



August 11, 2014

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

**Re: Response to August 6, 2014 ADEQ Correspondence
Approval of the Northeast Corner Investigation Work Plan
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 the Arkansas Department of Environmental Quality's (ADEQ) contingent approval of the Northeast Corner Investigation Work Plan for the Whirlpool facility in Ft. Smith, Arkansas. ENVIRON's response follows for each of ADEQ's comments in the subject correspondence.

ADEQ Comment:

***Investigation Work Plan, Second Paragraph:** The report states that surface of shale bedrock is expected to be encountered between approximately twenty-four (24) feet and thirty (30) feet below ground surface (bgs). Previous membrane interface probe (MIP) profiles in the northeast corner of the building indicated shale bedrock would be lower than thirty (30) feet bgs. Of the MIP profiles along the eastern portion of the building, only two (M-112 and M-114) appeared to encounter bedrock between thirty (30) and thirty-five (35) feet bgs. Information from the five (5) newly installed monitoring wells at the northeast portion of the site may have confirmed bedrock at a higher elevation east of the current MIP profiles, but ADEQ has not received any information on the geology penetrated or construction (including total depths) of these wells. Soil borings must extend down to bedrock even if total depth is greater than thirty (30) feet. Please provide the needed data.*

ENVIRON Response:

The Northeast Corner Investigation Work Plan indicates probes will be advanced to probe refusal or bedrock, whichever occurs first. The Northeast Corner Report presenting the findings from the installation of the five new onsite monitoring wells will be submitted to ADEQ on August 15, 2014 (these findings are summarized in the subject Work Plan). The boring logs and well construction diagrams for the new groundwater monitoring wells at the northeast corner are attached.

ADEQ Comment:

ADEQ would request at least one (1) additional MIP profile and soil boring location to be placed on the City of Fort Smith property located northeast of the intersection of Ingersoll Avenue and Jenny Lind Road.

ENVIRON Response:

We have gained access to the City of Ft. Smith properties referenced in ADEQ's comment and we will perform at least one probe positioned on the subject City of Ft. Smith property (the first probe was performed on the subject City of Ft. Smith center property immediately north of Jenny Lind Road on August 8, 2014).

ADEQ Comment:

The four existing MIP profiles at the northeast corner of the building (M-108, M-110, M-250, and M-251) display minor but consistent (decreasing toward the east) chlorinated ethene reading in the shallow surface soil/perched groundwater. ADEQ requests that any soil samples within the depth of surface to ten (10) feet bgs with elevated PID indications of Volatile Organic Carbons (VOCs) be collected for laboratory analysis.

ENVIRON Response:

The Membrane Interface Probe (MIP) probe screening tool provides a semi-quantitative, continuous vertical profile to screen for the presence of VOCs. The subject Work Plan summarizes actual laboratory results for soil samples collected from the soil borings for the new monitoring wells at the northeast corner which indicates that no TCE impact was identified in any of the soil samples collected from the onsite borings for these new exterior monitoring wells.

Soil samples will be collected from the offsite probe locations from the surface to depths of 10 feet bgs to confirm that no TCE impact in soil exists at offsite locations.

ADEQ Comment:

A minimum of three surface water and three sediment samples should also be collected from Mill Creek, located east of the Boys and Girls Club.

ENVIRON Response:

With the help of ADEQ, Whirlpool and ENVIRON have been following an Adaptive Remedy Approach for this site. Based upon MIP screening data from the interior of the former manufacturing building on the Whirlpool property, we were able to identify the potential for TCE impact in the groundwater at the northeast corner of the property. In response to this finding, Whirlpool and ENVIRON submitted a work plan on June 20, 2014, that included installation of five new exterior groundwater monitoring to assess soil and groundwater conditions at the northeast corner of the Whirlpool property. As summarized in the subject Work Plan, no TCE was discovered in the soil samples collected while installing the new monitoring wells. TCE was detected in groundwater in samples taken from three of the five

new wells, and the concentration of TCE in groundwater at the northeast corner decreased significantly near the Whirlpool property boundaries.

