D R A F T

June 19, 2015

Mr. Michael Mikulka
USEPA – Region 5
77 West Jackson Blvd., LU-9J
Chicago, IL 60604-3590

Re: RCRA 3013 Administrative Order IND 005 462 601
Response to USEPA Comments Dated April 28, 2015
Additional Site Investigation Report for the Former Coke Plant
Tecumseh Redevelopment, Inc., East Chicago, Indiana

Dear Mr. Mikulka:

This letter has been prepared in response to the United States Environmental Protection Agency (USEPA) correspondence dated April 28, 2015, regarding the referenced Former Coke Plant located in East Chicago, Indiana. Based on previous investigation results, additional investigations were conducted in 2012 and 2013 to further evaluate soil, groundwater, and light non-aqueous phase liquids (LNAPL) impacts at the Former Coke Plant. This additional investigative work scope is presented in the USEPA-approved Additional Investigation/Source Evaluation Work Plan (Revision 1) dated March 2011, prepared by AECOM. In January 2014, an Additional Site Investigation Report for the Former Coke Plant was prepared by Ramboll Environ US Corporation (Ramboll Environ), formerly ENVIRON International Corporation (ENVIRON) and submitted to the USEPA. The USEPA provided comments to the Additional Site Investigation Report in a letter dated February 21, 2014. ArcelorMittal Indiana Harbor LLC (ArcelorMittal) provided responses to the USEPA's comments in a letter dated July 14, 2014. The April 28, 2015 USEPA correspondence provided comments to the July 14, 2014 letter and indicated that the following additional activities need to be included in a pre-design work plan to address data gaps related to the Former Coke Plant Area:

- sampling and evaluation of the uppermost 2 feet, not just the uppermost 6 inches, of soil, particularly at areas with surface soil quality data objective (DQO) exceedances;
- sampling to confirm that soil between 2 to 8 feet below ground surface (bgs) at boring MW-824D does not contain DQO exceedances;
- advancement of a soil boring in the immediate vicinity of boring MW-826M, in an effort to delineate the vertical extent of polycyclic aromatic hydrocarbons (PAH) contamination in this area; and
- steps to confirm and document that the aquitard is continuous across the site.

In addition, the USEPA indicated that concerns regarding the proposed 5-step process for evaluating risks to aquatic organisms and human health in the Indiana Harbor Ship Canal will need to be addressed in order for the USEPA to approve the Additional Site Investigation Report. The April 28, 2015 USEPA correspondence further requested that a revised Additional Site Investigation Report, which address the April 2015 USEPA comments, and a Pre-Design Work Plan, be submitted to the USEPA.

The April 28, 2015 USEPA correspondence (page 3) indicated that it may be most efficient if the USEPA and ArcelorMittal reach agreement on the approach to risk calculations prior to their completion. To that end, this letter has been prepared to provide responses to the USEPA's General Comment 3 and Specific Comment 16 of the April 28, 2015 USEPA correspondence. The USEPA comments are identified below, and the corresponding responses are provided below each comment in ***bold and italic font***.

Upon further discussion of these responses and concurrence with the proposed approaches herein, a final comment response letter will be prepared which will address all of the USEPA comments. The final comment response letter will be submitted along with revised text, tables, and figures, all of which will be incorporated into the January 2014 Report and submitted to the USEPA as the Final Additional Site Investigation Report. The Final Additional Site Investigation Report will be followed by preparation of the Pre-Design Work Plan, which will address the additional delineation work requested by the USEPA and pre-design remedial activities required to enable completion of a Corrective Measures Study Report as recommended in the January 2014 Report. A Pre-Design Report will be subsequently prepared to summarize the additional information collected during implementation of the Pre-Design Work Plan. The Pre-Design Report will also include (as an appendix) the results of the Focused Ecological and Human Health Tiered Risk Assessments further discussed below in response to General Comment 3 and Specific Comment 16.

