key members of the Emergency Response Team to respond immediately to the area by typing in the location and emergency information on the Alpha keyboard.**

**Note: At this point the security guard shall turn the volume down on the switch board and focus on the 2222 line until the emergency situation has ended.**

- ***If an ERT member does not contact Security at Ext. 2222 within 2 minutes, repeat process.***

- ***If an ERT member does not contact Security at Ext. 2222 within 1 minute, after second page; Security will sound the Emergency Response Team Alarm, (hi-low tone) and announce over the public address system, "ERT report to Post # _____", "ERT report to Post # _____".***

C) The ERT Shift Captain, or Team Leader will determine if the City Fire Department is needed and notify Security.

## 3.0 Procedure: (Con't)

**If the City Fire Department is contacted, a Security officer will meet and direct them to a designated location in the vicinity of the fire.**

E) The On-Scene Incident Commander will :

1) Notify Security that they are on the scene.

2) If additional manpower is needed (**Security will sound the Emergency Response Team Alarm, (hi-low tone) and announce; over the public address system, "ERT report to Post # _____", "ERT report to Post #_____".**

3) Notify the Safety Department.

4) Notify the Business Unit Manager of the concerned area.

F) All injuries must be reported and administered through the Medical Department.

G) A Whirlpool Fire Report must be completed by the ERT Shift Captain, or Shift Team Leader, and (attach the City Fire Department "Fire Report", if contacted) be distributed to the Safety Engineer and Business Unit Manager of the concerned area.

II) **When a fire is spotted during non-production, "DIAL 2222"**, on any telephone immediately. **Security will answer the telephone, and ask the following:** (be prepared to give the following information calmly and accurately).

**1) Your name and clock number.**

**2) Location (Inside Plant - Post location, Outside Plant - geographical location, i.e., South side of plant, Master Batch Facility, West parking lot, etc.)**

**A) Security will respond immediately to the area.**

**1) Security shall attempt to extinguish the fire.**

**2) If unsuccessful, contact the Fort Smith Fire Department.**

**3) In the event the Fire Department is needed contact the following:**

**A) Katrina Cheshire - Home Phone - (479)478-9880 Pager 880**

**B) Scott Horton - Home Phone - (918)962-2040 Pager 495**

## 3.0 Procedure: (Con't)

III) Simplex Alarm System (Fire Alarm Activated on Panel)
(Evacuation of Front Offices)

A) Security will:

1) Respond immediately to the location.
2) Page key members of the Response Team to respond immediately to the area by typing in the following:
Fire alarm #_____ initiated at (location).

Note: At this point the security guard shall turn the volume down on the switch board and focus on the 2222 line until the emergency situation has ended.

First Shift Response Team

| | |
|---|---|
| ERT | - Shift Captain & Team Leader |
| Maintenance | - Jon Watson, Rick Hamrick, Mechanical & Electrical Shift Advisers |
| Safety | - Katrina Cheshire, Scott Horton |
| Employee Relations | - Ron Bankston or Sharen Reeder |

Second Shift Response Team

| | |
|---|---|
| ERT | - Shift Captain & Team Leader |
| Maintenance | - Mechanical & Electrical Shift Advisers |
| Production | - Hardy Hodgens & Bill Yocum |

Third Shift Response Team

| | |
|---|---|
| ERT | - Shift Captain & Team Leader |
| Maintenance | - Mechanical & Electrical Shift Advisers |
| Production | - Sandy Sprayberry & Jim Webb |

- *If an ERT member does not contact Security @ Ext. 2222 within 2 minutes, repeat process.*

- *If an ERT member does not contact Security @ Ext. 2222 within 1 minute, after second page; Security will sound the Emergency Response Team Alarm, (hi-low tone) and announce over the public address system, "ERT report to Post # _____", "ERT report to Post # _____".*

B) The ERT Shift Captain, or Team Leader will determine if the City Fire Department is needed and notify Security.

C) If the City Fire Department is contacted, a Security officer will meet and direct them to a designated location in the vicinity of the fire.

## 3.0 Procedure: (Con't)

D) The On-Scene Incident Commander will :

1) Notify Security that they are on the scene.
2) If additional manpower is needed (**Security will sound the Emergency Response Team Alarm, (hi-low tone) and announce; over the public address system, "ERT report to Post # _____", "ERT report to Post #_____".**
3) Notify the Safety Department.
4) Notify the Business Unit Manager of the concerned area.

E) Responsibility for contacting security to silence alarm: Emergency Response Team - Incident Commander

F) Responsibility for bringing employees inside once the emergency has ended:

First Shift - **North Exit - Security**
East Exit - Ron Bankston or Sharen Reeder
South Exit - Ron Bankston or Sharen Reeder

Second Shift - **North Exit - Security**
East Exit - Hardy Hodgens or Bill Yocum
South Exit - Hardy Hodgens or Bill Yocum

Third Shift - **North Exit - Security**
East Exit - Sandy Sprayberry or Jim Webb
South Exit - Sandy Sprayberry or Jim Webb

G) All injuries must be reported and administered through the Medical Department.

H) A Whirlpool Fire Report must be completed by the ERT Shift Captain, or Shift Team Leader, and (attach the City Fire Department "Fire Report", if contacted) be distributed to the Safety Engineer and Business Unit Manager of the concerned area.

## IV) Debriefing

A) Once the emergency is over a debriefing shall take place to identify corrective actions and responsibilities.
First Shift - Safety Department will schedule.
Second Shift - Shift Manager will schedule.
Third Shift - Shift Manager will schedule.

B) Safety Tech. Coordinator to issue report to proper individuals.

## V) Monthly Drill

A monthly drill will be completed by the appointed individuals. The Safety Department & Security to organize.

## 4.0 Plastics Department Fire Procedure

A. When a localized fire is noticed in an inline thermoformer, the operator shall perform the following:

1.1 Depress the "FIRE" button
1.2 Alert other operators nearby of the fire and ask for help
1.3 Attempt to extinguish fire if possible

B. Operators near the fire shall perform the following:

1.1 "Dial 2222" on any telephone immediately to notify Security of the fire, and to initiate section 3.0.I
1.2 Activate the 5 building exhaust fans
1.3 Notify the Plastics Department Advisor that there is a fire

C. When a fire occurs, determine if evacuation is needed.

***Notice: Changes must be approved by the Safety Department.***

## 1.0 Purpose:

This procedure is designed to identify and establish polices/procedures and the responsibility for employee protection during chemical spills at the Fort Smith Division of Whirlpool Corporation.

## 2.0 Scope:

This policy and procedure is applicable to all employees of the Fort Smith Division.

## 3.0 Procedure:

**I) When a chemical spill is spotted,** ***"Dial 2222"***, on any telephone immediately. Security will answer the telephone, and ask the following: (be prepared to give the following information calmly and accurately).

1) Your name and clock number.
2) Location, (Inside Plant - Post location; Outside Plant - geographical location, i.e., South side of plant, Masterbatch facility, West Parking lot, etc.)
3) Description of chemical type if known.

***Note - 1: Do not approach container for information due to possible exposure of chemical.***

***Note - 2: To the best of your ability, keep everyone away from area until the ERT Hazardous Material Team arrives.***

A) Security will respond immediately to the area.

B) Security will page key members of the Emergency Response Team to respond immediately to the area by typing in the location and emergency information on the Alpha keyboard.

- ***If an ERT member does not contact Security within 5 minutes, repeat process.***

- ***If an ERT member does not contact Security within 3 minutes, after second page; Security will sound the Emergency Response Team Alarm, (hi-low tone) and announce over the public address system, "ERT report to Post # _____", "ERT report to Post # _____".***

## 3.0 Procedure: (Con't)

C) The ERT Shift Captain, or Team Leader will determine if the City Fire Department is needed and notify Security.

D) If the City Fire Department is contacted, a Security officer will meet and direct them to a designated location in the vicinity of the hazardous material spill.

E) The On-Scene Incident Commander will :

1) Notify Security that they are on the scene.
2) If additional manpower is needed (Security will sound the Emergency Response Team Alarm, (hi-low tone) and announce; over the public address system, “ERT report to Post # _____", “ERT report to Post #_____".
3) Notify the Safety Department.
4) Notify the Business Unit Manager of the concerned area.

F) All injuries must be reported and administered through the Medical Department.

G) A Whirlpool Spill Report must be completed by the ERT Shift Captain, or Shift Team Leader, and (attach the City Fire Department Report, if contacted) distributed to the Safety Engineer and Business Unit Manager of the concerned area.

H) Debriefing

1) Once the emergency is over a debriefing meeting will take place
with the ERT, affected area personnel and the Safety Department.

**II) When a chemical spill is spotted during non-production**, **"DIAL 2222"**, on any telephone immediately. Security will answer the telephone, and ask the following: (be prepared to give the following information calmly and accurately).

1) Your name and clock number.
2) Location (Inside Plant - Post location, Outside Plant - geographical location, i.e., South side of plant, Master Batch Facility, West parking lot, etc.)
3) Description of chemical type if know.

***Note 1:*** ***Do not approach container for information due to possible chemical exposure.***

***Note 2:*** ***To the best of your ability, keep everyone away from the area until the ERT Hazardous Material Team arrives.***

## 3.0 Procedure: (Con't)

A) Security will respond immediately to the area.

B) Security will page key members of the Emergency Response Team to respond immediately to the area by typing in the location and emergency information on the Alpha keyboard.

- ***ERT members shall notify Security that they are in route to the facility.***

- ***If an ERT member does not contact Security within 5 minutes activate the "call in list". (Members should be contacted until 5 have indicated they are in route to the scene.***

C) The On-Scene Incident Commander will:

1) Notify Security once they have reached the scene.
2) Notify Security if additional manpower is needed and the number of members needed.

D) Security will activate the **"call in list"**.

1) Security should contact active members, which live closest to the plant to respond. *(If the IC requests 10 members, Security may need to contact 20 in order for 10 to respond.)*
2) If the IC requests all, Security should contact all active members. (Do not contact "inactive" members.)
3) Security should record each call made, time of call and comments of conservation. *(Copies of this information should be forwarded to Katrina Cheshire.)*
4) Security shall contact the following:
   A) Katrina Cheshire - Home Phone - (479)-478-9880 Pager 880
   B) Scott Horton - Home Phone - (918)962-2040 Pager 495

E) Debriefing

1) Once the emergency is over a debriefing meeting will take place with the ERT, affected area personnel and the Safety Department. (Safety Department will schedule.)

# Procedure for Reporting Chemical Spills on *"OFF SHIFTS"*

I. When a Chemical Spill is spotted, **"DIAL 2222"**, on any telephone immediately. Security will answer the telephone, and ask the following: (be prepared to give the following information calmly and accurately).

A. Your name and clock number.
B. Location (Inside Plant - Post location, Outside Plant - geographical location, i.e., South side of plant, Master Batch Facility, West parking lot, etc.)
C. Description of chemical type if know.

***Note 1: Do not approach container for information due to possible chemical exposure.***

***Note 2: To the best of your ability, keep everyone away from the area until the ERT Hazardous Material Team arrives.***

*II.* Security will page a **"Call 400"** *(this will activate key members of the Emergency Response Team to respond immediately to the area).*

- ***ERT members shall notify Security that they are in route to the facility.***
- ***If an ERT member does not contact Security within 5 minutes activate the "call in list". (Members should be contacted until 5 have indicated they are in route to the scene.***

III. The On-Scene Incident Commander will:

A. Notify Security once they have reached the scene.
B. Notify Security if additional manpower is needed and the number of members needed.

1. Security will activate the **"call in list"**.

*A.* Security should contact active members, which live closest to the plant to respond. *(If the IC requests 5 members, Security may need to contact 10 in order for 5 to respond.)*
B. If the IC requests all, Security should contact all active members. (Do not contact "inactive" members.)
C. Security should record each call made, time of call and comments of conservation. *(Copies of this information should be forwarded to Kevin Rice and Scott Horton.)*
D. Security shall contact the following:
1. Kevin Rice- Cell Phone- (479)719-9096 Pager 213
2. Scott Horton - Home Phone - (918)962-2040 Pager 495

***Revised 01/14/03***

Environmental
Resources
Management

16300 Katy Freeway
Suite 300
Houston, Texas 77094-1611
(281) 600-1000
(281) 600-1001 (fax)

ERM

August 30, 2002

Mr. Daniel Clanton
Whirlpool Corporation
8001 National Drive
Post Office Box 8913
Little Rock, Arkansas 72219-8913 W.O. #581-007

Subject: February 2002 Semi-Annual Ground Water Monitoring Report

Dear Mr. Clanton:

Environmental Resources Management (ERM) is pleased to provide the historical ground water monitoring data you requested during the Whirlpool Fort Smith facility scoping meeting held on August 13, 2002.

Semi-annual ground water monitoring was initiated at the facility during 1999 with the most recent event occurring in February of 2002. The following documents providing the requested available historical ground water data are attached:

| | |
|---|---|
| Attachment 1: | February 2002 Semi-Annual Ground Water Sampling Report |
| Attachment 2: | TCE Isoconcentration Maps and Potentiometric Surface Maps for Sampling Events in 1999, 2000, and 2001 |
| Attachment 3: | Summary of CPT Grab Ground Water Sample Data conducted October 1999. |

In reviewing the Conceptual Site Model (CSM) in the meeting, we noticed that Figure 5-1 of the CSM was incorrect. Therefore, we are also providing you with a replacement for Figure 5-1 as Attachment 4.

Environmental
Resources
Management

If you have any questions concerning the attached data or other information provided in the conceptual site model, please do not hesitate to call.

Sincerely,

Environmental Resources Management

Troy W. Meinen

TWM/mnt
Attachments

cc: Mr. Michael Hill, Arkansas Department of Environmental Quality
Ms. Linda Hanson, MsC, P.G., Arkansas Department of Environmental Quality
Mr. Benjamin May, Arkansas Department of Environmental Quality
Mr. Scott Horton, Whirlpool Corporation
Mr. Bob Karwowski, Whirlpool Corporation
Mr. Steven P. Willis, Whirlpool Corporation
Mr. Larry Yinger, Whirlpool Corporation
Mr. Andy Huggins, Environmental Resources Management (Exton)
Mr. H. Reiffert Hedgcoxe, P.G., Environmental Resources Management (Houston)

# February 2002 Semi-Annual Ground Water Sampling Report

*Attachment 1*

*August 30, 2002*
*W.O. #481-007*

**Environmental Resources Management**
16300 Katy Freeway, Suite 300
Houston, Texas 77094-1611
(281) 600-1000

Environmental
Resources
Management

3204 Long Prairie Road
Suite C
Flower Mound, TX 75022
(972) 355-2100
(972) 355-7201 (fax)

ERM

April 12, 2002

Mr. Scott Horton
Senior Environmental Engineer
Whirlpool Corporation
6400 Jenny Lind Road
P.O. Box 17001
Fort Smith, AR 72917-7001

W.O. #581-009

Subject: February 2002 Semi-Annual Ground Water Monitoring
Whirlpool Corporation, Fort Smith, Arkansas

Dear Mr. Horton:

Environmental Resources Management (ERM) is pleased to provide this letter report summarizing the subject monitoring event. This work was conducted in accordance with the scope of work authorized under Whirlpool's PAF FTS-109. The purpose of this letter is to document the sampling activities and to present the data. An evaluation of the results from this monitoring event will be conducted with the data analysis after the second semi-annual event is completed.

*Scope of Work*

The first round of semi-annual ground water monitoring at the Whirlpool Fort Smith facility for 2002 was performed on February 18 through February 22, 2002. All wells were sampled for volatile organic compounds (VOCs). Monitoring wells MW-1 through MW-37 were purged and sampled using traditional pump and bail methods. In addition, 17 of those wells were also sampled using low-flow methodology (MW-1, MW-5, MW-7, MW-10, MW-11, MW-12, MW-13, MW-15, MW-16, MW-17, MW-19, MW-20, MW-23, MW-25, MW-26, MW-28 and MW-37). Wells sampled using the traditional method were gauged for pH, specific conductivity (SC) and temperature. Wells sampled using the low-flow method were gauged for pH, SC, temperature, dissolved oxygen (DO) and redox potential (ORP). Samples from the low-flow wells were also sampled for nitrate and sulfate at a local Fort Smith laboratory, and for iron using a field test kit.

*Well Purging*

Following mobilization to the Site on February 18, 2002, water levels were measured in each well. A summary of the recorded water level measurements is provided as Table 1, Attachment 1. The measurements were then used to calculate the appropriate purge volume for each location. The volume of standing water in each well casing and annular sand pack was calculated based on the static water level and the known depth of the well.

At wells scheduled to be sampled using both traditional and low-flow methods, low-flow sampling was performed first using a peristaltic pump and dedicated polyethylene tubing. The tubing was placed in the middle of the screened interval, or water column depending on depth to water. During low-flow purging, the wells were pumped at a sufficiently low rate (generally less than 0.5 L/min) so that drawdown during purging did not exceed 0.3 ft. The drawdown and flow rate were monitored continuously. The flow rate was checked using a stop-watch and a graduated Pyrex measuring cup. Water quality parameters were monitored using a YSI 650XL multiprobe and flow-thru cell. Readings were recorded approximately every 5 minutes until parameters stabilized. Stabilization parameters include: pH within 0.1 units; SC ± 3%; turbidity ±10%; DO ±10%; ORP ±10 mV; all for three successive readings. In the event all parameters did not stabilize within approximately 45 minutes, low-flow purging was terminated and samples were collected. In general, turbidity and DO were the only parameters that did not reach stabilization in some wells.

For traditional purging methods, three borehole volumes were purged using dedicated inline 12-volt submersible electrical pumps and dedicated polyethylene tubing. Purge water generated during development was placed in drums, provided by Whirlpool, and labeled according to the date and drum contents.

Upon completion of the purging, the pump and associated tubing from each well was individually double-bagged, labeled and stored on-site for use during future semiannual sampling events.

*Sampling and Analyses*

When using low-flow techniques, wells were sampled using the same flow rate maintained during the purging activities. These samples were labeled with the well ID and "L", indicating they were sampled using the low flow method. Low-flow ground water samples were collected directly from the tubing into laboratory supplied sample jars. Samples for volatile analysis were collected in three 40-ml vials preserved with hydrochloric acid (HCl). Samples collected for nitrate, sulfate, and chloride analysis were collected in a neat 500 ml plastic jar. Samples for potassium analysis were collected in a 250 ml neat plastic jar. Samples for iron analysis were collected in a pyrex beaker and tested in the field.

Wells purged using traditional purge methods were sampled using dedicated, 2-inch disposable polyethylene bailers following removal of the dedicated pump and tubing. A total of three preserved 40-ml vials were filled at each location. These samples were labeled with the well ID and "T", indicating they were sampled using the traditional purging and sampling method.

Four blind duplicate samples, one field blank sample and one trip blank sample were collected during this event. Additional duplicate samples were collected during this event to provide quality assurance data on the samples collected by both traditional and low-flow methods. VOC samples were labeled, stored on ice, and shipped to Severn Trent Laboratory (STL) in Houston, Texas for analyses by SW-846 Method 8260 for trichloroethylene and related chlorinated solvents and degradation products that have been identified in previous sampling events. Potassium, chloride, nitrate and sulfate samples were labeled, stored on ice, and delivered to Data Testing, Inc. in Fort Smith, Arkansas for analyses by EPA water/wastewater methods. Samples for Ferrous iron analysis were analyzed in the field by Hach DR820 colorimeter glass ampule method 8146. Chain of custody procedures were established and followed from the time of sample collection until the analyses were complete.

Upon completion of sampling activities, the 2-inch bailers from each well were individually double-bagged, labeled and stored on-site for use during the next semi-annual sampling event.

All samples were submitted for volatile analysis by GCMS, method SW-846 8260.

*Comparison of Low-Flow vs Traditional Purging/Sampling Methods*

A review of the February 2002 data indicate that, in general, the data obtained via the low-flow methology correlates well with the "traditional" data for most of the wells across the Site (Figures 1 and 2, Attachment 2). The primary exception is that data from wells in the vicinity of the in situ chemical oxidation pilot study area (MW-11, MW-12, MW-15, etc.) are not well correlated. This is not unexpected since ground water in the pilot study area is not in chemical equilibrium with the surrounding ground water. Compared to low-flow, traditional purging method ground water pulls a relatively large volume of water from a larger portion of the aquifer. As a result, the low-flow data are likely to be more representative of the ground water concentrations in the immediate vicinity of each well. Based on this comparison, it appears that switching to low-flow sampling will not prohibit comparison of such data to the substantial historical ground water data set that exists for the Fort Smith Facility.

With a few exceptions, the February 2002 semi-annual sampling data appears similar to historical data.. Concentrations at off-site wells (MW-31 through MW-36) have decreased. The maximum off-site TCE concentration reported is 0.325 mg/L; down from 1.03 mg/L in September 2001. Other results are consistent with previously observed changes related to the seasonal shift in ground water flow direction between the spring and fall sampling events. The TCE concentration reported this period at MW-25 (29.9 mg/L (L) and 24.3 mg/L (T)), is the lowest concentration reported since February 1999. Other notable changes in concentrations observed during this event include the decrease in TCE concentration at MW-20. In September 2001, TCE was reported at MW-20, near the propane tanks on the west side of the property, for the first time since 1996; however, the February 2002 data indicate that MW-20 has no detectable concentrations, suggesting that the September 2001 data may be anomalous.

A summary of the data is provided in Table 2, Attachment 1. A TCE Concentration vs. Time plot is presented as Figure 3, Attachment 2, and demonstrates concentration trends over time in a south-north transect from MW-19 to MW-34. Since not all wells were sampled using low-flow methods, data collected using traditional sampling methods is used in the development of this figure.

*Ground Water Flow Evaluation*

Ground water elevations for the February 2002 (Figure 4, Attachment 2) event appear similar to previous March sampling events (Table 1, Attachment 1). The data continue to suggest that, during the fall time frame, the predominate flow direction in the vicinity of the apparent source area is toward the south-southwest and then predominately to the south-southeast during the spring time frame.

Evaluation of the water level data also continues to show the presence of a ground water divide oriented northwest to southeast in the general area of well MW-26. Flow directions northeast of the apparent divide are toward the east While flow in the vicinity of MW-20 and MW-21 is more toward the southeast. As was apparent in the September 2001 data, February 2002 data shows that there appears to be a flattening of the ground water gradient in the vicinity of MW-33, MW-35 and MW-36. The February data, however, indicates that this area of flattened gradient extends into the area of wells MW-23 and MW-24. As has been indicated previously, this may indicate the presence of a more permeable zone that would trend to the north across Ingersoll

Avenue. However, additional data is needed before reaching any conclusions about flow in this area.

Natural attenuation data (nitrate, sulfate and ferrous iron) will be discussed in the September semi-annual monitoring report after another round of data has been collected using the low-flow sampling method.

We appreciate the opportunity to continue to assist Whirlpool with this important project. If you have any questions concerning the scope of work or need additional information, please do not hesitate to call.

Sincerely,

ENVIRONMENTAL RESOURCES MANAGEMENT

Troy Meinen

Lori D. Pfeil

LDP:vjm

cc: Mr. Bob Karwowski, Whirlpool Corporation
Mr. Steven P. Willis, Whirlpool Corporation
Mr. Larry Yinger, Whirlpool Corporation
Mr. Andy Huggins, ERM, Exton
Mr. H. Reiffert Hedgcoxe, P.G., ERM, Houston

# Tables

*Attachment 1*

*April 12, 2002*
*W.O. #581-009*

Environmental Resources Management
3204 Long Prairie Road, Suite C
Flower Mound, TX 75022
(972) 355-2100

TABLE 1

Water Level Elevations, Conventional Monitoring Wells

Whirlpool Corporation
Fort Smith, Arkansas

| Well ID | Easting (ft) | Northing (ft) | Top of Pipe (ftAMSL) | Depth to Water (ftBTOP) 22 Feb. 1999* | Water Level (ftAMSL) 28 Oct. 1999 | Water Level (ftAMSL) 10 Dec. 1999 | Water Level (ftAMSL) 27 Mar. 2000 | Water Level (ftAMSL) 18 Sept. 2000 | Depth to Water (ftBTOP) 26 Mar. 2001 | Water Level (ftAMSL) 26 Mar. 2001 | Depth to Water (ftBTOP) 10 Sep. 2001 | Water Level (ftAMSL0 10 Sep. 2001 | Depth to Water (ftBTOP) 18 Feb. 2002 | Water Level (ftAMSL) 18 Feb. 2002 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ITMW-1 | 8259.51 | 9007.54 | 476.93 | 12.86 | 469.03 | 464.39 | 463.79 | 464.70 | 14.09 | 462.84 | 12.61 | 464.32 | 14.15 | 462.78 |
| ITMW-2 | 8058.55 | 9103.07 | 477.58 | 12.82 | 465.21 | 464.57 | 464.41 | 464.91 | 13.72 | 463.86 | 13.03 | 464.55 | 14.03 | 463.55 |
| ITMW-3 | 8169.81 | 9165.86 | 474.72 | 10.32 | 465.19 | 464.47 | 464.08 | 464.83 | 11.32 | 463.40 | 10.22 | 464.50 | 11.54 | 463.18 |
| ITMW-4 | 8170.16 | 8296.26 | 478.19 | 13.91 | 465.25 | 464.53 | 463.82 | 464.58 | 15.30 | 462.89 | 13.99 | 464.20 | 15.29 | 462.90 |
| ITMW-5 | 7902.33 | 8278.92 | 478.93 | 14.84 | 465.05 | 464.33 | 463.68 | 464.38 | 16.07 | 462.86 | 14.95 | 463.98 | 16.16 | 462.77 |
| ITMW-6 | 7858.85 | 8042.21 | 483.04 | 19.05 | 464.79 | 464.18 | 463.54 | 464.14 | 20.37 | 462.67 | 19.30 | 463.74 | 20.35 | 462.69 |
| ITMW-7 | 7461.02 | 8370.89 | 481.95 | 17.87 | 464.21 | 463.83 | 463.83 | 463.85 | 18.43 | 463.52 | 18.43 | 463.52 | 18.52 | 463.43 |
| ITMW-9 | 8179.81 | 8237.69 | 481.90 | 17.74 | 465.16 | 464.44 | 463.73 | 464.47 | 19.10 | 462.80 | 17.81 | 464.09 | 19.09 | 462.81 |
| ITMW-10 | 7901.42 | 8230.16 | 480.84 | 16.78 | 465.01 | 464.33 | 463.64 | 464.46 | 18.04 | 462.80 | 16.82 | 464.02 | 18.29 | 462.55 |
| ITMW-11 | 7846.97 | 9109.44 | 476.50 | 11.52 | 465.15 | 465.10 | 464.60 | 464.85 | 12.31 | 464.19 | 11.84 | 464.66 | 12.68 | 463.82 |
| ITMW-12 | 7869.05 | 9077.56 | 476.67 | 11.76 | 465.19 | 464.60 | 464.59 | 464.85 | 12.51 | 464.16 | 12.05 | 464.62 | 12.76 | 463.91 |
| ITMW-13 | 7915.02 | 9124.81 | 477.79 | 12.82 | 465.19 | 464.60 | 464.58 | 464.92 | 13.64 | 464.15 | 13.19 | 464.60 | 13.99 | 463.80 |
| ITMW-14 | 7966.02 | 9131.80 | 477.30 | 12.38 | 465.19 | 464.67 | 464.54 | 464.93 | 13.22 | 464.08 | 12.70 | 464.60 | 13.57 | 463.73 |
| ITMW-15 | 7812.25 | 9109.60 | 476.49 | 11.47 | 465.15 | 464.58 | 464.63 | 464.88 | 12.28 | 464.21 | 11.91 | 464.58 | 12.65 | 463.84 |
| ITMW-16 | 7831.59 | 9168.78 | 478.79 | 13.57 | 465.34 | 464.77 | 464.68 | 465.09 | 14.36 | 464.43 | 14.02 | 464.77 | 14.70 | 464.09 |
| ITMW-17 | 7732.61 | 9112.96 | 477.90 | 12.54 | 465.12 | 464.54 | 464.63 | 464.92 | 14.66 | 463.24 | 13.32 | 464.58 | 13.91 | 463.99 |
| ITMW-18 | 7849.92 | 9023.55 | 473.55 | 8.64 | 465.16 | 464.55 | 464.55 | 464.89 | 9.42 | 464.13 | 8.99 | 464.56 | 9.77 | 463.78 |
| ITMW-19 | 7763.78 | 9024.94 | 476.25 | 11.28 | 465.15 | 464.52 | 464.61 | 464.95 | 11.51 | 464.74 | 11.40 | 464.85 | 12.47 | 463.78 |
| ITMW-20 | 7238.94 | 9074.08 | 477.87 | 12.55 | 464.93 | 464.55 | 464.82 | 464.73 | 13.12 | 464.75 | 13.45 | 464.42 | 13.33 | 464.54 |
| ITMW-21 | 7506.54 | 8945.65 | 476.52 | 11.21 | 464.93 | 464.59 | 464.90 | 464.68 | 11.69 | 464.83 | 11.90 | 464.62 | 12.26 | 464.26 |
| MW-22 | 8726.94 | 9038.96 | 473.93 | 9.64 | 465.64 | 464.91 | 464.23 | 465.20 | 10.71 | 463.22 | 9.11 | 464.82 | 10.82 | 463.11 |
| MW-23 | 7747.16 | 9303.10 | 475.80 | 10.95 | 465.27 | 464.70 | 464.65 | 464.04 | 11.39 | 464.41 | 11.10 | 464.70 | 11.73 | 464.07 |
| MW-24 | 7738.13 | 9198.53 | 476.39 | 11.25 | 465.27 | 464.69 | 464.82 | 465.04 | 12.01 | 464.38 | 11.70 | 464.69 | 12.31 | 464.08 |
| MW-25 | 7614.43 | 9060.33 | 476.89 | 11.68 | 465.28 | 464.77 | 464.86 | 465.09 | 12.41 | 464.48 | 12.16 | 464.73 | 12.74 | 464.15 |
| MW-26 | 7421.64 | 9273.87 | 478.05 | 12.36 | 465.32 | 464.89 | 465.10 | 465.09 | 13.07 | 464.98 | 13.27 | 464.78 | 12.33 | 465.72 |
| MW-27 | 7932.29 | 9302.59 | 475.42 | -- | -- | 464.70 | 464.61 | 465.02 | 11.04 | 464.38 | 10.71 | 464.71 | 11.43 | 463.99 |
| MW-28 | 8180.18 | 9301.14 | 470.49 | -- | -- | 464.39 | 464.41 | 464.92 | 6.25 | 464.24 | 5.66 | 464.83 | 6.76 | 463.73 |
| MW-29 | 7092.87 | 8392.87 | 474.91 | -- | -- | 464.07 | 464.59 | 463.91 | 10.47 | 464.44 | 11.32 | 463.59 | 10.62 | 464.29 |
| MW-30 | 7485.76 | 8480.10 | 478.99 | -- | -- | 464.22 | 464.35 | 464.24 | 14.95 | 464.04 | 15.07 | 463.92 | 15.30 | 463.69 |
| MW-31 | 7675.36 | 9348.43 | 476.03 | -- | -- | -- | -- | -- | 11.25 | 464.78 | 10.68 | 465.35 | 12.02 | 464.01 |
| MW-32 | 7760.17 | 9347.50 | 475.68 | -- | -- | -- | -- | -- | 11.36 | 464.32 | 10.97 | 464.71 | 11.62 | 464.06 |
| MW-33 | 7845.31 | 9348.62 | 474.88 | -- | -- | -- | -- | -- | 10.50 | 464.38 | 10.18 | 464.70 | 10.84 | 464.04 |
| MW-34 | 7760.24 | 9404.60 | 474.29 | -- | -- | -- | -- | -- | 11.90 | 462.39 | 9.56 | 464.73 | 10.15 | 464.14 |
| MW-35 | 7841.74 | 9406.36 | 473.90 | -- | -- | -- | -- | -- | 9.24 | 464.66 | 9.20 | 464.70 | 9.83 | 464.07 |
| MW-36 | 7927.38 | 9405.11 | 473.30 | -- | -- | -- | -- | -- | 8.61 | 464.69 | 8.60 | 464.70 | 9.11 | 464.19 |
| MW-37 | 7839.60 | 9101.64 | 473.57 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9.46 | 464.11 |
| MW-38 | 7840.94 | 9115.29 | 474.60 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 10.62 | 463.98 |

NOTES:

ft = feet
AMSL = above mean sea level
BTOP = below top of pipe
Co-ordinates provided by EDM Consultants, Inc.
Elevations are taken from Table 3-1, "Draft Report, Remedial Investigation, North Side Ground Water", Malcolm Pirnie, Inc., with the exceptions of ITMW-4 and MW-22 through MW-26 (EDM Consultants, Inc.) and MW-27 through MW-30 (Philip J. Lerans, P.E., L.S.).
* = Depth to water measurements for MW-24 through MW-26 were taken on 25 February 1999.

TABLE 2

Historic Analytical Data, Selected VOCs in Ground Water

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Sampler | PCE | TCE | c-1,2-DCE | t-1,2-DCE | 1,1-DCE | VC |
|---|---|---|---|---|---|---|---|---|
| ITMW-1 | Nov-89 | IT | ND | ND | NT | ND | ND | ND |
| | Jan-90 | IT | ND | ND | NT | ND | ND | ND |
| | Nov-93 | MP | ND | 0.01 | NT | ND | ND | ND |
| | Dec-96 | MP | ND | 0.021 | NT | ND | ND | ND |
| | Feb-99 | ERM | ND | 0.037 | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.125 | 0.008 | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.031 | 0.007 | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.03 | 0.006 | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.027 | 0.009 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.026 | 0.006 | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.025 | 0.007 | ND | ND | ND |
| ITMW-2 | Oct-89 | IT | ND | ND | NT | ND | ND | ND |
| | Nov-89 | IT | ND | ND | NT | ND | ND | ND |
| | Jan-90 | IT | ND | ND | NT | ND | ND | ND |
| | Nov-90 | IT | ND | ND | NT | ND | ND | ND |
| | Nov-90 (dupl.) | IT | ND | ND | NT | ND | ND | ND |
| | Mar-91 | IT | ND | ND | NT | ND | ND | ND |
| | Nov-93 | MP | ND | 0.004 | NT | ND | ND | ND |
| | Dec-96 | MP | ND | 0.0034 | NT | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | 0.006 | ND | ND | ND |
| ITMW-3 | Oct-89 | IT | ND | ND | NT | ND | ND | ND |
| | Jan-90 | IT | ND | ND | NT | ND | ND | ND |
| | Nov-93 | MP | ND | 0.003 | NT | ND | ND | ND |
| | Dec-96 | MP | ND | 0.0017 | NT | ND | ND | ND |
| | Feb-99 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-00 (Dup) | ERM | ND | ND * | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND |
| ITMW-4 | Oct-89 | IT | ND | ND | NT | ND | ND | ND |
| | Nov-89 | IT | ND | ND | NT | ND | ND | ND |
| | Jan-90 | IT | ND | ND | NT | ND | ND | ND |
| | Nov-93 | MP | ND | ND | NT | ND | ND | ND |
| | Dec-96 | MP | ND | 0.075 | NT | ND | ND | ND |
| | Feb-99 | ERM | ND | 0.093 | 0.054 | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.022 | 0.016 | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.014 | 0.011 | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.009 | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.006 | 0.008 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.034 | 0.005 | ND | ND | ND |
| ITMW-5 | Oct-89 | IT | ND | ND | NT | ND | ND | ND |
| | Jan-90 | IT | ND | ND | NT | ND | ND | ND |
| | Dec-96 | MP | ND | 0.021 | NT | ND | ND | ND |
| | Feb-99 | ERM | ND | 0.086 | 0.039 | ND | 0.007 | ND |
| | Mar-00 | ERM | ND | 0.073 | 0.059 | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.085 | 0.064 | ND | 0.006 | ND |
| | Mar-01 | ERM | ND | 0.1 | 0.046 | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.072 | 0.064 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.093 | 0.066 | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.081 | 0.068 | ND | ND | ND |

NOTE:

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TABLE 2 (Cont'd)

Historic Analytical Data, Selected VOCs in Ground Water

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Sampler | PCE | TCE | c-1,2-DCE | t-1,2-DCE | 1,1-DCE | VC |
|---|---|---|---|---|---|---|---|---|
| ITMW-6 | Oct-89 | IT | ND | ND | NT | ND | ND | ND |
| | Jan-90 | IT | ND | ND | NT | ND | ND | ND |
| | Dec-96 | MP | ND | 0.0068 | NT | ND | ND | ND |
| | May-97 | MP | ND | 0.007 | ND | ND | ND | ND |
| | Feb-99 | ERM | ND | ND | ND | ND | ND | ND |
| | Feb-99 | ERM (CoreLab) | ND | 0.025 | ND | NT | ND | ND |
| | Feb-99 | ERM (CoreLab Dupl.) | ND | 0.006 | ND | NT | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | ND | ND | ND | ND | ND |
| ITMW-7 | Nov-89 | IT | ND | ND | NT | ND | ND | ND |
| | Jan-90 | IT | ND | ND | NT | ND | ND | ND |
| | Dec-96 | MP | ND | 0.29 | NT | ND | ND | 0.003 |
| | May-97 | MP | ND | 0.38 | 0.18 | ND | ND | ND |
| | Feb-99 | ERM (SPL) | ND | ND | ND | ND | ND | ND |
| | Jun-99 | ERM (SPL) | ND | 0.32 | 0.14 | ND | ND | ND |
| | Jun-99 | ERM (SPL Dupl.) | ND | 0.3 | 0.14 | ND | ND | ND |
| | Jun-99 | ERM (CoreLab) | ND | 0.306 | 0.144 | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.262 | 0.1 | ND | ND | ND |
| | Mar-00 (dup) | ERM | ND | 0.207 | 0.092 | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.207 | 0.1 | ND | ND | ND |
| | Sep-00 (dup) | ERM | ND | 0.109 | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.161 | 0.066 | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.139 | 0.068 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.261 | 0.107 | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.119 | 0.070 | ND | ND | ND |
| ITMW-8 | Jan-90 | IT | ND | ND | NT | ND | ND | ND |
| ITMW-9 | Jan-90 | IT | ND | ND | NT | ND | ND | ND |
| | Dec-96 | MP | ND | 0.23 | NT | ND | 0.015 | ND |
| | May-97 | MP | ND | 0.007 | ND | ND | ND | ND |
| | Feb-99 | ERM | ND | 0.04 | 0.024 | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.069 | 0.045 | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.057 | 0.014 | ND | ND | ND |
| | Sep-00 (dup) | ERM | ND | 0.055 | 0.014 | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.04 | 0.012 | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.04 | 0.012 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.046 | 0.023 | ND | ND | ND |
| ITMW-10 | Jan-90 | IT | ND | ND | NT | ND | ND | ND |
| | Dec-96 | MP | ND | 0.004 | NT | ND | 0.002 | ND |
| | Feb-99 | ERM | ND | 0.025 | 0.013 | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.023 | 0.017 | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.018 | 0.016 | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.04 | 0.021 | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.029 | 0.028 | ND | ND | ND |
| | Sep-01 (dup) | ERM | ND | 0.027 | 0.03 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.056 | 0.048 | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.044 | 0.038 | ND | ND | ND |

NOTE:

Footnotes on last page of table.

TABLE 2 (Cont'd)

Historic Analytical Data, Selected VOCs in Ground Water

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Sampler | PCE | TCE | c-1,2-DCE | t-1,2-DCE | 1,1-DCE | VC |
|---|---|---|---|---|---|---|---|---|
| ITMW-11 | Jan-90 | IT | 0.015 | 19 | NT | 3.6 | ND | 0.18 |
| | Nov-90 | IT | ND | 4.7 | NT | 1.5 | 0.009 | 0.093 |
| | Feb-91 | IT | 0.0089 | 3.4 | NT | 1 | ND | ND |
| | Nov-93 | MP | 0.001 | 2.3 | NT | ND | ND | 0.043 |
| | Dec-96 | MP | ND | 0.51 | NT | 0.011 | ND | ND |
| | Feb-99 | ERM | ND | 0.65 | 0.01 | ND | ND | ND |
| | Mar-00 | ERM | ND | 3.37 | 0.206 | ND | ND | ND |
| | Sep-00 | ERM | 0.006 | 8 | 0.330 | ND | ND | 0.01 |
| | Mar-01 | ERM | ND | 7 | 0.200 | ND | ND | ND |
| | Sep-01 | ERM | ND | 6 | 0.183 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 6.8 | ND | ND | 0.010 | ND |
| | Feb-02 | ERM (L) | ND | 2.48 | 0.123 | ND | ND | ND |
| ITMW-12 | Nov-90 | IT | ND | 2.4 | NT | 1.3 | 0.0099 | 0.14 |
| | Feb-91 | IT | ND | 2.1 | NT | 1 | ND | ND |
| | Nov-93 | MP | ND | 2.5 | NT | 0.002 | 0.004 | 0.035 |
| | Dec-96 | MP | ND | 1.2 | NT | ND | ND | ND |
| | Feb-99 | ERM | ND | 3.1 | 0.48 | ND | ND | 0.034 |
| | Mar-00 | ERM | ND | 3.11 | 0.32 | ND | ND | 0.019 |
| | Sep-00 | ERM | ND | 3.3 | 0.18 | ND | ND | 0.01 |
| | Mar-01 | ERM | ND | 3.9 | 0.2 | ND | ND | 0.02 |
| | Sep-01 | ERM | ND | 3.1 | 0.159 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 3.51 | 0.275 | ND | 0.007 | 0.023 |
| | Feb-02 | ERM (L) | ND | 3.6 | ND | ND | 0.008 | 0.019 |
| ITMW-13 | Nov-90 | IT | ND | 0.034 | NT | 0.19 | ND | 0.018 |
| | Feb-91 | IT | ND | 0.032 | NT | 0.17 | ND | 0.035 |
| | Nov-93 | MP | ND | NA | NT | NA | NA | 0.029 |
| | Dec-96 | MP | ND | 0.036 | NT | 0.0013 | 0.0016 | 0.036 |
| | Feb-99 | ERM | ND | 0.036 | 0.14 | ND | ND | 0.048 |
| | Mar-00 | ERM | ND | 0.037 | 0.121 | ND | ND | 0.053 |
| | Sep-00 | ERM | ND | 0.022 | 0.112 | ND | ND | 0.05 |
| | Mar-01 | ERM | ND | 0.044 | 0.092 | ND | ND | 0.04 |
| | Sep-01 | ERM | ND | 0.035 | 0.111 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.129 | 0.195 | ND | ND | 0.035 |
| | Feb-02 | ERM (L) | ND | 0.048 | 0.080 | ND | ND | ND |
| ITMW-14 | Nov-90 | IT | ND | ND | NT | 0.03 | ND | 0.013 |
| | Feb-91 | IT | ND | ND | NT | ND | ND | ND |
| | Nov-93 | MP | ND | 0.006 | NT | ND | ND | ND |
| | Dec-96 | MP | ND | ND | NT | ND | ND | ND |
| | Feb-99 | ERM | ND | ND | 0.029 | ND | ND | 0.02 |
| | Mar-00 | ERM | ND | ND | 0.024 | ND | ND | 0.012 |
| | Sep-00 | ERM | ND | ND | 0.014 | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | 0.024 | ND | ND | 0.01 |
| | Sep-01 | ERM | ND | ND | 0.005 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | 0.023 | ND | ND | ND |
| ITMW-15 | Nov-90 | IT | ND | 2.5 | NT | 1.5 | 0.0081 | 0.055 |
| | Feb-91 | IT | ND | 1.7 | NT | 0.87 | ND | ND |
| | 15-Apr-91 | IT | ND | 2 | NT | 0.6 | ND | ND |
| | 19-Apr-91 | IT | ND | 2.1 | NT | 1 | ND | ND |
| | 20-Apr-91 | IT | ND | 2.4 | NT | 1.1 | ND | ND |
| | Nov-93 | MP | ND | 4.3 | NT | 0.001 | ND | 0.01 |
| | Dec-96 | MP | ND | 0.24 | NT | ND | ND | ND |
| | Feb-99 | ERM | ND | 0.4 | 0.12 | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.339 | 0.097 | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.36 | 0.093 | ND | ND | ND |
| | Sep-00 (dup) | ERM | ND | 0.38 | 0.091 | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.29 | 0.057 | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.38 | 0.087 | ND | ND | ND |
| | Sep-01 (dup) | ERM | ND | 0.37 | 0.08 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.186 | 0.064 | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.311 | 0.108 | ND | ND | ND |

NOTE:

Footnotes on last page of table.

TABLE 2 (Cont'd)

Historic Analytical Data, Selected VOCs in Ground Water

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Sampler | PCE | TCE | c-1,2-DCE | t-1,2-DCE | 1,1-DCE | VC |
|---|---|---|---|---|---|---|---|---|
| ITMW-16 | Feb-91 | IT | ND | 0.031 | NT | 0.06 | ND | ND |
| | Nov-93 | MP | ND | 0.041 | NT | ND | ND | 0.007 |
| | Dec-96 | MP | ND | ND | NT | ND | ND | ND |
| | Feb-99 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.007 | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | ND | ND | ND | ND | ND |
| ITMW-17 | Feb-91 | IT | ND | 21 | NT | ND | ND | ND |
| | 15-Apr-91 | IT | ND | 18 | NT | 0.76 | ND | ND |
| | 24-Apr-91 | IT | ND | 21 | NT | 0.58 | ND | ND |
| | Nov-93 | MP | 0.004 | 18 | NT | 0.003 | ND | 0.015 |
| | Dec-96 | MP | ND | 9.3 | NT | ND | ND | ND |
| | Feb-99 | ERM | ND | 11 | 0.24 | ND | 0.013 | ND |
| | Mar-00 | ERM | ND | 6.78 | 0.171 | ND | ND | ND |
| | Sep-00 | ERM | ND | 5.5 | 0.18 | ND | 0.009 | ND |
| | Jan-01 | ERM | ND | 8.3 | 0.179 | ND | ND | ND |
| | Mar-01 | ERM | ND | 6.7 | 0.134 | ND | 0.007 | ND |
| | Sep-01 | ERM | ND | 6.3 | 0.158 | ND | 0.007 | ND |
| | Feb-02 | ERM (T) | ND | 6.07 | 0.149 | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 6.29 | 0.174 | ND | 0.011 | ND |
| ITMW-18 | Feb-91 | IT | ND | 3.7 | NT | 0.33 | ND | ND |
| | Nov-93 | MP | ND | 4.5 | NT | ND | 0.009 | 0.006 |
| | Dec-96 | MP | ND | 1.6 | NT | ND | ND | ND |
| | Feb-99 | ERM | ND | 6.3 | 0.48 | ND | ND | ND |
| | Mar-00 | ERM | ND | 3.56 | 0.401 | ND | ND | ND |
| | Sep-00 | ERM | ND | 4.1 | 0.4 | ND | 0.007 | ND |
| | Mar-01 | ERM | ND | 4 | 0.4 | ND | 0.006 | ND |
| | Sep-01 | ERM | ND | 4.1 | 0.3 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 5.26 | 0.426 | ND | ND | ND |
| ITMW-19 | Feb-91 | IT | ND | 9.9 | NT | ND | ND | ND |
| | Nov-93 | MP | 0.005 | 27 | NT | ND | NA | 0.007 |
| | Dec-96 | MP | ND | 25 | NT | ND | ND | ND |
| | Feb-99 | ERM | 0.008 | 33 | 0.15 | ND | 0.04 | ND |
| | Mar-00 | ERM | 0.007 | 33.1 | 0.128 | ND | 0.029 | ND |
| | Sep-00 | ERM | 0.01 | 36 | 0.197 | ND | 0.056 | ND |
| | Jan-01 | ERM | 0.01 | 34 | 0.166 | ND | 0.04 | ND |
| | Mar-01 | ERM | 0.01 | 38 | 0.119 | ND | 0.037 | ND |
| | Sep-01 | ERM | ND | 19 | 0.132 | ND | 0.034 | ND |
| | Feb-02 | ERM (T) | 0.0062 | 26.1 | ND | 0.006 | 0.047 | ND |
| | Feb-02 | ERM (L) | 0.0051 | 24.6 | 0.192 | ND | 0.065 | ND |
| ITMW-20 | Mar-91 | IT | ND | ND | NT | ND | ND | ND |
| | Nov-93 | MP | ND | ND | NT | ND | ND | ND |
| | Dec-96 | MP | ND | 0.29 | NT | ND | ND | ND |
| | May-97 | MP | ND | ND | ND | ND | ND | ND |
| | Feb-99 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.021 | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | ND | ND | ND | ND | ND |

NOTE:

Footnotes on last page of table.

TABLE 2 (Cont'd)

Historic Analytical Data, Selected VOCs in Ground Water

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Sampler | PCE | TCE | c-1,2-DCE | t-1,2-DCE | 1,1-DCE | VC |
|---|---|---|---|---|---|---|---|---|
| ITMW-21 | Mar-91 | IT | ND | 0.021 | NT | ND | ND | ND |
| | Nov-93 | MP | ND | 0.037 | NT | ND | ND | ND |
| | Dec-96 | MP | ND | 0.15 | NT | ND | ND | ND |
| | Feb-99 | ERM | ND | 0.19 | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.196 | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.192 | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.123 | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.116 | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.152 | ND | ND | ND | ND |
| MW-22 | Dec-96 | MP | ND | ND | NT | ND | ND | ND |
| | May-97 | MP | ND | ND | 0.005 | ND | ND | ND |
| | Feb-99 | ERM | ND | ND | 0.005 | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND |
| MW-23 | Dec-96 | MP | ND | 0.21 | NT | ND | ND | ND |
| | May-97 | MP | ND | 2.4 | NT | ND | ND | ND |
| | Feb-99 | ERM | ND | 0.35 | 0.01 | ND | ND | ND |
| | Feb-99 (dup) | ERM | ND | 0.44 | 0.01 | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.147 | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.067 | ND | ND | ND | ND |
| | Jan-01 | ERM | ND | 0.137 | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.087 | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.023 | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.063 | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.098 | ND | ND | ND | ND |
| MW-24 | Feb-99 | ERM | ND | 1.4 | 0.049 | ND | ND | ND |
| | Mar-00 | ERM | ND | **0.403*** | **0.025*** | ND | ND | ND |
| | Mar-00 (dup) | ERM | ND | **0.595*** | **0.024*** | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.128 | 0.011 | ND | ND | ND |
| | Jan-01 | ERM | ND | 0.25 | 0.012 | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.33 | 0.011 | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.124 | 0.006 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.204 | 0.006 | ND | ND | ND |
| MW-25 | Feb-99 | ERM | 0.011 | 29 | 0.17 | ND | 0.069 | 0.1 |
| | Feb-99 (dupl.) | ERM | 0.012 | 27 | 0.18 | ND | 0.074 | 0.11 |
| | Feb-99 | ERM (CoreLab) | 0.009 | 24.8 | 0.149 | ND | 0.057 | 0.074 |
| | Dec-99 | ERM (ERM) | ND | 94.5 | ND | ND | ND | ND |
| | Mar-00 | ERM | 0.011 | 35.9 | 0.245 | ND | 0.066 | 0.063 |
| | Sep-00 | ERM | 0.014 | 59 | 0.3 | ND | 0.092 | 0.05 |
| | Mar-01 | ERM | 0.012 | 34 | 0.117 | ND | 0.047 | 0.06 |
| | Sep-01 | ERM | 0.011 | 60 | 0.3 | ND | 0.101 | ND |
| | Feb-02 | ERM (T) | ND | 24.3 | 0.326 | ND | ND | ND |
| | Feb-02 | ERM (L) | 0.007 | 29.9 | 0.369 | 0.005 | 0.052 | 0.052 |
| MW-26 | Feb-99 | ERM (SPL) | ND | 0.36 | 0.15 | ND | ND | ND |
| | Jun-99 | ERM (SPL) | ND | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 (dup) | ERM | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | ND | ND | ND | ND | ND |

NOTE:

Footnotes on last page of table.

TABLE 2 (Cont'd)

Historic Analytical Data, Selected VOCs in Ground Water

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Sampler | PCE | TCE | c-1,2-DCE | t-1,2-DCE | 1,1-DCE | VC |
|---|---|---|---|---|---|---|---|---|
| MW-27 | Dec-99 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Jan-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND |
| MW-28 | Dec-99 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | ND | ND | ND | ND | ND |
| MW-29 | Dec-99 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-00 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND |
| MW-30 | Dec-99 | ERM | ND | 0.115 | 0.034 | ND | ND | ND |
| | Mar-00 | ERM | ND | 0.086 | 0.025 | ND | ND | ND |
| | Sep-00 | ERM | ND | 0.102 | 0.025 | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.043 | 0.011 | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.063 | 0.018 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | 0.067 | 0.021 | ND | ND | ND |
| MW-31 | Jan-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | ND | ND | ND | ND | ND |
| MW-32 | Jan-01 | ERM | ND | 0.108 | ND | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.174 | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.095 | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.0536 | ND | ND | ND | ND |

NOTE:

Footnotes on last page of table.

TABLE 2 (Cont'd)

Historic Analytical Data, Selected VOCs in Ground Water

Whirlpool Corporation
Fort Smith, Arkansas

| Well | Date | Sampler | PCE | TCE | c-1,2-DCE | t-1,2-DCE | 1,1-DCE | VC |
|---|---|---|---|---|---|---|---|---|
| MW-33 | Jan-01 | ERM | ND | 0.12 | 0.034 | ND | ND | ND |
| | Mar-01 | ERM | ND | 0.26 | 0.007 | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.31 | 0.008 | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.115 | ND | ND | ND | ND |
| MW-34 | Mar-01 | ERM | ND | 0.083 | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | 0.061 | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.0214 | ND | ND | ND | ND |
| MW-35 | Mar-01 | ERM | ND | 0.91 | 0.034 | ND | ND | ND |
| | May-01 | ERM | ND | 0.86 | 0.036 | ND | ND | ND |
| | Sep-01 | ERM | ND | 1.03 | 0.04 | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.325 | 0.0133 | ND | ND | ND |
| MW-36 | Mar-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Sep-01 | ERM | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | ND | ND | ND | ND | ND |
| MW-37 | Sep-01 | ERM | ND | 5 | 0.34 | ND | ND | ND |
| | Feb-02 | ERM (T) | ND | ND | ND | ND | ND | ND |
| | Feb-02 | ERM (L) | ND | 0.773 | 3.25 | 0.052 | 0.01 | ND |
| MW-38 | Sep-01 | ERM | ND | 0.62 | 0.09 | ND | ND | ND |
| | MW-38 was used as an injection well for the pilot study and was not sampled in February 2002. | | | | | | | |

NOTES:

Units used are mg/L. ND = not detected NT = not tested NA = not available
(L) = Sample collected using low-flow sampling methods.
(T) = Sample collected using traditional purge and sample methods.
IT = International Technology Corporation, Inc.
ERM = Environmental Resources Management
MP = Malcolm Pirnie, Inc.
PCE = perchloroethylene (tetrachloroethene) TCE = trichloroethylene
c-1,2-DCE = cis-1,2-dichloroethylene (not an analytical parameter until May 1997)
t-1,2-DCE = trans-1,2-dichloroethylene
1,1-DCE = 1,1-dichloroethylene VC = vinyl chloride
* = Analysis was re-run due to QA/QC concerns. Data reported is for the second run.
SPL was used as the subcontract laboratory from 1996 to June 1999. ChemLab was used for earlier MP sampling events. The current laboratory is STL in Houston, Texas.
Pre-1999 data reproduced from "Remedial Investigation, North Side Ground Water, Whirlpool Corporation", Malcolm Pirnie, Inc., January 1997, (revised entry for MW-11, Jan-90) and SPL Certificates of Analysis, May 1997, supplied by Whirlpool Corporation.

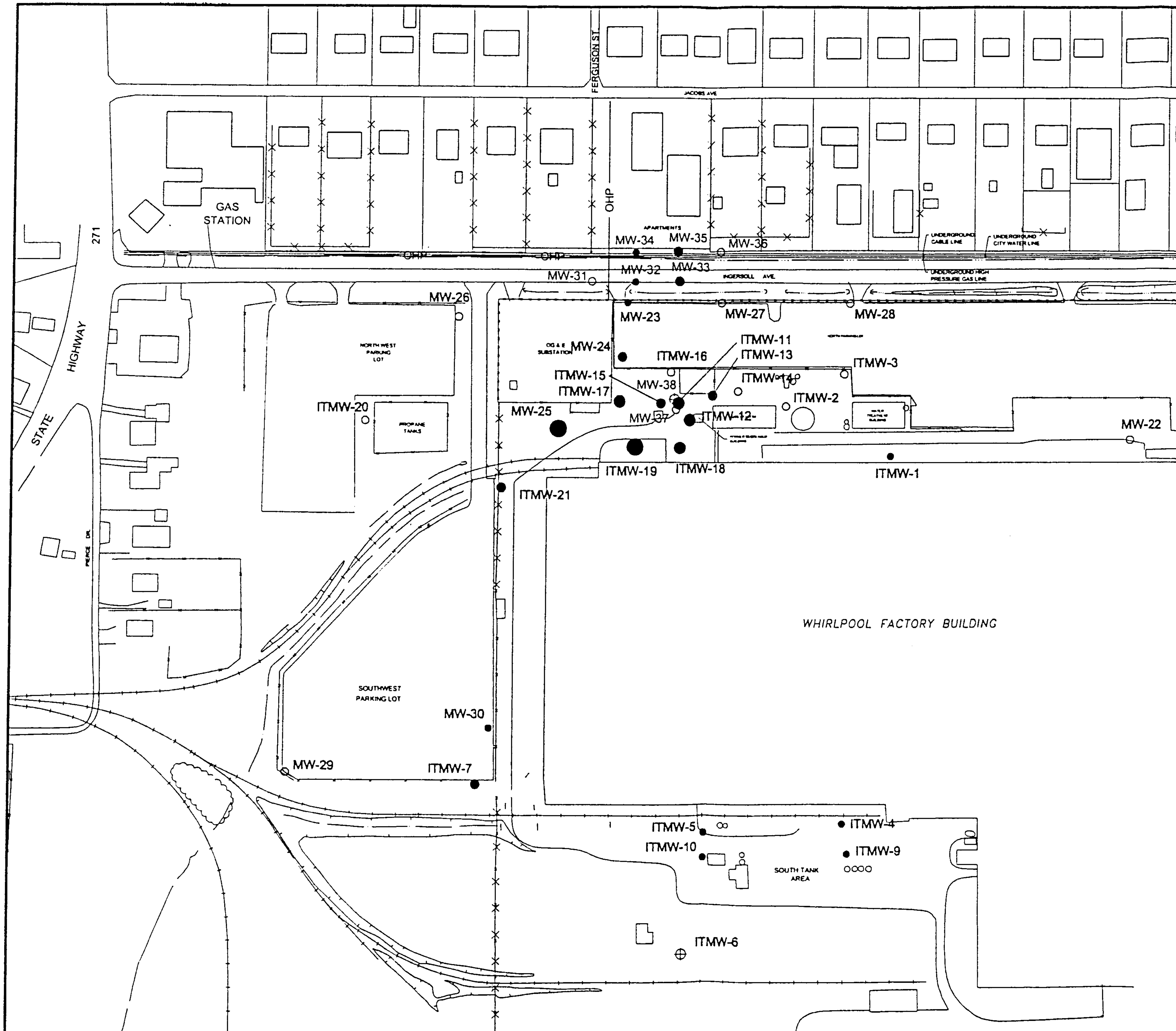
**Figures**

*Attachment 2*

*April 12, 2002*

*W.O. # 581-009*

Environmental Resources Management
3204 Long Prairie Road, Suite C
Flower Mound, TX 75022
(972) 355-2100




LEGEND

MW-26 ● EXISTING MONITORING WELL SAMPLED USING TRADITIONAL PURGE METHOD

⊕ EXISTING MONITORING WELL NOT SAMPLED USING TRADITIONAL PURGE METHOD

TCE CONCENTRATION (mg/l)
FEBRUARY 2002

- ○ < 0.005
- • 0.005 to 0.10
- ● 0.10 to 1.00
- ● 1.00 to 10.0
- ● > 10.0

NOTE:

1) MW-38 WAS USED AS AN INJECTION WELL FOR THE PILOT STUDY AND WAS NOT SAMPLED IN FEBRUARY 2002.

