

# TCE REMEDIATION PLAN UPDATE

*Fort Smith City Directors Study Session  
Tuesday, October 8, 2013*

Representatives from Whirlpool Corporation and ENVIRON International made a presentation to the City of Fort Smith City Directors study session on October 8, 2013 at 6 PM CDT at the Fort Smith Senior Center, 2700 Cavanaugh Road, Fort Smith, Arkansas.

This document contains the slides used during that presentation, accompanied with notes that explain the illustrations on each slide. This document is not, and is not intended to be, a transcript or recreation of the oral presentation to the City Director's study session.



**Jeff Noel**  
Vice President  
Whirlpool Corporation

*Founded in 1982*

*1,500 employees with offices in  
18 countries around the world*

*A leader resolving the most demanding  
environmental and human health issues*

**Greg Gillespie**  
Principal Consultant, ENVIRON  
Project Lead

**Tamara House-Knight, PhD**  
Manager, ENVIRON  
Toxicologist

**Steve McGinnis, MEng, PE**  
Senior Manager, ENVIRON  
Licensed AR Engineer

**Kerry Stonestreet, PG**  
Manager, ENVIRON  
Licensed AR Geologist

The presenters at the October 8, 2013 City Directors study session included Jeff Noel from Whirlpool and representatives from ENVIRON.

ENVIRON is the environmental consultant retained by Whirlpool to conduct the remediation effort.

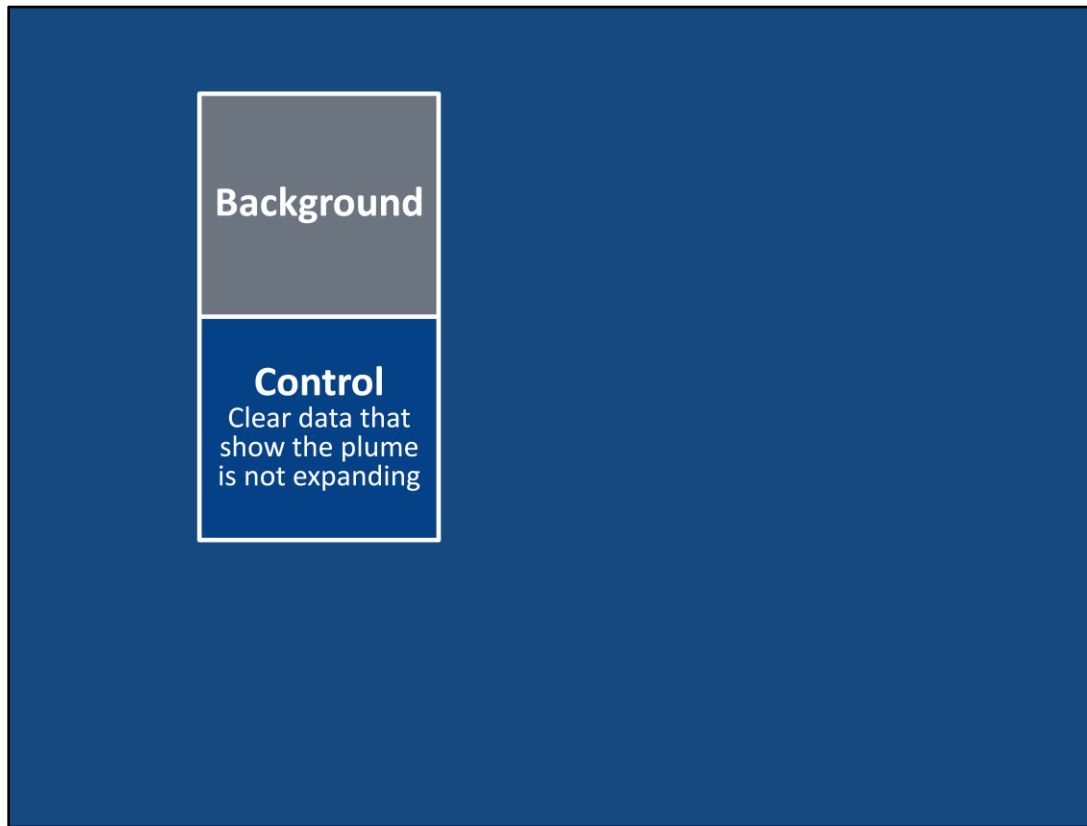


## Background

### Introduction: Background

When Whirlpool representatives attended the Fort Smith City Directors meeting on March 27, 2013, the residents and the city directors asked a lot of questions. At the October 8, 2013 City Directors study session, Whirlpool returned to answer as many of those questions as possible. Whirlpool Corporation remains committed to keeping the City Directors up to date on the progress related to this issue.

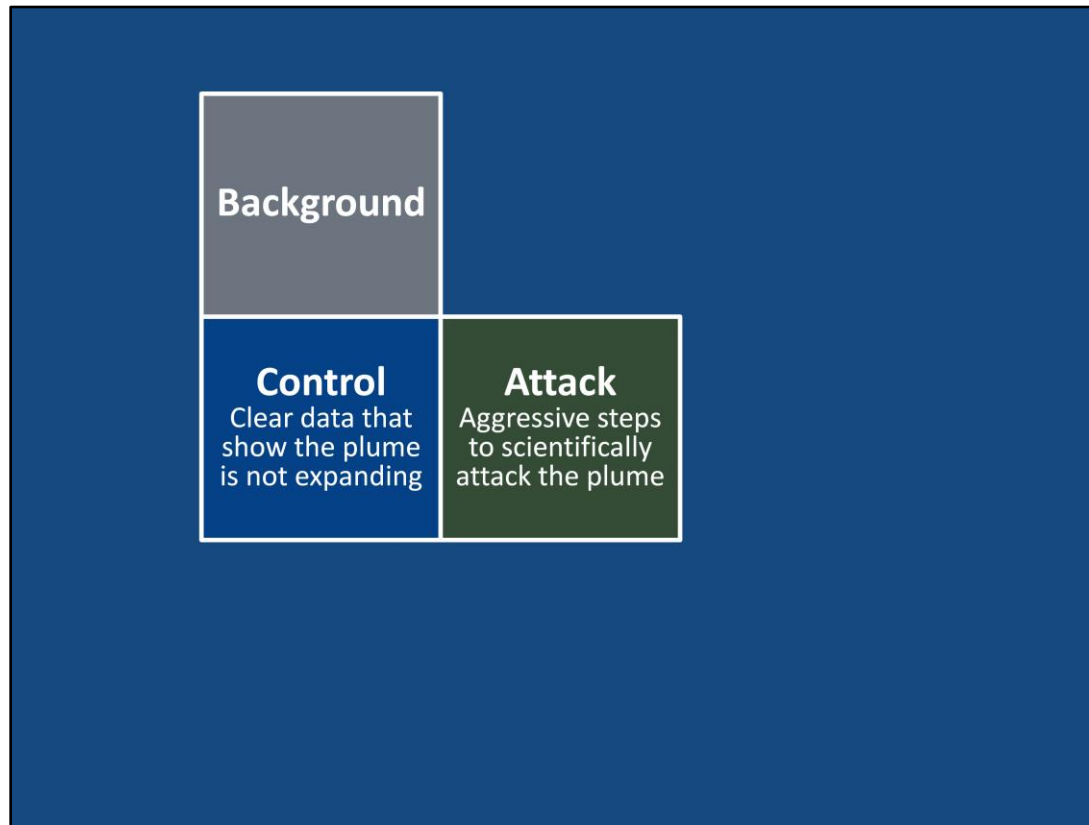
Some Fort Smith residents have raised claims about property values. Because lawsuits have been filed, it would be inappropriate to get into any discussions about the issues raised in the litigation. Whirlpool has committed to treating the residents fairly, and at this time, attorneys for Whirlpool are in discussions with attorneys for the property owners making these claims in an effort to reach a reasonable and appropriate resolution.



#### Introduction: Control

You wanted to know if the TCE plume is staying in the same place and if residents are safe. The answer to both is yes.

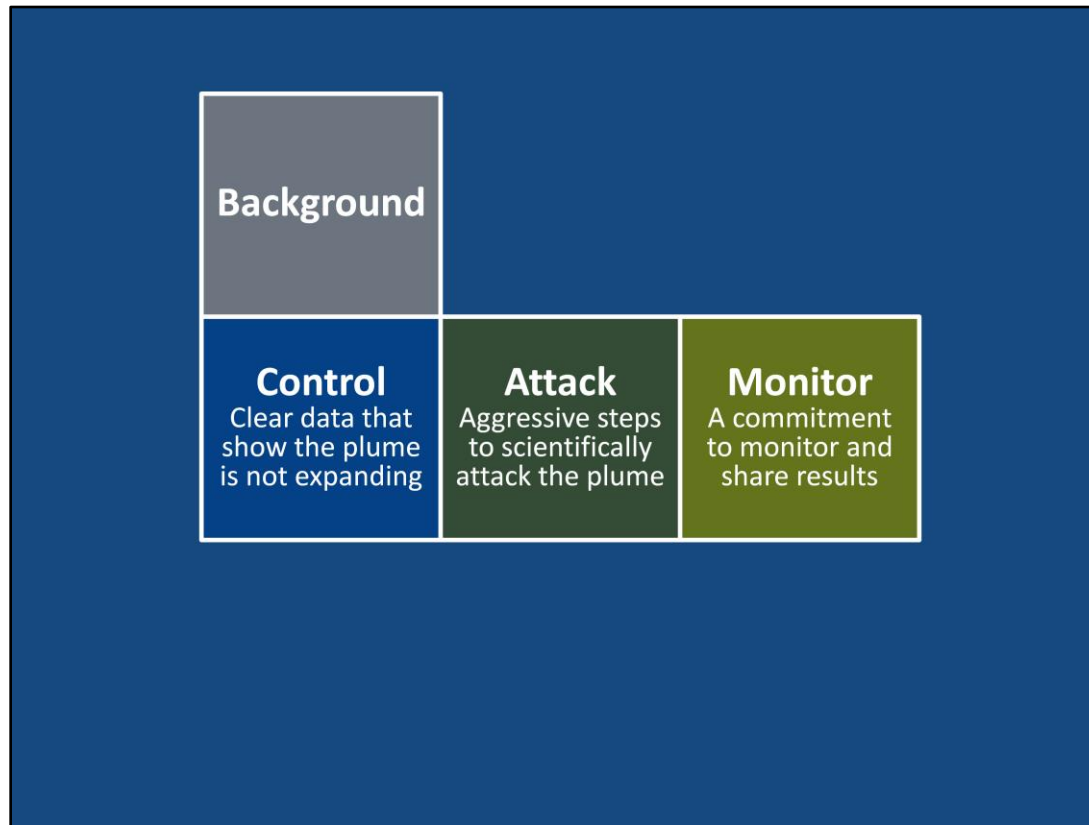
- **The TCE plume is not expanding.**
- **There is no risk of exposure to TCE.**



#### Introduction: Attack

You wanted to know if we had a plan to attack the TCE and remove it from the groundwater.