USEPA General Comment 3

Please note that EPA does not approve the use of the 10x dilution factor proposed as part of the evaluation of ecological risks from groundwater within the Indiana Harbor Ship Canal or Lake Michigan. The 10x dilution factor you referenced is used within EPA's internal groundwater environmental indicator report, but is not appropriate to use as you have suggested in your response. As is noted in your response, in a screening level ecological assessment (SLEA), maximum values are compared to the conservative screening values, or to "no observable adverse effects level" (NOAEL) benchmarks. The first step in the ERA is therefore to screen maximum concentrations, with no dilution, of each constituent found in the groundwater, against the ESLs. Those constituents that exceed the ESLs are retained for further evaluation in a baseline ecological risk assessment (BERA). Less conservative benchmarks, or lowest observable adverse effects level (LOAEL) benchmarks are used as part of the BERA. A tiered approach is presented in the responses to select LOAELs for use in the BERA.

Response: To clarify, the 10x factor proposed in the July 11, 2014 letter was not intended as a NOAEL-to-LOAEL adjustment factor. Rather, as further discussed below, it was intended to reflect dilution and attenuation expected to occur as groundwater is discharged to surface water. We intend to compare maximum chemical concentrations to ESLs as an initial step. A refined evaluation of potential risk will be undertaken for those chemicals that have maximum concentrations greater than their respective ESLs.

In the response to General Comment 3, ArcelorMittal acknowledges that aquatic organisms in the Indiana Harbor Ship Canal may be exposed to contaminants via groundwater discharge, and proposes a 5-step process for evaluating risks to aquatic organisms in the Indiana Harbor

Ship Canal. ArcelorMittal should address the following concerns regarding the proposed 5-step approach:

Response: An expansion of analyses beyond the typical SLERA may be necessary in order to accurately characterize the likelihood of adverse ecological effects as a result of groundwater discharge to surface water via the breach in the sheet piling. In the interest of proceeding rapidly towards remediation, we will evaluate whether an expanded SLERA is sufficient to determine that no further evaluation of ecological risk is warranted. If so, the SLERA will include a conclusory step that considers factors such as:

a) dilution and attenuation as groundwater discharges to surface water via the breach in the sheet piling;

b) studies that underpin screening values and resultant conservatism and uncertainty; and

c) chemical-physical properties (e.g., volatility, solubility, partitioning factors, influence of hardness) of groundwater constituents and how those factors influence the constituents' toxicity, bioaccumulation, volatilization, and/or partitioning to organic carbon.

The responses that follow are intended to help clarify how and why this step will be conducted as a means of expanding the SLERA. Even if the expanded SLERA concludes that further evaluation (i.e., a BERA) is warranted, it is expected that the expanded SLERA will enable the BERA to focus on only those constituents and pathways that are likely to cause adverse ecological effects.

- Step 1 is acceptable. Refinement of the conceptual site model is an important first step in understanding contaminant fate and transport.

  Response: Confirmed.

- EPA does not agree with the approach laid out in Step 2. It is not appropriate as a refinement of the ecologically based benchmark, or better stated, the first tier in selecting a LOAEL, to multiply the ESLs by 10. Although it is appropriate to calculate a NOAEL from a LOAEL assuming a 10 fold lower effect, it is not appropriate to apply this logic in reverse; that is, to calculate a LOAEL from a NOAEL. The actual lowest level of effects can be missed using this approach. Oftentimes the LOAEL is only a fraction higher than the NOAEL. Using the approach you suggest would result in a LOAEL bench mark that is not conservative enough and is not acceptable for use in this ERA. As mentioned above, all methodologies used within EPA groundwater environmental indicator report are not appropriate for use in the ERA. The first tier in selecting a LOAEL should be the selection of EPA's chronic ambient water quality criteria (AWQC). Many ESLs are already based on AWQC. The next appropriate tier would be the application of IDEM's AWQC, followed by Michigan DEQ's final chronic values (FCVs).

  Response: The 10x factor is not intended as a NOAEL-to-LOAEL adjustment factor and instead reflects a conservative estimate of dilution and attenuation that occurs when groundwater discharges to surface water. Dilution and attenuation must be accounted for in order to accurately predict ecological risks because

ecological receptors are not directly exposed to constituents in groundwater. The EI CA750 guidance (USEPA, 1999b) and USEPA's June 18, 2013 comments on the North Lagoon LNAPL report (USEPA, 2013) both recognize the appropriateness and conservatism of accounting for dilution and attenuation using a 10x factor. Given that the EI CA750 guidance applies to the same regulatory program (i.e., RCRA) as this SLERA and is also intended as a conservative screening tool, it is applicable to this purpose. Likewise, the North Lagoon report is a highly relevant and applicable precedent, in that it is part of the same overall site and regulatory program, and is a recent submittal.

