October 22, 2014

Mr. Mostafa Mehran
Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118

Re: Response to ADEQ Correspondence Dated September 17, 2014
2nd Quarter 2014 Progress Report
Whirlpool Corporation
Fort Smith, Arkansas
EPA No. ARD042755389
AFIN No. 66-00048
CAO LIS 13-202

Dear Mr. Mehran:

ENVIRON International Corporation (ENVIRON), on behalf of Whirlpool Corporation, is submitting this response to your September 17, 2014, letter (received on September 22) providing comments on the 2nd Quarter 2014 Progress Report submitted on August 15, 2014. Arkansas Department of Environmental Quality (ADEQ) comments are provided in the text below and the respective response follows.

The responses below address the stability of the groundwater plume, installation of an additional boundary monitoring well, abandonment and replacement of existing small diameter monitoring wells, and trichloroethene (TCE) concentrations in soil at Area 1.

Summary of Findings, First Bullet

Based on the Mann-Kendall trend analysis of the northern plume shown in the Table 7, seven (7) wells display decreasing trends and five (5) wells were determined to have increasing trends. Please provide justification to support the conclusion made by the [sic] Whirlpool in determining that the plume is stable.

ENVIRON Response:

The Mann-Kendall trend analysis utilizes data from all wells associated with the monitoring for the northern plume (page 15, Appendix A, *Second Quarter Groundwater Monitoring Report*). As described in more detail below, our determination that the plume is stable is based on the fact that 82% of these wells exhibit either little or no TCE or a decreasing or stable TCE concentration trend.

The trend analysis for the 39 wells associated with monitoring the northern plume (MW-42B and MW-43 are no longer included because they are in the process of being abandoned) indicates the following:

- Fourteen wells exhibit a stable trend for TCE concentrations:
- Seven wells exhibit a decreasing trend for TCE concentrations;

- Seven wells exhibit no trend regarding TCE concentrations [TCE concentrations in five of these wells consisting of MW-28, MW-31, MW-36, MW-39 and MW-68 have been non-detect or less than 1 microgram per liter (µg/L) since October 2011);
- Six wells exhibit TCE concentrations below detection limits; and
- Five wells exhibit an increasing trend for TCE concentrations.

TCE concentrations in 11 of the 39 (28%) have been non-detect or less than 1 µg/L since October 2011 and 21 of the 39 wells (54%) have exhibited decreasing or stable trends; therefore, 32 of the 39 wells (82%) of the wells exhibit either little or no TCE or a decreasing or stable TCE concentration trend. We believe that this supports our plume stability conclusions.

In addition, Table 8 (Appendix A, *Second Quarter 2014 Groundwater Monitoring Report*) indicates that the average TCE concentration for all wells in the north plume (average calculated based upon the TCE concentration for all wells in the north plume) decreased from 384 µg/L in April 2009 to 209 µg/L in May 2014. The reduction in the average TCE concentration over time further supports plume stability conclusions.

A trend analysis combining all of the wells within the north plume, south plume and entire groundwater plume based upon average TCE concentrations from 2009 through 2014 Second Quarter (see Table 7 in the *Second Quarter 2014 Groundwater Monitoring Report*) is presented as Table 1. The table shows that the average TCE concentrations for the:

- Northern plume exhibited a stable trend;
- Southern plume exhibited a decreasing trend; and
- Entire plume exhibited a decreasing trend.

The Mann-Kendall trend analysis for the grouping of all wells supports the plume stability conclusions.

As noted, TCE concentration trends are increasing in five of 39 (13%) of the wells (MW-55, MW-56, MW-57, MW-61 and IW-77). Further, of the five wells located in the northern plume with increasing TCE concentration trends:

- Two wells (MW-56 and MW-57) had concentrations during the 2014 2nd Quarter that were within historical ranges of detected values further leading the conclusions regarding stability;
- MW-61 had concentrations marginally exceeding historical maximum concentration (6.6 µg/L versus 4.7 µg/L);
- IW-77 had concentrations that marginally exceeded the historical maximums by relatively small amounts(1,460 µg/L versus 1,400 µg/L) while noting IW-77 is located adjacent to the ISCO treatment area (Area 3) and therefore the increased TCE concentrations may be affected by the ISCO injection); and

- MW-55 has not been sampled since October 2013 because access has not been granted to the well during the 2014 1st and 2nd groundwater monitoring events (the maximum TCE concentration detected in MW-55 was 14 µg/L in November 2010; latest sampling occurred in October 2013).

Summary of Findings, Second Bullet

Increase of Trichloroethene (TCE) concentration at monitoring well MW-61 above the Minimum [sic] Contaminant Level (MCL) of 5.0 µg/L is an indication that the boundary of 5.0 µg/L MCL contour line has increased. An approximate assessment of the increase in the concentration of TCE indicates the area of the plume may have increased two (2) acres (a 6.5 percent increase). Please explain in detail why Whirlpool believes the plume is stable.

ENVIRON Response:

The area of the northern plume during the first quarter was approximately 426,000 square feet (ft^2) (slightly less than 10 acres) (plume area north of MW-24), and the area during the second quarter was approximately 464,000 ft^2 representing an approximate increase of 38,000 ft^2 or slightly less than 1 acre.

As discussed above, a temporal trend analysis of individual well TCE concentrations and the average TCE concentrations for the plume supports the determination that the overall plume is stable. Some variability with the plume boundaries is expected as a result of fluctuations in TCE concentrations in groundwater due to sampling techniques, laboratory variability and seasonal changes.

Summary of Findings, Third Bullet

Although monitoring well MW-61 shows exceedance of 5.0 µg/L TCE concentration for the first time, TCE concentrations in monitoring well MW-61 have displayed a continuous increasing trend since 2011. It should also be noted that from the five plume boundary wells located at the northeastern extent of the plume (MW-50, MW-60, MW-61, MW-67 and MW-66), three monitoring wells (MW-60, MW-61, and MW-66) show consistent detectable concentrations of TCE. Please provide proposed locations for the placement of step-out (i.e. Non-Detect) groundwater monitoring wells down-gradient of the plume front.

ENVIRON Response:

The TCE concentration in MW-61 in October 2011 was non-detect. The next sampling event was performed in October 2012 where the TCE concentration was reported as 2.4 µg/L J (estimated concentration below the laboratory reporting limits). The TCE concentration trend in MW-61 has been increasing since October 2012 based upon concentrations increasing from 2.4 µg/L J in October 2012 to 6.6 µg/L in May 2014. Historically, MW-61 has exhibited a non-detect TCE concentration in 12 of the 18 monitoring events since April 2005.

TCE has only been detected once in MW-60 during 18 monitoring events performed since April 2005. TCE was detected during the last monitoring event in MW-60 at 0.2 µg/L J (i.e. more than an order of magnitude below the RAL).

MW-66 has only exhibited a continuous trend of detections of TCE since October 2013 with a maximum TCE concentration detected of 3.5 µg/L J in March 2014.

The location for a proposed monitoring well located down-gradient of MW-61 is shown on Figure 1. A MIP and soil boring were performed at this location in August 2014. No TCE was detected in soil or groundwater at M-347/DP-58 (see Appendix C for logs). The proposed location is near the pending Jenny Lind Road widening project. The schedule for well installation will be dependent on completion of the road construction project.

Review of Activities Completed – 2nd Quarter 2014, Fourth paragraph, Second Sentence

Well diagrams for monitoring wells MW-81 through MW-86 do not contain location, ground surface elevation, or top of casing elevation information. Please provide this information.

ENVIRON Response:

A licensed Arkansas surveyor is scheduled to be onsite during the week of October 27, 2014, to survey recently installed monitoring and injection wells. MW-81 through MW-86 will be surveyed at this time and survey coordinates for MW-81 through MW-86 will be included in the in the Third Quarter Progress Report.

Section 2.2 Monitoring Well Sampling, Seventh Paragraph

Monitoring wells MW-50, MW-56, MW-57, MW-60 and MW-61 are five (5) of the seventeen (17) monitoring wells that are equipped with 0.75 inch diameter PVC with pre-packed screens place in three inch (3") diameter DPT boreholes. These monitoring wells (as per ADPCE PRCR 96-4) should only be used as temporary monitoring locations. These monitoring wells and the remaining twelve (12) 0.75 inch diameter temporary monitoring wells placed in drilled boreholes. Please provide a schedule for the implementation of this task.

ENVIRON Response:

A brief letter work plan will be submitted with the Third Quarterly Progress Report on November 14, 2014, indicating the locations for installation of new, 2 inch diameter wells, screened intervals, construction detail, and drilling and development methodology. There are some locations where other existing 2 or 4 inch wells may provide sufficient coverage of groundwater conditions precluding the necessity of replacing all of the ¾ inch wells.

The schedule for new well installation will be provided in the proposed work plan; however, the schedule will be dependent upon negotiating and procuring access to the well sites to over drill and remove the existing wells and seal the current bore hole and install new, 2 inch diameter wells. Additionally, MW-66 and MW-67 are currently located within the pending construction zone associated with the widening of Jenny Lind Road.

3.3.2 MNA Results, Geochemical Lines of Evidence, 2nd Paragraph, 5th Bullet

This text indicates monitoring well MW-61 appears to now be inside the plume. Please correct.

ENVIRON Response:

MW-61 is within the 5 µg/L plume boundary as depicted on Figure 2, Second Quarter 2014 TCE Isoconcentration Map. The text of the report was incorrect.

Table 4: Evaluation of VOCs in Soil Vapor

ADEQ is unable to duplicate Whirlpool's cancer risk and Hazard Quotient (HQ) values found in Table 4. Please provide ADEQ with Whirlpool's Johnson and Ettinger worksheets showing the parameters used to calculate the cancer risks and HQ's from groundwater data at MW-71 for 1,1-Dichloroethene. In addition, please provide detailed calculations used to determine the cancer risks and HQ's from the soil vapor data at VP-1D for 1,2-Dichloroethane.

ENVIRON Response:

The footnotes in Table 4 have been revised to include additional details and references on how the risk calculations were performed. In addition, detailed risk calculations are also included and will be included as an appendix in subsequent quarterly reports.

General Comment

Please provide an explanation that the subsurface distribution of TCE would end abruptly at the western end of the drainage feature depicted in Figure 2. Examination of aerial photographs shows what appears to be a storm water drainage outlet located west of the drainage feature (latitude: 35.322649, longitude: 94.419852). This apparent drainage outlet is in the line with the western end of the drainage feature depicted in Figure 2. Given the abrupt absence of TCE in the subsurface west of the western end of the drainage feature, it is possible that a drain and subsurface conduit once fed storm water (and possibly TCE) to the drainage outlet. Please obtain MIP profiles and soil samples in the drainage channel immediately west of the storm water drainage outlet.

ENVIRON Response:

Figure 2 in Appendix E, *Area 1 Soil Investigation Summary Report* depicts the sample locations performed in accordance with the *Area 1 Soil Investigation Work Plan* dated May 27, 2014. No depictions of subsurface distribution of TCE are provided on the figure. An existing storm water catch basin is depicted on Figure 2 near the western end of former linear drainage feature.