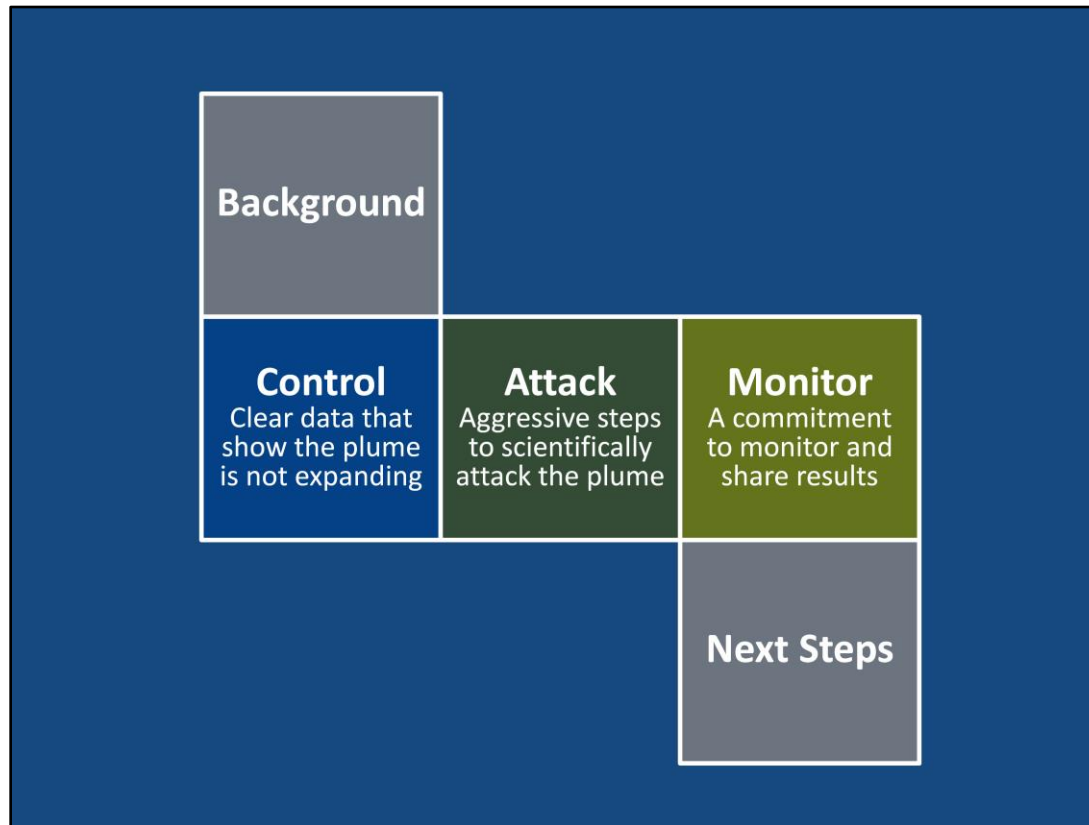
- **The answer is yes.**



#### Introduction: Monitor

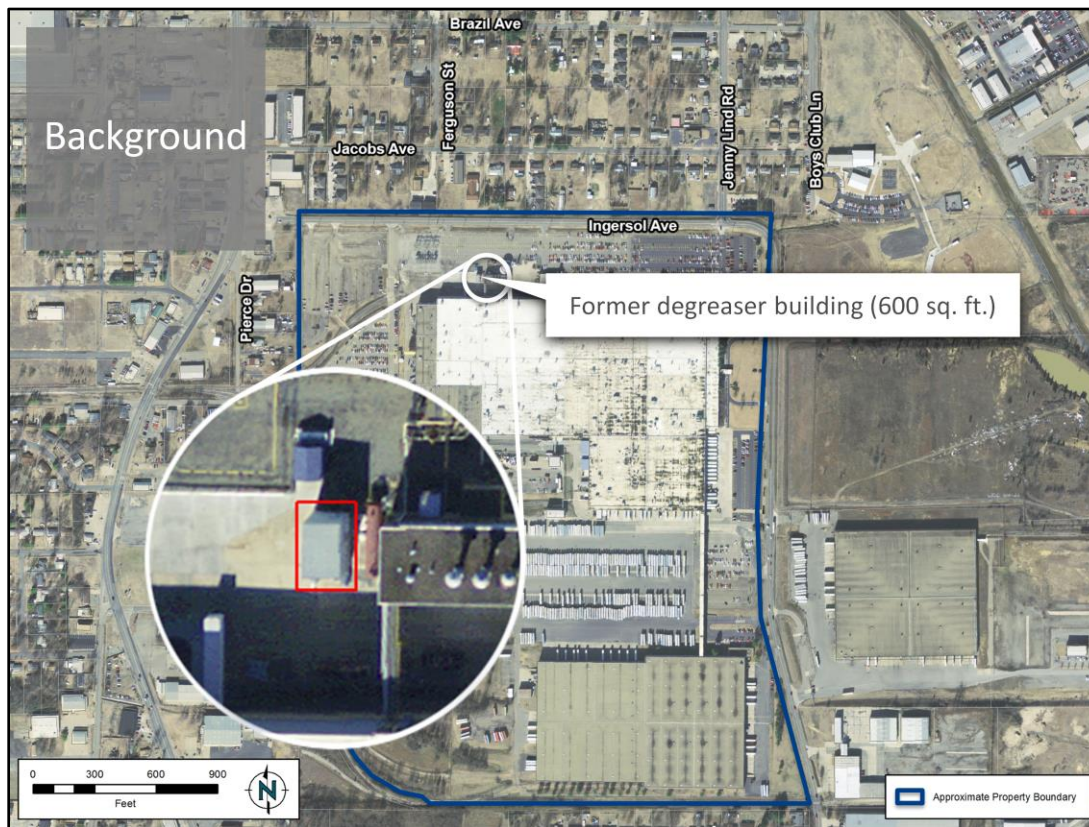
You wanted to know whether Whirlpool would stay until this issue had been fully addressed.

- **The answer is yes. Whirlpool will remain in Ft Smith to be sure the TCE remediation is completed to the satisfaction of ADEQ.**



#### Introduction: Next Steps

Finally, you asked where we are going to go from here, and this presentation will cover that as well.



## Background

The Whirlpool plant in Fort Smith, outlined here by the blue line, operated for more than 60 years.

TCE was used as a degreaser to clean equipment in a small building separate from the main manufacturing facility from approximately 1967 to the 1980s. Use of TCE as a degreaser was a commonplace practice used at many manufacturing plants at the time.

Whirlpool stopped using TCE in the 1980s as better materials became available on the market.

TCE is still widely used in many industrial applications and is present in retail household products today, including some paints, paint removers, adhesives, rug cleaners, metal cleaners and laundry spot removers.



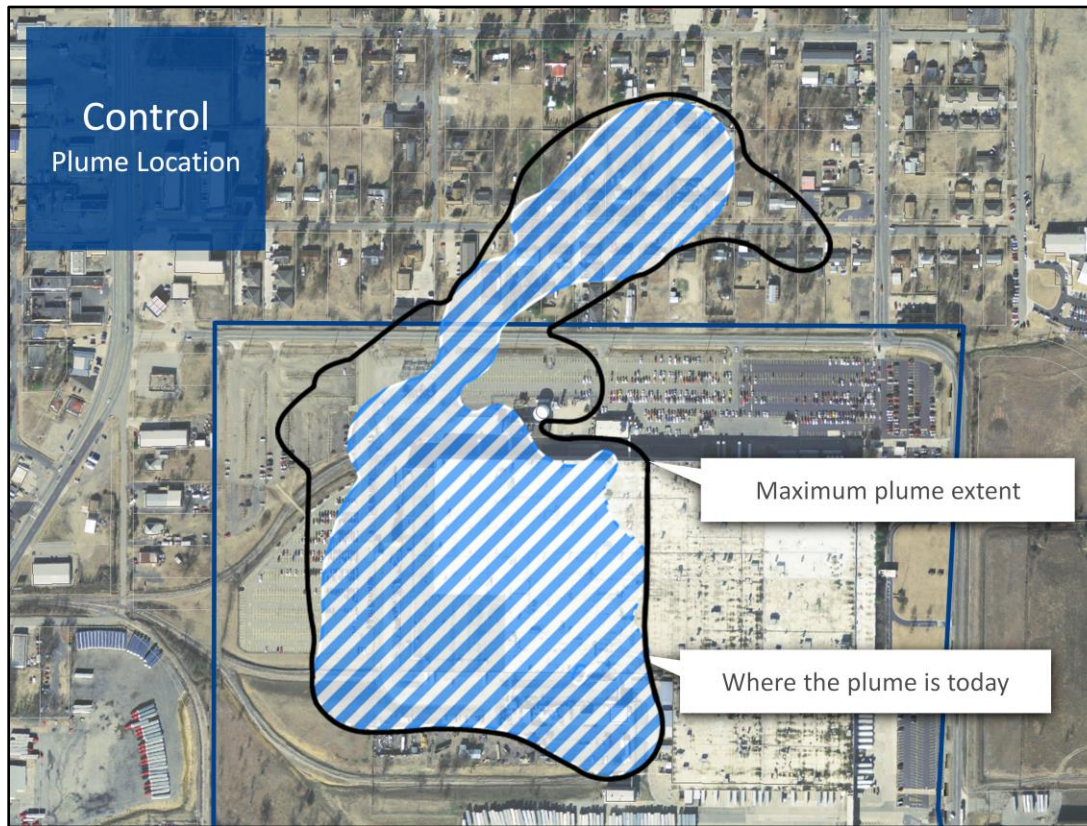


### Control: The Plume Boundary Has Not Expanded (1)

We know where the TCE is, and we know that the outer boundaries of the plume north of Whirlpool's property have not expanded during the last eight years of monitoring.