In response to the groundwater results from three of the five new groundwater wells at the northeast corner, Whirlpool and ENVIRON submitted the Northeast Corner Supplemental Work Plan to perform offsite investigation, which is the subject of this correspondence. This investigation includes collection of soil and groundwater samples at offsite locations to characterize the extent of groundwater impact and confirm that no offsite TCE impact in soil exists.

We propose to continue to follow this sequential investigative approach in accordance with the adaptive remedy and keep ADEQ apprised of all data collected from these sequential investigations regarding potential TCE impacts from the Whirlpool property.

We respectfully disagree with the request to “step out” and collect surface and sediment samples from three locations in Mill Creek. Mill Creek is an urban drainage way, which collects surface water from industrial, commercial and residential properties covering a water shed of approximately 3,400 acres (approximately 5 square miles) up-gradient from the Boys and Girls Club property [based upon review of the Cedar Creek-Poteau River watershed (National Hydrologic Dataset 111101050904 Hydrologic Unit Code covering 29,200 acres)].

We propose to continue our current sequential investigative approach and assess TCE impact confirmed to be associated with the site. This continued approach currently includes:

- Screening and investigation of soil and groundwater beyond the northeast corner of the Whirlpool property as described in the subject Work Plan (this screening and investigation work commenced on August 6, 2014);
- Screening and investigation of soil and groundwater near property boundary locations as summarized in the Property Boundary Supplemental Work Plan submitted to ADEQ on August 8, 2014 (this screening and investigation work commenced on August 4, 2014); and
- Screening and investigation of the two permitted outfalls from the former Whirlpool property to assess surface water and sediment at these two outfalls.

Outfall 001 discharged from the Whirlpool property at the northeast corner of the site to the ditch along the south side of the Boys and Girls Club property. This ditch ultimately discharges to Mill Creek approximately 1,200 feet east of the northeast corner of Jenny Lind Road and Ingersoll Avenue. Outfall 002 discharged from the Whirlpool property at the west central portion of the Whirlpool property where the rail lines exit the site near the intersection of Pierce Drive and Goodwin Street. If potential TCE impact is identified in sediment or surface water at these outfalls, then additional investigation will be proposed to characterize potential TCE impacts that may exist beyond the outfalls associated with the Whirlpool property, including investigation of Mill Creek, as appropriate.

Our reluctance to immediately initiate sampling of sediment and surface water in Mill Creek is based upon the magnitude of other sources for contamination to be present in Mill Creek, and little or no basis to distinguish this contamination, if present, from the Whirlpool property. Our proposed approach of screening and investigating potential migration pathways and transport mechanisms is preferred to avoid inherent complications of assessing laboratory results as a result of collection of sediment and surface water samples from the Mill Creek urban drainage way.

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As always, we appreciate ADEQ's feedback regarding our ongoing monitoring and validation activities, which is a critical element of the Adaptive Remedy Process. 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 APPENDICES

Appendix A: Northeast Corner Boring Logs and Well Construction Diagrams

APPENDIX A: Northeast Corner Boring Logs and Well Construction Diagrams



7500 College Blvd, Overland Park, Kansas 66210

Site ID: **MW-87**

Date(s): **6/24/2014**

Location: **Fort Smith, Arkansas**

Logged By: **N. Zurweller**

Checked By: **K. Stonestreet**

Contractor: **Walker-Hill Environmental**

Purpose: **Monitoring Well**

Drilling Method: **Sonic**

GS Elevation: **471.02 amsl**

TOC Elevation: **470.78 amsl**

Sampling Method: **Continuous Sampler**

North: **368835.33**

East: **592268.87**

Well Construction:

Blank Casing: Sch 40 PVC 0 FT to 17 FT

Borehole Dia.: **6 inches**

Total Depth: **27.0 feet**

Screen: Sch. 40 0.10 PVC 17 FT to 27 FT

Project Number: **3433233A**

Annular Fill: Cement Grout 0 FT to 11.5 FT
Bentonite 11.5 FT to 14.5 FT
Sand 14.5 FT to 27 FT