In light of the Site's current regulatory status and all parties' preference to move quickly towards remediation, expansion of the SLERA methodology is an efficient means of proceeding. An expanded SLERA will eliminate those compounds that, upon discharge to surface water, will be present at concentrations below conservative screening values. This approach may eliminate the need for a BERA altogether or, if a BERA is needed, ensure that it focuses on those constituents most likely to pose ecological risk.

Given the importance and appropriateness of accounting for dilution and attenuation as groundwater discharges to surface water via the breach in the sheet piling, the question then becomes one of methodology. Collection of empirical data (i.e., sampling surface water immediately downstream of the breach) is not an option for this site given the many sources of constituents to the canal. Due to the presence of numerous sources, direct measurement of surface water will not enable us to determine which constituents originate in site groundwater. Therefore, modeling is necessary to estimate dilution and attenuation upon discharge of groundwater to surface water.

Dilution and attenuation of groundwater could be modeled based on flow and volume of groundwater discharged through the breach in the sheet piling relative to canal flow and volume. However, variability in all factors may result in considerable variability and uncertainty in the model's output. Such modeling also would slow down the overall assessment and remediation process, since a breach in sheet piling is not a standard scenario considered in off-the-shelf models. In our experience generating site-specific dilution and attenuation factors for waterways of similar scale, we have observed that the resultant dilution and attenuation factors tend to be much greater than 10, sometimes by orders of magnitude. Therefore, we expect the 10x dilution and attenuation factor to be quite conservative. For these reasons, we recommend retaining the 10x dilution and attenuation factor as an expansion of the SLERA, based on its ease of implementation, regulatory precedent, and conservatism.

If there are chemicals in groundwater present with a 95% UCL concentration greater than 10 times the screening value, it may still be necessary to generate a site-specific dilution and attenuation factor in order to realistically assess the risk that they may contribute. If so, then the application of the 10x dilution and attenuation

factor will reduce the number of chemicals subjected to the site-specific modelling, thereby reducing time and complexity in the site-specific analysis.

If a constituent still lacks an appropriate LOAEL, then a literature search is appropriate, keeping in mind that the effects level should not exceed 20%. Also, for constituents lacking ambient water quality criteria and for which ArcelorMittal derives literature-based values, the following information should be provided to support the derived values: a detailed description of literature search and review methods, a tabulation of study methods and results for all relevant studies identified in the literature, and a complete description of the rationale for the final toxicity values selected for use in the risk assessment.

Response: We will apply these recommendations for selecting toxicity values.

- Use of the 95% upper confidence level on the mean (95% UCL) is appropriate as part of Step 3. It is not clear how professional judgment would be used "to determine the likelihood that concentrations at the groundwater/surface water interface do or will exceed refined ecological benchmarks." It would seem that the concentrations either exceed the benchmarks or they do not; professional judgment does not seem to apply.

  Response: We agree that determination of whether a 95% UCL concentration exceeds a benchmark is a binary question—either the 95% UCL does or does not exceed the benchmark. However, there can be circumstances when a 95% UCL exceeds a benchmark, but such exceedances are unlikely to translate to adverse ecological effects. This is where professional judgment may be considered within the expanded SLERA. Examples of such circumstances are described below for illustrative purposes. However, until the analysis is conducted, it is not possible to know which (if any) circumstances are pertinent to this site. As such, the following examples are hypothetical.

  The magnitude of 95% UCLs is directly tied to sample size and variability across results. As such, the 95% UCL may be quite high (e.g., higher than the maximum measured concentration) if the sample size is low and/or the data set is highly variable. Its value also may be unduly influenced by non-detect results with elevated detection limits. Even if the 95% UCL is not strongly influenced by such data limitations, an exceedance of a benchmark may reflect conservatism inherent in the benchmark.