During the September 2013 pre-design mobilization MIP borings M-73 and M-74 were completed adjacent to storm water inlets located on the north and south sides of the rail spur. The storm water inlets and M-73 and M-74 are located approximately 80 feet west along the storm water utility and the storm water catch basin referenced in ADEQ's comment. No electron capture device (ECD) responses were observed in M-73 and M-74 indicating that no further investigation to the west was necessary (M-73 maximum ECD

responses 4 x 10^5 excluding a slightly higher response at a depth of 1 foot and M-74 maximum ECD responses were 6 x 10^5) [a general ECD response of 1 x 10^6 or greater has been used as guidance regarding performance of supplemental soil probes or borings (see *Response to ADEQ Correspondence regarding the Property Boundary Supplemental Work Plan* dated September 19, 2014 that includes a MIP Narrative)].

On August 5, 2014, M-307 was completed approximately 85 feet west of M-73 along the south side of the surface water drainage along the railroad tracks. No MIP response was observed warranting further delineation to the west (M-307 maximum ECD responses were 4 x 10^5). Locations and logs for the discussed borings are attached as Figure 2 and Appendix C.

On August 6, 2014, DP-39 was completed adjacent to M-74. Five soil samples and one groundwater sample were collected from DP-39. Soil samples were collected at depths of 4 feet below ground surface (bgs), 7 feet bgs, 16.5 feet bgs, 23.5 feet bgs, and 28 feet bgs. TCE was not in soil samples collected from 4, 7 and 16.5 feet bgs. TCE was marginally detected in soil samples collected at 23.5 feet bgs and 28 feet bgs at 2.2 (J) micrograms per kilograms (µg/kg) and 7 µg/kg, respectively. The TCE concentration in the groundwater sample was reported at 18.1 µg/L. This result is similar to the second quarter groundwater sample result for ITMW-21, located approximately 65 feet to the south.

On August 18, 2014, a surface water sample was collected from the western storm water outfall (Outfall 002) and on August 20, five sediment samples were collected from the storm water drainage features along the west side of the site. No TCE was detected in the surface water sample or sediment samples. The results of the surface water and sediment sampling efforts were presented in the *Surface Water and Sediment Sampling near Whirlpool Facility Report* dated September 18, 2014 (this report was approved by ADEQ in correspondence dated October 14, 2014).

Based upon the investigation efforts summarized above, the western extent of TCE impacts associated with the drainage feature identified in ADEQ's comment are considered fully delineated.

Section 4, Summary, Paragraph1, Second Bullet

It is stated, "The highest TCE concentrations are generally located near the center of the former linear drainage feature extending roughly from DP-29 to the east towards DP-08 to the west." This statement is inaccurate. The soil concentration at monitoring well MW-86 to the west of DP-08 exhibits TCE concentration of 137 mg/kg (Figure 7). MW-86 is near DP-06. Therefore, the statement should be revised to indicate, "The highest TCE concentrations are generally located near the center of the former linear drainage feature extending roughly from DP-29 to the east towards DP-06 to the west," Please correct.

ENVIRON Response:

The discussion in the Area 1 Summary Investigation Report consisted of a generalization of the data. However, as described by ADEQ in the comment above, impacted soil is present in DP-06.

Figures 8, 9 and 10

East-West labels on the cross sections are reversed. Please correct.

ENVIRON Response:

The East-West labels on Figures 8, 9 and 10 have been corrected and attached.

-oo0oo-

If you have any questions or comments please contact me at your earliest convenience.

Sincerely,

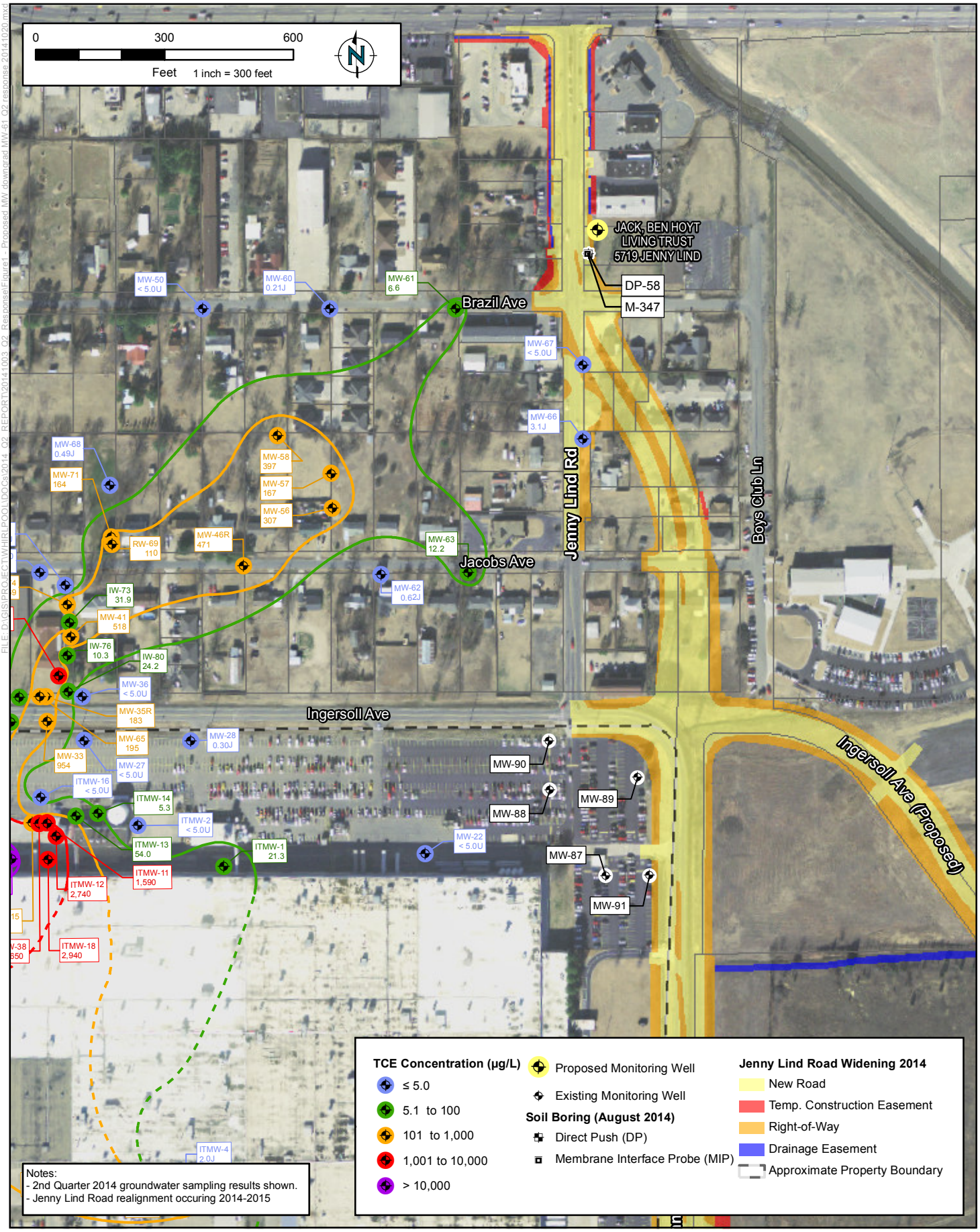
ENVIRON International Corporation

Michael F. Ellis, PE
Principal

LIST OF ATTACHMENTS

Figure 1:	Proposed Monitoring Well Location
Figure 2:	Select MIP and DP Boring Locations Located Along West End of Drainage Feature
Appendix A:	Revised Figures 8, 9 and 10
Appendix B:	Summary of Statistical Temporal Trend Analysis of Mean Groundwater Concentrations
Appendix C:	MIP and Boring Logs M-73, M-74, M-307, M-347, DP-39 and DP-58
Appendix D:	Supplemental Soil Vapor Tables

FIGURES

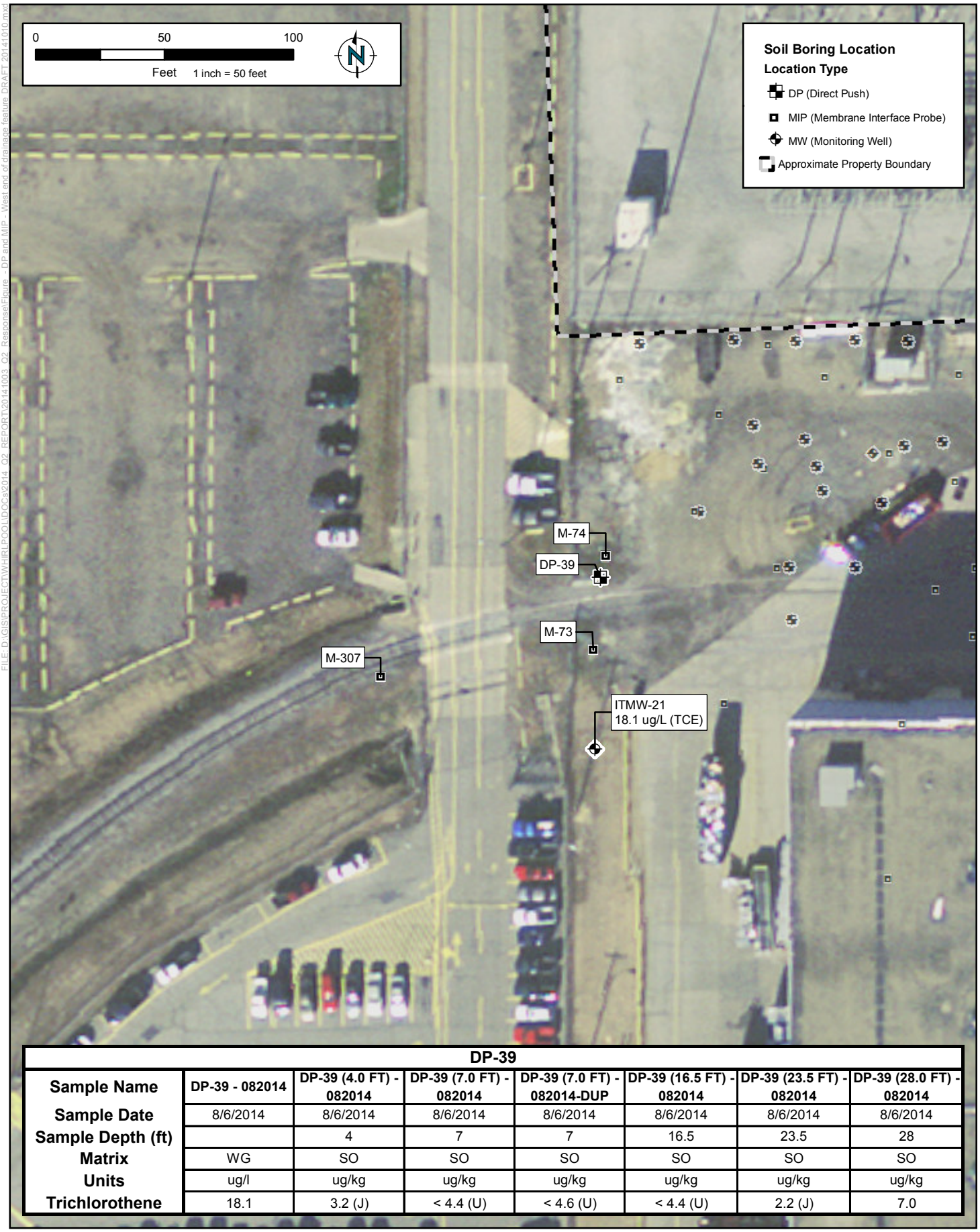


ENVIRON

PROPOSED MONITORING WELL LOCATION
Response to ADEQ Comments on the 2nd Quarter Progress Report
Whirlpool Facility - Fort Smith, Arkansas