Project Name: **Whirlpool Corporation**

Remarks:

Elevation (ft)	Depth (ft)	Recovery (feet)	Sample No.	PID (ppm)	Graphic Log	USCS Code	Material Description	Water Level	Well Construction Flush Mount
470	3.8		MW-87(4.5)	1.0		MH	Asphalt Clayey Silt, dark grayish brown, little root hairs, stiff, slightly cohesive, slightly plastic, moist		
465	5			2.7					
465	5			0.6		CL	Silty Clay, strong brown, with light gray mottling, some black nodules, little subrounded gravel up to 1/4", stiff, plastic, slightly moist		
460	10			0.8					
460	5			3.6			Silty Clay as above, little black nodules, very stiff	▼	
455	15		MW-87(15)	7.0			Silty Clay, strong brown, little light gray mottling, with fine sand, some subrounded and subangular gravel up to 1/4", stiff, plastic, moist		
455	5			4.1					
450	20	2		6.3					
450	2			3.5		GC	Silty Clay and Gravel, strong brown, subrounded gravel up to 1", fine to medium sand, slightly stiff, very cohesive, slightly plastic, moist to to very moist, increasing silty clay with depth		
450	5			1.8		CL	Silty Clay, strong brown, little dark gray, hard, plastic, slightly moist		
445	25			0.6			Shale, very dark gray, hard, laminated, dry, crumbles with hand pressure		

Report: WELL_LOG_REV_MKE: File: THURSDAY_12PM_NZ.GPJ: 07/18/14

▼ Static ground water



7500 College Blvd, Overland Park, Kansas 66210

Site ID: MW-88

Date(s): 6/23/2014

Location: Fort Smith, Arkansas

Logged By: N. Zurweller

Checked By: K. Stonestreet

Contractor: Walker-Hill Environmental

Purpose: Monitoring Well

Drilling Method: Sonic

GS Elevation: 469.12 amsl

TOC Elevation: 468.89 amsl

Sampling Method: Continuous Sampler

North: 369043.00

East: 592151.24

Well Construction:

Blank Casing: Sch 40 PVC 0 FT to 18
 Screen: Sch. 40 0.10 PVC 18 FT to 28 FT
 Annular Fill: Cement Grout 0 FT to 13 FT
 Bentonite 13 FT to 16 FT
 Sand 16 FT to 28 FT

Borehole Dia.: 6 inches

Total Depth: 28.0 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	Well Construction Flush Mount
465	3.5			14.2		CL	Asphalt		
	5			13.7			Silty Clay, strong brown, some light gray mottling, some red mottling, some fine sand, little subrounded gravel up to 1/4", little black nodules, stiff, slightly plastic, moist		
				20.0			Silty Clay as above, plastic		
460	5			20.6			Silty Clay, strong brown and grayish brown, little clayey silt, some black nodules, little subrounded gravel up to 1/4", little fine sand, very stiff, plastic to slightly plastic, slightly moist	▼	
	10			35.7			Silty Clay as above, very stiff		
			MW-88(12)	18.8			Sandy Clay, strong brown, with silt, with subrounded gravel up to 1/2", fine to medium sand, cohesive, moist		
455	15			22.4			Sandy Clay as above, little light gray mottling		
	4			39.4		GC	Silty Clay and Gravel, strong brown, with fine sand, subrounded to subangular gravel up to 1", hard, dry		
450	20			15.1		MH	Clayey Silt, dark brown, some strong brown, laminated, hard, dry		
	4			12.5			Shale, with clayey silt, dark grayish brown, laminated, hard, dry		
445	25			6.2			Shale, dark grayish brown and very dark gray, laminated, hard, dry		
	4			3.2					
440									