  If the benchmark was developed from a published study (which may be the only study available) that is not very representative of the Indiana Harbor, uncertainty in the benchmark may contribute to uncertainty in interpreting the implications of exceeding the benchmark. For example, the study used as the benchmark basis may have been conducted under very different environmental conditions or with test organisms that are not present or under conditions that do not represent the Indiana Harbor area. These are the types of factors that may be considered qualitatively while comparing 95% UCLs to benchmarks and judging the environmental implications of any exceedances. Presentation of such considerations represents an expansion of the typical SLERA.

- Step 4: Regarding refined ecological benchmarks, note that EPA and state ambient water quality criteria are typically developed based only on direct exposure to aquatic organisms, and use of these criteria may not be adequately protective of exposures through food web pathways. Additional methods for evaluating dietary risks to aquatic life may be needed for persistent, bio-accumulative, and toxic chemicals. Risks to higher level trophic receptors need to be considered through food chain modeling, if necessary.

  Response: Bioaccumulative chemicals of potential ecological concern (COPECs) will be defined consistent with USEPA's Final Water Quality Guidance for the Great Lakes System (60 Federal Register: 15365; March 23, 1995, Table 6). No chemicals defined by USEPA as bioaccumulative[1] that have been analyzed in groundwater have been detected in the monitoring wells most proximate to the breach in the sheet piling. Thus, further evaluation of higher trophic level receptors through food chain modeling will not be warranted. The basis for this conclusion will be presented in the expanded SLERA.

- Additional detail regarding the calculation of the refined exposure point concentrations (EPC) is needed prior to approval. Please tabulate all monitoring wells and sample dates that will be included in the EPC calculations, and describe the approach that will be taken with respect to time-series data. It may be most efficient if EPA and ArcelorMittal reach agreement on these details before EPC and risk calculations are conducted.

  Response: Our primary objective in selecting monitoring wells and sampling events for inclusion in calculating the EPC is to identify and include data that are most representative of discharges to the ship canal via the breach in the sheet piling. Secondary and related objectives are to avoid diluting results with less applicable data and to retain data that are consistent with the most representative data.

  Given these objectives, the monitoring wells most proximate to the breach—both laterally and vertically—were selected for inclusion. These wells are MW-827S, MW-810S, MW-826S, MW-826M, MW-809S and MW-809M. On this basis, it is appropriate to pool groundwater data across these six wells.

  These six wells were sampled in both 2012 and 2013. In order to determine whether it is appropriate to pool the groundwater data for these six wells across the two sampling events, we plotted the probability distribution functions for the resultant data by year for five representative constituents (arsenic, benzene, cyanide, sulfate and ammonia). As shown below, the probability distribution functions are qualitatively similar across the 2 years for the five representative constituents. On this basis, it is also appropriate to pool data for the six wells across the two sampling events (i.e., 2012 and 2013).

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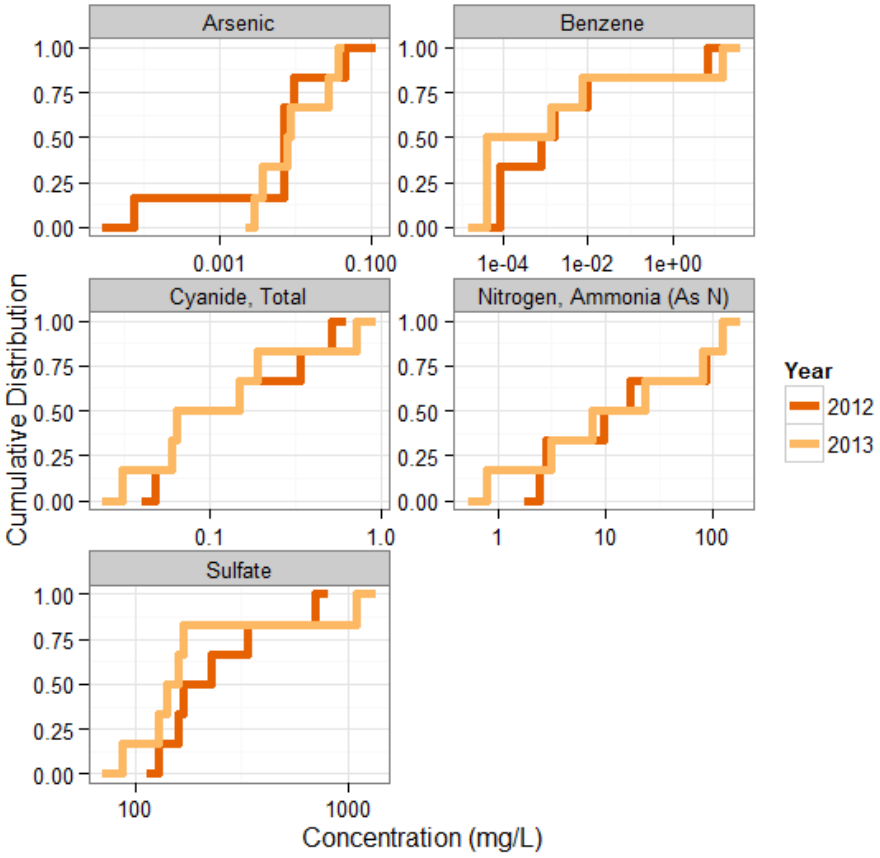
[1] i.e., alpha-lindane, beta-lindane, camphechlor, chlordane, DDD, DDE, DDT, delta-lindane, dieldrin, gamma-lindane, hexachloro-1,3-butadiene, hexachlorobenzene, 1,2,3,4,5,6-hexachlorocyclohexane (mixture of isomers), mercury, mirex, octachlorostyrene, pentachlorobenzene, photomirex, polychlorinated biphenyls, 1,2,4,5-tetrachlorbenzol, 1,2,3,4-tetrachlorobenzene, 2,3,7,8-tetrachlorodibenzo-p-dioxin