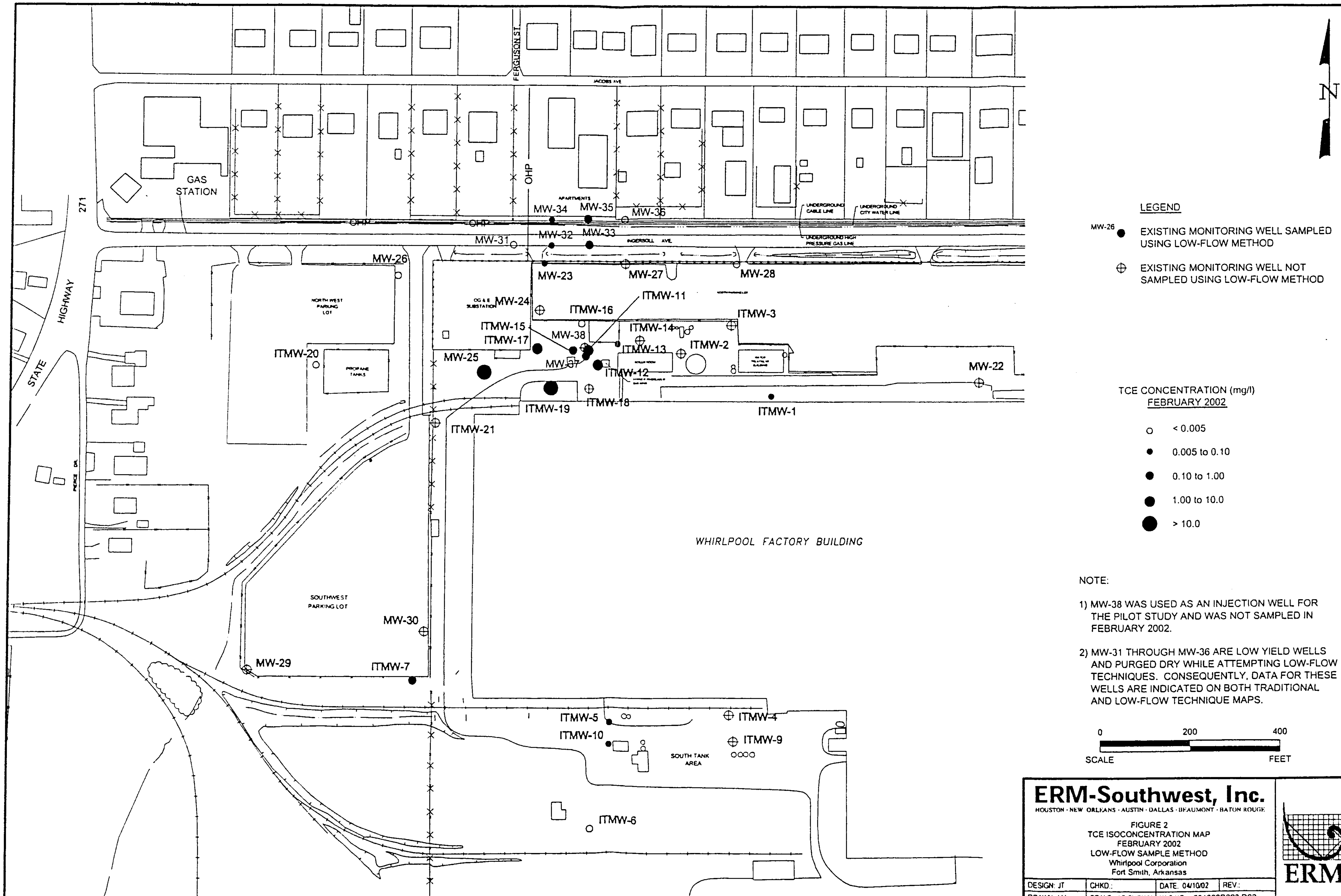
0 200 400
SCALE FEET

**ERM-Southwest, Inc.**
HOUSTON · NEW ORLEANS · AUSTIN · DALLAS · BEAUMONT · BATON ROUGE

FIGURE 1
TCE ISOCONCENTRATION MAP
FEBRUARY 2002
TRADITIONAL SAMPLE METHOD
Whirlpool Corporation
Fort Smith, Arkansas

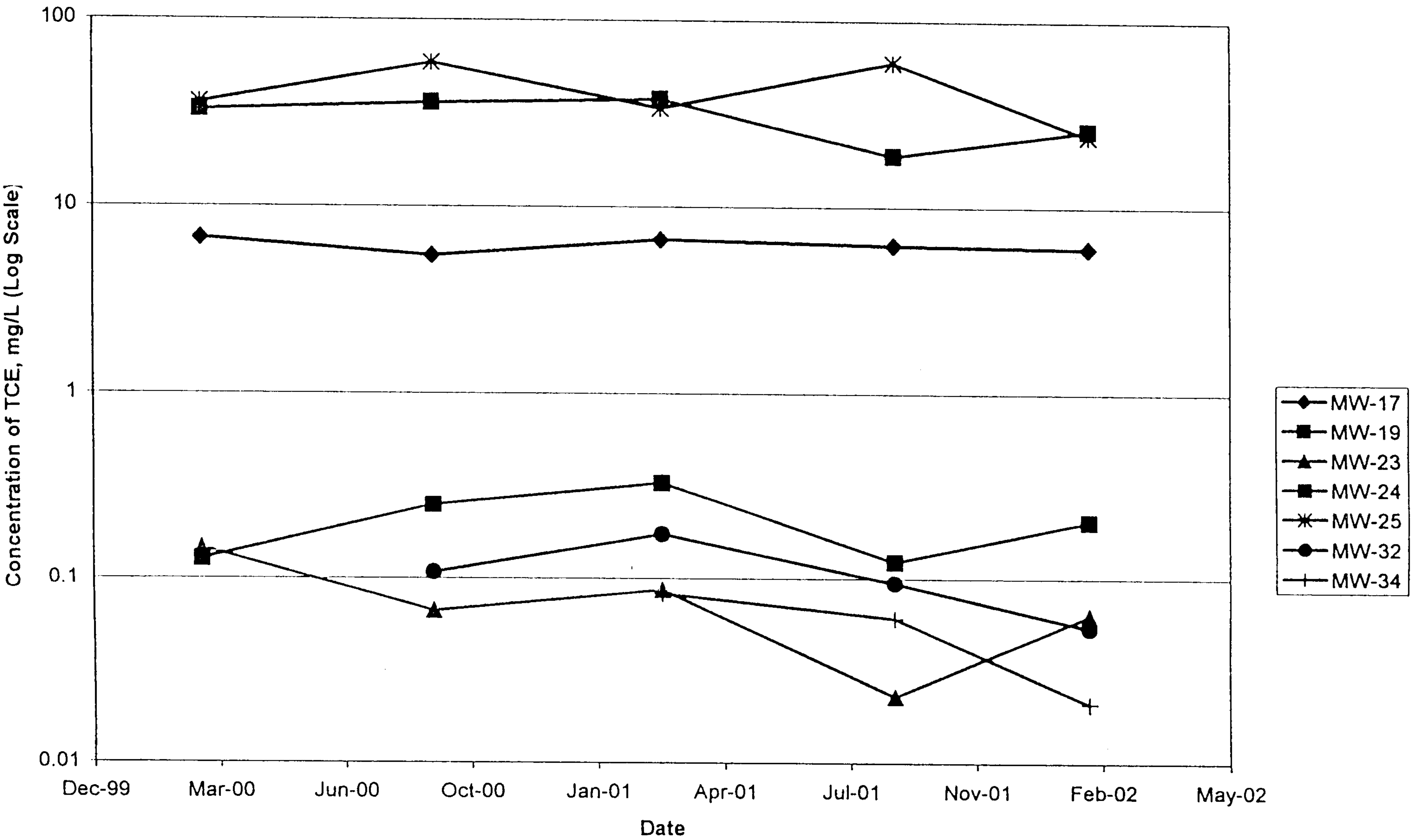
ERM.

| DESIGN: JT | CHKD.: | DATE: 04/10/02 | REV.: |
|---|---|---|---|
| DRAWN: LMc | SCALE: AS SHOWN | W.O.NO.: 581009B202 D02 | |

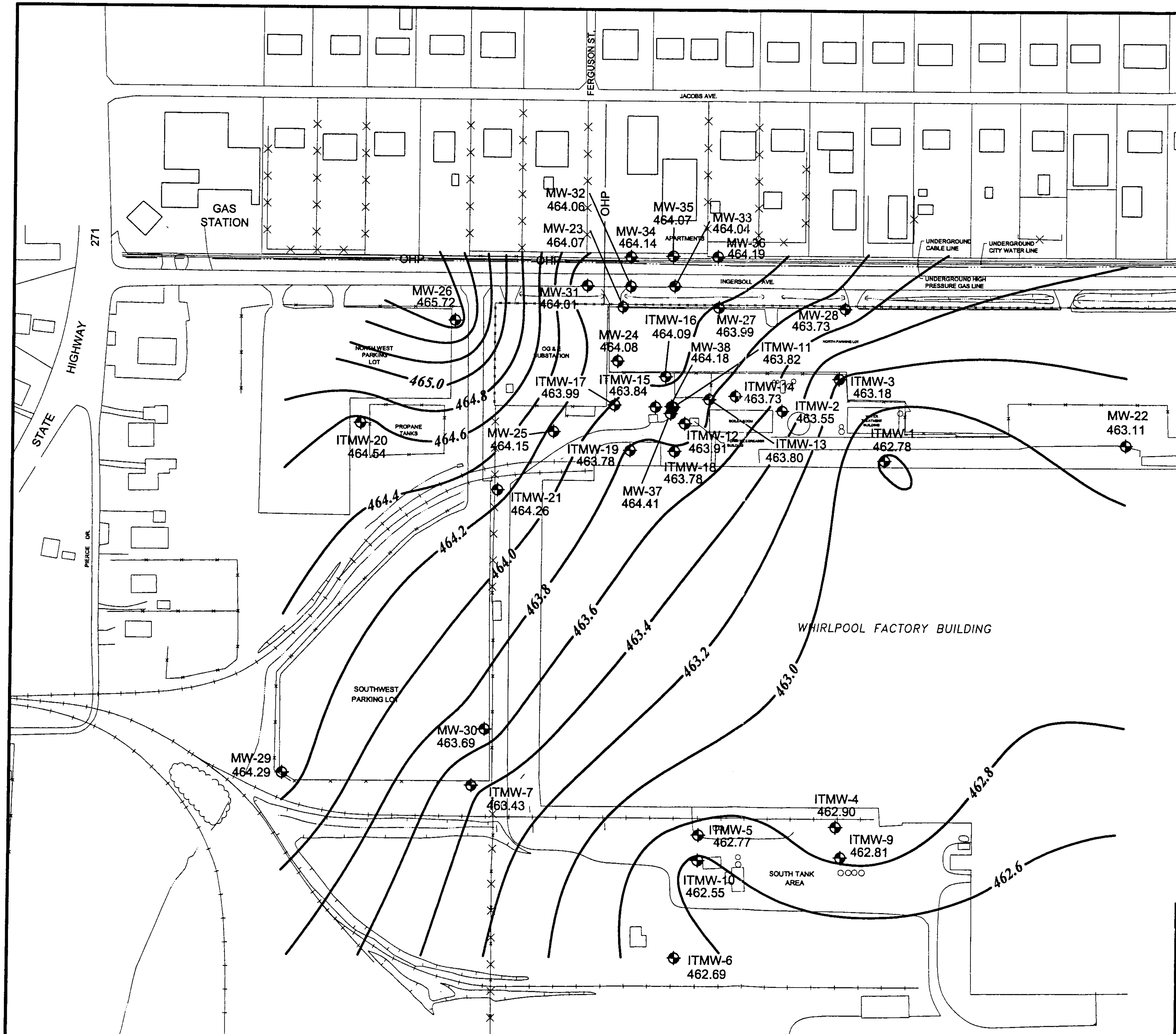


N
JACOBS AVE
FERGUSON ST.
OHP
GAS STATION
STATE HIGHWAY 271
PIERCE DR.
APARTMENTS
INGERSOLL AVE.
UNDERGROUND CABLE LINE
UNDERGROUND CITY WATER LINE
UNDERGROUND HIGH PRESSURE GAS LINE
NORTH WEST PARKING LOT
PROPANE TANKS
OG & E SUBSTATION
SOUTHWEST PARKING LOT
WHIRLPOOL FACTORY BUILDING
SOUTH TANK AREA
MW-22
MW-23
MW-24
MW-25
MW-26
MW-27
MW-28
MW-29
MW-30
MW-31
MW-32
MW-33
MW-34
MW-35
MW-36
MW-37
MW-38
ITMW-1
ITMW-2
ITMW-3
ITMW-4
ITMW-5
ITMW-6
ITMW-7
ITMW-9
ITMW-10
ITMW-11
ITMW-12
ITMW-13
ITMW-14
ITMW-15
ITMW-16
ITMW-17
ITMW-18
ITMW-19
ITMW-20
ITMW-21
LEGEND
MW-26 EXISTING MONITORING WELL SAMPLED USING LOW-FLOW METHOD
EXISTING MONITORING WELL NOT SAMPLED USING LOW-FLOW METHOD
TCE CONCENTRATION (mg/l)
FEBRUARY 2002
< 0.005
0.005 to 0.10
0.10 to 1.00
1.00 to 10.0
> 10.0
NOTE:
1) MW-38 WAS USED AS AN INJECTION WELL FOR THE PILOT STUDY AND WAS NOT SAMPLED IN FEBRUARY 2002.
2) MW-31 THROUGH MW-36 ARE LOW YIELD WELLS AND PURGED DRY WHILE ATTEMPTING LOW-FLOW TECHNIQUES. CONSEQUENTLY, DATA FOR THESE WELLS ARE INDICATED ON BOTH TRADITIONAL AND LOW-FLOW TECHNIQUE MAPS.
0
200
400
SCALE
FEET
ERM-Southwest, Inc.
HOUSTON · NEW ORLEANS · AUSTIN · DALLAS · BEAUMONT · BATON ROUGE
FIGURE 2
TCE ISOCONCENTRATION MAP
FEBRUARY 2002
LOW-FLOW SAMPLE METHOD
Whirlpool Corporation
Fort Smith, Arkansas
ERM
DESIGN: JT
CHKD.:
DATE: 04/10/02
REV.:
DRAWN: LMc
SCALE: AS SHOWN
W.O.NO.: 581009B203.D02

**Figure 3**
**TCE Concentrations vs. Time of MW-19 to MW-34 Transect**
Whirlpool Corporation
Fort Smith, Arkansas




581-009/D0906grph.xls




LEGEND

MW-26 465.72 — EXISTING MONITORING WELL

464.0 — GROUND WATER CONTOUR LINE (FEET, MSL) (CONTOUR INTERVAL = 0.2 FEET)

NOTES:

1. DATA RECORDED ON FEBRUARY 18, 2002.
2. CONTOURS UNDER THE FACTORY BUILDING ARE INFERRED.
3. MW-37 AND MW-38 WATER LEVELS WERE NOT USED TO CONTOUR THIS MAP DUE TO ANOMALOUS READINGS.

0 200 400
SCALE FEET

**ERM-Southwest, Inc.**
HOUSTON · NEW ORLEANS · AUSTIN · DALLAS · BEAUMONT · BATON ROUGE

FIGURE 2
POTENTIOMETRIC SURFACE MAP
FEBRUARY 2002
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| DESIGN: JT | CHKD.: | DATE: 03/01/02 | REV.: |
|---|---|---|---|
| DRAWN: CAK | SCALE: AS SHOWN | W.O.NO.: 581004B207 C02 | |

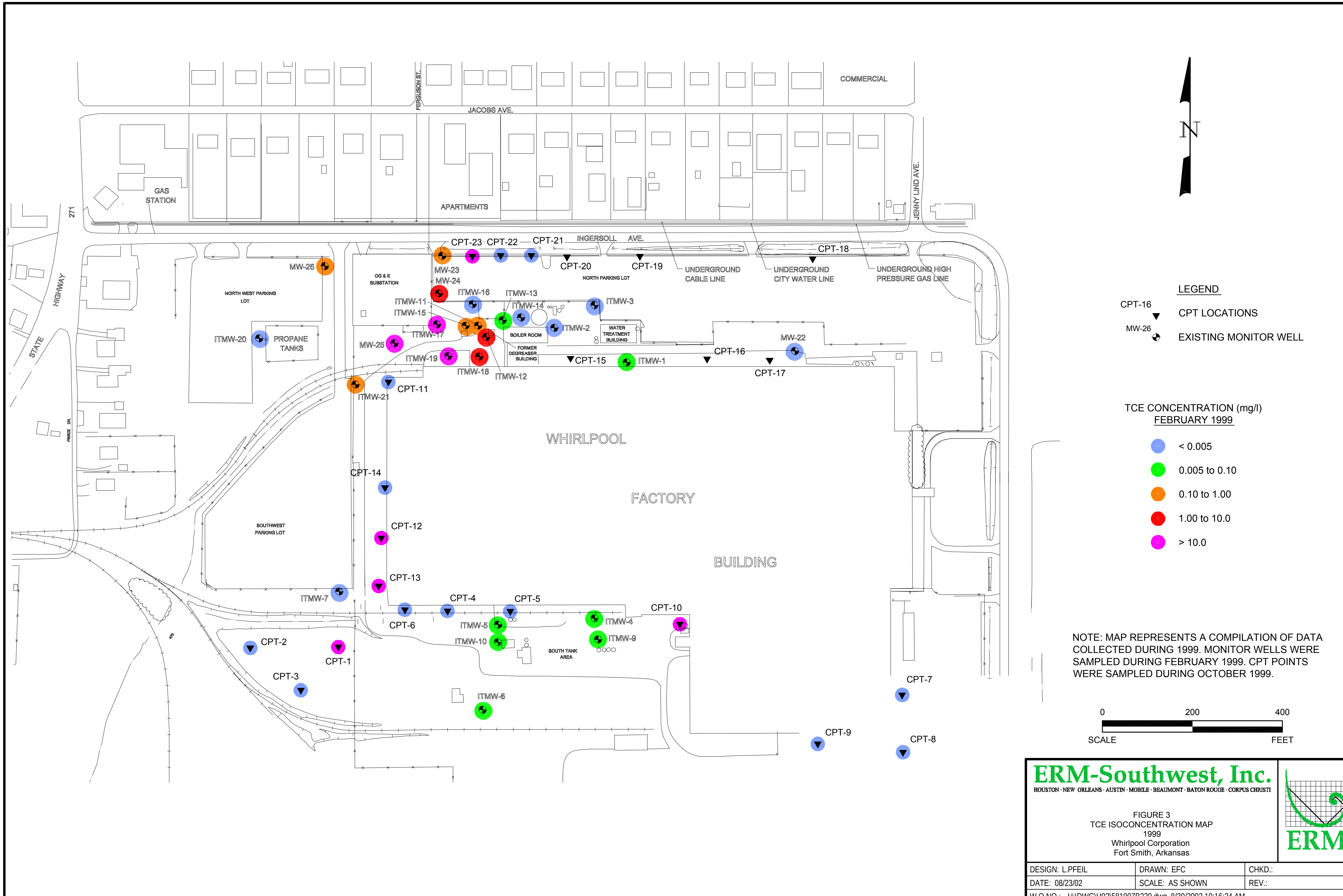
H:\DWG\C02\581004B207.dwg, 03/01/2002 02:01:45 PM, 1:1

# TCE Isoconcentration Maps and Potentiometric Surface Maps from 1999, 2000, and 2001 Semi-Annual Ground Water Sampling Reports

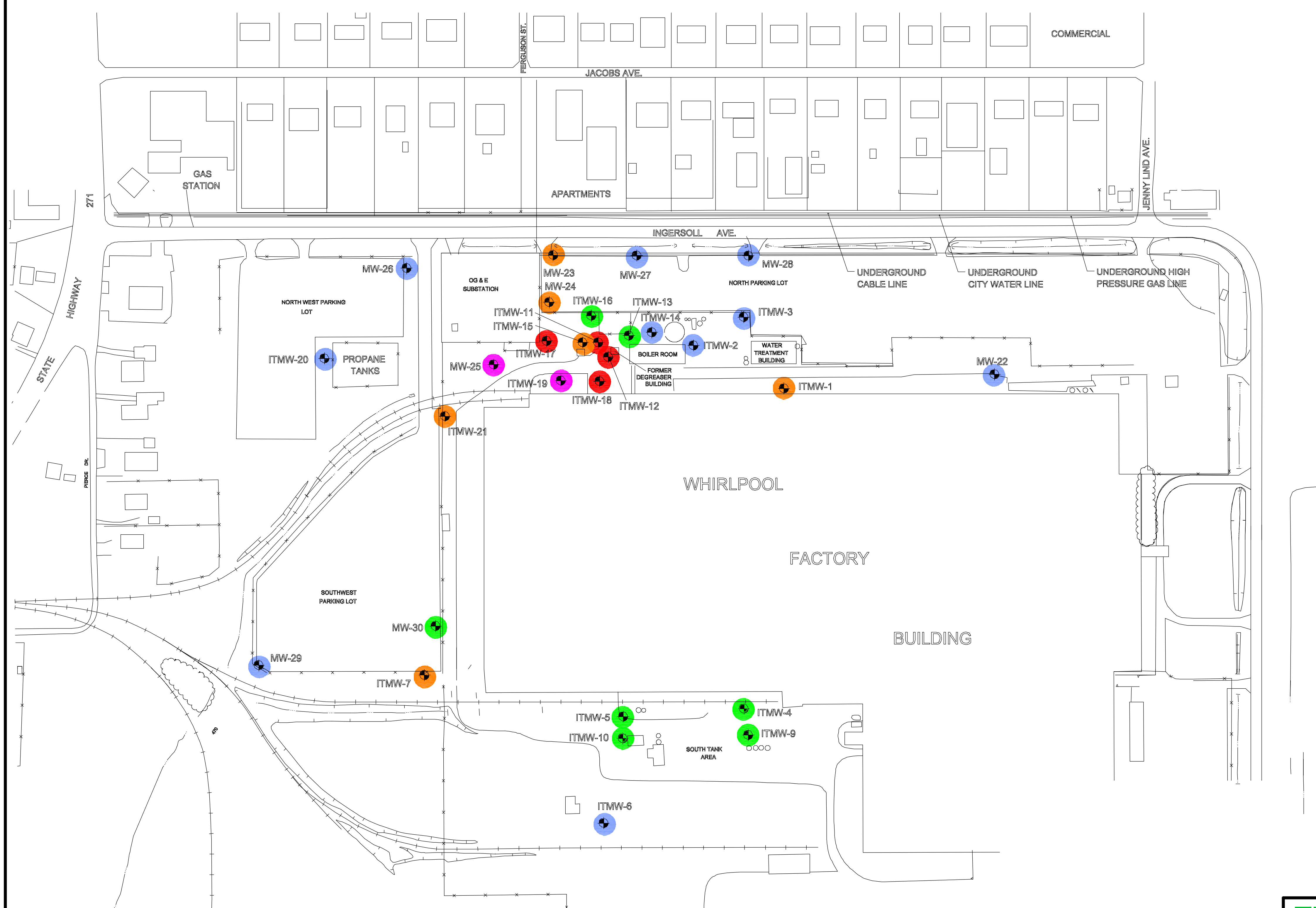
*Attachment 2*

*August 30, 2002*
*W.O. #481-007*

**Environmental Resources Management**
16300 Katy Freeway, Suite 300
Houston, Texas  77094-1611
(281) 600-1000



COMMERCIAL
JACOBS AVE.
FERGUSON ST.
GAS STATION
APARTMENTS
JENNY LIND AVE.
271
HIGHWAY
STATE
INGERSOLL AVE.
CPT-23
CPT-22
CPT-21
CPT-20
CPT-19
CPT-18
NORTH PARKING LOT
UNDERGROUND CABLE LINE
UNDERGROUND CITY WATER LINE
UNDERGROUND HIGH PRESSURE GAS LINE
MW-26
MW-23
MW-24
OG & E SUBSTATION
NORTH WEST PARKING LOT
ITMW-16
ITMW-13
ITMW-14
ITMW-3
ITMW-11
ITMW-15
ITMW-17
ITMW-2
BOILER ROOM
WATER TREATMENT BUILDING
ITMW-20
PROPANE TANKS
MW-25
ITMW-19
ITMW-18
FORMER DEGREASER BUILDING
ITMW-12
CPT-15
ITMW-1
CPT-16
MW-22
CPT-17
ITMW-21
CPT-11
WHIRLPOOL
FACTORY
BUILDING
CPT-14
CPT-12
SOUTHWEST PARKING LOT
CPT-13
ITMW-7
CPT-4
CPT-5
CPT-10
CPT-6
ITMW-4
ITMW-5
ITMW-10
ITMW-9
SOUTH TANK AREA
CPT-2
CPT-1
CPT-3
ITMW-6
CPT-7
CPT-9
CPT-8
N
LEGEND
CPT-16
CPT LOCATIONS
MW-26
EXISTING MONITOR WELL
TCE CONCENTRATION (mg/l)
FEBRUARY 1999
< 0.005
0.005 to 0.10
0.10 to 1.00
1.00 to 10.0
> 10.0
NOTE: MAP REPRESENTS A COMPILATION OF DATA COLLECTED DURING 1999. MONITOR WELLS WERE SAMPLED DURING FEBRUARY 1999. CPT POINTS WERE SAMPLED DURING OCTOBER 1999.
0
200
400
SCALE
FEET
ERM-Southwest, Inc.
HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE · CORPUS CHRISTI
FIGURE 3
TCE ISOCONCENTRATION MAP
1999
Whirlpool Corporation
Fort Smith, Arkansas
ERM
DESIGN: L.PFEIL
DRAWN: EFC
CHKD.:
DATE: 08/23/02
SCALE: AS SHOWN
REV.:
W.O.NO.: H:\DWG\H02\581007B220.dwg, 8/30/2002 10:16:24 AM




LEGEND

MW-26 EXISTING MONITORING WELL

TCE CONCENTRATION (mg/l)
MARCH 2000

- < 0.005
- 0.005 to 0.10
- 0.10 to 1.00
- 1.00 to 10.0
- > 10.0

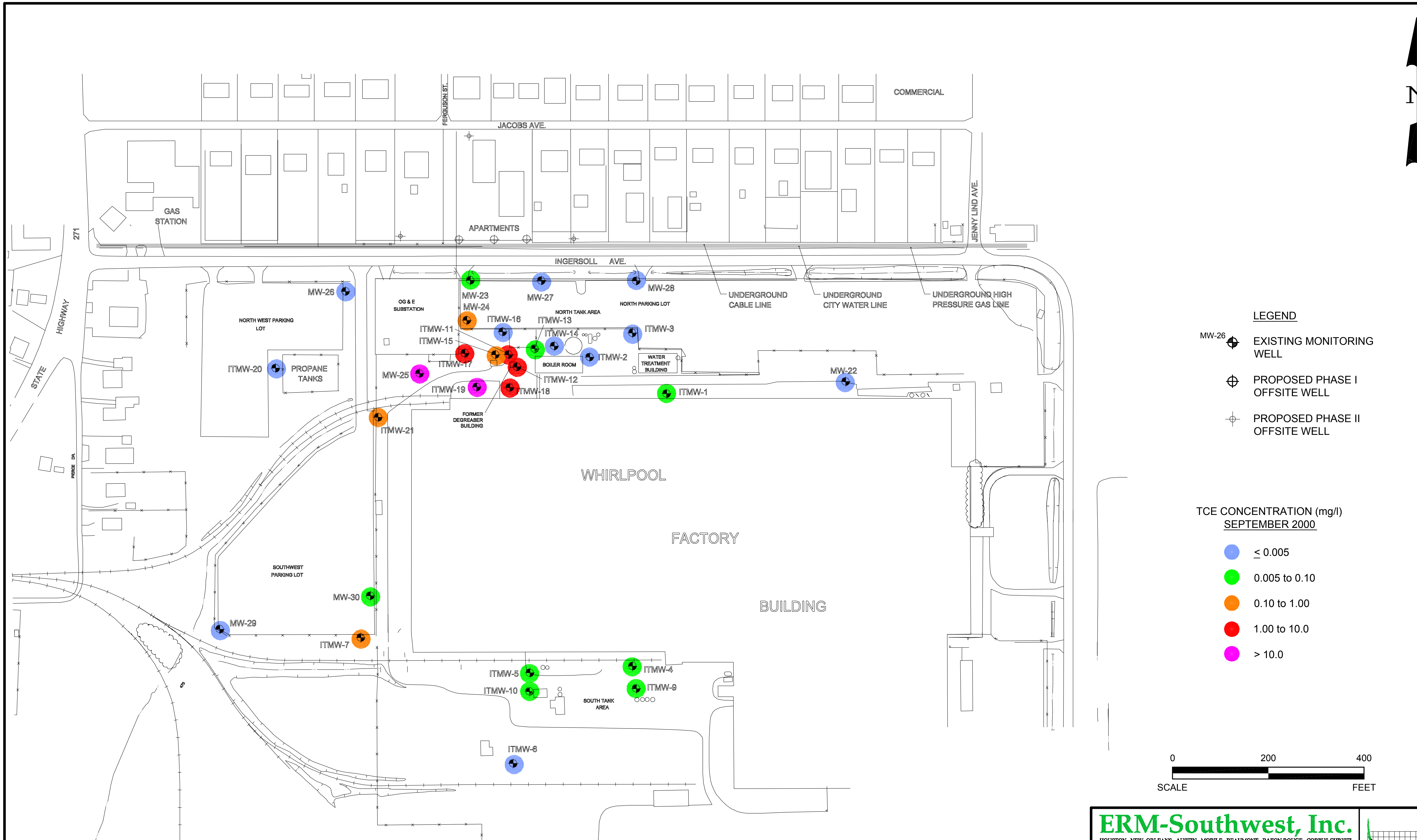
0 200 400
SCALE FEET

**ERM-Southwest, Inc.**
HOUSTON · NEW ORLEANS · AUSTIN · DALLAS · BEAUMONT · BATON ROUGE

FIGURE 3
TCE ISOCONCENTRATION MAP
MARCH 2000
Whirlpool Corporation
Fort Smith, Arkansas

| DESIGN: L.PFEIL | CHKD.: | DATE: 08/15/02 | REV.: |
|---|---|---|---|
| DRAWN: EFC | SCALE: AS SHOWN | W.O.NO.: 581002B018 H02 | |

ERM




LEGEND

MW-26 EXISTING MONITORING WELL

PROPOSED PHASE I OFFSITE WELL

PROPOSED PHASE II OFFSITE WELL

TCE CONCENTRATION (mg/l)
SEPTEMBER 2000

- $\leq$ 0.005
- 0.005 to 0.10
- 0.10 to 1.00
- 1.00 to 10.0
- > 10.0

0 200 400
SCALE FEET

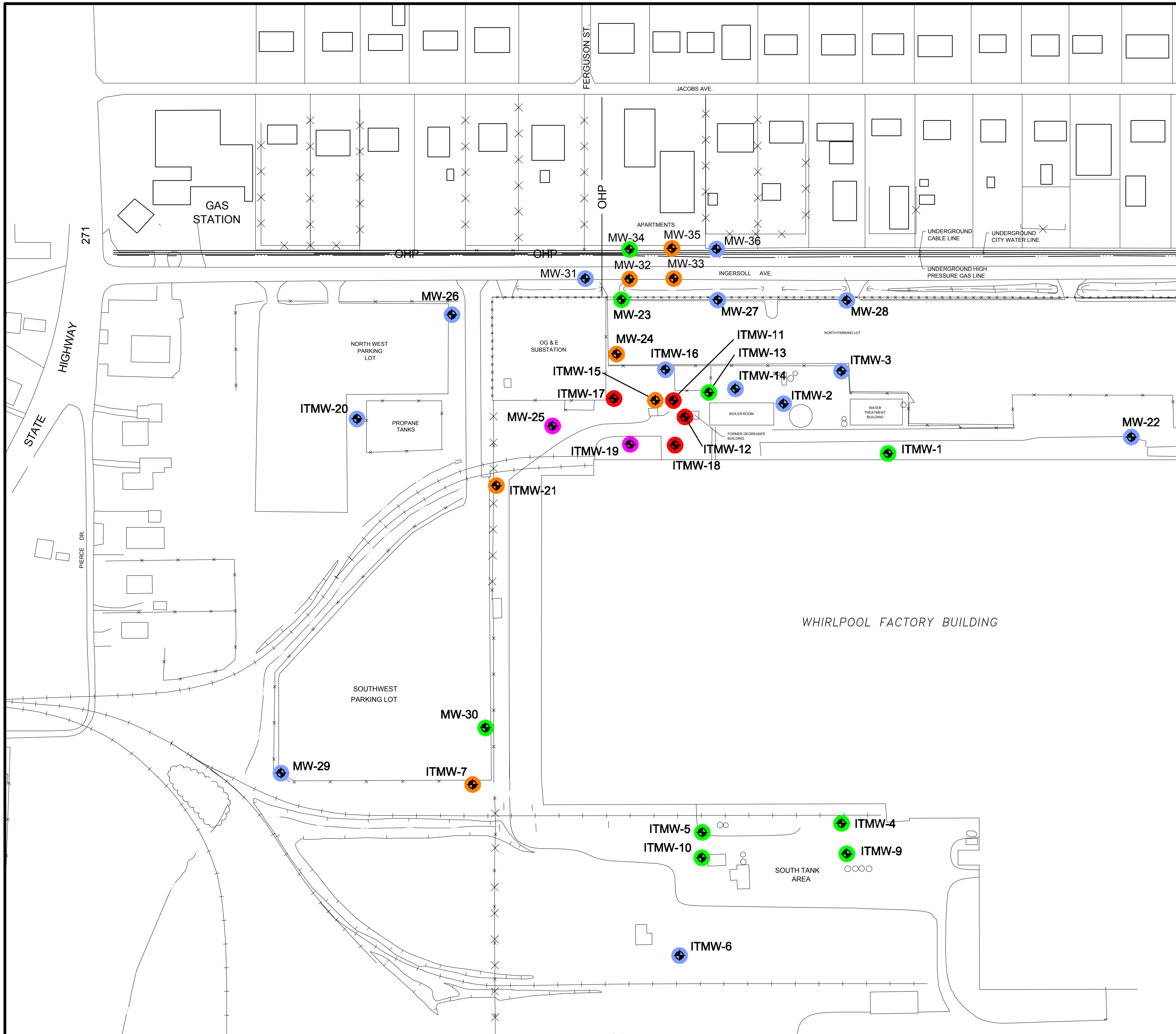
**ERM-Southwest, Inc.**
HOUSTON · NEW ORLEANS · AUSTIN · MOBILE · BEAUMONT · BATON ROUGE · CORPUS CHRISTI

FIGURE 4
TCE ISOCONCENTRATION MAP
SEPTEMBER 2000
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| DESIGN: L.PFEIL | DRAWN: EFC | CHKD.: |
|---|---|---|
| DATE: 08/21/02 | SCALE: AS SHOWN | REV.: |

W.O.NO.: H:\DWG\H02\581007B218.dwg, 8/30/2002 10:18:38 AM



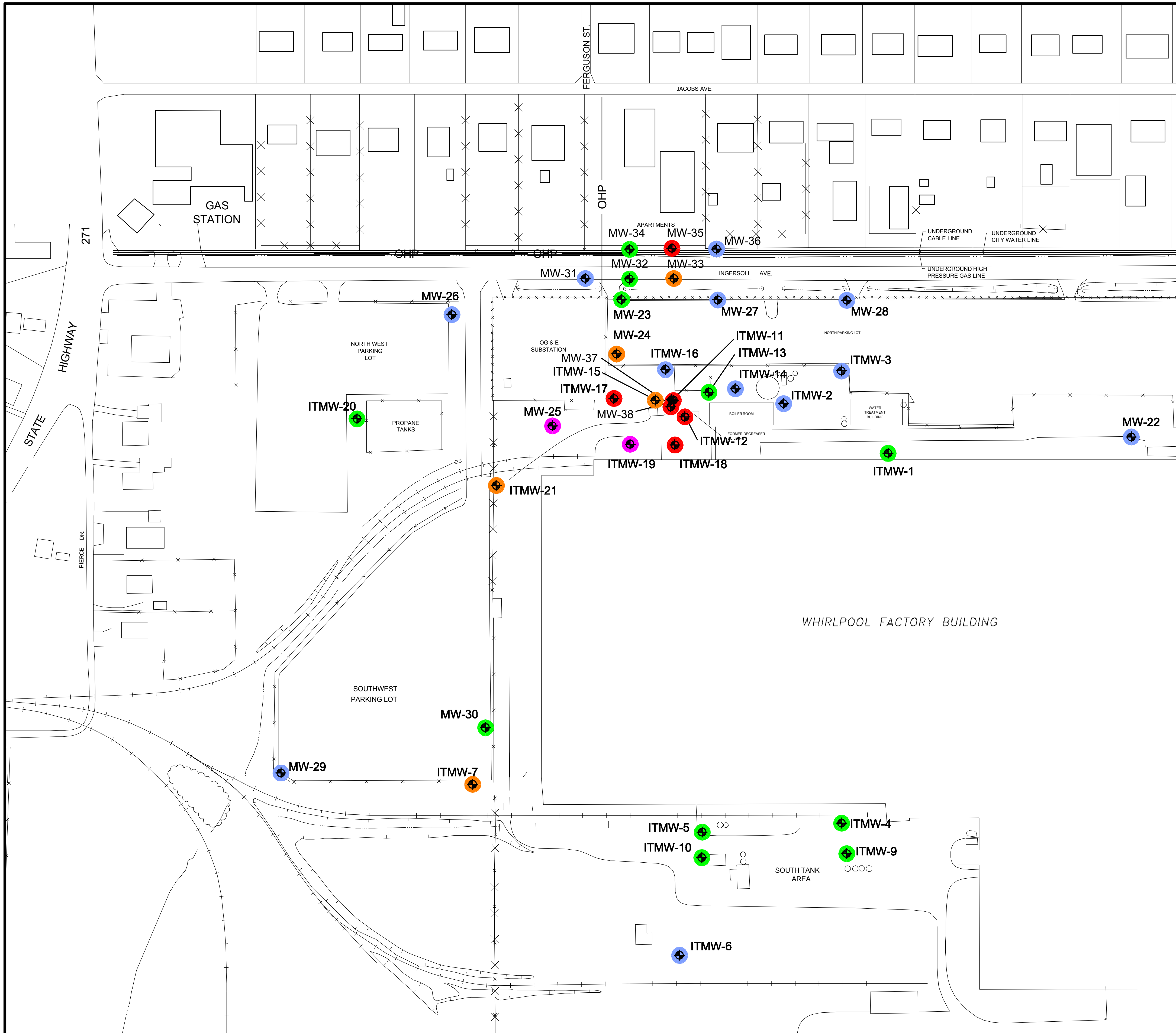

**ERM-Southwest, Inc.**

HOUSTON • NEW ORLEANS • AUSTIN • DALLAS • BEAUMONT • BATON ROUGE

FIGURE 1
TCE ISOCONCENTRATION MAP
MARCH 2001
Whirlpool Corporation
Fort Smith, Arkansas

| | | | |
|---|---|---|---|
| DESIGN: JT | CHKD.: | DATE: 08/16/02 | REV.: |
| DRAWN: CAK/LMc | SCALE: AS SHOWN | W.O.NO.: 581007B211 H02 | |

ERM




LEGEND

MW-26 EXISTING MONITORING WELL

TCE CONCENTRATION (mg/l)
SEPTEMBER 2001

- < 0.005
- 0.005 to 0.10
- 0.10 to 1.00
- 1.00 to 10.0
- > 10.0

NOTES:

1. LOCATIONS FOR WELLS ITMW-37 AND ITMW-38 ARE APPROXIMATE AND WILL BE UPDATED WHEN SURVEY DATA ARE RECEIVED.

0 200 400

SCALE FEET

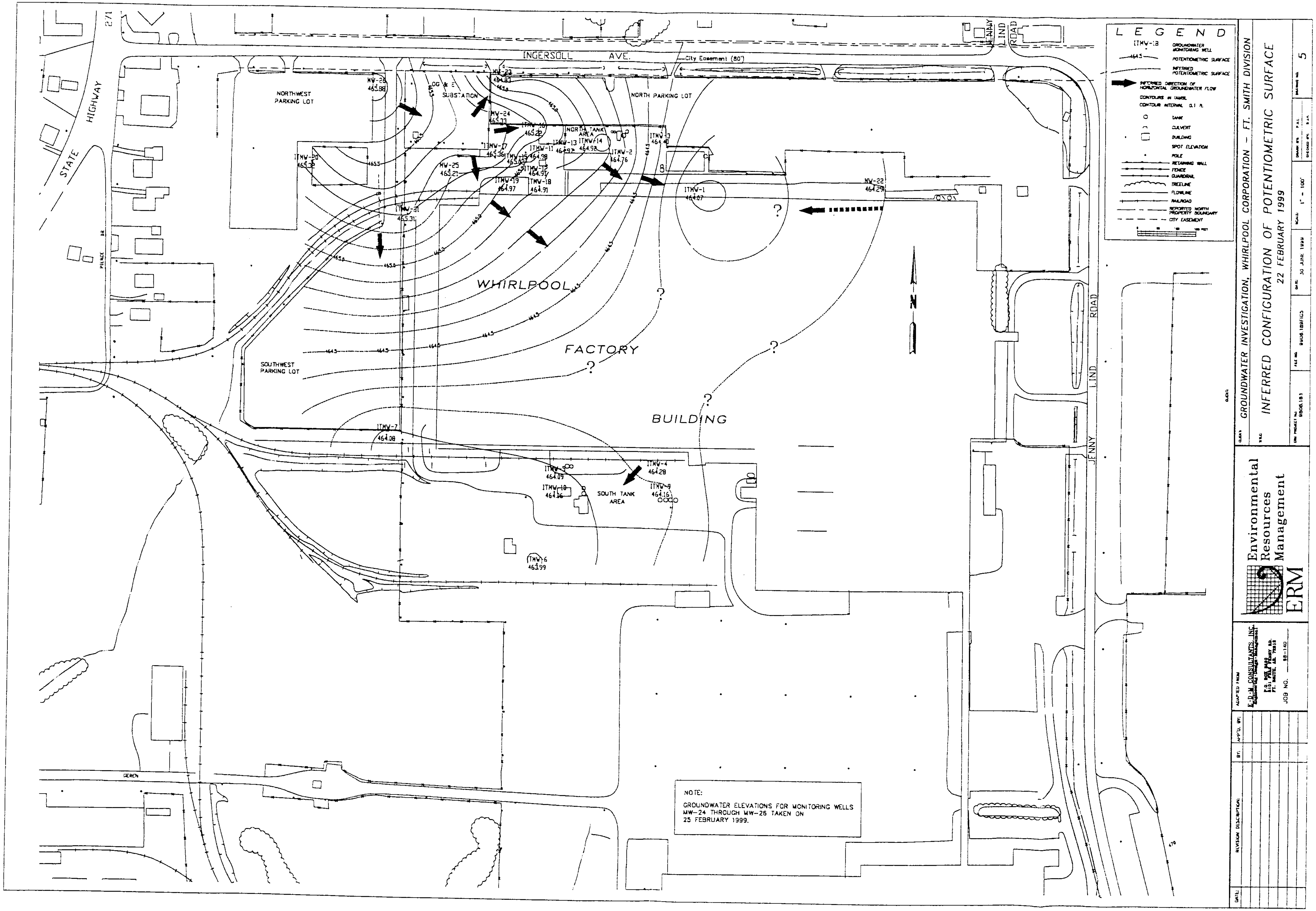
**ERM-Southwest, Inc.**

HOUSTON • NEW ORLEANS • AUSTIN • DALLAS • BEAUMONT • BATON ROUGE

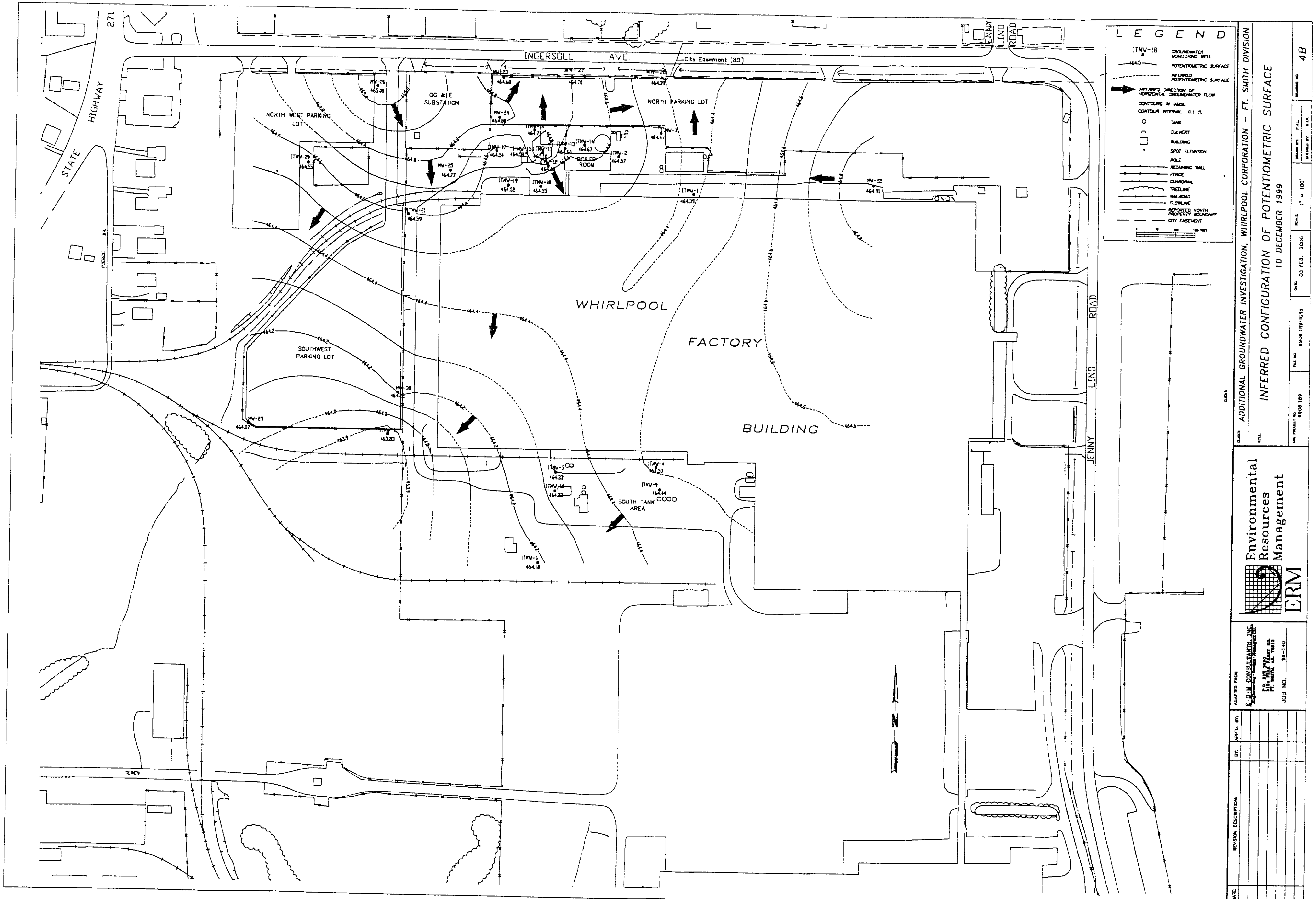
FIGURE 1
TCE ISOCONCENTRATION MAP
SEPTEMBER 2001
Whirlpool Corporation
Fort Smith, Arkansas

| | | | |
|---|---|---|---|
| DESIGN: JT | CHKD.: | DATE: 08/21/02 | REV.: |
| DRAWN: CAK/LMc | SCALE: AS SHOWN | W.O.NO.: 581007B212 H02 | |

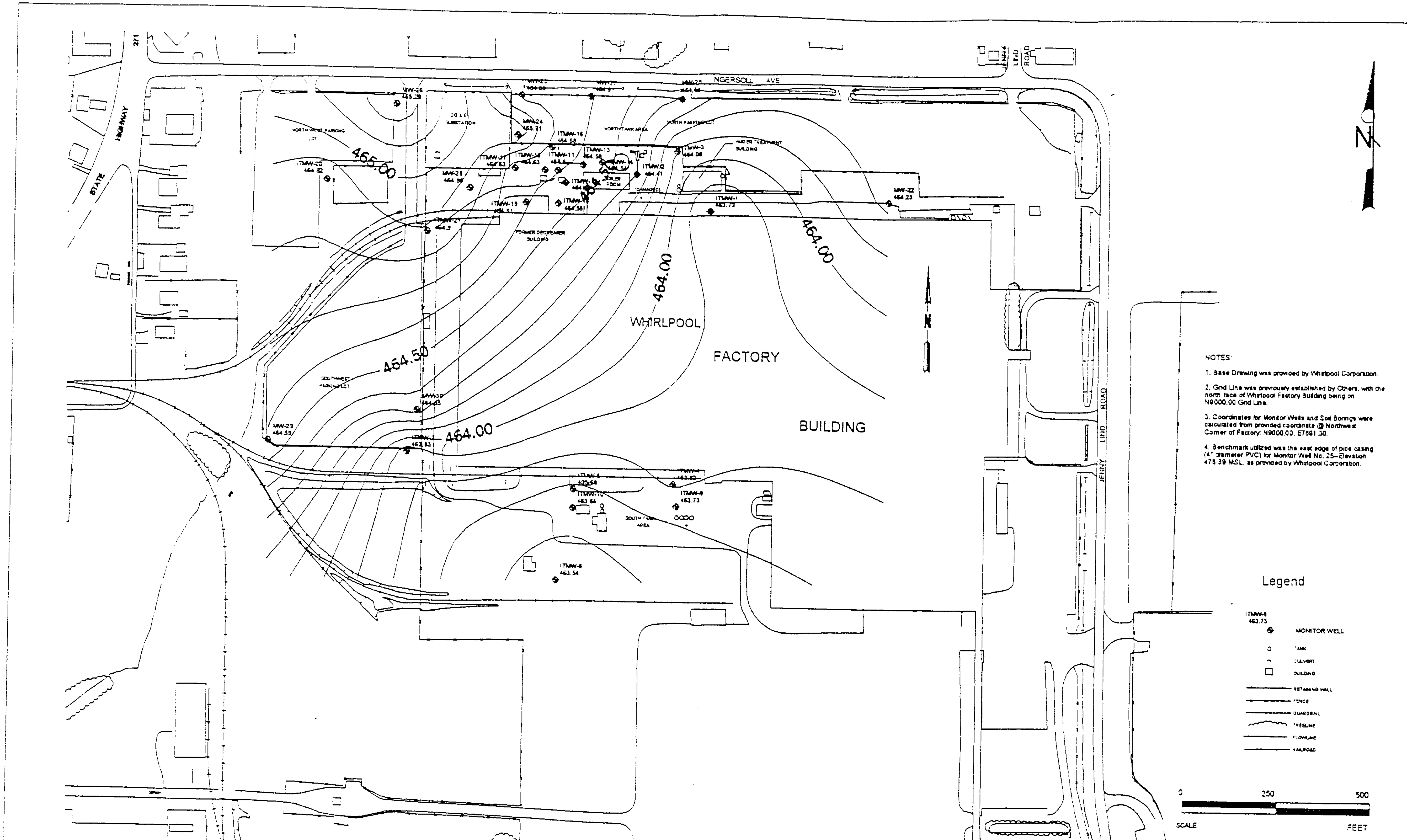
ERM®




H:\DWG\J00\9906.189FIG5.dwg



ADDITIONAL GROUNDWATER INVESTIGATION, WHIRLPOOL CORPORATION – FT. SMITH DIVISION
INFERRED CONFIGURATION OF POTENTIOMETRIC SURFACE
10 DECEMBER 1999
ERM PROJECT NO. 9906.189
FILE NO. 9906.189FIG4B
DATE: 03 FEB. 2000
SCALE: 1" = 100'
DRAWING NO. 4B
Environmental Resources Management
ERM
ADAPTED FROM E-D-M CONSULTANTS, INC.
JOB NO. 98-140
LEGEND
GROUNDWATER MONITORING WELL
POTENTIOMETRIC SURFACE
INFERRED POTENTIOMETRIC SURFACE
INFERRED DIRECTION OF HORIZONTAL GROUNDWATER FLOW
CONTOURS IN MSL
CONTOUR INTERVAL 0.1 ft.
INGERSOLL AVE.
City Easement (80')
STATE HIGHWAY 271
JENNY LIND ROAD
NORTH WEST PARKING LOT
OG & E SUBSTATION
NORTH PARKING LOT
BOILER ROOM
SOUTHWEST PARKING LOT
WHIRLPOOL FACTORY BUILDING
SOUTH TANK AREA
N




NOTES:

1. Base Drawing was provided by Whirlpool Corporation.

2. Grid Line was previously established by Others, with the north face of Whirlpool Factory Building being on N9000.00 Grid Line.

3. Coordinates for Monitor Wells and Soil Borings were calculated from provided coordinate @ Northwest Corner of Factory: N9000.00, E7691.30.

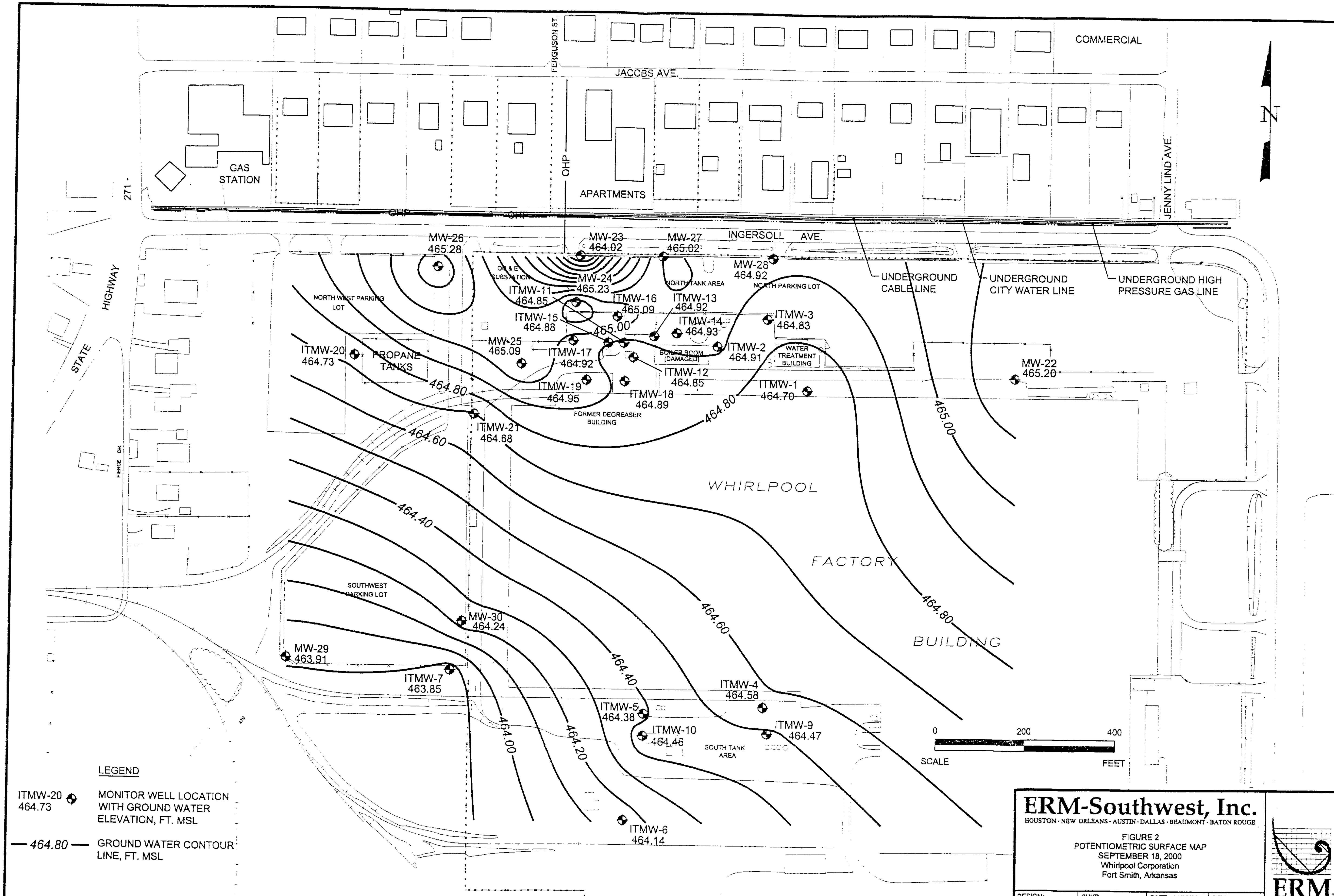
4. Benchmark utilized was the east edge of pipe casing (4" diameter PVC) for Monitor Well No. 25–Elevation 475.89 MSL, as provided by Whirlpool Corporation.

**ERM-Southwest, Inc.**
Houston - New Orleans - Austin - Dallas - Beaumont

Figure 1
Potentiometric Surface Map
March 2000
Whirlpool Corporation
Fort Smith Arkansas

| | | | |
|---|---|---|---|
| DESIGN: TM | CHKD.: TM | DATE: 06/18/00 | REV.: |
| DRAWN: R.M | SCALE: AS SHOWN | W.O. NO.: 581001801F00 | |

ERM



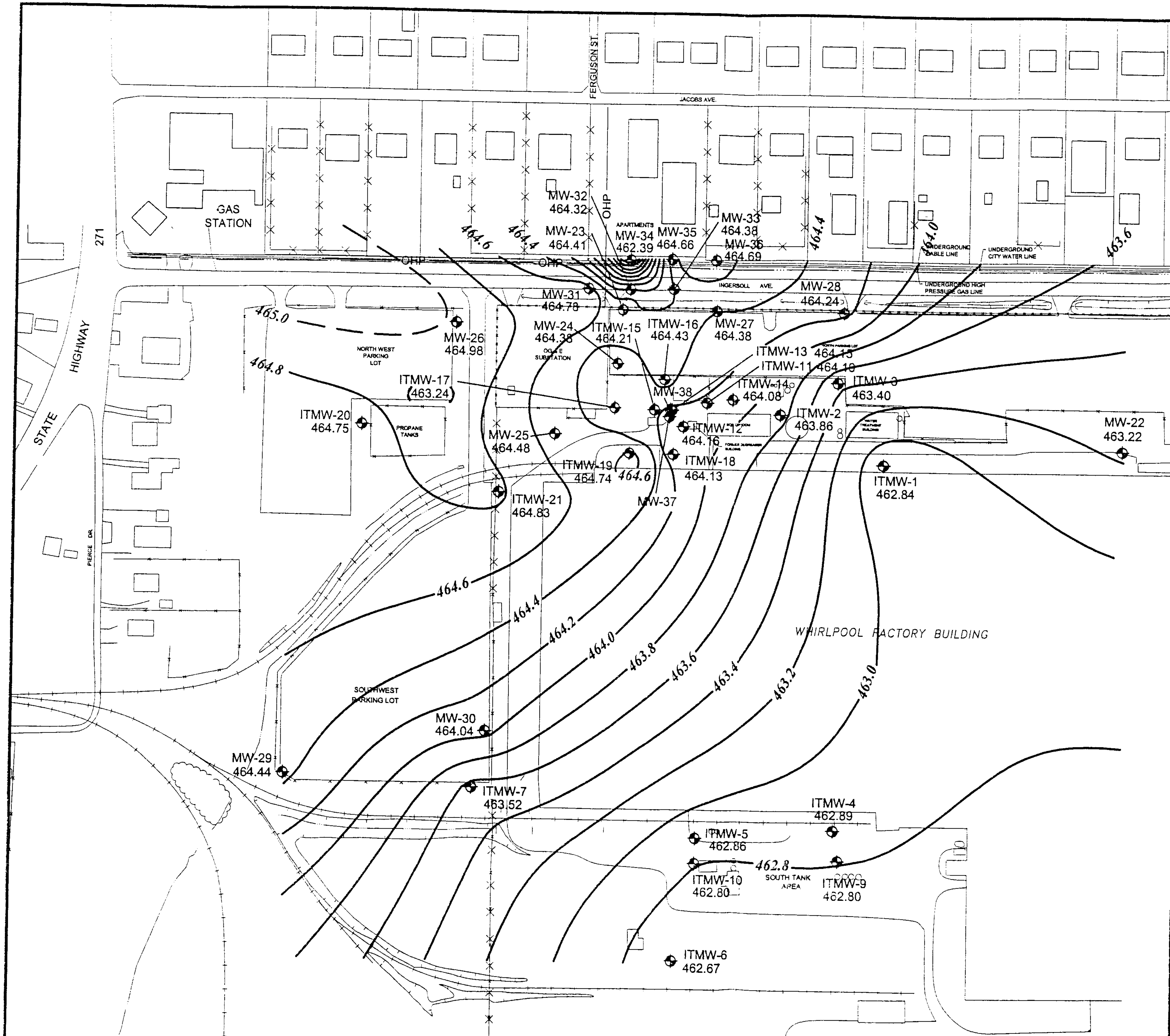

**ERM-Southwest, Inc.**

HOUSTON · NEW ORLEANS · AUSTIN · DALLAS · BEAUMONT · BATON ROUGE

FIGURE 2
POTENTIOMETRIC SURFACE MAP
SEPTEMBER 18, 2000
Whirlpool Corporation
Fort Smith, Arkansas

| | | | |
|---|---|---|---|
| DESIGN: | CHKD.: | DATE: 11/02/00 | REV.: |
| DRAWN: CAK | SCALE: AS SHOWN | W.O.NO.: 581001B001 K00 | |

ERM




LEGEND

MW-26 464.98 — EXISTING MONITORING WELL

464.0 — GROUND WATER CONTOUR LINE (FEET, MSL) (CONTOUR INTERVAL = 0.2 FEET)

NOTES:

1. DATA RECORDED ON MARCH 26, 2001.
2. ELEVATIONS FOR MW-17, MW-34, MW-35, AND MW-36 WERE RECHECKED ON MAY 1, 2001 TO CONFIRM THE MARCH DATA.
3. CONTOURS UNDER THE FACTORY BUILDING ARE INFERRED.
4. ELEVATION FOR MW-17 WAS NOT USED FOR CONTOURING.

0 200 400

SCALE FEET

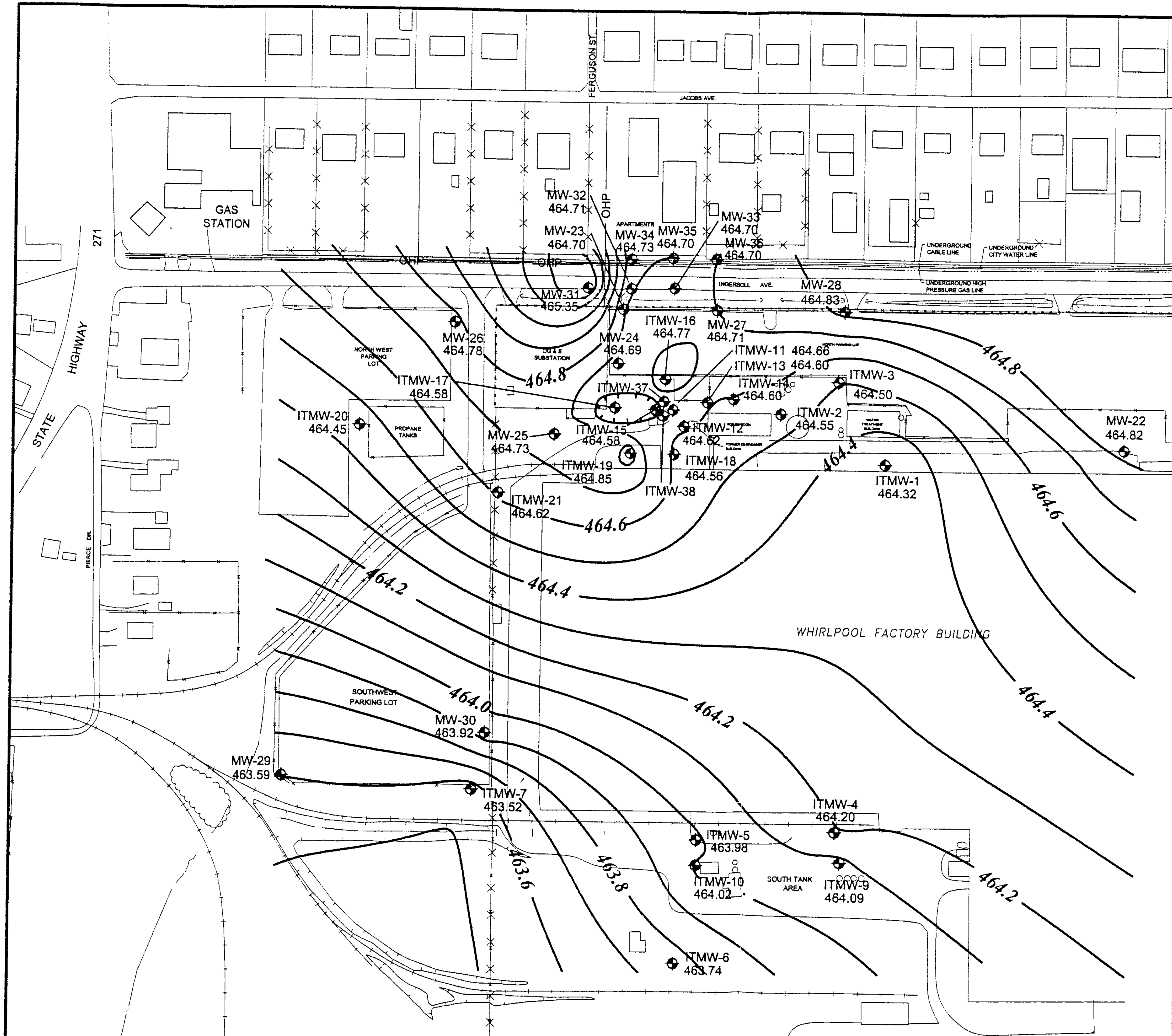
**ERM-Southwest, Inc.**

HOUSTON · NEW ORLEANS · AUSTIN · DALLAS · BEAUMONT · BATON ROUGE

FIGURE 3
POTENTIOMETRIC SURFACE MAP
MARCH 2001
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| DESIGN: JT | CHKD.: | DATE: 08/21/02 | REV.: |
|---|---|---|---|
| DRAWN: JEM/LMc | SCALE: AS SHOWN | W.O.NO.: 581007B217 H02 | |




LEGEND

MW-26 464.38 EXISTING MONITORING WELL

464.0 GROUND WATER CONTOUR LINE (FEET, MSL) (CONTOUR INTERVAL = 0.1 FEET)

NOTES:

1. DATA RECORDED ON SEPTEMBER 10, 2001.
2. CONTOURS UNDER THE FACTORY BUILDING ARE INFERRED.
3. LOCATIONS FOR WELLS ITMW-37 AND ITMW-38 ARE APPROXIMATE AND WILL BE UPDATED WHEN SURVEY DATA ARE RECEIVED.

0 200 400
SCALE FEET

**ERM-Southwest, Inc.**
HOUSTON · NEW ORLEANS · AUSTIN · DALLAS · BEAUMONT · BATON ROUGE

FIGURE 4
POTENTIOMETRIC SURFACE MAP
SEPTEMBER 2001
Whirlpool Corporation
Fort Smith, Arkansas

| | | | |
|---|---|---|---|
| DESIGN: JT | CHKD.: | DATE: 10/31/01 | REV.: |
| DRAWN: LMc | SCALE: AS SHOWN | W.O.NO.: 581004B206 J01 | |

ERM

# Summary of CPT Grab Ground Water Sample Data

*Attachment 3*

*August 30, 2002*
*W.O. #481-007*

**Environmental Resources Management**
16300 Katy Freeway, Suite 300
Houston, Texas 77094-1611
(281) 600-1000

**TABLE 4**

**ANALYTICAL RESULTS, VOCs DETECTED IN GROUNDWATER SAMPLES**

| Parameter | LOQ | CPT-1 | CPT-2 | CPT-3 | CPT-4 | CPT-5 | CPT-6 | CPT-7 | CPT-8 | CPT-9 |
|---|---|---|---|---|---|---|---|---|---|---|
| Tetrachloroethene | 5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| Trichloroethene | 5 | 66 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| cis-1,2-Dichloroethene | 5 | 10 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| trans-1,2-Dichloroethene | 5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| Total 1,2-Dichloroethene | 10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 |
| 1,1-Dichloroethene | 5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| Vinyl Chloride | 10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 |

| Parameter | LOQ | CPT-10 | CPT-11 | Dup-1 (Dupl. of CPT-11) | Dup-1A (Chemron CPT-11) | CPT-12 | CPT-13 | CPT-14 | CPT-21 | CPT-22 |
|---|---|---|---|---|---|---|---|---|---|---|
| Tetrachloroethene | 5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| Trichloroethene | 5 | 32 | <5 | <5 | <5 | 41 | 5,900 | <5 | <5 | <5 |
| cis-1,2-Dichloroethene | 5 | <5 | <5 | <5 | <5 | 16 | <5 | <5 | <5 | <5 |
| trans-1,2-Dichloroethene | 5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| Total 1,2-Dichloroethene | 10 | <10 | <10 | <10 | <10 | 20 | <10 | <10 | <10 | <10 |
| 1,1-Dichloroethene | 5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| Vinyl Chloride | 10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 |

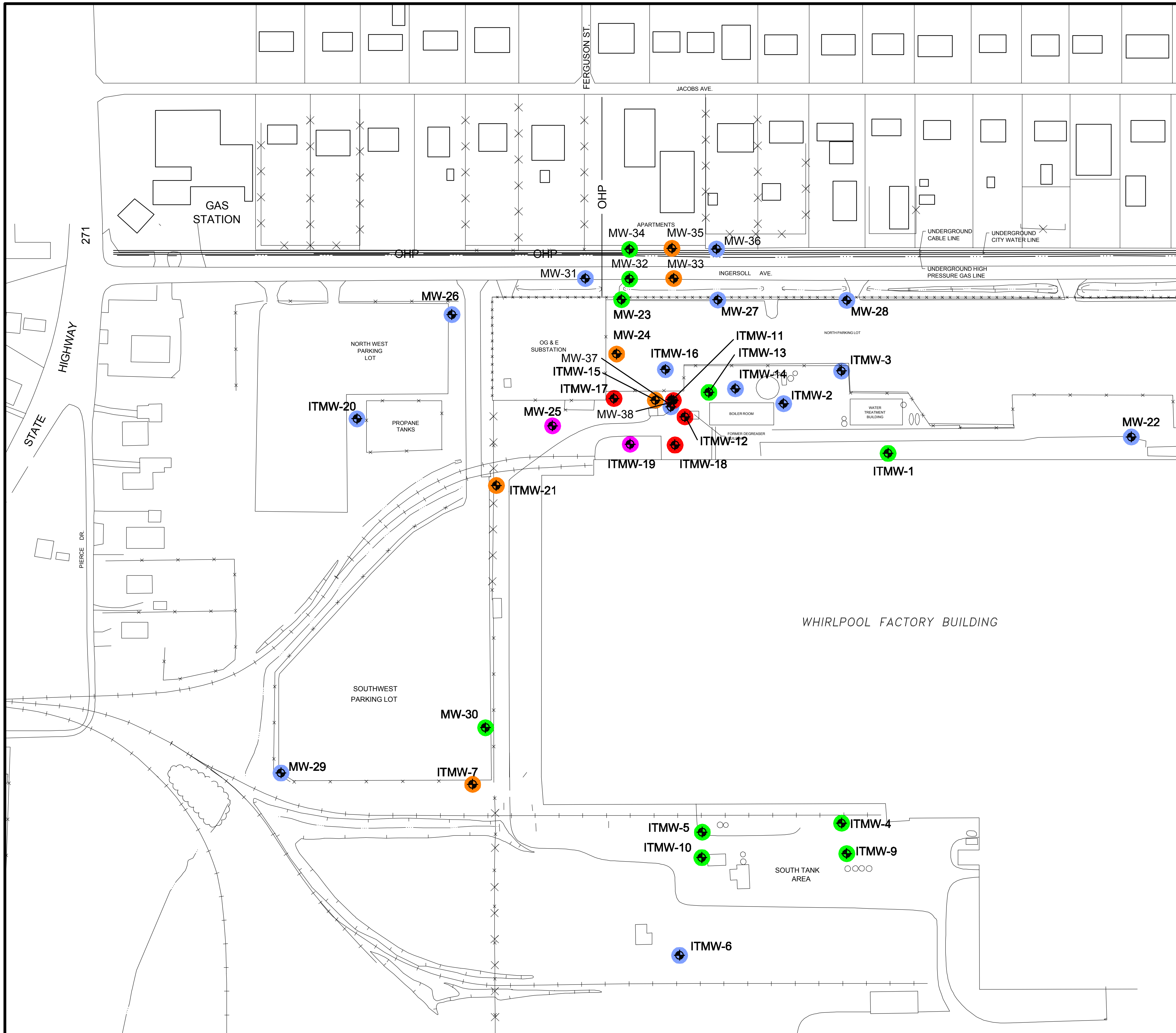
| Parameter | LOQ | CPT-23 | "FB" (Field Blank) | Travel Blank | MW-27 | MW28 | Duplicate (Dupl. MW-28) | Duplicate (Chemron, MW-28) | MW-29 | MW-30 |
|---|---|---|---|---|---|---|---|---|---|---|
| Tetrachloroethene | 5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| Trichloroethene | 5 | 340 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | 115 |
| cis-1,2-Dichloroethene | 5 | 16 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | 34 |
| trans-1,2-Dichloroethene | 5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| Total 1,2-Dichloroethene | 10 | 20 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | 30 |
| 1,1-Dichloroethene | 5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| Vinyl Chloride | 10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 |

Analysis by US EPA Method SW-846 8260B.
Units used are mg/L.
LOQ = laboratory Limit of Quantitation
Samples from CPT wells collected 27 October 1999. Samples from MW-series wells collected 09 December 1999.
Chemron = Chemron Incorporated (secondary subcontract laboratory).