The black line shows the maximum extent of the TCE in the groundwater over the past eight years of monitoring.

The TCE has not gone beyond this boundary in eight years.



### Control: The Plume Boundary Has Not Expanded (2)

The blue and white striped area in this slide shows the plume's location based on the most recent monitoring presented in the latest Annual Groundwater Monitoring Report submitted to ADEQ dated June 2013.

In some areas, the plume has shrunk from the maximum recorded boundary.





### Control: The Plume Boundary Has Not Expanded (3)

We have monitoring wells around the entire area that show us where the plume is located. All of these wells were “non-detect” in our most recent monitoring. Under ADEQ guidelines, we do regular sampling of these wells to verify the location of the plume and that it is NOT expanding.

Some questions have been raised about the southern boundary of the plume and whether the monitoring network is showing any expansion to the south. ADEQ and Whirlpool are in full agreement that the plume is a long way from the southern and eastern borders of Whirlpool’s property. The monitoring wells in this area have shown fluctuations in concentrations for many years, which is expected, and under ADEQ’s oversight, we are closely monitoring these fluctuations. The monitoring wells south of the known plume boundary, however, continue to register non-detect, thus indicating there is no expansion of the plume boundary on the south.

## Control

No risk  
of exposure

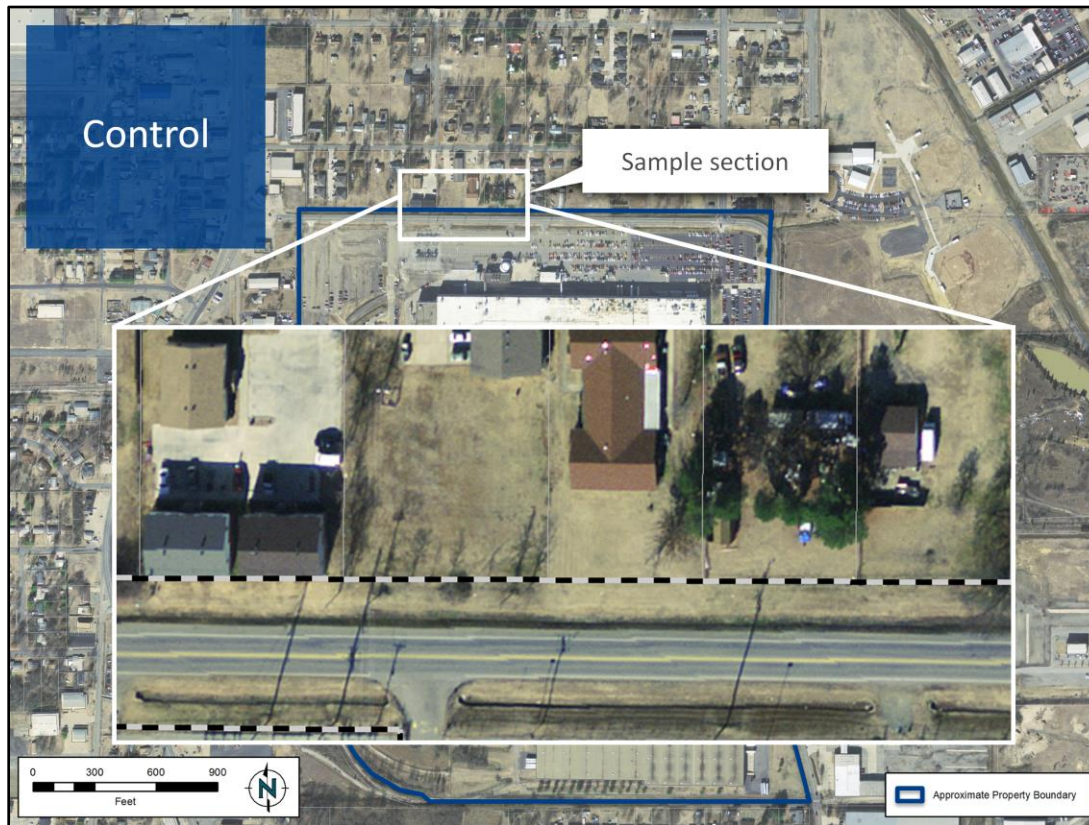


### Control: No Risk of Exposure (1)

ADEQ has stated publicly there is no risk of exposure to the TCE – and therefore no risk to human health.

Why? Because:

- **You can't touch it.**
- **You can't drink it.**
- **You can't breathe it.**

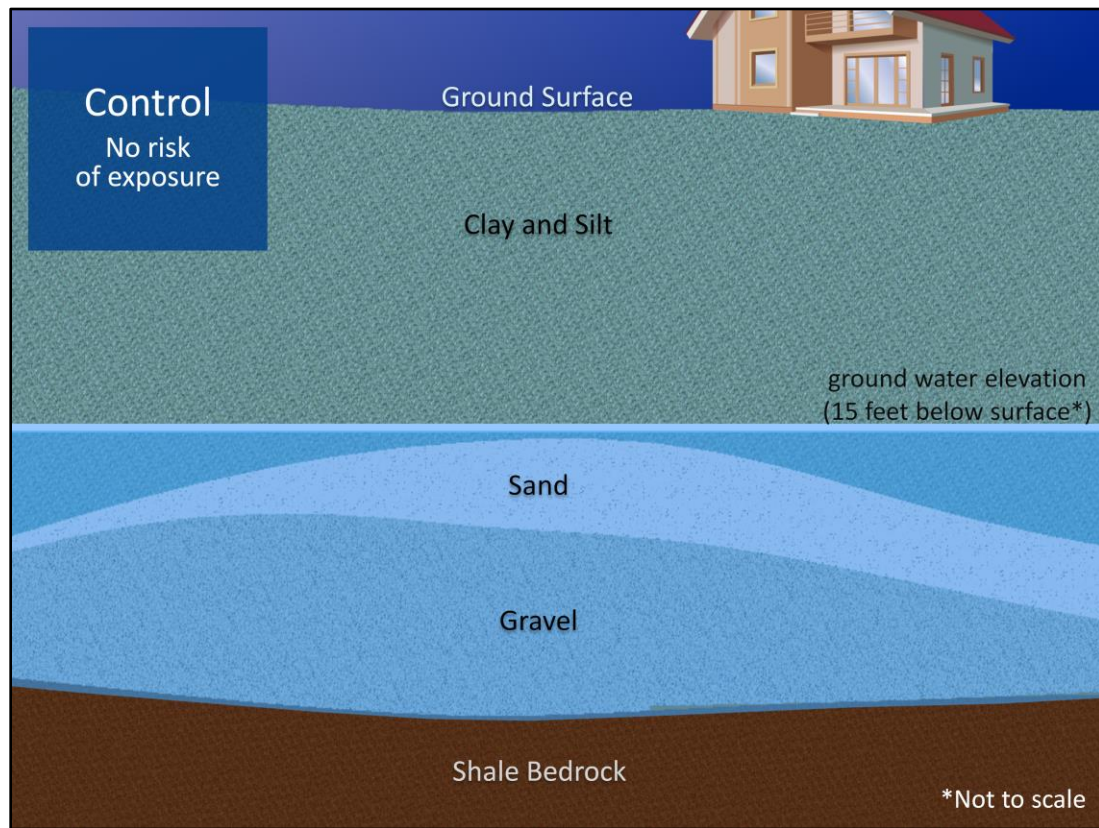


### Control: No Risk of Exposure (2)

We will explore the reasons there is no risk of exposure by focusing on one particular area just to the north of the Whirlpool plant in the neighborhood.

Blown-up in the white box is an aerial view of this area along Ingersoll Road.



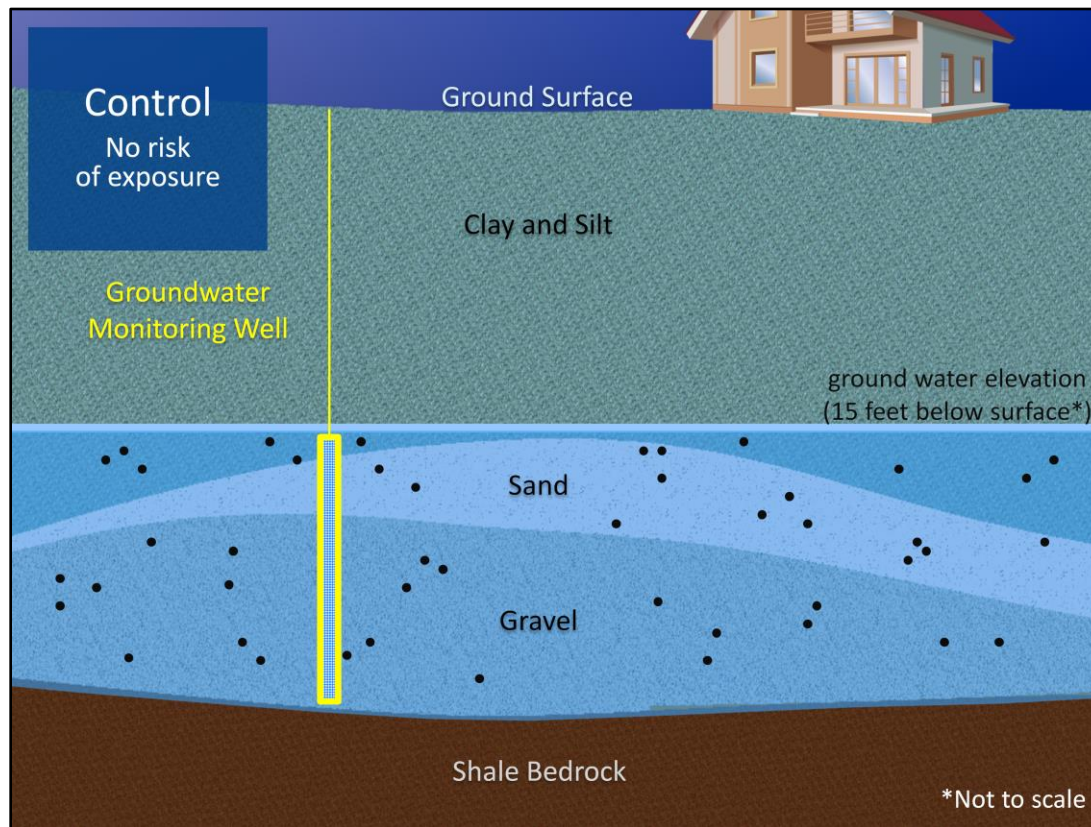


Control: No Risk of Exposure (3)

This slide presents a representation of the ground underneath the area in the white box on the previous slide (slide 13).