In summary, we propose to calculate 95% UCL concentrations by pooling groundwater data for wells MW-827S, MW-810S, MW-826S, MW-826M, MW-809S and MW-809M across wells and across years, an approach that best meets the objectives listed in the opening paragraph of this response.



- Note that ArcelorMittal should discuss, and EPA will consider, the uncertainty around any qualitative evaluations of fate and transport. Quantitative evaluation is preferred.

  Response: Qualitative evaluation of fate and transport, to the extent that it is employed at all, is expected to take the form of general conclusions regarding anticipated chemical behavior based on each constituent's volatility, solubility, and/or partitioning behavior, as well as the water's hardness. For example, volatile compounds (as defined by chemical class and/or Henry's Law coefficient) will volatilize upon discharge from groundwater into surface water. As such, volatile compounds are not expected to accumulate in surface water over time. Similar qualitative fate and transport discussions may be presented in the expansion of the SLERA.

  As discussed above, a fate and transport model may be used to quantitatively estimate site-specific dilution and attenuation that occurs when groundwater discharges to surface water via the breach in the sheet piling. The site-specific

model would be developed if one or more constituents are found to warrant further site-specific evaluation.

In addition, ArcelorMittal should confirm that there is no discharge of groundwater to bottom sediments in the Indiana Harbor Ship Canal (i.e., that groundwater only discharges to the canal through breaches in sheet pile wall). If this assumption is not correct, additional ecological risk evaluation will be required.

Response: Indiana Harbor Ship Canal sediments are not germane to this assessment for the following reasons:

1. ***The Canal and Turning Basin are being remediated by the Army Corps of Engineers with funds supplied by multiple parties.***
2. ***The contribution, if any, from the Coke Plant cannot be readily distinguished from the documented current and historic upstream sediment loading from other industrial facilities.***

Even if the above were not key factors at this site, the following information leads to the conclusion that groundwater is discharging to the Indiana Harbor Ship Canal through breaches in the sheet pile wall, rather than to bottom sediments in the Canal:

> ***Sheet pile barriers were historically emplaced within the Indiana Harbor Ship Canal to define and create the Indiana Harbor Ship Canal. These interlocking walls of sheet steel were driven through the permeable Calumet aquifer and anchored in the underlying low permeability confining unit. Groundwater to surface water discharges along the Indiana Harbor Ship Canal and Lake Michigan shorelines were estimated by AECOM in 2009, based on the results of flow modeling using an analytic element model known as GFLOW.***
>
> ***Based on the results of model calibration and sensitivity analysis, the estimated hydraulic conductivity of the sheet pile revetments is on the order of 5×10^{-7} cm/s. This hydraulic conductivity is 99.998 percent less than the estimated hydraulic conductivity of Calumet aquifer sands, based on geometric mean of in-situ hydraulic conductivity testing conducted in ten shallow monitoring wells at the Former Coke Plant site (3.1×10^{-2} cm/s). Groundwater elevation data for Coke Plant shallow monitoring wells located in closest proximity to the Indiana Harbor Ship Canal reveal the presence of groundwater mounding that is consistent with the discontinuity in hydraulic conductivity between the Calumet aquifer sands and the sheet pile barrier. Ranges in measured groundwater elevations obtained in October 2012 and July 2013 for the shallow monitoring wells are summarized as follows.***