**Replacement Figure 5-1 for Conceptual Site Model**
*Attachment 4*

*August 30, 2002*
*W.O. #481-007*

**Environmental Resources Management**
16300 Katy Freeway, Suite 300
Houston, Texas 77094-1611
(281) 600-1000




LEGEND

MW-26 EXISTING MONITORING WELL

TCE CONCENTRATION (mg/l)
FEBRUARY 2002

- < 0.005
- 0.005 to 0.10
- 0.10 to 1.00
- 1.00 to 10.0
- > 10.0

NOTES:

1. LOCATIONS FOR WELLS ITMW-37 AND ITMW-38 ARE APPROXIMATE AND WILL BE UPDATED WHEN SURVEY DATA ARE RECEIVED.

0 200 400

SCALE FEET

**ERM-Southwest, Inc.**

HOUSTON • NEW ORLEANS • AUSTIN • DALLAS • BEAUMONT • BATON ROUGE

FIGURE 5-1
TCE ISOCONCENTRATION MAP
FEBRUARY 2002
Whirlpool Corporation
Fort Smith, Arkansas

| | | | |
|---|---|---|---|
| DESIGN: JT | CHKD.: | DATE: 08/27/02 | REV.: |
| DRAWN: CAK/LMc | SCALE: AS SHOWN | W.O.NO.: 581007B215 H02 | |

ERM

# Boring Logs and Well Completion Details

*Appendix C*

*June 25, 2004*
*Project No. 0014507*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

ERM

# MW-39
# DRILLING LOG

W.O. NO. 58113 Boring/Well ID MW-39 Date Drilled 7/14/03

Project Off-site delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 29.5 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' MSL Datum

Screen: Type Stainless prepak Diam. 0.75 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 19.5 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. ______ (______) 2. Ft. ______ (______)

Drilling Company TWF Drilling Driller Sammy Smith

Drilling Method Geoprobe Log By Troy Meinen

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM HEADSPACE (PPM) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | 0-4 | 0-0.5 | SILTY CLAY: Grayish-brown, dry, hard, occasional rootlets, occuring 1/2" diameter pieces of black shale. |
| | | | | | | | 0.5-2.8 | SILTY SAND to SANDY SILT: pale brown, moist to dry, crumbly, stiff, abundant rootlets. |
| | | | | | 0.0 | | | |
| | | | | | 0.0 | | 2.8-4.5 | SILTY SANDY CLAY: Pale brown with reddish-brown mottling, moist, slightly plastic to crumbly, occasional rootlets, occuring 1/4" diameter iron nodules. |
| | | | | | | 4-8 | | |
| -5 | 5 | | | | 0.0 | | 4.5-5.7 | SILTY SANDY CLAY: Strong brown to orange with dark brown mottling, moist to dry, firm, abundant iron nodules and dark brown mottling large occasional pockets of pale brown, soft, silty clay. |
| | | | | | | | 5.7-7.5 | SILTY CLAY: Strong brown, dark brown, and orange mottled, moist, stiff to firm, occasional 1/2" diameter iron nodules, occasional 1/2" diameter to 1" diameter calcareous nodules. |
| | | | | | 0.0 | | | |
| | | | | | | | 7.5-8 | SILTY CLAY: Pale brown, dark brown, and orange mottled, moist, stiff to soft,occasional 1/2" to 1" diameter calcareous nodules. |
| | | | | | | 8-10 | 8-9 | SILTY CLAY: Strong brown with pale brown and minor dark brown mottling, moist, firm to hard, crumbly to plastic. |
| | | | | | 0.0 | | 9-11.1 | SILTY CLAY: Strong brown with minor pale gray and abundant dark brown mottling, moist, hard, crumbly, abundant 1/4" diameter calcareous nodules and iron nodules. |
| -10 | 10 | | | | | 10-12 | | |
| | | | | | 0.0 | | 11.1-11.6 | SILTY SANDY CLAY: Strong brown with pale brown mottling and minor dark brown mottling, moist, stiff to firm, plastic. |
| | | | | | | | 11.6-12.2 | CLAYEY SILTY SAND: Strong brown with abundant dark brown mottling, moist, stiff, crumbly, abundant 1/4"-1/2" calcareous and iron nodules. |
| | | | | | | 12-14 | 12.2-15.5 | SILTY SANDY CLAY: Strong brown with pale brown and minor dark brown mottling, moist, stiff, slightly plastic. |
| | | | | | 0.0 | | | |
| | | | | | | 14-16 | | |
| -15 | 15 | | | | | | | |

ERM

# MW-39 DRILLING LOG

W.O. NO. 58113 Boring/Well ID MW-39 Date Drilled 7/14/03

Project Off-site delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 29.5 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' MSL Datum

Screen: Type Stainless prepak Diam. 0.75 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 19.5 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. ______ (______) 2. Ft. ______ (______)

Drilling Company TWF Drilling Driller Sammy Smith

Drilling Method Geoprobe Log By Troy Meinen

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM HEADSPACE (PPM) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -15 | 15 | | | | 0.0 | | | |
| | | | | | | | 15.5-16 | SILTY CLAYEY SAND: Brown to strong brown with minor dark brown mottling, moist to wet, soft to firm, slightly crumbly. |
| | | | | | | 16-20 | 16-18.7 | SILTY CLAYEY SAND TO SILTY SANDY CLAY: strong brown to brown with occasional dark brown mottling, moist to wet, soft to firm, slightly crumbly to slightly plastic (clay content high but varies). |
| | | | | | 0.0 | | | |
| | | | | | 0.0 | | 18.7-19 | SILTY CLAY: Reddish-brown with occasional dark brown mottling, moist, hard, plastic. |
| | | | | | | | 19-20 | SILTY CLAYEY SAND TO SILTY SANDY CLAY: strong brown to brown with occasional dark brown mottling, moist to wet, soft to firm, slightly crumbly to slightly plastic (clay content high but varies), with silty sand pocket with medium-grained sand at base, bro |
| -20 | 20 | | | | | 20-24 | 20-24 | SILTY SANDY CLAY: Strong brown, moist, stiff to firm, plastic. |
| | | | | | 0.0 | | | |
| | | | | | 0.0 | | | |
| | | | | | | 24-25.5 | 24-24.5 | CLAYEY SILTY SAND: Strong brown with dark brown mottling, moist to wet, stiff, occasional 1/4" quartzite gravel, sand grain size increases with depth to medium-grained at 24.5'. |
| | | | | | 0.0 | | 24.5-25.5 | GRAVELLY SANDY CLAY to CLAYEY SAND: strong brown with pale gray mottling, moist, hard, crumbly 1/4" to 1/2" diameter quartzite gravel. |
| -25 | 25 | | | | | | | |
| | | | | | | 25.5-27 | 25.5-26 | SILTY GRAVELLY CLAYEY SAND: brown, water-saturated, 1/4" to 1/2" diameter quartzite gravel. |
| | | | | | | | 26-27.5 | GRAVELLY SANDY CLAY to CLAYEY SAND: strong brown with pale gray mottling, wet to water-saturated, hard, crumbly 1/4" to 1/2" diameter quartzite gravel. |
| | | | | | 0.0 | | | |
| | | | | | | 27-28 | | |
| | | | | | 0.0 | | 27.5-28 | GRAVELLY SAND: Strong brown, water-saturated, dense, medium to coarse-grained with 1/2" to 1" diameter quartzite gravel. |
| | | | | | | 28-29.5 | 28-29 | SILTY CLAY: Brown to brownish-gray, moist to wet, stiff to hard, plastic, grades to fissil gray shale at base. |
| | | | | | 0.0 | | 29-29.5 | SHALE: Gray with occasional brown mottling along fractures, fissil, weathered. |
| -30 | 30 | | | | | | | |

ERM

# MW-39
# DRILLING LOG

W.O. NO. 58113 Boring/Well ID MW-39 Date Drilled 7/14/03

Project Off-site delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 29.5 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' MSL Datum

Screen: Type Stainless prepak Diam. 0.75 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 19.5 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. ______ (______) 2. Ft. ______ (______)

Drilling Company TWF Drilling Driller Sammy Smith

Drilling Method Geoprobe Log By Troy Meinen

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM HEADSPACE (PPM) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -30 | 30 | | | | | | | |
| | | | | | | | | T.D. = 29.5 ' |
| -35 | 35 | | | | | | | |
| -40 | 40 | | | | | | | |
| -45 | 45 | | | | | | | |

ERM

# MW-40
# DRILLING LOG

W.O. NO. 58113 Boring/Well ID MW-40 Date Drilled 7/14/03

Project Off-site delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 28.5' Boring Diam. 3"

N. Coord. ______ E. Coord. ______ Surface Elevation 0' MSL Datum

Screen: Type Stainless prepak Diam. 0.75" Length 10' Slot Size 0.01"

Casing: Type Schedule 40 PVC Diam. 0.75" Length 17.8' Sump Length 0'

Top of Casing Elevation 0' Stickup 0'

Depth to Water: 1. Ft. ______ (______) 2. Ft. ______ (______)

Drilling Company TWF Drilling Driller Sammy Smith

Drilling Method Geoprobe Log By Troy Meinen

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | 0-4 | 0-0.3 | SILTY SANDY CLAY: Gray, dry to damp, soft, crumbly, abundant rootlets. |
| | | | | | | | 0.3-0.8 | WEATHERED SHALE MIXED WITH SILT: black to dark gray, soft, crumbly, fissil (fill material). |
| | | | | | 0.0 | | 0.8-2 | SILTY SANDY CLAY: Strong brown, black, and gray mottled, moist to wet, firm, plastic, abundant rootlets. |
| | | | | | 0.0 | | 2-3.5 | SANDY SILT: Brown with occasional dark brown mottling, water-saturated, soft, crumbly. (Boring is at edge of a 2 ft deep wet drainage ditch). |
| | | | | | | | 3.5-4 | SILTY CLAY: Brown with occasional dark brown mottling, water-saturated, soft, crumbly. |
| -5 | 5 | | | | 0.0 | 4-8 | 4-6.2 | SANDY CLAYEY SILT: Brown and strong brown with occasional dark brown mottling, wet to water-saturated, soft. |
| | | | | | 0.0 | | 6.2-8.5 | SILTY SANDY CLAY: Strong brown with gray mottling, moist, stiff to hard, plastic. |
| | | | | | 0.0 | 8-10 | 8.5-9.5 | SILTY SANDY CLAY: Strong brown with occasional pale gray mottling, moist, stiff to hard. |
| -10 | 10 | | | | | 10-12 | 9.5-10.8 | SILTY SANDY CLAY: Strong brown with gray mottling, moist, stiff to hard, plastic. |
| | | | | | 0.0 | | 10.8-11 | SILTY CLAY: Pale brown, wet, soft, fine-grained. |
| | | | | | | | 11-11.5 | SILTY CLAY: Gray with occasional strong brown mottling, moist, stiff, plastic. |
| | | | | | 0.0 | 12-14 | 11.5-14 | SILTY CLAY: Strong brown with occasional gray to pale gray mottling, moist, stiff, plastic. At 12.5ft dark brown to very dark gray mottling |
| | | | | | | 14-16 | 14-14.5 | SILTY SANDY CLAY: Strong brown with occasional dark brown mottling, moist, firm, plastic. |
| -15 | 15 | | | | | | 14.5-15.5 | CLAYEY SANDY SILT: Strong brown, wet to water-saturated, soft, loose, with coarse-grained sand to small gravel. |

ERM

# MW-40
# DRILLING LOG

W.O. NO. 58113 Boring/Well ID MW-40 Date Drilled 7/14/03

Project Off-site delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 28.5 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' MSL Datum

Screen: Type Stainless prepak Diam. 0.75 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 17.8 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

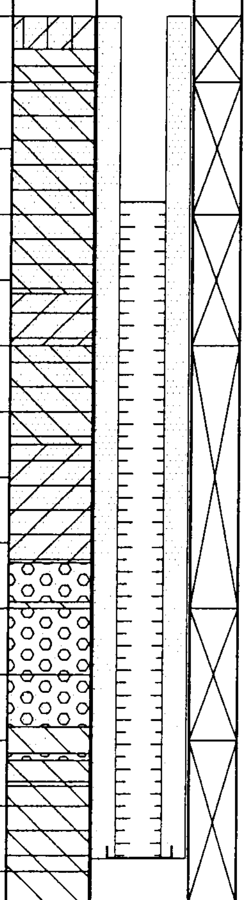
Depth to Water: 1. Ft. ______ ( ______ ) 2. Ft. ______ ( ______ )

Drilling Company TWF Drilling Driller Sammy Smith

Drilling Method Geoprobe Log By Troy Meinen

SKETCH MAP

NOTES



| Elevation (Feet) | Depth (Feet) | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| -15 | 15 | 0.0 | | | |
| | | | | 15.5-16 | SILTY CLAY: Strong brown and pale gray, stiff to hard. |
| | | | 16-18 | 16-18 | SILTY SANDY CLAY: Strong brown with occasional pale gray mottling, moist, stiff, slightly crumbly to plastic. At 15.6ft occasional 1/2" diameter iron nodules. |
| | | 0.0 | | | |
| | | | 18-20 | 18-19.2 | SILTY SANDY CLAY: Strong brown with occasional pale gray mottling, moist, stiff, slightly crumbly to plastic, with occasional dark brown 1/4" to 1/2" diameter nodules, grades to sand at base. |
| | | 0.0 | | 19.2-20 | SILTY CLAYEY SAND WITH GRAVEL: strong brown to brown, wet to water-saturated, dense, gravel is 1/8" to 1/4" diameter quartzite. |
| -20 | 20 | | 20-24 | 20-21.5 | SILTY SANDY CLAY: Strong brown with gray mottling, wet, stiff, plastic. |
| | | 0.0 | | | |
| | | | | 21.5-23.3 | SILTY SANDY GRAVEL: water-saturated, loose to flowing, 1/8"-1/4" diameter quartzite gravel, grades to clayey gravel. |
| | | 0.0 | | | |
| | | | | 23.3-23.9 | CLAYEY GRAVEL: wet to water-saturated, stiff, crumbly. |
| | | | 24-26 | 23.9-24 | GRAVELLY CLAY: Strong brown, wet to moist, hard, plastic, gravel is 1/4" to 1/2" diameter quartzite. |
| | | | | 24-25 | SILTY SANDY GRAVEL: strong brown to brown, water-saturated, dense, 1/8" to 1/4" quartzite gravel. |
| -25 | 25 | 0.0 | | 25-25.8 | GRAVELY SILTY SAND: strong brown, water-saturated, dense, crumbly, 1/4" to 1/2" diameter quartzite gravel. |
| | | | 26-28.5 | 25.8-26.2 | SANDY CLAY: Strong brown with very pale grey mottling, moist to wet, hard, crumbly, occasional quartzite gravel (1/2" to 1" diameter). |
| | | | | 26.2-26.3 | SANDY GRAVEL: brown to strong brown, wet, hard, dense, gravel is 1/2" diameter quartzite. |
| | | | | 26.3-26.7 | SANDY SILTY CLAY: Pale gray with strong brown mottling, moist, stiff to hard, plastic. |
| | | 0.0 | | 26.7-28 | SILTY CLAY: Strong brown to orange with occasional gray mottling, fissil to slightly blocky texture, (weathered shale). |
| | | | | 28-28.5 | SHALE: Gray, moist, hard, slightly crumbly, fissil. |
| -30 | 30 | | | | |

ERM

# MW-40
# DRILLING LOG

W.O. NO. 58113 | Boring/Well ID MW-40 | Date Drilled 7/14/03

Project Off-site delineation | Owner Whirlpool Corporation

Location Fort Smith, AR | Boring T.D. 28.5 ' | Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ | Surface Elevation 0 ' | MSL Datum

Screen: Type Stainless prepak | Diam. 0.75 " | Length 10 ' | Slot Size 0.01 "

Casing: Type Schedule 40 PVC | Diam. 0.75 " | Length 17.8 ' | Sump Length 0 '

Top of Casing Elevation 0 ' | Stickup 0 '

Depth to Water: 1. Ft. ______ (______) 2. Ft. ______ (______)

Drilling Company TWF Drilling | Driller Sammy Smith

Drilling Method Geoprobe | Log By Troy Meinen

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -30 | 30 | | | | | | | T.D. = 28.5 ' |
| -35 | 35 | | | | | | | |
| -40 | 40 | | | | | | | |
| -45 | 45 | | | | | | | |

ERM

# MW-41
# DRILLING LOG

W.O. NO. 58113 | Boring/Well ID MW-41 | Date Drilled 7/15/03

Project Off-site delineation | Owner Whirlpool Corporation

Location Fort Smith, AR | Boring T.D. 29' | Boring Diam. 8"

N. Coord. ____ E. Coord. ____ | Surface Elevation 0' | MSL Datum

Screen: Type Stainless prepak | Diam. 0.75" | Length 10' | Slot Size 0.01"

Casing: Type Schedule 40 PVC | Diam. 0.75" | Length 18.7' | Sump Length 0'

Top of Casing Elevation 0' | Stickup 0'

Depth to Water: 1. Ft. ____ (____) 2. Ft. ____ (____)

Drilling Company TWF Drilling | Driller Sammy Smith

Drilling Method Geoprobe | Log By Troy Meinen

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM HEADSPACE (PPM) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | 0-4 | 0-0.5 | SILTY CLAY: Gray, moist, firm, plastic to slightly crumbly, abundant rootlets, occasional iron nodules. |
| | | | | | 0.0 | | 0.5-3 | SILTY CLAY: Gray with orange mottling, moist, firm to stiff, plastic, abundant rootlets, occasional iron nodules to 1/4" diameter. At 2.6' to 3' no orange mottling. |
| | | | | | 0.0 | | 3-4.3 | SILTY SANDY CLAY: Brown with gray mottling, moist, slightly plastic to slightly crumbly. |
| | | | | | | 4-8 | 4.3-5.5 | SILTY CLAY: Brown to pale brown with minor dark brown and orange mottling, moist, hard, crumbly, blocky, abundant 1/4" to 1/2" calcareous nodules and occasional 1/4" diameter iron nodules. |
| -5 | 5 | | | | 0.0 | | 5.5-6.5 | SILTY CLAY: Strong brown and pale gray mottled, moist, stiff to hard, plastic, occasional calcareous nodules to 1" diameter, occasional iron nodules to 1/2" diameter. |
| | | | | | 0.0 | | 6.5-8.2 | SILTY CLAY: Pale brown with minor strong brown and gray mottling, moist, hard, plastic. At 7' sandy and softer. |
| | | | | | | 8-12 | 8.2-9 | SILTY CLAY: Gray and strong brown mottled, wet, soft, plastic. |
| | | | | | 0.0 | | 9-9.2 | SILTY SAND: Brown, water-saturated, loose to flowing, medium-grained, abundant dark gray grains. |
| -10 | 10 | | | | | | 9.2-12 | SILTY SANDY CLAY: Strong brown to orange with pale gray mottling and minor dark brown mottling, moist, hard, plastic, occasional iron nodules to 1/2" diameter. |
| | | | | | 0.0 | | | |
| | | | | | | 12-16 | 12-19 | SILTY CLAY: Pale gray with occasional orange to strong brown mottling, moist, hard, plastic. At 16' to 18' ornage to strong brown with occasional iron nodules to 1/8" diameter. At 18' to 19' pale gray and sandy. |
| | | | | | 0.0 | | | |
| -15 | 15 | | | | | | | |

ERM

# MW-41 DRILLING LOG

W.O. NO. 58113 Boring/Well ID MW-41 Date Drilled 7/15/03

Project Off-site delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 29 ' Boring Diam. 8 "

N. Coord. ____ E. Coord. ____ Surface Elevation 0 ' MSL Datum

Screen: Type Stainless prepak Diam. 0.75 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 18.7 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

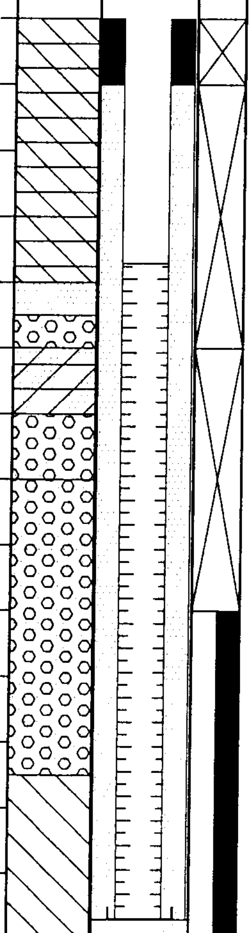
Depth to Water: 1. Ft. ____ (____) 2. Ft. ____ (____)

Drilling Company TWF Drilling Driller Sammy Smith

Drilling Method Geoprobe Log By Troy Meinen

SKETCH MAP

NOTES



| Elevation (Feet) | Depth (Feet) | OVM HEADSPACE (PPM) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| -15 | 15 | 0.0 | | | |
| | | | 16-20 | | |
| | | 0.0 | | | |
| | | 0.0 | | 19-19.5 | SAND TO SILTY SAND: strong brown with minor pale brown mottling, water-saturated, dense, medium-grained quartz. |
| | | | | 19.5-20 | GRAVELY SILTY SANDY CLAY: strong brown, moist to wet, hard, crumbly, 1/2"-1" diameter quartzite gravel. |
| -20 | 20 | | 20-24 | 20-21 | SILTY SANDY CLAYEY GRAVEL: strong brown, water-saturated, dense, crumbly, 1/2"-1" diameter quartzite gravel, 1/8" gravel and medium and coarse-grained sand. |
| | | 0.0 | | 21-22 | SILTY SANDY GRAVEL, strong brown, water-saturated, dense, crumbly, 1/2"-1" diameter quartzite gravel, 1/8" diameter quartzite gravel and medium and coarse-grained quartz sand. |
| | | 0.0 | | 22-26.5 | SILTY SANDY GRAVEL: strong brown, water-saturated, dense, 1/4"-1/8" diameter quartzite gravel. |
| | | | 24-29 | | |
| -25 | 25 | | | | |
| | | | | 26.5-29 | SILTY CLAY AND SHALE: strong brown to orange grading to dark gray to black, moist, fissil (zone describes cuttings). |
| | | | | | T.D. = 29 ' |
| -30 | 30 | | | | |

ERM

# MW-42B DRILLING LOG

W.O. NO. 581-013 Boring/Well ID MW-42B Date Drilled 11/10/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 27 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type 65 Mesh stainless steel Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 22 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

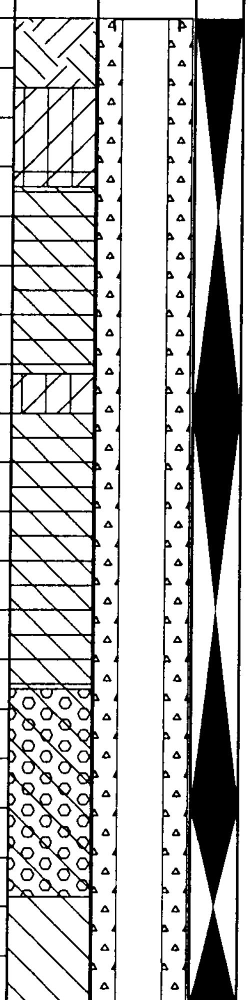
Depth to Water: 1. Ft. 0 ( ______ ) 2. Ft. 0 ( ______ )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES



| Elevation (Feet) | Depth (Feet) | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| 0 | 0 | | 0-4 | 0-0.7 | FILL: Clayey Asphalt, dark gray and black mottled, dry, coarse-grained, gravel (up to 1/2"-diameter), brittle. |
| | | | | 0.7-1.55 | CLAYEY SILT: Medium brown, dry, nonplastic, very loose, very fine-grained, trace of rootlets. From 1'-1.55' medium and pale brown mottled. |
| | | | | 1.55-1.7 | CLAYEY SILT: Reddish-yellow, dry, nonplastic, medium dense, very fine-grained, crumbly, pockets of silty clay, dark brown. |
| -2 | 2 | 0.0 | | 1.7-3.6 | SILTY CLAY: Yellowish-red with some red, wet, slightly plastic, soft, with trace of up to 1/16"-diameter hard black nodules, trace of black burrowing. |
| | | | | 3.6-4 | CLAYEY SILT: Red and yellowish-red mottled, dry to moist, nonplastic, medium dense, crumbly, with some black nodules. |
| -4 | 4 | | 4-8 | 4-6.8 | SILTY CLAY: Yellowish-red and red mottled, dry, nonplastic, soft, very fine-grained, pockets of clayey silt, dark brown and gray mottled, very fine-grained, loose to medium dense, crumbly. From 4.3'-4.6' trace of black silty clay material, hard, with slight luster. From 4.6'-5.4' slightly plastic, stiff, slightly crumbly, layer of yellowish-red throughout. From 5.4'-6.8' becomes hard, crumbly, with clay seam, gray, hard, traces of black nodules. |
| -6 | 6 | 0.0 | | | |
| | | | | 6.8-8.9 | GRAVELLY CLAY INTERMIXED WITH SANDY CLAY, reddish-brown, with trace of red, light gray, black mottled, dry, plastic, hard coarse-grained, intermixed with silty sand with black calcareous nodules. |
| -8 | 8 | | 8-12 | 8.9-14.8 | CLAY: Yellowish-brown and light gray mottled, moist, hard, plastic, trace of black burrowing at 8.9'-9.1', 11.3'-11.4', and 9.8'-10.4'. From 12'-12.7' trace of dark brown mottled From 12'-12.5' trace of light gray From 12.5'-12.7', moist, stiff. From 12.7'-12.9' layer of silty clay, yellowish-brown and dark gray, moist, nonplastic, soft, loose, with trace of hard nodules (1/16"-1/8" diameter). From 12.9'-14.8' yellowish-brown with some light gray and black burrowing throughout, moist, very stiff, plastic. |
| -10 | 10 | | | | |

ERM

# MW-42B DRILLING LOG

W.O. NO. 581-013 Boring/Well ID MW-42B Date Drilled 11/10/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 27 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type 65 Mesh stainless steel Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 22 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 0 (______) 2. Ft. 0 (______)

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -10 | 10 | | | | 0.0 | | | |
| -12 | 12 | | | | | 12-16 | | |
| -14 | 14 | | | | 0.0 | | | |
| | | | | | | | 14.8-16 | CLAY WITH SILT, yellowish-brown with some light gray, moist, plastic, very stiff, black burrowing throughout. |
| -16 | 16 | | | | | 16-20 | 16-18 | NO RECOVERY: Cuttings indicate sandy clay. |
| -18 | 18 | | | | 0.0 | | 18-20 | NO RECOVERY: Cuttings incated clayey sand. |
| -20 | 20 | | | | | | | |

ERM

# MW-42B
# DRILLING LOG

W.O. NO. 581-013 Boring/Well ID MW-42B Date Drilled 11/10/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 27 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type 65 Mesh stainless steel Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 22 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

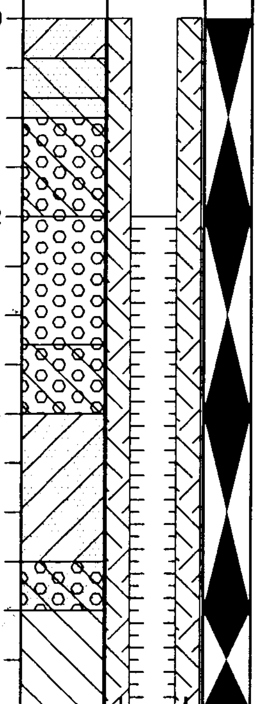
Depth to Water: 1. Ft. 0 ( ______ ) 2. Ft. 0 ( ______ )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES



| Elevation (Feet) | Depth (Feet) | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| -20 | 20 | | 20-22 | 20-20.4 | CLAYEY SAND: Pale brown with some light gray mottled, very wet, very loose to loose, medium-grained, with seam of sandy clay throughout, slightly plastic, firm to very soft. |
| | | | | 20.4-20.8 | SANDY CLAY: Yellowish-brown and reddish-brown, wet to moist, slightly plastic, stiff, laminations of clayey sand, loose, fine-grained. |
| | | 0.0 | | 20.8-21 | SANDY CLAY: Gray with some yellowish-brown, moist to damp, very stiff, trace of greenish-gray calcareous nodules (up to 1/4"-diameter). |
| | | | | 21-22 | GRAVELLY CLAY: Reddish-brown with a trace of dark brown and red., dry, nonplastic, coarse-grained, very crumbly, gravel (up to 1/2"-diameter) increases towards base. |
| -22 | 22 | | 22-24 | 22-23.3 | GRAVEL: CLAYEY GRAVEL, yellow, brown, and reddish-brown mottled, water-saturated, gravel nodules (up to 1/8"-diameter), very coarse-grained. |
| | | 0.0 | | 23.3-24 | GRAVELLY CLAY: Yellowish-brown and reddish-brown mottled, very wet, slightly plastic, hard, abundant gravel nodules. |
| -24 | 24 | | 24-26 | 24-25.5 | CLAYEY SAND: dark brown and dark gray mottled with some loose gravel, water-saturated, gravel nodules (up to 1/8"-diameter), very coarse-grained. |
| | | 0.0 | | 25.5-26 | GRAVELLY SANDY CLAY: dark brown and yellowish-brown mottled, wet to moist, slightly plastic, soft, loose, coarse-grained. |
| -26 | 26 | | 26-27 | 26-27 | CLAY: Dark brownish-gray, damp, plastic, hard, blocky towards base with layers of light gray with fractures throughout. |
| | | | | | T.D. = 27 ' |
| -28 | 28 | | | | |
| -30 | 30 | | | | |

ERM

# MW-43
# DRILLING LOG

W.O. NO. 581-013 Boring/Well ID MW-43 Date Drilled 11/11/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 26.2 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type 65 Mesh stainless steel Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 21 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 0 ( ) 2. Ft. 0 ( )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | 0-4 | 0-1.5 | NO RECOVERY, sediment too soft. |
| | | | | | | | 1.5-2.1 | CONCRETE |
| -2 | 2 | | | | 0.0 | | 2.1-3.2 | CLAYEY SANDY SILT: Medium brown with a trace of yellowish-red, and dark gray, damp, nonplastic, medium dense, fine-grained with occasional black asphalt nodules (1/8"-diameter). From 3.0'-3.2' pocket of asphalt, black, luster, hard coarse-grained nodules (up to 1/2"-diameter), intermixed with coarse-grained sand, loose. |
| | | | | | | | 3.2-3.8 | SILTY CLAY: Medium brown with some dark gray mottled, wet, slightly plastic, soft, with occasional calcareous nodules (up to 1/8"-diameter). At 3.5' trace of reddish-yellow. |
| -4 | 4 | | | | | 4-8 | 3.8-4.5 | SILTY CLAY AND CLAYEY SILT INTERMIXED, medium brown and yellowish-red mottled, damp, nonplastic, stiff to firm. |
| | | | | | | | 4.5-5.3 | SILTY CLAY: Medium brown with some yellowish-brown and gray mottled, moist, firm, slightly plastic. From 4.5'-4.7' trace of black and brownish-gray mottled, wet, very soft. From 4.85'-5.10' clayey silt parting, gray. |
| | | | | | | | 5.3-6.1 | SANDY CLAYEY SILT: Yellowish-brown with some reddish-yellow mottled, dry, medium dense to loose, very crumbly, fine-grained, well-sorted, with occasional black calcareous nodules (up to 1/4" diameter), very crumbly. |
| -6 | 6 | | | | 0.0 | | 6.1-7.4 | CLAYEY SILT: Yellowish-brown and reddish-yellow mottled, dry, medium dense to loose, fine-grained, crumbly, with occasional dark gray and black burrowing. |
| | | | | | | | 7.4-8 | SILTY CLAY: Yellowish-brown with trace of gray and red, damp, slightly plastic, stiff to very stiff, with trace of black nodules (up to 1/16"-diameter), caliche. |
| -8 | 8 | | | | | 8-12 | 8-9 | NO RECOVERY |
| | | | | | | | 9-11.3 | SILTY SANDY CLAY: Yellowish-brown and gray with occasional reddish-yellow mottling, dry, plastic, hard, slightly crumbly. |
| -10 | 10 | | | | | | | |

ERM

# MW-43
# DRILLING LOG

W.O. NO. 581-013 Boring/Well ID MW-43 Date Drilled 11/11/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 26.2 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type 65 Mesh stainless steel Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 21 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 0 ( ______ ) 2. Ft. 0 ( ______ )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| -10 | 10 | 0.0 | | | |
| | | | | 11.3-12 | CLAYEY SILT: Gray with some yellowish-brown mottled, dry, medium dense to dense, very fine-grained, well-sorted. |
| -12 | 12 | | 12-14 | 12-12.8 | SILTY CLAY: Yellowish-brown and medium brown mottled with some gray, very wet, nonplastic to slightly plastic, very soft, slightly flowing, with parting of clayey silt, gray. |
| | | | | 12.8-13.1 | CLAYEY SILTY SAND: Gray, dry, hard, nonplastic, fine-grained, black burrowing. |
| | | 0.0 | | 13.1-14 | SILTY SAND: Yellowish-brown, dark gray, and black mottled, moist, loose, with occassional black calcareous nodules. At 13.6' dense. |
| -14 | 14 | | 14-16 | 14-14.4 | SILTY CLAY: Yellowish-brown and gray mottled, wet, very soft, nonplastic, very fine-grained, well-sorted.From 14.3'-14.4' pocket of black, brownish-gray, and yellowish-brown mottling. |
| | | 0.0 | | 14.4-17 | SILTY SAND: Yellowish-brown, wet, medium-grained, moderately sorted, quartz grains visibile of various colors, loose to medium dense. From 15.6'-16' fining downward. |
| -16 | 16 | | 16-18 | | SILTY CLAY: Gray with trace of yellowish-brown, moist to damp, slightly plastic, stiff. |
| | | 0.0 | | 17-17.5 | SILTY CLAYEY SAND: Reddish-brown, moist, medium to fine-grained, loose to medium dense, well-sorted. |
| | | | | 17.5-18 | GRAVELLY CLAYEY SAND: reddish-brown, very wet, loose, medium to coarse-grained, poorly sorted, abundant gravel (up to 3/4"-diameter). |
| -18 | 18 | | 18-20 | 18-18.5 | CLAYEY SILTY SAND: Reddish-brown, moist to wet, medium dense, medium-grained, poorly sorted, with occassional gravel (up to 1/4"-diameter). |
| | | | | 18.5-19.5 | SILTY CLAY: Bluish-gray with trace of yellowish-brown mottling, damp to dry, slightly plastic, hard. |
| | | 0.0 | | 19.5-19.8 | CLAYEY SILTY SAND: Pale brown, yellowish-red, and gray mottled, damp to dry, medium dense, very fine-grained, well sorted to medium sorted, with trace of iron staining throughout. |
| -20 | 20 | | | 19.8-20 | |

ERM

# MW-43 DRILLING LOG

W.O. NO. 581-013 Boring/Well ID MW-43 Date Drilled 11/11/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 26.2' Boring Diam. 3"

N. Coord. ____ E. Coord. ____ Surface Elevation 0' Ft. MSL Datum

Screen: Type 65 Mesh stainless steel Diam. 0.75" Length 5' Slot Size 0.01"

Casing: Type Schedule 40 PVC Diam. 0.75" Length 21' Sump Length 0'

Top of Casing Elevation 0' Stickup 0'

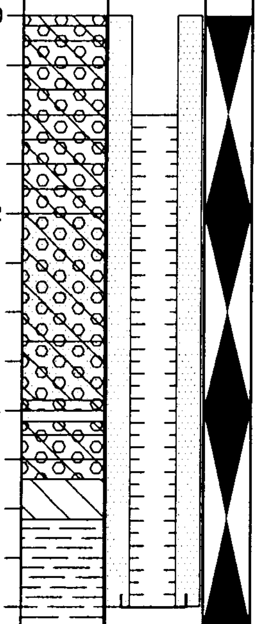
Depth to Water: 1. Ft. 0 ( ) 2. Ft. 0 ( )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES



| Elevation (Feet) | Depth (Feet) | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| -20 | 20 | | 20-22 | 20-20.1 | SILTY CLAYEY GRAVEL, reddish and reddish-brown mottling, wet, poorly graded, abundant gravels (up to 3/4"-diameter), semi-angular, coarse, sand and clay mixtures, hard, nonplastic, stiff. From 20.6'-20.10' some pink mottling. |
| | | 0.0 | | 20.1-22 | CLAYEY SILTY SANDY GRAVEL: abundant gravels (up to 1"-diameter), wet, hard, nonplastic, semi-rounded, coarse-grained, with clayey silty sandy mixtures that are dark gray and black mottled. |
| -22 | 22 | | 22-24 | 22-23.3 | CLAYEY SANDY GRAVEL: water, saturated, well graded, gravel makes up 95% of matrix (up to 1"-diameter), with traces of gravel-clayey and mixtures. |
| | | 0.0 | | 23.3-23.9 | CLAYEY GRAVELLY SAND, yellowish-brown, dry to damp, nonplastic, fine-grained, occasional gravels (up to 1/4"-diameter) semi-rounded . |
| | | | | 23.9-24 | SANDY GRAVELLY CLAY, medium brown, brownish-gray, and yellowish-brown mottled, dry, occasional gravel (up to 1"-diameter). |
| -24 | 24 | | 24-26.2 | 24-24.11 | SILTY SAND WITH GRAVEL: light brown, pale brown, dark gray, and black mottled, dry to moist, medium dense, fine-grained, angular gravel nodules (up to 1/2"-diameter). |
| | | | | 24.11-24.7 | CLAYEY SILTY GRAVEL, wet, well graded, (up to 1/2"-diameter), angular, yellowish-brown clayey silt, nonplastic, fine-grained. |
| | | 0.0 | | 24.7-25.11 | CLAY: Brownish with some black, dark gray and gray mottling, moist, hard, plastic, becomining dominantly dark gray and brownish-gray mottling at 25.6', grades to a fissile shale. |
| | | | | 25.11-26.2 | SHALE: Dark gray, hard, weathered, fissiles, occassional brown mottling along fractures. T.D. = 26.2' |
| -26 | 26 | | | | |
| -28 | 28 | | | | |
| -30 | 30 | | | | |

ERM

# SB-45
# DRILLING LOG

W.O. NO. 581-013 | Boring/Well ID SB-45 | Date Drilled 11/12/2003

Project Off-Site Delineation | Owner Whirlpool Corporation

Location Fort Smith, AR | Boring T.D. 24 ' | Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ | Surface Elevation 0 ' Ft. MSL Datum

Screen: Type ______ Diam. 2 " Length 0 ' Slot Size 0 "

Casing: Type ______ Diam. 0 " Length 0 ' Sump Length 0 '

Top of Casing Elevation 0 ' | Stickup 0 '

Depth to Water: 1. Ft. 0 ( ______ ) 2. Ft. 0 ( ______ )

Drilling Company TWF Drilling | Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger | Log By Karin Shultz

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | 0-4 | 0-3.5 | SANDY CLAY: Dark brown and brown mottled, damp, slightly plastic, soft, trace of asphalt nodules (1/8"-diameter). From 0.8'-3.5' becomes medium and pale brown mottled, damp to dry, higher sand content. |
| -2 | 2 | | | | 0.0 | | | |
| | | | | | | | 3.5-4 | SILTY CLAY: Yellowish-brown and brown mottled, damp, slightly plastic, firm, pockets of gray clayey silt, very fine-grained, nonplastic, medium dense to dense. |
| -4 | 4 | | | | | 4-6 | 4-4.3 | SANDY CLAY: Reddish-yellow with traces of brown, pale brown and light gray, slightly plastic, damp, firm to soft. |
| | | | | | | | 4.3-6 | SILTY CLAY: Brown and yellowish-brown mottled, damp, slightly plastic, firm, trace of roolets at 4.11', seam of sandy clay, gray, nonplastic, loose to medium dense, fine-grained. From 5.2'-5.6' silty clay becomes reddish-yellow with pockets of clayey silt, loose to medium dense, crumbly. |
| | | | | | 0.0 | | | |
| -6 | 6 | | | | | 6-8 | 6-7.1 | SILTY CLAY: Brown, yellowish-brown, and gray mottled, moist, slightly plastic, firm to stiff, pockets of sandy clay, reddish-yellow, slightly plastic. |
| | | | | | 0.0 | | 7.1-8.1 | SILTY CLAY: Gray and brown mottled with some reddish-yellow that are pockets of sandy clay, damp, slightly plastic. From 7.7'-8' seam of reddish-yellow silty clay, stiff. |
| -8 | 8 | | | | | 8-12 | 8.1-9.8 | CLAY WITH SILT, gray with trace of reddish-yellow, dry, hard, plastic. From 9.0'-9.8' becomes gray and reddish-yellow mottled, no silt. |
| -10 | 10 | | | | | | 9.8-14 | SILTY CLAY: Reddish-yellow with some gray mottled, dry, plastic, hard, trace of black burrowing throughout and iron staining, becoming harder towards base. From 10.9'-12.10' becomes brown with trace of gray and yellowish-brown mottling, damp to moist, plastic to slightly plastic, soft. From 12.10'-14' becomes firm intermixed with plastic and slightly plastic. From 13.6'-14' pockets of silty clay, gray and sandy clay, red, slightly plastic to nonplastic, medium dense, very fine-grained. |

ERM

# SB-45
# DRILLING LOG

W.O. NO. 581-013 Boring/Well ID SB-45 Date Drilled 11/12/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 24 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type ______ Diam. 2 " Length 0 ' Slot Size 0 "

Casing: Type ______ Diam. 0 " Length 0 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 0 ( ______ ) 2. Ft. 0 ( ______ )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | OVM Headspace (ppm) | Sample Interval (Feet) |
|---|---|---|---|
| -10 | 10 | 0.0 | |
| -12 | 12 | | 12-14 |
| | | 0.0 | |
| -14 | 14 | | 14-16 |
| | | 0.0 | |
| -16 | 16 | | 16-18 |
| | | 0.0 | |
| -18 | 18 | | 18-20 |
| | | 0.0 | |
| -20 | 20 | | |

| Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|
| 14.0-14.7 | SANDY CLAY: Red with trace of gray, damp to dry, soft, crumbly, equal amounts of sand and clay. At 14.2' and 14.5' pocket of silty clay, gray, loose to medium dense, very soft. |
| 14.7-14.9 | CLAY: Light greenish-gray with trace of red mottled, damp to dry, plastic, hard. |
| 14.9-14.10 | CLAYEY SILT: Gray, damp, soft, loose, nonplastic, very fine-grained. |
| 14.10-15.8 | CLAYEY SAND: Yellowish-red and red mottled, wet, well sorted, rounded, fine-grained, pockets of clayey silt, pale brown, throughout. From 14.10'-15' black burrowing. |
| 15.8-15.10 | SILTY SAND: Red, wet to very wet, medium dense, fine-grained, abundant iron staining, black burrowing. |
| 15.10-17 | SILTY GRAVELLY SAND: red and yellowish-red mottled, very wet, poorly to medium sorted, gravel (up to 1/8"-diameter), semi-rounded, increase gravel towards base. At 16' water-saturated. At 16.7' pocket of silty sand, greenish-gray and bluish-gray, very wet, loose, with some calcareous nodules (up to 1/16"-diameter). From 16.9'-17' trace of clay content in mixture so clayey silty sand. Decrease in gravel content to trace. |
| 17-18 | CLAYEY GRAVELLY SAND: red and reddish-brown mottled, water-saturated, abundant gravel (up to 3/4"-diameter), semi-rounded, fine-grained to medium-grained, loose to very loose. |
| 18-18.9 | SILTY GRAVEL: water-saturated, abundant gravels (up to 3/4"-diameter), rounded to semi-angular, medium-graded to well graded, with silt and sand mixtures, yellowish-red and yellowish-brown mottled. |
| 18.9-19.9 | GRAVELLY SILTY SAND: moist, medium-grained, very loose, trace of gravel (up to 1/16"-diameter), abundant iron staining. |
| 19.9-19.11 | SILTY GRAVELLY SAND: wet to moist, medium-grained, poorly sorted, very loose, abundant gravel (up to 1/8"-diameter). |
| 19.11-20 | SILTY CLAYEY SAND: Yellowish-brown, damp, fine-grained, medium dense to dense, slightly plastic to nonplastic. |

ERM

# SB-45
# DRILLING LOG

W.O. NO. 581-013 Boring/Well ID SB-45 Date Drilled 11/12/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 24 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type ______ Diam. 2 " Length 0 ' Slot Size 0 "

Casing: Type ______ Diam. 0 " Length 0 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 0 ( ______ ) 2. Ft. 0 ( ______ )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -20 | 20 | | | | | 20-22 | 20-21.6 | CLAYEY GRAVELLY SAND: yellowish-brown, very wet, rounded gravel (up to 1/16"-diameter), clayey sand mixture, increases clay content towards base. From 20.9'-21.6' abundant gravel. |
| | | | | | 0.0 | | | |
| | | | | | | | 21.6-22 | CLAYEY SAND: Dark brown and yellowish-brown mottled, moist, nonplastic, fine-grained, medium dense, with some gravel (up to 3/4"-diameter), becoming dense towards base. |
| -22 | 22 | | | | | 22-24 | 22-23.9 | SILTY SAND: Yellowish-brown and medium brown mottled with some black and dark gray mottling, damp, very loose. |
| | | | | | 0.0 | | | |
| -24 | 24 | | | | | | 23.9-24 | CLAY: Dark brown with some black, dark gray, and red mottling, damp, plastic, hard, weathered, fissles towards base with iron staining along fractures. T.D. = 24 ' |
| -26 | 26 | | | | | | | |
| -28 | 28 | | | | | | | |
| -30 | 30 | | | | | | | |

ERM

# MW-46
# DRILLING LOG

W.O. NO. 581-013 Boring/Well ID MW-46 Date Drilled 11/13/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 22 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type 65 Mesh stainless steel Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 21 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 0 ( ______ ) 2. Ft. 0 ( ______ )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | 0-2 | 0-4 | SILTY CLAY: Gray and dark gray mottled, moist, nonplastic, soft, with some iron nodules (1/8"-diameter). From 0.8'-1.1' with some black hard clay nodules (1/8"-diameter). From 1.1'-1.10' slightly plastic, with pockets of sandy silty clay, brown.At 0.7'-1.1' firm, plastic. From 1.10'-2' brownish-gray, plastic to slightly plastic, with seam of clayey sand, reddish-yellow, medium dense, very fine-grained. From 2'-2.3' gray and dark gray with trace of brown mottled, moist, soft, slightly plastic. At 2.2' pocket of black silty clay, plastic. From 2.3'-2.11' brown with gray mottled, damp to dry, stiff, plastic. From 2.11'-3.4' moist, soft,slightly plastic. From 3.4'-3.7' red, yellowish-brown, gray, and light gray mottled, moist, very stiff, plastic. From 3.7'-4' Gray with some yellowish-red mottled, damp, plastic, very stiff to stiff, with iron concretions mottled (1/8"-diameter). |
| | | | | | 0.0 | | | |
| -2 | 2 | | | | | 2-4 | | |
| | | | | | 0.0 | | | |
| -4 | 4 | | | | | 4-8 | 4-4.11 | CLAYEY SILT: Gray, damp, nonplastic, loose to medium dense, very fine-grained. |
| | | | | | | | 4.11-5.9 | SILTY CLAY: Brownish-gray with trace of pale yellow mottled, damp, plastic, soft. From 5.4'-5.5' pocket of sandy clayey silt mottling, brownish-gray with some dark gray, loose to medium dense, nonplastic. From 5.6'-5.7' pocket of reddish-yellow clayey sand, loose to medium dense, very fine-grained. |
| -6 | 6 | | | | 0.0 | | 5.9-6.5 | SANDY SILTY CLAY: Brown with some yellowish-red mottled, dry to damp, slightly plastic, stiff, very fine-grained. |
| | | | | | | | 6.5-8 | SILTY SANDY CLAY: Pale brown and medium brown mottled, dry to damp, nonplastic, soft. At 6.8' pocket of very fine silty clay, gray, plastic, very soft. From 7.6'-8' gray and pale brown with some yellowish-red and black mottling, nonplastic, firm. |
| -8 | 8 | | | | | 8-12 | 8-8.7 | SILTY CLAY: Gray and medium brown mottled, moist, plastic, soft to firm, becomes softer towards base. At 8.5' pocket of clay, gray, with trace of silt, stiff, plastic. |
| | | | | | | | 8.7-10.11 | SILTY CLAY: Gray, damp to dry, firm to stiff, slightly plastic. From 8.10'-8.11' red burrowing, rootlets, seam of sandy silty clay, yellowish-red, nonplastic, firm. From 10'-10.1' and 10.4' pocket of red and black iron resude and concretions, clayey silt, loose. At 10.6'-10.8' caliche. |
| -10 | 10 | | | | | | | |

ERM

# MW-46 DRILLING LOG

W.O. NO. 581-013 Boring/Well ID MW-46 Date Drilled 11/13/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 22 ' Boring Diam. 3 "

N. Coord. ____ E. Coord. ____ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type 65 Mesh stainless steel Diam. 0.75 " Length 5 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 21 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

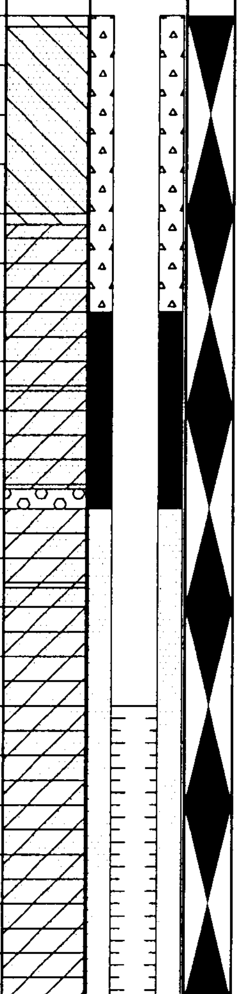
Depth to Water: 1. Ft. 0 ( ) 2. Ft. 0 ( )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES



| Elevation (Feet) | Depth (Feet) | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| -10 | 10 | 0.0 | | 10.11-12 | SANDY CLAY: Yellowish-red, damp to dry, hard, slightly plastic. From 10.11'-11' trace of black burrowing, rootlets. From 11.5'-12' seam of clay, gray, plastic, hard. |
| -12 | 12 | | 12-14 | 12-12.11 | SILTY CLAY: Gray and light gray, damp to dry, slightly plastic, very stiff, high clay content, with some black burrowing throughout, with sandy silty clay parting, yellowish-red, slightly plastic, stiff. From 12.8'-12.11' increase in black clayey silt. |
| | | 0.0 | | 12.11-13.8 | CLAYEY SILTY SAND: Yellowish-red, damp, loose, very fine-grained, with black mottling. From 13.5'-13.8, black iron-stained concretions abundant. |
| -14 | 14 | | 14-16 | 13.8-14.8 | SILTY CLAYEY SAND: Yellowish-red, dense, abundant black nodules, silty clay pocket, gray, trace of gravel towards base. |
| | | 0.0 | | 14.8-15 | GRAVELLY SAND: CLAYEY GRAVELLY SAND, brown and yellowish-red mottled, wet to moist, nonplastic, dense, medium sorted, rounded grains, abundant gravel (up to 1/8"-diameter) increase towards base. |
| | | | | 15-15.8 | CLAYEY SILTY SAND: Yellowish-red with trace of brown and pale brown mottled, moist, medium dense, fine-grained, pocket of clayey silty sand, gray, loose at 15.3'. |
| -16 | 16 | | 16-18 | 15.8-16 | CLAYEY SAND: GRAVELLY CLAYEY SAND, yellowish-red, dry, dense, abundant gravel towards base (up to 1/16"-diameter), semi-rounded, fine-grained, with trace of black concretions towards base. |
| | | 0.0 | | 16-20 | CLAYEY SILTY SAND: CLAYEY SILTY GRAVELLY SAND, yellowish-red, water-saturated, loose, with abundant gravel (up to 3/4"-diameter), poorly sorted, angular grains, medium to fine-grained clayey silty sand matrix with gravels that are well graded. At 18' changes to clayey gravelly silty sand, medium to coarse grained matrix silty sandy material. |
| -18 | 18 | | 18-20 | | |
| | | 0.0 | | | |
| -20 | 20 | | | | |

ERM

# MW-46 DRILLING LOG

| | | | | | |
|---|---|---|---|---|---|
| W.O. NO. | 581-013 | Boring/Well ID | MW-46 | Date Drilled | 11/13/2003 |
| Project | Off-Site Delineation | Owner | Whirlpool Corporation | | |
| Location | Fort Smith, AR | Boring T.D. | 22 ' | Boring Diam. | 3 " |
| N. Coord. | | E. Coord. | | Surface Elevation | 0 ' Ft. MSL Datum |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Screen: Type | 65 Mesh stainless steel | Diam. | 0.75 " | Length | 5 ' | Slot Size | 0.01 " |
| Casing: Type | Schedule 40 PVC | Diam. | 0.75 " | Length | 21 ' | Sump Length | 0 ' |
| Top of Casing Elevation | 0 ' | | | | | Stickup | 0 ' |

Depth to Water: 1. Ft. 0 ( ) 2. Ft. 0 ( )

| | | | |
|---|---|---|---|
| Drilling Company | TWF Drilling | Driller | Ed Wilson |
| Drilling Method | Geoprobe/Hollow Stem Auger | Log By | Karin Shultz |

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -20 | 20 | | | | | 20-22 | 20-20.7 | SILTY SANDY CLAY: Yellowish-red, very wet, slightly plastic, firm. |
| | | | | | | | 20.7-21.10 | SANDY SILTY CLAY: Yellowish-brown, damp, slightly plastic, with some black burrowing. At 21.6' plasticity and hardness increase towards base. |
| | | | | | 0.0 | | 21.10-22 | CLAY: Brown with some gray layers, plastic, hard, fissiles towards base to shale. |
| -22 | 22 | | | | | | | T.D. = 22 ' |
| -24 | 24 | | | | | | | |
| -26 | 26 | | | | | | | |
| -28 | 28 | | | | | | | |
| -30 | 30 | | | | | | | |

ERM

# SB-49
# DRILLING LOG

W.O. NO. 581-013 Boring/Well ID SB-49 Date Drilled 11/13/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 20.6 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type ______ Diam. 0 " Length 0 ' Slot Size 0 "

Casing: Type ______ Diam. 0 " Length 0 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 0 ( ______ ) 2. Ft. 0 ( ______ )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | 0-4 | 0-0.10 | FILL: CLAYEY SILT with trace of gravel, dark brown, dry, very fine-grained, very loose, rootlets. |
| | | | | | | | 0.10-1.5 | CLAYEY SILT: Medium brown, dry to damp, very fine-grained, loose, trace of rootlets. |
| | | | | | | | 1.5-2.1 | SILTY CLAY: Pale brown, dry, nonplastic, loose to medium dense, firm to soft, crumbly, with occasional gravel pieces, angular (up to 1/2"-diameter), with trace of yellowish-red iron concretions. |
| -2 | 2 | | | | 0.0 | | 2.1-2.8 | CLAYEY SILT: Pale brown and light brown, dry, crumbly, very loose, very fine-grained, blocky with trace of yellowish-red clayey sand. |
| | | | | | | | 2.8-3.5 | SILTY SANDY CLAY: Yellowish-red and pale brown mottled, dry, nonplastic, loose to medium dense, very fine-grained. With a parting of silty clay, gray, slightly plastic, soft. |
| | | | | | | | 3.5-4 | INTERMIXED SANDY CLAYEY SILT AND SILTY CLAY, yellowish-red, dry, loose to medium dense, fine-grained, silty clay is brown and reddish-brown mottled, stiff, slightly plastic, with some black clayey silt pockets throughout, nonplastic, stiff, increasing towards base. |
| -4 | 4 | | | | | 4-8 | 4-4.8 | SILTY SANDY CLAY: Medium brown, pale brown, and gray mottled with some yellowish-brown, dry, slightly plastic, very loose, crumbly, trace of rootlets, trace of black clayey silt layering. From 4.6'-4.8' pocket of black layering and yellowish-red clayey silt, medium dense. |
| | | | | | | | 4.8-5.2 | SILTY CLAY: Brown, moist, slightly plastic to plastic, very soft. |
| | | | | | | | 5.2-6.3 | CLAY: Gray and yellowish-red mottled, damp, plastic, very stiff, with a parting of silty clay, yellowish-red, plastic, very stiff. From 6.9'-6.12' some black and iron staining pockets, loose, nodules (up to 1/16"-diameter). |
| -6 | 6 | | | | 0.0 | | 6.3-7.4 | SILTY CLAY: Yellowish-red, dry, slightly plastic, very stiff, with black nodules and staining at 6.9'. |
| | | | | | | | 7.4-8 | CLAYEY SILT: Yellowish-red, dry, nonplastic, medium dense to loose, nonplastic, with trace of black and red (iron) nodules and stain at 7.10'. |
| -8 | 8 | | | | | 8-12 | 8-8.11 | SILTY CLAY: Yellowish-brown and dark brown mottled, moist, plastic to slightly plastic, very soft. From 8.7'-8.11' becomes yellowish-brown, dry to damp, very stiff, with seam of clayey silt, deep brown, loose to medium dense, rootlets, with some black and iron staining. |
| | | | | | | | 8.11-9.5 | SANDY SILTY CLAY: Gray, brown, and yellowish-red mottled, dry to damp, slightly plastic to nonplastic, very stiff, slightly crumbly. |
| | | | | | | | 9.5-9.10 | SANDY CLAYEY SILT: Yellow and gray mottled, dry to damp, very loose to loose, very fine-grained. From 9.9'-9.10' pocket of clay, brown, plastic, soft to firm. |
| -10 | 10 | | | | | | 9.10-10.4 | SANDY SILT: Yellowish-red, dry, nonplastic, soft, very loose, very fine-grained. |

ERM

# SB-49
# DRILLING LOG

W.O. NO. 581-013 Boring/Well ID SB-49 Date Drilled 11/13/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 20.6 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type ______ Diam. 0 " Length 0 ' Slot Size 0 "

Casing: Type ______ Diam. 0 " Length 0 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 0 ( ______ ) 2. Ft. 0 ( ______ )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|
| -10 | 10 | | | 0.0 | | | |
| | | | | | | 10.4-11.5 | SANDY SILTY CLAY: Yellowish-red with some pale brown and gray, dry to damp, nonplastic, soft to firm, very fine-grained. From 11'-11.2' pockets of clay, gray and yellowish-red mottled, plastic, firm to soft. |
| | | | | | | 11.5-12 | From 11.2'-1..5' yellowish-red silty clay with loose sandy silt, slightly plastic, firm. |
| -12 | 12 | | | | 12-14 | 12-12.3 | SILTY CLAY: Gray and yellowish-red and red, dry to damp, slightly plastic, stiff, with black burrowing and iron staining. |
| | | | | | | 12.3-12.8 | SILTY SANDY CLAY: Yellowish-brown, brown, and gray mottled, dry, slightly plastic, stiff, with dark gray laminations, slightly loose sediment. |
| | | | | 0.0 | | 12.8-13.10 | SILTY CLAY: Brown with some yellowish-red, moist, slightly plastic, soft. |
| | | | | | | 13.10-14.5 | SANDY CLAYEY SILT: Yellowish-brown and pale brown mottled, dry, nonplastic, loose, blocky, crumbly. |
| -14 | 14 | | | | 14-16 | 14.5-14.11 | CLAYEY SILT: Gray with some yellowish-red, dry, dense to loose, very fine-grained. |
| | | | | | | 14.5-16 | SILTY SAND: Red and yellowish-red mottled, dry, loose, fine-grained, with some hard iron nodules (up to 1/4"-diameter). |
| | | | | | | | CLAYEY SILTY SAND INTERLAYERED WITH CLAYEY SILT, clayey silty sand is red and yellowish-red, damp, loose to medium dense, fine-grained, clayey silt is gray, medium dense to loose, very fine-grained. |
| -16 | 16 | | | | 16-20 | 16-17.3 | SILTY CLAY AND CLAYEY SILT, medium brown, damp to dry, very loose to medium dense, very crumbly, fine-grained, blocky. |
| | | | | | | 17.3-19.8 | SILTY CLAY TO CLAYEY SILT, brown and dark brown mottled, dry, medium dense to loose, blocky, very fine-grained, nonplastic, very crumbly. |
| -18 | 18 | | | 0.0 | | | |
| -20 | 20 | | | | | 19.8-20.6 | CLAY: Brown and gray mottled, dry, plastic, very stiff, crumbly. From 19.10'-20.6' hard, turns dark gray, fissiles down to weathered shale. T.D. = 20.6 ' |

ERM

# MW-50
# DRILLING LOG

W.O. NO. 581-013 Boring/Well ID MW-50 Date Drilled 11/13/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 18.6 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type 65 Mesh stainless steel Diam. 0.75 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 8 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 0 (______) 2. Ft. 0 (______)

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | | | | | 0-4 | 0-1.8 | NO RECOVERY: Sediment too soft. |
| -2 | 2 | | | | 0.0 | | 1.8-2.4 | CLAYEY SILT: Dark brown, damp, nonplastic, very fine-grained, abundant rootlets, trace of gravel (up to 1/4"-diameter). |
| | | | | | | | 2.4-4.5 | SILTY CLAY: Brown, red, and pale brown mottled with some yelloiwsh-red, damp, stiff, slightly plastic, rootlets. From 4'-4.3' becomes brown with trace of gray and dark brown mottling, moist, plastic to slightly plastic, soft. From 4.3'-4.5' damp, plastic, firm. |
| -4 | 4 | | | | | 4-6 | | |
| | | | | | | | 4.5-4.9 | SANDY SILTY CLAY INTERMIXED WITH CLAYEY SAND, dark brown with some pale brown and yellowish-red mottled, damp, slightly plastic, stiff, with a parting of silty clay, gray, slightly plastic, soft, with some loose silt. |
| | | | | | 0.0 | | | |
| | | | | | | | 4.9-6.8 | SILTY CLAY: Brown and pale brown mottled, dry to damp, plastic, soft to firm, with a parting of clayey silt, yellowish-red, loose. From 5.8'-6' becomes slightly plastic to nonplastic, firm, moist. From 6'-6.8' becomes pale brown, damp, slightly plastic, stiff, with a seam of clayey silt, gray, nonplastic, medium dense, with trace of yellowish-red mottled. |
| -6 | 6 | | | | | 6-8 | 6.8-6.10 | CLAY: Light gray with trace of yellowish-red mottled, damp, plastic, soft to firm, with trace of silt. |
| | | | | | 0.0 | | 6.8-8 | SANDY CLAYEY SILT: Yellowish-red with some gray mottling, dry, dense to medium dense, nonplastic, crumbly, very fine-grained, black clayey burrowing, luster, nodules (up to 1/4"-diameter), becomes looser towards base. |
| -8 | 8 | | | | | 8-12 | 8-8.11 | SILTY CLAY: Brown with trace of yellowish-red mottled, wet, plastic. |
| | | | | | | | 8.11-9.1 | CLAY: Reddish-brown, damp, stiff, plastic. |
| | | | | | | | 9.1-11.2 | SILTY CLAY: Gray, damp, slightly plastic, stiff to firm, with lamination of silty clayey sand, yellowish-red, nonplastic, trace of iron concretions. |
| -10 | 10 | | | | | | | |

ERM

# MW-50 DRILLING LOG

W.O. NO. 581-013 Boring/Well ID MW-50 Date Drilled 11/13/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 18.6 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type 65 Mesh stainless steel Diam. 0.75 " Length 10 ' Slot Size 0.01 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 8 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

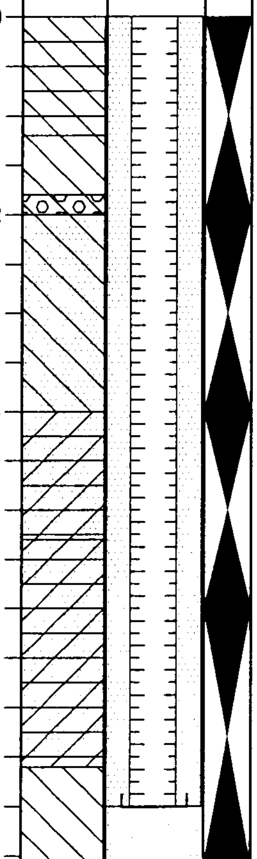
Depth to Water: 1. Ft. 0 ( ______ ) 2. Ft. 0 ( ______ )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES



| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -10 | 10 | | | | 0.0 | | | |
| | | | | | | | 11.2-11.8 | CLAY: Yellowish-red, damp to moist, plastic, very stiff, becoming hard towards base, decreasing moisture towards base. |
| -12 | 12 | | | | | 12-14 | 11.8-12 | GRAVELLY CLAY: Red and dark brown mottled, damp to moist, with abundant gravel (up to 1/2"-diameter), very dense, hard, with abundant iron and black staining. |
| | | | | | | | 12-14 | SANDY CLAY: GRAVELLY SANDY CLAY, red and yellowish-brown mottled, wet, abundant gravel (poorly sorted, up to 1"-diameter), in a sandy clayey matrix, dense, nonplastic, hard. Increasing gravelly clayey sand towards base. |
| | | | | | 0.0 | | | |
| -14 | 14 | | | | | 14-16 | 14-15.3 | CLAYEY SILTY SAND: GRAVELLY CLAYEY SILTY SAND, wet, abundant gravels (up to 1"-diameter), dense to loose, semirounded and angular. |
| | | | | | 0.0 | | | |
| | | | | | | | 15.3-17.6 | CLAYEY SILTY SAND: Gray and yellowish-brown, wet, medium dense to very loose, fine-grained. |
| -16 | 16 | | | | | 16-18.6 | | |
| | | | | | 0.0 | | | |
| | | | | | | | 17.6-18.6 | CLAY: Dark gray, plastic, hard, weathered, fissile to shale at 17.8'. |
| -18 | 18 | | | | | | | |
| | | | | | | | | T.D. = 18.6 ' |
| -20 | 20 | | | | | | | |

ERM

# SB-51 DRILLING LOG

W.O. NO. 581-013 Boring/Well ID SB-51 Date Drilled 11/14/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 16 ' Boring Diam. 3 "

N. Coord. ______ E. Coord. ______ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type ______ Diam. 0 " Length 0 ' Slot Size 0 "

Casing: Type ______ Diam. 0 " Length 0 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

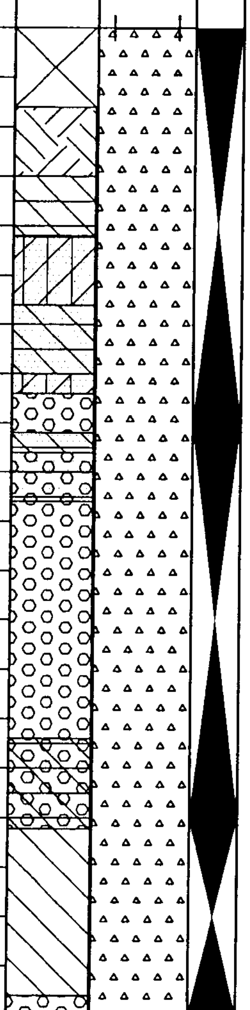
Depth to Water: 1. Ft. 0 ( ______ ) 2. Ft. 0 ( ______ )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES



| Elevation (Feet) | Depth (Feet) | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|
| | | | | | NO RECOVERY: Sediment too soft. |
| 0 | 0 | | 0-4 | 0-0.8 | FILL: CLAYEY SILT, dark brown and brown, damp, very loose, nonplastic, abundant rootlets. From 1.2'-1.5' becomes dark brown and gray mottling, slightly plastic, soft, loose, with large pieces of bark. |
| | | | | 0.8-1.5 | SILTY CLAY: Medium brown, moist, slightly plastic to plastic, with trace of yellowish-red nodules, trace of rootlets, coarsening down to a silty clay with equal silt and clay amounts at 1.9'. |
| | | | | 1.5-2.1 | SANDY CLAYEY SILT: Reddish-yellow, brown, and pale brown mottled, dry, nonplastic, very loose, crumbly, with occassional gravel (up to 1/8"-diameter), trace of dark brown and black mottled towards base. |
| -2 | 2 | 0.0 | | 2.1-2.8 | SANDY SILTY CLAY: Gray, light gray, reddish-yellow, brown, and pale brown mottled, dry, slightly plastic, stiff, with some black burrowing towards base. |
| | | | | 2.8-2.11 | |
| | | | | 2.11-3.5 | SILTY SANDY CLAY: Yellowish-red and black with trace of light gray mottled, dry, very stiff, very crumbly, loose to dense, with abundant black mottling throughout. |
| | | | | 3.5-3.7 | SANDY CLAYEY SILT: Gray, yellowish-red, and black mottled, dry, nonplastic, loose to very loose, very fine-grained. |
| | | | | 3.7-4.3 | SILTY SANDY CLAY: Deep yellowish-red and some black mottled, dry, hard, nonplastic, with some pockets of iron staining with some gravel (up to 1/4"-diameter). |
| -4 | 4 | | 4-8 | 4.8-4.10 | |
| | | | | 4.3-4.8 | GRAVEL: with clayey sandy silt mixture, dry, gravels up to 1/4"-diameter, loose, poorly sorted, well graded, angular, clayey sand crumbles easily. |
| | | | | 4.10-7.2 | GRAVELLY SILTY SAND, with clay parting, silty clay parting is gray, hard, plastic, gravelly silty sand is red and deep orange yellowish-red and black mottled, silty sand is matrix with abundant gravel (up to 1/8"-diameter), nonplastic, loose, angular to semi-rounded. |
| | | | | | SANDY CLAYEY GRAVELS INTERMIXES WITH CLAYEY SANDY GRAVELS, abundant gravels (up to 3/4"-diameter), angular to semi-angular, dry, well graded gravels, with a sandy clay matrix, dense, dry. |
| -6 | 6 | 0.0 | | | |
| | | | | 7.2-8.11 | GRAVELLY SILTY CLAY, yellowish-red, dry, with gravels (up to 3/4"-diameter), very hard, plastic, with trace of iron staining and black mottling. |
| -8 | 8 | | 8-10 | 8.11-9.8 | CLAY: Yellowish-red, moist, plastic, stiff, with seam of silty clay, slightly plastic, yellowish-red.From 9.3'-9.5' pocket of silty sand intermixed with gravelly clay, very loose, nonplastic, gravel and nodules up to 1/4"-diameter, poorly sorted.From 9.5'-9.8' clay becomes gray, hard, plastic. |
| | | 0.0 | | | |
| -10 | 10 | | | 9.8-11.5 | SEE PAGE 2 |

ERM

# SB-51
# DRILLING LOG

W.O. NO. 581-013 Boring/Well ID SB-51 Date Drilled 11/14/2003

Project Off-Site Delineation Owner Whirlpool Corporation

Location Fort Smith, AR Boring T.D. 16 ' Boring Diam. 3 "

N. Coord. ____ E. Coord. ____ Surface Elevation 0 ' Ft. MSL Datum

Screen: Type ____ Diam. 0 " Length 0 ' Slot Size 0 "

Casing: Type ____ Diam. 0 " Length 0 ' Sump Length 0 '

Top of Casing Elevation 0 ' Stickup 0 '

Depth to Water: 1. Ft. 0 ( ____ ) 2. Ft. 0 ( ____ )

Drilling Company TWF Drilling Driller Ed Wilson

Drilling Method Geoprobe/Hollow Stem Auger Log By Karin Shultz

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | OVM Headspace (ppm) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| -10 | 10 | | | | | 10-12 | 9.8-11.5 | SILTY GRAVELLY SAND, dry, red and yellowish-red mottled, nonplastic, fine-grained, poorly sorted, gravel is up to 3/4"-diameter) in a silty sand matrix.From 10'-11.5' matrix changes to a silty sandy clay, dense, slightly plastic, with some loose silty sand throughout, deeper red and yellowish-red mottled, gravel up to 1"-diameter. |
| | | | | | 0.0 | | | |
| | | | | | | | 11.5-12 | CLAYEY GRAVEL, abundant gravel (gray and light gray, angular, well sorted gravel) in a clay matrix (yellowish-red, slightly plastic, hard). |
| -12 | 12 | | | | | 12-14 | 12-12.11 | SILTY SANDY CLAY: Yellowish-red and gray mottled, damp, slightly plastic, soft. |
| | | | | | | | 12.11-12.3 | CLAYEY SILT: Yellowish-red, loose, very fine-grained, with some occasional gravel up to 1/2"-diameter, angular. |
| | | | | | | | 12.3-12.45 | GRAVELLY CLAY: Dark brown, fractures, breaks easily, weathered, gravel up to 1/4"-diameter with some loose silt. |
| | | | | | 0.0 | | 12.45-13.4 | GRAVELLY CLAYEY SAND, yellowish-red, moist, abundant gravel from 12.10'-13.2' up to 1"-diameter, with clayey sand mixture, medium-grained, nonplastic. |
| | | | | | | | 13.4-14 | SAND: Yellowish-red, moist, medium-grained, loose with occasional gravel (up to 1/4"-diameter). |
| -14 | 14 | | | | | 14-16 | 14-15.7 | CLAY: Yellowish-red, damp to dry, very stiff to stiff, plastic, with occasional pockets of sandy clay throughout, hardening towards base. |
| | | | | | 0.0 | | | |
| | | | | | | | 15.7-16 | CLAY: Dark gray, weathered into shale, very hard, plastic, fractures throughout. T.D. = 16 ' |
| -16 | 16 | | | | | | | |
| -18 | 18 | | | | | | | |
| -20 | 20 | | | | | | | |

# Well Development Records

*Appendix D*

*June 25, 2004*
*Project No. 0014507*

**Environmental Resources Management**
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

**Environmental Resources Management**
MONITOR WELL DEVELOPMENT RECORD

Area: Whirlpool
Well No.: MW-39

Client: Whirlpool
Location: Fort Smith
W.O. # 581-013
Developer(s):Lance Harbinson

Date: 7/14/2003
Well Casing Diameter ($d_{wc}$): 0.75 in.
Borehole Diameter ($d_b$): 3 in.
Measuring Point: GND
Measuring Point Elevation: ft.