Figure 1

DRAFTED BY: KTS | DATE: 10/20/2014 | PROJECT: 2131344B



DP-39

Sample Name	DP-39 - 082014	DP-39 (4.0 FT) - 082014	DP-39 (7.0 FT) - 082014	DP-39 (7.0 FT) - 082014-DUP	DP-39 (16.5 FT) - 082014	DP-39 (23.5 FT) - 082014	DP-39 (28.0 FT) - 082014
Sample Date	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014	8/6/2014
Sample Depth (ft)		4	7	7	16.5	23.5	28
Matrix	WG	SO	SO	SO	SO	SO	SO
Units	ug/l	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Trichlorothene	18.1	3.2 (J)	< 4.4 (U)	< 4.6 (U)	< 4.4 (U)	2.2 (J)	7.0

ENVIRON

DRAFTED BY: KTS | DATE: 10/20/2014

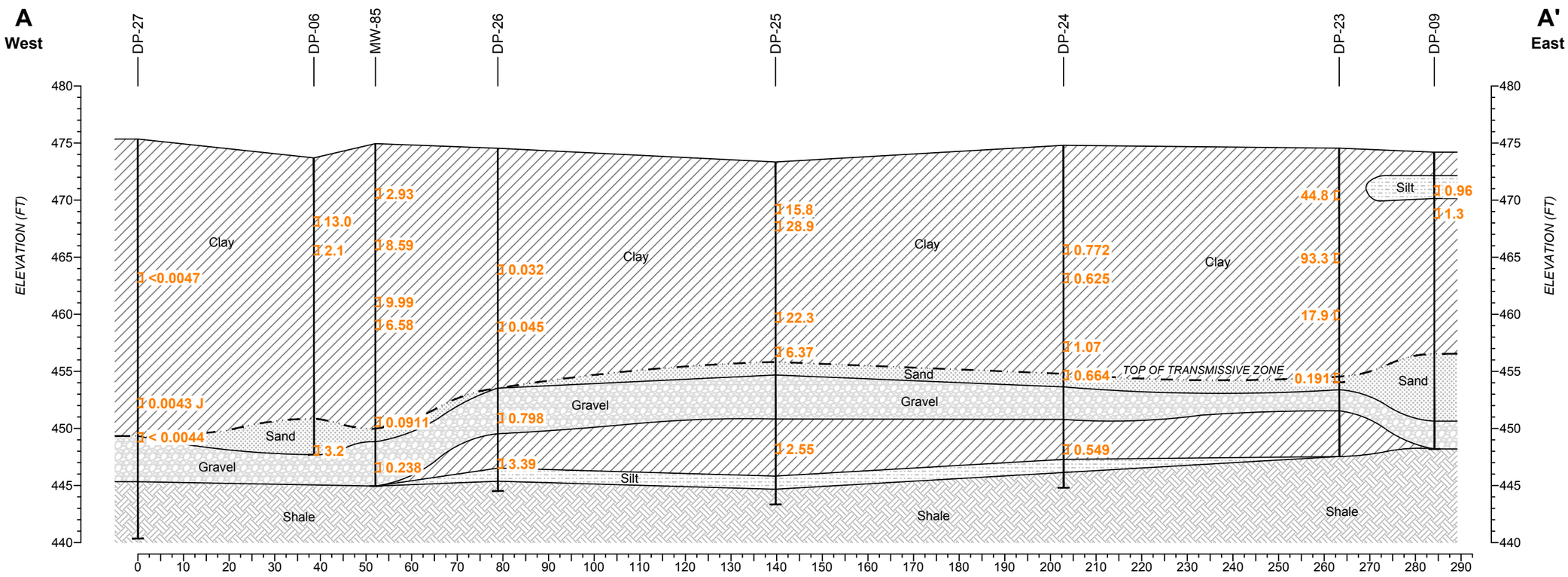
SELECT MIP AND DP BORING LOCATIONS LOCATED ALONG WEST END OF DRAINAGE FEATURE

Whirlpool Facility - Fort Smith, Arkansas

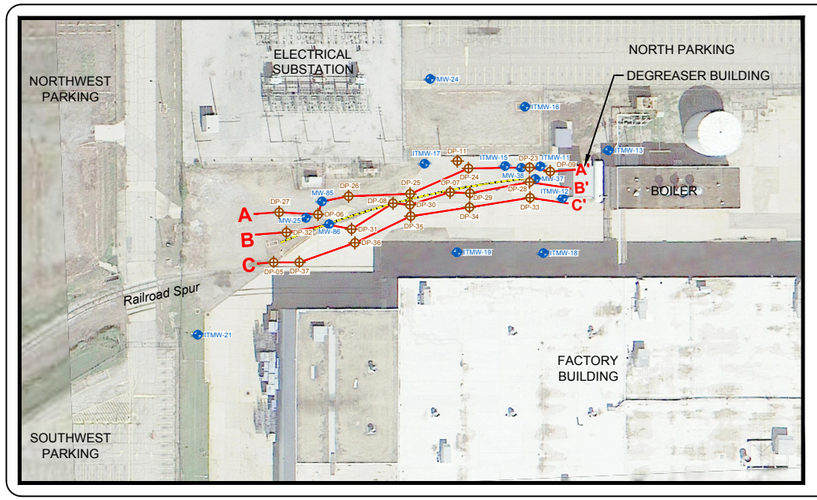
Figure 2

PROJECT: 2131344B

APPENDIX A
Revised Figures 8, 9 and 10



CROSS-SECTION A-A'



CROSS-SECTION OVERVIEW

APPROX. SCALE (ft.)
0 150

LITHOLOGY	
SHALE	SAND
CLAY	GRAVEL
SILT	

LEGEND	
DP BORINGS	
MONITORING WELLS	
BORING	
200	TCE CONCENTRATION (mg/kg)

NOTE:
Vertical Exaggeration is 2.5x.

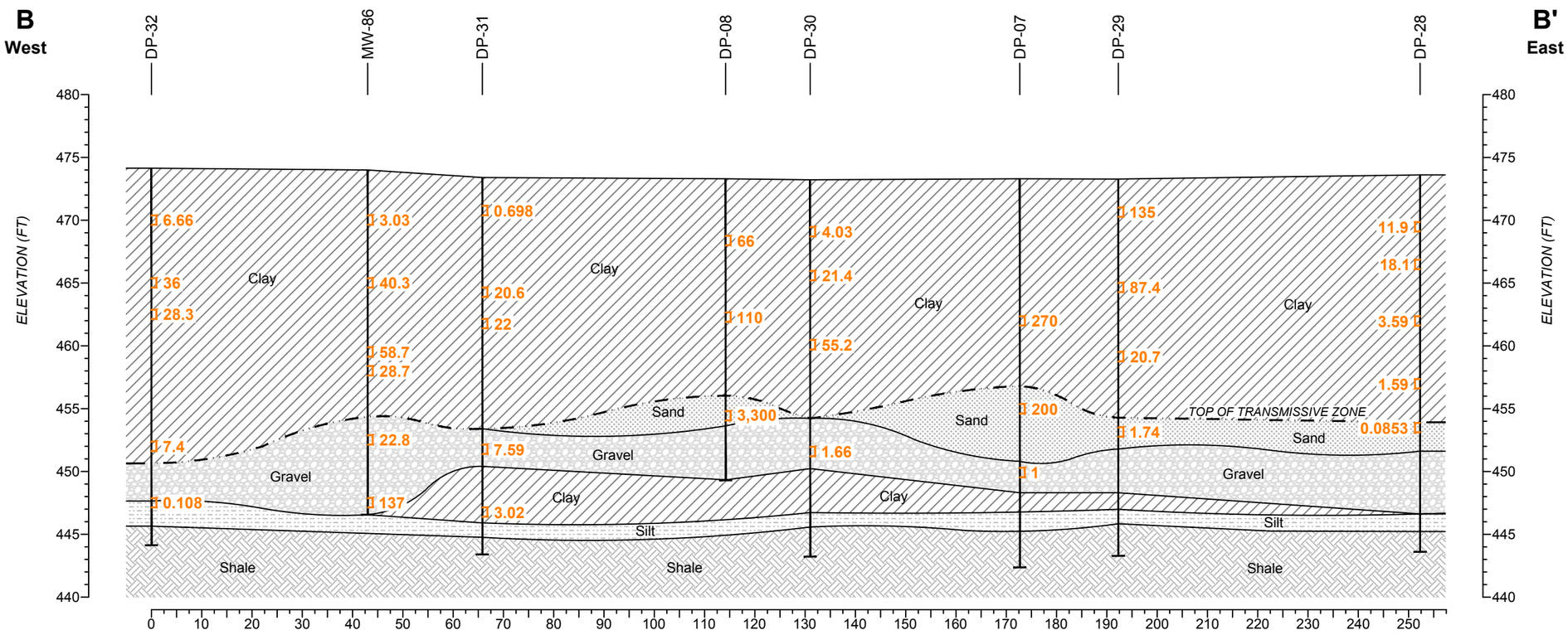
CROSS-SECTION A-A'
WHIRLPOOL FACILITY
FORT SMITH, ARKANSAS

ENVIRON

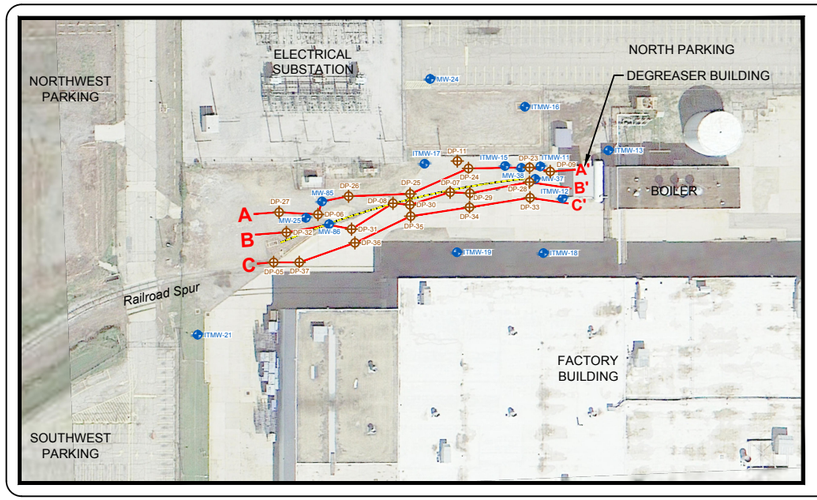
FIGURE 8

DRAFTED BY: CKL | DATE: 10/8/14 | 3433233A

L:\Loop Project Files\00_CAD FILES\34\NMRS_Whirlpool Ft. Smith LitSup 3433233A\08-10_Cross Sections.dwg



CROSS-SECTION B-B'



CROSS-SECTION OVERVIEW

APPROX. SCALE (ft.)
0 150

LITHOLOGY	
SHALE	SAND
CLAY	GRAVEL
SILT	

LEGEND	
DP BORINGS	
MONITORING WELLS	
BORING	
200	TCE CONCENTRATION (mg/kg)

NOTE:
Vertical Exaggeration is 2.5x.