For the October 2012 data, groundwater elevations for those wells near the shoreline where the sheet pile barrier is present (MW-817S and MW-818S) ranged from 581.83 to 582.36 feet, whereas the groundwater elevations for those wells

near the shoreline where the sheet pile barrier is absent to a depth of 25 feet (MW-810S, MW-826S and MW-827S) ranged from 577.69 to 580.05 feet.

For the July 2013 data, groundwater elevations near the shoreline where the sheet pile barrier is present ranged from 583.70 to 584.92 feet, and the groundwater elevations near the shoreline where the sheet pile barrier is absent ranged from 578.78 to 580.81 feet.

The groundwater elevation data near the sheet pile barrier are approximately 3 to 4 feet greater than in the shoreline area of the sheet pile barrier breach. Based on the available data, the sheet pile barrier is re-directing groundwater flow towards the breached area. In addition, based on information contained in Cohen et al. (2002), hydraulic conductivities in the Calumet aquifer are generally 100 to 10,000 times greater than hydraulic conductivities in the underlying and continuous clay confining unit, as will be further documented in the revised Additional Investigation Report. Moreover, groundwater flow in the underlying confining unit is mostly vertical with relatively minor amounts of horizontal flow.

The observed groundwater mounding near the sheet pile barrier relative to groundwater levels near the breach, coupled with the reported absence of horizontal groundwater flow in the underlying clay confining unit (within which the sheet pile barrier is anchored), lead to the conclusion that groundwater is discharging to the Canal through breaches in the sheet pile wall, rather than to bottom sediments in the Indiana Harbor Ship Canal.

USEPA Specific Comment 16

The Response to Specific Comment 16 needs to be revised, consistent with the discussion in Response to General Comment 3. ArcelorMittal appears to be proposing the same approach to human health risk assessment. That approach would also not be appropriate. The text identifies arsenic, benzene, toluene, and pentachlorophenol as constituents for further evaluation for potential human health and ecological risk. However, based on review of Table 11, this list appears relevant to human health risk only. The list of constituents to be evaluated further for ecological risk, according to the approach described in General Comment 3, should include all constituents that exceed the ecological screening level. Aquatic impacts related to conventional parameters ammonia, chloride and phenols should also be addressed. There appear to be significant ammonia and chloride contamination at depth.

With respect to human health risk, EPA concurs with the plan to perform a Focused Human Health Tiered Risk Assessment for further human health risk evaluation at the site. This Tiered assessment would be focused specifically on groundwater contaminants which currently discharge or have the potential to discharge to surface water. EPA has the following comments and requirements for the Focused Assessment:

(a) EPA will view the proposed Focused Assessment as a baseline evaluation for all detected contaminants which have the potential to contribute to discharges to surface water based on the available groundwater monitoring data. (Response 16 cites a "less than 10 times the applicable groundwater standard" as a factor applied in the

groundwater environmental indicator report. That procedure is useful for evaluating the need for groundwater migration controls, but it is not appropriate as a screening procedure for a baseline risk assessment.) Consequently, EPA does not believe that it is appropriate to screen out all of the constituents which have maximum detected concentrations less than ten times higher than their respective drinking water standards. Those constituents could also contribute to the baseline exposure and health risk associated with groundwater releases to surface water. The list ·of detected "Constituents in Groundwater" shown in Table 11 of the letter response appears to be the appropriate starting list for constituents of concern (COCs) in the human health assessment. If there are constituents in Table 11 which are concern for a baseline ecological assessment but not for a baseline human health assessment, those constituents may be candidates for removal from the COC list after appropriate rationale is provided.