Just below the surface is a layer of dense silt and clay then transitions into sand and gravel layers with termination at bedrock.

The silt and clay extends above the ground water, which is generally 15 feet below the surface.

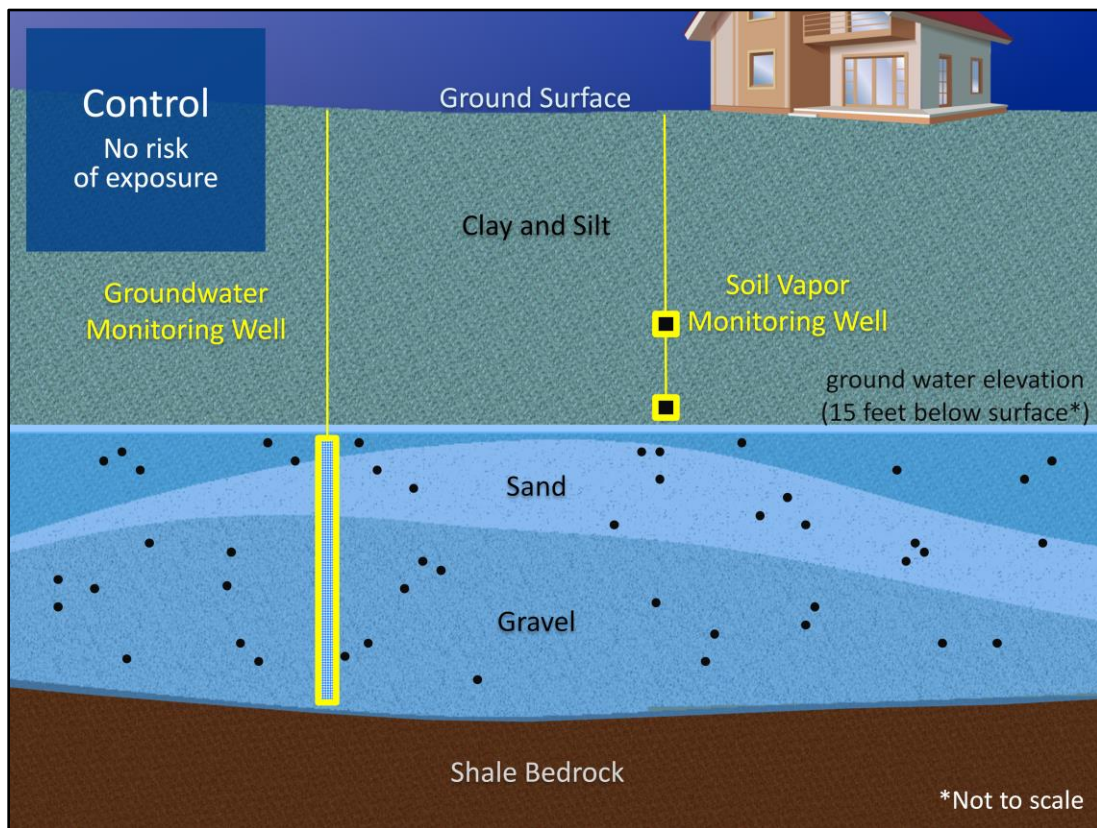


#### Control: No Risk of Exposure (4)

In this visualization, the black dots represent TCE in the groundwater and there is a typical monitoring well. We have groundwater monitoring wells in this area, and a total of over 70 monitoring wells across the entire impact area.

Due to the dense clay and soil between the surface and the groundwater, people are not in contact with groundwater. There are no groundwater wells in this area today and there have not been any since the area was developed.

Whirlpool has committed to ADEQ to work with residents on a long-term solution to ensure that there is no future risk of exposure to the groundwater. Because of the lawsuits that have been filed, this is an issue that will be part of that litigation process.

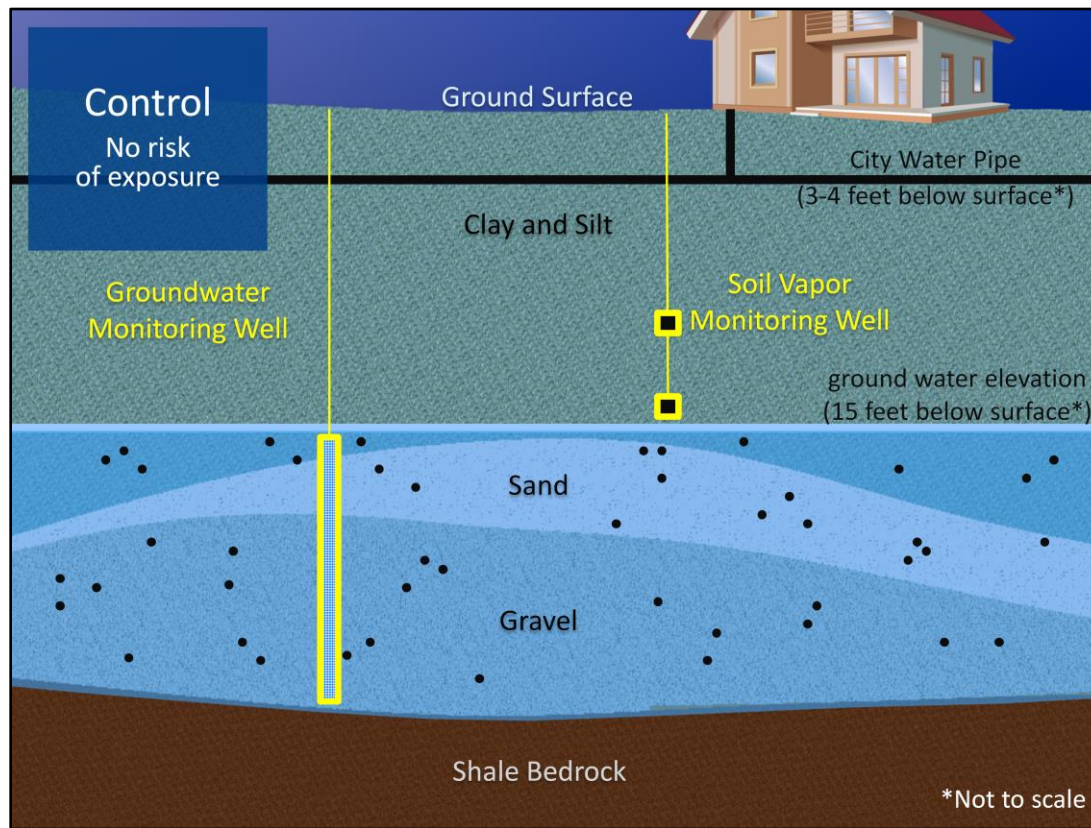


#### Control: No Risk of Exposure (5)

ADEQ has stated there are no unacceptable risks to human health due to vapor intrusion. Because of the nature of the dense clay and silt in the area, TCE **vapors are not being released** through the soil to the surface or into people's homes. Whirlpool installed soil gas monitoring points in July 2012 to confirm that vapors were not getting through the layer of clay and silt. A typical soil gas monitoring well is depicted in this slide. This type of monitoring well takes readings right above the groundwater to detect any vapor coming off the groundwater, and then readings several feet above the groundwater to confirm that vapors are not rising through the silt and clay.