Total Well Depth **TD**: 29.5 ft.
Depth to Water **DTW**: 10.9 ft.
Well Volume $V_w$=3.14 x ($d_{wc}$/24)$^2$ x $h_{wc}$ x 7.5 gal/ft$^3$
$V_w$ = 0.42 gal.
Height of Water Column $h_{wc}$=TD - DTW 18.6 ft.
Depth to Product, if present, **DTP** --- ft. Use DTP=DTW to calculate $h_{wc}$, if product is present.
Height of Filter Sand Above Sump $h_{fs}$ 14.5 ft.
Volume of Water in Filter Sand $V_{fs}$ = 3.14 x (($d_b$/24)$^2$ - ($d_{wc}$/24)$^2$) x 0.3 x $h_{fs}$ x 7.5 gal/ft$^3$ = 1.54 gal.
Assumed 30% porosity for filter sand.
Borehole Volume $V_b$ = $V_{wc}$ + $V_{fs}$ = 1.96 gal.

**Minimum** volume to be purged for well development:
Eight borehole volumes 8 x $V_b$ = 15.68 gal.
Volume of water added during well installation + 0 gal.
Minimum volume to be removed 16 gal.
**Maximum** volume not to exceed if water parameters do not stabilize. Check with **ERM** project manager.
Ten borehole volume 10 x $V_b$ = 19.6 gal.
Volume of water added during well installation + 0 gal.
Maximum volume to be removed 20 gal.

MONITOR WELL DEVELOPMENT RECORD Date: 7/15/2003 Page 1 of 1

Method: watera pump/peristaltic
Field Instruments:

Area: Whirlpool
Well No.: MW-41

| Time | Depth (ft) | Volume Removed (gal) | Volume Cumulative (gal) | pH (std units) | temp. (°C) | SC (µS/cm) | turbidity (NTU / FTU) | Color | Comments | Date |
|---|---|---|---|---|---|---|---|---|---|---|
| 1641 | 10.9 | | | | | | Turbid/silty | Brown | Watera | 7/14/03 |
| 1810 | | 5 | 5 | | | | Turbid/silty | Brown | Watera | 7/14/03 |
| 825 | 10.9 | | | | | | Turbid/silty | Brown | Peristaltic | 7/15/03 |
| 845 | | | | | | | Turbid/silty | Brown | Watera | 7/15/03 |
| 905 | | | | | | | Turbid/silty | Brown | Watera | 7/15/03 |
| 922 | | 6 | 6 | | | | Turbid/silty | Brown | Watera | 7/15/03 |
| 1008 | 10.88 | 5 | 11 | 5.95 | 23.06 | 0.995 | Turbid/silty | Brown | Watera | 7/16/03 |
| 1058 | | | | 7.10 | 28.86 | 0.008 | Turbid/silty | Brown | Peristaltic | 7/16/03 |
| 1103 | | | | 7.10 | 28.86 | 0.008 | Milky/silty | Clear | Peristaltic | 7/16/03 |
| 1108 | | | | 7.10 | 28.86 | 0.008 | Milky/silty | Clear | Peristaltic | 7/16/03 |
| 1120 | | | | 7.10 | 28.86 | 0.008 | --- | Clear | Peristaltic | 7/16/03 |
| 1130 | | | | 7.10 | 28.86 | 0.008 | --- | Clear | Peristaltic | 7/16/03 |
| 1140 | | | | 7.10 | 28.86 | 0.008 | --- | Clear | Peristaltic | 7/16/03 |
| 1150 | | 5 | 16 | 7.10 | 28.86 | 0.008 | --- | Clear | Peristaltic | 7/16/03 |

**Environmental Resources Management**
MONITOR WELL DEVELOPMENT RECORD

Area: Whirlpool
Well No.: MW-40

Client: Whirlpool
Location: Fort Smith
W.O. # 581-013
Developer(s): Lance Harbinson

Date: 7/15/2003
Well Casing Diameter ($d_{wc}$): 0.75 in.
Borehole Diameter ($d_b$): 3 in.
Measuring Point: GND
Measuring Point Elevation: ft.

Total Well Depth **TD**: 27.8 ft.
Depth to Water **DTW**: 9.11 ft.
Height of Water Column $h_{wc}$=TD - DTW 18.6 ft.
Depth to Product, if present, **DTP** --- ft. Use DTP=DTW to calculate $h_{wc}$, if product is present.
Height of Filter Sand Above Sump $h_s$ 14.5 ft.

Well Volume $V_w = 3.14 \times (d_{wc}/24)^2 \times h_{wc} \times 7.5$ gal/ft$^3$

$V_w$ = 0.43 gal.

Volume of Water in Filter Sand $V_{fs} = 3.14 \times ((d_b/24)^2 - (d_{wc}/24)^2) \times 0.3 \times h_{fs} \times 7.5$ gal/ft$^3$ = 1.56 gal.

Assumed 30% porosity for filter sand.

Borehole Volume $V_b = V_{wc} + V_{fs}$ = 2 gal.

**Minimum** volume to be purged for well development:

Eight borehole volumes $8 \times V_b$ = 16 gal.
Volume of water added during well installation + 0 gal.
Minimum volume to be removed 16 gal.

**Maximum** volume not to exceed if water parameters do not stabilize. Check with **ERM** project manager.

Ten borehole volume: $10 \times V_b$ = 20 gal.
Volume of water added during well installation + 0 gal.
Maximum volume to be removed 20 gal.

MONITOR WELL DEVELOPMENT RECORD

Date: 7/15/2003

Page 1 of 1

Method: Watera/peristaltic pump
Field Instruments:

Area: Whirlpool
Well No.: MW-40

| Time | Depth (ft) | Volume Removed (gal) | Volume Cumulative (gal) | pH (std units) | temp. (°C) | SC (µS/cm) | turbidity (NTU / FTU) | Color | Comments | Date |
|---|---|---|---|---|---|---|---|---|---|---|
| 1000 | 9.11 | | | | | | Turbid/silty | Brown | Watera | 7/15/03 |
| 1015 | | | | | | | Turbid/silty | Brown | Watera | 7/15/03 |
| 1045 | | | | | | | Turbid/silty | Brown | Watera | 7/15/03 |
| 1115 | | 2.5 | 2.5 | 5.55 | 24 | 0.621 | Turbid/silty | Light brown | Peristaltic | 7/15/03 |
| 1305 | 9.81 | | | | | | Turbid/silty | Brown | Watera | 7/16/03 |
| 1450 | | 5 | 7.5 | | | | Turbid/silty | Brown | Peristaltic | 7/16/03 |
| 1505 | | | | 5.15 | 24.19 | 0.632 | --- | Clear | Peristaltic | 7/16/03 |
| 1515 | | | | 5.35 | 24.70 | 0.631 | --- | Clear | Peristaltic | 7/16/03 |
| 1525 | | | | 5.40 | 24.41 | 0.631 | --- | Clear | Peristaltic | 7/16/03 |
| 1535 | | | | 5.44 | 24.42 | 0.63 | --- | Clear | Peristaltic | 7/16/03 |
| 1545 | | | | 5.43 | 29.39 | 0.629 | --- | Clear | Peristaltic | 7/16/03 |
| 1555 | | | | 5.41 | 24.20 | 0.629 | --- | Clear | Peristaltic | 7/16/03 |
| 1605 | | | | 5.40 | 24.10 | 0.629 | --- | Clear | Peristaltic | 7/16/03 |
| 1615 | | | | 5.39 | 24.21 | 0.629 | --- | Clear | Peristaltic | 7/16/03 |
| 1625 | | | | 5.35 | 24.10 | 0.629 | --- | Clear | Peristaltic | 7/16/03 |
| 1635 | | | | 5.33 | 23.99 | 0.629 | --- | Clear | Peristaltic | 7/16/03 |
| 1645 | | | | 5.30 | 23.94 | 0.628 | --- | Clear | Peristaltic | 7/16/03 |
| 1655 | | 10 | 17.5 | 5.28 | 23.92 | 0.629 | --- | Clear | Peristaltic | 7/16/03 |

**Environmental Resources Management**
MONITOR WELL DEVELOPMENT RECORD

Area: Whirlpool
Well No.: MW-41

Client: Whirlpool
Location: Fort Smith
W.O. # 581-013
Developer(s):Troy Meinen and Lance Harbinson

Date: 7/15/2003
Well Casing Diameter ($d_{wc}$): 0.75 in.
Borehole Diameter ($d_b$): 8 in.
Measuring Point: GND
Measuring Point Elevation: ft.

Total Well Depth **TD**: 28.7 ft.
Depth to Water **DTW**: 7.95 ft.
Well Volume $V_w$=3.14 x $(d_{wc}/24)^2$ x $h_{wc}$ x 7.5 gal/ft$^3$
$V_w$ = 0.47 gal.
Height of Water Column $h_{wc}$=TD - DTW 20.75 ft.
Depth to Product, if present, **DTP** --- ft. Use DTP=DTW to calculate $h_{wc}$, if product is present.
Height of Filter Sand Above Sump $h_s$ 12.7 ft.
Volume of Water in Filter Sand $V_{fs}$ = 3.14 x $((d_b/24)^2 - (d_{wc}/24)^2)$ x 0.3 x $h_{fs}$ x 7.5 gal/ft$^3$ = 9.78 gal.
Assumed 30% porosity for filter sand.
Borehole Volume $V_b$ = $V_{wc}$ + $V_{fs}$ = 10.25 gal.

**Minimum** volume to be purged for well development:

| | | |
|---|---|---|
| Eight borehole volumes | 8 x $V_b$ = | 82 gal. |
| Volume of water added during well installatio | + | 0 gal. |
| Minimum volume to be removed | | 82 gal. |

**Maximum** volume not to exceed if water parameters do not stabilize. Check with **ERM** project manager.

| | | |
|---|---|---|
| Ten borehole volume: | 10 x $V_b$ = | 102 gal. |
| Volume of water added during well installatio | + | 0 gal. |
| Maximum volume to be removed | | 102 gal. |

MONITOR WELL DEVELOPMENT RECORD Date: 7/15/2003 Page 1 of 2

Method: Watera/peristaltic pump
Field Instruments:

Area: Whirlpool
Well No.: MW-41

| Time | Depth (ft) | Volume Removed (gal) | Volume Cumulative (gal) | pH (std units) | temp. (°C) | SC (µS/cm) | turbidity (NTU / FTU) | Color | Comments | Date |
|---|---|---|---|---|---|---|---|---|---|---|
| 815 | 7.5 | 2.5 | | | | | Turbid | Brown | Watera | 7/15/03 |
| 845 | 7.5 | | 5 | | | | Turbid | Brown | Watera | 7/16/03 |
| 845 | 28 | 2.5 | 5 | | | | Turbid | Brown | Watera | 7/16/03 |
| 855 | 8.5 | | | | | | Turbid | Brown | Watera | 7/16/03 |
| 905 | 22 | 1.5 | | | | | Turbid | Brown | Watera | 7/16/03 |
| 920 | 22 | 3 | 8 | 6.66 | 24.92 | 522 | Turbid | Brown | Watera | 7/16/03 |
| 945 | 22 | 2 | 10 | | | | Turbid | Brown | Watera | 7/16/03 |
| 1715 | 7.65 | | | | | | Turbid | Brown | Watera | 7/16/03 |
| 1755 | | 5 | 15 | 5.55 | 26.23 | 0.757 | Turbid | Brown | Watera | 7/16/03 |
| 1810 | | 5 | 20 | 5.21 | 22.61 | 0.749 | Turbid | Brown | Watera | 7/16/03 |
| 1822 | | 5 | 25 | 5.07 | 20.69 | 0.741 | Turbid | Brown | Watera | 7/16/03 |
| 1253 | 7.62 | 5 | 30 | 4.89 | 19.67 | 0.717 | --- | Clear | Peristaltic | 7/17/03 |
| 1300 | | | | 4.96 | 19.74 | 0.705 | --- | Clear | Peristaltic | 7/17/03 |
| 1310 | | 5 | 35 | 4.99 | 19.80 | 0.698 | --- | Clear | Peristaltic | 7/17/03 |
| 1320 | | | | 4.91 | 19.80 | 0.691 | --- | Clear | Peristaltic | 7/17/03 |
| 1330 | | 5 | 40 | 4.92 | 20.04 | 0.690 | --- | Clear | Peristaltic | 7/17/03 |
| 1400 | | 5 | 45 | 4.8 | 19.25 | 0.685 | --- | Clear | Peristaltic | 7/17/03 |
| 1410 | | | | 4.76 | 19.57 | 0.682 | --- | Clear | Peristaltic | 7/17/03 |
| 1420 | | 5 | 50 | 4.79 | 19.26 | 0.682 | --- | Clear | Peristaltic | 7/17/03 |

Area: Whirlpool
Well No.: MW-41

| Time | Depth (ft) | Volume Removed (gal) | Volume Cumulative (gal) | pH (std units) | temp. (°C) | SC (μS/cm) | turbidity (NTU / FTU) | Color | Comments | Date |
|---|---|---|---|---|---|---|---|---|---|---|
| 1440 | | 5 | 55 | 4.75 | 19.37 | 0.680 | --- | Clear | Peristaltic | 7/17/03 |
| 1500 | | 5 | 60 | 4.70 | 19.26 | 0.679 | --- | Clear | Peristaltic | 7/17/03 |
| 1520 | | 5 | 65 | 4.80 | 19.77 | 0.679 | --- | Clear | Peristaltic | 7/17/03 |
| 1525 | | 5 | 70 | 4.73 | 19.52 | 0.678 | --- | Clear | Peristaltic | 7/17/03 |
| 1545 | | 5 | 75 | 4.53 | 19.41 | 0.680 | Turbid | Brown | Watera | 7/17/03 |
| 1615 | | 5 | 80 | 4.70 | 20.55 | 0.678 | Turbid | Brown | Watera | 7/17/03 |
| 1640 | | 5 | 85 | 4.59 | 19.79 | 0.680 | --- | Clear | Peristaltic | 7/17/03 |

**Environmental Resources Management**
MONITOR WELL DEVELOPMENT RECORD

Area: Whirlpool- Fort Smith, AK
Well No.: MW-42B

Client: Whirlpool
Location: Fort Smith, AK
W.O. #581-013/ 0014507
Developer(s):

Date: 11/13/2004, 11/14/2004, 11/15/2004
Well Casing Diameter ($d_{wc}$): 3/4 in.
Borehole Diameter ($d_b$): 3 in.
Measuring Point: Ground Surface
Measuring Point Elevation: ft.

Total Well Depth **TD**: 27 ft.
Depth to Water **DTW**: 7.2 ft.
Well Volume $\mathbf{V_w}$=3.14 x $(d_{wc}/24)^2$ x $h_{wc}$ x 7.5 gal/ft$^3$
$V_w$ = 0.5 gal.
Height of Water Column $\mathbf{h_{wc}}$=TD - DTW 19.8 ft.
Depth to Product, if present, **DTP** ft. Use DTP=DTW to calculate $h_{wc}$, if product is present.
Height of Filter Sand Above Sump $\mathbf{h_{fs}}$ 4 ft.
Volume of Water in Filter Sand $\mathbf{V_{fs}}$ = 3.14 x $((d_b/24)^2 - (d_{wc}/24)^2)$ x 0.3 x $h_{fs}$ x 7.5 gal/ft$^3$ = 0.4 gal.
Assumed 30% porosity for filter sand.
Borehole Volume $\mathbf{V_b}$ = $V_{wc}$ + $V_{fs}$ = 0.9 gal.

**Minimum** volume to be purged for well development:
Five borehole volume 5 x $V_b$ = 4 gal.
Volume of water added during well installatio + gal.
Minimum volume to be removed 4 gal.
**Maximum** volume not to exceed if water parameters do not stabilize. Check with **ERM** project manager.
Ten borehole volumes 10 x $V_b$ = 9 gal.
Volume of water added during well installatio + gal.
Maximum volume to be removed 9 gal.

MONITOR WELL DEVELOPMENT RECORD



Method:
Field Instruments: peristaltic pump, YSI

Area: Whirlpool- Fort Smith, AK
Well No.: MW-42B

| Time | Depth (ft) | Volume Removed (gal) | Volume Cumulative (gal) | pH (std units) | temp. ($^oC$) | SC (µS/cm) | turbidity (NTU / FTU) | Color | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 11/13/2003 | | | | | | | | | |
| ~1200 | | | | | | | | | begin pumping |
| 1205 | | 0.67 | 0.67 | | | | | | pumped dry |
| ~1420 | | | | | | | | | still dry |
| ~1535 | | | | | | | | | insufficient head |
| 11/14/2003 | | | | | | | | | |
| 855 | | | | | | | | | collect sample, dry |
| 11/15/2003 | | | | | | | | | |
| ~1328 | | | | | | | | | begin pumping |
| ~1328 | | 0.125 | 0.795 | | | | | | pumped dry |
| 4/15/2004 | | | | | | | | | |
| 1432 | | | | | | | | | begin pumping |
| 1436 | | 0.5 | 1.295 | 5.41 | 19.9 | 1046 | 530 | | |
| 1441 | | 0.5 | 1.795 | 5.42 | 20.4 | 1036 | 1000 | | |
| 1446 | | 0.5 | 2.295 | 5.17 | 20.36 | 1059 | 1000 | | |
| 1448 | | | | | | | | | pumped dry |
| 1615 | | | | | | | | | collect sample |

**Environmental Resources Management**
MONITOR WELL DEVELOPMENT RECORD

Area: Whirlpool- Fort Smith, AK
Well No.: MW-43

Client: Whirlpool
Location: Fort Smith, AK
W.O. #581-013/ 0014507

Developer(s): Tristram Dodds

Date: 11/13/2004, 11/14/2004, 11/15/2004
Well Casing Diameter ($d_{wc}$): 3/4 in.
Borehole Diameter ($d_b$): 3 in.
Measuring Point: Ground Surface
Measuring Point Elevation: ft.

Total Well Depth **TD**: 26 ft.
Depth to Water **DTW**: 10.68 ft.

Well Volume $\mathbf{V_w}$=3.14 x $(d_{wc}/24)^2$ x $h_{wc}$ x 7.5 gal/ft$^3$
$V_w$ = 0.4 gal.

Height of Water Column $\mathbf{h_{wc}}$=TD - DTW 15.32 ft.
Depth to Product, if present, **DTP** ft. Use DTP=DTW to calculate $h_{wc}$, if product is present.
Height of Filter Sand Above Sump $\mathbf{h_{fs}}$ 11 ft.
Volume of Water in Filter Sand $\mathbf{V_{fs}}$ = 3.14 x $((d_b/24)^2 - (d_{wc}/24)^2)$ x 0.3 x $h_{fs}$ x 7.5 gal/ft$^3$ = 1.1 gal.
Assumed 30% porosity for filter sand.

Borehole Volume $\mathbf{V_b}$ = $V_{wc}$ + $V_{fs}$ = 1.5 gal.

**Minimum** volume to be purged for well development:
Five borehole volume 5 x $V_b$ = 7 gal.
Volume of water added during well installatio + gal.
Minimum volume to be removed 7 gal.
**Maximum** volume not to exceed if water parameters do not stabilize. Check with **ERM** project manager.
Ten borehole volumes 10 x $V_b$ = 15 gal.
Volume of water added during well installatio + gal.
Maximum volume to be removed 15 gal.

MONITOR WELL DEVELOPMENT RECORD



Method:
Field Instruments: peristaltic pump, YSI

Area: Whirlpool- Fort Smith, AK
Well No.: MW-43

| Time | Depth (ft) | Volume Removed (gal) | Volume Cumulative (gal) | pH (std units) | temp. (°C) | SC (µS/cm) | turbidity (NTU / FTU) | Color | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 11/13/2003 | | | | | | | | | |
| ~1300 | | | | | | | | | begin pumping |
| 1306 | | 0.5 | 0.5 | | | | | | pumped dry |
| 1429 | | | | | | | | | still dry |
| 1535 | | | | | | | | | insufficient head |
| 11/14/2003 | | | | | | | | | |
| 915 | | | | | | | | | collect sample, dry |
| 11/15/2003 | | | | | | | | | |
| ~1331 | | | | | | | | | begin pumping |
| ~1340 | | 0.125 | 0.625 | | | | | | pumped dry |
| 4/15/2004 | | | | | | | | | |
| 1507 | | | | | | | | | begin pumping |
| 1512 | | 0.5 | 1.125 | 9.48 | 19.53 | 381 | 234 | | |
| 1517 | | 0.5 | 1.625 | 7.13 | 19.28 | 388 | 1000 | | |
| 1522 | | 0.5 | 2.125 | 6.97 | 19.41 | 414 | 1000 | | |
| 1526 | | | | | | | | | pumped dry |
| 1625 | | | | | | | | | collect sample |

**Environmental Resources Management**
MONITOR WELL DEVELOPMENT RECORD

Area: Whirlpool- Fort Smith, AK
Well No.: MW-46

Client: Whirlpool
Location: Fort Smith, AK
W.O. #581-013/ 0014507

Developer(s):

Date: 11/13/2004, 11/14/2004, 11/15/2004
Well Casing Diameter ($d_{wc}$): 3/4 in.
Borehole Diameter ($d_b$): 3 in.
Measuring Point: Ground Surface
Measuring Point Elevation: ft.

Total Well Depth **TD**: 22 ft.
Depth to Water **DTW**: 8.55 ft.
Well Volume $\mathbf{V_w}$=3.14 x $(d_{wc}/24)^2$ x $h_{wc}$ x 7.5 gal/ft$^3$
$V_w$ = 0.3 gal.

Height of Water Column $\mathbf{h_{wc}}$=TD - DTW 13.45 ft.
Depth to Product, if present, **DTP** ft. Use DTP=DTW to calculate $h_{wc}$, if product is present.
Height of Filter Sand Above Sump $\mathbf{h_{fs}}$ 7 ft.
Volume of Water in Filter Sand $\mathbf{V_{fs}}$ = 3.14 x $((d_b/24)^2 - (d_{wc}/24)^2)$ x 0.3 x $h_{fs}$ x 7.5 gal/ft$^3$ = 0.7 gal.
Assumed 30% porosity for filter sand.

Borehole Volume $\mathbf{V_b}$ = $V_{wc}$ + $V_{fs}$ = 1.0 gal.

**Minimum** volume to be purged for well development:
Five borehole volume: 5 x $V_b$ = 5 gal.
Volume of water added during well installatio + gal.
Minimum volume to be removed 5 gal.
**Maximum** volume not to exceed if water parameters do not stabilize. Check with **ERM** project manager.
Ten borehole volumes 10 x $V_b$ = 10 gal.
Volume of water added during well installatio + gal.
Maximum volume to be removed 10 gal.

MONITOR WELL DEVELOPMENT RECORD



Method:
Field Instruments: peristaltic pump, YSI

Area: Whirlpool- Fort Smith, AK
Well No.: MW-46

| Time | Depth (ft) | Volume Removed (gal) | Volume Cumulative (gal) | pH (std units) | temp. (°C) | SC (µS/cm) | turbidity (NTU / FTU) | Color | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 11/13/2003 | | | | | | | | | |
| ~1400 | | | | | | | | | begin pumping |
| 1412 | | 0.5 | 0.5 | | | | | | pumped dry |
| 1550 | | | | | | | | | insufficient head |
| 11/14/2003 | | | | | | | | | |
| 950 | | | | | | | | | collect sample, dry |
| 11/15/2003 | | | | | | | | | |
| ~1342 | | | | | | | | | begin pumping |
| ~1347 | | 0.25 | 0.75 | | | | | | pumped dry |
| 4/15/2004 | | | | | | | | | |
| 1537 | | | | | | | | | begin pumping |
| 1541 | | 0.5 | 1.25 | 7.29 | 19.5 | 4.2 | 424 | | |
| 1546 | | 0.5 | 1.75 | 7.01 | 19.59 | 421 | 929 | | |
| 1551 | | 0.5 | 2.25 | 6.92 | 19.63 | 425 | 1000 | | pumped dry |
| 1635 | | | | | | | | | collect sample |

MONITOR WELL DEVELOPMENT RECORD Date:________________ Page _____ of _____

**Environmental Resources Management**
MONITOR WELL DEVELOPMENT RECORD

Area: Whirlpool- Fort Smith, AK
Well No.: MW-50

Client: Whirlpool
Location: Fort Smith, AK
W.O. #581-013/ 0014507
Developer(s):

Date: 11/15/2004
Well Casing Diameter ($d_{wc}$): 3/4 in.
Borehole Diameter ($d_b$): 3 in.
Measuring Point: Ground Surface
Measuring Point Elevation: ft.

Total Well Depth **TD**: 18.6 ft.
Depth to Water **DTW**: 11.75 ft.
Well Volume $\mathbf{V_w}$=3.14 x ($d_{wc}$/24)$^2$ x $h_{wc}$ x 7.5 gal/ft$^3$
$V_w$ = 0.2 gal.
Height of Water Column $\mathbf{h_{wc}}$=TD - DTW 6.85 ft.
Depth to Product, if present, **DTP** ft. Use DTP=DTW to calculate $h_{wc}$, if product is present.
Height of Filter Sand Above Sump $\mathbf{h_{fs}}$ 13.6 ft.
Volume of Water in Filter Sand $\mathbf{V_{fs}}$ = 3.14 x (($d_b$/24)$^2$ - ($d_{wc}$/24)$^2$) x 0.3 x $h_{fs}$ x 7.5 gal/ft$^3$ = 1.4 gal.
Assumed 30% porosity for filter sand.
Borehole Volume $\mathbf{V_b}$ = $V_{wc}$ + $V_{fs}$ = 1.6 gal.

**Minimum** volume to be purged for well development:
Five borehole volumes 5 x $V_b$ = 8 gal.
Volume of water added during well installatio + gal.
Minimum volume to be removed 8 gal.
**Maximum** volume not to exceed if water parameters do not stabilize. Check with **ERM** project manager.
Ten borehole volumes 10 x $V_b$ = 16 gal.
Volume of water added during well installatio + gal.
Maximum volume to be removed 16 gal.

MONITOR WELL DEVELOPMENT RECORD

Page 1 of 1

Method:
Field Instruments: peristaltic pump, YSI

Area: Whirlpool- Fort Smith, AK
Well No.: MW-50

| Time | Depth (ft) | Volume Removed (gal) | Volume Cumulative (gal) | pH (std units) | temp. (°C) | SC (µS/cm) | turbidity (NTU / FTU) | Color | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 4/15/2004 | | | | | | | | | |
| 1603 | | | | | | | | | begin pumping |
| 1606 | | | | 6.33 | 19.51 | 426 | 510 | | |
| 1609 | | | | | | | | | pumped dry |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
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MONITOR WELL DEVELOPMENT RECORD Date:________ Page ____ of ____

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Whirlpool Corporation, Inc.

# Conceptual Site Model

*Fort Smith, Arkansas*

August 2, 2002

W.O. #581-007

**Troy W. Meinen**

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# *1.0 INTRODUCTION*

## *1.1 SITE BACKGROUND*

The Whirlpool Fort Smith facility is located at 6400 Jenny Lind Road on the south side of Fort Smith, Arkansas (Figure 1-1). The facility manufactures side-by-side household refrigerators, trash compactors and icemakers. The facility has been operated by Whirlpool for over 30 years.

A series of soil and ground water studies were initiated at the site as part of a project to remove an underground fuel storage tank (UST). That work indicated that there was no evidence of releases of petroleum hydrocarbons from the UST. However, the analytical data showed the presence of trichloroethylene (TCE) and other solvents not related to the UST in the shallow ground water. Subsequent investigations, including a soil investigation to assess the potential source area, have been conducted to delineate the ground water plume.

Whirlpool has implemented a voluntary semi-annual ground water sampling program to monitor ground water conditions at the site. Studies are also currently under way to evaluate options for remediation of the on-site affected ground water.

Data from wells in the northern part of the facility indicate that TCE affected ground water is present near the northern boundary of the facility and may extend off site. In addition, recent site investigations indicate that there may be a limited northerly component to ground water flow. Based on these data, Whirlpool initiated discussions with the Arkansas Department of Environmental Quality (ADEQ) to enter a letter of agreement (LOA) to implement a Corrective Action Strategy (CAS) at the Whirlpool Facility.

## *1.2 OBJECTIVES OF THE CSM*

This Conceptual Site Model (CSM) has been prepared to fulfill the requirements specified in Section II. F. of the LOA dated (June 6). Based on the LOA, a CSM must be submitted at the scoping meeting that has been tentatively scheduled for August 14, 2002

Successful implementation of the CAS relies on the development of a complete, yet concise CSM. To that end, the CSM for the whirlpool facility was developed using readily available data to illustrate the relationship between potential constituents of concern (COCs), potential exposure pathways, and potential receptors. Specifically, this CSM will be used as the framework on which the implementation of the CAS will be based.

## 2.0 FACILITY PROFILE

### 2.1 SITE FEATURES

The facility consists of the main manufacturing building (approximately 1.3 million square feet), and adjoining warehouse and administrative offices (Figure 2-1). Additional buildings located on the north side of the property include a water treatment plant and boiler house. The majority of the property surrounding the buildings is covered with concrete or asphalt for parking. Some gravel parking areas are also present. An outdoor waste storage area is located on the south side of the manufacturing facility. This paved area is enclosed with a chain-link fence topped with razor wire.

As stated in the LOA, the focus of the CAS is the area north and northwest of the facility. The major structures in that portion of the facility are the water treatment plant and boiler house mentioned previously (Figure 2-2). However, historical records indicate that a small building located west of the boiler house was formerly used for degreasing operations. This small building has not been used since the mid 1980's.

### 2.2 FACILITY OPERATIONS

Whirlpool-Fort Smith is a refrigerator manufacturing facility. The manufacturing processes conducted at the site include polyurethane foaming, metal fabrication, plastic thermoforming and assembly operations. All storage of hazardous wastes is limited to 90 days or less in containers, no hazardous waste treatment activities are conducted on site. It is believed that constituents in the soils and groundwater identified in the facility investigation are the result of historical practices prior to 1980.

Dating back to approximately 1967, equipment degreasing operations utilizing trichloroethylene (TCE) were performed in the former degreaser building located near the northwestern corner of the main manufacturing building. The use of TCE was discontinued in the mid 1980's and the degreaser building is not currently used for any cleaning operations.

Based on verbal reports from former workers, the degreasing equipment consisted of a tank and a parts rack. The degreasing operations involved placing parts into the parts rack positioned over the tank. The TCE tank was then heated creating a TCE vapor in the area where the parts were placed. Following degreasing activities, the vapor was condensed and returned to the tank below the parts rack.

## 3.0 LAND USE AND EXPOSURE PROFILE

### 3.1 FACILITY AND ADJACENT PROPERTIES

The Whirlpool facility is a manufacturing and warehousing operation. No other specific land use categories are present on the property.

Surrounding property uses include light industrial/commercial activities to the south and east, residential to the north and undeveloped land to the west (Figure 3-1). Residential properties to the north include single-family homes and two multi-family units. No recreational or agricultural properties are located in the vicinity of the Whirlpool facility. In addition, schools, hospitals, day care centers, etc. are located at least 0.5 miles from the facility.

### 3.2 RESOURCE USE AND LOCATIONS

Based on the EPA ground water classification guidelines Ground water in the vicinity of the Whirlpool facility would be classified as Class IIB ground water (a potential drinking water source). Following EPA guidance, the area near the facility has been evaluated to identify potential groundwater use and ecological receptors.

As is detailed in Section 6.0 of this submittal, there are no ecologically vital areas within a two–mile radius of the Whirlpool facility.

A water well search was performed within a one-mile radius of the Whirlpool facility. No federal, state or public water supply wells were identified within the search distance (Figure 3-2). Drinking water and sanitary sewer services for both commercial/industrial and residential properties in the vicinity of the Whirlpool plant are supplied by the City of Fort Smith. Drinking water supplies include Lake Fort Smith, Lake Shepherd Springs and the Lee Creek Reservoir. These reservoirs are not located near the facility. (http://www.fsark.com/NewsReleases/Archive/2001-07-24SpecialReportWaterSupplyPlanning.html)

Additionally, available literature indicates that the majority of shallow wells in the Fort Smith area are completed in the McAlester Shale. Apparently, the thin alluvial deposits in the Fort Smith area (specifically those not associated with the Arkansas River) yield insufficient quantities of water to justify shallow wells. Most wells completed in the McAlester Shale are completed to depths up to 475 feet and produce poor quality water with yields of 25 to 75 gallons per minute.

### 3.3 APPLICABLE EXPOSURE SCENARIOS AND PATHWAYS

Whirlpool has conducted a survey of the land use and potential exposure scenarios/pathways in the immediate vicinity of the impacted area. Based on this survey, both industrial and residential exposure scenarios are potentially applicable. Industrial exposure pathways may include incidental soil ingestion, dermal contact with soil or inhalation or volatiles by a construction or maintenance worker. Residential pathways appear to be limited to inhalation of volatiles through the use of underground storm shelters at locations immediately north of the plant (across Ingersoll Avenue.).

## 4.0 PHYSICAL PROFILE

### 4.1 TOPOGRAPHY

The facility is situated near the crest of a low hill such that the topography of the Whirlpool facility gently slopes to the east-northeast along the northern portion of the facility, and to the south-southeast along the southern portion of the facility. The location of the site is identified on the USGS 7.5 min. topographic quadrangle for Fort Smith, Arkansas in Figures 3-1 and 3-2). The site is located outside the 100-year and 500-year floodplains.

Drainage ditches are located along Ingersoll Avenue on the north side of the facility and along Jenny Lind Road on the east side of the facility. Surface water generally flows toward the northeast corner of the facility where it enters the city storm sewer system under Jenny Lind Road and flows toward Mill Creek.

### 4.2 GEOLOGY

The geology of the Fort Smith area of Western Arkansas is generally characterized by Pennsylvanian age sediments. The Whirlpool facility, situated on the Northwestern flank of the Massard Prairie Anticline, overlies Quaternary Alluvium and gently dipping Pennsylvanian McAlester Shale.

Quaternary Alluvium is present from ground surface to a depth of 29 to 37 feet at the Whirlpool facility. Site boring logs and previous site literature indicate the alluvium is generally composed of a shallow fine-grained unit, and a coarse-textured basal unit (Figures 4-1 and 4-2).

The Upper Fine-Grained unit exhibits significant variations in lithologic texture throughout the site and with depth, generally varying from fine-grained silt to sandy clay. In general, the central portion of this unit (from 4 to 10 feet below ground surface (bgs)) consists of sandy clay. The thickness of this sandy-clay zone is highly variable; ranging from a maximum thickness of approximately 13 feet to 1 foot or less at many locations. This sandy-clay zone is not recognizable in approximately half of the borings at the site.

The lower unit of the alluvium at the site, commonly referred to as the Basal Aquifer, consists of sands and gravels. The upper portion of the Basal Aquifer unit is typically composed of a fine-grained silty sand to sandy silt. This sandy silt grades to a sandy gravel with depth in the lower portrion. Where present, the silty sand portion of the unit is from 5 to 10 feet thick and forms a gradational transition between the Upper Fine-Grained unit and the Basal Aquifer.

The sandy gravel at the base of the Basal Aquifer is commonly 3 to 6 feet thick and has variable amounts of clay and silt. This sand and gavel layer is present in the majority of the borings at the site and it rests unconformably on either weathered shale or clay associated with the weathered shale.

The alluvial units are underlain by the McAlester Shale. This formation ranges up to 1000 feet thick in the Fort Smith region. In the vicinity of the Whirlpool facility the upper portion has been eroded leaving a thickness of 100 to 500 feet. The full thickness of the McAlester Shale immediately beneath the Whirlpool facility has not been determined.

Based on the site boring logs, the top of the shale is present from 26 to 35 feet bgs (Figure 4-3). The upper portion of the shale is typically silty, black to dark-gray, fissile, micaceous shale. Commonly, there is a thin veneer of friable red-orange to gray-brown clay between the base of the gravel zone and the weathered shale. This clay typically grades to the black or dark gray shale of the McAlester Formation.

Soil boring logs, cone penetrometer test logs and monitoring well completion details are provided in Appendix A.

### *4.3 HYDROGEOLOGY*

The facility has been conducting ground water monitoring activities since 1989. Water level measurements from these sampling events, indicate that the predominate direction of shallow ground water flow during fall is to the south and southwest (Figure 4-4). This dominant flow direction, however, changes during the spring to the southeast (Figure 4-5). In addition, recent information implies that ground water flow in the northern portion of the site may have a limited northerly component.

Based on data from numerous ground water investigations at the site, the Basal Aquifer is semi-confined. Calculated hydraulic conductivity values for the Basal Aquifer unit range from 1.74 x 10-4 cm/s up to 1.0 x 10-2 cm/s. One aquifer pumping test conducted at the facility indicated that the average hydraulic conductivity for the north side of the facility is 4.6 x 10-3 cm/s based on an aquifer thickness of 16 feet. The storage coefficient was estimated at 6.5 x 10-3.

Ground water flow velocity for the northern portion of the facility has been calculated at 24 feet per year. Based on a limited number of borings and piezometers installed north of the site, it appears the basal coarse-grained formation pinches out to the north and, consequently, additional studies are needed to assess the potential and characteristics of off-site, northerly ground water flow.

## *5.0 RELEASE PROFILE*

As discussed in Section 3, equipment degreasing operations utilizing TCE were previously performed at the facility. However, the use of TCE was discontinued in the mid 1980's and the degreaser building is no longer used for any cleaning operations.

There are no historical records that document any specific spills or other release incidents from the degreaser building. However, it is possible that historical leaks from the tank may have occurred, resulting in releases to the soil and ground water.

Based on historical process knowledge, and recent analytical data, the major constituent of concern (COC) is TCE. Daughter products (including tetrachloroethene, cis- and trans-1,2 dichloroethylene, 1,1-dichloroethylene, and vinyl chloride) resulting from degredation of TCE have also been periodically detected in site wells.

Analytical data from the monitoring well system show that the majority of the affected ground water has migrated from the apparent source area (near MW-25) in a southerly and southwesterly direction under the northwest corner of the main manufacturing building (Figure 5-1). The extent of affected ground water to the south and southwest appears to be limited to the Whirlpool property; that is, the ground water plume does not extend off site in that direction. However, recent data from wells north of the main building, along the north side of Ingersoll Avenue (MW-23, MW-31 through MW-33), indicate that affected ground water is present near the north boundary of the Whirlpool facility and extends off site in a limited area (Figure 5-1).

## 6.0 ECOLOGICAL PROFILE

The Whirlpool Fort Smith facility consists of approximately 153 acres. Approximately 21 acres are undeveloped and consist of open grassy areas on the southwestern portion of the property. As indicated previously, the developed portion of the property consists of a warehouse, manufacturing facility and water treatment plant. Concrete driveways and concrete and asphalt parking areas surround the structures. Residential areas are located to the north and south of the property, and commercial industrial properties are located to the east and west.

City of Fort Smith stormwater drainage ditches are located along the northern and eastern boundaries of the property along Ingersoll Avenue and Jenny Lind Road, respectively.

In accordance with the requirements of the CAS an assessment to identify potential endangered and threatened species habitat in the vicinity of the facility has been requested from the U.S Fish and Wildlife Service.

There are no wetlands or gaining streams located north of the facility. Therefore, off-site migration of affected ground water to the north of the facility does not appear to impact any surface water features. Data collected during limited off-site investigation activities indicate that only off-site ground water is affected. Affected off-site soils have not been encountered.

An intermittent drainage channel is also located on the west side of the property and appears to drain to an unnamed tributary of the Poteau River approximately 1.0 mile to the west. The nearest major surface water body is Mill Creek located approximately 0.25-mile to 0.5-mile east of the property. All of these features are located outside of the limit of affected ground water. Based on this profile, it appears that there are no complete exposure pathways from the affected ground water to any ecological receptors in the vicinity of the facility.

## *7.0 RISK MANAGEMENT PROFILE*

Once additional data is collected and this CSM will be updated. That additional information will then be used to develop a risk management profile for the site. The risk management profile will include the following components:

- Summary of risks
- Impact of a risk management activity on release and exposure characteristics
- Performance monitoring locations and media
- Contingency plans

# Figures

*August 2, 2002*
*W.O. # 581-007*

**Environmental Resources Management**
16300 Katy Freeway, Suite 300
Houston, Texas 77094-1611
(281) 600-1000


SOURCE: U.S.G.S. 7.5' QUADRANGLE, SOUTH FORT SMITH, ARK.-OKLA., 1987.

**ERM-Southwest, Inc.**

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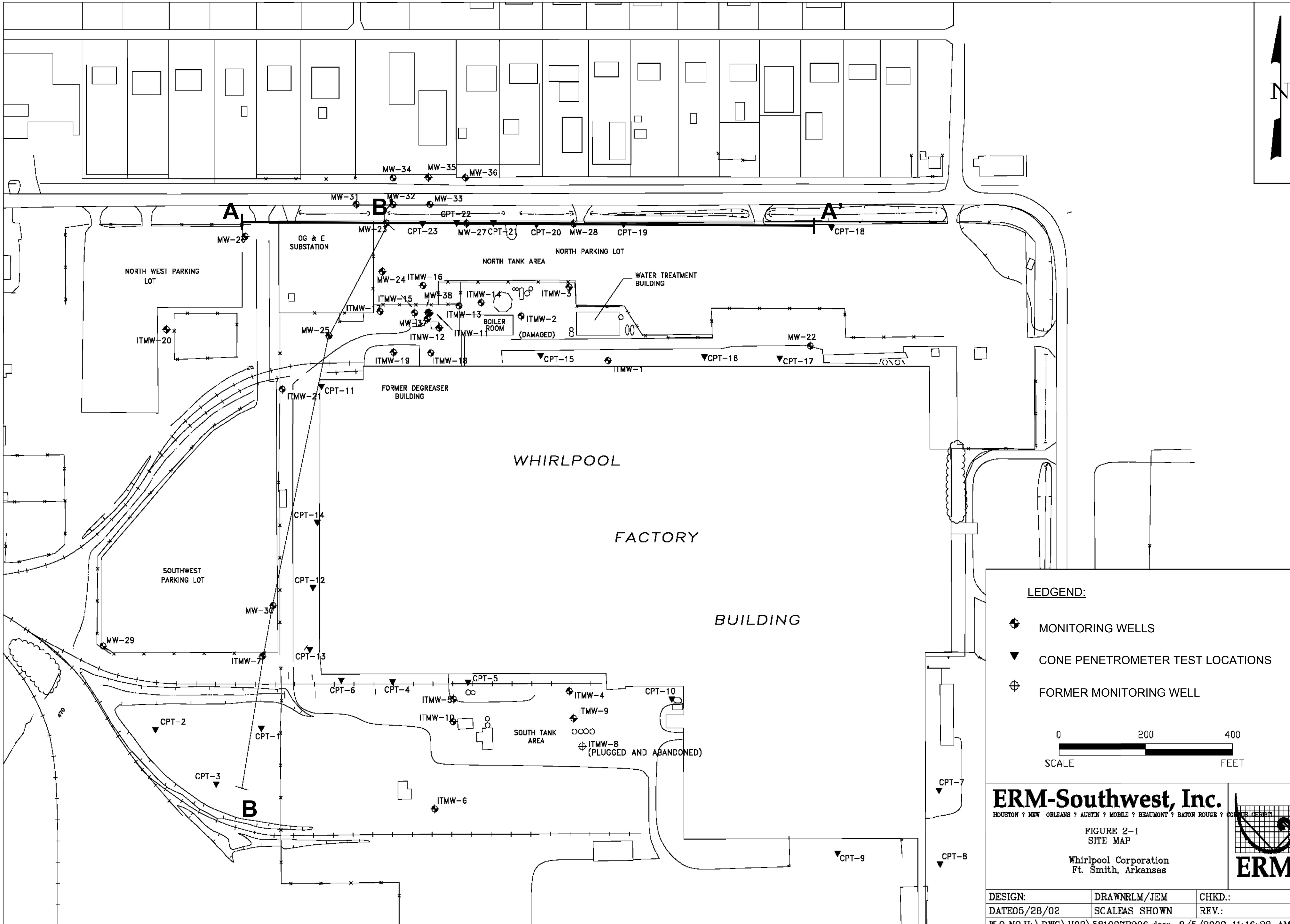
FIGURE 1-1
SITE LOCATION MAP
Whirlpool Corporation
Fort Smith, Arkansas

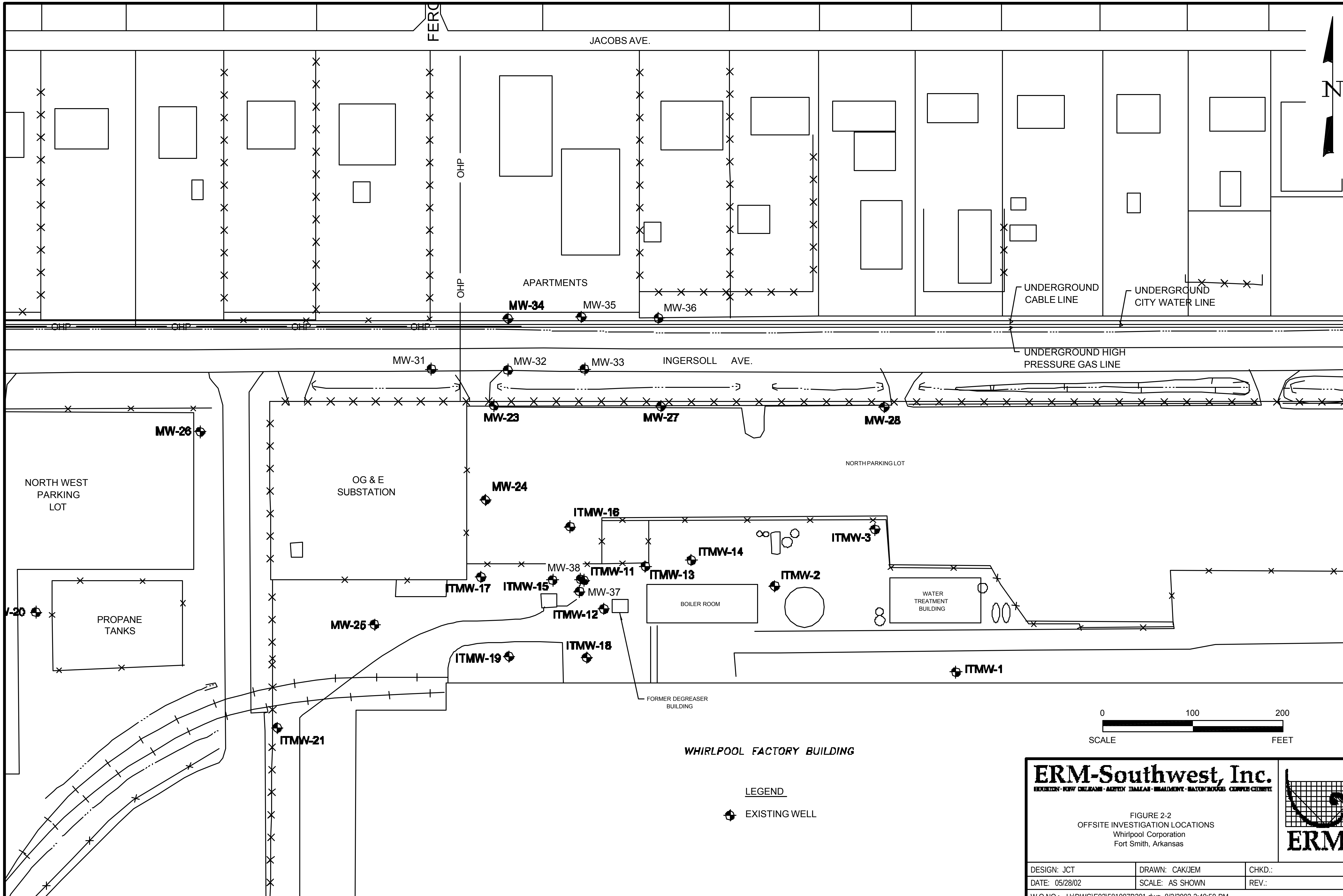
ERM

| | | | |
|---|---|---|---|
| DESIGN: | CHKD.: SK | DATE: 10/23/00 | REV.: |
| DRAWN: EFC | SCALE: AS SHOWN | W.O.NO.: 581002A001 J00 | |

g:\2004\006296\0014507\5578Hfig1-1.pdf



N
A
A'
B
B
MW-34
MW-35
MW-36
MW-31
MW-32
MW-33
CPT-22
MW-23
CPT-23
MW-27
CPT-21
CPT-20
MW-28
CPT-19
CPT-18
MW-26
OG & E SUBSTATION
NORTH TANK AREA
NORTH PARKING LOT
NORTH WEST PARKING LOT
WATER TREATMENT BUILDING
MW-24
ITMW-16
ITMW-15
MW-38
ITMW-14
ITMW-3
ITMW-17
ITMW-13
ITMW-2
(DAMAGED)
MW-37
BOILER ROOM
ITMW-11
ITMW-12
MW-25
ITMW-20
ITMW-19
ITMW-18
CPT-15
ITMW-1
CPT-16
CPT-17
MW-22
ITMW-21
CPT-11
FORMER DEGREASER BUILDING
WHIRLPOOL
FACTORY
BUILDING
CPT-14
SOUTHWEST PARKING LOT
CPT-12
MW-30
MW-29
ITMW-7
CPT-13
CPT-6
CPT-4
CPT-5
ITMW-5
ITMW-4
CPT-10
ITMW-9
ITMW-10
SOUTH TANK AREA
ITMW-8
(PLUGGED AND ABANDONED)
CPT-2
CPT-1
CPT-3
ITMW-6
CPT-9
CPT-7
CPT-8
470
LEDGEND:
MONITORING WELLS
CONE PENETROMETER TEST LOCATIONS
FORMER MONITORING WELL
0
200
400
SCALE
FEET
ERM-Southwest, Inc.
FIGURE 2-1
SITE MAP
Whirlpool Corporation
Ft. Smith, Arkansas
ERM
DESIGN:
DRAWNRLM/JEM
CHKD.:
DATE05/28/02
SCALEAS SHOWN
REV.:
W.O.NO.H:\DWG\H02\581007B206.dwg, 8/5/2002 11:16:23 AM

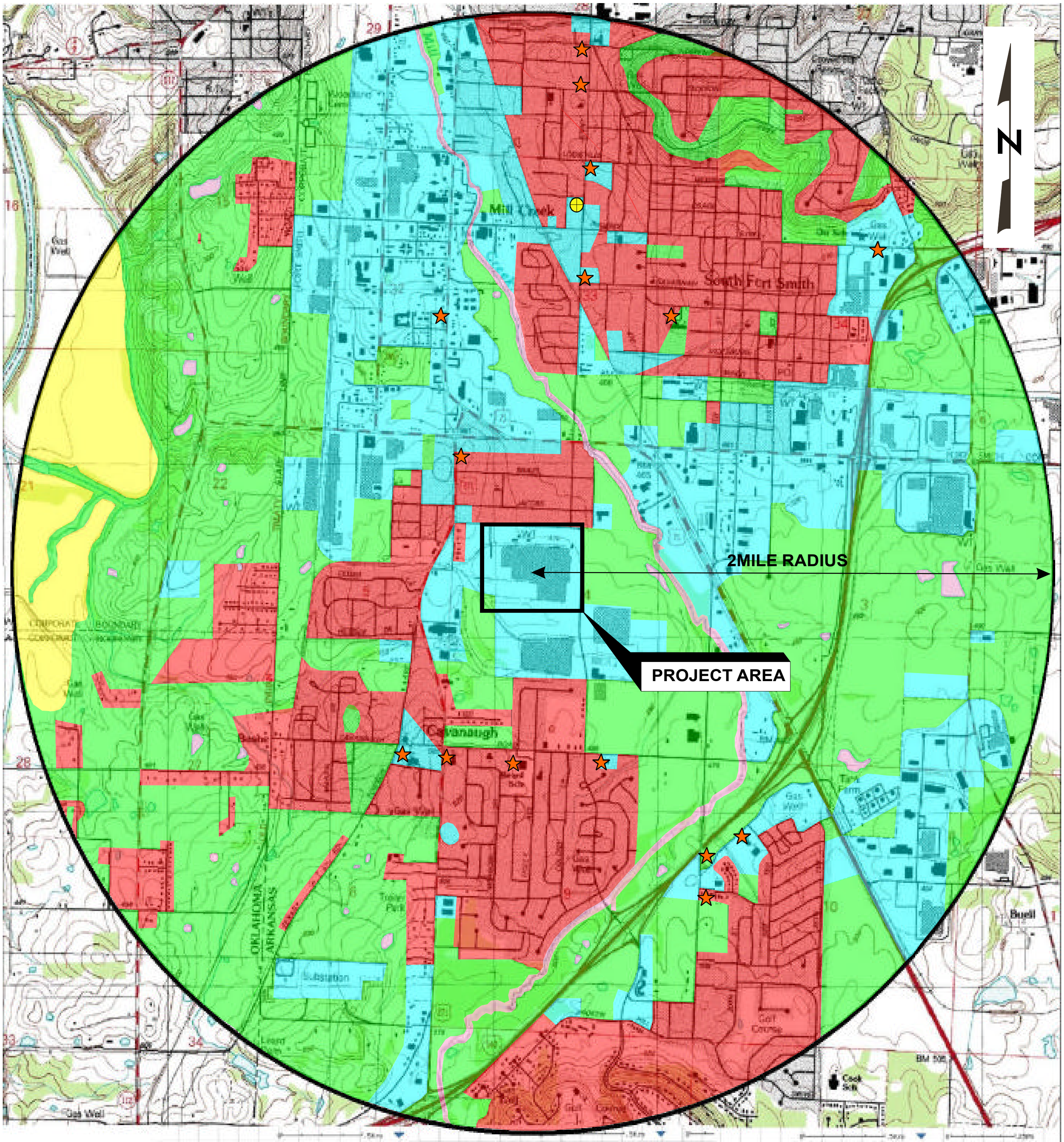



ERM-Southwest, Inc.

FIGURE 2-2
OFFSITE INVESTIGATION LOCATIONS
Whirlpool Corporation
Fort Smith, Arkansas

ERM.

| | | |
|---|---|---|
| DESIGN: JCT | DRAWN: CAK/JEM | CHKD.: |
| DATE: 05/28/02 | SCALE: AS SHOWN | REV.: |
| W.O.NO.: H:\DWG\E02\581007B201.dwg, 8/2/2002 2:40:59 PM | | |




SOURCE: U.S.G.S. 7.5 Minute Quadrangle, South Forth Smith, Arkansas, 1973

0 3000 6000
SCALE FEET

LEGEND:

- RESIDENTIAL
- UNDERDEVELOPED
- AGRICULTURAL
- COMMERCIAL / INDUSTRIAL
- SURFACE WATER
- HOSPITAL
- SCHOOL / DAYCARE

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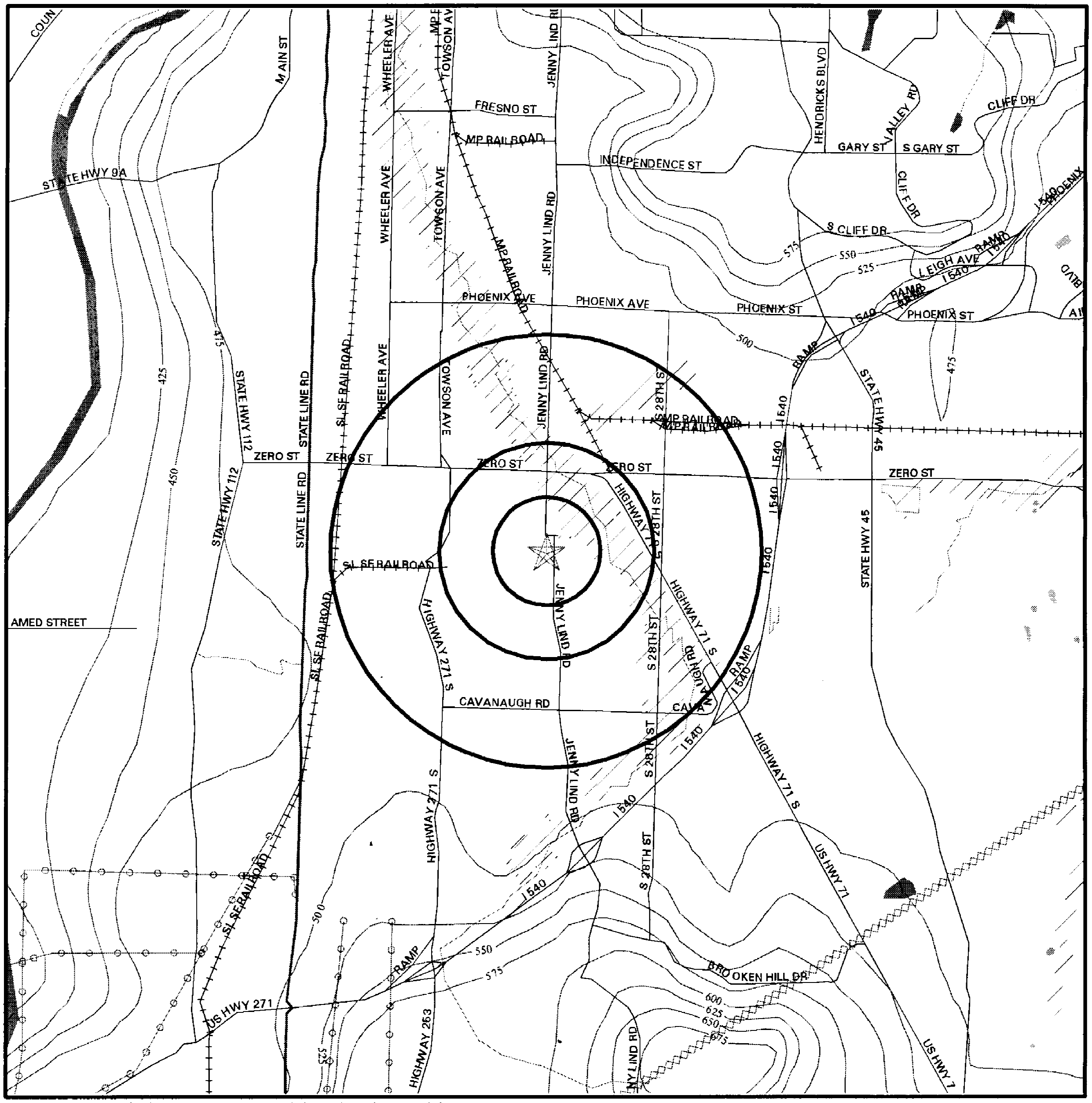
FIGURE 3-1
LAND USE MAP
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| | | | |
|---|---|---|---|
| DESIGN: JCT | CHKD.: TM | DATE: 05/31/02 | REV.: 0 |
| DRAWN: JEM | SCALE: AS SHOWN | W.O.NO.: 581007A208 E02 | |

TOPOGRAPHIC MAP –591164.1s –'ERM –Southwest, Inc.'