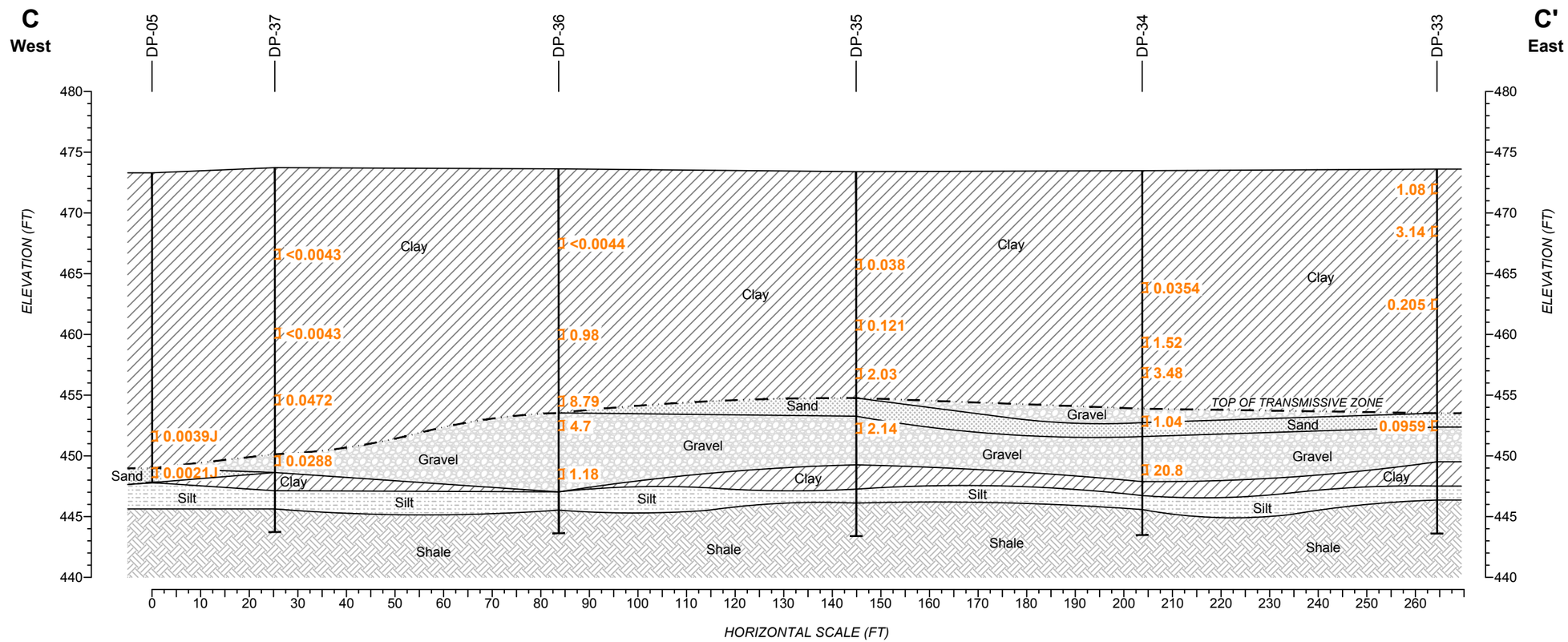
CROSS-SECTION B-B'
WHIRLPOOL FACILITY
FORT SMITH, ARKANSAS

ENVIRON

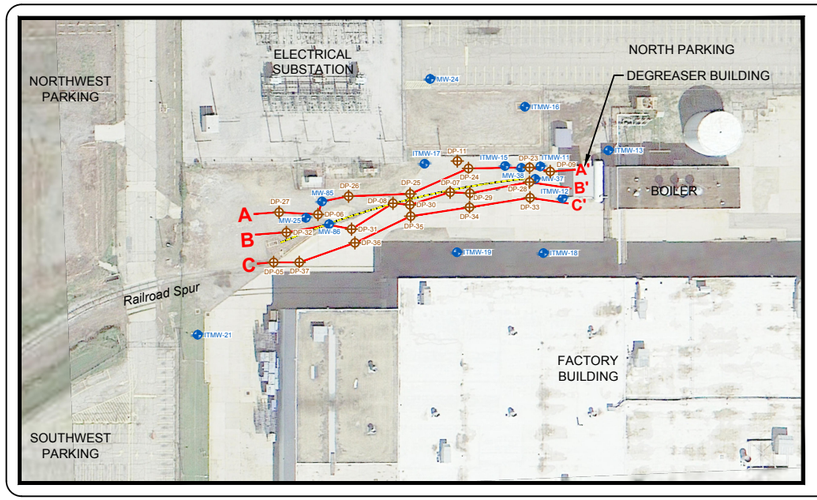
FIGURE 9

DRAFTED BY: CKL | DATE: 10/8/14 | 3433233A

L:\Loop Project Files\00_CAD FILES\34\NMRS_Whirlpool Ft. Smith LitSup 3433233A\08-10_Cross Sections.dwg



CROSS-SECTION C-C'



CROSS-SECTION OVERVIEW

APPROX. SCALE (ft.)
0 150

LITHOLOGY	
SHALE	SAND
CLAY	GRAVEL
SILT	

LEGEND	
DP BORINGS	
MONITORING WELLS	
BORING	
200	TCE CONCENTRATION (mg/kg)

NOTE:
Vertical Exaggeration is 2.5x.

CROSS-SECTION C-C'
WHIRLPOOL FACILITY
FORT SMITH, ARKANSAS

ENVIRON

FIGURE
10

DRAFTED BY: CKL | DATE: 10/8/14 | 3433233A

L:\Loop Project Files\00_CAD FILES\34\NMRS_Whirlpool Ft. Smith LitSup 3433233A\08-10_Cross Sections.dwg

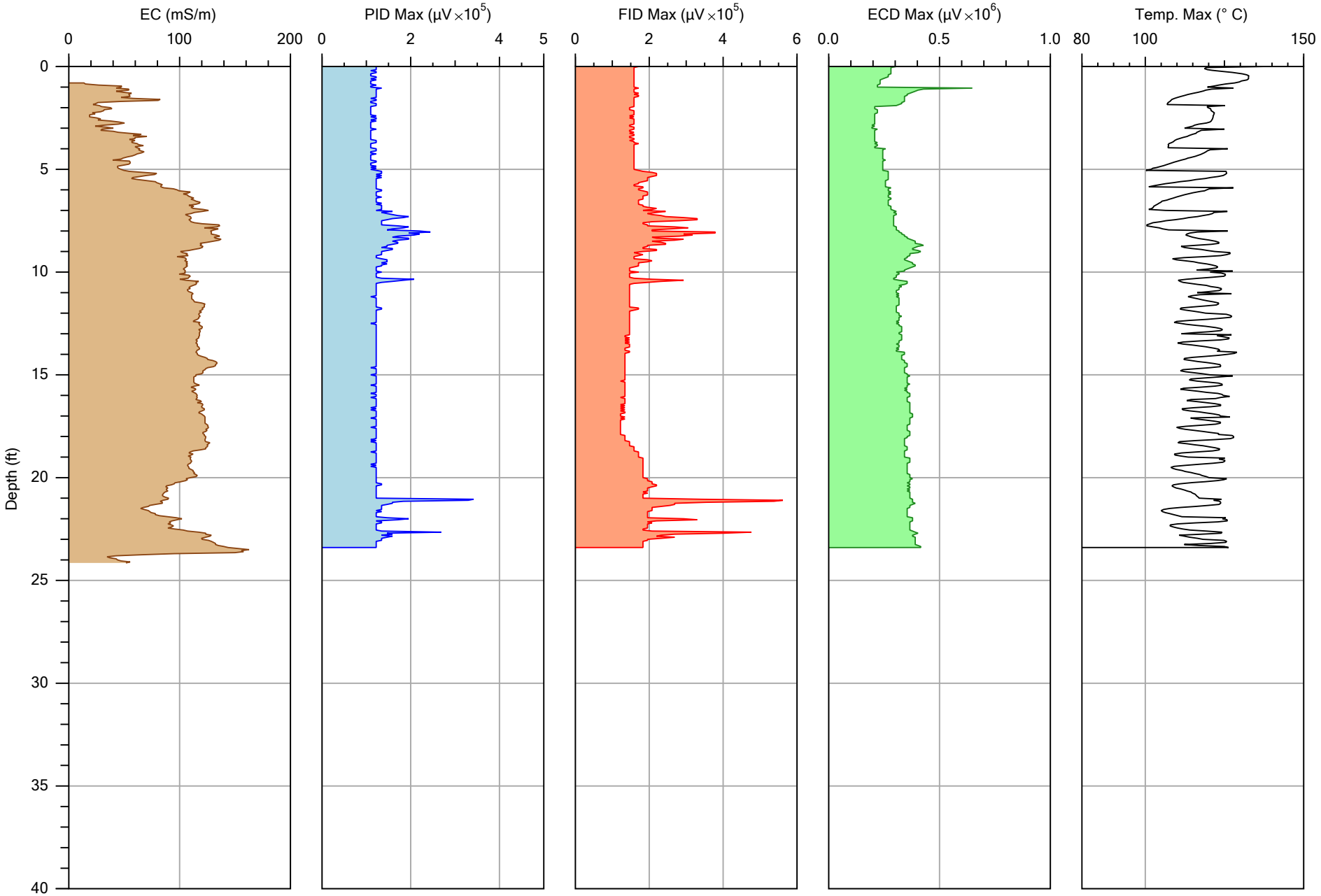
APPENDIX B
Summary of Statistical Temporal Trend Analysis of Mean Groundwater Concentrations

TABLE 1
SUMMARY OF STATISTICAL TEMPORAL TREND ANALYSIS OF MEAN CONCENTRATIONS
(2009 through 2nd Quarter 2014)
Whirlpool Facility
Fort Smith, Arkansas

Well Grouping	Start Date	End Date	Number of Mean Values	Trichloroethene	cis-1,2-Dichloroethene	Vinyl Chloride
All Plume Wells	4/24/2009	5/15/2014	12	Decreasing	Decreasing	Decreasing
Northern Plume Wells	4/24/2009	5/15/2014	12	Stable	Stable	Increasing
Southern Plume Wells	4/24/2009	5/15/2014	12	Decreasing	Decreasing	Decreasing

