

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

**Re: Response to ADEQ Correspondence Dated August 3, 2015  
First Quarter 2015 Progress Report – May 2015  
Whirlpool Corporation  
Fort Smith, Arkansas  
EPA No. ARD042755389  
AFIN No. 66-00048  
CAO LIS 13-202**

Dear Mr. Mehran:

Date September 9, 2015

Ramboll Environ US Corporation (Ramboll Environ), on behalf of Whirlpool Corporation, is submitting this response to Arkansas Department of Environmental Quality's (ADEQ) August 3, 2015, comment letter on Whirlpool's correspondence dated July 15, 2015 regards Ramboll Environ's First Quarter 2015 Progress Report dated May 2015. ADEQ comments are provided in italics below and the respective response follows.

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**Volume 1, Section 2, Groundwater Sample Collection and Onsite Activities:** *ADEQ agrees that those wells installed within or immediately adjacent to In-Situ Chemical Oxidation (ISCO) treatment areas do not need to be monitored for the monitored natural attenuation (MNA) parameters. However, MW-95 is located immediately down-gradient (southeast) of the source area in an area of elevated Trichloroethylene (TCE) concentrations. The MNA parameters should be measured in MW-95, a minimum of four quarters to establish trends. This would also be true for MW-96 through MW- 99 located northeast of the facility. MW-87 through MW-91 located northeast of the facility building were sampled for the MNA parameters during the First Quarter of 2015. If wells in close proximity (e.g. MW-96, MW-97 and MW-98) display similar MNA parameter values then one well from that grouping of wells could be chosen for an additional three quarters of sampling. This MNA parameter sampling should continue until trends can be established.*

**Ramboll Environ Response:** Whirlpool will sample all wells for volatile organic compounds (VOCs) and MNA parameters in the fourth quarter sampling event (October 2015) and subsequent quarters subject to any future ADEQ-approved changes.

**Volume 1, Section 3, Results, 3.3.1 VOC Results, Plume Boundary Wells:** *DP-58 is not an acceptable location for a northern plume step-out monitoring well. The DP-58 location is north of the apparent path of the northern plume and the lithology reported at DP-58 indicated the presence of Hartshorne Shale at a depth of 11.5 feet below ground surface (bgs) overlain by silty clay. Please revise plans for the step-out well for the northern plume to be located east of MW-67 and MW-66 directly down-gradient of the center line of the northern plume.*

**Ramboll Environ Response:** The center line of the plume and the groundwater flow direction has been consistently towards the northeast in the vicinity of MW-61, MW-66 and MW-67 based upon monitoring performed for the more than nine years. Our interpretation of the centerline of the north plume originates near IW-73 and extends northeast through the proposed well location at DP-58. This conclusion is based upon TCE isoconcentration lines and the groundwater flow direction at the northeast corner of the north plume. This interpretation is further supplemented by the increasing trend of TCE concentrations at MW-61 observed during the last year.

The McAlester shale was encountered at 11.5 feet below surface at DP-58.

As discussed further below, TCE was detected at MW-67 during the first quarter at 1.3 micrograms per liter ( $\mu\text{g/L}$ ); however, the concentration decreased to 0.77  $\mu\text{g/L}$  during the second quarter. TCE in plume boundary wells MW-66 and MW-67 will continue to be monitored.

The pending Jenny Lind Road re-alignment project will include positioning the new Jenny Lind Road on the properties east of the existing Jenny Lind Road. We have attached the figure from the City of Fort Smith depicting the monitoring well locations and proposed new and existing Jenny Lind Road alignments (the road alignments on the attached figure have been depicted on the potentiometric surface maps in the 2014 Annual Report and the 2015 First Quarter Progress Report). The figure shows the properties east of MW-66 and MW-67 are encompassed by the pending road re-alignment project.

**Volume 1, Section 4, Plume Stability, 4.1 Lines of Evidence, 4.1.1 Statistical Analysis of Temporal Trends:** *The increasing trend at ITMW-10 has been verified based on the last six (6) quarters of monitoring since October 2013. Additionally, although daughter products are present indicating biodegradation is occurring, the degradation rate is not sufficient to halt the increasing TCE concentrations detected in the well.*

*ADEQ disagrees that this most recent unqualified result of 3.7  $\mu\text{g/L}$  can be considered to be consistent with historical data from the well ITMW-06. The most recent value of 3.7  $\mu\text{g/L}$  from in January of 2015 is the first unqualified result from the well and as such cannot be considered consistent with historical data from the well. Whirlpool should continue the evaluation of the progress of biodegradation in the southern plume.*