Report: WELL_LOG_REV_MKE: File: THURSDAY_12PM_NZ.GPJ: 07/18/14

▼ Static ground water



7500 College Blvd, Overland Park, Kansas 66210

Site ID: **MW-89**

Date(s): **6/23/2014**

Location: **Fort Smith, Arkansas**

Logged By: **N. Zurweller**

Checked By: **K. Stonestreet**

Contractor: **Walker-Hill Environmental**

Purpose: **Monitoring Well**

Drilling Method: **Sonic**

GS Elevation: **467.08 amsl**

TOC Elevation: **466.91 amsl**

Sampling Method: **Continuous Sampler**

North: **369059.25**

East: **592356.91**

Well Construction:

Blank Casing: Sch 40 PVC 0 FT to 15 FT

Screen: Sch. 40 0.10 PVC 15 FT to 25 FT

Annular Fill: Cement Grout 0 FT to 10 FT
 Bentonite 10 FT to 13 FT
 Sand 13 FT to 25 FT

Borehole Dia.: **6 inches**

Total Depth: **25.0 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	Well Construction Flush Mount
465	3.5			21.2		MH	Asphalt		
	5			37.8			Clayey Silt, dark grayish brown, with root hairs, plastic, moist		
				42.2			Clayey Silt as above, slightly plastic, very moist, wood debris at 4.0-4.3' bgs		
				49.2			Clayey Silt as above, little subrounded gravel up to 1/4", soft		
460	4.6			42.2		CL	Silty Clay, strong brown, some gray and red mottling, little subrounded gravel up to 1/4", little black nodules, very stiff, plastic, moist, some subrounded to subangular gravel last at 9.8-10.0' bgs		
	10			49.2			Silty Clay as above, some dark brown		
455	5			36.3			Silty Clay, strong brown, some light gray mottling, some fine sand, very stiff, slightly plastic, dry		
	15			20.5			Sandy Clay, strong brown, little light bluish gray mottling, with silt, fine to medium sand, slightly stiff, cohesive, slightly moist to moist		
450	5		MW-89(17.5)	57.8			Sandy Clay, strong brown, with silt, with subrounded gravel up to 1", fine to medium sand, stiff, dry		
	20			48.2			Shale, very dark gray to dark grayish brown, some clayey silt, hard, laminated, dry, crumbles with hand pressure		
445	5			15.8					
440	25								

Report: WELL_LOG_REV_MKE: File: THURSDAY_12PM_NZ.GPJ: 07/18/14

▼ Static ground water



7500 College Blvd, Overland Park, Kansas 66210

Site ID: MW-90

Date(s): 6/23/2014

Location: Fort Smith, Arkansas

Logged By: N. Zurweller

Checked By: K. Stonestreet

Contractor: Walker-Hill Environmental

Purpose: Monitoring Well

Drilling Method: Sonic

GS Elevation: 466.97 amsl

TOC Elevation: 466.71 amsl

Sampling Method: Continuous Sampler

North: 369157.02

East: 592156.74

Well Construction:

Blank Casing: Sch 40 PVC 0 FT to 15 FT

Borehole Dia.: 6 inches

Total Depth: 25.0 feet

Screen: Sch. 40 0.10 PVC 15 FT to 25 FT

Project Number: 3433233A

Annular Fill: Cement Grout 0 FT to 10 FT
Bentonite 10 FT to 13 FT
Sand 13 FT to 25 FT

Project Name: Whirlpool Corporation

Remarks:

Elevation (ft)	Depth (ft)	Recovery (feet)	Sample No.	PID (ppm)	Graphic Log	USCS Code	Material Description	Water Level	Well Construction Flush Mount
465	2.5			20.2		CL	Asphalt Fill, sand and gravel, dark brown, medium sand, moist, slightly cohesive		
460	5			23.8			Silty Clay, strong brown, little light gray and red mottling, little black nodules, little subrounded gravel up to 1/4", very stiff, plastic, moist	▼	
	10			22.1			Silty Clay as above, moist to very moist, stiff		
455	15		MW-90(14.5)	28.6			Silty Clay as above, moist, very stiff		
	20			38.3			Silty Clay as above, with black nodules, increasing silt with depth		
450	25		MW-90(20.5)	21.3			Sandy Clay, strong brown, some light gray mottling, with silt, some subrounded gravel up to 1/4", fine sand, very stiff, slightly plastic, slightly moist		
	20			21.8			Sandy Clay, strong brown, with silt, with subrounded gravel up to 1/2", medium sand, cohesive, moist		
445	25			21.8		MH	Sandy Clay, strong brown, some light gray mottling, with silt, with subrounded gravel up to 1", medium sand, cohesive, slightly moist to moist		
	20			23.1			Clayey Silt, strong brown, some dark brown, some weathered shale, hard, laminated, dry		
440	25			14.3			Shale, very dark gray, hard, laminated, dry, crumbles with hand pressure		

Report: WELL_LOG_REV_MKE: File: THURSDAY_12PM_NZ.GPJ: 07/18/14

▼ Static ground water



7500 College Blvd, Overland Park, Kansas 66210

Site ID: MW-91

Date(s): 6/24/2014

Location: Fort Smith, Arkansas

Logged By: N. Zurweller

Checked By: K. Stonestreet

Contractor: Walker-Hill Environmental

Purpose: Monitoring Well

Drilling Method: Sonic

GS Elevation: 469.15 amsl

TOC Elevation: 468.90 amsl

Sampling Method: Continuous Sampler

North: 368830.37

East: 592370.83

Well Construction:

Blank Casing: Sch 40 PVC 0 FT to 15 FT

Borehole Dia.: 6 inches

Total Depth: 25.0 feet

Screen: Sch. 40 0.10 PVC 15 FT to 25 FT

Project Number: 3433233A

Annular Fill: Cement Grout 0 FT to 10 FT
Bentonite 10 FT to 13 FT
Sand 13 FT to 25 FT

Project Name: Whirlpool Corporation

Remarks:

Elevation (ft)	Depth (ft)	Recovery (feet)	Sample No.	PID (ppm)	Graphic Log	USCS Code	Material Description	Water Level	Well Construction Flush Mount
465	5	3	MW-91(12.5)	4		MH	Fill, clayey sand and gravel, very dark brown, moist	▼	
				4.5		CL	Clayey Silt, dark brown, slightly plastic, very moist		
460	5	3	MW-91(12.5)	4.5		CL	Silty Clay, strong brown, little light gray and red mottling, stiff, plastic, moist		
				5.1			Silty Clay, strong brown, with light gray mottling, little subrounded to subangular gravel up to 1/2", very stiff, plastic, slightly moist		
455	10	3	MW-91(12.5)	4.8					
				5.8		GC	Clayey Sand and Gravel, subrounded to subangular gravel up to 1/2", fine sand, very cohesive, sticky, wet, note: lost first 2' out of sample bag		
450	15	4.5	MW-91(12.5)	4.5		CL	Silty Clay, strong brown, with light gray mottling, little subrounded to subangular gravel up to 1/2", very stiff, plastic, slightly moist		
				5.9			Silty Clay, strong brown, some light bluish gray mottling, with subrounded to subangular gravel up to 1/2", with fine to medium sand, very stiff, slightly plastic, slightly moist to moist		
445	20	4.5	MW-91(12.5)	6		GC	Sandy Clay and Gravel, subrounded to subangular gravel up to 1/2", fine sand, very cohesive, sticky, wet, note: lost first 2' out of sample bag		
				11.4		MH	Silty Clay, strong brown, some light bluish gray mottling, with subrounded to subangular gravel up to 1/2", with fine to medium sand, very stiff, slightly plastic, slightly moist to moist		
440	25			3.5			Clayey Silt, strong brown, some dark grayish brown, hard, slightly plastic, dry Shale, very dark gray, hard, laminated, dry		

Report: WELL_LOG_REV_MKE: File: THURSDAY_12PM_NZ.GPJ: 07/18/14

▼ Static ground water