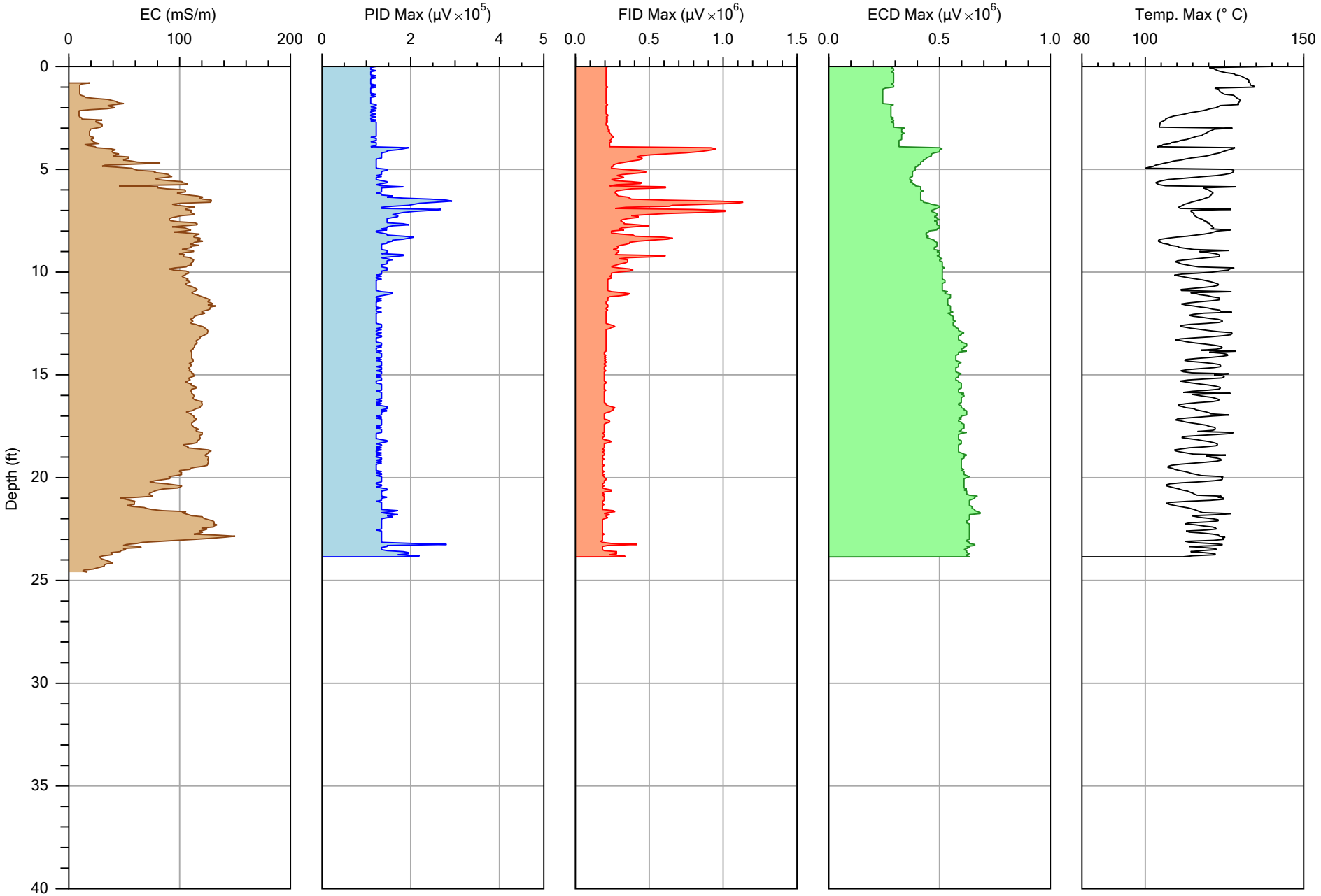
Notes:
ND - Result is Not Detected at the associated method quantitation limit
<PQL - Analyte qualified as estimated because it was detected above method detection limit but below reporting limit or mixture of estimated and non-detect results

APPENDIX C
MIP and Boring Logs M-73, M-74, M-307, DP-39 amd DP-58



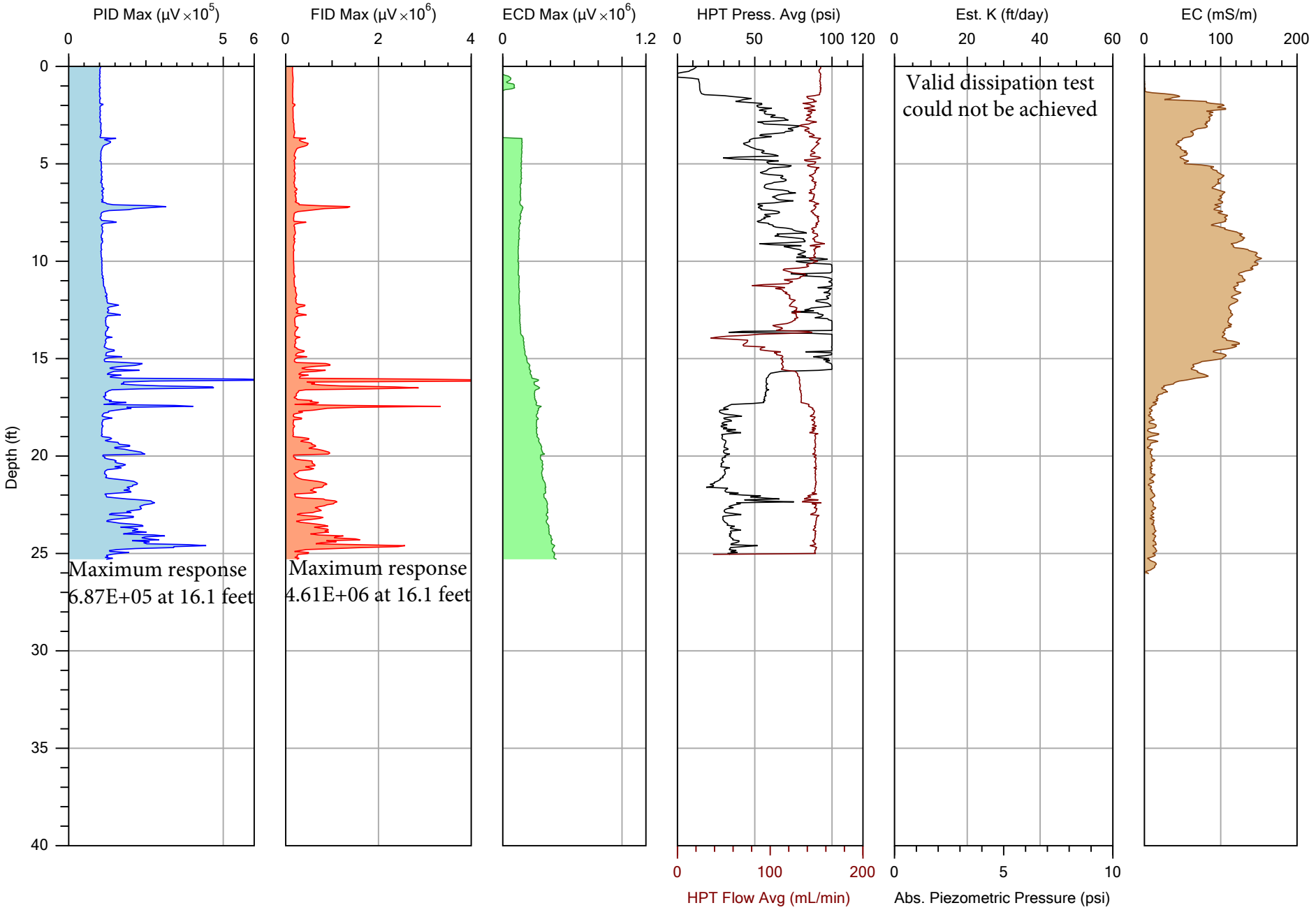
COLUMBIA TECHNOLOGIES

Company: COLUMBIA Technologies	Operator: DJM	File: M73.DAT
Project ID: Fort Smith	Client: ENVIRON	Date: 9/24/2013
		Location:



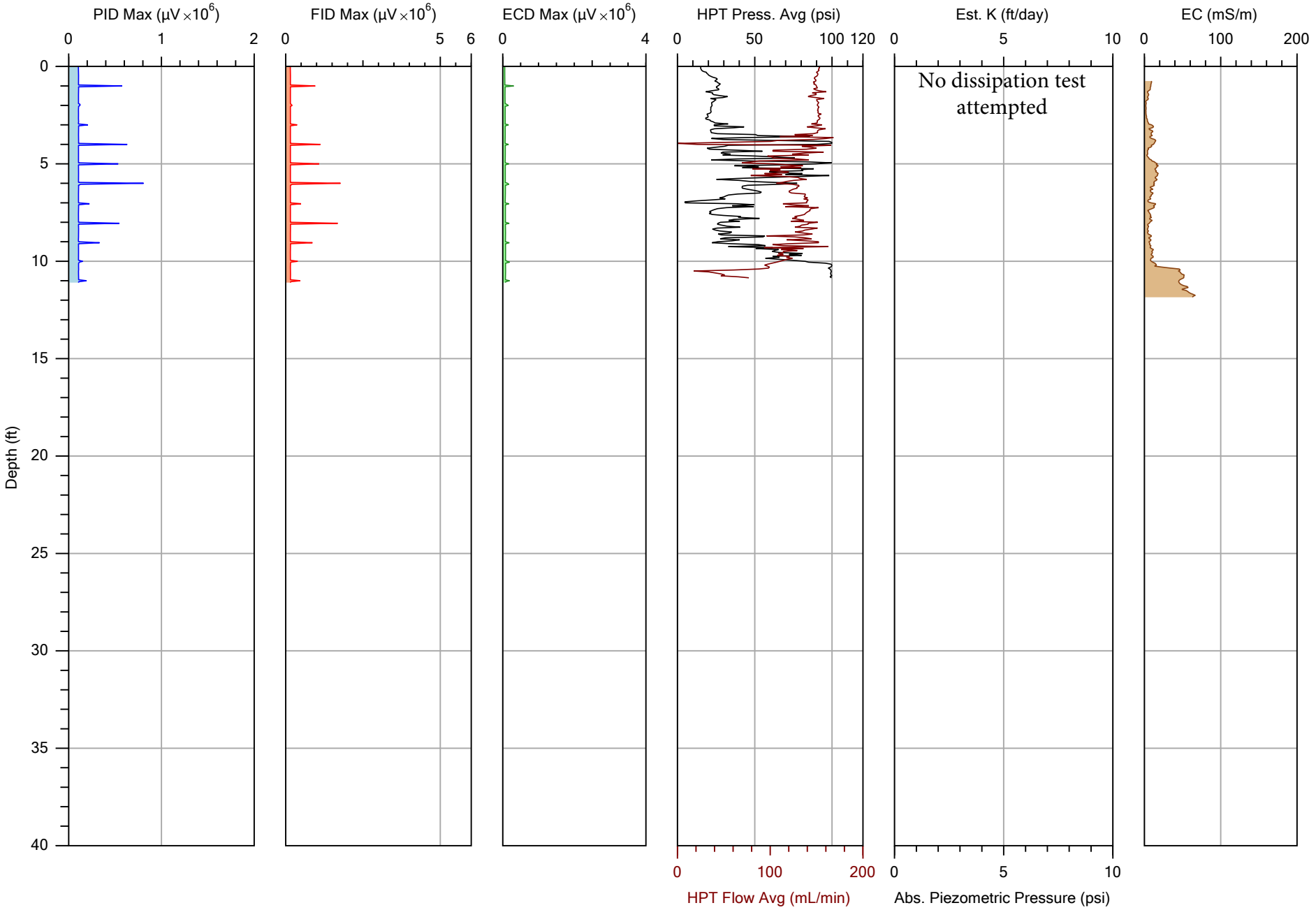
COLUMBIA TECHNOLOGIES

Company: COLUMBIA Technologies	Operator: DJM	File: M74.DAT
Project ID: Fort Smith	Client: ENVIRON	Date: 9/24/2013
		Location:



COLUMBIA TECHNOLOGIES

		File: M307.MHP
Company: COLUMBIA Technologies	Operator: DJM	Date: 8/5/2014
Project ID: Fort Smith	Client: ENVIRON	Location:



COLUMBIA TECHNOLOGIES

		File: M347.MHP
Company: COLUMBIA Technologies	Operator: DJM	Date: 8/25/2014
Project ID: Fort Smith	Client: ENVIRON	Location:

ENVIRON

2118 N. Tyler Road, Wichita, Kansas 67212

Site ID: DP-39		Date(s): **8/6/2014**	
Location: **Fort Smith, Arkansas**			
Logged By: **N. Zurweller**	Checked By: **K. Stonestreet**		
Contractor: **McCray Drilling**	Purpose: **Soil Boring**		
Drilling Method: **Direct Push**	GS Elevation: **472.7 amsl**	TOC Elevation: **amsl**	
Sampling Method: **Continuous Sampler**	North: **368963.94**	East: **590634.94**	
	Borehole Dia.: **2.25 inches**	Total Depth: **30.0 feet**	
	Project Number: **3433233A**		
	Project Name: **Whirlpool Corporation**		
	Remarks:		

Elevation (ft)	Depth (ft)	Recovery (feet)	Sample No.	PID (ppm)	Graphic Log	USCS Code	Material Description	Water Level
		2		0			FILL	
470		2		0		CL	SILTY CLAY, BROWN AND DARK BROWN, LITTLE LIGHT GRAY MOTTLING, STIFF, PLASTIC, MOIST	
		2	DP-39(4)	0			SILTY CLAY, BROWN, SOME GRAY MOTTLING, TRACE GRAVEL, SUBROUNDED, UP TO 1/4", LITTLE BLACK NODULES, PLASTIC, STIFF, MOIST	
	5	2		0				
		2	DP-39(7)	0				
465		2		0			SILTY CLAY, BROWN, SOME RED-BROWN MOTTLING, TRACE BLACK NODULES, PLASTIC, STIFF, MOIST	
	10	2		0				
		2		0				
460		2		0				
	15	2		0			SILTY CLAY, BROWN, LITTLE RED-BROWN MOTTLING, TRACE BLACK NODULES, INCREASING SILT WITH DEPTH, PLASTIC, STIFF, MOIST, VERY MOIST FROM 19.5-21' BGS	
		2	DP-39(16.5)	0				
455		2		0				
	20	2		0				
		2		0		SC	CLAYEY SAND WITH SILT, BROWN, FINE TO MEDIUM GRAIN, COHESIVE, WET	
450		2	DP-39(23.5)	0		CL	SILTY CLAY, BROWN, LITTLE LIGHT GRAY MOTTLING, SOME SAND, FINE TO MEDIUM GRAIN, SLIGHTLY PLASTIC, STIFF, MOIST	
	25	2		0		GC	SANDY CLAY, WITH SILT, SOME GRAVEL, FINE TO MEDIUM GRAIN, SUBROUNDED, UP TO 3/4", COHESIVE, SLIGHTLY STIFF, MOIST TO VERY MOIST	
		2		0			SAND AND GRAVEL, BROWN, WITH SILTY CLAY, MEDIUM TO COARSE GRAIN, SUBROUNDED AND SUBANGULAR, UP TO 1", COHESIVE, MOIST TO VERY MOIST	
445		2	DP-39(28)	0		CL	SILTY CLAY, BROWN, TRACE BLACK NODULES, PLASTIC, VERY STIFF, SLIGHTLY MOIST	
		2		0		MH	CLAYEY SILT, VERY DARK GRAY, TRACE BROWN, CRUMBLY,	

ENVIRON

2118 N. Tyler Road, Wichita, Kansas 67212

Site ID: DP-39
Project Name: **Whirlpool Corporation**
Project Number: **3433233A**

Elevation (ft)	Depth (ft)	Recovery (feet)	Sample No.	PID (ppm)	Graphic Log	USCS Code	Material Description	Water Level
							SLIGHTLY PLASTIC, SLIGHTLY MOIST SHALE, VERY DARK GRAY, CRUMBLY, LAMINATED, STIFF, DRY	
440								
	35							
435								
	40							
430								
	45							
425								
	50							
420								
	55							
415								
	60							
410								
	65							
405								

Report: WELL_LOG_REV_MKE; File: WHIRLPOOL_LOGS.GPJ; 8/28/14

ENVIRON

7500 College Blvd, Overland Park, Kansas 66210

Site ID: DP-58		Date(s): **8/25/2014**	
Location: **Fort Smith, Arkansas**			
Logged By: **N. Zurweller**		Checked By: **K. Stonestreet**	
Contractor: **McCray Drilling**		Purpose: **Soil Boring**	
Drilling Method: **Direct Push**		GS Elevation: **455.1 amsl**	TOC Elevation: **Not Measured**
Sampling Method: **Continuous Sampler**		North: **370284.74**	East: **592319.29**
		Borehole Dia.: **2.25 inches**	Total Depth: **13.0 feet**
		Project Number: **3434446A**	
		Project Name: **Whirlpool Corporation**	
		Remarks:	

Elevation (ft)	Depth (ft)	Recovery (feet)	Sample No.	PID (ppm)	Graphic Log	USCS Code	Material Description	Water Level
		2	DP-58(1)	0.8		CL	SILTY FILL, DARK BROWN, SOME ROOT HAIRS, LITTLE GRAVEL AND SAND, SUBROUNDED, UP TO 1/4", FINE GRAIN, MOIST	
		2		0.1			SILTY CLAY, BROWN, WITH GRAVEL, SUBROUNDED, UP TO 1/4", SOME SAND, FINE GRAIN, SOME BLACK NODULES, SLIGHTLY PLASTIC, SLIGHTLY STIFF, DRY	
450	5	2		0.1				
		2	DP-58(8)	0.1			SILTY CLAY, BROWN, WITH GRAVEL, SUBROUNDED, UP TO 1/2", SOME SAND, FINE GRAIN, SOME BLACK NODULES, SLIGHTLY PLASTIC, SLIGHTLY STIFF, SLIGHTLY MOIST	
		2		0.2			SILTY CLAY, BROWN, WITH GRAVEL, SUBROUNDED, UP TO 3/4", LITTLE SAND, MEDIUM TO COARSE GRAIN, SOME BLACK NODULES, SLIGHTLY PLASTIC, SLIGHTLY STIFF, MOIST	
445	10						SILTY CLAY, BROWN, PLASTIC, VERY STIFF, SLIGHTLY MOIST	
		2		0.1			SILTY CLAY, BROWN, SOME DARK BROWN, LITTLE WEATHERED SHALE, PLASTIC, VERY STIFF, DRY	
		1		0			SHALE, VERY DARK GRAY, CRUMBLY, LAMINATED, SLIGHTLY STIFF, DRY	
440	15							
435	20							
430	25							

APPENDIX D
Supplemental Soil Vapor Tables

Table 4: Evaluation of VOCs in Soil Vapor
Whirlpool, Fort Smith, Arkansas

Chem Group	Chemical	CASRN	Off-Site			
			VP-1D		MW-71	
			Soil Vapor		Groundwater	
			Risk	HQ	Risk	HQ
VOC	1,2-Dichloroethane	107-06-2	7.4E-08	9.5E-04		
VOC	1,1-Dichloroethene	75-35-4				1.8E-05
VOC	cis-1,2-Dichloroethene	156-59-2				
VOC	Tetrachloroethene	127-18-4	1.3E-09	3.0E-04		
VOC	Trichloroethene	79-01-6			6.1E-07	1.3E-01
VOC	Vinyl Chloride	75-01-4			6.8E-09	1.0E-05
VOC	Xylenes (total)	1330-20-7				
	Cumulative Risk and HI:		8E-08	1E-03	6E-07	1E-01

Notes:

The risks from the deep soil vapor sample at VP-1D represent hypothetical risks because no shallow soil vapor sample at this location was collected.

No shallow soil vapor sample was collected at VP-1S because the screen, which is 7 ft bgs and 4 ft above the deeper port, was saturated.

No soil vapor sample was collected at either VP-2S or VP-2D because both screens, 5 ft bgs and 10 ft bgs, respectively, were saturated.

Only VOCs detected in the 2nd Quarter 2014 samples at MW-71 and VP-1D are shown.

Risk and HQ estimates were not calculated for detected chemicals with inadequate toxicity or physical/chemical parameters or where chemical concentrations were non-detect.

Risk estimates for soil vapor data were calculated using USEPA's default attenuation factor for subslab gas to indoor air of 0.03, as discussed in Section 6.8.2 of the April 2013 Revised Risk Management Plan.

Risk estimates based on groundwater data were calculated using the model derived by Johnson & Ettinger (1991), as discussed in Section 3.3.1 of the April 2013 Revised Risk Management Plan.

Residential risks were calculated assuming residents could be exposed to soil vapor intrusion into indoor air 24-hours a day, 350 days a year, for 30 years.

Detected concentrations are from samples collected in May 2014.

Appendix C

Risk Calculations and Input Parameters

Contents:

Attachment C.1: Toxicity Values
Whirlpool, Fort Smith, Arkansas

Chem Group	Chemical	CASRN	Cancer Classification			ADAF			URF ($mg/m^3)^{-1}$			RfC (mg/m^3)			
			Group	Ref	Note	Y/N	f_{oral}	f_{inh}	Value	Ref	Notes	Value	UF	Ref	Notes
VOC	Acetone	67-64-1	ID	1		N						3.1E+01	100	129	111
VOC	Benzene	71-43-2	A	1		N			7.8E-03	1	60	3.0E-02	300	1	
VOC	Bromoform	75-25-2	B2	1		N			1.1E-03	1				126	90
VOC	Carbon Disulfide	75-15-0				N						7.0E-01	30	1	
VOC	Chlorobenzene	108-90-7	D	1		N						5.0E-02	1,000	126	
VOC	Chloroform	67-66-3	B2	1		N			2.3E-02	1		5.0E-02	100	117	
VOC	Dibromochloromethane	124-48-1	C	1		N								126	90
VOC	1,2-Dichloroethane	107-06-2	B2	1		N			2.6E-02	1		7.0E-03	3,000	126	
VOC	1,1-Dichloroethene	75-35-4	C	1		N						2.0E-01	30	1	
VOC	cis-1,2-Dichloroethene	156-59-2	ID	1		N								1	90
VOC	trans-1,2-Dichloroethene	156-60-5	ID	1		N								1	90
VOC	Methylene Chloride	75-09-2	LC	1		Y	1	1	1.0E-05	1	159	6.0E-01	30	1	
VOC	Tetrachloroethene	127-18-4	LC	1		N			2.6E-04	1		4.0E-02	1,000	1	
VOC	Toluene	108-88-3	ID	1		N						5.0E+00	10	1	
VOC	1,1,1-Trichloroethane	71-55-6	ID	1		N						5.0E+00	100	1	
VOC	Trichloroethene	79-01-6	HC	1		Y	0.202	0.244	4.1E-03	1	159	2.0E-03	100	1	
VOC	Vinyl Chloride	75-01-4	A	1		N			4.4E-03	1	79	1.0E-01	30	1	

References

Toxicity values were selected following the hierarchy of sources defined by USEPA (Human Health Toxicity Values in Superfund Risk Assessment, 2003), as discussed in Appendix A, Section 4 of the ADEQ-approved Revised Risk Management Plan, which was used as the basis for the ADEQ Remedial Action Decision. Values are current as of March 5, 2014.