**Ramboll Environ Response:** We acknowledge an increasing trend for TCE concentrations at ITMW-10 based upon 25 years of monitoring; however, ITMW-4,

ITMW-6 and ITMW-9 provide a boundary for the evaluation of the extent of the south plume (i.e. ITMW-10 is not representative of the south plume boundary), and these wells are more than 400 feet and 1,100 feet from the south and east property boundaries, respectively. The extent of the south plume was assessed during the plume boundary investigation in August 2014 which confirmed the south plume groundwater impacts do not extend to nor are they approaching the southern or eastern property boundaries. In addition, sentinel wells are proposed to be installed approximately 200 feet from the south and eastern boundaries to provide early detection if any further migration of the south plume occurs.

Historically, TCE was detected in ITMW-6 at concentrations ranging from 6 µg/L to 25 µg/L between December 1996 and February 1999. Since October 2013, TCE has been detected in ITMW-6 at concentrations ranging from 2.7 µg/L to 4.4 µg/L, but this data has been qualified with a "J" (i.e. estimated). We have consistently considered qualified data as relevant data for evaluation of groundwater conditions particularly at plume boundary locations. Therefore, when we consider the detection of TCE at 3.7 µg/L (unqualified in January 2015) and compare those results to recent and historical data from the well, we conclude the results are consistent with historical data.

We will continue to evaluate biodegradation in the southern plume.

**Volume 1, Section 4.1.1 Statistical Analysis of Temporal Trends:** *ADEQ disagrees that the 1.3 µg/L value in MW-67 is consistent with historical results. Historically data that were below the reporting limit, which was arbitrarily set at 5 µg/L, were reported as less than 5 µg/L regardless of the estimated value, or even if the results were non-detects. Previously reported results from monitoring well MW-67 were flagged as estimated values. The value of 1.3 µg/L reported for the First Quarter of 2015 was not flagged and as the first unqualified result from the well cannot be considered consistent with historical results. Whirlpool should continue the evaluation of the progress of biodegradation in the northern plume.*

**Ramboll Environ Response:** The concentration of TCE in MW-67 for the second quarter of 2015 is 0.77 µg/L. This value is qualified (i.e. J flagged). As discussed above, we have consistently considered qualified data as relevant data for evaluation of groundwater conditions particularly at plume boundary locations.

Whirlpool will continue to evaluate biodegradation in the northern plume.

**Volume 1, Section 4.1.2 Isoconcentration Maps:** *The discussion of plume stability, in the 2015 First Quarter Report, did not specify use of the 100 µg/L isoconcentration line. Discussions of plume stability generally contain the expansion or contraction of the aerial extent of the portion of the plume exceeding the MCL for the contaminant of concern. The use of the 100 µg/L isoconcentration line provides a line of evidence for total mass reduction in the plume. The aforementioned line is not considered for the stability or reduction of the aerial extent of the plume boundary as implied in the 2015 First Quarter*

*Report. Please use the position of the MCL isopleth when discussing plume expansion or contraction in future reports.*

**Ramboll Environ Response:** ADEQ is correct that the 2015 First Quarter Report did not discuss plume stability specifically regarding the 100 µg/L isoconcentration line, and we agree that plume stability should be based upon assessment of the 5 µg/L isoconcentration line. The 5 µg/L isoconcentration line will be used while discussing plume stability in the future.

Our previous responses to ADEQ's comments in our July 15, 2015 response letter should have indicated the change in area of the 100 µg/L isoconcentration line is a far better metric for assessing the impacts of groundwater remediation.

**Volume 2, Page 1, Section 2, Summary of Findings:** *ADEQ acknowledges Whirlpool's response. However, in the future when evaluating residential scenarios, ADEQ recommends evaluating carcinogenic health risks at 1E-6. Therefore, please ensure that the lowest possible laboratory reporting limits are achieved. If specific contaminants have reporting limits above their respective screening levels, please provide a brief discussion regarding these elevated reporting limits.*

**Ramboll Environ Response:** Ramboll Environ, on behalf of Whirlpool, will honor ADEQ's request to use 1E-06 as a point of departure for evaluating residential cancer risks. Cumulative cancer risk estimates will be evaluated based on USEPA's and ADEQ's acceptable cancer risk range of 1E-06 to 1E-04. Indoor air laboratory analysis was performed using Method TO-15 SIM to ensure that reporting limits fall below respective screening levels.

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Yours sincerely,



**Michael F. Ellis, PE**  
Principal

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## **LIST OF ATTACHMENTS**

Figure: Property Acquisition Map, Jenny Lind Road Relocation, Brazil to Jacobs