Source: US Geological Survey 1-Degree Digital Elevation Model
Compiled 09/15/92

0 1/2 1 2
scale in miles

N

–Major Roads
–Contour lines (25 foot interval unless otherwise shown)
–Waterways
–Wells within search distance to Target Property
–Earthquake Epicenters (Richter 5 or greater)
–Power lines
–Pipe lines
–Fault lines
–Water
–Wetlands
–100-year flood zone
–500-year flood zone

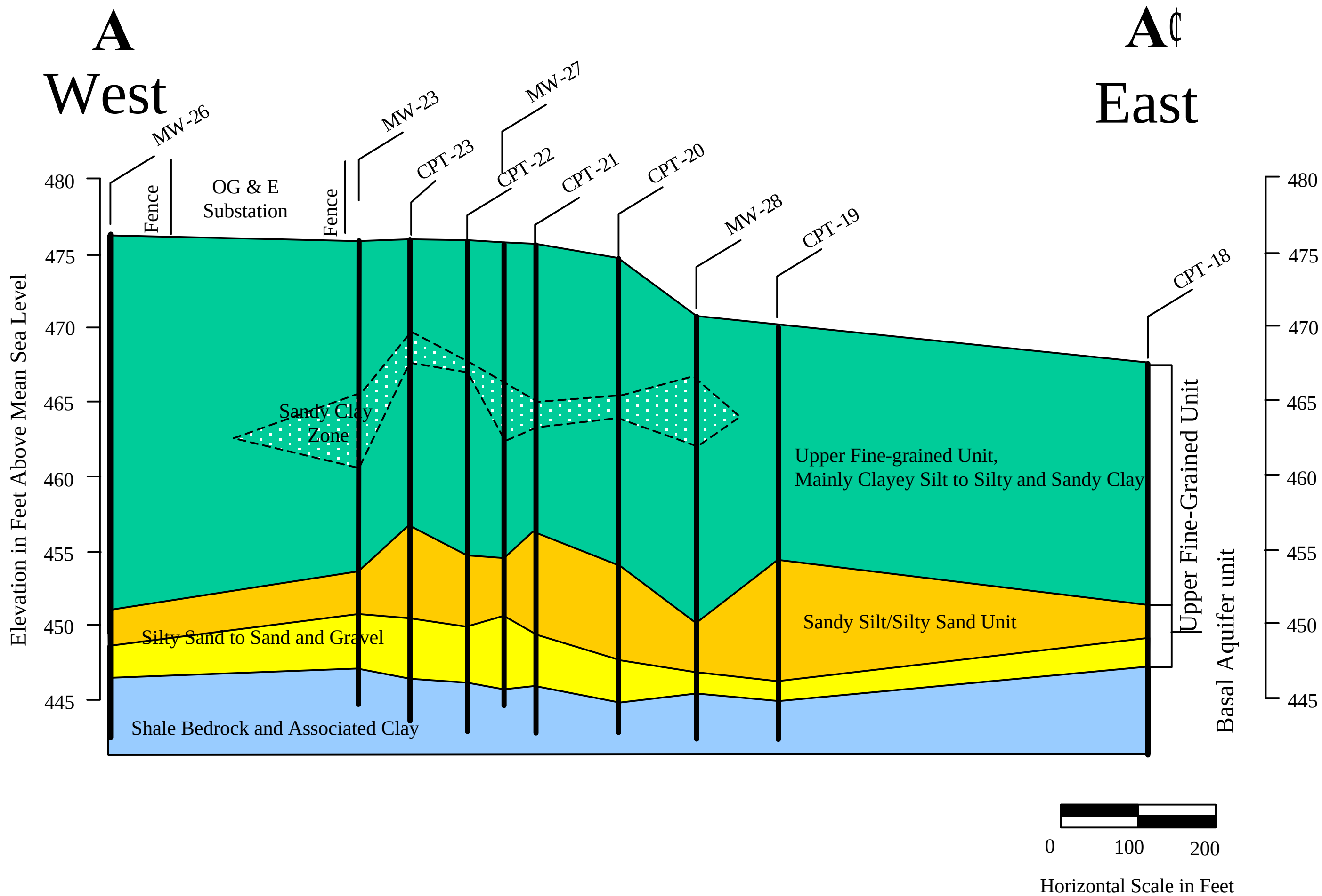
| | | | |
|---|---|---|---|
| TARGET PROPERTY: | Whirlpool Corporation | CUSTOMER: | ERM –Southwest, Inc. |
| ADDRESS: | 6400 Jenny Lind Rd | CONTACT: | Roberta Smith |
| CITY/STATE/ZIP: | Fort Smith AR 72908 | INQUIRY #: | 591164.1s |
| LAT/LONG: | 35.3224 / 94.4137 | DATE: | February 02, 2001 |

**ERM-Southwest, Inc.**
HOUSTON · NEW ORLEANS · AUSTIN · DALLAS · BEAUMONT · BATON ROUGE · CORPUS CHRISTI

FIGURE 3-2
WATER WELL RADIUS SEARCH RESULTS
Whirlpool Corporation
Fort Smith, Arkansas

| | | |
|---|---|---|
| DESIGN: | DRAWN: | CHKD.: |
| DATE: 05/23/02 | SCALE: AS SHOWN | REV.: |
| W.O.NO.: H:\DWG\E02\581007A207.dwg, 8/2/2002 2:14:22 PM | | |

ERM

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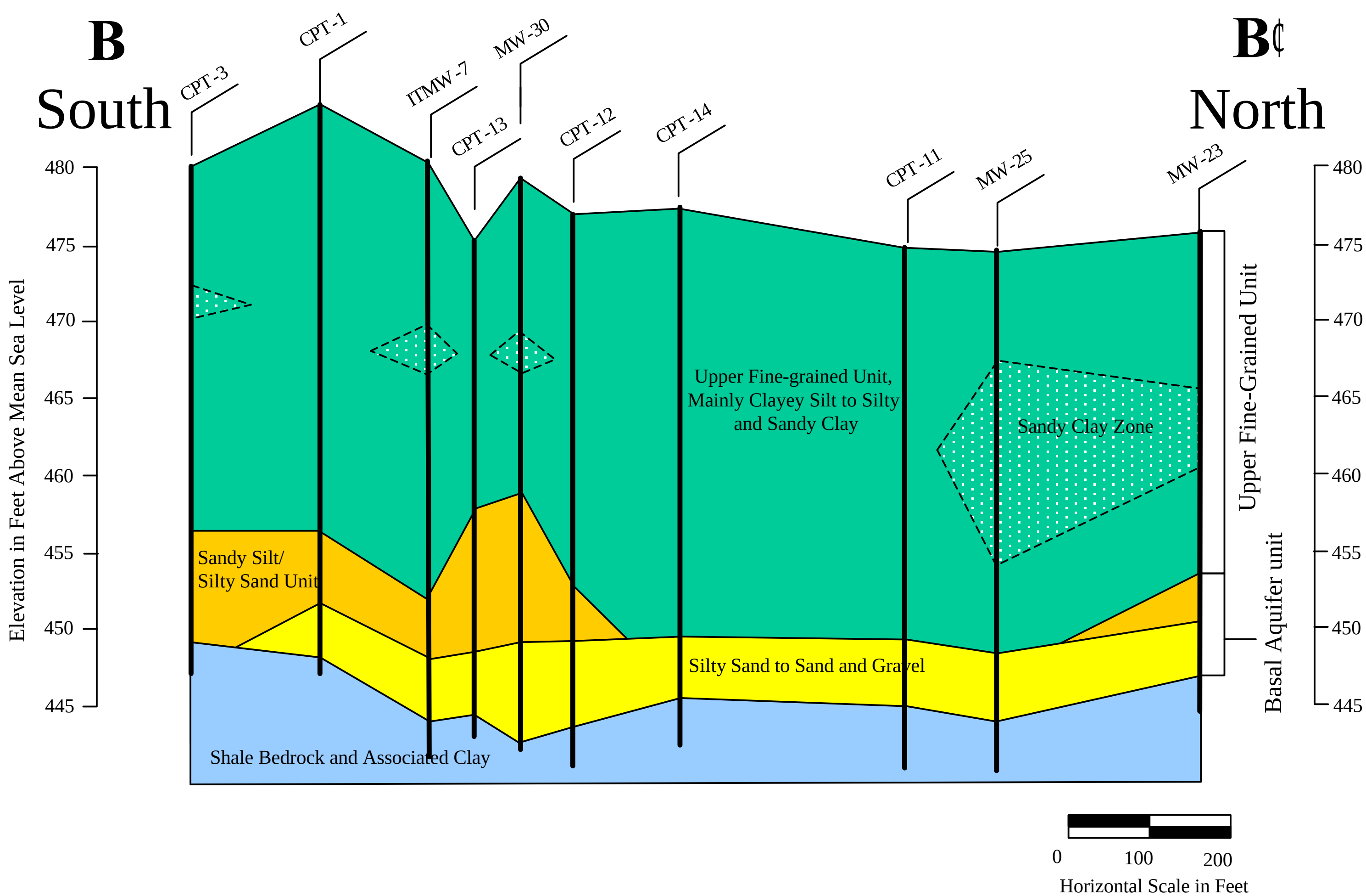
| | | | |
|---|---|---|---|
| DESIGN: | CHKD.: | DATE: 05/21/02 | REV.: |
| DRAWN: | SCALE:AS SHOWN | W.O.NO.: | 581007A205 H02 |

FIGURE 4-1
Cross Section along Ingersoll Avenue
Whirlpool Corporation
Fort Smith, Arkansas

ERM®



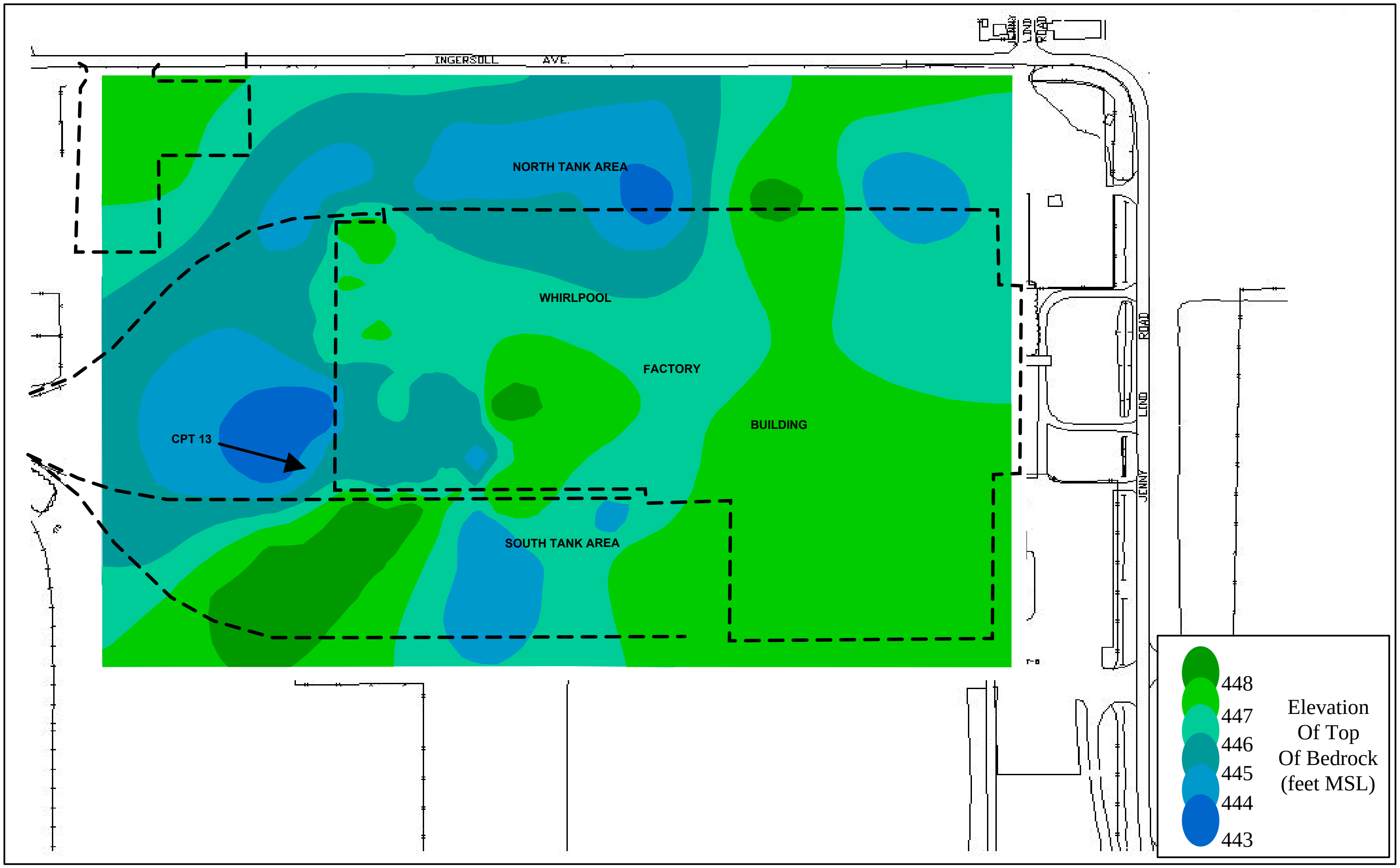

ERM-Southwest, Inc.

HOUSTON • NEW ORLEANS • AUSTIN • DALLAS • BEAUMONT • BATON ROUGE

| | | | |
|---|---|---|---|
| DESIGN: | CHKD.: | DATE: 05/21/02 | REV.: |
| DRAWN: | SCALE:AS SHOWN | W.O.NO.: 581007A205 E02 | |

FIGURE 4-2
Cross Section Along West Side of Building
Whirlpool Corporation
Fort Smith, Arkansas

ERM




ERM-Southwest, Inc.

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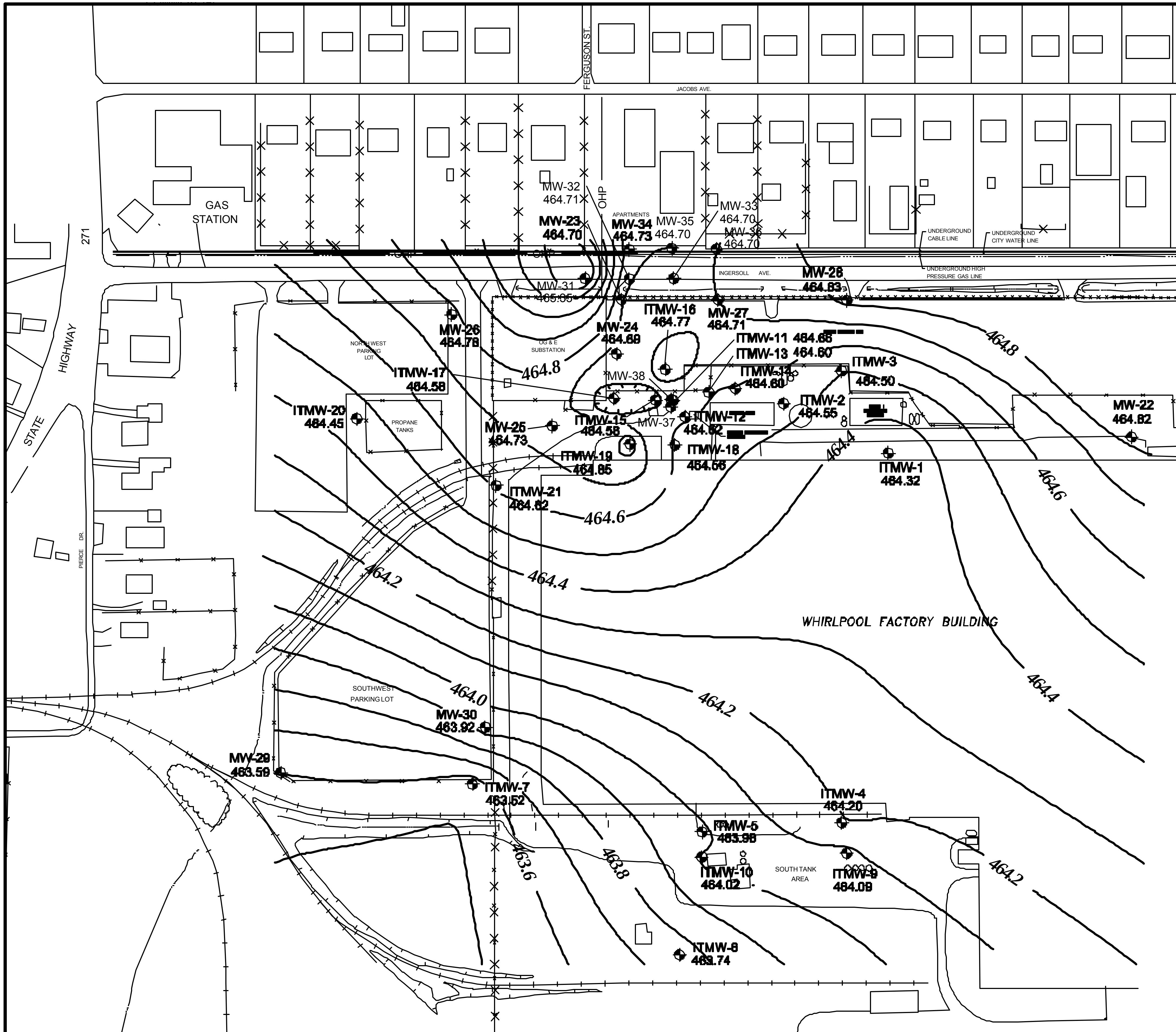
| | | | |
|---|---|---|---|
| DESIGN: | CHKD.: | DATE: 07/31/02 | REV.: |
| DRAWN: | SCALE: AS SHOWN | W.O.NO.: 581007A210.ppt G02 | |

FIGURE 4-3
Contour Map of McAlester Shale Surface
Whirlpool corporation
Fort Smith, Arkansas

ERM




LEGEND

MW-26 464.98 EXISTING MONITORING WELL

464.0 GROUND WATER CONTOUR LINE (FEET, MSL) (CONTOUR INTERVAL = 0.1 FEET)

NOTES:

1. DATA RECORDED ON SEPTEMBER 10, 2001.
2. CONTOURS UNDER THE FACTORY BUILDING ARE INFERRED.
3. LOCATIONS FOR WELLS ITMW-37 AND ITMW-38 ARE APPROXIMATE AND WILL BE UPDATED WHEN SURVEY DATA ARE RECEIVED.

0 200 400
SCALE FEET

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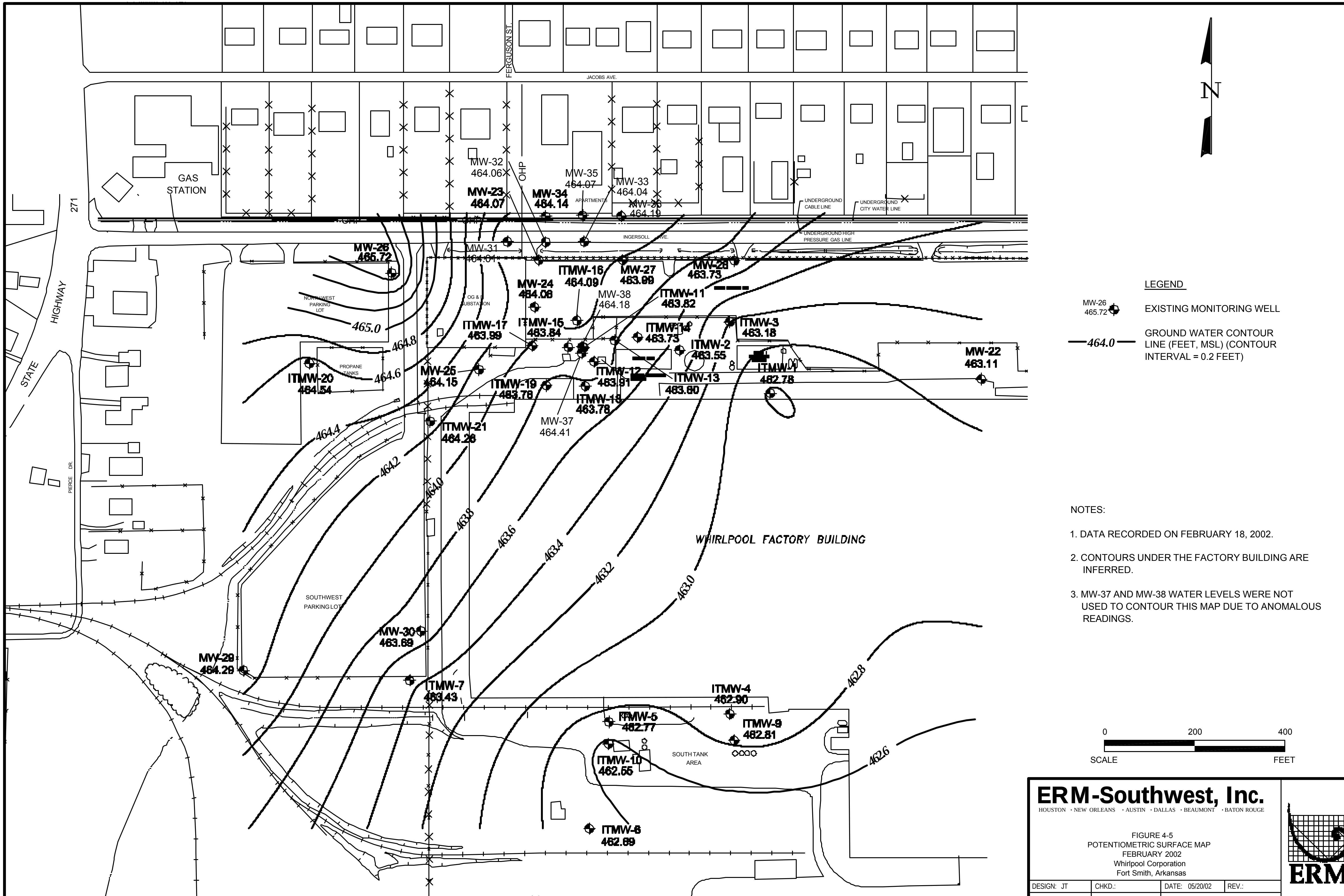
FIGURE 4-4
POTENTIOMETRIC SURFACE MAP
SEPTEMBER 2001
Whirlpool Corporation
Fort Smith, Arkansas

| | | | |
|---|---|---|---|
| DESIGN: JT | CHKD.: | DATE: 05/28/02 | REV.: |
| DRAWN: LMc/JEM | SCALE: AS SHOWN | W.O.NO.: 581007B202 E02 | |

ERM




NOTES:

1. DATA RECORDED ON FEBRUARY 18, 2002.
2. CONTOURS UNDER THE FACTORY BUILDING ARE INFERRED.
3. MW-37 AND MW-38 WATER LEVELS WERE NOT USED TO CONTOUR THIS MAP DUE TO ANOMALOUS READINGS.

**ERM-Southwest, Inc.**

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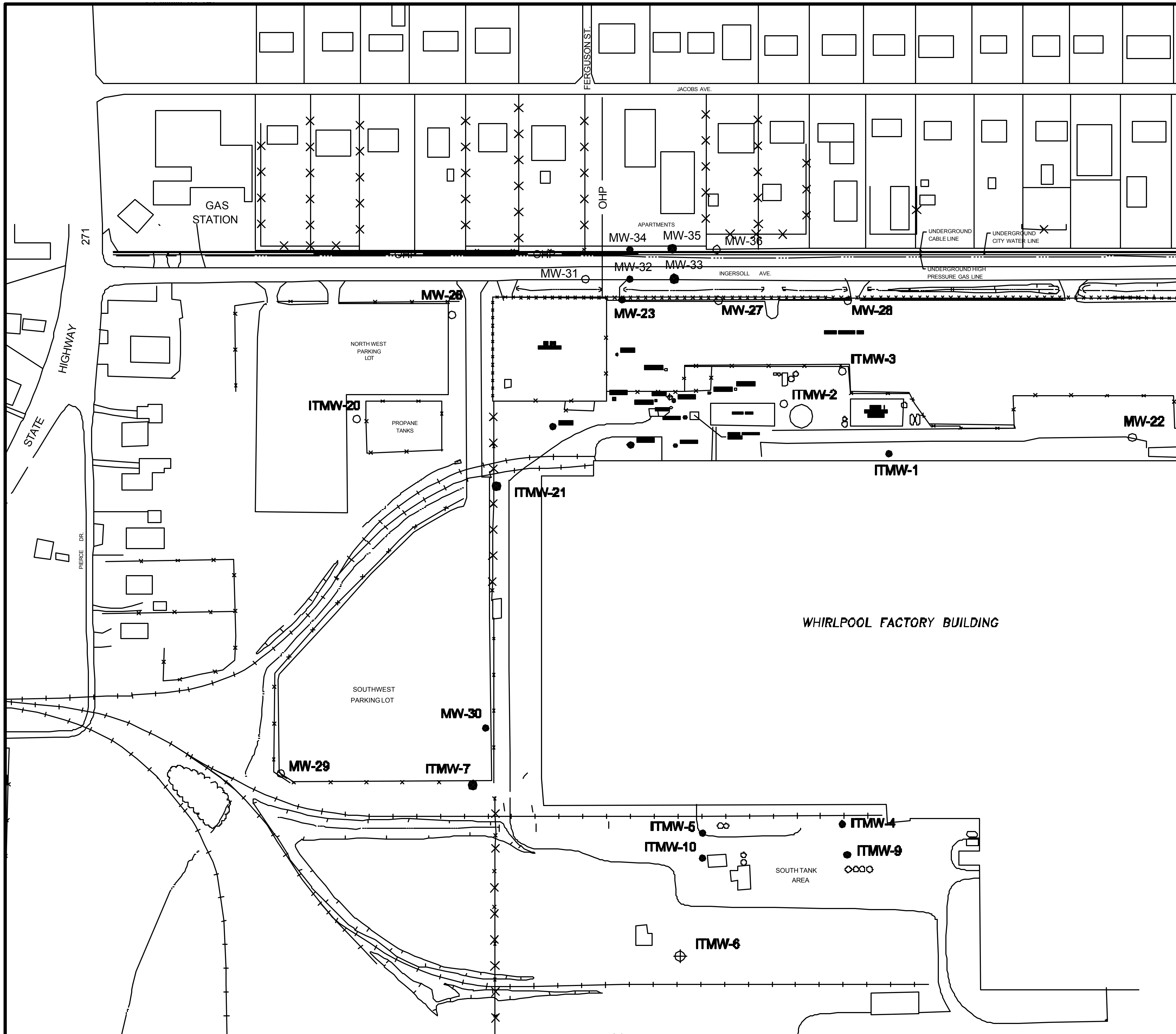
FIGURE 4-5
POTENTIOMETRIC SURFACE MAP
FEBRUARY 2002
Whirlpool Corporation
Fort Smith, Arkansas

| | | | |
|---|---|---|---|
| DESIGN: JT | CHKD.: | DATE: 05/20/02 | REV.: |
| DRAWN: CAK | SCALE: AS SHOWN | W.O.NO.: 581007B203 E02 | |

ERM




LEGEND

MW-26 EXISTING MONITORING WELL SAMPLED USING TRADITIONAL PURGE METHOD

EXISTING MONITORING WELL NOT SAMPLED USING TRADITIONAL PURGE METHOD

TCE CONCENTRATION (mg/l)
FEBRUARY 2002

- < 0.005
- 0.005 to 0.10
- 0.10 to 1.00
- 1.00 to 10.0
- > 10.0

NOTE:

1) MW-38 WAS USED AS AN INJECTION WELL FOR THE PILOT STUDY AND WAS NOT SAMPLED IN FEBRUARY 2002.

0 200 400
SCALE FEET

**ERM-Southwest, Inc.**
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FIGURE 5-1
TCE ISOCONCENTRATION MAP
FEBRUARY 2002
TRADITIONAL SAMPLE METHOD
Whirlpool Corporation
Fort Smith, Arkansas

| | | | |
|---|---|---|---|
| DESIGN: JT | CHKD.: | DATE: 05/28/02 | REV.: |
| DRAWN: LMc/JEM | SCALE: AS SHOWN | W.O.NO.: 581009B202 E02 | |

ERM

# Boring Logs
*Appendix A*

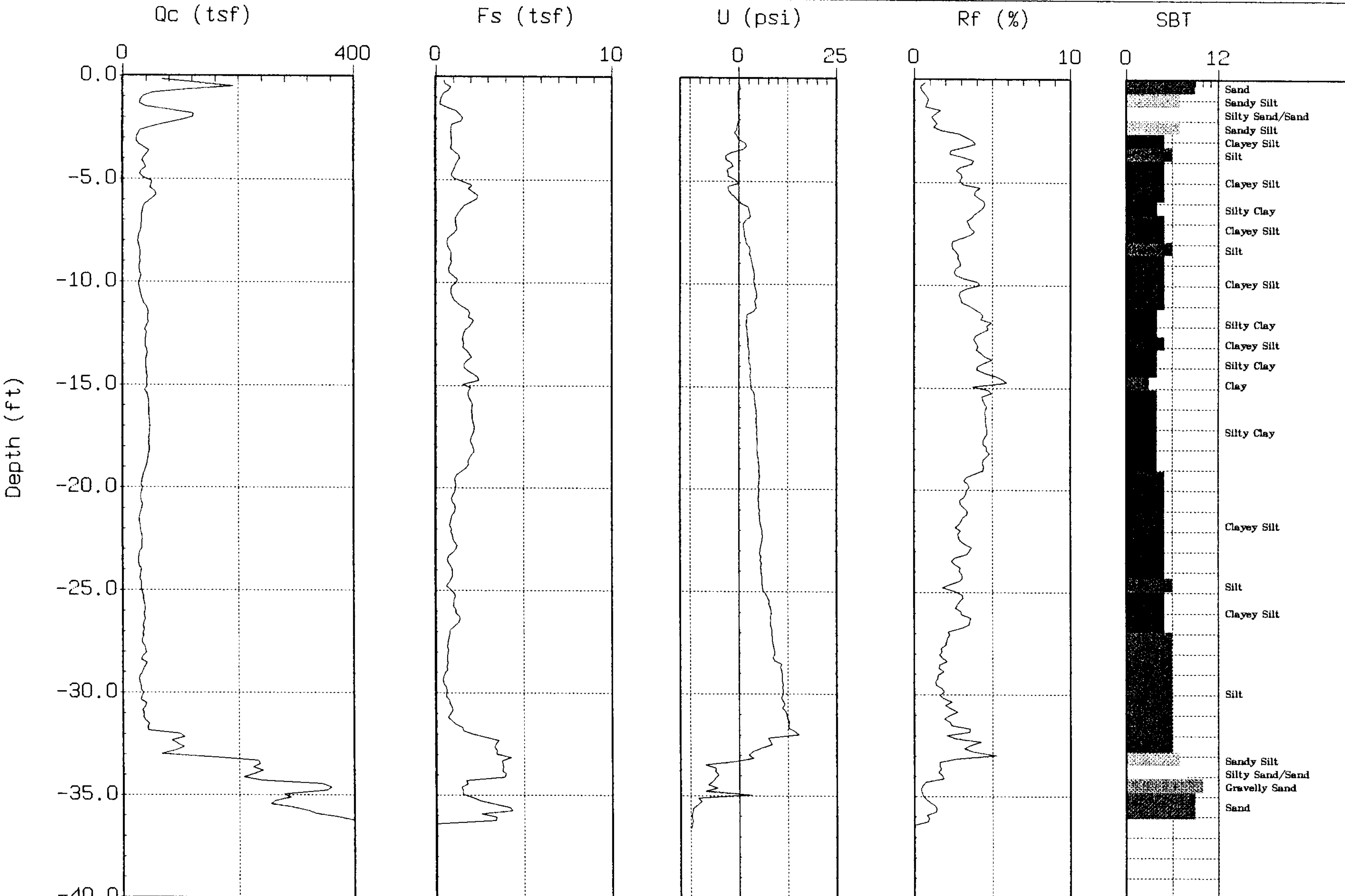
*August 2, 2002*
*W.O. # 581-007*

**Environmental Resources Management**
16300 Katy Freeway, Suite 300
Houston, Texas 77094-1611
(281) 600-1000

ERM Southwest

Site : WHIRLPOOL
Location : CPT-01

Geologist : Lori Pfeil
Date : 10:25:99 09:57




Max. Depth: 36.58 (ft)

Depth Inc.: 0.164 (ft)

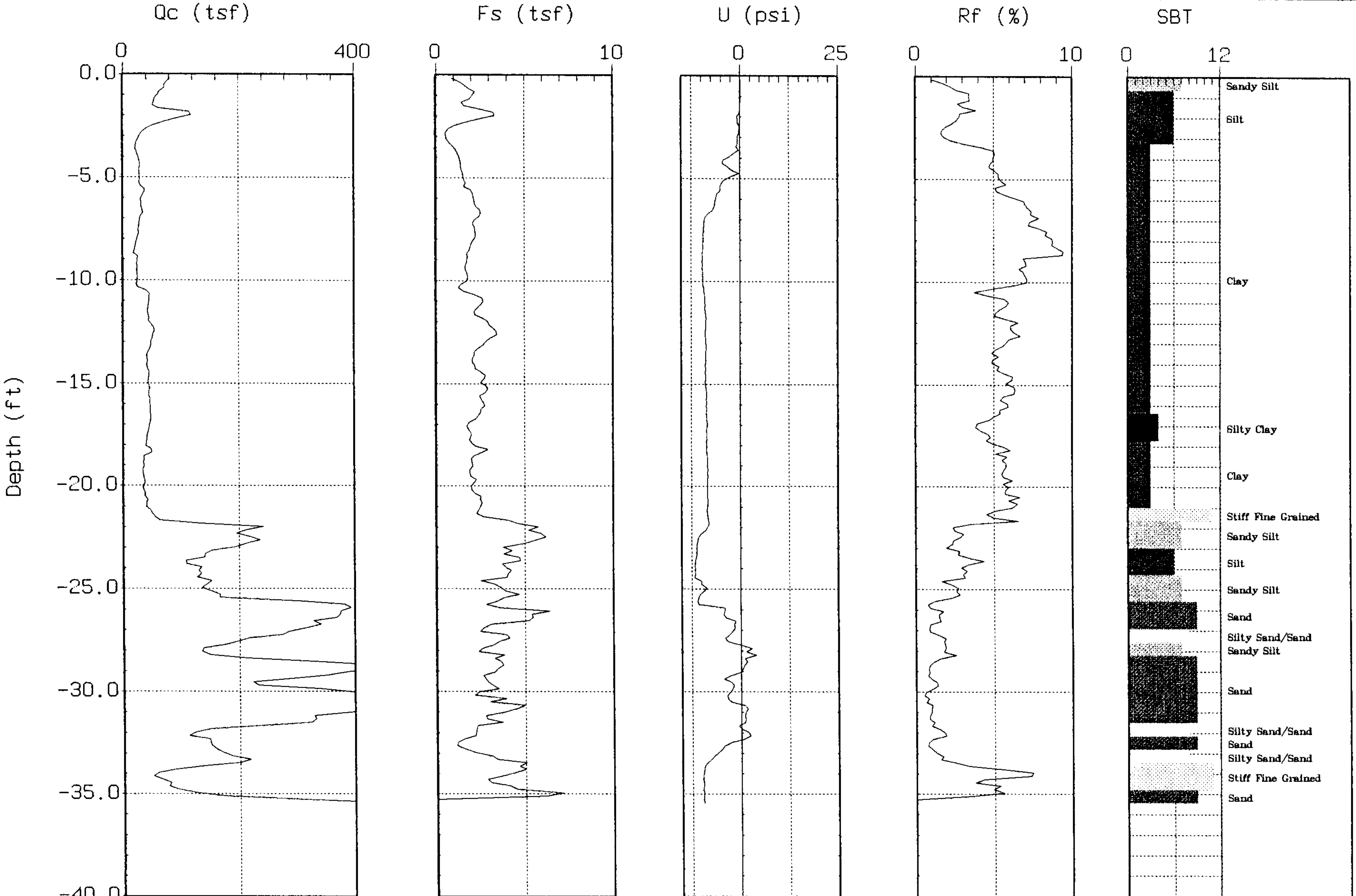
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

# ERM Southwest

Site : WHIRLPOOL
Location : CPT-02

Geologist: Lori Pfeil
Date : 10:25:99 10:52




Max. Depth: 35.43 (ft)

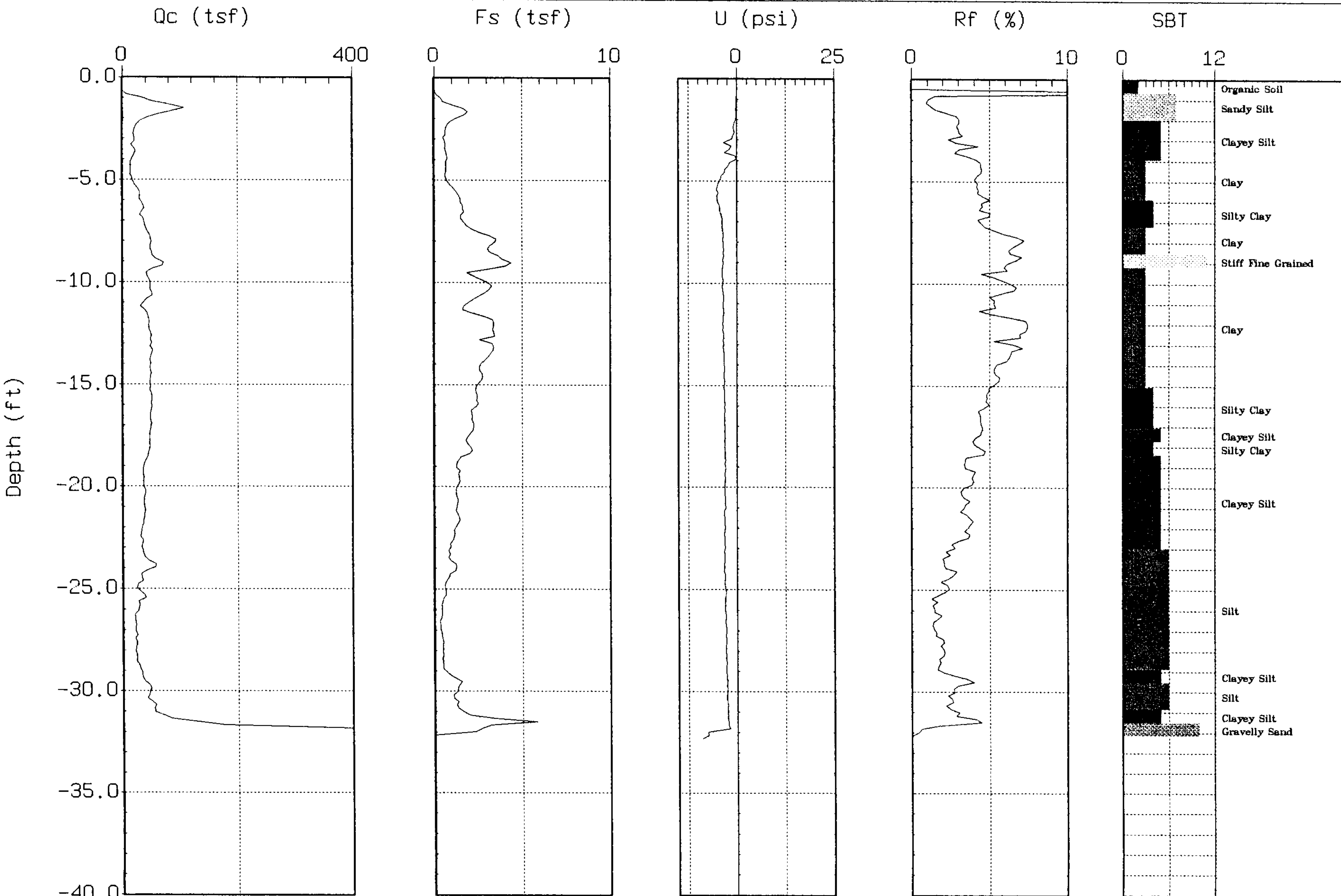
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site : WHIRLPOOL
Location : CPT-03

Geologist: Lori Pfeil
Date : 10:25:99 11:35




Max. Depth: 32.32 (ft)

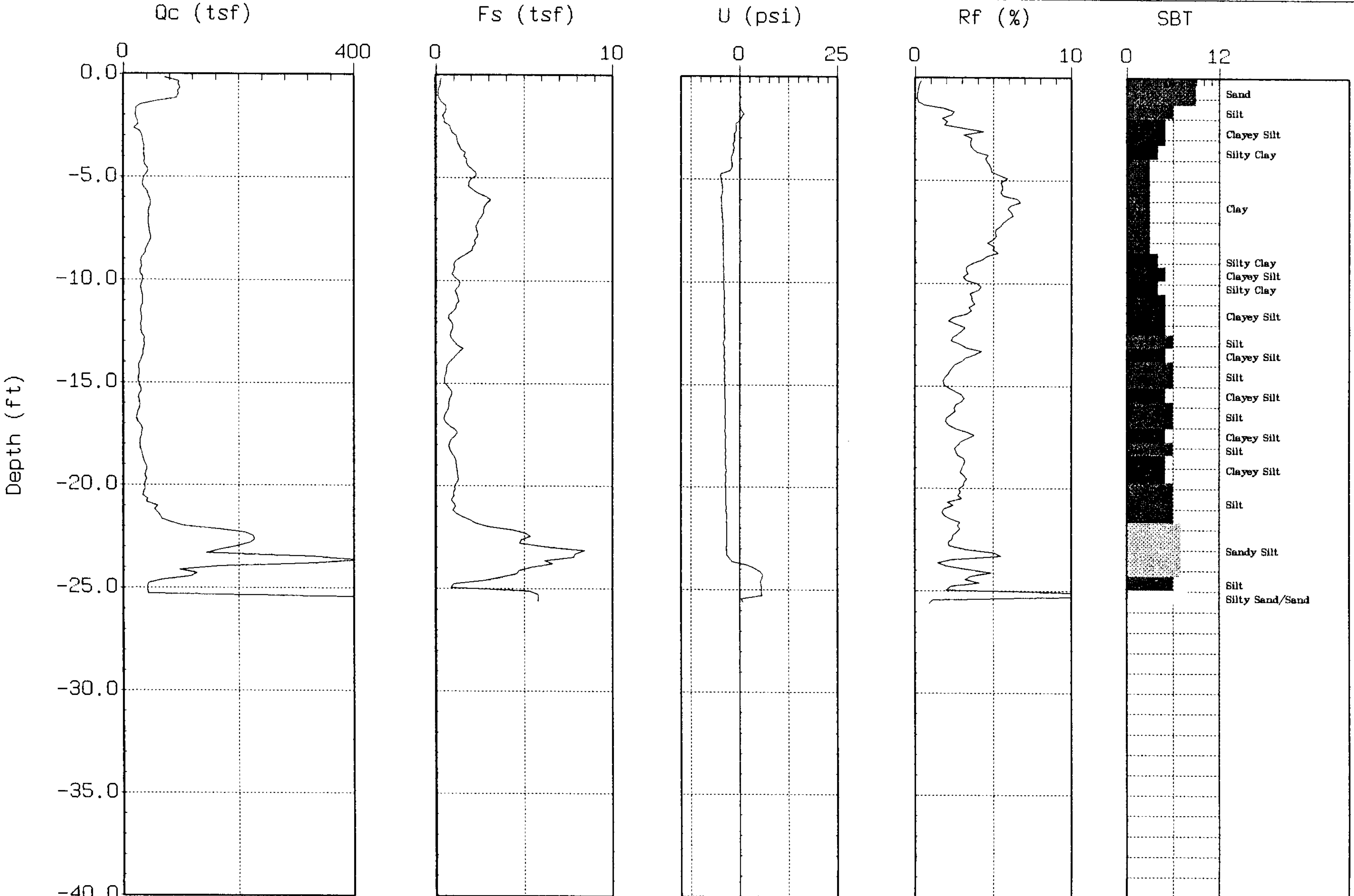
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site : WHIRLPOOL
Location : CPT-04

Geologist: Lori Pfeil
Date : 10:25:99 13:03



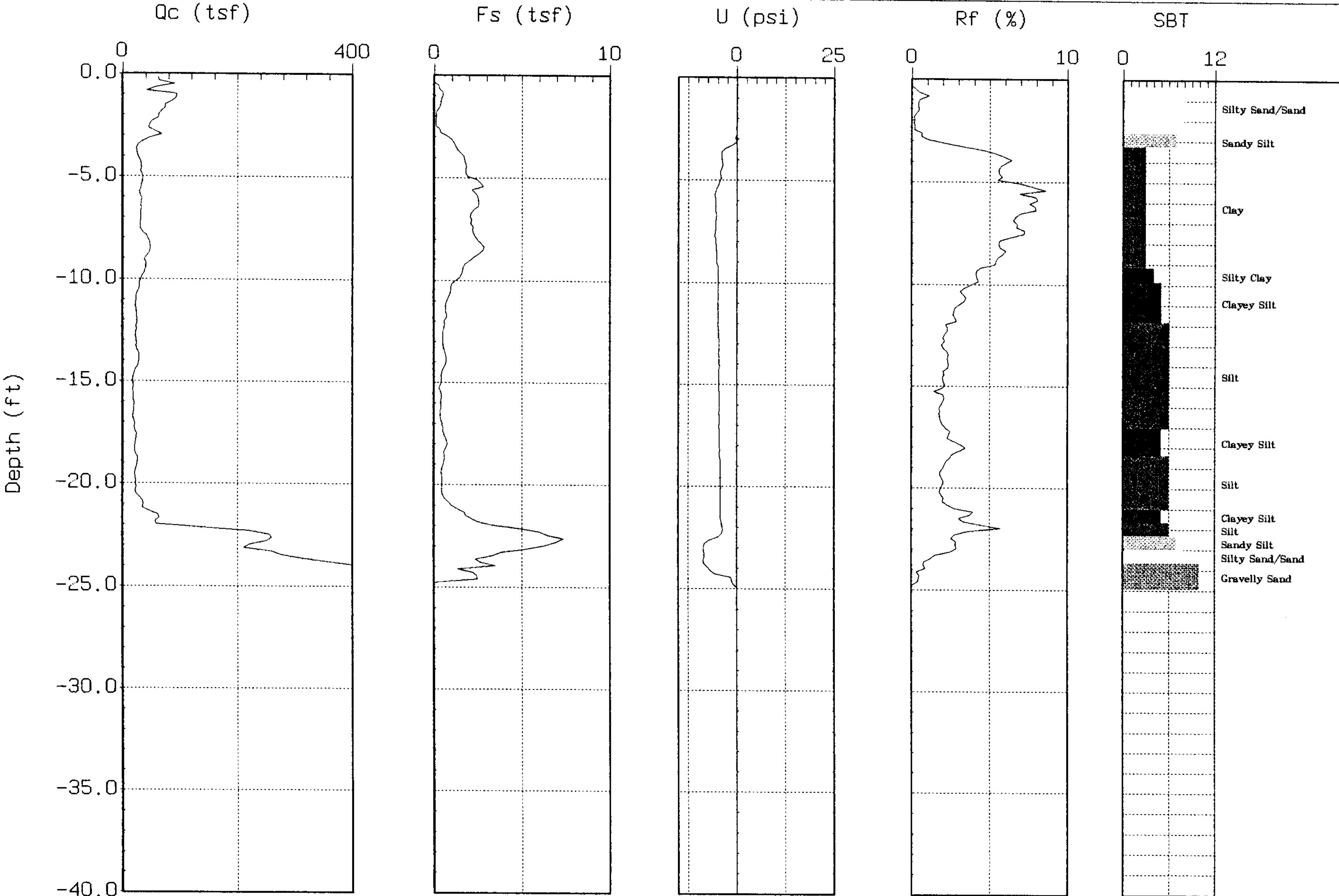

Max. Depth: 25.59 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site : WHIRLPOOL
Location : CPT-05

Geologist: Lori Pfeil
Date : 10:25:99 13:41




Max. Depth: 24.93 (ft)

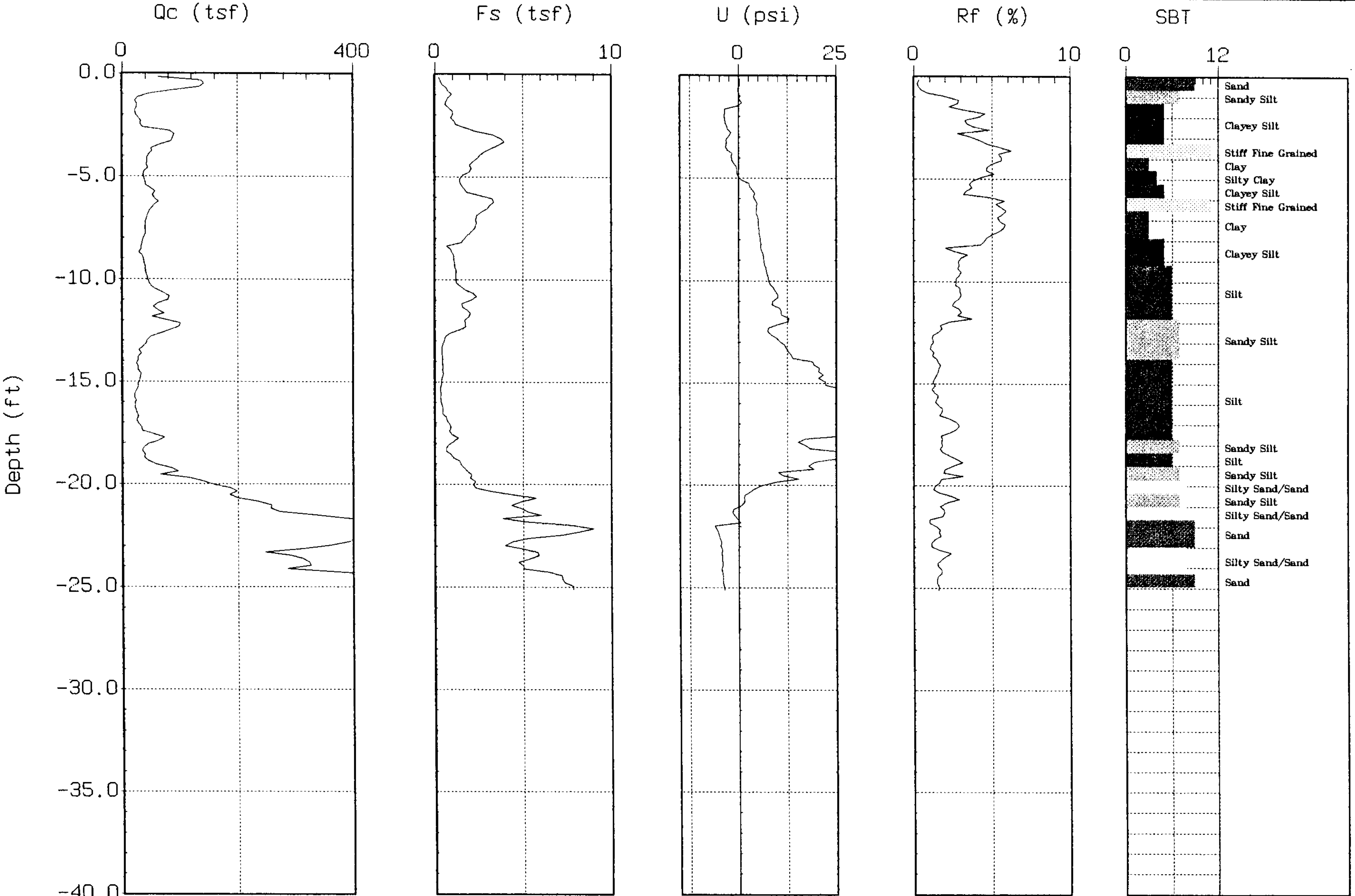
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site : WHIRLPOOL
Location : CPT-06

Geologist: Lori Pfeil
Date : 10:25:99 14:34




Max. Depth: 25.10 (ft)

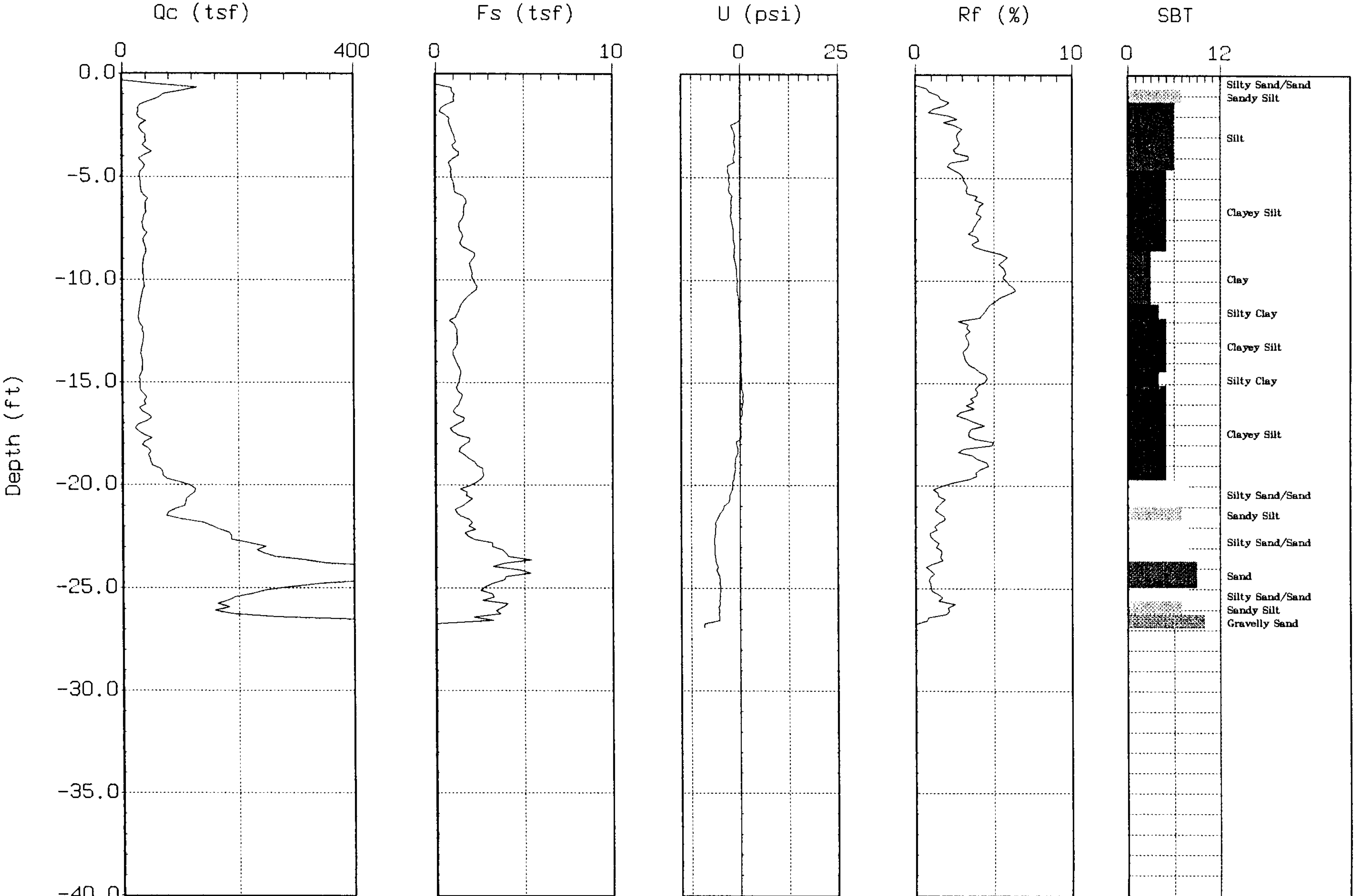
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site : WHIRLPOOL
Location : CPT-07

Geologist: Lori Pfeil
Date : 10:25:99 15:28




Max. Depth: 26.90 (ft)

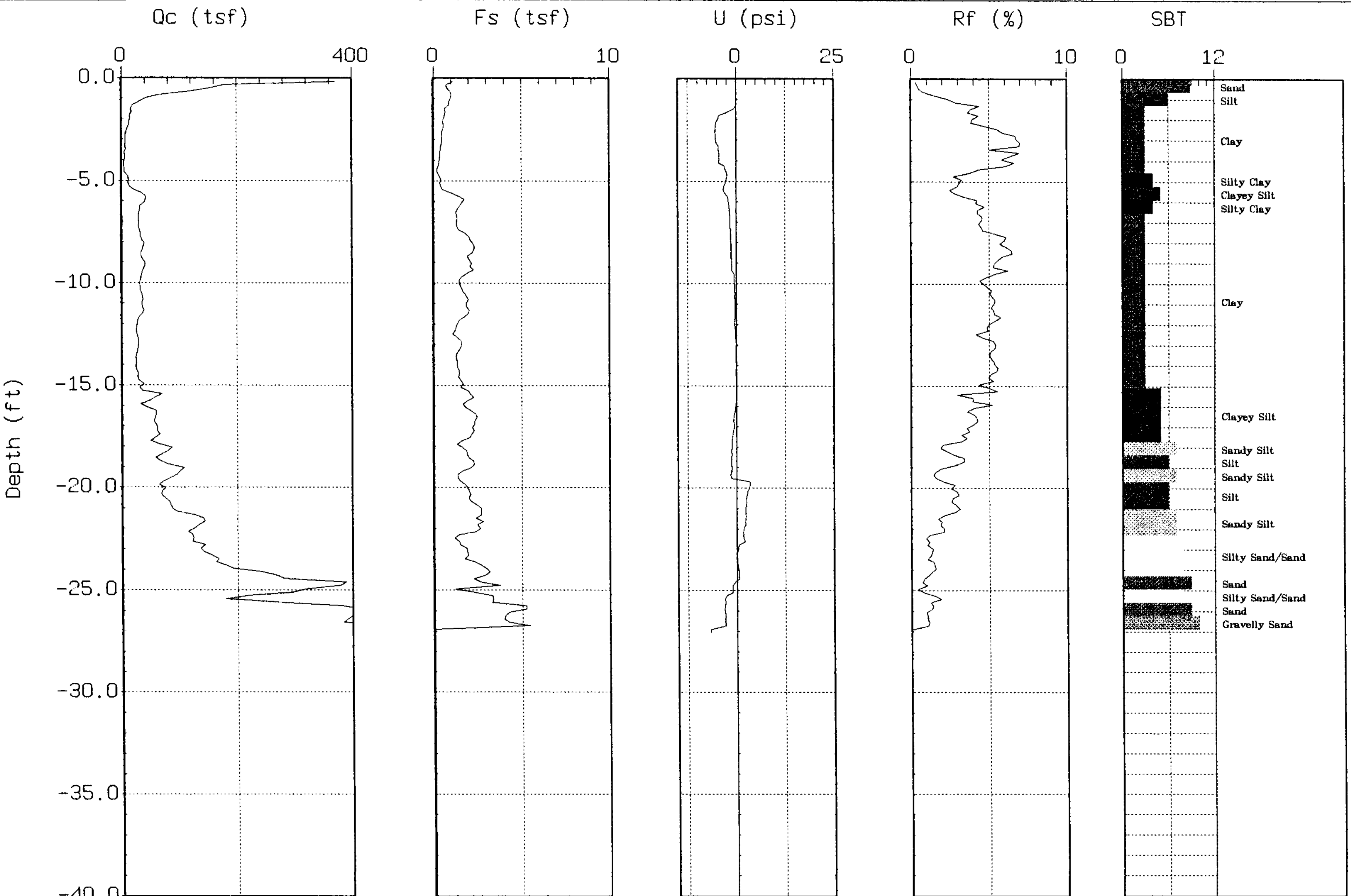
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site : WHIRLPOOL
Location : CPT-08

Geologist: Lori Pfeil
Date : 10:25:99 16:02




Max. Depth: 27.07 (ft)

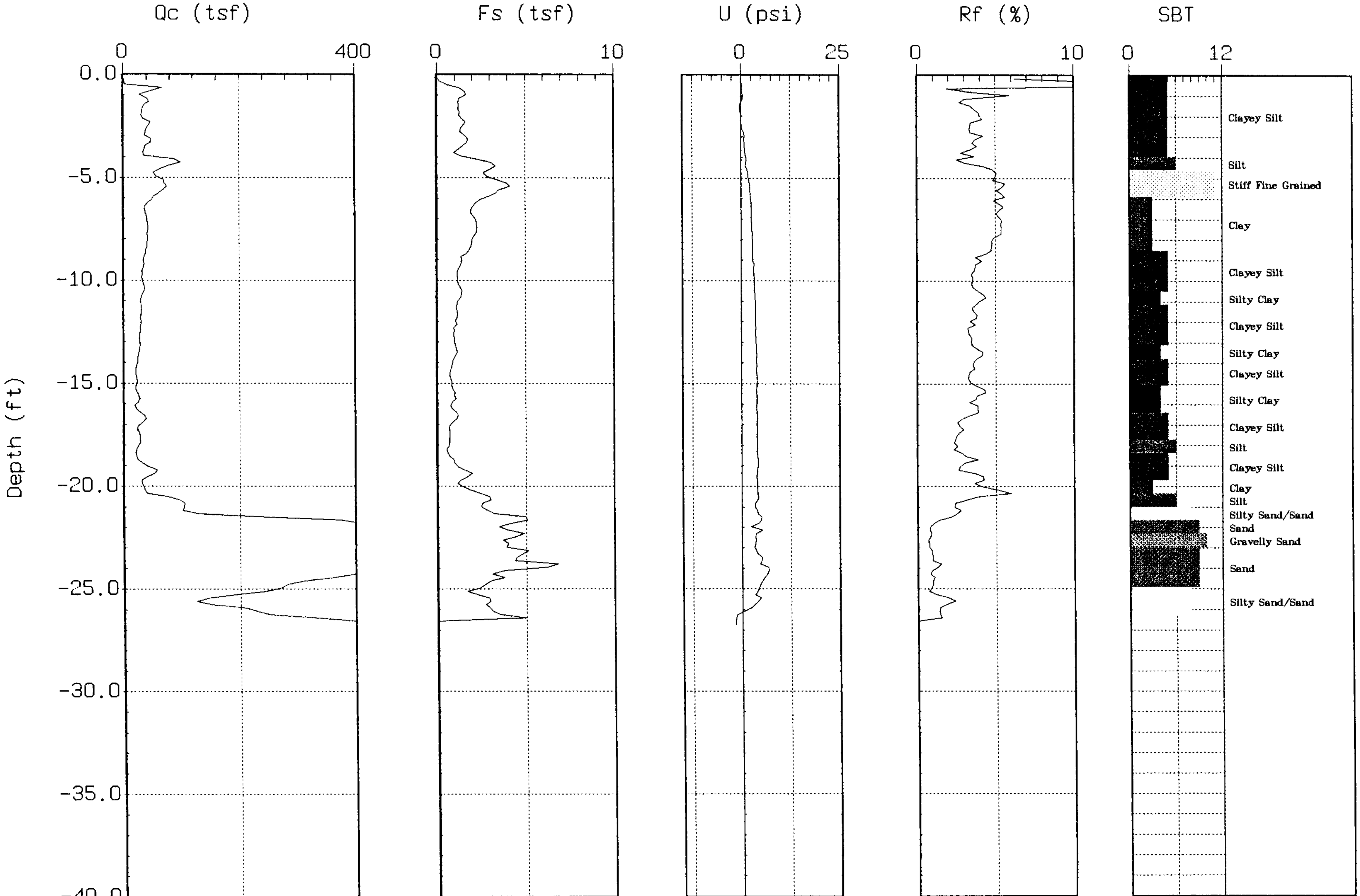
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site : WHIRLPOOL
Location : CPT-09

Geologist: Lori Pfeil
Date : 10:25:99 16:30




Max. Depth: 26.74 (ft)
Depth Inc.: 0.164 (ft)

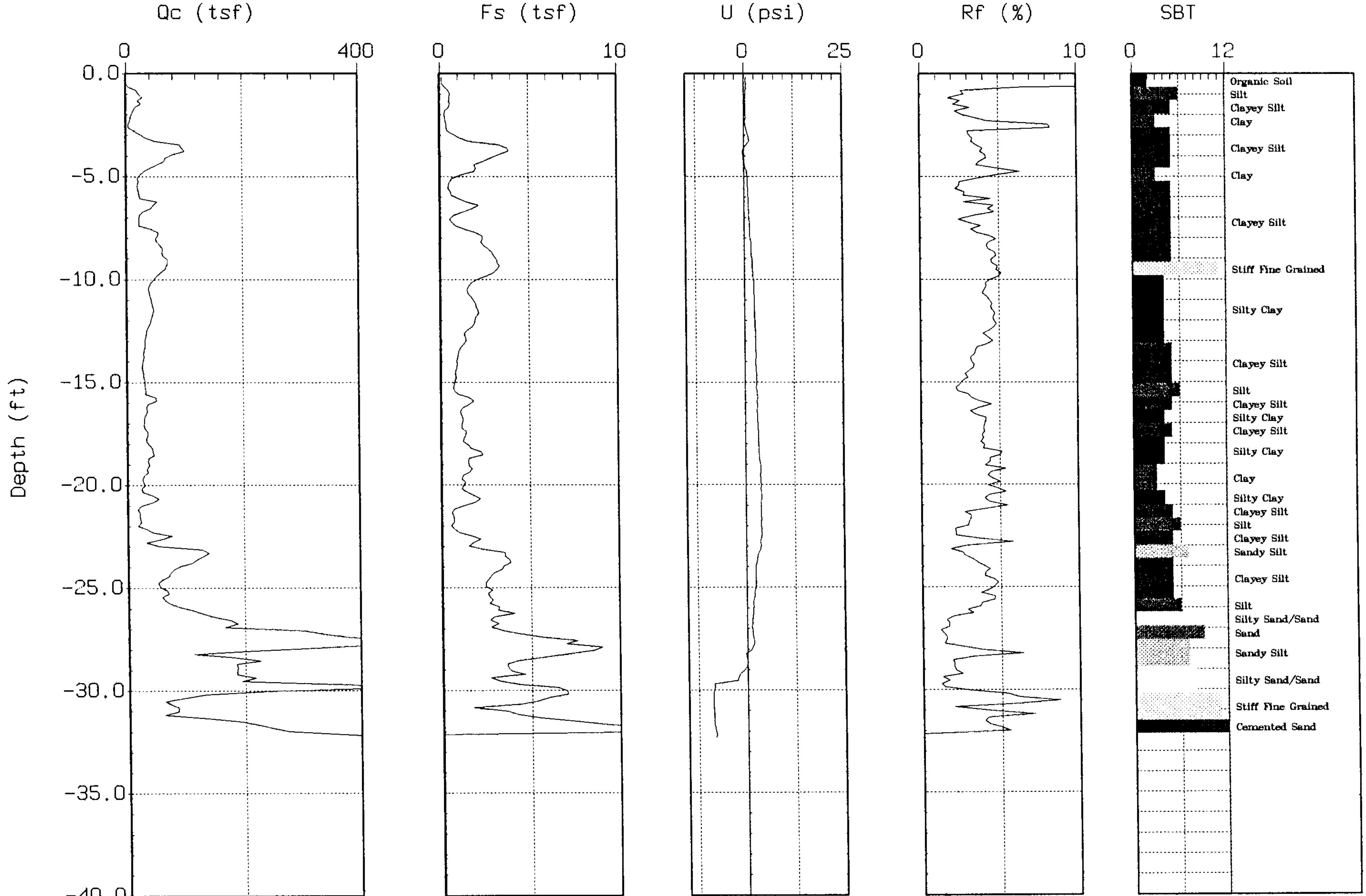
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

# ERM Southwest

Site : WHIRLPOOL
Location : CPT-10

Geologist: Lori Pfeil
Date : 10:25:99 17:01




Max. Depth: 32.32 (ft)

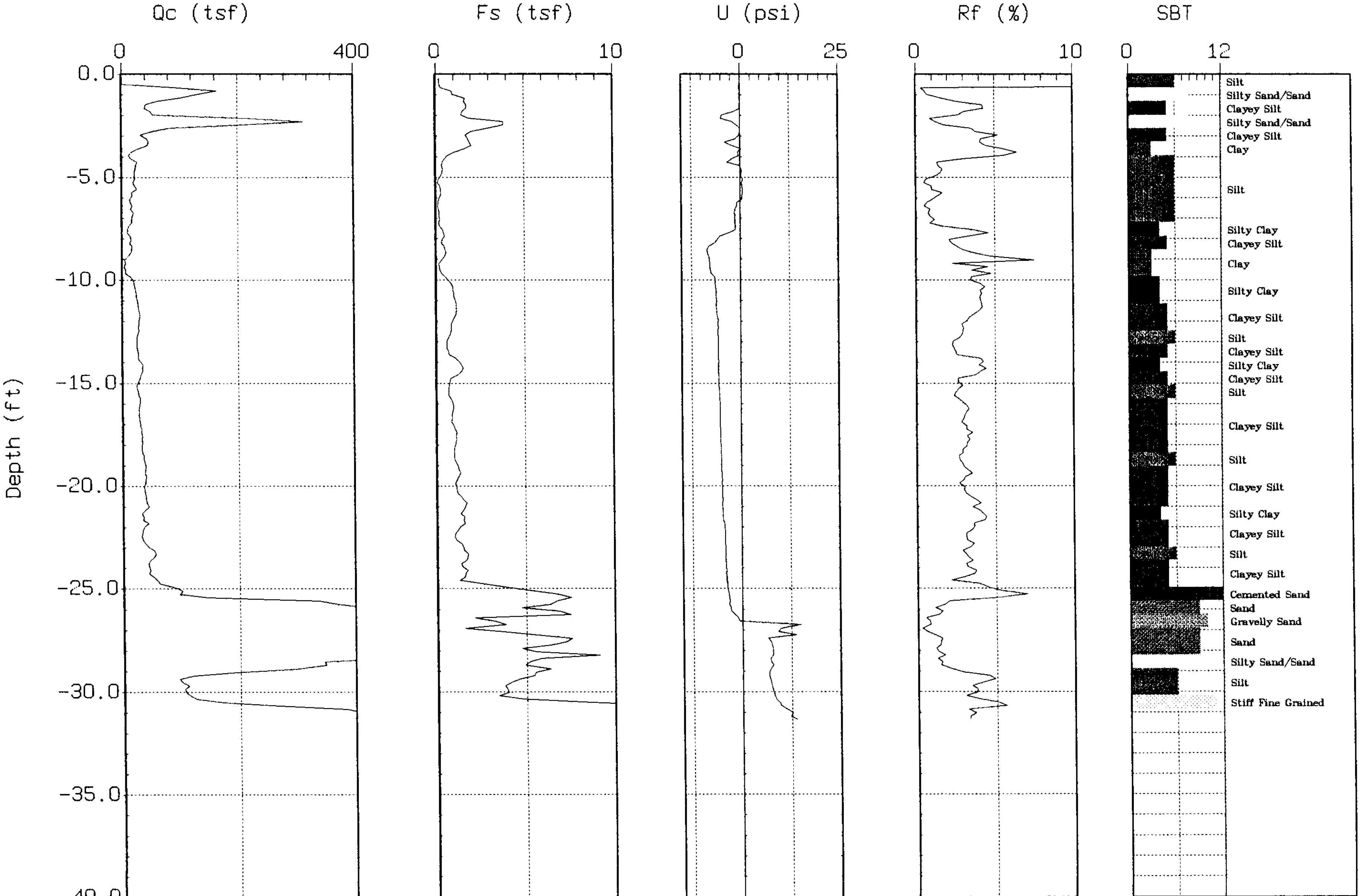
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site : WHIRLPOOL
Location : CPT-11