1 USEPA. Integrated Risk Information System (IRIS). On-line database.

117 USEPA. NCEA. 2003. Risk Assessment Issue Paper for: Derivation of Provisional Subchronic and Chronic RfCs for Chloroform [CASRN 67-66-3]. January 23.

126 Provisional Peer Reviewed Toxicity Values for Superfund (PPRTV) Database.

129 ATSDR. 2013. Minimal Risk Levels. March.

Notes:

60 IRIS provides a range of 2.2E-6 to 7.8E-6 (ug/m3)-1 as the inhalation URF for Benzene.

79 For evaluating partial lifetime exposures that include early-life exposure, the unit risk factor is also used in risk calculations that do not prorate the early-life exposure, per USEPA's May 2000 Toxicological Review.

90 Inadequate data exist to derive a toxicity value, according to the indicated reference.

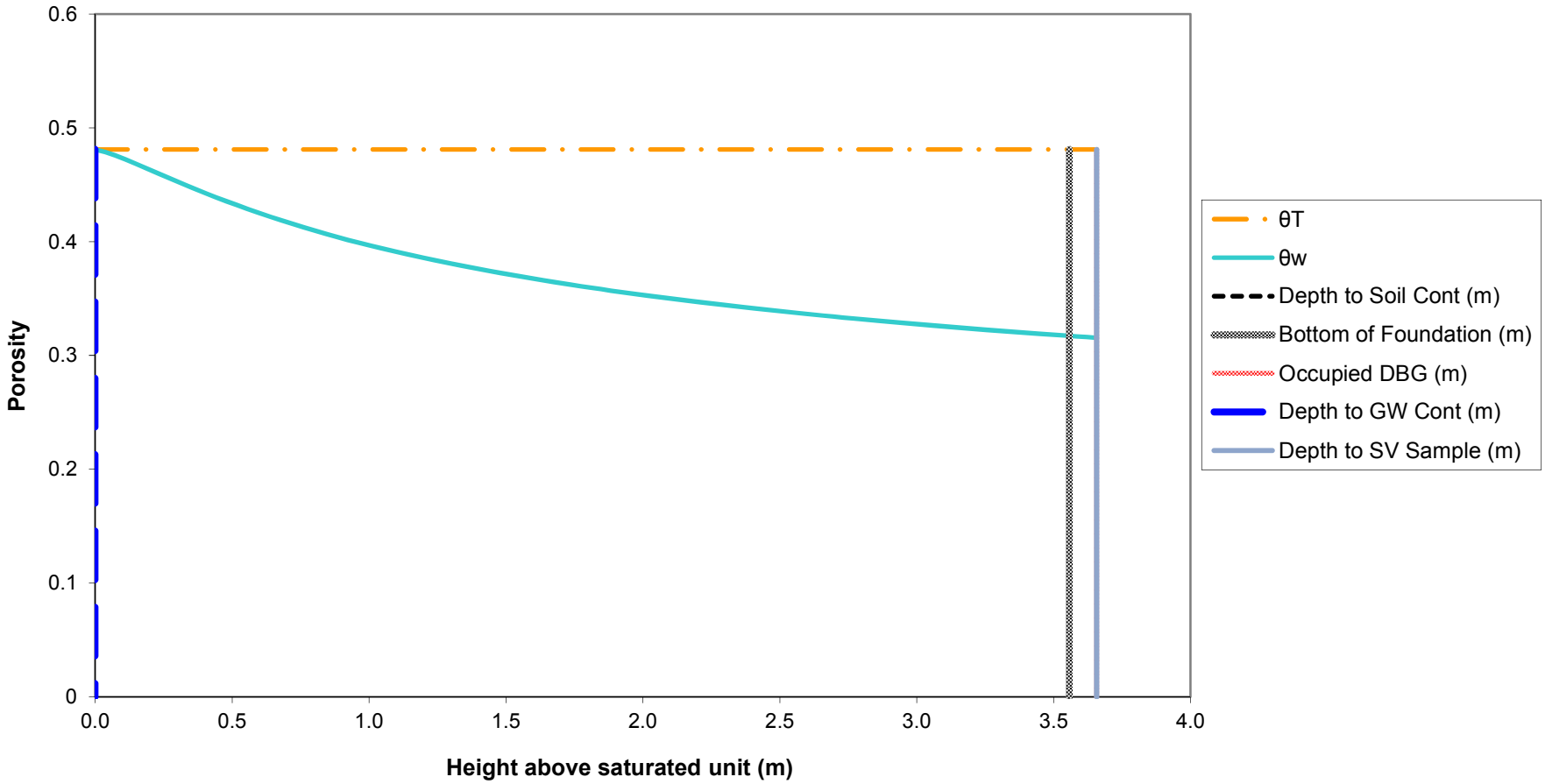
111 Value as published is an MRL in the indicated reference.

159 Because the chemical has a mutagenic mode of action according to USEPA, the SF and URF are adjusted by the following age-dependent adjustment factors (ADAFs) before use: 10 for ages 0 to 2; 3 for ages 2 to 16; and 1 for ages 16 and older (USEPA 2005).

Attachment C.2: Physical and Chemical Properties
Whirlpool, Fort Smith, Arkansas

Chem Group	Chemical	CASRN	H (unitless)			D_{air} (m^2/d)		D_{water} (m^2/d)		HENRY Ref Temp (°C)
			Value	Adjusted	Ref	Value	Ref	Value	Ref	Value
VOC	Acetone	67-64-1	1.6E-03	1.1E-03	44	1.1E+00	44	9.8E-05	44	2.5E+01
VOC	Benzene	71-43-2	2.3E-01	1.6E-01	44	7.6E-01	44	8.5E-05	44	2.5E+01
VOC	Bromoform	75-25-2	2.2E-02	1.3E-02	44	1.3E-01	44	8.9E-05	44	2.5E+01
VOC	Carbon Disulfide	75-15-0	1.2E+00	9.3E-01	44	9.0E-01	44	8.6E-05	44	2.5E+01
VOC	Chlorobenzene	108-90-7	1.5E-01	9.8E-02	44	6.3E-01	44	7.5E-05	44	2.5E+01
VOC	Chloroform	67-66-3	1.5E-01	1.1E-01	44	9.0E-01	44	8.6E-05	44	2.5E+01
VOC	Dibromochloromethane	124-48-1	3.2E-02	2.4E-02	44	1.7E-01	44	9.1E-05	44	2.5E+01
VOC	1,2-Dichloroethane	107-06-2	4.0E-02	2.7E-02	44	9.0E-01	44	8.6E-05	44	2.5E+01
VOC	1,1-Dichloroethene	75-35-4	1.1E+00	8.1E-01	44	7.8E-01	44	9.0E-05	44	2.5E+01
VOC	cis-1,2-Dichloroethene	156-59-2	1.7E-01	1.2E-01	44	6.4E-01	44	9.8E-05	44	2.5E+01
VOC	trans-1,2-Dichloroethene	156-60-5	3.9E-01	2.8E-01	44	6.1E-01	44	1.0E-04	44	2.5E+01
VOC	Methylene Chloride	75-09-2	9.0E-02	6.6E-02	44	8.7E-01	44	1.0E-04	44	2.5E+01
VOC	Tetrachloroethene	127-18-4	7.5E-01	4.9E-01	44	6.2E-01	44	7.1E-05	44	2.5E+01
VOC	Toluene	108-88-3	2.7E-01	1.8E-01	44	7.5E-01	44	7.4E-05	44	2.5E+01
VOC	1,1,1-Trichloroethane	71-55-6	7.1E-01	5.0E-01	44	6.7E-01	44	7.6E-05	44	2.5E+01
VOC	Trichloroethene	79-01-6	4.2E-01	2.9E-01	44	6.8E-01	44	7.9E-05	44	2.5E+01
VOC	Vinyl Chloride	75-01-4	1.1E+00	9.0E-01	44	9.2E-01	44	1.1E-04	71	2.5E+01
References:										
	Physical and chemical parameters were selected following the hierarchy of sources used by USEPA (Soil Screening Guidance: Technical Background Document, 1996), as discussed in Appendix A, Section 54 of the ADEQ-approved Revised Risk Management Plan, which was used as the basis for the ADEQ Remedial Action Decision.									
44	USEPA. 1996. Soil Screening Guidance: Technical Background Document and User Guide. Office of Emergency and Remedial Response. EPA/540/R-95/128. May.									
71	USEPA. 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. Office of Solid Waste and Emergency Response. OSWER 9355.4-24. December.									

Appendix C.3: Soil Moisture Profile for Residential Building (Slab on Grade)
Whirlpool, Fort Smith, Arkansas



Notes:
The soil-water profile in the vadose zone is estimated using the van Genuchten soil-water retention equation with default water retention parameters appropriate for silt clay, as discussed in Appendix A, Section 3.3.1 of the ADEQ-approved Revised Risk Management Plan, which was used as the basis for the ADEQ Remedial Action Decision.

Attachment C.4: Normalized Indoor Air Concentration in a Residential Building (Slab on Grade) due to Vapor Intrusion from Groundwater
Whirlpool, Fort Smith, Arkansas