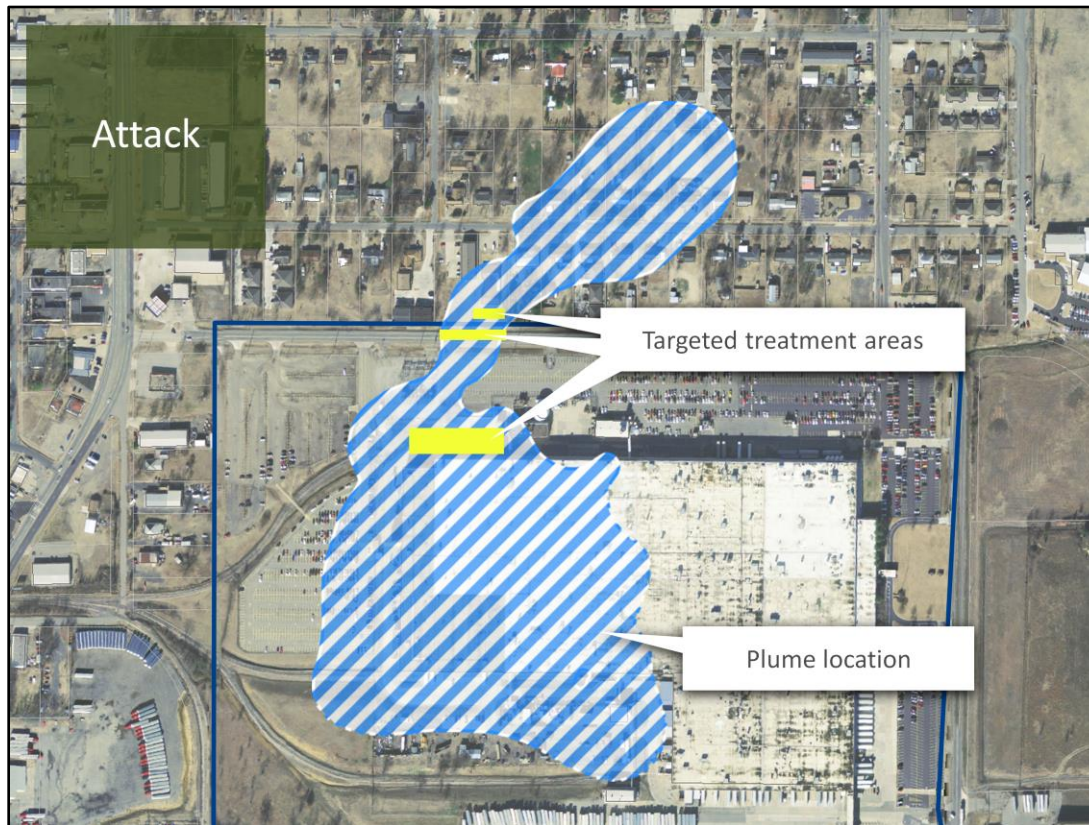
Whirlpool voluntarily committed to expand the soil gas monitoring network and complete quarterly soil gas monitoring, and has received permission from ADEQ to install the additional soil vapor monitoring points prior to the approval of the final RADD. Whirlpool wanted to add even more data to assure residents there is no reason for concern. City of Fort Smith licenses are required to install some soil vapor sampling points, and the appropriate applications will be submitted at a future City Directors meeting. Once completed, the results from these tests will be shared with the City Directors and on WhirlpoolFortSmith.com.





Control: No Risk of Exposure (6)

All homes in this area are connect to and use city water for all water needs – nobody is using this groundwater.



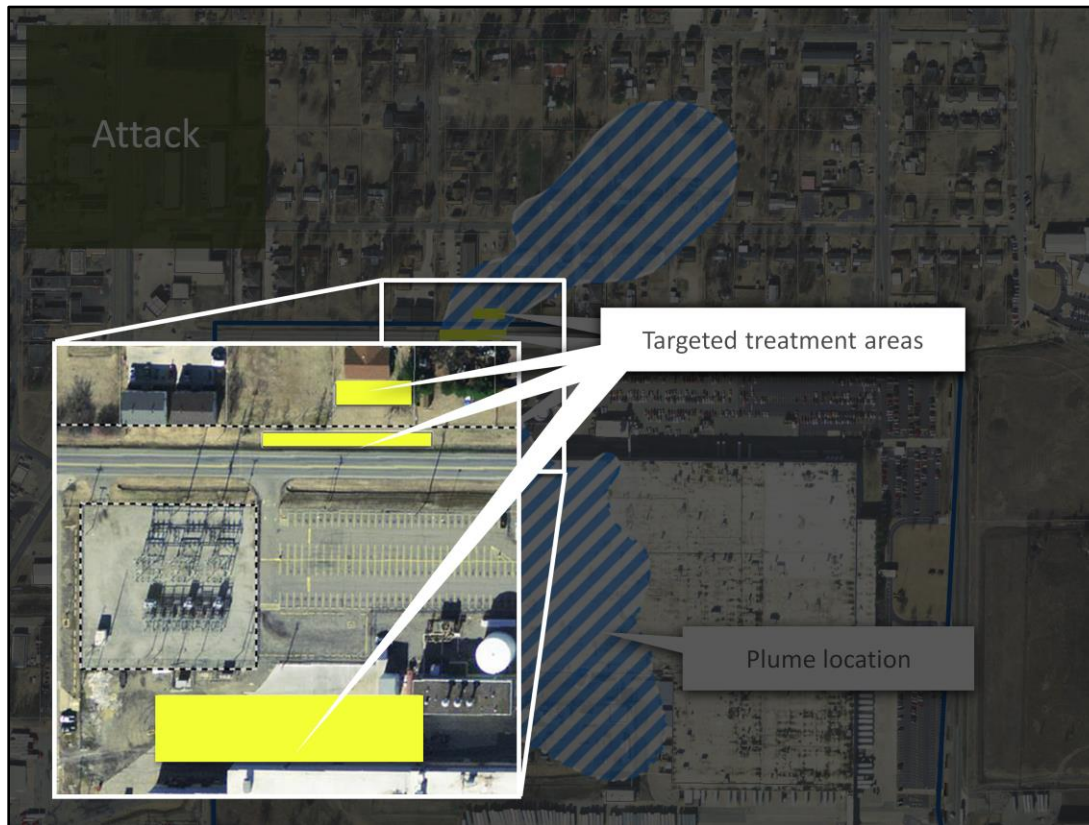
### Attack (1)

Do we have a plan attack and destroy the TCE? **Yes.**

Because we know where the plume is located, and where the areas of higher concentration are, we know where we need to attack and destroy the TCE.

The Risk Management Plan dated May 21, 2013, with the amendment dated June 6, 2013, and implementation Work Plan Dated July 16, 2013, laid out Whirlpool's plan to remediate the TCE.

The documents detail a targeted application of in-situ chemical oxidation (ISCO) in the higher concentration areas of TCE defined by the three yellow boxes in the above graphic, coupled with monitored natural attenuation, will remediate the TCE in groundwater.

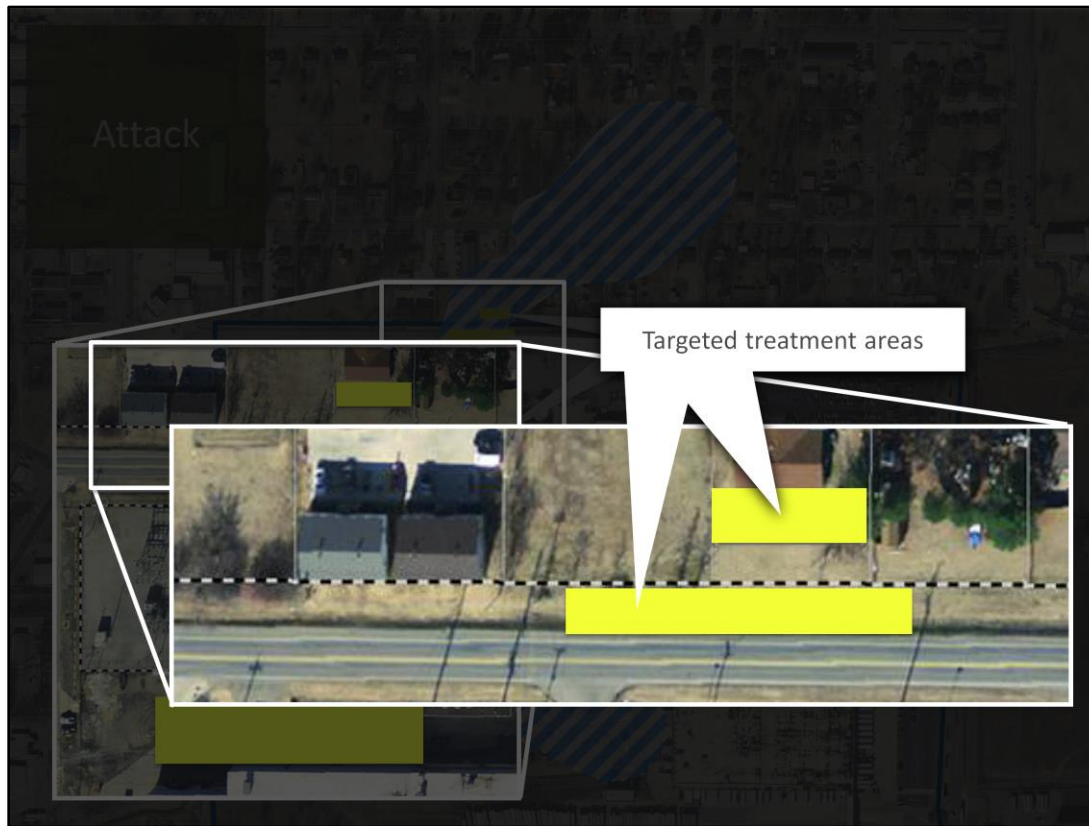


### Attack (2)

This is an aerial photo highlighting the three target areas depicted in the previous slide (slide 18).

The target areas are locations where the TCE has been found to be in high concentrations and in the transmissive sand and gravel in the soils, which makes them an effective target area.