Geologist: Lori Pfeil
Date : 10:25:99 17:55




Max. Depth: 31.33 (ft)

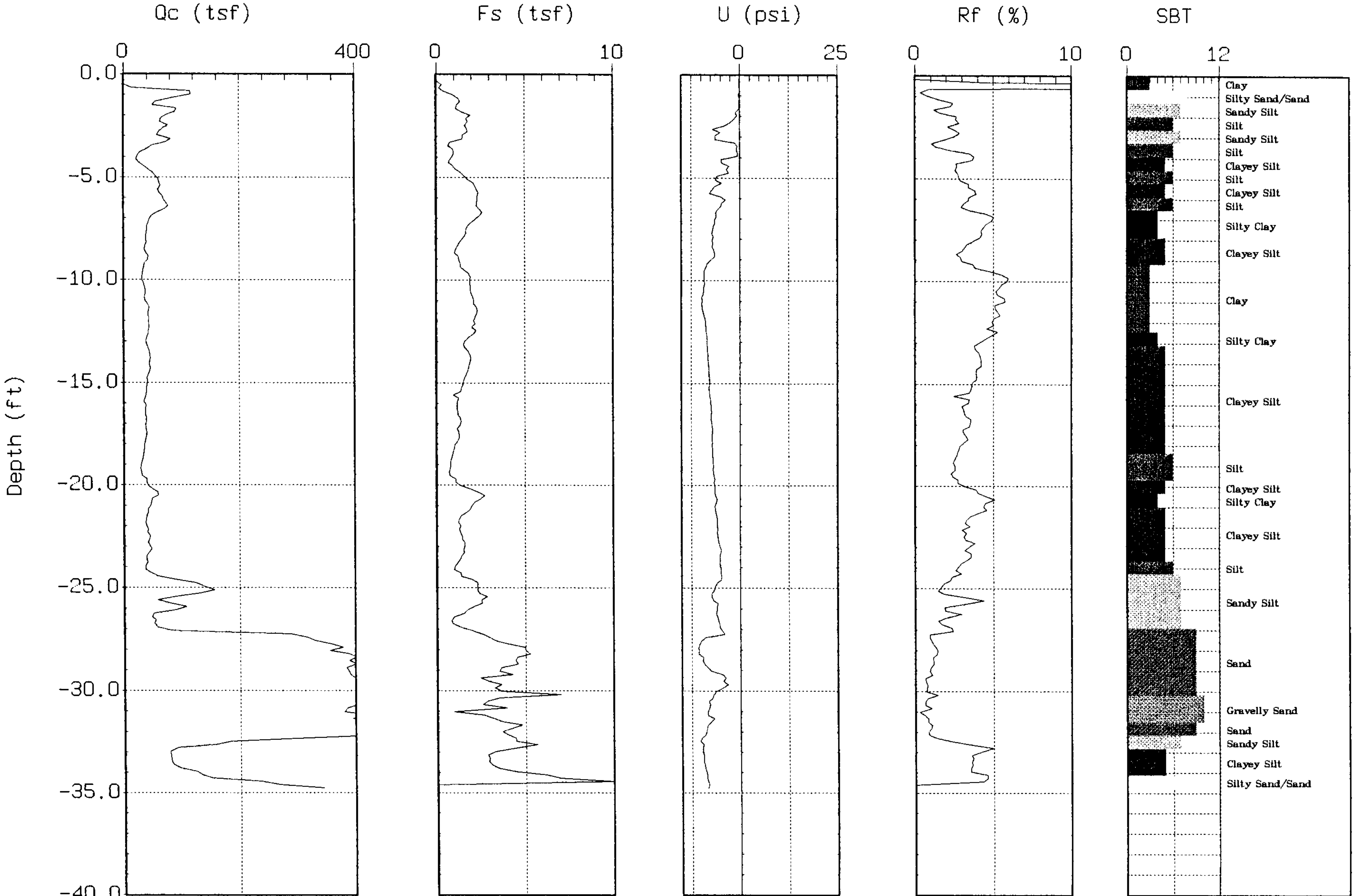
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

**ERM Southwest**

Site : WHIRLPOOL
Location : CPT-12

Geologist: Lori Pfeil
Date : 10:26:99 08:42




Max. Depth: 34.78 (ft)
Depth Inc.: 0.164 (ft)

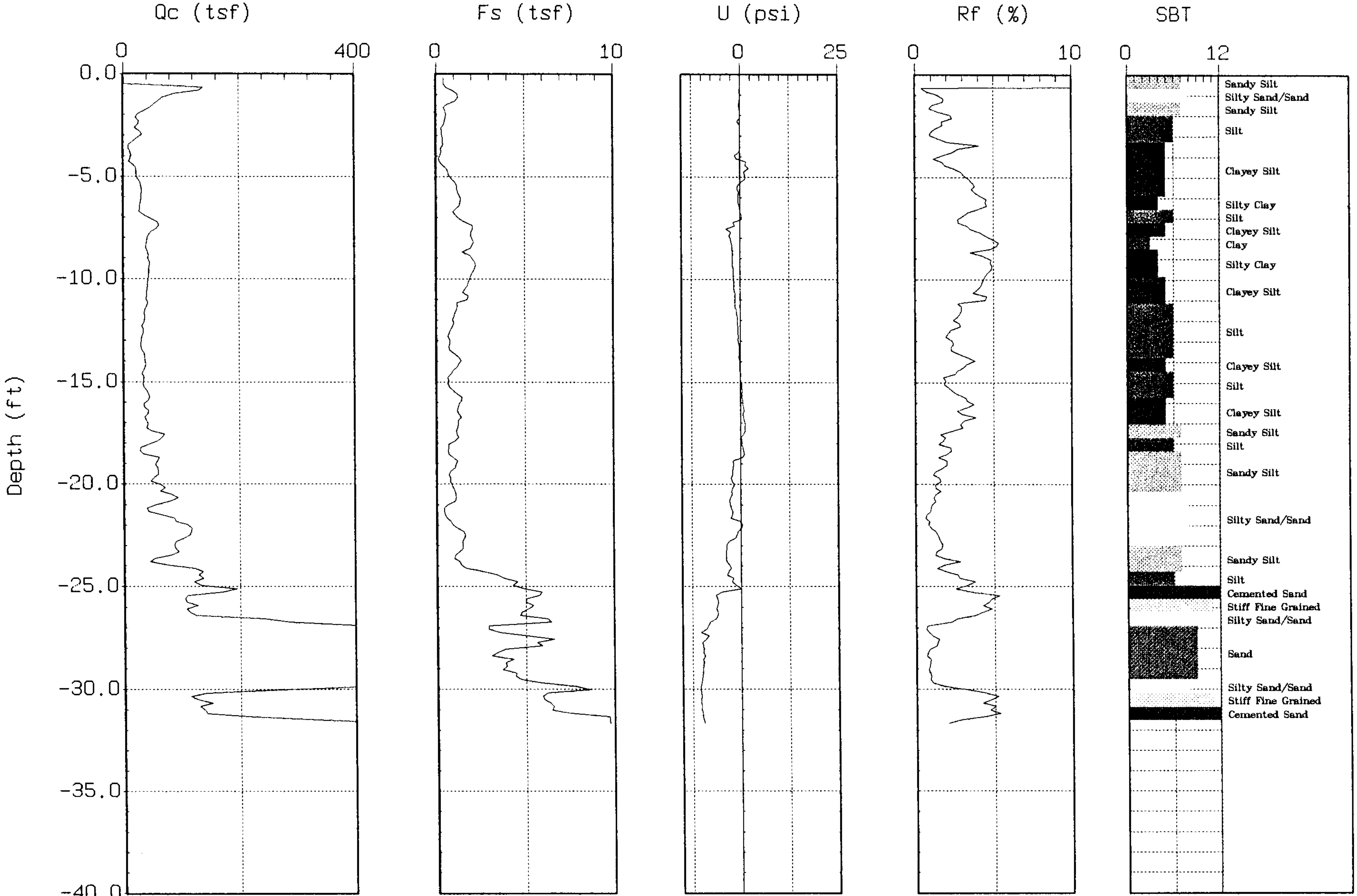
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

# ERM Southwest

Site : WHIRLPOOL
Location : CPT-13

Geologist: Lori Pfeil
Date : 10:26:99 09:24




Max. Depth: 31.66 (ft)

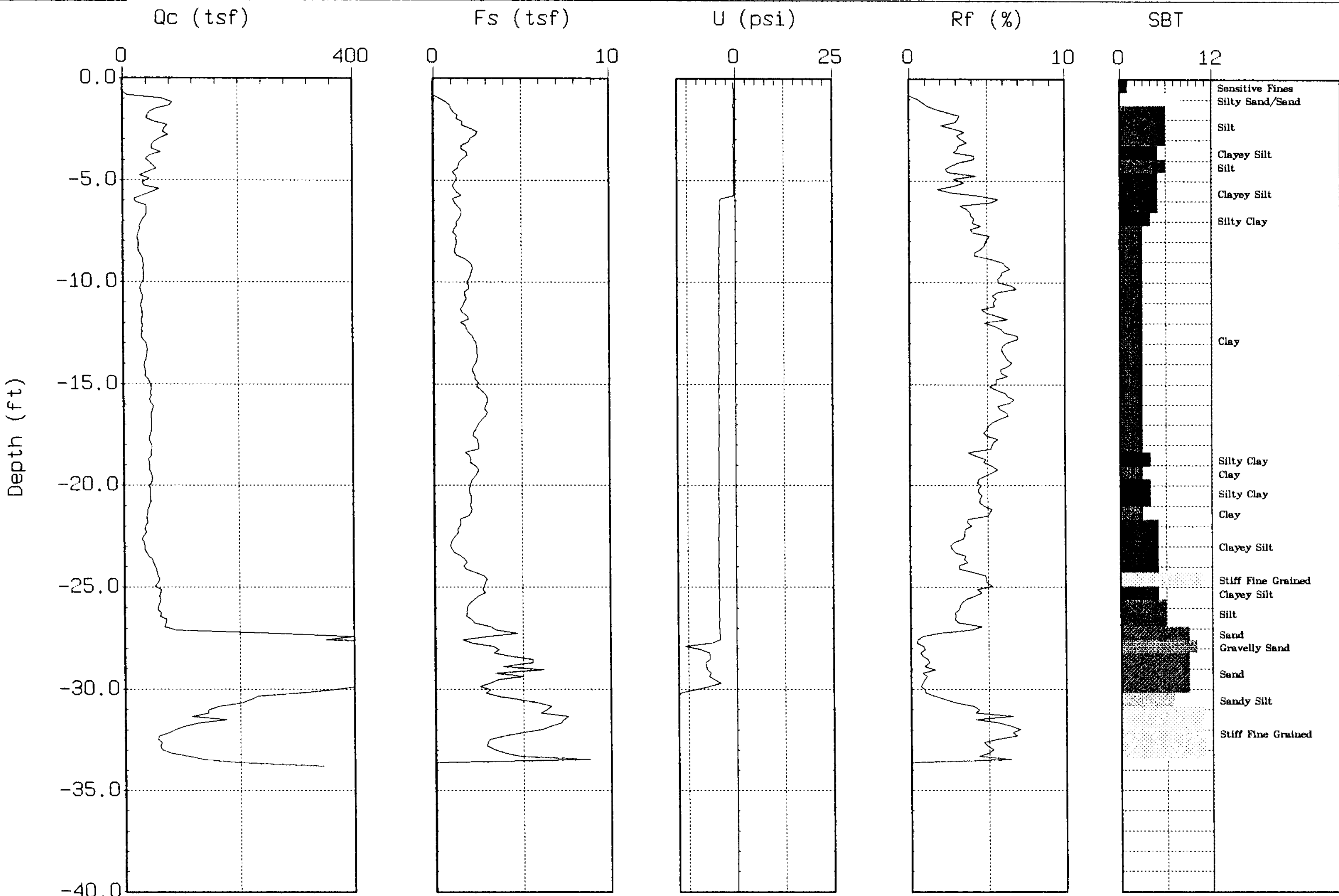
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site : WHIRLPOOL WHIRLPOOL
Location : CPT-14

Geologist: Lori Pfeil 20 TO
Date : 10:26:99 15:58




Max. Depth: 33.79 (ft)

Depth Inc.: 0.164 (ft)

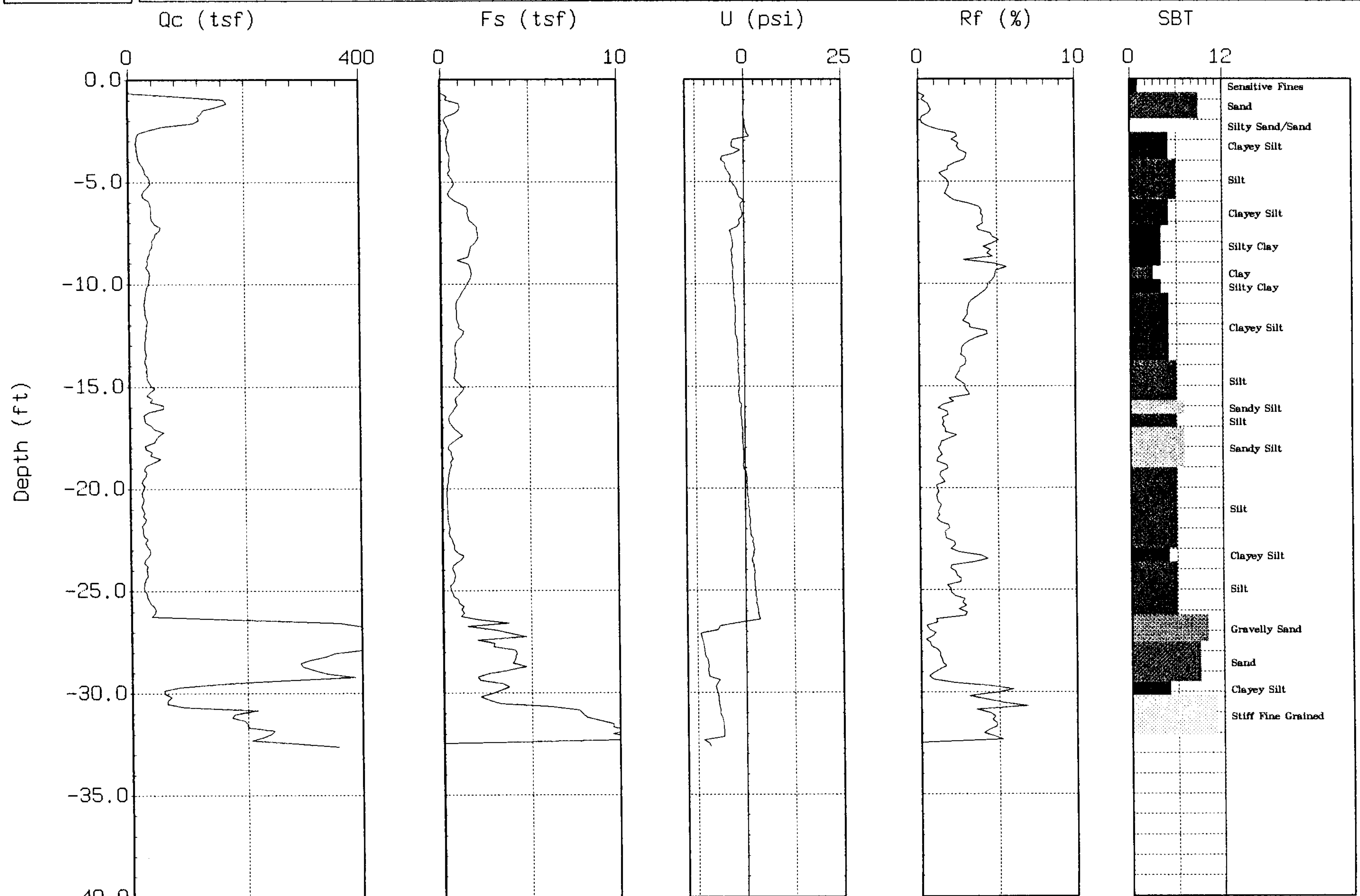
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

# ERM Southwest

Site : WHIRLPOOL
Location : CPT-15

Geologist: Lori Pfeil
Date : 10:26:99 10:20




Max. Depth: 32.64 (ft)

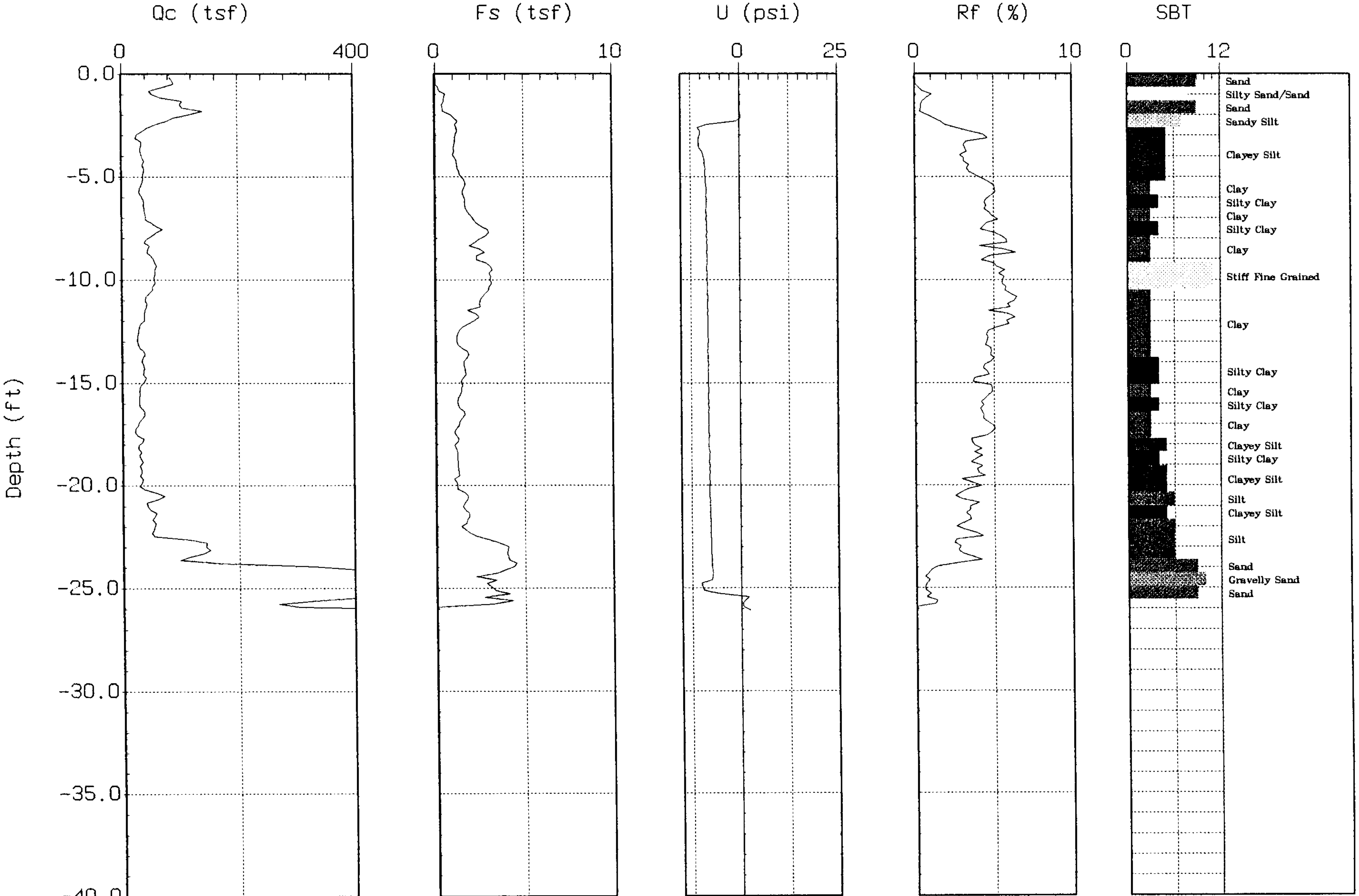
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site : WHIRLPOOL
Location : CPT-16

Geologist: Lori Pfeil
Date : 10:26:99 11:16




Max. Depth: 26.08 (ft)

Depth Inc.: 0.164 (ft)

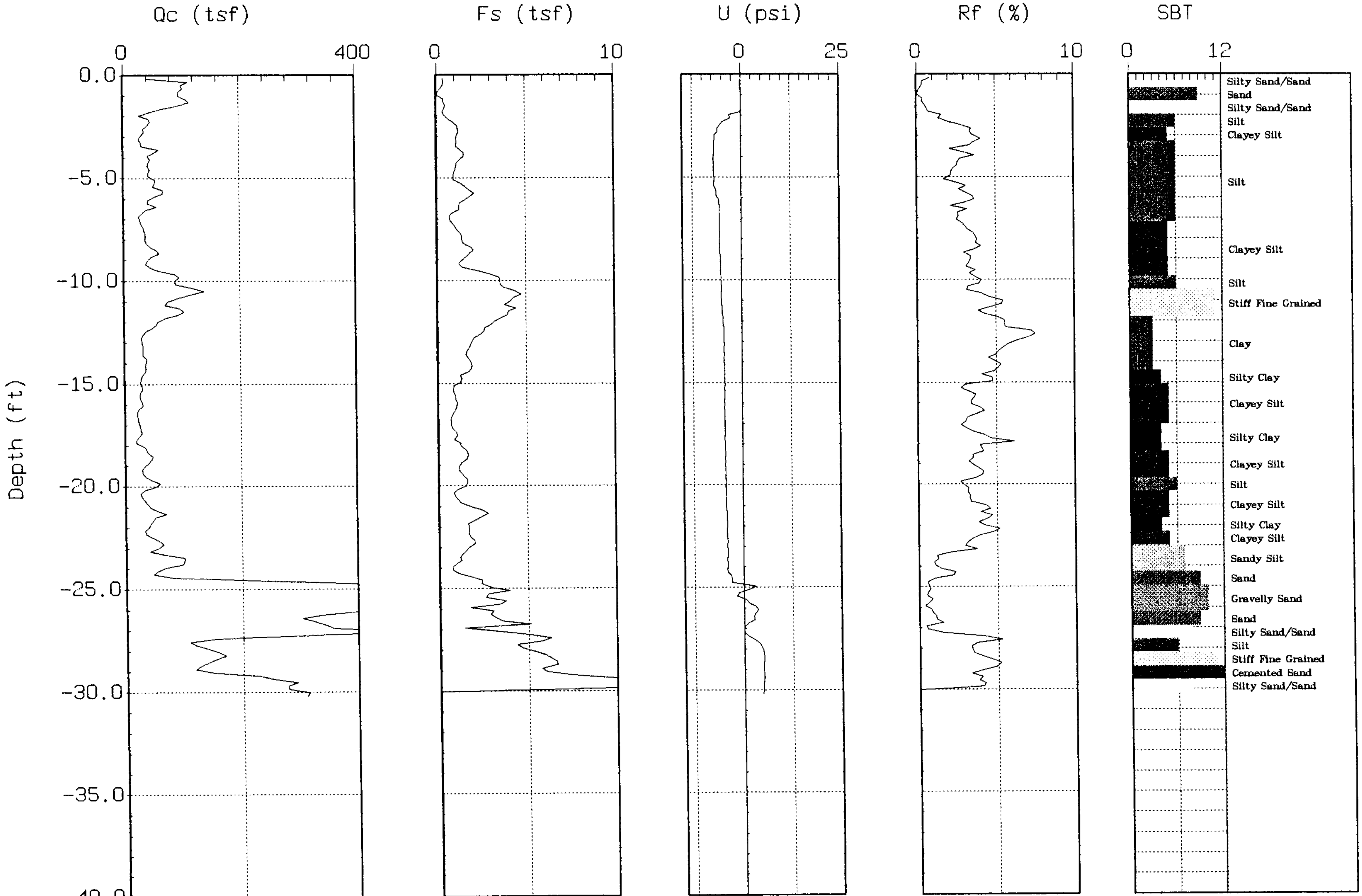
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

ERM Southwest

Site : WHIRLPOOL
Location : CPT-17

Geologist: Lori Pfeil
Date : 10:26:99 11:47




Max. Depth: 30.18 (ft)

Depth Inc.: 0.164 (ft)

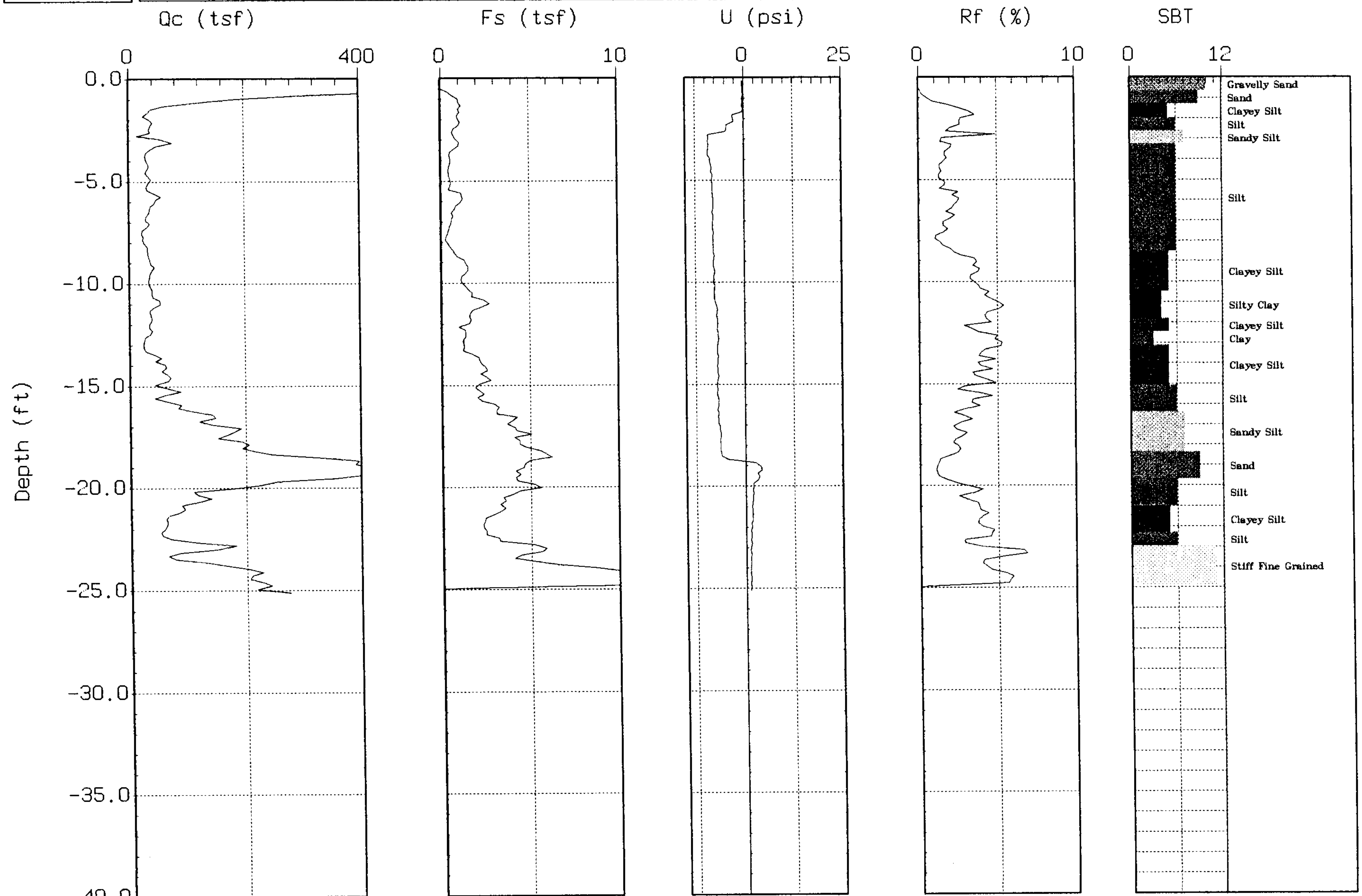
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

# ERM Southwest

Site : WHIRLPOOL
Location : CPT-18

Geologist: Lori Pfeil
Date : 10:26:99 12:45




Max. Depth: 25.10 (ft)

Depth Inc.: 0.164 (ft)

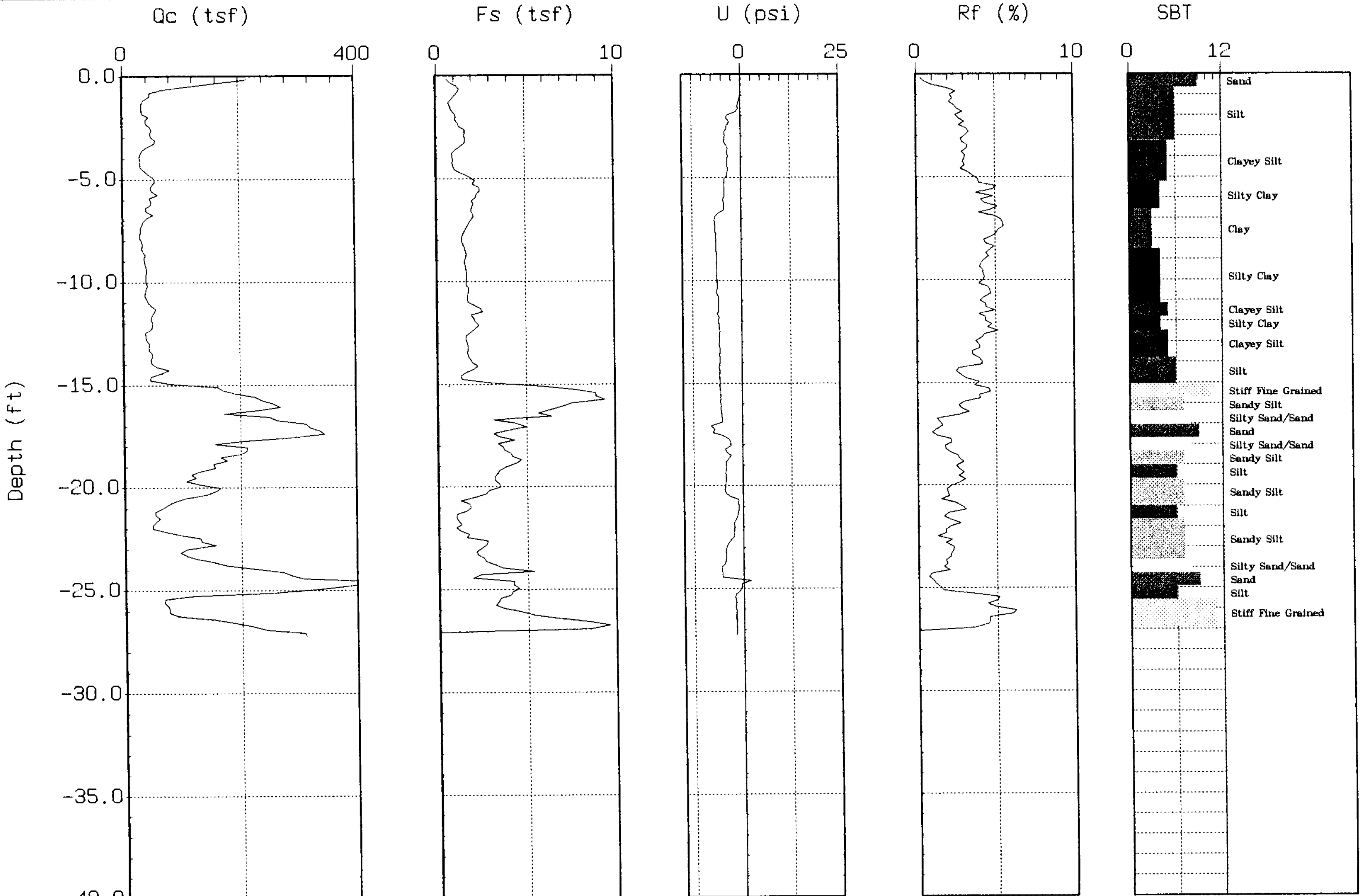
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

ERM Southwest

Site :WHIRLPOOL
Location : CPT-19

Geologist:Lori Pfeil
Date : 10:26:99 13:14




Max. Depth: 27.23 (ft)

Depth Inc.: 0.164 (ft)

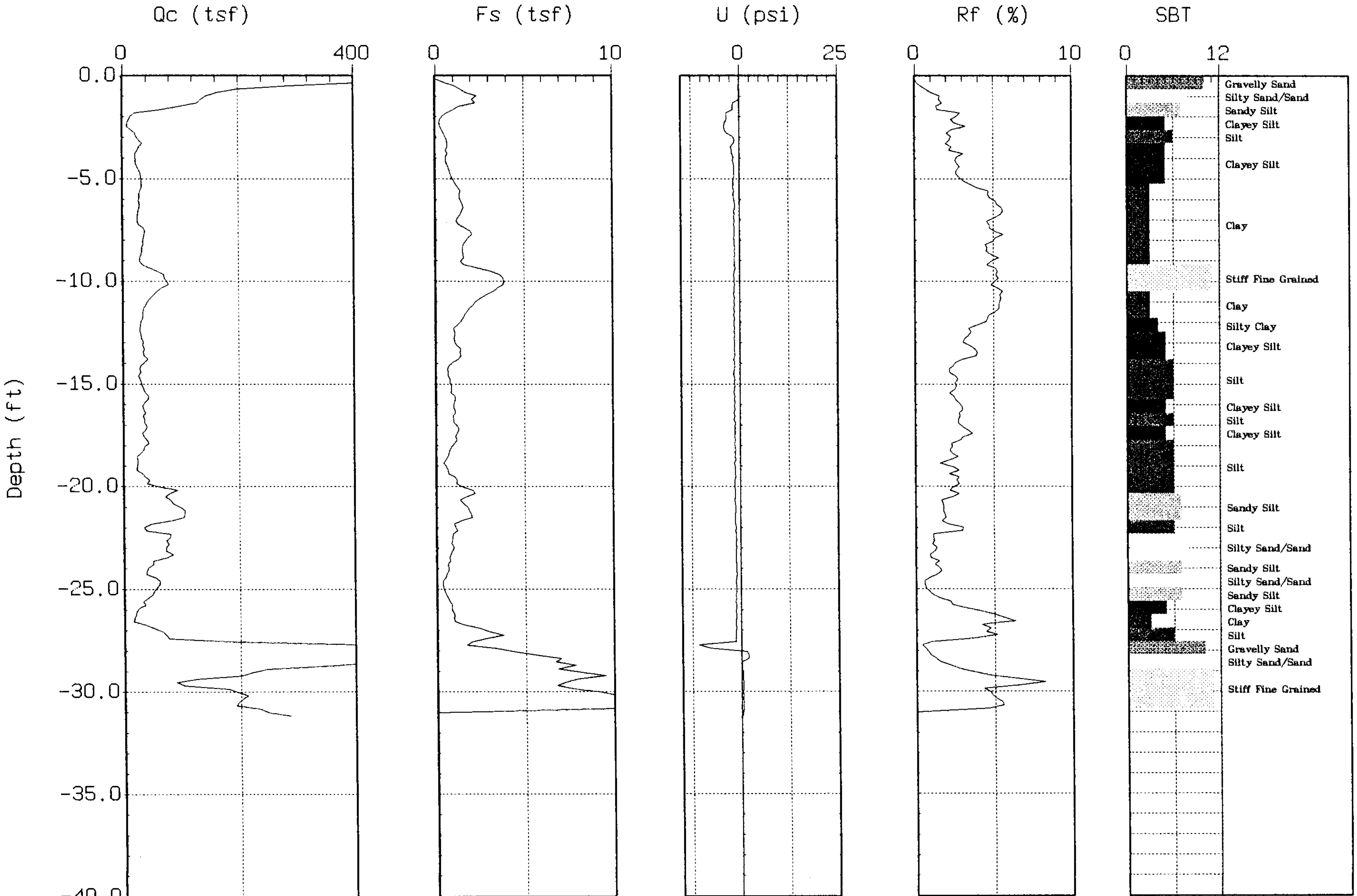
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

ERM Southwest

Site :WHIRLPOOL
Location : CPT-20

Geologist:Lori Pfeil
Date : 10:26:99 13:35




Max. Depth: 31.17 (ft)

Depth Inc.: 0.164 (ft)

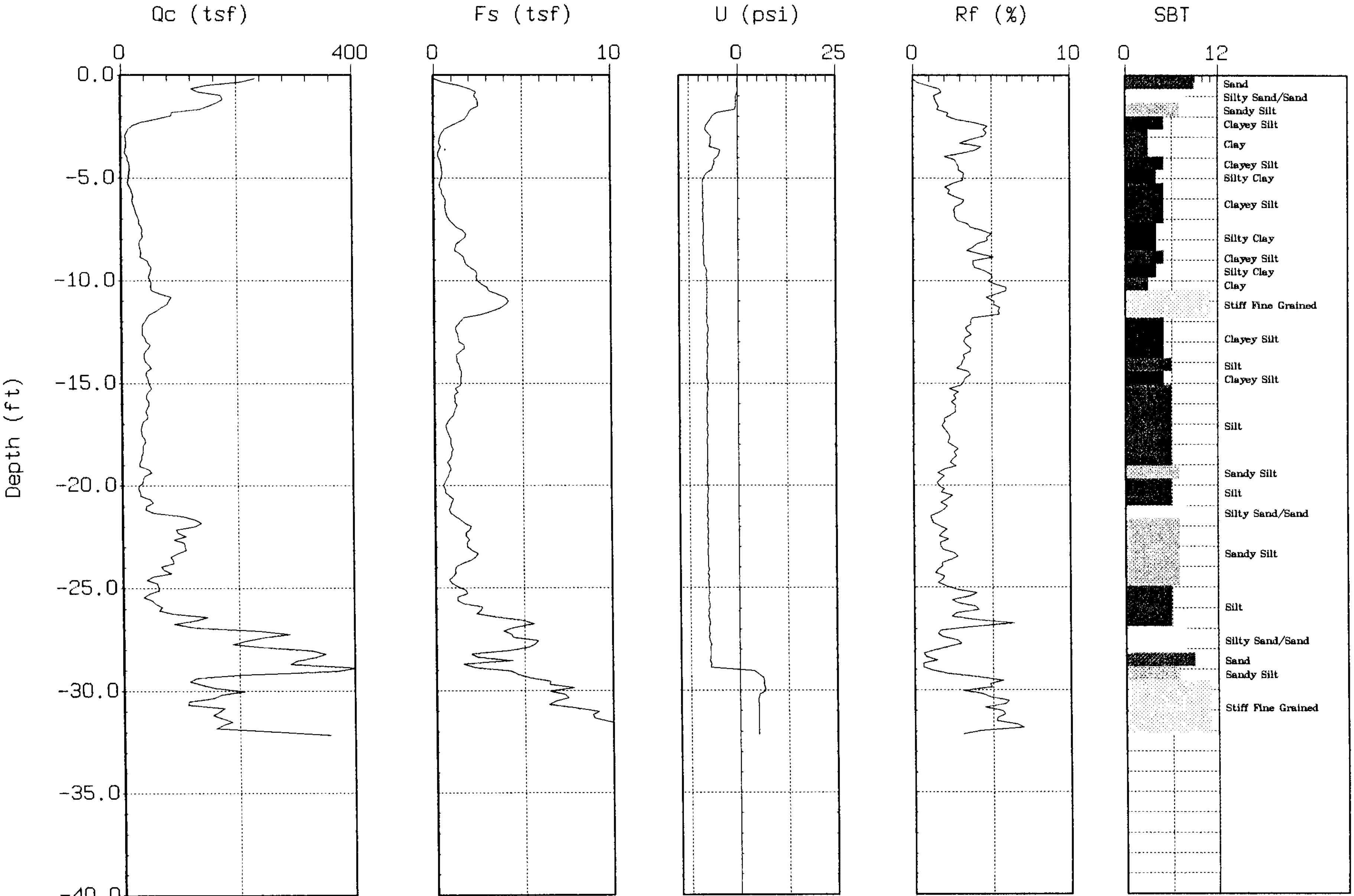
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

ERM Southwest

Site : WHIRLPOOL
Location : CPT-21

Geologist: Lori Pfeil
Date : 10:26:99 14:05




Max. Depth: 32.15 (ft)

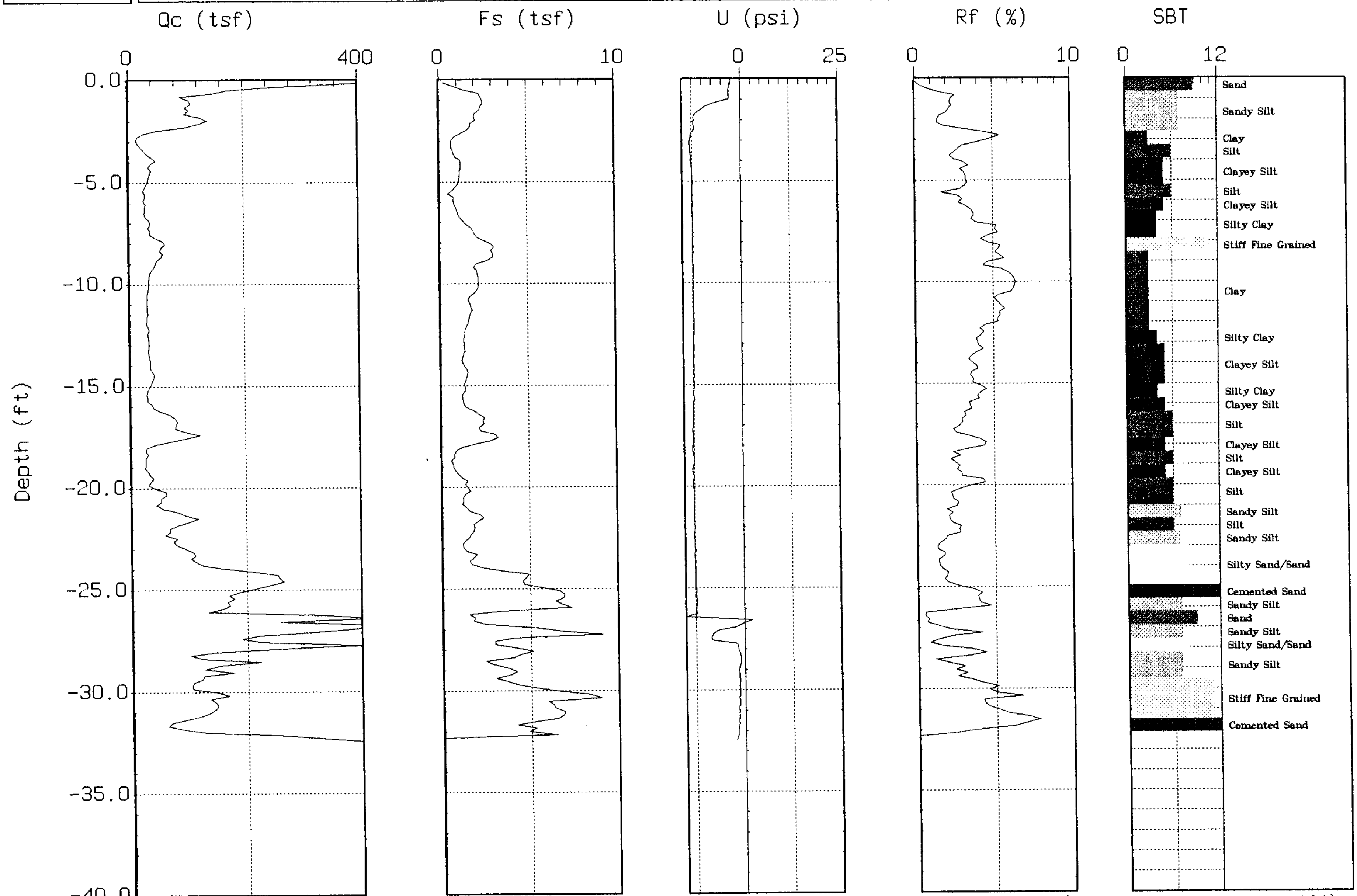
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

ERM Southwest

Site : WHIRLPOOL
Location : CPT-22

Geologist: Lori Pfeil
Date : 10:26:99 14:34




Max. Depth: 32.48 (ft)

Depth Inc.: 0.164 (ft)

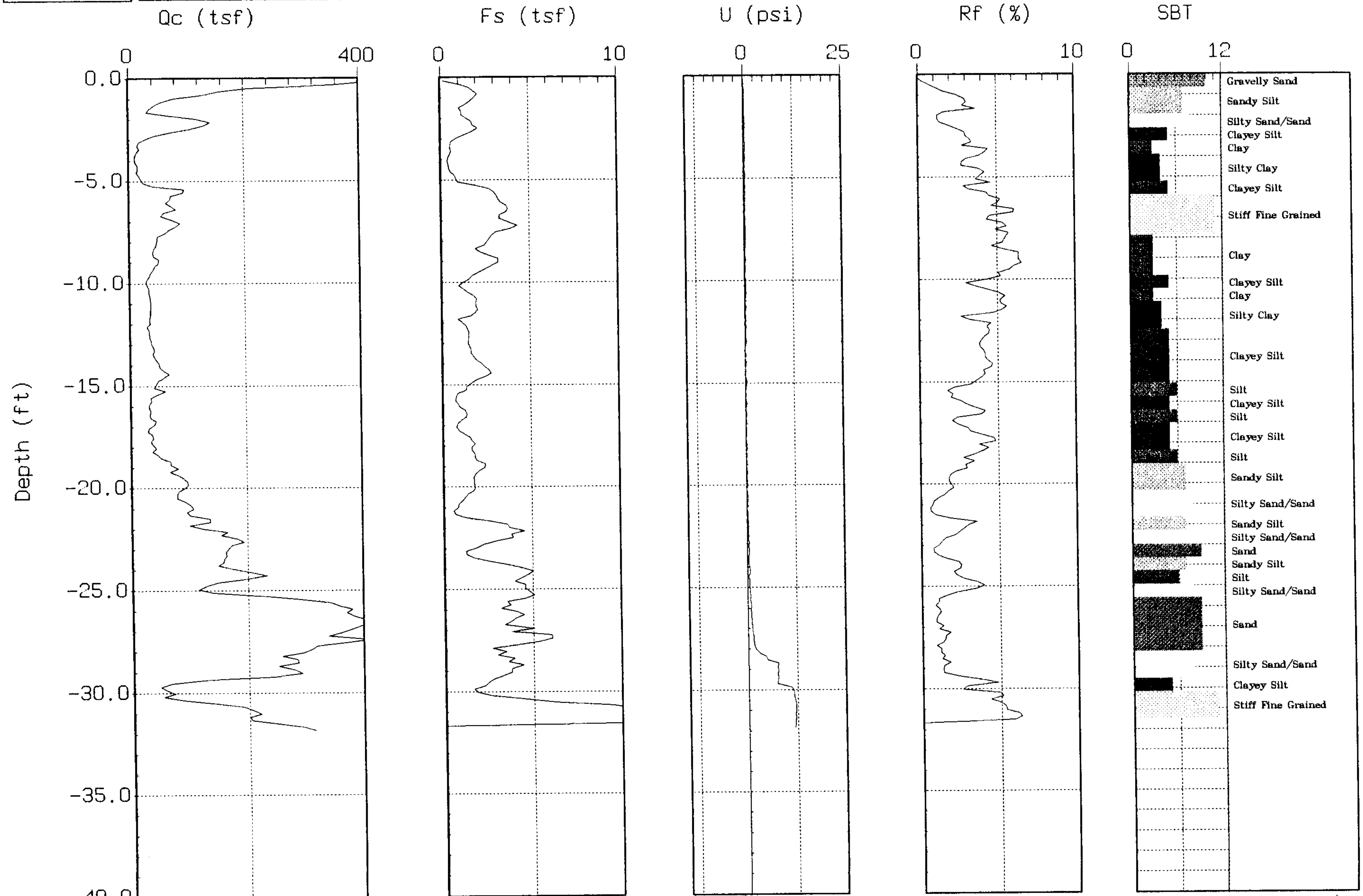
SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

# ERM Southwest

Site : WHIRLPOOL
Location : CPT-23

Geologist: Lori Pfeil
Date : 10:26:99 15:11




Max. Depth: 31.82 (ft)

Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

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# Monitor Well Installation

JTMW 1

Well No [illegible]

Client [illegible] Job No [illegible] Date Drilled [illegible] 89 Sheet [illegible] of [illegible]

Site FORT SMITH, AR Elevation Pad [illegible] Top of PVC Casing [illegible]

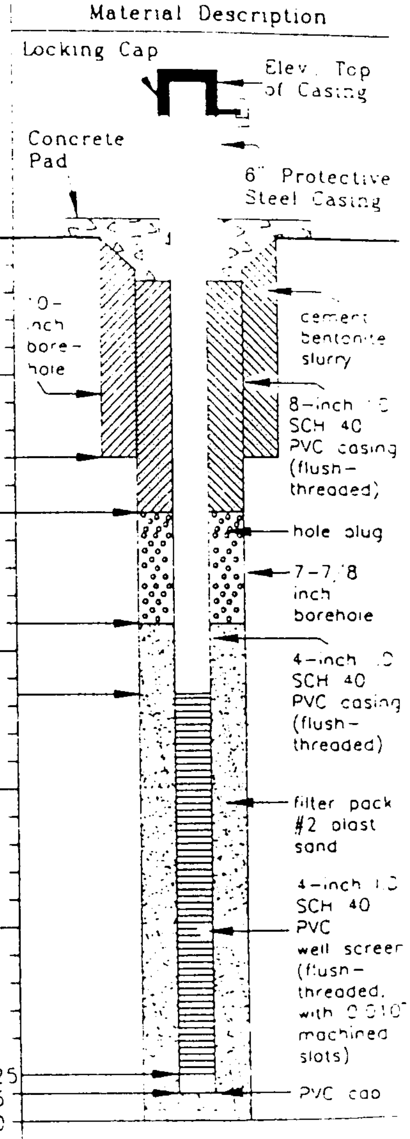
Total Depth [illegible] Casing Size & Type [illegible] INCH [illegible] Screen Size [illegible] NC-

Comments 8 INCH HOLLOW STEM AUGER [illegible] HOLLOW STEM AUGER AND MUD ROTARY [illegible] SPLIT SPOON 5' CONTINUOUS SAMPLE

| Depth in Feet | PID (ppm) | Symbol | Sample Description | Material Setting |
|---|---|---|---|---|
| 0–4.5 | | | GRAVEL FILL, saturated | |
| 5 | | ML | CLAYEY SILT, yellowish brown, silt with clay, low plasticity, firm, moist | 8 |
| 10 | | | | 10 |
| 14 | 0.6 | | CLAYEY SILT, yellowish brown, silt with clay(20-40%) low plasticity, firm,dry | 14 |
| 15 | | ML | SANDY SILT, yellowish brown/light gray, silt with very fine sand(20-30%) moderately firm, moist | 16.5 |
| 20 | | | SILTY SAND, yellowish brown, very fine-fine sand with silt | |
| | 0.1 | SW | SILTY SAND, yellowish brown, fine-medium sand with silt | |
| | | | SILTY SAND, yellowish brown, medium-coarse sand and silt | |
| | 0.2 | ML | SANDY SILT, silt with very fine sand (10-30%) | |
| 25 | | | SANDY GRAVEL, yellowish-brown, gravel up to 1" diameter with sand, fine-coarse, trace of silt | |
| | | GW | SANDY GRAVEL, strong brown, gravel up to 1" predominately 1/8" with sand, fine-coarse, trace of silt | |
| 30 | | ML | CLAYEY SILT, strong brown, silt with clay(20-40%) low plasticity | 30.25 |
| | | ML | SILT, dark gray, silt, slightly-medium lithified fissile | 30.5 |
| | | | TOTAL DEPTH = 32.0 FEET | 32.0 |

## Completion Data

Material Description

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# Monitor Well Installation

ITMW 2

Well No [illegible]

Client [illegible] Job No [illegible] Date Drilled [illegible] 89 Sheet [illegible] of [illegible]

Site [illegible] SMITH, AR Elevation Pad 425.14 Top of PVC Casing [illegible]

Total Depth 31.0 FEET Casing Size & Type 4-INCH [illegible] Screen Size [illegible]

Comments 8-INCH HOLLOW STEM AUGER

2' SPLIT-SPOON 5' CONTINUOUS SAMPLE

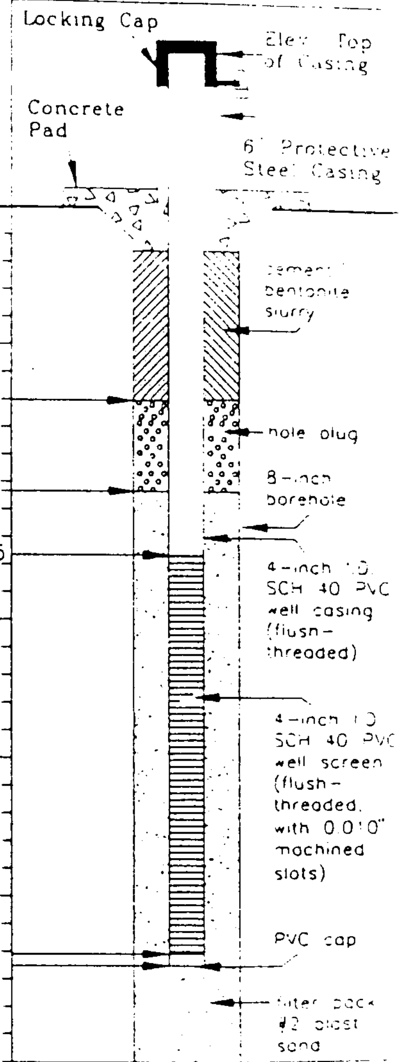
| Depth in Feet | PID (ppm) | Symbol | Sample Description |
|---|---|---|---|
| | | | CONCRETE FILL |
| | 9 | GW | SILTY GRAVEL, yellowish brown, gravel up to 3/8" of decomposing shale and rock, 3" clayey silt, low plasticity, moist |
| | 7.6 | ML | CLAYEY SILT, yellowish brown, silt with clay, low plasticity, moderate-firm moist, mottled in color |
| 5 | 13.0 | GW | SILTY SANDY GRAVEL, 2" layer of gravel up to 1/2" with medium-coarse sand and silt |
| | | ML | CLAYEY SILT, strong brown/light gray, silt with clay(25-45%) low plasticity, moist, slight odor. |
| | 6.1 | | |
| 10 | | ML | GRAVELY CLAYEY SILT, strong brown, silt with clay and gravel sized decomposing shale and rock up to 1/8", moist, mottled in color medium-firm |
| | 3.4 | ML | CLAYEY SILT, silt with clay, low plasticity, moist, moderate, firm |
| | | ML | CLAYEY SANDY SILT, silt with clay and very fine sand, wet saturated.NEOC |
| 15 | | ML | CLAYEY SILT, strong brown/light gray, silt with clay (20-40%) low plasticity, firm, dry |
| | 0.7 | ML | SANDY SILT, silt with very fine sand, moist, wet, low plasticity |
| 20 | | | |
| | 0.7 | | SANDY SILT, strong brown/light gray, silt with very fine sand, wet throughout. AT 24.5' a 1" layer of coarse sand. |
| 25 | | ML | CLAYEY SILT, strong brown. |
| | 0.0 | GW | SILTY SANDY GRAVEL, strong brown, gravel up to 1" diameter with fine-coarse sand and silt, wet, saturated. |
| 30 | | ML | CLAYEY SILT, strong brown, silt with clay (20-40%) laminated |
| | 0.0 | ML | SILT, dark gray, silt moderately lithified, finely laminated, moist |

TOTAL DEPTH = 31.0 FEET

Material Setting

Completion Data

Material Description

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# Monitor Well Installation

ITMW3

Well No [illegible]

Client [illegible] Job No [illegible] Date Drilled [illegible] Sheet [illegible] of

Site [illegible] Elevation Pad [illegible] Top of PVC Casing [illegible]

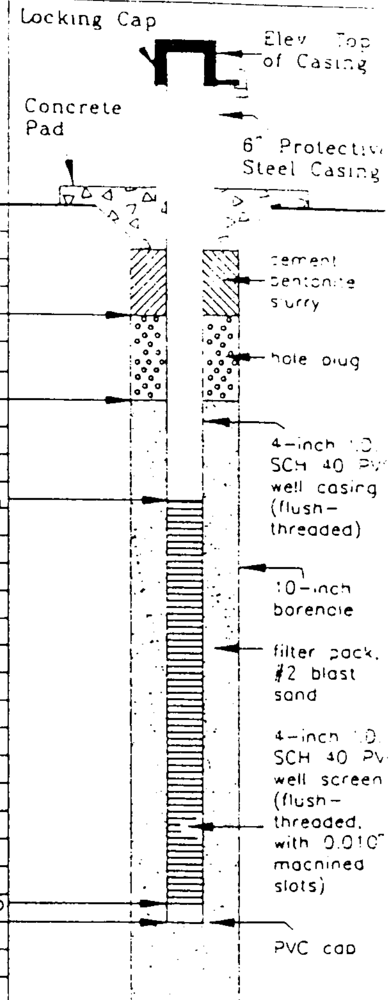
Total Depth [illegible] Casing Size & Type 4-INCH SCH 40 PVC Screen Size [illegible]

Comments [illegible] HOLLOW STEM AUGER AND 10-INCH HOLLOW STEM AUGER [illegible] SPOON [illegible] CONTINUOUS SAMPLE

| Depth in Feet | PID (ppm) | Symbol | Stratigraphy | Sample Description | Material Setting |
|---|---|---|---|---|---|
| | 0.0 | ML | | CLAYEY SILT, brown, silt with clay (10-20%) moist, wet, roots | |
| | 0.0 | ML | | CLAYEY SILT, brownish yellow, silt with clay, low plasticity, some gravel sized decomposing shale, intermittant roots, moist | 4.0 |
| 5 | 0.0 | ML | | SANDY CLAYEY SILT, silt with clay (20-30%) low plasticity, with very fine sand (10-20%) moist, wet | |
| | | ML | | CLAYEY SILT, strong brown/light gray, silt with clay(20-40%) low-moderate plasticity, firm, moist, mottled in color | 7.0 |
| | | ML | | GRAVELY CLAYEY SILT, strong brown, silt with clay (10-30%) and gravel sized shale fragments and rock up to 1/8" | |
| 10 | | ML | | CLAYEY SILT, strong brown/light gray, silt with clay(25-45%) low-moderate plasticity, firm, moist, mottled in color, some black staining | 10.65 |
| 15 | | ML | | SANDY CLAYEY SILT, strong brown/light gray, silt with clay (10-25%) and very fine sand, moist, wet | |
| 20 | 0.0 | SW | | CLAYEY SAND, sand coarse-very coarse, well graded, with clay (10-20%) saturated | |
| | | GW | | CLAYEY SANDY GRAVEL, strong brown, gravel up to 1" diameter with sand medium-coarse, and clay (10-30%) saturated | |
| 25 | | GW | | SILTY SANDY GRAVEL, strong brown, gravel up to 1 1/2" diameter with fine-coarse sand and silt, wet, saturated | 25.45<br>26.0 |
| | | ML | | SILT, dark gray, silt moderately lithified, finely laminated, dry fissile | 29.0 |
| 30 | | | | TOTAL DEPTH = 29.0 FEET | |

Completion Data

Material Description

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INTERNATIONAL TECHNOLOGY CORPORATION

# Monitor Well Installation

ITMW4

Well No [illegible]

Client [illegible] Job No [illegible] Date Drilled [illegible] Sheet of

Site [illegible] Elevation Asphalt [illegible] Top of PVC Casing [illegible]

Total Depth 33.0 FEET Casing Size & Type [illegible] Screen Size [illegible]

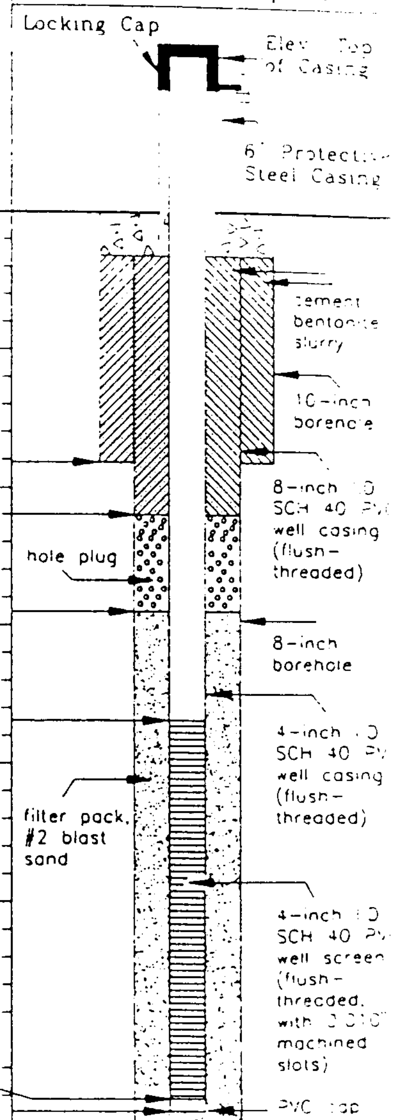
Comments [illegible]-INCH HOLLOW STEM AUGER, 10-INCH HOLLOW STEM AUGER AND MUD ROTARY

2" SPLIT-SPOON, 5' CONTINUOUS SAMPLE

| Depth in Feet | PID (ppm) | Symbol | Sample Description | Material Setting |
|---|---|---|---|---|
| | | | ASPHALT | |
| | 1.4 | GW | GRAVEL FILL, black, gravel fill, saturated with oily sheen and odor present | |
| | 1.7 | | | |
| 5 | 1.4 | | | |
| | 0.7 | ML | CLAYEY SILT, strong brown, silt with clay (20-40%) low plasticity moderate-firm, moist | |
| 10 | | | | 9.1 |
| | 3.9 | | CLAYEY SILT, strong brown | 11 |
| | 2.7 | | CLAYEY SILT, olive, silt with clay, low plasticity, moist, odorous | |
| | | | CLAYEY SILT, light olive brown | |
| 15 | 2.0 | | CLAYEY SILT, light gray/light olive brown, silt with clay, low plasticity, moist trace of very fine sand | 14.5 |
| | 2.5 | | CLAYEY SILT, light gray/yellowish brown, silt with clay, low plasticity, moist trace of fine sand | 18.2 |
| 20 | 1.9 | SW | SILTY SAND, yellowish brown, medium-coarse sand with silt (15-35%) wet, saturated | |
| | | ML | CLAYEY SILT, yellowish brown, silt with clay (20-40%) moist-wet | |
| | 1.3 | SW | SILTY SAND, yellowish brown, medium-coarse sand with silt (20-40%) saturated, becoming coarse with depth, well graded | |
| 25 | 1.1 | GW | SILTY SANDY GRAVEL, dark yellowish brown, gravel up to 1 1/4" diameter with fine-coarse sand and silt | |
| | 0.9 | | SILTY SANDY GRAVEL, dark yellowish brown, gravel up to 1/2" with fine to coarse sand, mostly medium-coarse and silt (10-15%) gravel becomes much finer than above | |
| | 0.7 | | SILTY SANDY GRAVEL, gravel up to 1/2" thick with fine-coarse sand and silt, increasing in silt with depth, becoming slightly lithified | |
| 30 | | | | |
| | | | CLAYEY SILT, yellowish brown, silt with clay (25-45%) laminated, low plasticity, firm | 32.2 |
| | | | SILT, dark gray, silt moderately lithified, laminated | 32.5 |
| | | | TOTAL DEPTH = 33.0 FEET | 33.0 |

## Completion Data

Material Description

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**IT** INTERNATIONAL TECHNOLOGY CORPORATION

# Monitor Well Installation

ITMW5

Well No [illegible]

Client WHIRLPOOL  Job No 446498  Date Drilled [illegible]  Sheet [illegible] of [illegible]

Site FORT SMITH, AR  Elevation Pad 4?6.57  Top of PVC Casing 4?8.93

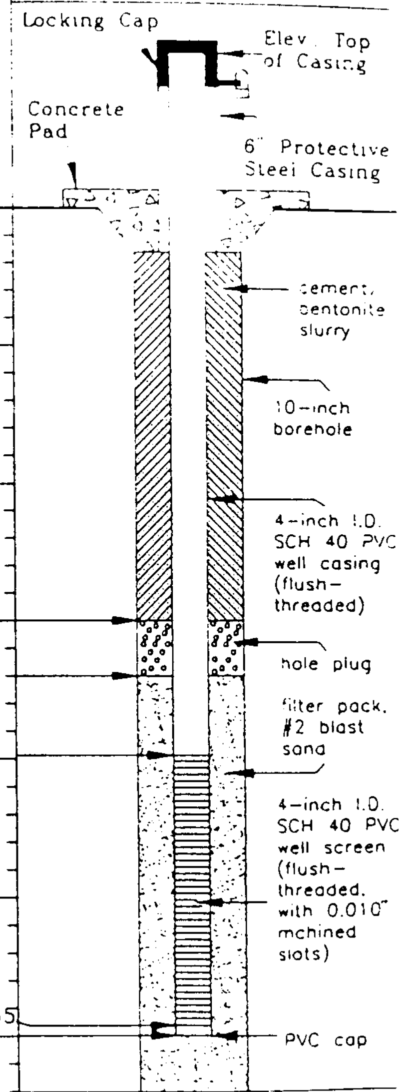
Total Depth [illegible]  Casing Size & Type 4-INCH SCH 40 PVC  Screen Size 0.010 INCH