Chem Group	Chemical	CASRN	D_{air} (m^2/day)	D_{water} (m^2/day)	H (unitless)	D_{crack} (m^2/day)	D_{eff}^T (m^2/day)	α_{soil}	α_{slab}	α_{∞}	C_{bldg} (L-water/m^3)
VOC	Acetone	67-64-1	1.07E+00	9.85E-05	1.14E-03	1.72E-01	1.87E-02	6.80E-02	2.73E-03	1.86E-04	2.12E-04
VOC	Benzene	71-43-2	7.60E-01	8.47E-05	1.59E-01	1.22E-01	8.15E-04	3.17E-03	2.73E-03	8.67E-06	1.38E-03
VOC	Bromoform	75-25-2	1.29E-01	8.90E-05	1.34E-02	2.07E-02	1.64E-03	6.37E-03	2.73E-03	1.74E-05	2.33E-04
VOC	Carbon Disulfide	75-15-0	8.99E-01	8.64E-05	9.26E-01	1.44E-01	2.93E-04	1.14E-03	2.73E-03	3.12E-06	2.89E-03
VOC	Chlorobenzene	108-90-7	6.31E-01	7.52E-05	9.77E-02	1.01E-01	9.32E-04	3.63E-03	2.73E-03	9.91E-06	9.68E-04
VOC	Chloroform	67-66-3	8.99E-01	8.64E-05	1.07E-01	1.44E-01	1.11E-03	4.32E-03	2.73E-03	1.18E-05	1.27E-03
VOC	Dibromochloromethane	124-48-1	1.69E-01	9.07E-05	2.38E-02	2.72E-02	1.27E-03	4.94E-03	2.73E-03	1.35E-05	3.21E-04
VOC	1,2-Dichloroethane	107-06-2	8.99E-01	8.55E-05	2.74E-02	1.44E-01	2.37E-03	9.19E-03	2.73E-03	2.51E-05	6.88E-04
VOC	1,1-Dichloroethene	75-35-4	7.78E-01	8.99E-05	8.10E-01	1.25E-01	3.12E-04	1.22E-03	2.73E-03	3.32E-06	2.69E-03
VOC	cis-1,2-Dichloroethene	156-59-2	6.36E-01	9.76E-05	1.19E-01	1.02E-01	9.72E-04	3.78E-03	2.73E-03	1.03E-05	1.22E-03
VOC	trans-1,2-Dichloroethene	156-60-5	6.11E-01	1.03E-04	2.81E-01	9.81E-02	5.96E-04	2.32E-03	2.73E-03	6.35E-06	1.79E-03
VOC	Methylene Chloride	75-09-2	8.73E-01	1.01E-04	6.60E-02	1.40E-01	1.58E-03	6.14E-03	2.73E-03	1.68E-05	1.11E-03
VOC	Tetrachloroethene	127-18-4	6.22E-01	7.08E-05	4.90E-01	9.99E-02	3.40E-04	1.33E-03	2.73E-03	3.63E-06	1.78E-03
VOC	Toluene	108-88-3	7.52E-01	7.43E-05	1.80E-01	1.21E-01	6.97E-04	2.71E-03	2.73E-03	7.41E-06	1.34E-03
VOC	1,1,1-Trichloroethane	71-55-6	6.74E-01	7.60E-05	4.97E-01	1.08E-01	3.64E-04	1.42E-03	2.73E-03	3.87E-06	1.92E-03
VOC	Trichloroethene	79-01-6	6.83E-01	7.86E-05	2.88E-01	1.10E-01	5.23E-04	2.04E-03	2.73E-03	5.57E-06	1.60E-03
VOC	Vinyl Chloride	75-01-4	9.16E-01	1.06E-04	9.00E-01	1.47E-01	3.44E-04	1.34E-03	2.73E-03	3.66E-06	3.30E-03
Notes:	**Crack Soil and Building Characteristics**			**Crack Soil**							
	SCS Soil texture class			Sand							
	Bulk density	kg/L	ρ_b	1.66							
	Total porosity	L/L-soil	θ_T	0.375							
	Water-filled porosity	L/L-soil	θ_w	0.054							
	Air-filled porosity	L/L-soil	θ_a	0.321							
	Residual saturation	L/L-soil	θ_r	0.053							
	Hydraulic conductivity	cm/s	**K**	7.4E-03							
	Dynamic viscosity of water	g/cm-s	μ_w	0.01307							
	Density of water	g/cm^3	ρ_w	1.0							
	Gravitational acceleration	cm/s^2	**g**	980.7							
	Intrinsic permeability	cm^2	**k**	9.9E-08							
	Relative saturation	unitless	S_e	0.004							
	van Genuchten N	unitless	**N**	3.177							
	van Genuchten M	unitless	**M**	0.685							
	Relative air permeability	unitless	k_{rg}	0.998							
	Permeability to vapor	cm^2	k_v	9.89E-08							
	Distance from building foundation to source	m	$L_{T\text{-}gw}$	3.56							
	Bldg foundation thickness	m	L_{crack}	0.1							
	Bldg foundation length	m		10.00							
	Bldg foundation width	m		10.00							
	Bldg occupied height	m		2.44							
	Bldg occupied volume	m^3		244.00							
	Occupied depth below ground	m		0.0							
	Bldg area for vapor intrusion	m^2	A_B	100.0							
	Ratio of A_{crack} to A_B		η	4E-04							
	Area of cracks	m^2	A_{crack}	4E-02							
	Air exchange rate	$hour^{-1}$	**ach**	0.45							
	Building ventilation rate	m^3/day	Q_{bldg}	2.64E+03							
	Pressure difference between outdoors-indoors	$kg/m\text{-}s^2$	ΔP	1.0							
	Viscosity of air	kg/m-s	μ_a	1.8E-05							
	Crack length (bldg perimeter)	m	X_{crack}	40							
	Crack depth below ground	m	Z_{crack}	0.10							
	Crack radius	m	r_{crack}	1E-03							
	Soil gas flow rate into bldg	m^3/day	Q_{soil}	7.20							
	Indoor air concentrations resulting from groundwater vapor intrusion into a building are estimated using the relationships described by Johnson and Ettinger (Heuristic model for predicting the intrusion rate of contaminant vapors into buildings, 1991), which USEPA recommends for screening level calculations, as discussed in Appendix A, Section 3.3.1 of the ADEQ-approved Revised Risk Management Plan, which was used as the basis for the ADEQ Remedial Action Decision.										
	The effective diffusion term DeffT is calculated based on a silty clay soil, as discussed in Appendix A, Section 3.3.1 of the ADEQ-approved Revised Risk Management Program.										

Attachment C.5: Cancer Risk and Hazard Index Calculations for Vapor Intrusion into a Residential Building (Slab on Grade) from Groundwater In Off-Site Wells Whirlpool, Fort Smith, Arkansas

							Cancer				Noncancer	
Chem Group	**Chemical**	**CASRN**	**Carc Class**	**ADAF**	**C_{gw}** (mg/L)	**C_{air}** (mg/m^3)	**URF** (m^3/mg)	**f_{inh}**	**Risk**		**RfC** (mg/m^3)	**HQ**
VOC	Acetone	67-64-1	ID	N	7.00E-03	1.48E-06					3.1E+01	4.6E-08
VOC	Benzene	71-43-2	A	N	1.20E-04	1.65E-07	7.8E-03		5.3E-10		3.0E-02	5.3E-06
VOC	Bromoform	75-25-2	B2	N	2.53E-02	5.88E-06	1.1E-03		2.7E-09			
VOC	Carbon Disulfide	75-15-0		N	2.60E-04	7.51E-07					7.0E-01	1.0E-06
VOC	Chlorobenzene	108-90-7	D	N	2.40E-04	2.32E-07					5.0E-02	4.5E-06
VOC	Chloroform	67-66-3	B2	N	2.60E-04	3.30E-07	2.3E-02		3.1E-09		5.0E-02	6.3E-06
VOC	Dibromochloromethane	124-48-1	C	N	9.30E-04	2.99E-07						
VOC	1,1-Dichloroethene	75-35-4	C	N	1.90E-03	5.11E-06					2.0E-01	2.5E-05
VOC	cis-1,2-Dichloroethene	156-59-2	ID	N	1.80E-02	2.20E-05						
VOC	trans-1,2-Dichloroethene	156-60-5	ID	N	8.70E-04	1.55E-06						
VOC	Methylene Chloride	75-09-2	LC	Y	2.90E-04	3.21E-07	1.0E-05	1	3.3E-12		6.0E-01	5.1E-07
VOC	Tetrachloroethene	127-18-4	LC	N	1.40E-04	2.49E-07	2.6E-04		2.7E-11		4.0E-02	6.0E-06
VOC	Toluene	108-88-3	ID	N	1.10E-03	1.47E-06					5.0E+00	2.8E-07
VOC	1,1,1-Trichloroethane	71-55-6	ID	N	3.10E-04	5.97E-07					5.0E+00	1.1E-07
VOC	Trichloroethene	79-01-6	HC	Y	5.18E-01	8.31E-04	4.1E-03	0.244	1.9E-06		2.0E-03	4.0E-01
VOC	Vinyl Chloride	75-01-4	A	N	7.60E-04	2.51E-06	4.4E-03		1.6E-08		1.0E-01	2.4E-05
							Cumulative Risk:		2E-06		**HI:**	4E-01

Note:

f_{inh} is the fraction of the inhalation toxicity value that USEPA identified as having a mutagenic mode of action.

Only VOCs detected in the 2nd Quarter 2014 off-site groundwater samples are shown.

Residential risks were calculated assuming residents could be exposed to soil vapor intrusion into indoor air for 24 hours per day and 350 days per year for 30 years.

Attachment C.6: Cancer Risk and Hazard Index Calculations for Vapor Intrusion into a Residential Building (Slab on Grade) from Groundwater at MW-71 Whirlpool, Fort Smith, Arkansas

							Cancer				Noncancer	
Chem Group	**Chemical**	**CASRN**	**Carc Class**	**ADAF**	**C_{gw}** (mg/L)	**C_{air}** (mg/m^3)	**URF** (m^3/mg)	**f_{inh}**	**Risk**		**RfC** (mg/m^3)	**HQ**
VOC	1,1-Dichloroethene	75-35-4	C	N	1.40E-03	3.77E-06					2.0E-01	1.8E-05
VOC	cis-1,2-Dichloroethene	156-59-2	ID	N	5.30E-03	6.49E-06						
VOC	Trichloroethene	79-01-6	HC	Y	1.64E-01	2.63E-04	4.1E-03	0.244	6.1E-07		2.0E-03	1.3E-01
VOC	Vinyl Chloride	75-01-4	A	N	3.30E-04	1.09E-06	4.4E-03		6.8E-09		1.0E-01	1.0E-05
							Cumulative Risk:		6E-07		**HI:**	1E-01
Note:												
f_{inh} is the fraction of the inhalation toxicity value that USEPA identified as having a mutagenic mode of action.												
Only VOCs detected in the 2nd Quarter 2014 groundwater sample at MW-71 are shown.												
Residential risks were calculated assuming residents could be exposed to soil vapor intrusion into indoor air for 24 hours per day and 350 days per year for 30 years.												

Attachment C.7: Cancer Risk and Hazard Index Calculations for Intrusion into a Residential Building (Slab on Grade) from Soil Vapor
Whirlpool, Fort Smith, Arkansas

							Cancer			Noncancer	
Chem Group	**Chemical**	**CASRN**	**Carc Class**	**ADAF**	**C_{sv}** (mg/m^3)	**C_{air}** (mg/m^3)	**URF** (m^3/mg)	**Risk**		**RfC** (mg/m^3)	**HQ**
VOC	1,2-Dichloroethane	107-06-2	B2	N	2.30E-04	6.90E-06	2.6E-02	7.4E-08		7.0E-03	9.5E-04
VOC	Tetrachloroethene	127-18-4	LC	N	4.20E-04	1.26E-05	2.6E-04	1.3E-09		4.0E-02	3.0E-04
						Cumulative Risk:		8E-08		**HI:**	1E-03
Note:											
Only VOCs detected in the 2nd Quarter 2014 soil vapor sample at VP-1D are shown.											

Residential risks were calculated assuming residents could be exposed to soil vapor intrusion into indoor air for 24 hours per day and 350 days per year for 30 years.

Indoor air concentrations due to intrusion of soil vapor were calculated using USEPA's 95th percentile subslab soil gas attenuaion factor of 0.03 (EPA's Vapor Intrusion Database: Evaluation and Characterization of Attenuation Factors for Chlorinated Volatile Organic Compounds and Residential Buildings, 2012), as discussed in Appendix A, Section 6.8.2 of the ADEQ-approved Revised Risk Management Plan, which was used as the basis for the ADEQ Remedial Action Decision.