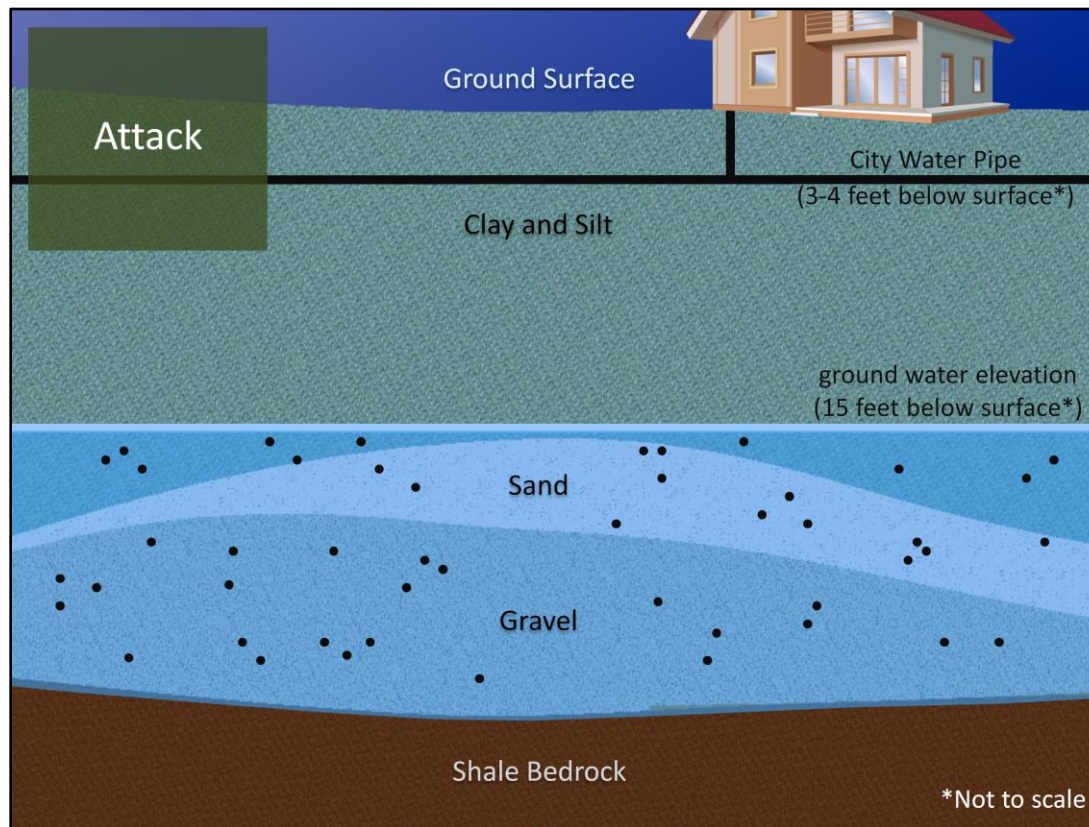




### Attack (3)

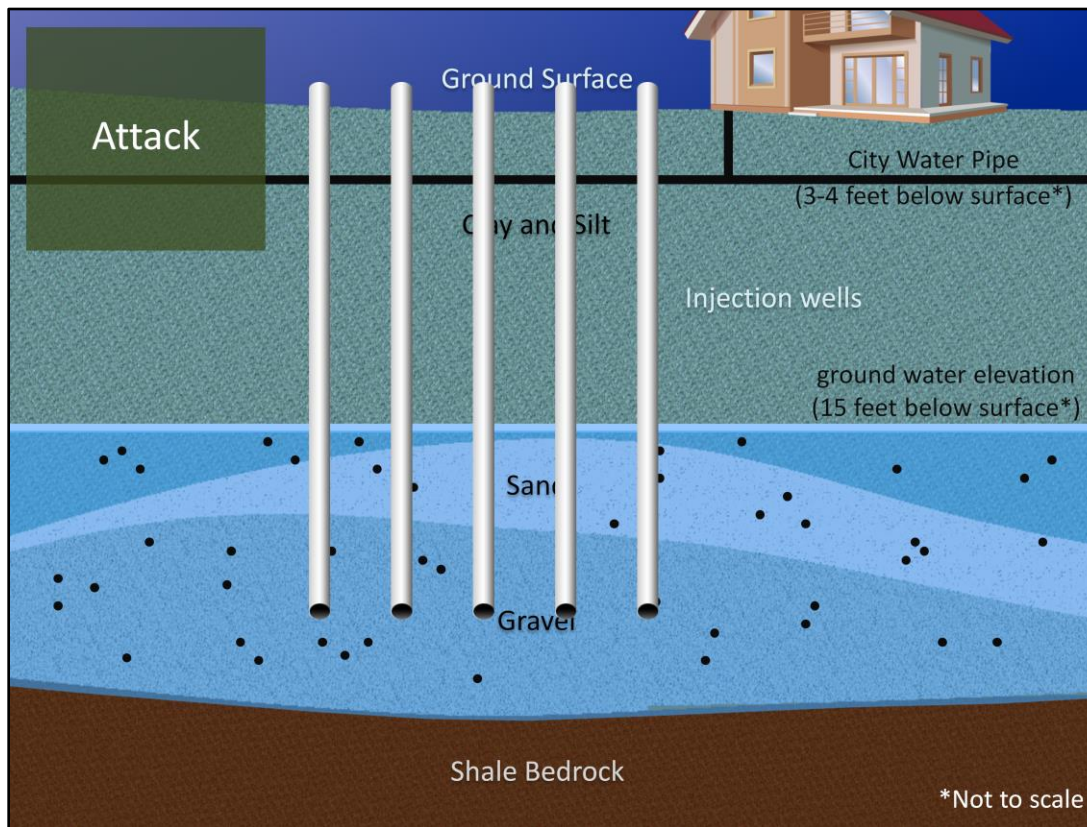
This slide provides an aerial view of the same area shown in slide 13, highlighting the placement of two of the targeted treatment areas shown in the prior slides (slides 18 and 19).

These two areas are located at the “neck” of the plume where the plume crosses over the Whirlpool property line.



#### Attack (4)

This is a graphical representation of the ground below the area shown from above in the previous slide (slide 20). It is the same cross-section shown in slides 14 through 17.



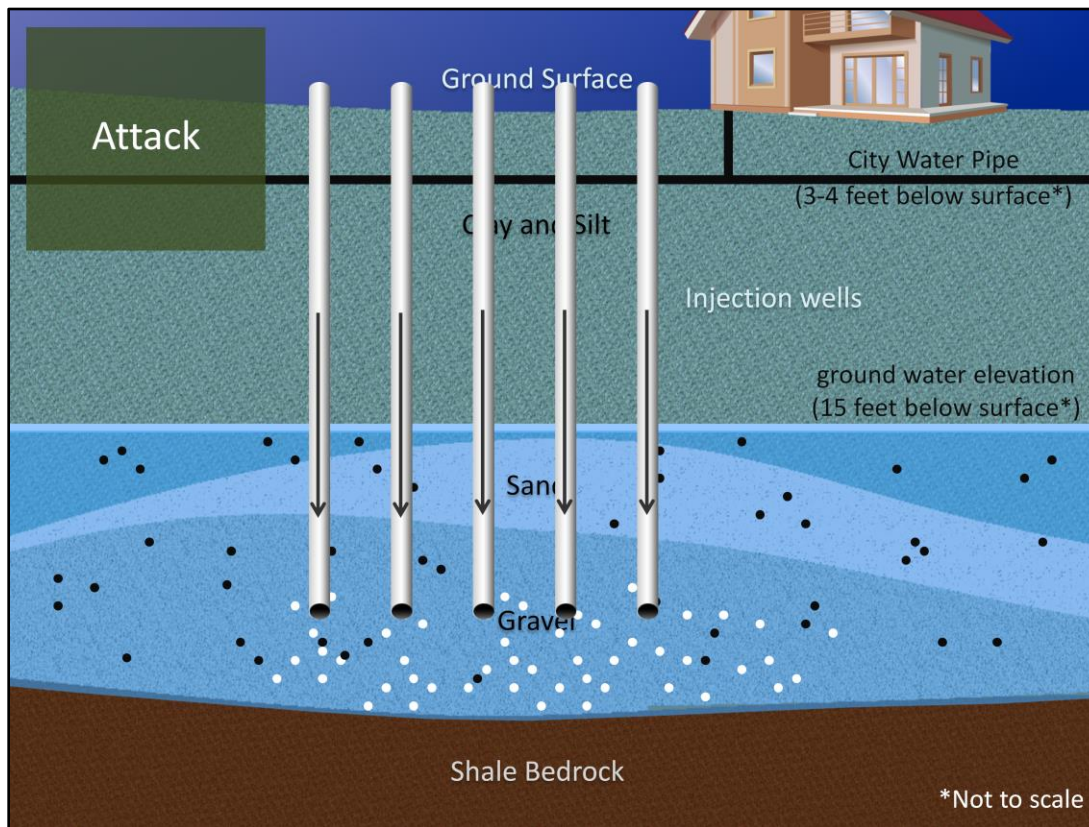
#### Attack (5)

The proven, active method presented in the Risk Management Plan dated May 21, 2013, with the amendment dated June 6, 2013, and implementation Work Plan Dated July 16, 2013, uses in-situ chemical oxidation (ISCO) treatment at multiple locations, along with natural attenuation to achieve our goals.

The ISCO process involves the use of temporary and permanent injection wells placed in the target areas. The exact number of injection points for this area will be defined as part of the detailed design phase that will begin after the final Remedial Action Decision Document, or RADD, is approved by ADEQ.

The attack won't be intrusive in the community. A pickup truck and/or truck mounted rig will be used to install the injection point and inject the oxidant below the ground surface into the groundwater. We will not use heavy construction equipment (such as large excavators, dozers, dump trucks or trenchers).





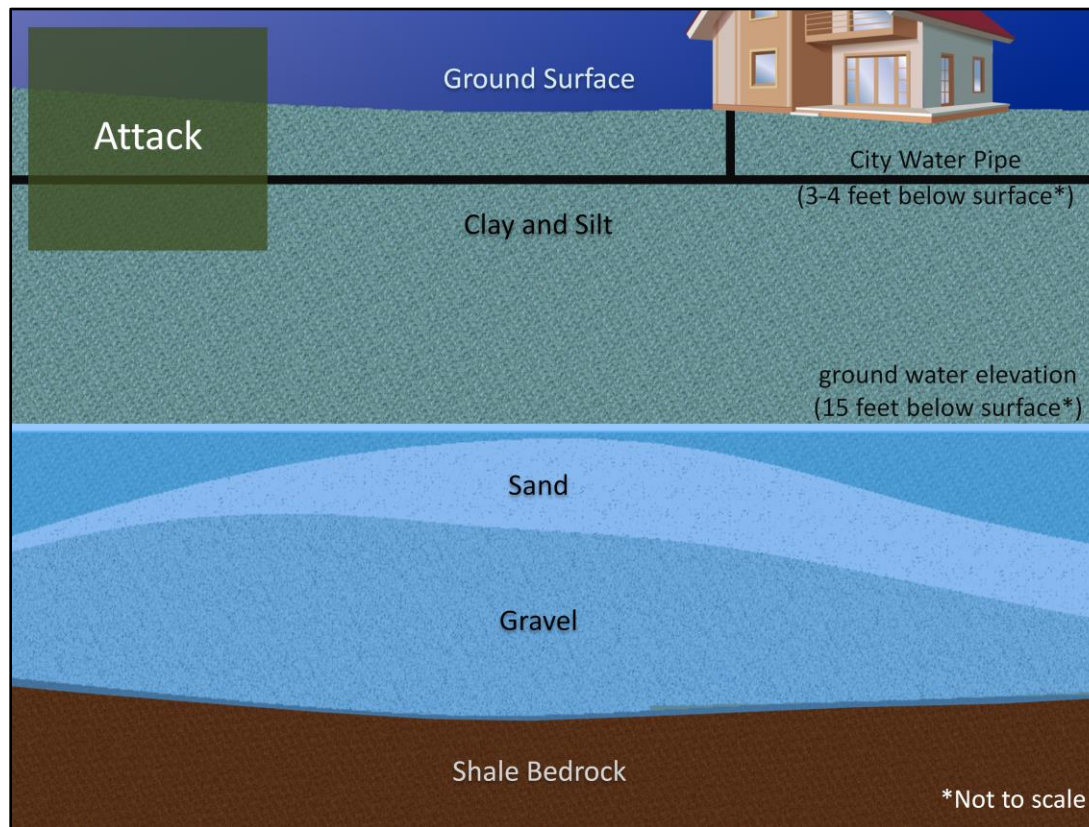
#### Attack (6)

The selected oxidant determined during the design phase of the project will be pumped into the areas of TCE concentration using these wells. The oxidant will be placed directly into the transmissive sand and gravel in order to make it most effective.