Comments: 8-INCH HOLLOW STEM AUGER, 10-INCH HOLLOW STEM AUGER AND MUD ROTARY
2" SPLIT SPOON 5' CONTINUOUS SAMPLE

| Depth in Feet | PID (ppm) | Symbol | Stratigraphy | Sample Description | Material Setting |
|---|---|---|---|---|---|
| | | | | GRAVEL FILL | |
| | 0.0 | | | CLAYEY SILT, light gray/strong brown, silt with clay (20-40%) low plasticity moist-wet, mottled in color | |
| | 0.0 | | | CLAYEY SILT, light gray/strong brown, silt with clay (20-40%) low plasticity moist, some gravel sized shale fragments intermittant | |
| 5 | 0.0 | | | CLAYEY SILT, strong brown/light gray, silt with clay (20-40%) low plasticity dry, firm, gravel sized shale fragments intermittant | |
| | 0.5 | | | CLAYEY SILT, light gray/strong brown, silt with clay (30-45%) low plasticity firm, dry, mottled in color, some black staining | |
| 10 | | | | | |
| | 0.7 | ML | | CLAYEY SILT, light gray/strong brown, silt with clay (35-45%) low plasticity very firm, dry, slickensides at 13.5', black staining throughout mottled in color | |
| 15 | | | | | 15 |
| | | | | | 17 |
| | | | | CLAYEY SILT, light gray/strong brown, silt with clay (35-45%) low plasticity very firm, dry, mottled in color, black staining | |
| 20 | | | | | 19.9 |
| | 0.5 | | | | |
| 25 | | GW | | CLAYEY SANDY GRAVEL, strong brown, gravel up to 1 1/2" with medium-coarse sand and clay, moist-wet | |
| | | | | CLAYEY SANDY GRAVEL, strong brown, gravel with medium-coarse sand and clay, saturated | 29.65 |
| 30 | | | | | 30 |
| | | ML | | CLAYEY SILT, strong brown, silt finely laminated, crumbly with clay (10-25%) | |
| | 0.0 | ML | | SILT, dark gray, silt, finely laminated, medium-well lithified, fissile | 32 |
| | | | | TOTAL DEPTH = 32.0 FEET | |

## Completion Data

Material Description

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# Monitor Well Installation

ITMW6

Well No [illegible]

Client [illegible] Job No [illegible] Date Drilled [illegible] 89 Sheet [illegible] of [illegible]

Site [illegible] AR Elevation Pad 481.05 Top of PVC Casing [illegible]

Total Depth 36.7 FEET Casing Size & Type 4-INCH [illegible] 40 [illegible] Screen Size [illegible]

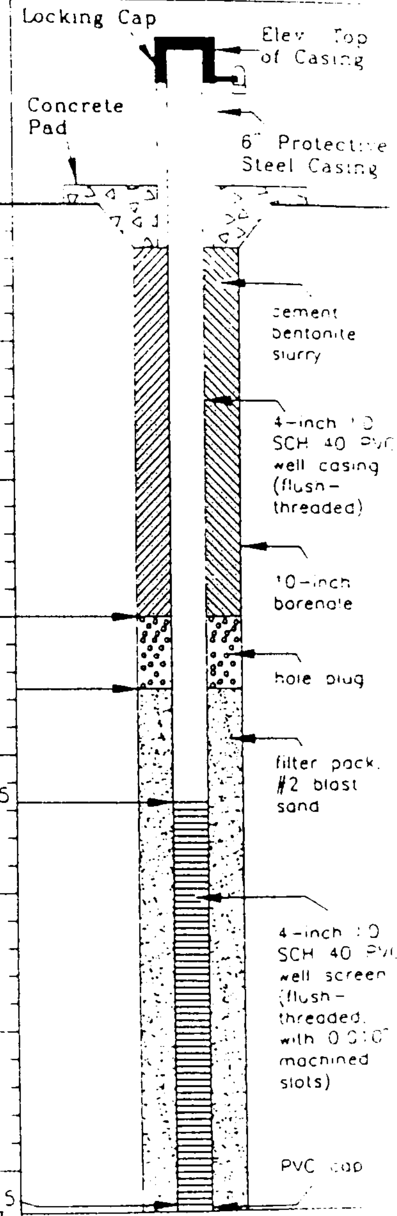
Comments [illegible] INCH HOLLOW STEM AUGER

[illegible] SPLIT-SPOON [illegible] CONTINUOUS SAMPLE

| Depth in Feet | PID (ppm) | Symbol | Sample Description | Material Setting |
|---|---|---|---|---|
| 0 | 0.0 | GW | CLAYEY SILTY GRAVEL, brown, gravel fill with clay and silt | |
| | 0.0 | ML | CLAYEY SILT, red/dark yellowish brown, silt with clay (20–40%) firm, dry, roots, mottled in color | |
| 5 | 0.0 | | | |
| | 0.0 | ML | CLAYEY GRAVELY SILT, silt with clay (30–40%) and gravel (5%) up to 3/8" diameter, firm, dry | |
| 10 | | | CLAYEY SILT, yellowish brown, silt with clay (30–40%) firm, dry | |
| | 0.0 | ML | CLAYEY SILT, strong brown, silt with clay (30–40%) firm, dry, at 12.5' a 3" layer of clayey gravely silt, with shale fragment, gravel size abundant, mottled in color becoming strong brown at 13' | |
| 15 | | | | 15 |
| | 0.0 | | CLAYEY SILT, strong brown, silt with clay (20–30%) moderately firm slightly moist, some decomposed shale intermittant | 17.5 |
| 20 | | | | 21.65 |
| | [illegible]9 | | CLAYEY SILT, strong brown, silt with clay (30–40%) moderately firm slightly moist | |
| 25 | | ML | CLAYEY SANDY SILT, strong brown, silt with clay (20–30%) and very fine sand (10–20%) moist-wet | |
| | | SP | SAND, yellowish brown, very fine-fine sand, poorly graded, saturated | |
| 30 | | SP | SILTY SAND, light gray, very fine sand with silt(20–30%) wet-saturated | |
| | | ML | CLAYEY SILT, strong brown, silt with clay | |
| | | GW | CLAYEY GRAVEL, strong brown, gravel up to 1", most 1/8–1/4" with clay (10–20%) saturated | |
| 35 | | GW | CLAYEY SANDY GRAVEL, strong brown, gravel 1/8–1/4" with medium-coarse sand and clay (10–20%) | |
| | | ML | SILT, dark gray, finely laminated, moderately lithified, fissile silt | 36.15 |
| | | | TOTAL DEPTH = 36.7 FEET | 36.7 |

## Completion Data

Material Description

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INTERNATIONAL TECHNOLOGY CORPORATION

# Monitor Well Installation

ITMW8

Client [illegible] Job No. 446498 Date Drilled [illegible] 89 Sheet [illegible] of [illegible] Well No. MW8

Site [illegible] MITH, AR Elevation Cover Rim 482.33 Top of PVC Casing 481.79

Total Depth 34.60 FEET Casing Size & Type 4-INCH SCH 40 PVC Screen Size 0.010 [illegible]

Comments: 8-INCH HOLLOW STEM AUGGER 10-INCH HOLLOW STEM AUGER

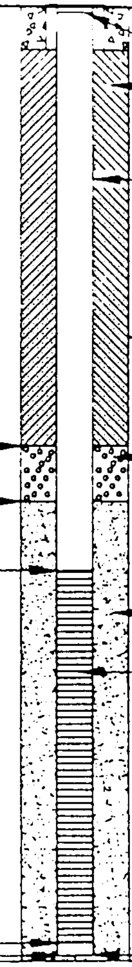
2' SPLIT-SPOON 5' CONTINUOUS SAMPLE

| Depth in Feet | PID (ppm) | Symbol | Sample Description | Material Setting |
|---|---|---|---|---|
| | | | CONCRETE SLAB | |
| | | ML | SANDY SILT, brown, silt with sand, very fine to fine, moist, odorous | |
| 5 | 1.0 | ML | CLAYEY SILT, yellowish brown/light gray, silt with clay (10-20%), trace very fine sand, roots, rock fragments, moist, odorous | |
| | 0.4 | | | |
| 10 | 0.4 | | CLAYEY SILT, yellowish brown/light gray, silt with clay (10-30%), trace (10%) very fine sand, weathered rock fragments, roots, black staining, moist | |
| | | GW | SILTY SANDY GRAVEL, yellowish brown, gravel with medium to coarse sand and silt, moist | |
| | 0.4 | ML | SANDY SILT, yellowish brown/light gray, silt with very fine sand (30-50%), moist, intermitant rock fragments, black staining | |
| 15 | | ML | SANDY SILT, yellowish brown, silt with sand, fine to medium (30-50%), moist, rock fragments | 16.0 |
| | | | SANDY SILT, same as above | 18.0 |
| 20 | 0.2 | | CLAYEY SANDY SILT, yellowish brown/light gray, silt with clay (10-20%), fine sand, trace (10%), moist | |
| | | | SANDY SILT, silt with fine to medium sand, moist | 20.45 |
| | 0.4 | ML | SANDY CLAYEY SILT, yellowish brown/light gray, silt with clay and very fine to fine sand, wet | |
| 25 | 0.2 | SW | SILTY SAND, yellowish brown, medium to coarse, sand with silt, saturated | |
| 30 | | GW | SILTY SANDY GRAVEL, yellowish brown, gravel up to 1", angular, with medium to very coarse sand and silt, saturated | |
| | 0.2 | | SILTY SANDY GRAVEL, yellowish brown, same as above | |
| | | ML | CLAYEY SILT, yellowins brown, silt with clay (10-30%), firm, moist | 33.90 |
| 35 | | ML | SHALE, gray, shale | 34.45 |
| | | | TOTAL DEPTH = 35.0 FEET | 34.60 |

## Completion Data

Material Description

Flush Completion

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**DRAFT**

INTERNATIONAL TECHNOLOGY CORPORATION

# Monitor Well Installation

ITMW9

Client WHIRLPOOL Job No 346498 Date Drilled 12/19/89 Well No MW9 Sheet 1 of 1

Site FORT SMITH AR Elevation Ground 479.50 Top of PVC Casing 481.90

Total Depth 34.5 FEET Casing Size & Type: 4-INCH SCH 40 PVC Screen Size 0.010 INCH

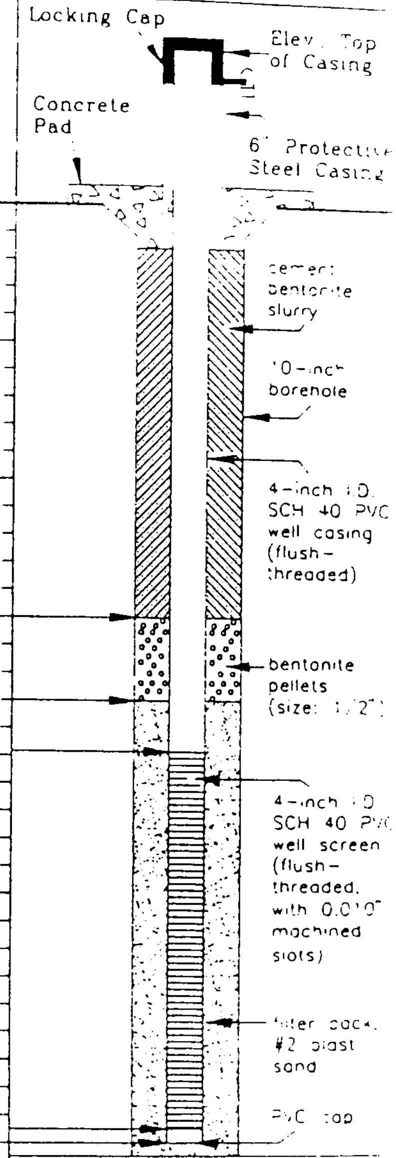
Comments 8-INCH HOLLOW STEM AUGER

2" SPLIT-SPOON 5' CONTINUOUS SAMPLE

| Depth in Feet | PID (ppm) | Symbol | Stratigraphy | Sample Description | Material Setting |
|---|---|---|---|---|---|
| | | ML | | SANDY SILT, brown, silt with very fine to fine sand, moist | |
| 5 | 30.0 | ML | | CLAYEY SILT, yellowish brown/light gray, silt with clay (10–30%), low plasticity, moist, crumbly rock fragments, black staining, slight odor, roots | |
| 10 | 50.0 | | | CLAYEY SILT, yellowish brown/light gray, silt with clay (10–30%), low plasticity, becoming more rigid, weathered rock fragments, black staining, moist, slight odor | |
| 15 | 0.0 | ML | | SANDY CLAYEY SILT, yellowish brown, silt with clay (10–20%), low plasticity, moderately firm with medium to coarse sand (10–30%), moist | 15.0 |
| | | | | SANDY CLAYEY SILT, yellowish brown, same as above | 18.0 |
| 20 | | GW | | SILTY SANDY GRAVEL, yellowish brown, gravel with up to 1", angular, with medium to very coarse sand, 30–40% silt, moist to wet | 19.95 |
| | | | | SILTY SANDY GRAVEL, yellowish brown | |
| | 0.0 | SW | | SAND, yellowish brown, well graded, medium to coarse sand with trace silt, wet to saturated | |
| | | SW | | SILTY SAND, yellowish brown, medium to coarse sand with silt (30–40%), moderately firm, cohesive, moist to wet | |
| 25 | | GW | | SILTY SANDY GRAVEL, yellowish brown, gravel up to 1", angular, with medium to coarse sand and silt, cohesive, moist to wet | |
| 30 | 0.0 | | | SILTY SANDY GRAVEL, yellowish brown, gravel with medium to coarse sand and silt, saturated, beginning at 26.5' BGL | |
| | 0.0 | | | SILTY SANDY GRAVEL, yellowish brown, same as above | |
| | | ML | | CLAYEY SILT, yellowish brown, silt with clay (10–30%), firm, moist | 33.45 |
| | | ML | | SHALE, gray, shale, fissile, dry to moist | 34.0 |
| | | | | TOTAL DEPTH = 34.16 FEET | 34.5 |

## Completion Data

Material Description

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DRAFT

INTERNATIONAL TECHNOLOGY CORPORATION

# Monitor Well Installation

ITMW10

Client: WHIRLPOOL Job No: 446498 Date Drilled: 12/20/89 Well No: MW-? Sheet 1 of 1

Site: FORT SMITH, AR Elevation: Ground 478.60 Top of PVC Casing 480.84

Total Depth: 35.5 FEET Casing Size & Type: 4-INCH SCH 40 PVC Screen Size: 0.010 INCH

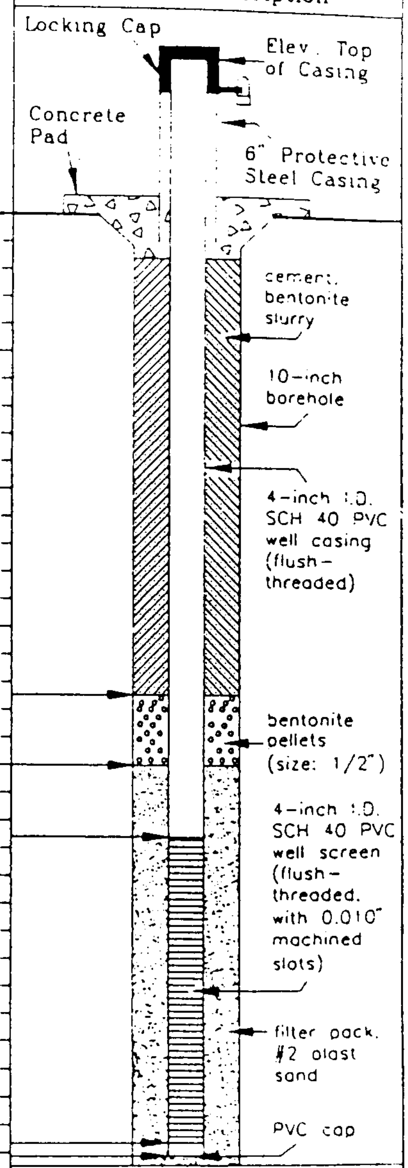
Comments: 8-INCH HOLLOW STEM AUGER
2" SPLIT-SPOON 5' CONTINUOUS SAMPLE

| PID (ppm) | Symbol | Sample Description |
|---|---|---|
| 0.4 | ML | CLAYEY SILT, yellowish brown/light gray, silt with clay (10–30%), low plasticity, moderately firm, moist, mottled in color, weathered rock fragments, intermitant, roots |
| 0.4 | | CLAYEY SILT, yellowish brown/light gray, silt with clay (10–30%), trace very fine sand, weathered rock fragments, intermitant, roots, moist, mottled in color, moderately firm |
| 0.2 | | CLAYEY SILT, yellowish brown/light gray, silt with clay (10–30%), trace very fine sand, weathered rock fragments, intermitant, black staining from weathering, becoming more firm with depth, moist |
| 0.0 | | CLAYEY SILT, yellowish brown/light gray, silt with clay (10–30%), trace very fine sand, weathered rock fragments, intermitant, black staining, dry to moist, firm |
| 0.2 | | CLAYEY SILT, yellowish brown/light gray, silt with clay (10–30%), trace very fine sand, increasing with depth, moist, black staining, moderately firm |
| | ML | CLAYEY SANDY SILT, yellowish brown/light gray, silt with clay (10–20%), very fine sand (10–30%), moist, low to moderately firm, black staining |
| 0.2 | GW | SILTY SANDY GRAVEL, yellowish brown, gravel up to 1" diameter, angular, with sand medium to coarse, and silt, cohesive, moist |
| | | SILTY SANDY GRAVEL, yellowish brown, gravel up to 1", angular, with sand medium to coarse, and silt, saturated at 31.5'BGL |
| 0.2 | ML | CLAYEY SILT, yellowish brown, silt with clay (20–40%), moderately firm, moist to dry |
| | ML | SHALE, gray, shale, fissile, dry |

TOTAL DEPTH = 35.5 FEET

Material Setting: 17.5, 20.0, 22.65, 33.60, 34.15, 34.25

## Completion Data
Material Description

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**DRAFT**

INTERNATIONAL TECHNOLOGY CORPORATION

# Monitor Well Installation

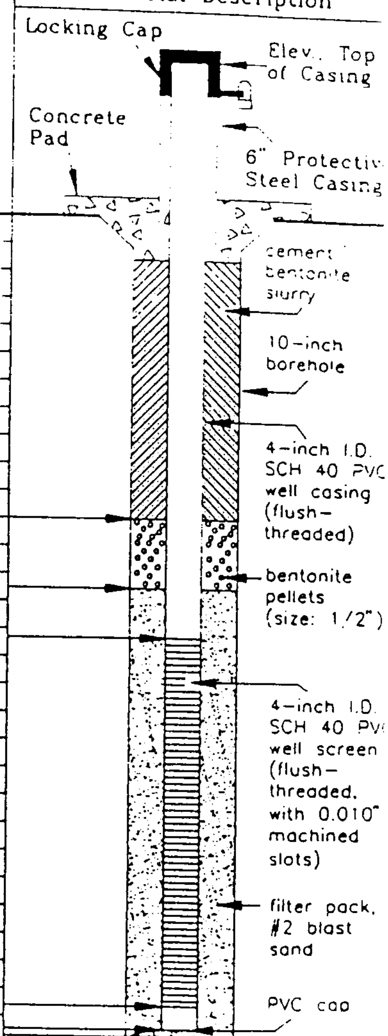
ITMW 11

Client: WHIRLPOOL  Job No: 446498  Date Drilled: 12/20/89  Well No: MW-[illegible]
Site: FORT SMITH, AR  Elevation Ground: 474.00  Top of PVC Casing: 476.50  Sheet: [illegible] of 1
Total Depth: 30.5 FEET  Casing Size & Type: 4-INCH SCH 40 PVC  Screen Size: 0.010 INCH
Comments: 8-INCH HOLLOW STEM AUGER
2" SPLIT-SPOON 5' CONTINUOUS SAMPLE

| Depth in Feet | PID (ppm) | Symbol | Sample Description | Material Setting |
|---|---|---|---|---|
| | | ML | SANDY CLAYEY SILT, yellowish brown/light gray | |
| 5 | 700.0 | | SANDY CLAYEY SILT, yellowish brown/light gray, silt with clay (10-30%), moderately firm, and sand very fine grained (10-30%), weathered rock fragments, moist, odorous | |
| | 450.0 | | SANDY CLAYEY SILT, yellowish brown/light gray, same as above, but less firm | |
| 10 | 400.0 | ML | CLAYEY SILT, yellowish brown/light gray, silt with clay (10-30%), low plasticity, moderately firm, moist, trace very fine sand, odorous | |
| | 400.0 | ML | SANDY CLAYEY SILT, yellowish brown/light gray, silt with clay (10-20%), angular, very fine to fine sand (20-40%), moist, odorous, black staining | 11.0 |
| 15 | 310.0 | | | 13.5 |
| | 75.0 | SW | SILTY SAND, yellowish brown/light gray, fine to medium sand with silt, black staining, slight odor, wet to saturated | 15.25 |
| 20 | 65.0 | | | |
| | 2.6 | GW | SILTY SANDY GRAVEL, yellowish brown, gravel, angular up to 1", with fine to very coarse sand, and silt (10-20%), saturated | |
| 25 | 0.0 | | | |
| | 0.0 | | SILTY SANDY GRAVEL, yellowish brown, same as above | 28.7 |
| 30 | | ML | SHALE, gray, shale fossile, slickenslide | 29.45<br>29.7 |

TOTAL DEPTH = 30.5 FEET

## Completion Data

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**DRAFT**

Client: WHIRLPOOL
Project Name: WHIRLPOOL
Project Location: FORT SMITH, ARK.
Project Number: 446498

# MONITOR WELL ITMW12

## DRILLING AND SAMPLING INFORMATION

Boring Location: ITMW12
SURFACE ELEV.(FT): 474.72
TOTAL DEPTH(FT.): 30.5
Logged By: L. JOHNSON
Date Started: 10/30/90
Drilled By: J. LANDEROS
Date Completed: 10/30/90

Drill Rig Type: B-53 MOBILE DRILL
Drilling Method: 8-INCH HOLLOW STEM AUGER, 10-INCH HOLLOW STEM AUGER
Sampling Method: 5-FOOT CONTINUOUS SAMPLE

Notes: –

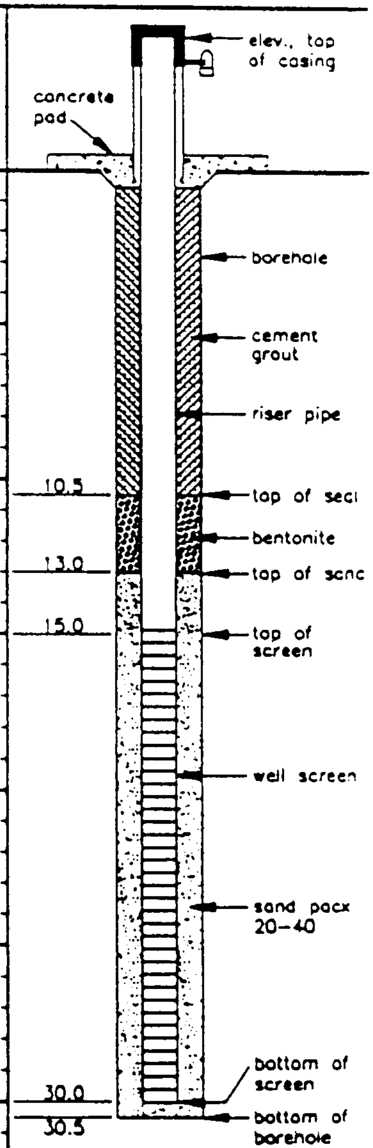
## WELL COMPLETION DATA

Elev-Top of Casing(ft.): 476.67 Ref. Datum: MSL
1. Riser Pipe-Dia(in.): 4 Depth(ft.): 15 Type: Sch 40 PVC
   Centralizers-Type: NA Depths(ft.): NA
2. Screen Dia.(in.): 4 Type: Sch 40 PVC FJT
   Depth Interval(ft.): 15–30 Slot Size(in.): .010
   Centralizers-Type: NA Depths(ft.): NA
3. Filter Pack Type: 20-40 Silica Depth Interval(ft.): 13–30.5
   Conc. Pad Size: 3'x3'x6"

NOTE: All depths are for base of pipe from ground surface.

| DESCRIPTION | SAMPLE TYPE / SAMPLE NO. | IN. DRIVEN / IN. RECOVERED | PID | USCS |
|---|---|---|---|---|
| CONCRETE – 4-inches thick with 2-inch fill sand | | | | |
| SILTY CLAY – reddish orange, some roots | CS | 60 / 24 | 2.5 | cl |
| CLAY – orange, some light gray 1cm thick silt stringers, black iron nodules | CS | 60 / 60 | 2.5 | cl |
| – orange to light gray, disseminated black spots, light gray – 1-2cm thick silt stringers, iron nodules | | | 3.0 | |
| – orange, black iron nodules, 1-3cm thick gray silt stringers, some cobbles/gravel | CS | 60 / 31 | 3.0 | |
| SILT – light gray, medium dense, slight clay content – wet | | | 2.5 | ml |
| | CS | 60 / 48 | 2.5 | |
| SAND – brown to orange, fine to medium grained, wet | | | | sp |
| | CS | 60 / 48 | | |
| SANDY CLAY – alternating silty sand and clay (15-30cm) layers | | | 1.9 | cl |
| GRAVEL – gray to white, 4-8mm | | | | gp |
| | CS | 60 / 60 | 1.9 | |
| SAND – orange brown, coarse grained, some 2-6mm gravel | | | | sw |
| CLAY – gray/orange, 1-inch layer of 2-5mm gravel | | | 1.9 | cl |

DEPTH IN FEET: 5, 10, 15, 20, 25, 30, 35, 40




TOTAL DEPTH = 30.5 FEET

| INTERNATIONAL TECHNOLOGY CORPORATION | DRAFT BY | STF 12/19/90 | DRAFT CHK | 6-7-91 | PROJ. CHK | 6-7-91 | APPRV. BY | 6-7-91 | DWG. NO. | 446498-A47 Sheet 1 of 1 |
|---|---|---|---|---|---|---|---|---|---|---|

# DRAFT

Client: WHIRLPOOL | Project Location: FORT SMITH, ARK.
Project Name: WHIRLPOOL | Project Number: 446498

## MONITOR WELL ITMW13

### DRILLING AND SAMPLING INFORMATION

Boring Location: ITMW13
SURFACE ELEV.(FT): 475.39
TOTAL DEPTH(FT.): 29.5
Logged By: L. JOHNSON
Date Started: 11/6/90
Drilled By: J. LANDEROS
Date Completed: 11/7/90

Drill Rig Type: DEEP ROCK
Drilling Method: 8-INCH HOLLOW STEM AUGER, 10-INCH HOLLOW STEM AUGER
Sampling Method: 5-FOOT CONTINUOUS SAMPLE

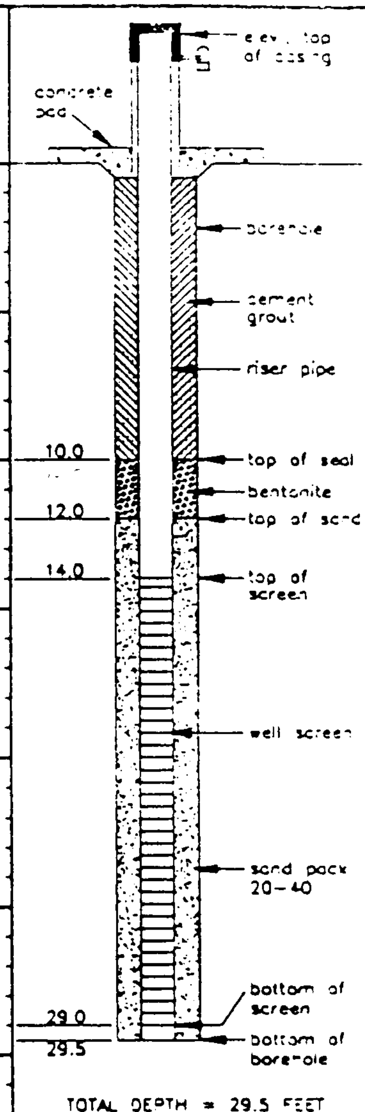
Notes:

### WELL COMPLETION DATA

Elev-Top of Casing(ft.): 477.79 — Ref. Datum: MSL
1. Riser Pipe-Dia(in.): 4 — Depth(ft.): 14 — Type: Sch 40 PVC
   Centralizers-Type: NA — Depths(ft.): NA
2. Screen Dia.(in.): 4 — Type: Sch 40 PVC FJT
   Depth Interval(ft.): 14-29 — Slot Size(in.): 010
   Centralizers-Type: NA — Depths(ft.): NA
3. Filter Pack Type: 20-40 Silica — Depth Interval(ft.): 12-29.5
   Conc. Pad Size: 3'x3'x6"

NOTE: All depths are for base of pipe from ground surface.

| DESCRIPTION | SAMPLE TYPE / SAMPLE NO. | IN. DRIVEN / IN. RECOVERED | PID | USCS | DEPTH IN FEET |
|---|---|---|---|---|---|
| GRAVEL - 5-inches thick, large amount of water | | | | | 0 |
| CLAY - orange to gray patches, hard | CS | 36 / 17 | 4.1 | cl | |
| - orange, some gray patches of silty clay | CS | 60 / 8 | 6.4 | | 5–10 |
| SILTY CLAY - orange to light brown | CS | 60 / 49 | 4.1 | cl | |
| - silty towards lower section | | | 9.1 | | 15 |
| - wet | CS | 60 / 60 | | | |
| SAND/SILTY CLAY - very fine grained sand with silty clay interbeds | | | 6.4 | cl | |
| CLAYEY SILTY SAND - light brown, fine grained, large amount of silts and clays, interbedded sand and clay | CS | 60 / 40 | | sc | 20 |
| SANDY CLAY - light gray brown, fine grained sand, clay interbeds, some gravel, sand, orange clay | | | 5.8 | cl | |
| SAND - orange brown, coarse grained, sub-round fragments up to 3mm in diameter | CS | 55 / 38 | | sp | 25 |
| GRAVEL/SAND - orange brown, coarse grained, some clasts range to 1-inch in diameter | | | 5.8 | sp | |
| SAND - orange brown, very coarse grained to silt size | | | 6.2 | sw | 30 |




| INTERNATIONAL TECHNOLOGY CORPORATION | DRAFT BY | STF 12/20/90 | DRAFT CHK | [illegible] 6-7-91 | PROJ. CHK | JOM 6-7-91 | APPRV BY | JOM 6-7-91 | DWG. NO. | 446498-A48 Sheet 1 of 1 |
|---|---|---|---|---|---|---|---|---|---|---|

**Client:** WHIRLPOOL **Project Location:** FORT SMITH, ARK.
**Project Name:** WHIRLPOOL **Project Number:** 446498

# DRAFT
# MONITOR WELL ITMW14

## DRILLING AND SAMPLING INFORMATION

**Boring Location:** ITMW14
**SURFACE ELEV.(FT):** 475.68
**TOTAL DEPTH(FT.):** 30
**Logged By:** L. JOHNSON
**Date Started:** 10/30/90
**Drilled By:** J. LANDEROS
**Date Completed:** 10/31/90

**Drill Rig Type:** B-53 MOBILE DRILL
**Drilling Method:** 8-INCH HOLLOW STEM AUGER, 10-INCH HOLLOW STEM AUGER
**Sampling Method:** 5-FOOT CONTINUOUS SAMPLE

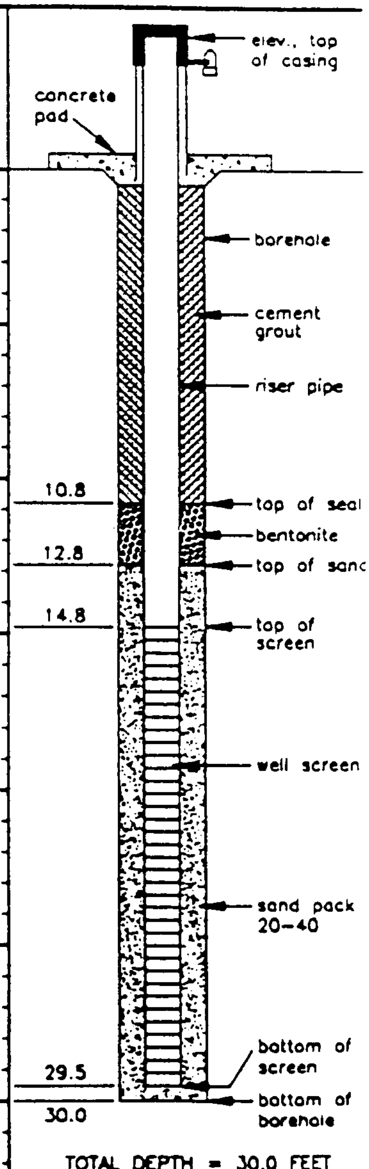
**Notes:** -

## WELL COMPLETION DATA

**Elev-Top of Casing(ft.):** 477.30 **Ref. Datum:** MSL
1. **Riser Pipe-Dia(in.):** 4 **Depth(ft.):** 14.8 **Type:** Sch 40 PV
   **Centralizers-Type:** NA **Depths(ft.):** NA
2. **Screen Dia.(in.):** 4 **Type:** Sch 40 PVC FJT
   **Depth Interval(ft.):** 14.8-29.5 **Slot Size(in.):** .010
   **Centralizers-Type:** NA **Depths(ft.):** NA
3. **Filter Pack Type:** 20-40 Silica **Depth Interval(ft.):** 12.8-30
   **Conc. Pad Size:** 3'x3'x6"

**NOTE:** All depths are for base of pipe from ground surface.

| DESCRIPTION | SAMPLE TYPE / SAMPLE NO. | IN. DRIVEN / IN. RECOVERED | PID | USCS | DEPTH IN FEET |
|---|---|---|---|---|---|
| GRAVEL - gravel pack surface, oil stained soil | CS | 60 / 48 | 3.6 | | 0 |
| CLAY - orange gray, roots and other organics, some iron nodules, hard, 1cm thick layers of silty clay<br>- alternating orange and gray clay, orange portion well oxidized and not as stiff as gray clay, 4-8mm gravels | CS | 60 / 60 | 5.2<br>4.2 | ch | 5 |
| CLAY/SILT - orange gray, more silty with depth, some 4-8mm gravels | CS | 60 / 60 | 6.4 | cl | 10 |
| SILT - gray, wet<br>- firm | CS | 60 / 60 | 8.0 | ml | 15 |
| SILTY SAND - orange brown, saturated, some 3-6mm gravels | CS | 60 / 18 | 4.1 | sm | 20 |
| SAND/GRAVEL - orange brown, top is very fine grained, middle is medium to coarse gravel at bottom (3-5cm grains) | CS | 60 / 12 | 3.0<br>4.7 | sp | 25-30 |




Depth in feet: 5, 10, 15, 20, 25, 30, 35, 40

| INTERNATIONAL TECHNOLOGY CORPORATION | DRAFT BY | STF 12/20/90 | DRAFT CHK | CWR 6-7-91 | PROJ. CHK | JDm 6-7-91 | APPRV. BY | JDm 6-7-91 | DWG. NO. | 446498-A49 Sheet 1 of 1 |
|---|---|---|---|---|---|---|---|---|---|---|

**DRAFT**

Client: WHIRLPOOL
Project Name: WHIRLPOOL
Project Location: FORT SMITH, ARK.
Project Number: 446498

# MONITOR WELL ITMW15

## DRILLING AND SAMPLING INFORMATION

Boring Location: ITMW15
SURFACE ELEV.(FT): 474.79
TOTAL DEPTH(FT.): 30
Logged By: L. JOHNSON
Date Started: 10/31/90
Drilled By: J. LANDEROS
Date Completed: 10/31/90

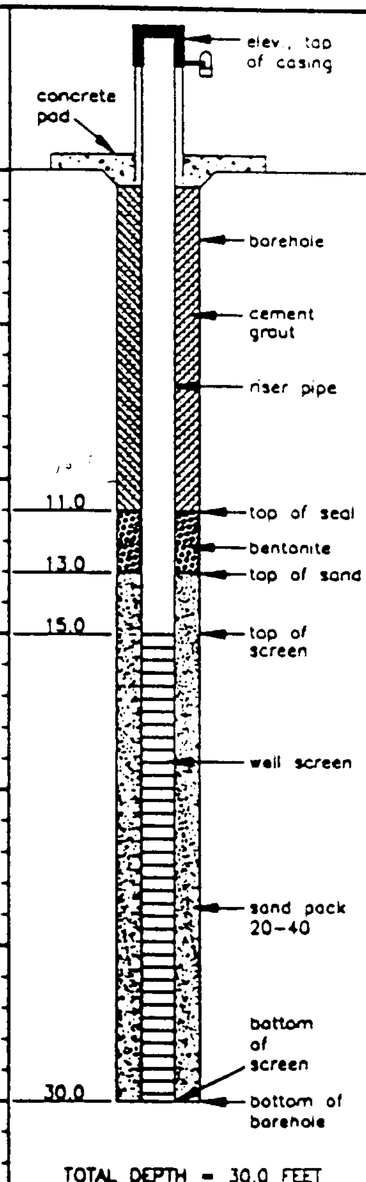
Drill Rig Type: B-53 MOBILE DRILL
Drilling Method: 8-INCH HOLLOW STEM AUGER, 10-INCH HOLLOW STEM AUGER
Sampling Method: 5-FOOT CONTINUOS SAMPLE - CS
2-FOOT SHELBY TUBE - ST
Notes: -

## WELL COMPLETION DATA

Elev-Top of Casing(ft.): 476.49 Ref. Datum: MSL
1. Riser Pipe-Dia(in.): 4 Depth(ft.): 15 Type: Sch 40 PVC
Centralizers-Type: NA Depths(ft.): NA
2. Screen Dia.(in.): 4 Type: Sch 40 PVC FJT
Depth Interval(ft.): 15-30 Slot Size(in.): .010
Centralizers-Type: NA Depths(ft.): NA
3. Filter Pack Type: 20-40 Silica Depth Interval(ft.): 13-30
Conc. Pad Size: 3'x3'x6"

NOTE: All depths are for base of pipe from ground surface.

| DESCRIPTION | SAMPLE TYPE / SAMPLE NO. | IN. DRIVEN / IN. RECOVERED | PID | USCS | DEPTH IN FEET |
|---|---|---|---|---|---|
| GRAVEL - fill material and soil | CS | 60 / 14 | | | |
| CLAY - orange, roots and other organics, some iron nodules, some silt | ST | | 8.6 | cl | 5 |
| - orange and gray, alternating, orange portion well oxidized and not as stiff as gray, 4-8mm gravels | | | 5.2 | | 10 |
| | ST | | | | |
| SILTY CLAY - orange gray silty clay turning more silty with depth, some 4-8mm gravels | | | 6.2 | cl | |
| | ST | 60 | | | 15 |
| - interbeds of clay and silt, soft | CS | 30 | 10.3 | | |
| - wet | | | | | 20 |
| SILT - orange brown, some gravel and iron nodules | | | 8.0 | ml | |
| SAND - white gray, fine grained, well sorted | | | | sp | 25 |
| - orange brown, medium to coarse grained | | | 12.5 | | |
| GRAVEL - orange to black, with matrix, 10-20mm fragments | | | 5.8 | gm | 30 |
| | | | | | 35 |
| | | | | | 40 |




TOTAL DEPTH = 30.0 FEET

| INTERNATIONAL TECHNOLOGY CORPORATION | DRAFT BY | STF 12/20/90 | DRAFT CHK | CMR 6-7-91 | PROJ. CHK | JDm 6-7-91 | APPRV. BY | JDm 6-7-91 | DWG. NO. | 446498-A50 Sheet 1 of 1 |
|---|---|---|---|---|---|---|---|---|---|---|

**DRAFT**

Client: WHIRLPOOL
Project Name: WHIRLPOOL
Project Location: FORT SMITH, ARK.
Project Number: 446498

# MONITOR WELL ITMW16

## DRILLING AND SAMPLING INFORMATION

Boring Location: ITMW16
SURFACE ELEV.(FT): 476.47
TOTAL DEPTH(FT.): 32.0
Logged By: B. HUEY
Date Started: 2/25/91
Drilled By: B. HOUSTON
Date Completed: 2/25/91

Drill Rig Type: B-61 HD TRUCK MOUNTED MOBILE RIG
Drilling Method: 8-INCH HOLLOW STEM AUGERS.
10-INCH HOLLOW STEM AUGERS
Sampling Method: 2 FOOT SPLIT SPOON (SS)

Notes: –

## WELL COMPLETION DATA

Elev-Top of Casing(ft.): 478.79 Ref. Datum: MSL
1. Riser Pipe-I.D.(in.): 4 Depth(ft.): 17 Type: Sch 40 PVC
Centralizers-Type: NA Depths(ft.): NA
2. Screen Dia.(in.): 4 Type: Sch 40 PVC FJT
Depth Interval(ft.): 17-32 Slot Size(in.): .010
Centralizers-Type: NA Depths(ft.): NA
3. Filter Pack Type: 20-40 Silica Depth Interval(ft.): 15-32
Conc. Pad Size: 3'x3'x6"

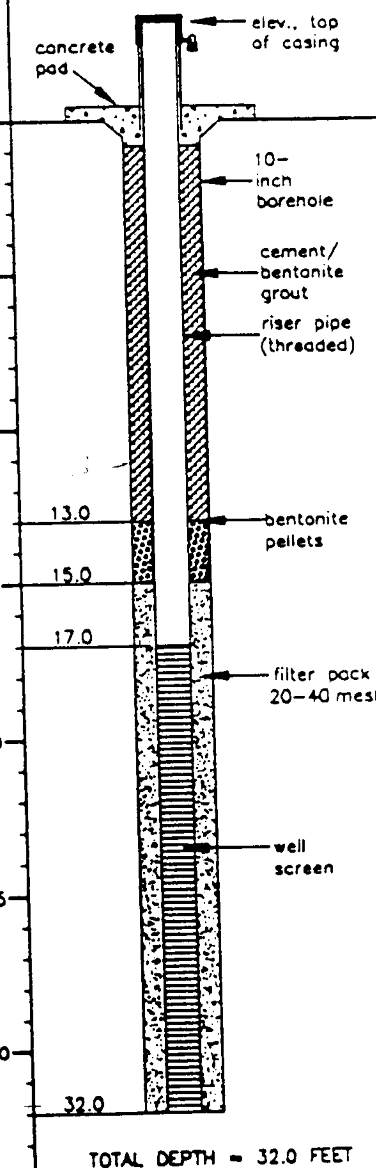
## DESCRIPTION

| DESCRIPTION | USCS |
|---|---|
| GRAVEL - coarse, 5 inches thick | gp |
| SILTY CLAY - medium plasticity; firm; 10-20% silt; light brown, mottled with red; no odor; no stain; moist | cl |
| CLAY - high plasticity; soft; brown; saturated; no odor; no stain | ch |
| SILTY CLAY - medium plasticity; 10-30% silt; hard; reddish brown; no odor; no stain; moist | cl |
| CLAY - medium plasticity; firm; light brown with 10-20% black mottling; no odor; no stain; moist | ch |
| SANDY CLAY - medium plasticity; 10-20% fine grained; hard; reddish brown; moist; no odor; no stain - reddish brown with gray mottling | cl |
| CLAYEY SAND - low plasticity; fine grained sand with 20-40% clay; reddish brown and gray; moist; no odor; no stain. Unit alternates between very soft; light brown; saturated layers and layers that are hard, reddish brown and moist | sc |
| GRAVELLY SAND - uniform; fine grained with 10-30% 1/2 inch gravel; dense; brown; saturated; no odor; no stain. Contains thin layers of uniform; fine grained sand light brown; dense; saturated; no odor; no stain | sp |
| CLAY - low plasticity; hard; brown; dry; no odor; no stain | ch |
| SHALE - non plastic; very hard; gray; dry; no odor; no stain | cl |

| SAMPLE TYPE | IN. DRIVEN | IN. RECOVERED |
|---|---|---|
| SS | 19 | 19 |
| SS | 24 | 24 |
| SS | 24 | 18 |
| SS | 24 | 24 |
| SS | 24 | 24 |
| SS | 24 | 15 |
| SS | 24 | 24 |
| SS | 24 | 24 |
| SS | 24 | 23 |
| SS | 24 | 24 |
| SS | 24 | 24 |
| SS | 24 | 24 |
| SS | 24 | 18 |
| SS | 24 | 24 |
| SS | 24 | 24 |

PID: 0.0, 0.0, 0.0, 0.0, 9.4, 2.7, 2.2, 0.5, 1.1, 1.1, 1.1, 1.6, 5.0, 0.0

DEPTH IN FEET: 5, 10, 15, 20, 25, 30, 35, 40




| INTERNATIONAL TECHNOLOGY CORPORATION | DRAFT BY | DED 4/2/91 | DRAFT CHK | GHR 6-7-91 | PROJ. CHK | JOM 6-7-91 | APPRV. BY | JOM 6-7-91 | DWG. NO. | 446498-A52 Sheet 1 of 1 |
|---|---|---|---|---|---|---|---|---|---|---|

**Client:** WHIRLPOOL　　**Project Location:** FORT SMITH, ARK
**Project Name:** WHIRLPOOL　　**Project Number:** 446498

# DRAFT
## MONITOR WELL ITMW17

### DRILLING AND SAMPLING INFORMATION

**Boring Location:** ITMW-17　　**SURFACE ELEV.(FT):** 476.14
**TOTAL DEPTH(FT.):** 31.0
**Logged By:** B. HUEY　　**Date Started:** 2/27/91
**Drilled By:** B. HOUSTON　　**Date Completed:** 2/27/91

**Drill Rig Type:** B-61 HD TRUCK MOUNTED RIG
**Drilling Method:** 8-INCH HOLLOW STEM AUGER, 10-INCH HOLLOW STEM AUGER
**Sampling Method:** 2 FOOT SPLIT SPOON (SS)

**Notes:** -

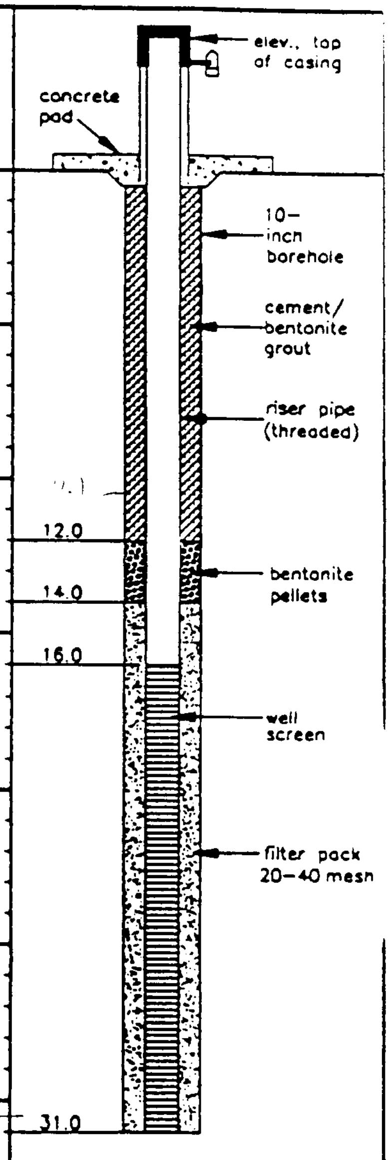
### WELL COMPLETION DATA

**Elev-Top of Casing(ft.):** 477.90　　**Ref. Datum:** MSL
1. **Riser Pipe-I.D.(in.):** 4　**Depth(ft.):** 16　**Type:** Sch 40 PVC
   **Centralizers-Type:** NA　**Depths(ft.):** NA
2. **Screen Dia.(in.):** 4　**Type:** Sch 40 PVC FJT
   **Depth Interval(ft.):** 16-31　**Slot Size(in.):** .010
   **Centralizers-Type:** NA　**Depths(ft.):** NA
3. **Filter Pack Type:** 20-40 Silica　**Depth Interval(ft.):** 14-31
   **Conc. Pad Size:** 3'x3'x6"

| DESCRIPTION | USCS |
|---|---|
| GRAVEL | gp |
| CLAY - medium plasticity; hard; reddish brown and gray mottled; moist; no odor ; no stain<br>- clay with 10-30% silt<br>- clay with 10-20% fine grained sand | cl |
| SILTY SAND - uniform; fine grained sand with 20-40% silt; dense light gray; moist, saturated in bottom 2 inches; no odor; no stain<br>- gray and brown; saturated to 18.2 feet then moist | sm |
| SAND - uniform; medium grained sand; loose; brown; saturated | sp |
| SILTY CLAY - uniform; clay with 10-30% silt; firm; brown; moist; no odor | cl |
| SAND - uniform; medium grained sand; loose; brown; saturated | sp |
| SANDY GRAVEL - uniform; 1/2 inch rounded gravel with fine grained sand; loose; brown; saturated; no odor; no stain | gp |
| SILTY CLAY - medium plasticity; clay with 20-40% silt; firm; brown; moist no odor; no stain | cl |
| SHALE - dark gray; moist | cl |

| SAMPLE TYPE | IN. DRIVEN | IN. RECOVERED | PID |
|---|---|---|---|
| SS | 18 | 18 | 0.0, 0.0 |
| SS | 24 | 24 | 0.0, 0.0 |
| SS | 24 | 24 | 0.0, 1.7 |
| SS | 24 | 24 | 0.7, 0.0 |
| SS | 24 | 24 | 0.0, 0.0 |
| SS | 24 | 24 | 0.0, 0.0 |
| SS | 24 | 24 | 0.0, 0.0 |
| SS | 24 | 24 | 0.0, 0.6 |
| SS | 24 | 18 | 0.0, 1.8 |
| SS | 24 | 24 | 1.3, 2.3 |
| SS | 24 | 24 | 5.5, 3.9 |
| SS | 24 | 24 | 18.9, 81.9 |
| SS | 24 | 24 | 5.1, 11.7 |
| SS | 12 | 12 | 5.8, 84.9 |
| SS | 24 | 18 | 24.9, 5.0 |
| SS | 12 | 12 | 0.0 |

DEPTH IN FEET: 5, 10, 15, 20, 25, 30, 35, 40




TOTAL DEPTH 31.0 FEET

| INTERNATIONAL TECHNOLOGY CORPORATION | DRAFT BY | DED 4/2/91 | DRAFT CHK | 6-7-91 | PROJ. CHK | 6-7-91 | APPRV. BY | 6-7-91 | DWG. NO. | 446498-A53 Sheet 1 of 1 |
|---|---|---|---|---|---|---|---|---|---|---|

# DRAFT

Client: WHIRLPOOL
Project Name: WHIRLPOOL
Project Location: FORT SMITH, ARK.
Project Number: 446498

# MONITOR WELL ITMW18

## DRILLING AND SAMPLING INFORMATION

Boring Location: ITMW18
SURFACE ELEV.(FT): 473.90
TOTAL DEPTH(FT.): 30.0
Logged By: B. HUEY
Drilled By: B. HOUSTON
Date Started: 2/28/91
Date Completed: 2/28/91

Drill Rig Type: B-61 HD TRUCK MOUNTED RIG
Drilling Method: 8-INCH HOLLOW STEM AUGER, 10-INCH HOLLOW STEM AUGER
Sampling Method: 2 FOOT SPLIT SPOON (SS)

Notes: -

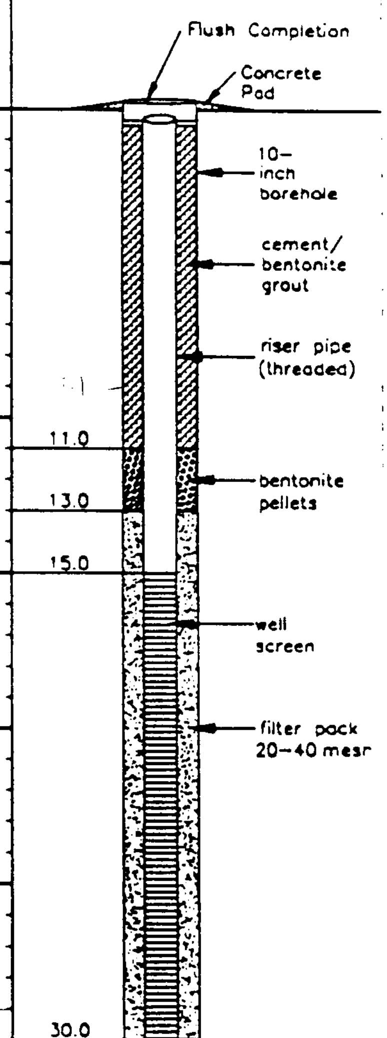
## WELL COMPLETION DATA

Elev-Top of Casing(ft.): 473.55 Ref. Datum: MSL

1. Riser Pipe-I.D.(in.): 4 Depth(ft.): 15 Type: Sch 40 PVC
   Centralizers-Type: NA Depths(ft.): NA
2. Screen Dia.(in.): 4 Type: Sch 40 PVC FJT
   Depth Interval(ft.): 15-30 Slot Size(in.): .010
   Centralizers-Type: NA Depths(ft.): NA
3. Filter Pack Type: 20-40 Silica Depth Interval(ft.): 13-30
   Conc. Pad Size: 3'x3'x6"

| DESCRIPTION | SAMPLE TYPE / SAMPLE NO. | IN. DRIVEN / IN. RECOVERED | PID | USCS |
|---|---|---|---|---|
| CONCRETE - light gray | | | | |
| CLAYEY SAND - medium plasticity; fine grained sand with 20-40% clay; orange; no odor; no stain | SS | 12 / 12 | 10.4, 33.5 | sc |
| CLAY - medium plasticity; trace gravel; hard; reddish brown; moist; no odor; no stain | SS | 20 / 24 | 36.8, 30.7 | cl |
| - tan/brown | | | | |
| - minor gravel; reddish brown | SS | 24 / 24 | 13.2, 9.8 | |
| - increase in gravel; red/brown/tan; black stain | SS | 24 / 24 | 1.4, 0.0 | |
| - minor gravel | SS | 24 / 24 | 0.2, 0.0 | |
| - firm; no stain | SS | 24 / 24 | 0.2, 2.5 | |
| | SS | 24 / 24 | 0.8, 0.8 | |
| SILTY CLAY - medium plasticity; clay with 10-30% silt; firm; red/brown/gray; moist; no odor; no stain | SS | 24 / 24 | 3.1, 3.1 | cl |
| SILTY SAND - low plasticity; fine grained; firm to soft; red/brown; saturated; no odor; no stain | SS | 20 / 24 | 0.0, 1.4 | sm |
| - very soft | SS | 24 / 24 | 0.2, 3.1 | |
| - very fine grained sand with 10-30% silt; soft to firm | SS | 24 / 24 | 0.8, 4.7 | |
| SAND - nonplastic; fine to medium grained; firm to soft; red/brown/black; saturated; no odor; no stain | SS | 24 / 24 | 18.8, 5.3 | sw |
| | SS | 12 / 12 | 8.7, 2.5 | |
| SANDY CLAY - medium to high plasticity; hard; red/brown; moist no odor; no stain | SS | 12 / 12 | 0.2, 0.0 | cl |
| SAND - non plastic; fine grained with trace of large gravel-sized particles firm; red/brown; saturated; no odor; no stain | SS | 18 / 18 | 0.0 | sp |
| SHALE - medium plasticity; grades to shale; red/brown/black/gray | | | | cl |

DEPTH IN FEET: 5, 10, 15, 20, 25, 30, 35, 40




TOTAL DEPTH 29.5 FEET

| INTERNATIONAL TECHNOLOGY CORPORATION | DRAFT BY | DED 4/2/91 | DRAFT CHK | GHR 6-7-91 | PROJ. CHK | JOM 6-7-91 | APPRV. BY | JOM 6-7-91 | DWG. NO. | 446498-A54 Sheet 1 of 1 |
|---|---|---|---|---|---|---|---|---|---|---|

# DRAFT

## MONITOR WELL ITMW19

**Client:** WHIRLPOOL  **Project Location:** FORT SMITH, ARK.
**Project Name:** WHIRLPOOL  **Project Number:** 446498

### DRILLING AND SAMPLING INFORMATION

**Boring Location:** ITMW19  **SURFACE ELEV.(FT):** 474.30
**TOTAL DEPTH(FT.):** 31.0
**Logged By:** B. HUEY  **Date Started:** 2/26/91
**Drilled By:** B. HOUSTON  **Date Completed:** 2/26/91

**Drill Rig Type:** B-61 HD TRUCK MOUNTED RIG
**Drilling Method:** 8-INCH HOLLOW STEM AUGERS. 10-INCH HOLLOW STEM AUGERS
**Sampling Method:** 2 FOOT SPLIT SPOON (SS)

**Notes:** –

### WELL COMPLETION DATA

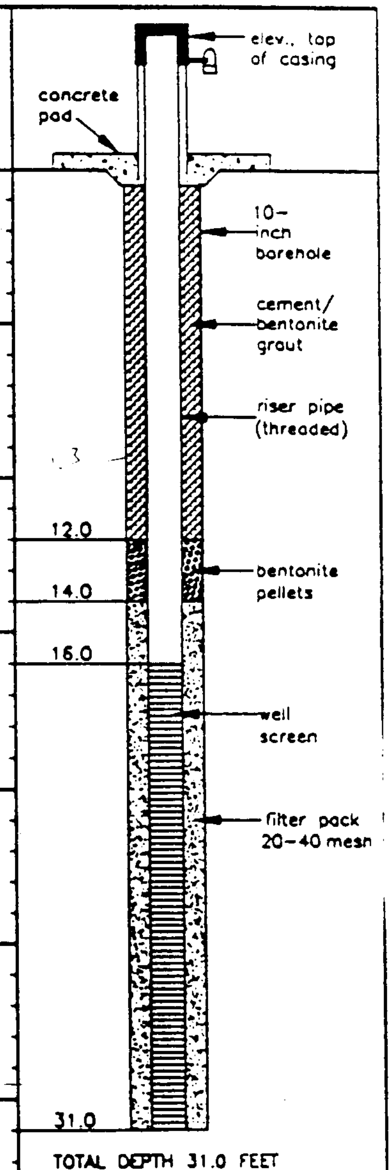
**Elev-Top of Casing(ft.):** 476.25  **Ref. Datum:** MSL
1. **Riser Pipe-I.D.(in.):** 4  **Depth(ft.):** 16  **Type:** Sch 40 PVC
   **Centralizers-Type:** NA  **Depths(ft.):** NA
2. **Screen Dia.(in.):** 4  **Type:** Sch 40 PVC FJT
   **Depth Interval(ft.):** 16-31  **Slot Size(in.):** .010
   **Centralizers-Type:** NA  **Depths(ft.):** NA
3. **Filter Pack Type:** 20-40 Silica  **Depth Interval(ft.):** 14-31
   **Conc. Pad Size:** 3'x3'x6"

| DESCRIPTION | USCS |
|---|---|
| GRAVEL – coarse gravel | gp |
| GRAVELLY CLAY – medium plasticity; clay with 20-40% 1/2-inch angular gravel; brown; moist; no odor; no stain | cl |
| CLAY – medium plasticity; hard; reddish brown and gray mottled; moist; no odor; no stain | cl |
| GRAVEL – 1/2 inch angular gravel; brown; saturated | gp |
| CLAY – medium plasticity; hard; reddish brown and gray mottled; moist; no odor; no stain | cl |
| CLAYEY SILT – low plasticity; silt with 20-40% clay; firm; reddish brown; moist; no odor; no stain | ml |
| SILTY SAND – uniform; fine grained sand with 30-50% silt; medium dense; reddish brown; moist with 2 inch saturated layers at 17.0, 17.5, 18.5, 19.7 feet; no odor; no stain – 10-20% silt; saturated | sm |
| SANDY GRAVEL – uniform; 1/2 inch angular gravel with 20-40% fine grained sand; medium dense; brown; no odor; no stain | gp |
| SAND – uniform; fine grained; medium dense; brown; saturated; no odor; no stain – medium grained; dense | sp |
| SANDY GRAVEL – uniform; 1/2 inch angular gravel with 40-50% fine grained sand; dense; saturated; brown; no odor; no stain | gp |
| CLAY – medium plasticity; stiff; brown; moist; no odor; no stain | cl |
| SHALE – dark gray | |

| SAMPLE TYPE | IN. DRIVEN | IN. RECOVERED |
|---|---|---|
| SS | 18 | 7 |
| SS | 24 | 24 |
| SS | 24 | 24 |
| SS | 24 | 24 |
| SS | 24 | 24 |
| SS | 24 | 24 |
| SS | 24 | 24 |
| SS | 24 | 24 |
| SS | 24 | 24 |
| SS | 24 | 24 |
| SS | 24 | 12 |
| SS | 18 | 18 |
| SS | 12 | 12 |
| SS | 24 | 24 |

PID (from top, in order): 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 2.2, 6.7, 12.2, 18.9, 10.1, 23.4, 9.2, 35.9, 11.5, 18.8, 15.0, 15.0, 10.9, 5.7, 0.0, 0.0

DEPTH IN FEET: 5, 10, 15, 20, 25, 30, 35, 40




| INTERNATIONAL TECHNOLOGY CORPORATION | DRAFT BY | DED 4/2/91 | DRAFT CHK | [illegible] 6-7-91 | PROJ. CHK | [illegible] 6-7-91 | APPRV. BY | [illegible] 6-7-91 | DWG. NO. | 446498-A55 Sheet 1 of 1 |
|---|---|---|---|---|---|---|---|---|---|---|

# DRAFT

## MONITOR WELL ITMW20

**Client:** WHIRLPOOL
**Project Name:** WHIRLPOOL
**Project Location:** FORT SMITH, ARK.
**Project Number:** 446498

### DRILLING AND SAMPLING INFORMATION

**Boring Location:** ITMW20
**SURFACE ELEV.(FT):** 475.73
**TOTAL DEPTH(FT.):** 29.0
**Logged By:** B. HUEY
**Date Started:** 3/5/91
**Drilled By:** B. HOUSTON
**Date Completed:** 3/6/91

**Drill Rig Type:** B-61 HD TRUCK MOUNTED RIG
**Drilling Method:** 10 INCH O.D. HOLLOW STEM AUGER

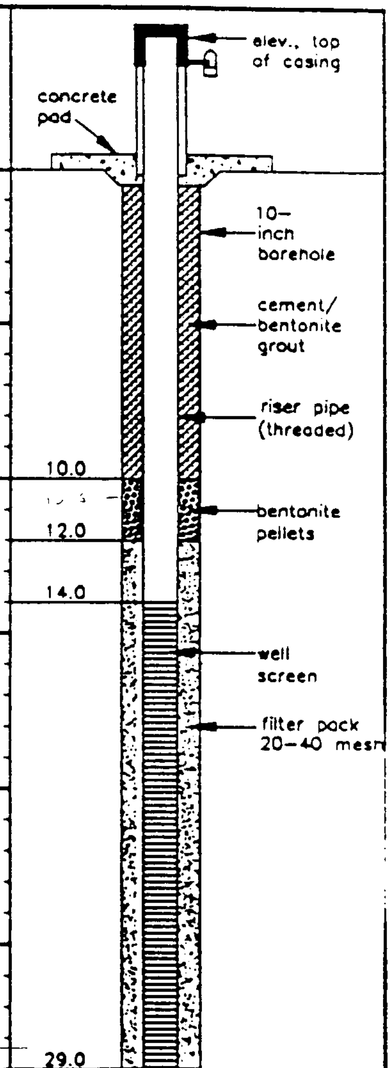
**Sampling Method:** 2 FOOT SPLIT SPOON (SS)

**Notes:** -

### WELL COMPLETION DATA

**Elev-Top of Casing(ft.):** 477.87 **Ref. Datum:** MSL
1. **Riser Pipe-I.D.(in.):** 4 **Depth(ft.):** 14 **Type:** Sch 40 PVC
   **Centralizers-Type:** NA **Depths(ft.):** NA
2. **Screen Dia.(in.):** 4 **Type:** Sch 40 PVC FJT
   **Depth Interval(ft.):** 14-29 **Slot Size(in.):** .010
   **Centralizers-Type:** NA **Depths(ft.):** NA
3. **Filter Pack Type:** 20-40 Silica **Depth Interval(ft.):** 12-29
   **Conc. Pad Size:** 3'x3'x6"

| DESCRIPTION | SAMPLE TYPE / SAMPLE NO. | IN. DRIVEN / IN. RECOVERED | PID | USCS | GRAPHIC LOG | DEPTH IN FEET |
|---|---|---|---|---|---|---|
| CLAY - medium plasticity; firm; light brown; moist; no odor; no stain | SS | 24 / 21 | 0.0 | cl | | |
| SILTY CLAY - low plasticity; clay with 20-40% silt; hard; light brown; moist; no odor; no stain | SS | 24 / 24 | 0.0 | cl | | 5 |
| CLAY - medium plasticity; hard; light brown with light gray mottling; moist; no odor; no stain | SS | 24 / 24 | 0.0 | cl | | 10 |
| SILTY CLAY - low plasticity; clay with 10-30% silt; hard; light brown, light gray and black; moist; no odor; no stain | SS | 24 / 24 | 0.0 | cl | | 15 |
| - moderately plastic; clay with 20-40% silt; light brown and gray | SS | 24 / 24 | 0.0 | | | 20 |
| SANDY SILT - non-plastic; silt with 20-40% fine grained sand; hard; light gray; moist | | | | sm | | |
| SANDY GRAVEL - uniform; 1/2 inch angular gravel with 20-40% fine grained sand; firm; light brown; saturated; no odor; no stain | SS | 24 / 24 | | gp | | 25 |
| | SS | 12 / 12 | | | | |
| SHALE - light gray; moist; weathered | | | | cl | | |
| | | | | | | 30 |
| | | | | | | 35 |
| | | | | | | 40 |




TOTAL DEPTH 29.0 FEET

| INTERNATIONAL TECHNOLOGY CORPORATION | DRAFT BY | OED 4/2/91 | DRAFT CHK | GMR 6-7-91 | PROJ. CHK | JRn 6-7-91 | APPRV. BY | JOm 6-7-91 | DWG. NO. | 446498-A56 Sheet 1 of 1 |
|---|---|---|---|---|---|---|---|---|---|---|

Client: WHIRLPOOL
Project Name: WHIRLPOOL

Project Location: FORT SMITH, ARK.
Project Number: 446498

# DRAFT

# MONITOR WELL ITMW21

## DRILLING AND SAMPLING INFORMATION

Boring Location: ITMW21
SURFACE ELEV.(FT): 474.37
TOTAL DEPTH(FT.): 31.0

Logged By: B. HUEY
Drilled By: B. HOUSTON
Date Started: 3/7/91
Date Completed: 3/7/91

Drill Rig Type: B-61 HD MOBILE TRUCK MOUNTED RIG
Drilling Method: 10 INCH O.D. HOLLOW STEM AUGERS

Sampling Method: 2 FOOT SPLIT SPOONS

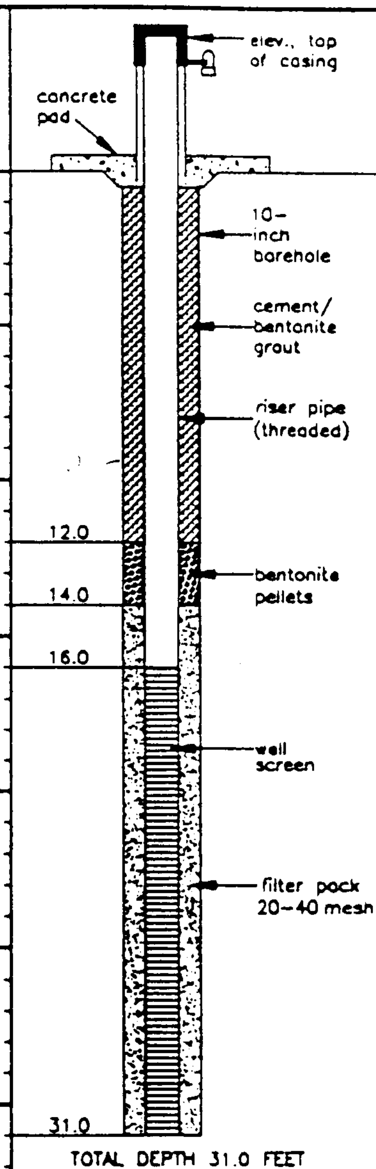
Notes: –

## WELL COMPLETION DATA

Elev–Top of Casing(ft.): 478.52 Ref. Datum: MSL

1. Riser Pipe–I.D.(in.): 4 Depth(ft.): 14 Type: Sch 40 PVC
   Centralizers–Type: NA Depths(ft.): NA
2. Screen Dia.(in.): 4 Type: Sch 40 PVC FJT
   Depth Interval(ft.): 16–31 Slot Size(in.): .010
   Centralizers–Type: NA Depths(ft.): NA
3. Filter Pack Type: 20–40 Silica Depth Interval(ft.): 14–31
   Conc. Pad Size: 3'x3'x6"

| DESCRIPTION | SAMPLE TYPE / SAMPLE NO. | IN. DRIVEN / IN. RECOVERED | PID | USCS | DEPTH IN FEET |
|---|---|---|---|---|---|
| SILTY CLAY – low plasticity; clay with 20–40% silt; hard; light gray with light brown; moist; no odor; no stain | SS | 24 / 24 | | cl | 0 |
| CLAY – medium plasticity; clay with 10–20% silt; hard; light brown with light gray; moist; no odor; no stain | SS | 24 / 20 | 0.0 | cl | 5 |
| – clay with no silt | SS | 24 / 24 | 0.0 | | 10 |
| – light brown and light gray with 5% black | SS | 24 / 24 | 0.0 | | 15 |
| – low plastic; light gray, red, brown, and black | SS | 24 / 24 | 0.0 | | 20 |
| SILTY GRAVEL – low plasticity; gravel with 20–30% clay, 10–20% silt; very hard; reddish brown; moist; no odor; no stain | SS | 12 / 11 | 0.0 | gc | 25 |
| CLAY – medium plasticity; hard; light brown and gray; moist; no detectable odor; no stain | SS | 24 / 24 | 4800 / 5441 / 1177 | cl | |
| SHALE – dark gray | | | | cl | 30 |
| | | | | | 35 |
| | | | | | 40 |




| IT INTERNATIONAL TECHNOLOGY CORPORATION | DRAFT BY | DED 4/2/91 | DRAFT CHK | CMR 6-7-91 | PROJ. CHK | JBM 6-7-91 | APPRV. BY | JBM 6-7-91 | DWG. NO. | 446498-A57 Sheet 1 of 1 |
|---|---|---|---|---|---|---|---|---|---|---|

MALCOLM PIRNIE, INC. Boring MW - 22

# BORING LOG

| | | | |
|---|---|---|---|
| CLIENT | Whirlpool | PROJECT # | 2172-047-100 |
| PROJECT | Remedial Investigation | CONTRACTOR | MHC |
| LOCATION | Ft. Smith, Ark | DRILLER | Todd Wages |
| START DATE | 12/05/96 | DRILLING METHOD | 6" I.D. H.S. A. |
| FINISH DATE | 12/05/96 | HYDROGEOLOGIST | R.B. Hernandez |

| DEPTH | SAMPLE DESCRIPTION | USCS | PID | Notes |
|---|---|---|---|---|
| | (0' - 2') Very Dark Brown (10 YR, 2/2) Silty Gravel, Very Stiff to Hard, Damp to Very Damp | Fill | 2.7 | |
| 5 | (2' - 5') Dark Yellowish Brown (10YR, 3/6) Silty Slightly Sandy CLAY with some Iron ("Fe") Staining, Very Stiff, Dry to Damp | CH<br>CL | 2.7 | |
| 10 | (5' - 10') Brownish Yellow (10 YR, 6/8) CLAY with Fe Nodules, Very Stiff, Damp | CL | 2.7 | |
| | (10' - 12') Light Grey (7.5 YR, 7/1) to Brownish Yellow (10 YR, 6/8) Silty CLAY, Stiff, Dry to Damp | CL | 2.7 | Silty from (10' - 12') |
| 15 | (12' - 18') Light Grey (7.5 YR, 7/1) to Brownish Yellow (10 YR, 6/8) Slightly Sandy Silty CLAY, Stiff to Very Stiff, Damp | CH<br>CL | 2.7 | |
| 20 | (18' - 23') Light Grey (7.5 YR, 7/1) to Brownish Yellow (10 YR, 6/8) Sandy SILT, Stiff, Damp to Moist | ML | 2.7 | H2O @ 18'<br>(20' - 23') Sticky Clays |
| 25 | (23' - 24') Dark Reddish Brown (5 YR, 3/4) Clayey Gravel, Very Dense, Wet | GC | | |
| | (24' - 28') Brownish Yellow (10 YR, 6/8) Gravelly CLAY, Very Stiff to Hard, Moist | CL<br>GC | 2.7 | |
| 30 | (28' - 29') Brownish Yellow (10 YR, 6/8) Very Silty CLAY, Very Hard, Dry | CL<br>ML | 2.7 | |
| 35 | (29' - 30') Very Dark Grey (7.5 YR, 3/10) to Black (10 YR, 2/1) SILT (McAlester Shale) Very Hard, Dry | ML | 2.7 | |

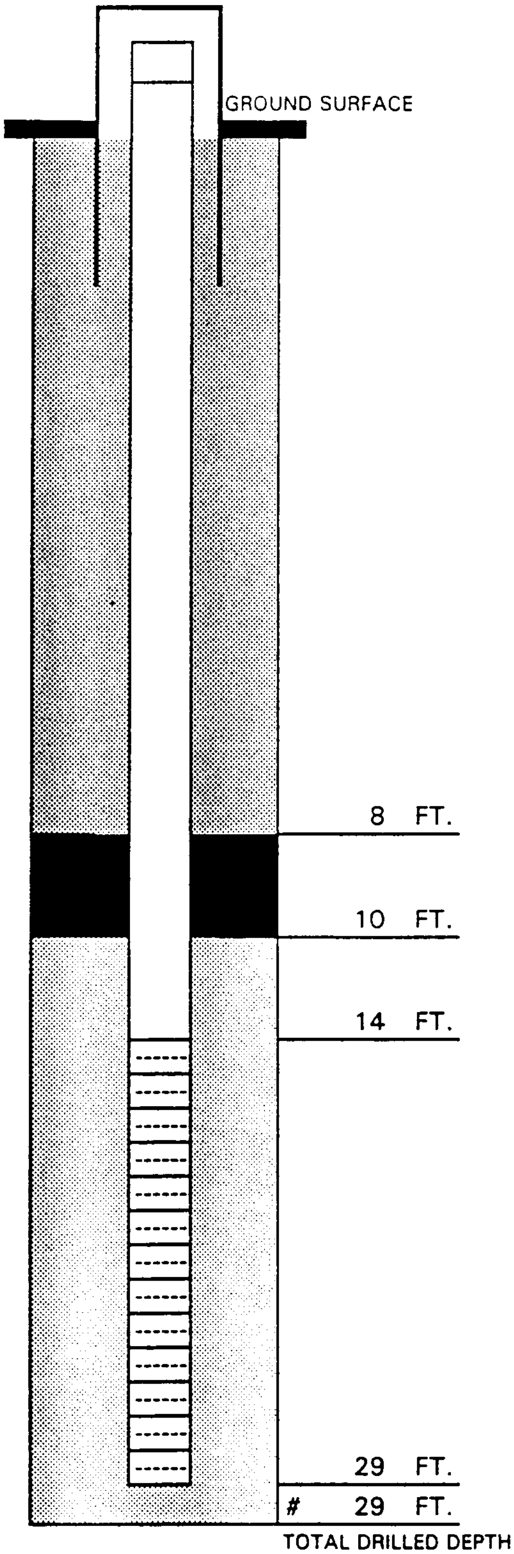
Notes:

Set up on MW-22 at 1515 hrs.
TD boring at 29' below grade at 1835 hrs. construct MW-22

MALCOLM
PIRNIE, INC.