The oxidant will quickly destroy the TCE at the source and target areas.

All of the potential oxidants being considered for the site are safe and effective for this use.

ISCO has been successfully used thousands of sites in the U.S. including sites in Arkansas. ISCO has also been successfully coupled with natural attenuation at thousands of sites in the U.S., including sites in Arkansas.



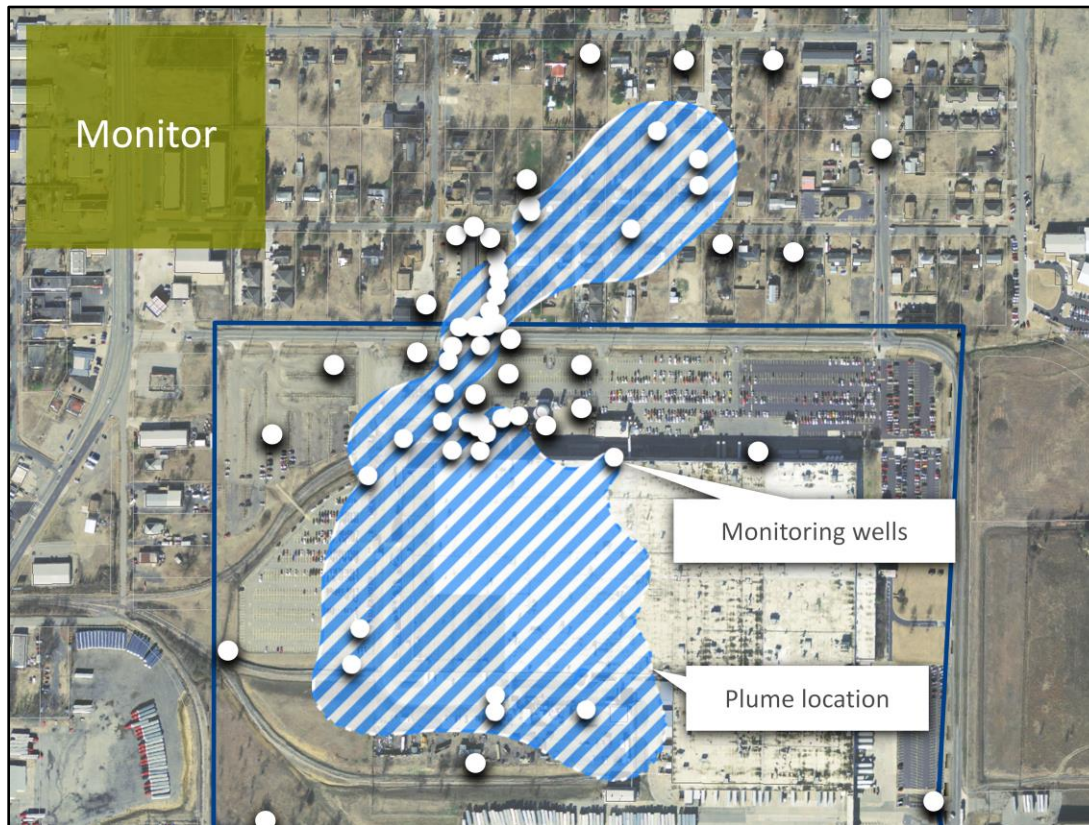
#### Attack (7)

The remaining TCE will naturally break down by ongoing natural attenuation.

Natural attenuation is occurring within the plume today. Through the extensive monitoring well network, we document the presence and effectiveness of natural attenuation. Natural attenuation is currently keeping up with TCE contributions from the source area.

Once we attack the source area and the neck of the plume across Ingersoll, natural attenuation will destroy the remaining TCE in the groundwater.





### Monitor (1)

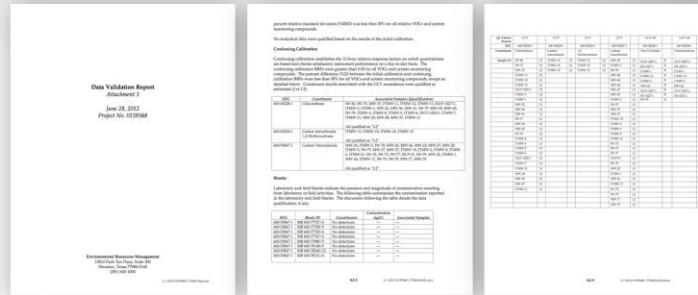
Whirlpool is going to stick around and make sure this plan works.

Whirlpool isn't going anywhere until we meet the remedial action goal and ADEQ agrees we are done. We will have a lasting presence in Fort Smith to ensure that the TCE plume has been appropriately remediated and that there continue to be no risks to human health.

We will continue to monitor progress from the implementation of our remedial attack through the extensive monitoring well network.

This ongoing monitoring is a core component part of this plan.

## Monitor



## Monitoring Reports Every 3 Months



Information will be made public at  
[www.WhirlpoolFortSmith.com](http://www.WhirlpoolFortSmith.com)

### Monitor (2)

Whirlpool will continue to produce monitoring reports.

These reports will be submitted to ADEQ and made available to the City every three months.

All of these updates and reports will also be made available to the public at [WhirlpoolFortSmith.com](http://WhirlpoolFortSmith.com).

Next Steps

# ADEQ Approval Whirlpool Action ADEQ Oversight

## Next Steps (1)

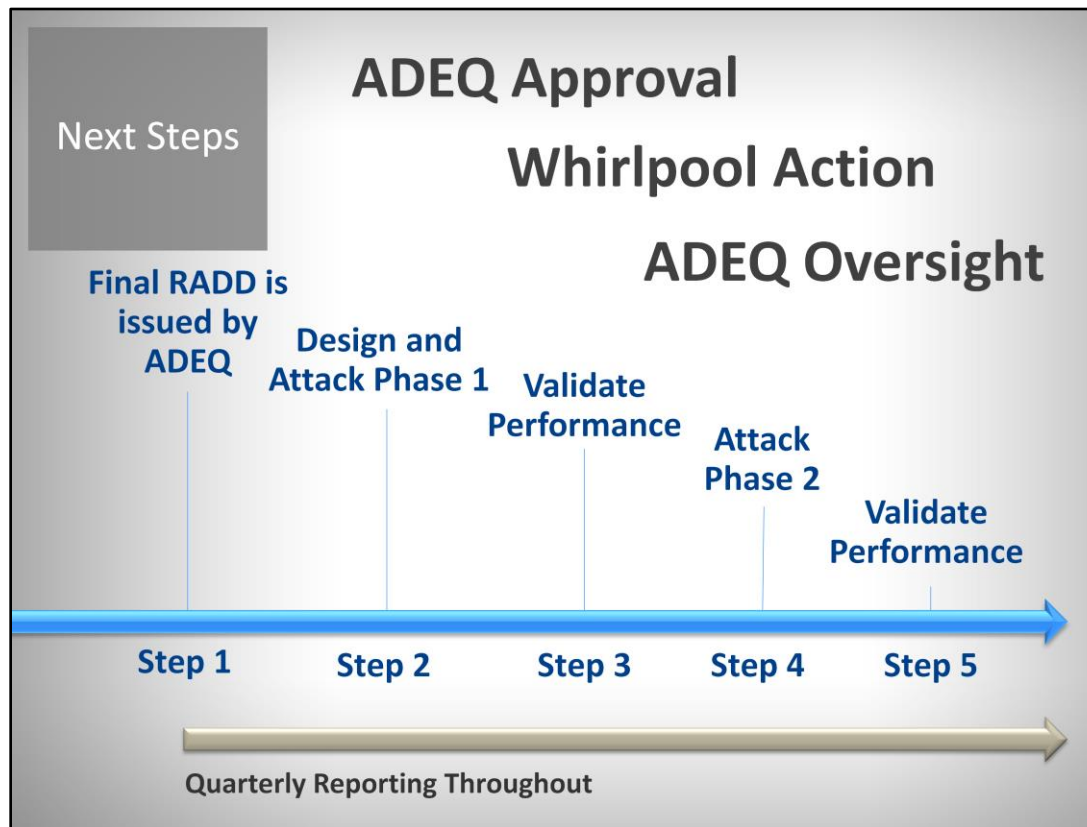
Whirlpool expects a rapid implementation of the first part of remediation plan – but this whole process is going to take some time.

It is critical to get this right, and that all regulatory requirements are followed.

Thus – first ADEQ approval is required.

Then Whirlpool will can take action.

And ADEQ is going to be monitoring Whirlpool at each step to make sure that the targets are met along the way.



#### Next Steps (2)

Following the public comment period, ADEQ will issue a final Remedial Action Decision Document, or RADD. Once ADEQ provides written approval to begin work, Whirlpool will immediately begin the Design and Attack Phase I.