Well ID MW-22

# Monitoring Well Construction Log




| | |
|---|---|
| CLIENT NAME | Whirlpool |
| PROJECT NAME | Remedial Investigation |
| PROJECT # | 2172-047-100 |
| PROJECT LOCATION | Ft. Smith, Arkansas |
| WELL LOCATION | 5' North and 12' East of Hydrant # 7 |
| DRILLING DATE | 12-5-96 |
| COMPLETION DATE | 12-5-96 |
| DRILLING CONT. | MHC |
| DRILLER | Todd Wages |
| BOREHOLE DIA. | 12" |
| DRILLING METHOD | 6" I.D., HSA's |
| DEPTH TO WATER | approximately 18' |
| DEVELOPMENT (date/vol.) | 12-7-96, 110 gallons |

**WELL MATERIALS:**

| | |
|---|---|
| SURFACE CASING | Flush Mount cover |
| **RISER** | |
| LENGTH | 14' |
| DIAMETER | 4" |
| MATERIAL | Sch 40, PVC |
| WELL SEAL | 2' bentonite pellets |
| **SCREEN:** | |
| LENGTH | 15' |
| DIAMETER | 4" |
| MATERIAL | PVC |
| SLOT SIZE | 0.010" |
| SAND PACK | 10 bags , (20-40 ) |
| REMARKS | |
| HYDROGEOLOGIST | R.B. Hernandez |

All measurments are from TOC
Unless noted otherwise noted

**MALCOLM PIRNIE, INC.**

Boring MW - 23

## BORING LOG

| | | | |
|---|---|---|---|
| CLIENT | Whirlpool | PROJECT # | 2172-047-100 |
| PROJECT | Remedial Investigation | CONTRACTOR | MHC |
| LOCATION | Ft. Smith, Ark | DRILLER | Todd Wages |
| START DATE | 12/06/96 | DRILLING METHOD | 6" I.D. H.S. A. |
| FINISH DATE | 12/06/96 | HYDROGEOLOGIST | R.B. Hernandez |

| DEPTH | SAMPLE DESCRIPTION | USCS | PID | Notes |
|---|---|---|---|---|
| | (0 - 3") Asphaltic Concrete | | 2.7 | |
| 5 | (3" - 5') Brownish Yellow (10YR, 6/8), Very Silty CLAY, Firm to Stiff, Dry to Damp | CL | | |
| 10 | (8' - 10') Light Grey (7.5 YR, 7/1) to Brownish Yellow (10 YR, 6/8) Sandy silty CLAY, Stiff to V. Stiff, Moist | CL | | Shelby Tube is wet |
| | (10' - 11') Brownish Yellow (10 YR, 6/8) Sandy CLAY with abundant Iron nodules, Very Stiff, Damp | CL | 2.7 | Wet seam at 10.2 ft. associated w/ drainage ditch north of fence |
| 15 | (11' - 12') Brownish Yellow (10 YR, 6/8) Slightly Sandy CLAY Very Stiff, Damp | CH CL | | |
| 20 | (15' - 17') Brownish Yellow (10 YR, 6/8) CLAY, Very stiff, Dry to Damp | CH | 2.7 | H2O @ 19' |
| | (22' - 23.5') Dark Brown (10 YR, 3/3) Sand with Gravel, Very Dense, Wet | GW GC | 2.7 | Chert & FeO2 gravels @ 22' |
| 25 | (23.5' - 28') Dark Reddish Brown (5 YR, 3/4) Clayey Gravel, Very Dense, Wet | GC | 2.7 | |
| 30 | (28' - 29.4') Brownish Yellow (10 YR, 6/8) SILT, Very Hard, Dry | ML | | |
| 35 | (29.4 - 30.5') Very Dark Grey (7.5 YR, 3/10) to Black (10 YR, 2/1) SILT (McAlester Shale) Very Hard, Dry | ML | 2.7 | |

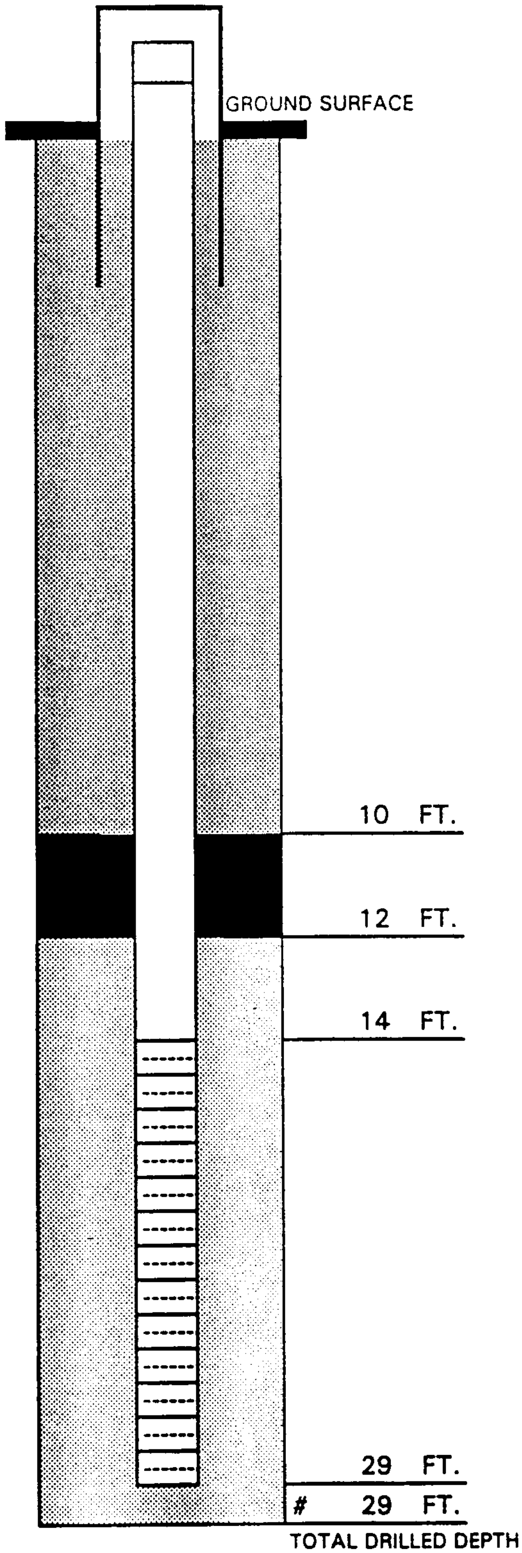
Notes: Set up on MW-23 at 0650 hrs.

TD boring at 30.5 below grade at 0955 hrs. construct MW-23

MALCOLM
PIRNIE, INC.

Well ID MW-23

# Monitoring Well Construction Log




| | |
|---|---|
| CLIENT NAME | Whirlpool |
| PROJECT NAME | Remedial Investigation |
| PROJECT # | 2172-047-100 |
| PROJECT LOCATION | Ft. Smith, Arkansas |
| WELL LOCATION | 5' East and 11' South of Gate # 12 |
| DRILLING DATE | 12-6-96 |
| COMPLETION DATE | 12-6-96 |
| DRILLING CONT. | MHC |
| DRILLER | Todd Wages |
| BOREHOLE DIA. | 12" |
| DRILLING METHOD | 6" I.D., HSA's |
| DEPTH TO WATER | approximately 19' |
| DEVELOPMENT (date/vol.) | 12-7-96, 110 gallons |

**WELL MATERIALS:**

| | |
|---|---|
| SURFACE CASING | Flush Mount cover |
| **RISER** | |
| LENGTH | 14' |
| DIAMETER | 4" |
| MATERIAL | Sch 40, PVC |
| WELL SEAL | 2' bentonite slurry |
| **SCREEN:** | |
| LENGTH | 15' |
| DIAMETER | 4" |
| MATERIAL | PVC |
| SLOT SIZE | 0.010" |
| SAND PACK | 10 bags , (20-40 ) |
| REMARKS | |
| HYDROGEOLOGIST | R.B. Hernandez |

All measurments are from TOC
Unless noted otherwise noted

Project No: 9808.183

# Log of Borehole: MW24

Project: Fort Smith Groundwater Investigation

Client: Whirlpool Corporation

Location: Fort Smith, Ar

Enclosure:

Engineer: LP

## SUBSURFACE PROFILE

| Description | Elev. |
|---|---|
| Ground Surface | 476.61 |
| ASPHALT | |
| SILTY CLAY, red-orange with grey, black and red staining, plastic, slightly moist, no odour. | 467.44 |
| GRAVELLY SILTY CLAY (fine gravel), reddish orange with grey mottling, moist, no odour. Gravel absent 10.2 - 10.5 feet. | 464.11 |
| GRAVELLY SAND, coarse, very moist, no odour. | |
| SILTY SANDY CLAY, reddish orange with grey mottling and black staining, plastic, moist, no odour. | 459.81 |
| SILTY SAND TO SAND, silty from 16.8 to 18 feet and 18.8 to 19.8 feet, saturated, no odour. | 456.61 |
| SANDY TO SILTY CLAY (silty in lower 0.8 foot), brown with black staining becoming reddish orange with grey mottling, moist. | 453.61 |
| SANDY GRAVEL, coarse sand in lower 0.3 foot, brown, saturated. | 447.11 |
| CLAY, reddish orange with grey and brown, slightly moist, no odour, friable. | 445.61 |
| WEATHERED SHALE (McAlester Formation), black to dark grey. | 443.61 |
| End of Borehole | |

Depth: ft 0, 5, 10, 15, 20, 25, 30, 35; m 0, 5, 10

## SAMPLE

| Number | Volatile Organic Concentration (ppm) |
|---|---|
| 3-4 | 0.2 |
| 4-6 | 1.6 |
| 6-8 | 1.2 |
| 8-10 | 1.4 |
| 10-12 | 1.2 |
| 12-14 | 0.6 |
| 14-16 | 1.4 |
| 16-18 | 0.8 |
| 18-20 | 1.6 |
| 20-22 | 3 |
| 22-24 | 1.6 |
| 24-26 | 5.6 |
| 26-28 | 6.8 |
| 28-30 | 3.8 |
| 30-32 | 1.8 |
| 32-33 | 1 |

Type | ppm 2 4 6 | Well Data

Drill Method: Hollow Stem Augers

Drill Date: 23 February 1999

Hole Size: 10 in.

ERM
Suite 201
50 Queen Street West
Brampton, Ontario

Datum: Mean Sea Level

Checked by: SJH

Sheet: 1 of 1

# Log of Borehole: MW25

**Project No:** 9808.183

**Project:** Fort Smith Groundwater Investigation

**Client:** Whirlpool Corporation

**Location:** Fort Smith, Ar

**Enclosure:**

**Engineer:** LP

## SUBSURFACE PROFILE

| Description | Elev. |
|---|---|
| Ground Surface | 474.65 |
| GRAVEL and sub-base. | |
| SILTY CLAY, grey, plastic, moist, slight odour. | 470.65 |
| SILTY SANDY CLAY, red-brown with grey mottling, plastic, moist, solvent odour. | 467.45 |
| SANDY CLAY with gravel, red-brown, moist but friable, red and black streaks. Inclusion of grey clay at 12.5 feet, solvent odour. | 454.85 |
| CLAY, red-brown with grey mottling, black streaks, hard, slightly moist, weak odour. | 453.85 |
| SILTY CLAY, red-brown with grey mottling, black streaks, slightly moist, weak odour. | 449.15 |
| GRAVELLY SANDY CLAY, brown, slightly moist, weak odour. | 446.65 |
| GRAVELLY SAND, brown to red-brown, saturated, weak odour. | 444.95 |
| CLAY, red-brown, hard, no odour, moist. | 442.65 |
| WEATHERED SHALE (McAlester Formation), black to dark grey. | |
| End of Borehole | |

Depth: ft 0, 5, 10, 15, 20, 25, 30, 35; m 0, 5, 10

## SAMPLE

| Number | Volatile Organic Concentration (ppm) |
|---|---|
| 0-2 | 3.6 |
| 2-4 | 2.4 |
| 4-6 | 348 |
| 6-8 | 343 |
| 8-10 | 383 |
| 10-12 | 356 |
| 12-14 | 333 |
| 14-16 | 320 |
| 16-18 | 319 |
| 18-20 | 277 |
| 20-22 | 330 |
| 22-24 | 352 |
| 24-26 | 290 |
| 26-28 | 53.1 |
| 28-30 | 28.7 |
| 30-32 | 4.8 |

Well Data

Drill Method: Hollow Stem Augers

Drill Date: 23 February 1999

Hole Size: 10 in.

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Sheet: 1 of 1

Project No: 9808.183

# Log of Borehole: MW26

Project: Fort Smith Groundwater Investigation

Client: Whirlpool Corporation

Location: Fort Smith, Ar

Enclosure:

Engineer: LP

## SUBSURFACE PROFILE

| Depth (ft) | Description | Elev. |
|---|---|---|
| 0 | Ground Surface | 476.11 |
| 0–3 | SILTY CLAY with organic debris, brown, moist to damp, plastic, no odour. | 473.11 |
| 3–14.5 | CLAY, mottled grey/red-brown, slightly plastic, no odour. Reduced grey colour and black staining below 6.5 feet. | 461.61 |
| 14.5–19.8 | SILTY CLAY, reddish orange, minor grey, black staining, slightly moist, slightly plastic, no odour. | 456.31 |
| 19.8–25 | SANDY CLAY, mottled red-orange/grey, some black streaks, moist. Sand content increases with depth. | 451.11 |
| 25–27 | SAND, red-brown, medium-grained, saturated. | 449.11 |
| 27–29.2 | GRAVELLY SAND, red-brown with black staining, saturated. | 446.91 |
| 29.2–33 | WEATHERED SHALE (McAlester Formation) and derived clay, red-brown to black, friable. | 443.11 |
| | End of Borehole | |

## SAMPLE

| Number | Volatile Organic Concentration (ppm) |
|---|---|
| 3-4 | 0.3 |
| 4-6 | 0.5 |
| 6-8 | 0.7 |
| 8-10 | 0.3 |
| 10-12 | 0.5 |
| 12-14 | 2 |
| 14-16 | 1.8 |
| 16-18 | 1.1 |
| 18-20 | 15 |
| 20-22 | 2 |
| 22-24 | 2 |
| 24-26 | 1.1 |
| 26-28 | 1.8 |
| 28-30 | 1.3 |
| 30-32 | 1.3 |
| 32-33 | 1.1 |

Well Data

Drill Method: Hollow Stem Augers

Drill Date: 22 February 1999

Hole Size: 10 in.

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Brampton, Ontario

Datum: Mean Sea Level

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Sheet: 1 of 1

Project No: 9908.189

# Log of Borehole: MW-27

Project: Additional Groundwater Investigation

Client: Whirlpool Corporation

Location: Fort Smith, Ar

Enclosure:

Geologist: LP

| SUBSURFACE PROFILE | | | | SAMPLE | | | |
|---|---|---|---|---|---|---|---|
| Depth (ft / m) | Symbol | Description | Elev. | Number | Type | PID Reading (ppm; scale 0, 2.5, 5, 7.5, 10) | Well Data |
| | | Ground Surface | 475.42 | | | | |
| 0 / 0 | | ASPHALT (2") over aggregates. | | | | | |
| | | SILTY CLAY, reddish brown with frequent red streaks, occasional black nodules, friable. | 473.42 | 0-2 | | 2 | |
| | | SANDY SILTY CLAY, reddish orange-brown, red streaks, friable, soft, damp. | | 2-4 | | 2.5 | |
| 5 | | | 469.92 | 4-6 | | 1.6 | |
| | | CLAY, mottled reddish orange and light gray, frequent red and black streaks, black nodules, hard. | | 6-8 | | 1.5 | |
| | | | 466.02 | 8-10 | | 3.1 | |
| 10 | | SILTY SANDY CLAY, inclusions of gravel, reddish orange-brown with black streaks, friable, dry to moist. | | 10-12 | | 1.8 | |
| | | | 462.42 | 12-14 | | 2.2 | |
| 15 | | SILTY CLAY with variable sand content (increases with depth), reddish orange-brown with black streaks, moist. | | 14-16 | | 1.5 | |
| / 5 | | | | 16-18 | | 0.7 | |
| | | | 455.62 | 18-20 | | 0.8 | |
| 20 | | | | | | | |

Drill Method: Hollow Stem Augers

Drill Date: 07 December 1999

Hole Size: 8.25 inch

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Brampton, Ontario

Datum: Mean Sea Level

Checked by: SJH

Sheet: 1 of 2

Project No: 9908.189

# Log of Borehole: MW-27

Project: Additional Groundwater Investigation

Client: Whirlpool Corporation

Location: Fort Smith, Ar

Enclosure:

Geologist: LP

## SUBSURFACE PROFILE

| Depth | Description | Elev. |
|---|---|---|
| | SANDY CLAY, reddish brown with black streaks, isolated clay lenses, moist. | 450.92 |
| 25 | SAND, coarse, reddish orange-brown, no odor, wet. | 450.22 |
| | GRAVELLY SAND, wet. 27.2-27.4': light gray clay. | 446.92 |
| | GRAVELLY SANDY CLAY, occasional cobbles, reddish orange brown, hard, moist to damp. | 446.02 |
| 30 | CLAY, reddish-orange, hard. | 445.32 |
| | WEATHERED SHALE. | 444.92 |
| | End of Borehole | |
| 35 | | |
| 40 | | |

## SAMPLE

| Number | PID Reading (ppm) |
|---|---|
| 20-22 | 0.3 |
| 22-24 | 0.7 |
| 24-26 | 0.5 |
| 26-28 | 1.4 |
| 28-30 | 0.2 |

PID Reading scale: 0, 2.5, 5, 7.5, 10 ppm

Well Data

Sandy clay

Sand + gravel

clay/shale

11

Drill Method: Hollow Stem Augers

Drill Date: 07 December 1999

Hole Size: 8.25 inch

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50 Queen Street West
Brampton, Ontario

Datum: Mean Sea Level

Checked by: SJH

Sheet: 2 of 2

**Project No:** 9908.189

**Project:** Additional Groundwater Investigation

**Client:** Whirlpool Corporation

**Location:** Fort Smith, Ar

# Log of Borehole: MW-28

**Enclosure:**

**Geologist:** LP

| SUBSURFACE PROFILE | | | SAMPLE | | |
|---|---|---|---|---|---|
| Depth (ft / m) | Description | Elev. | Number | Type | PID Reading (ppm, 0 – 10) |
| 0 / 0 | Ground Surface | 476.2 | | | |
| | ASPHALT (2") over aggregates. | | 0-2 | | 0 |
| | SILTY CLAY, trace gravel, dark brown, damp, no odor. | | | | |
| | CLAY, brown with red and black streaks, plastic. | 473.7 | 2-4 | | |
| | SILTY CLAY, reddish orange with red streaks, soft, no odor. | 472.7 | | | |
| | CLAY, mottled reddish orange and gray, black streaks, hard, damp, no odor. | | 4-6 | | |
| 5 | SANDY SILTY CLAY, dark reddish orange with frequent black streaks, friable. Sandier zone 6.4-7.0 ft. | 467.7 | 6-8 | | |
| | SILTY CLAY, mottled reddish orange and gray, friable, hard, damp. | 465 | 8-10 | | |
| 10 | | | 10-12 | | |
| | SILTY SANDY CLAY, dark reddish orange with some light gray sandy areas, soft. 14.0-17.0': hard. | 458.2 | 12-14 | | |
| 15 | | | 14-16 | | |
| 5 m | | | 16-18 | | |
| | SANDY CLAY, light gray with minor reddish orange, damp. CLAYEY SAND, reddish orange to brown, in lower 0.2 ft. | | 18-20 | | |
| 20 | | | | | |

Well Data

Drill Method: Hollow Stem Augers

Drill Date: 07 December 1999

Hole Size: 8.25 inch

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50 Queen Street West
Brampton, Ontario

Datum: Mean Sea Level

Checked by: SJH

Sheet: 1 of 2

Project No: 9908.189

Project: Additional Groundwater Investigation

Client: Whirlpool Corporation

Location: Fort Smith, Ar

# Log of Borehole: MW-28

Enclosure:

Geologist: LP

| Depth | Description | Elev. | Sample Number | PID Reading (ppm) |
|---|---|---|---|---|
| | | 455.5 | | |
| | CLAY, reddish orange and light gray, hard, moist. | 454.7 | 20-22 | 0 |
| | CLAYEY SAND, coarse, soft, moist. | 452.7 | 22-24 | 0 |
| | GRAVELLY SAND, coarse, brown to reddish brown, wet. 1" layer of cemented sand and gravel at 24'. | 451.4 | 24-26 | 0 |
| 25 | CLAY, reddish brown to brown, hard, moist, no odor. | 450.7 | | |
| | WEATHERED SHALE over 0.3 ft. competent shale. | 448.4 | 26-28 | 0 |
| | End of Borehole | | | |

Depth scale: 25, 30, 35, 40 (11)

Drill Method: Hollow Stem Augers

Drill Date: 07 December 1999

Hole Size: 8.25 inch

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Brampton, Ontario

Datum: Mean Sea Level

Checked by: SJH

Sheet: 2 of 2

Project No: 9908.189

Project: Additional Groundwater Investigation

Client: Whirlpool Corporation

Location: Fort Smith, Ar

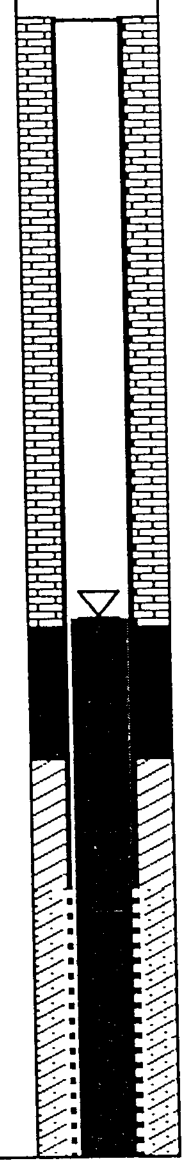
# Log of Borehole: MW-29

Enclosure:

Geologist: LP

| Depth (ft) | Description (Subsurface Profile) | Elev. | Sample Number | PID Reading (ppm) |
|---|---|---|---|---|
|  | Ground Surface | 474.91 |  |  |
| 0 | ASPHALT (2") over aggregates. |  |  |  |
|  | SILTY CLAY, brown with isolated red and black streaks, slightly plastic, damp. |  | 0-2 | 3.4 |
|  |  |  | 2-4 | 2.7 |
|  |  | 470.11 | 4-6 | 3.3 |
| 5 | SILTY SANDY CLAY, brown with black streaks, friable, soft, damp. |  |  |  |
|  |  | 467.71 | 6-8 | 3 |
|  | SILTY CLAY, mottled reddish orange and gray, hard. | 466.91 |  |  |
|  | CLAY, mottled reddish orange and gray, blocky texture, hard, dry to moist. |  | 8-10 | 2.6 |
| 10 |  |  | 10-12 | 3 |
|  | 8.0-8.2' and 13-16': abundant black and red nodules. |  | 12-14 | 3.4 |
| 15 | 15.2-16.0': silty, soft. |  | 14-16 | 3.8 |
|  |  |  | 16-18 | 4.3 |
|  |  | 455.51 | 18-20 | 4 |
| 20 |  |  |  |  |

Well Data



Drill Method: Hollow Stem Augers

Drill Date: 06 December 1999

Hole Size: 8.25 inch

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Datum: Mean Sea Level

Checked by: SJH

Sheet: 1 of 2

**Project No:** 9908.189

# Log of Borehole: MW-29

**Project:** Additional Groundwater Investigation

**Client:** Whirlpool Corporation

**Location:** Fort Smith, Ar

**Enclosure:**

**Geologist:** LP

## SUBSURFACE PROFILE

| Description | Elev. |
|---|---|
| GRAVELLY SANDY CLAY, isolated coarse gravel, moist. 21.8-22.0': clay, hard. | 451.91 |
| GRAVELLY SAND, coarse, brown to reddish brown, saturated. | 448.91 |
| CLAY, light gray to white, plastic. | 448.11 |
| GRAVELLY SANDY CLAY, coarse, brown to reddish brown, saturated. | 446.91 |
| SAND, coarse, brown. | 445.91 |
| GRAVELLY SANDY CLAY, coarse gravel, brown to reddish brown. | 445.31 |
| CLAY, reddish orange becoming dark gray in lower half, compacted. | 444.41 |
| WEATHERED SHALE. | 443.91 |
| End of Borehole | |

Depth: 25, 30, 35 — 11, 40

## SAMPLE

| Number | Type | PID Reading (ppm) |
|---|---|---|
| 20-22 | | 2.8 |
| 22-24 | | 1.7 |
| 24-26 | | 2.3 |
| 26-28 | | 2.3 |
| 28-30 | | 3.6 |

PID Reading: ppm 0 2.5 5 7.5 10

Well Data

Drill Method: Hollow Stem Augers

Drill Date: 06 December 1999

Hole Size: 8.25 inch

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Sheet: 2 of 2

Project No: 9908.189

Project: Additional Groundwater Investigation

Client: Whirlpool Corporation

Location: Fort Smith, Ar

# Log of Borehole: MW-30

Enclosure:

Geologist: LP

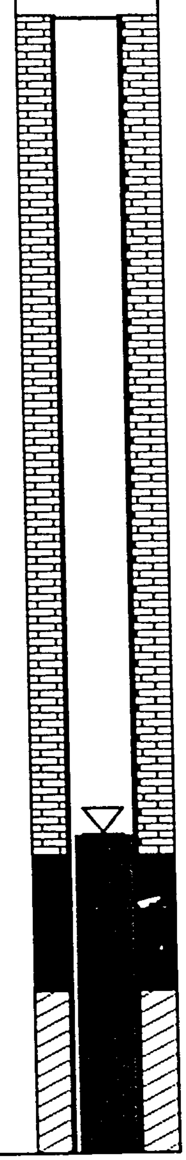
## SUBSURFACE PROFILE

| Depth (ft) | Description | Elev. |
|---|---|---|
| 0 | Ground Surface | 478.99 |
| 0 | ASPHALT (2") over aggregates. | |
| | SILTY CLAY, light brown with red staining and black streaks, moist. | 475.79 |
| | CLAY, isolated coarse gravel, mottled reddish brown and gray with large black nodules, friable. | 471.39 |
| | SILTY CLAY, mottled reddish brown and gray with black streaks, slightly plastic. | 469.19 |
| 10 | SILTY SANDY CLAY, trace fine gravel, friable, weak odor. | 466.59 |
| | CLAY, mottled reddish orange and gray, isolated black streaks, stiff, weak odor. | 462.49 |
| | SILTY CLAY, mottled reddish orange and gray, frequent small black accretions, friable. | 459.49 |
| 20 | SANDY CLAY, light brown and orange, black zones, hard. | |

## SAMPLE

| Number | PID Reading (ppm) |
|---|---|
| 0-2 | 3.2 |
| 2-4 | 57.1 |
| 4-6 | 51.7 |
| 6-8 | 65.4 |
| 8-10 | 78.8 |
| 10-12 | 79.9 |
| 12-14 | 54.7 |
| 14-16 | 49.6 |
| 16-18 | 47.7 |
| 18-20 | 42.8 |

Well Data



Drill Method: Hollow Stem Augers

Drill Date: 06 December 1999

Hole Size: 8.25 inch

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Datum: Mean Sea Level

Checked by: SJH

Sheet: 1 of 2

Project No: 9908.189

Project: Additional Groundwater Investigation

Client: Whirlpool Corporation

Location: Fort Smith, Ar

# Log of Borehole: MW-30

Enclosure:

Geologist: LP

## SUBSURFACE PROFILE

Depth: 25, 30, 35 — 11, 40

| Description | Elev. |
|---|---|
| SAND, white, moist, no odor. | 457.99 |
| CLAYEY SAND, fine, reddish-orange and gray, friable. | 455.99 |
| SANDY CLAY, reddish orange, moist to damp. | 449.99 |
| SAND, light reddish-orange, soft, damp. | |
| CLAYEY GRAVEL, coarse, reddish orange, moist, weak odor. Light gray to white clay 30.5-31.0 ft. | 447.49 |
| CLAY, isolated gravel, mottled reddish orange and gray, hard, moist. | 446.49 |
| SANDY GRAVEL, brown, wet. | 443.39 |
| CLAY, reddish orange to brown becoming gray with depth, fissile. | 442.79 |
| WEATHERED SHALE. | |
| End of Borehole | |

## SAMPLE

| Number | Type | PID Reading (ppm) 0 25 50 75 100 |
|---|---|---|
| 20-22 | | 34.9 |
| 22-24 | | 28.4 |
| 24-26 | | 37.9 |
| 26-28 | | 37 |
| 28-30 | | 8.3 |
| 30-32 | | 22.5 |
| 32-34 | | 12.3 |
| 34-36 | | 4.7 |

Well Data

Drill Method: Hollow Stem Augers

Drill Date: 06 December 1999

Hole Size: 8.25 inch

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# MW-31
# DRILLING LOG

W.O. NO. 58102 Boring/Well ID MW-31 Date Drilled 1/4/01

Project Whirlpool, Ft. Smith Owner Whirlpool Corporation

Location Fort Smith, Arkansas Boring T.D. 30 ' Boring Diam. 2.125 "

N. Coord. 9348.48 ' E. Coord. 7675.35 ' Surface Elevation 476.03 ' MSL Datum

Screen: Type Slotted Schedule 40 PVC Diam. 0.81 " Length 10 ' Slot Size 0.010 "

Casing: Type Schedule 40 PVC Diam. 0.75 " Length 17.6 ' Sump Length 0.1 '

Top of Casing Elevation 476.03 ' Stickup 0.2 '

Depth to Water: 1. Ft. 10 ( Boring ) 2. Ft. 3.7 ( Well )

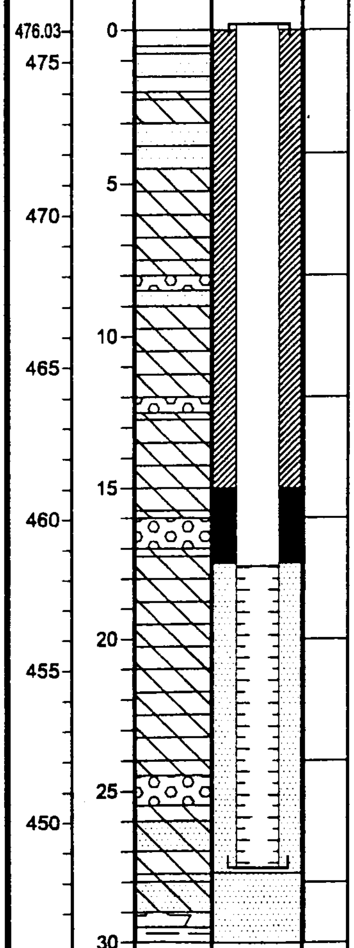
Drilling Company Tri-State Testing Srvcs., Inc. Driller Ken Smith

Drilling Method GeoProbe Log By Roberta Smith

SKETCH MAP

NOTES

Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type




Sample Interval (Feet): 0-4, 4-8, 8-12, 12-16, 16-20, 20-24, 24-28, 28-30

| Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|
| 0-0.5 | SILTY SAND: dark brown, slightly moist, soft, organic rich with grass and rootlets |
| 0.5-2 | SILTY SAND: medium brown, moist, soft, rocks up to 0.75 inches in diameter present |
| 2-3 | SILTY CLAY: grayish brown, slightly moist, firm, some iron nodules and orange streaking present |
| 3-4.5 | SILTY SAND: black, dry, gravel and rock inclusions up to 1 inch in diameter are present |
| 4.5-8 | SILTY CLAY: silty clay grading to clay, medium brown, moist, firm, massive |
| 8-8.5 | GRAVEL: medium brown, moist, loose, soft, mixture with rocks up to 1 inch in diameter |
| 8.5-9 | SILTY SAND: medium brown, moist, loose, soft, rock inclusions up to 1 inch in diameter |
| 9-12 | SILTY CLAY: medium brown grading to reddish brown at 11 feet, moist, firm, gray and red inclusions present beginning at 11 feet |
| 12-12.5 | GRAVEL: medium brown, loose, wet, with rocks up to 0.5 inches in diameter |
| 12.5-13.5 | SILTY CLAY: medium brown, wet, fluffy, with rock inclusions up to 0.5 inches in diameter |
| 13.5-16 | SILTY CLAY: reddish brown with gray and orange streaking, moist, firm, massive |
| 16-17 | GRAVEL: medium brown, loose |
| 17-24 | SILTY CLAY: medium brown grading to reddish brown and gray, very moist grading to slightly moist, soft from 17 - 18 feet, firm from 18-24 feet |
| 24-24.5 | SILTY CLAY: medium reddish brown, moist, loose |
| 24.5-25.5 | GRAVEL: medium brown, moist, loose |
| 25.5-26 | SILTY CLAY: medium reddish brown, moist, soft, loose |
| 26-27 | SANDY CLAY: light brown, moist, soft |
| 27-28 | SILTY CLAY: reddish light brown, firm, with rock inclusions up to 0.5 inches in diameter |
| 28-29 | SANDY CLAY: light brown, wet, soft, some gravel present |
| 29-29.5 | Other: reddish, dry, brittle, iron-rich material |
| 29.5-30 | SHALE: gray, slightly moist, firm, weathered |
| | T.D. = 30 ' |

# MW-32

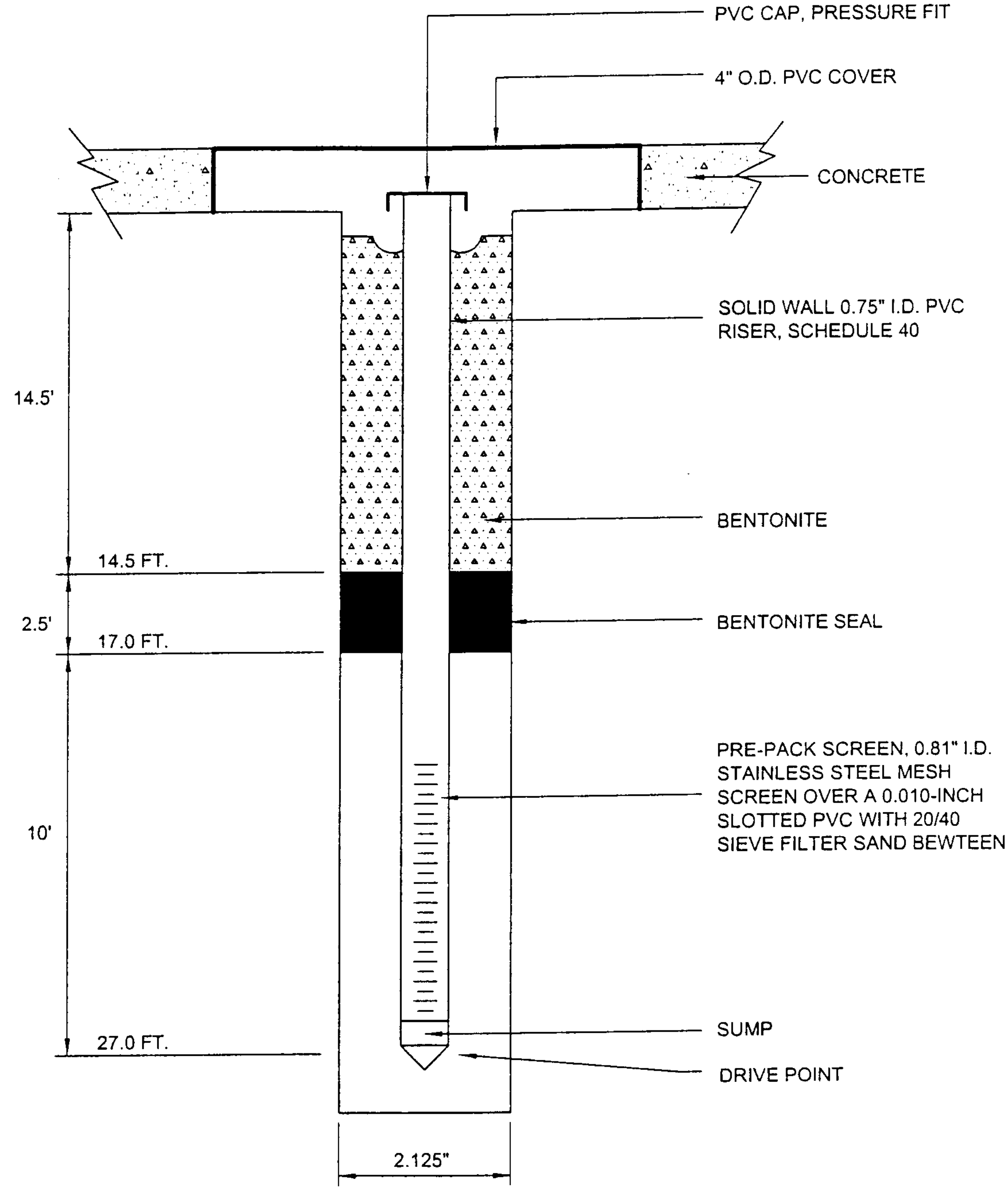



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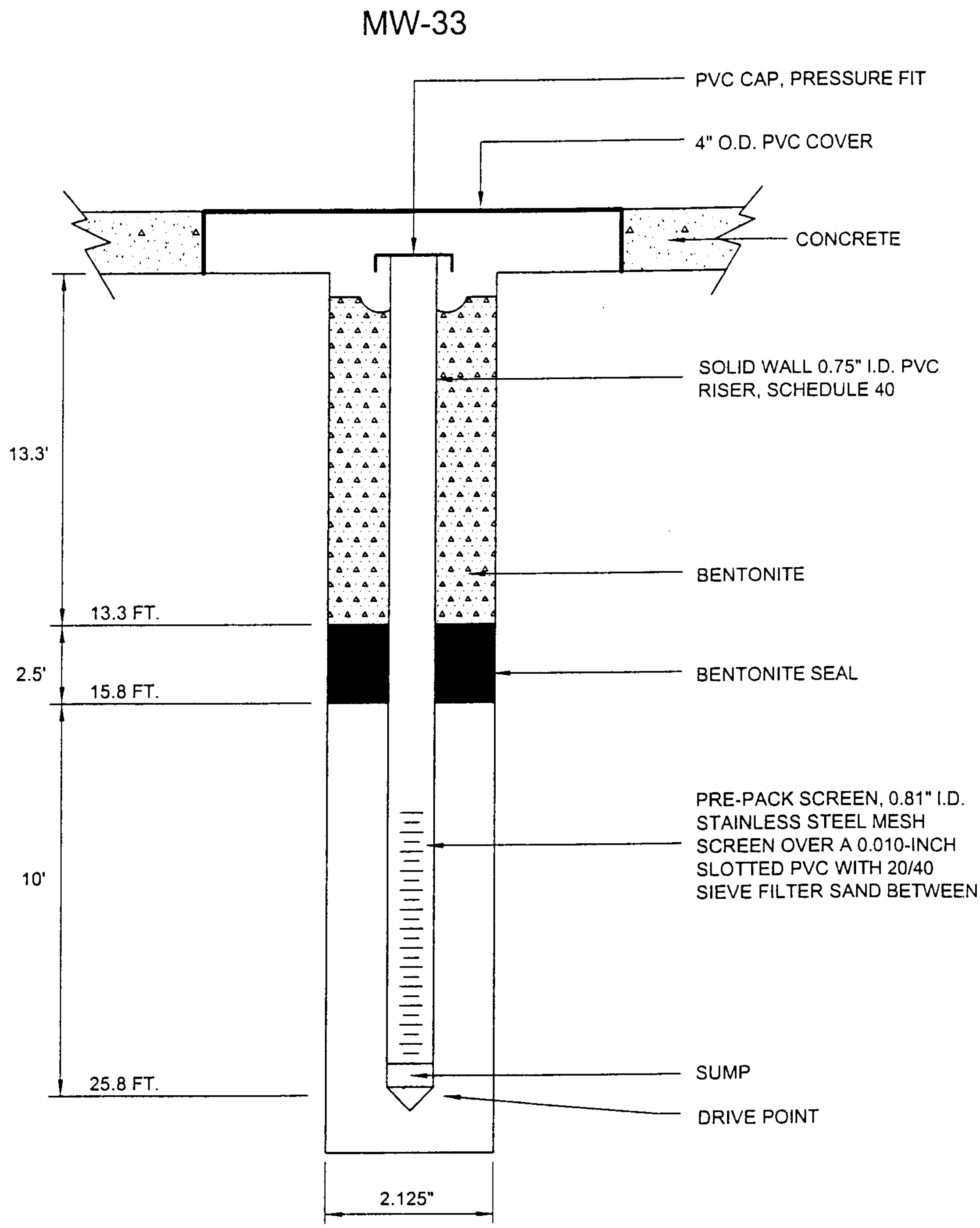
FIGURE 2
MW-32 CONSTRUCTION DETAIL
OFFSITE INVESTIGATION
Whirlpool Corporation
Fort Smith, Arkansas

ERM

| | | | |
|---|---|---|---|
| DESIGN: RS | CHKD.: | DATE: 01/23/01 | REV.: |
| DRAWN: LMc | SCALE: N.T.S. | W.O.NO.: 581002A020 A01 | |

H:\DWG\A01\581002a020.dwg, 01/23/2001 06:09:20 AM



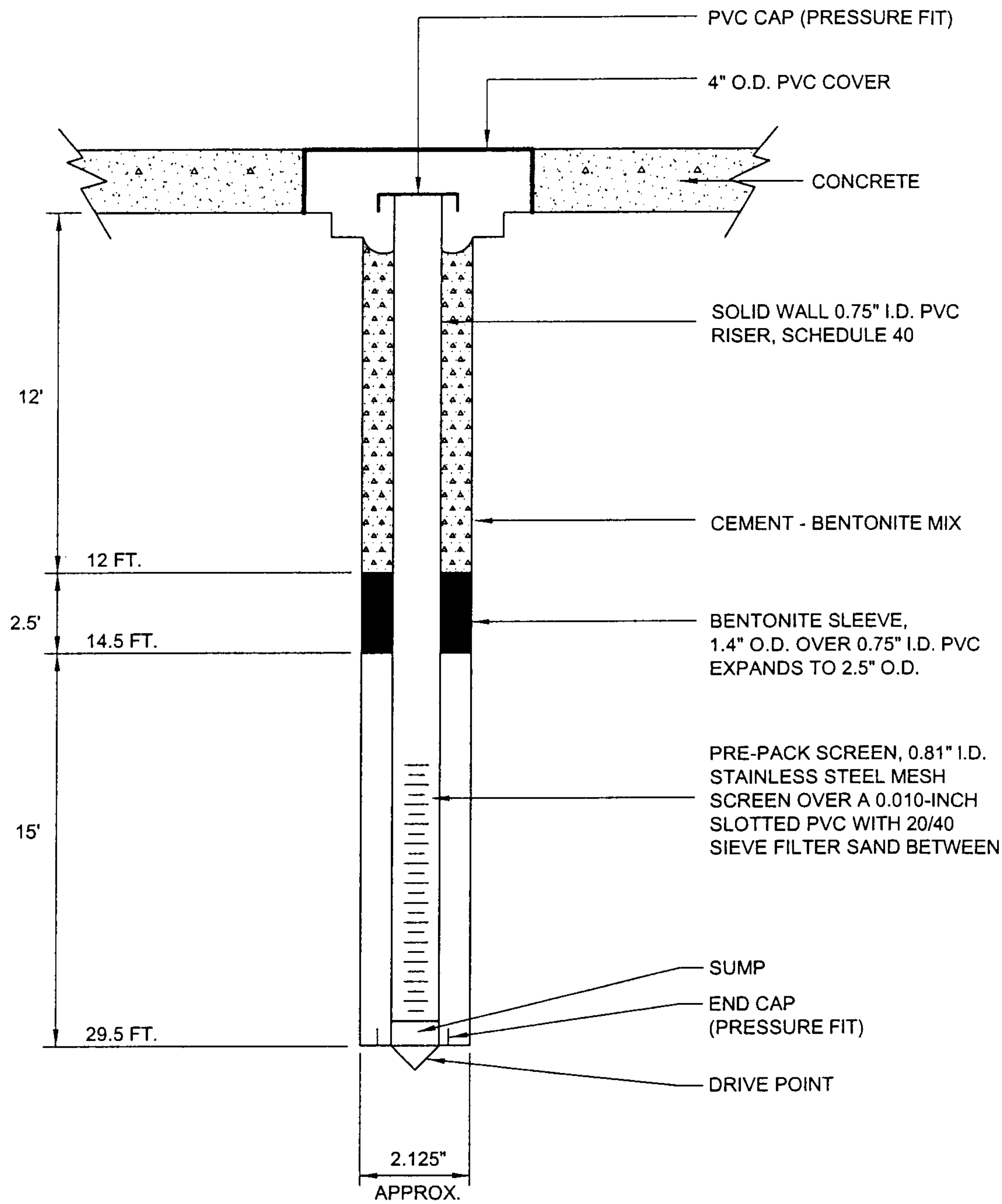

| | | | |
|---|---|---|---|
| **ERM-Southwest, Inc.** HOUSTON · NEW ORLEANS · AUSTIN · DALLAS · BEAUMONT | | | |
| DESIGN: RS | CHKD.: | DATE: 01/23/01 | REV.: |
| DRAWN: LMc | SCALE: N.T.S. | W.O.NO.: 581002A021 A01 | |

FIGURE 3
MW-33 CONSTRUCTION DETAIL
OFFSITE INVESTIGATION
Whirlpool Corporation
Fort Smith, Arkansas

ERM

H:\DWG\A01\581002a021.dwg, 01/23/2001 06:12:27 AM

# MW-34

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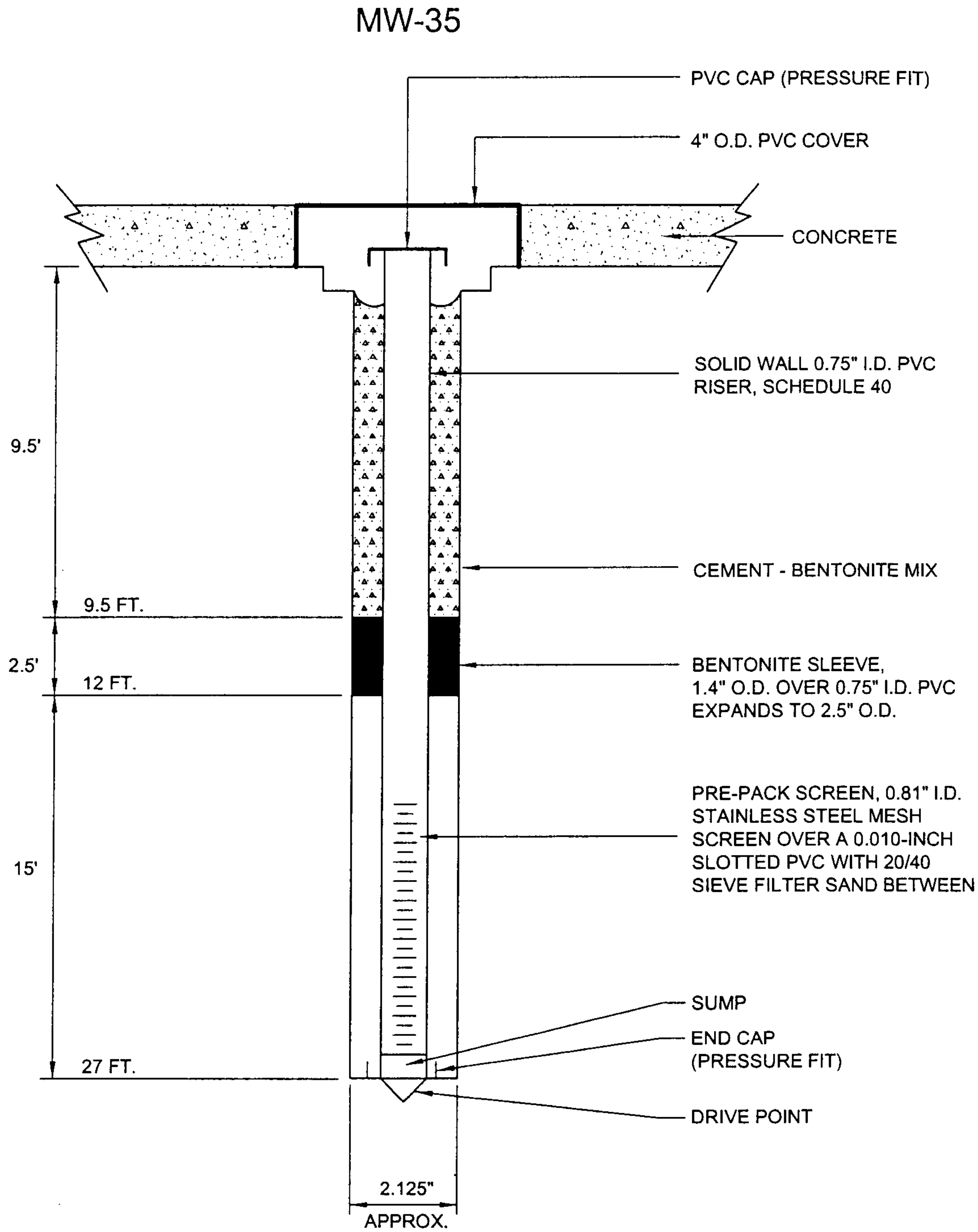
| | | | |
|---|---|---|---|
| DESIGN: RS | CHKD.: | DATE: 04/02/01 | REV.: |
| DRAWN: LMc | SCALE: N.T.S. | W.O.NO.: 581005A203 D01 | |

FIGURE 1
MW-34 CONSTRUCTION DETAIL
OFFSITE INVESTIGATION
Whirlpool Corporation
Fort Smith, Arkansas

ERM

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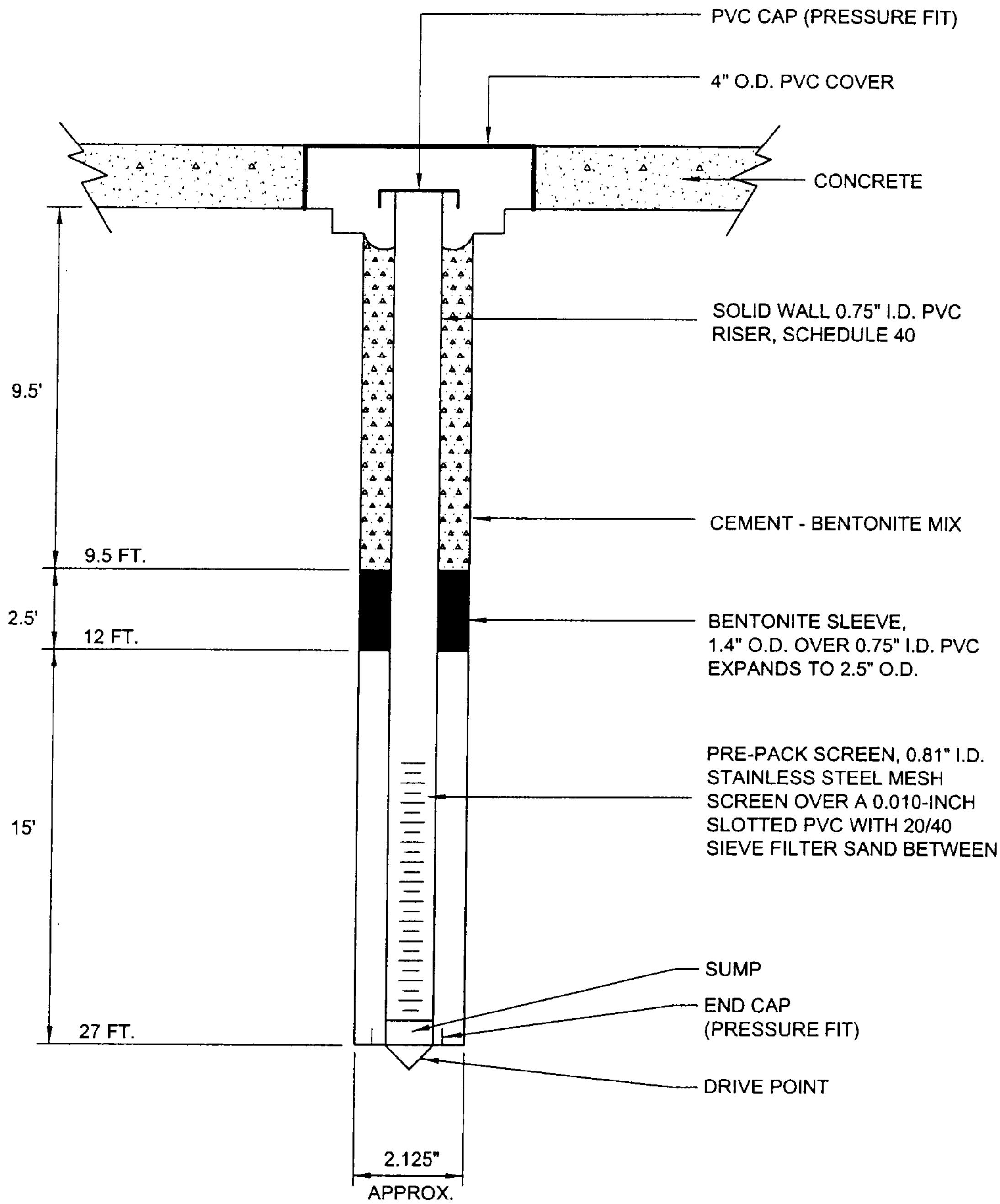
| DESIGN: RS | CHKD.: | DATE: 03/02/01 | REV.: |
|---|---|---|---|
| DRAWN: LMc | SCALE: N.T.S. | W.O.NO.: 581005A201 D01 | |

FIGURE 2
MW-35 CONSTRUCTION DETAIL
OFFSITE INVESTIGATION
Whirlpool Corporation
Fort Smith, Arkansas

ERM

# MW-36

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| | | | |
|---|---|---|---|
| DESIGN: RS | CHKD.: | DATE: 04/02/01 | REV.: |
| DRAWN: LMc | SCALE: N.T.S. | W.O.NO.: 581005A202 D01 | |

FIGURE 3
MW-36 CONSTRUCTION DETAIL
OFFSITE INVESTIGATION
Whirlpool Corporation
Fort Smith, Arkansas

ERM

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# MW-37
# DRILLING LOG

W.O. NO. 581007 Boring/Well ID MW-37 Date Drilled 09/13/01

Project CAS Support Owner Whirlpool

Location Ft. Smith, Arkansas Boring T.D. 30 ' Boring Diam. 5 "

N. Coord. ________ E. Coord. ________ Surface Elevation ________ MSL Datum

Screen: Type Schedule 40 PVC Diam. 2 " Length 15 ' Slot Size 0.010 "

Casing: Type Schedule 40 PVC Diam. 2 " Length 15 ' Sump Length 0 '

Top of Casing Elevation ________ Stickup 0 '

Depth to Water: 1. Ft. ________ (________) 2. Ft. ________ (________)

Drilling Company MHC Driller Ken Wages

Drilling Method Split spoon Log By Troy Meinen

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | PID HEADSPACE READINGS (PPM) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| | 0 | | | | | 0-5 | 0-0.33 | GRAVEL: Sandy silty gravel, 1" diameter quartzite gravel |
| | | | | | | | 0.33-0.63 | GRAVEL: Sandy silty gravel, reddish-brown to red, 1" diameter quartzite gravel |
| | | | | | | | 0.63-1.21 | CLAYEY SILT: Strong brown and gray, firm to hard, plastic, moist, occasional rootlets |
| | | | | | | | 1.21-1.33 | CLAYEY SILT: Gray, soft, crumbly, moist; with plastic and rubber fragments |
| | | | | | | | 1.33-2.5 | SILTY CLAY: Pale gray and strong brown, firm to hard, moist occasional calcareous nodules up to .25" in diameter |
| | | | | | | | 2.5-5 | SILTY CLAY: Strong brown with occasional gray mottling, stiff to hard, moist, occasional clacareous nodules up to 0.5" diameter |
| | 5 | | | | 142 | 5-10 | 5-9 | SILTY CLAY: Strong brown, slightly crumbly, moist to dry, stiff, occasional pale gray mottling; pale gray silt pocket at 6' (1" diameter), occasional calcareous and iron nodules up to 0.25" diameters, moderate chemical-like odor |
| | | | | | 7.0 | | | |
| | | | | | | | 9-15 | SILTY CLAY TO CLAY: strong brown to reddish-brown, very plastic, occasional pale gray mottling, moist, hard, moderate chemical-like odor |
| | 10 | | | | 24.2 | 10-15 | | |
| | | | | | 24.2 | | | |
| | 15 | | | | 1.4 | 15-20 | 15-16.3 | SILTY SANDY CLAY: Strong brown and pale gray, soft to firm, occasional dark gray speckles and streaks, mottling appears bedded in 0.5" thick beds |
| | | | | | | | 16.3-16.5 | SILTY CLAY: Strong brown and pale gray mottled, moist to dry, stiff |
| | | | | | 4.2 | | 16.5-17 | CLAYEY SILT: Sandy clayey silt to sandy silty clay, soft to firm, occasional dark gray and pale gray mottling, moist to wet |
| | | | | | | | 17-17.7 | CLAYEY SILTY SAND to clayey sandy silt: strong brown to brown, slightly plastic, wet to water saturated, soft, occasionl calcareous nodules to 0.25" diameter |
| | | | | | | | 17.7-21 | NO RECOVERY: No recovery |
| | 20 | | | | 4.2 | 20-25 | | |
| | | | | | | | 21-23 | SILTY SAND: Brown, fine to medium grained sand, loose to dense, mostly quartz, some reddish-brown grains |
| | | | | | 1.4 | | 23-24 | SILTY SAND AND SILT: Brown, loose to dense, moist to wet; with pale gray and strong brown silty clay interclasts up to 0.5" diameter, occasional pale gray sandy clay pockets, stiff crumbly |
| | | | | | | | 24-25 | |
| | 25 | | | | | | | |

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# MW-37
# DRILLING LOG

W.O. NO. 581007 Boring/Well ID MW-37 Date Drilled 09/13/01

Project CAS Support Owner Whirlpool

Location Ft. Smith, Arkansas Boring T.D. 30 ' Boring Diam. 5 "

N. Coord. ______ E. Coord. ______ Surface Elevation ______ MSL Datum

Screen: Type Schedule 40 PVC Diam. 2 " Length 15 ' Slot Size 0.010 "

Casing: Type Schedule 40 PVC Diam. 2 " Length 15 ' Sump Length 0 '

Top of Casing Elevation ______ Stickup 0 '

Depth to Water: 1. Ft. ______ (______) 2. Ft. ______ (______)

Drilling Company MHC Driller Ken Wages

Drilling Method Split spoon Log By Troy Meinen

SKETCH MAP

NOTES

| Elevation (Feet) | Depth (Feet) | Graphic Log | Well Construction | Sample Type | PID HEADSPACE READINGS (PPM) | Sample Interval (Feet) | Description Interval (Feet) | Description/Soil Classification (Color, Texture, Structure) |
|---|---|---|---|---|---|---|---|---|
| | 25 | | | | 0.0 | 25-30 | 25-28.5 | GRAVEL: Dark brown, water saturated; gravel is rounded to sub-angular quartzite < 0.25", coarsens downward to 1" diameter gravel at base. |
| | | | | | 0.0 | | | SILTY SANDY GRAVEL: Dark brown, water saturated; with increasing silt and clay content with depth, gravel up to 2-3" diameter at 27.5', 28' and 28.5' |
| | | | | | | | 28.5-29.5 | SILTY CLAY: Abundant gravel up to 3" diameter, yellowish-brown, stiff to plastic, wet; finely bedded 29.3 to 29.5 |
| | 30 | | | | 0.0 | | 29.5-30 | SHALE: Shale fissile, crumbly, very dark gray, moist to dry, weathered zone from 29.5 to 29.7 |
| | | | | | | | | T.D. = 30 ' |
| | 35 | | | | | | | |
| | 40 | | | | | | | |
| | 45 | | | | | | | |
| | 50 | | | | | | | |