After the first attack, we will do another round of testing to validate that the performance of the Phase I attack. Using results from that additional validation, we will initiate the Phase II attack. Another round of testing to validate performance will then occur, and then, only if necessary, a third phase of the oxidation treatment will be conducted.

Throughout this entire process, we will conduct quarterly reporting for ADEQ and reporting the results to ADEQ. Using the best science and working with ADEQ, we will make a material impact in the next 3-5 years.

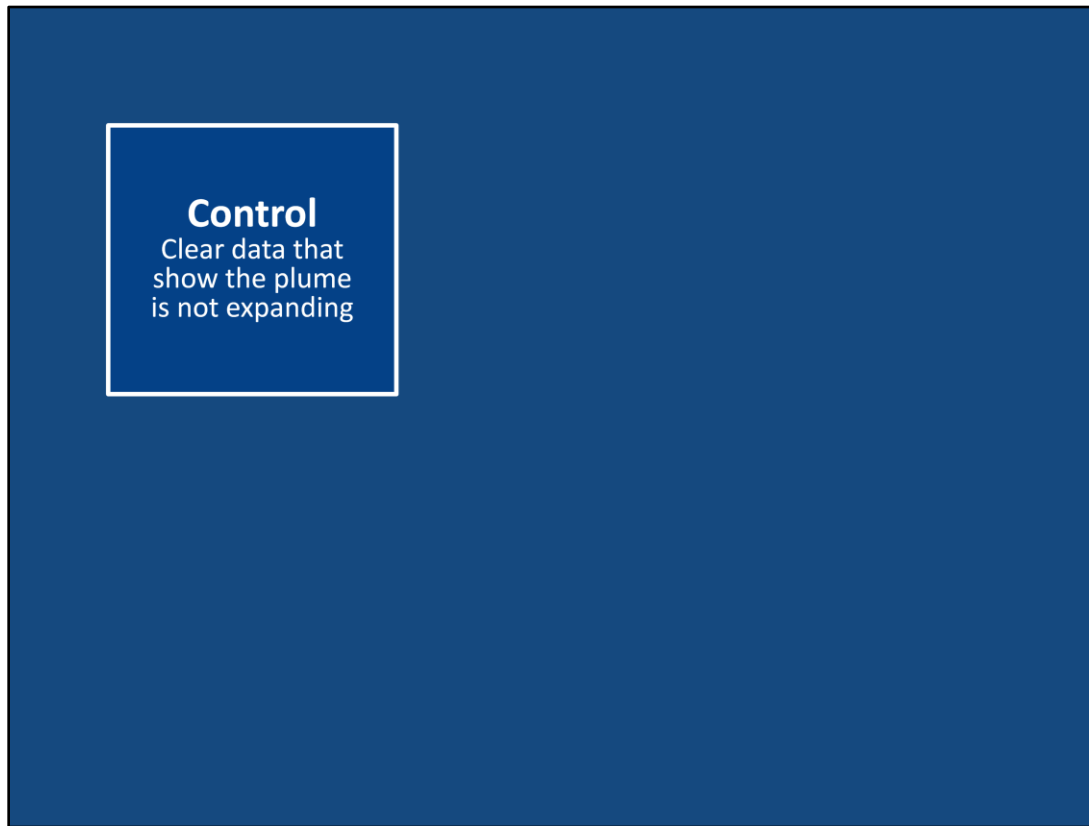




### Site Redevelopment

Whirlpool is working to redevelop the former plant site for creating new opportunities in Fort Smith.

Whirlpool is working with interested buyers, and while we are unable to know exactly what will happen until the sale is finalized, we anticipate that in order to maximize the benefit to the community, the use of the property may be mixed – green space, commercial, and retail.

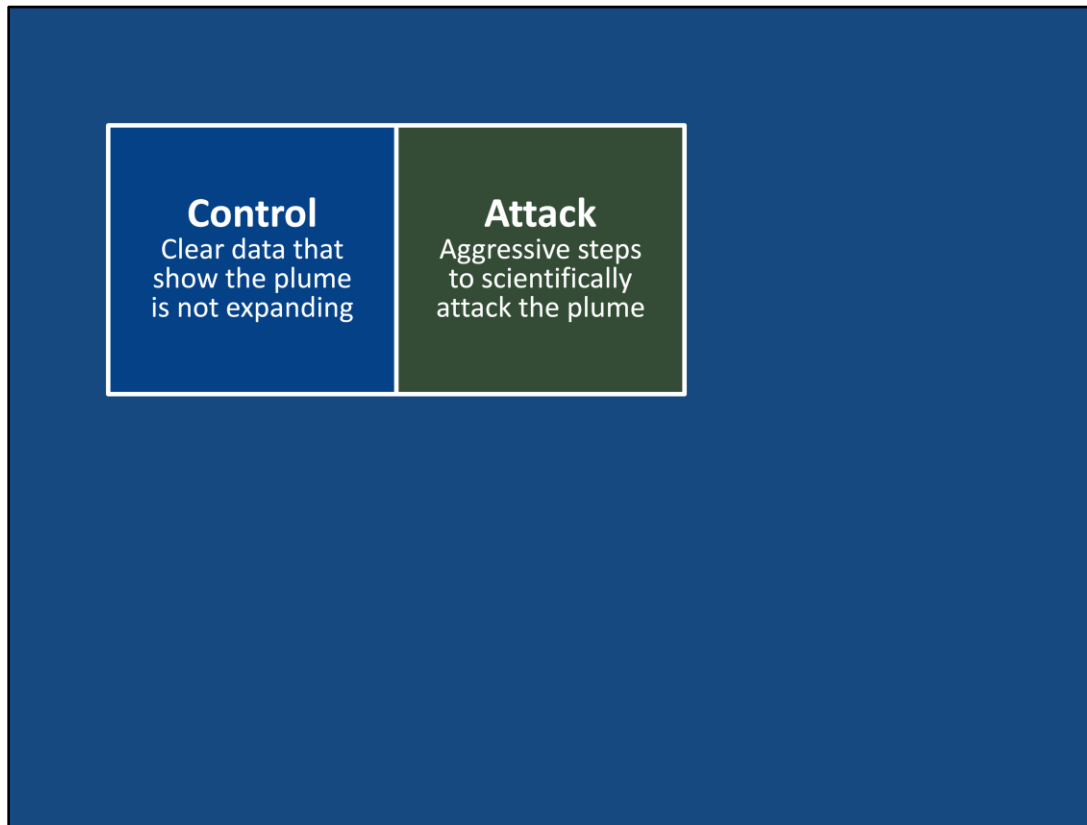


Closing Summary: Control

To conclude, we return to the questions from the Fort Smith residents, the City Directors, and ADEQ:

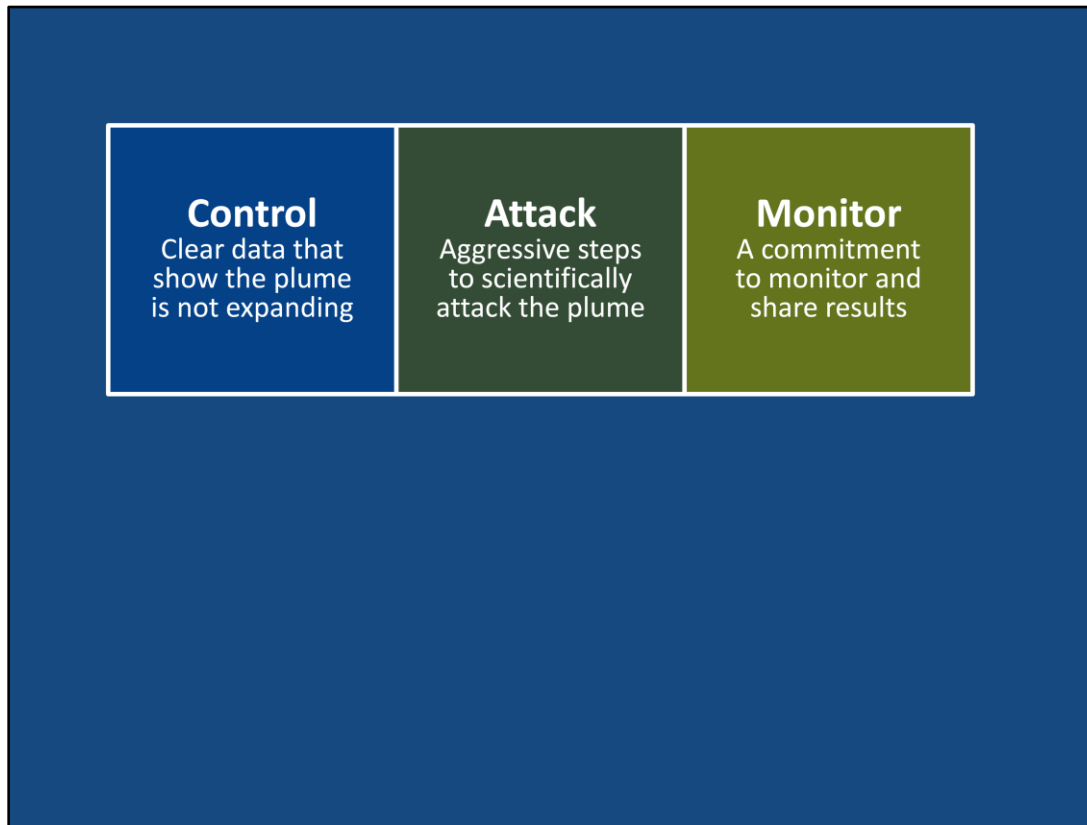
Is the plume expanding? **No.**

Are people safe? **Absolutely. Yes.**



Closing Summary: Attack

Is there a plan to attack and remove the TCE? **Yes.**



Closing Summary: Monitor

Is Whirlpool going to stay in Fort Smith and see this through? **Yes.**





Closing Summary: Additional Information

If you want more information about any of these items - including all of the documents Whirlpool has submitted to ADEQ as part of the creation of the remediation plan, as well as thousands of pages of background documents - you can find them at [WhirlpoolFortSmith.com](http://WhirlpoolFortSmith.com).

WhirlpoolFortSmith.com website is and will remain updated as we continue our monitoring in the area.