Response: The approach to identifying human health chemicals of concern for groundwater is proposed to be revised as follows: 1) any groundwater constituent present at a concentration less than the respective maximum contaminant level (MCL) will not be considered further. The rationale for this approach is if the concentration is safe for drinking water it is also acceptable in this exposure context (i.e., discharge to the canal) and 2) constituents that do not have an MCL or are present at concentrations greater than the MCL will be considered through comparison with a risk-based concentration that will be derived to be protective of a reasonable maximum exposure scenario for contact with contaminants in the canal surface waters (i.e., an exposure scenario for accidental immersion in the canal). This scenario will be fully described in the screening assessment and is also summarized under 16.c below. Briefly, USEPA RAGs (1998) equations will be solved for the concentration term using a 1 in 1,000,000 cancer risk for carcinogens and a hazard index of 1 for non-cancer effects. USEPA toxicity values will be applied using the USEPA hierarchy of values (USEPA, 2003 and 2013). Exposure parameters will be drawn from USEPA guidance including the USEPA 2011 Exposure Factors Handbook (USEPA, 2011) and the USEPA 2014 Update of Standard Default Exposure Factors and other resources as appropriate.

(b) For Step 1 of the Tiered assessment, it would be appropriate for the COCs identified in #1) above to have individual exposure point concentrations determined by calculating 95% UCL mean concentrations. That approach is acceptable with the following conditions. The EPA ProUCL procedure and recommendations should be followed (http://www.epa.gov/osp/hstl/tsc/software.htm). The assessment needs to explain which set of groundwater data will be used for the calculations. For example, will only data from monitoring wells located immediately upgradient of the breached sheet pile wall be used, and will data from all sampling events be used. If the recent groundwater constituent data show significant upward (or downward) trends in concentration, then the effect of concentration trends on the calculated UCL concentrations should be addressed in the analysis (the ProUCL guidance also presents options for handling non-detect values).

Response: The applicable groundwater data, and rationale for its use, are detailed in response to Comment 3. In summary, we propose to calculate 95% UCL concentrations by pooling groundwater data for wells MW-827S, MW-810S, MW-826S, MW-826M, MW-809S and MW-809M across wells and across years. The USEPA recommended ProUCL software and procedure will be followed and output will be documented and provided with the report.

(c) For Step 2, the assessment must explain why the apparent proposed exposure scenario (i.e., very short-term whole body exposure) is the appropriate conservative and only exposure scenario needed for the risk evaluation of all the COCs. This concern is relevant in light of the potential for long-term or chronic continuing COC discharges from groundwater that could have a range of physical- chemical properties (e.g., volatile, semivolatile, deposition to sediments). As suggested for Step 2, after the baseline individual and cumulative risks and hazard estimates are calculated, the assessment may consider uncertainty and sensitivity factors such as the effects of dilution, comparison to federal/state groundwater standards, and COC fate and transport.

Response: The site is heavily industrialized with no direct access to groundwater now or in the future for non-site personnel and is fenced and monitored 24 hours per day. The migration of groundwater to offsite surface water and sediments are potential exposure pathways. For reasons discussed in response to Comment 3, assessment of sediments is not germane to this evaluation. Even if sediments were germane, however, the potential for contact with sediments is minimal. Access to the canal, to the extent that it occurs at all, could only occur by boat. Contact with surface water in the canal is therefore expected to be limited to contact during water sports. In the unlikely event of surface water contact during water sports in the canal, contact with sediment is likely to be rare/negligible and, even if it does occur, surface water would readily wash the sediment off the body.

Some of the identified constituents present in groundwater are highly volatile (e.g., benzene), and thus could move from groundwater to surface water to outdoor air. Given the concentrations in groundwater, volatile constituents would be expected to be quickly dissipated. This pathway will be further evaluated in a qualitative or semi-quantitative manner.

As noted above, some limited use of the canal for recreational boating is possible though unlikely. Consequently, exposure for a person who contacts chemicals of concern in surface water is considered to be a reasonable maximum exposure scenario. Specifically, as described under the response to Comment 16a, a scenario assuming an individual becomes accidentally immersed in the canal will be used to derive risk-based concentrations for surface water. Ingestion and dermal contact with chemicals in surface water will be evaluated in this scenario and risk-based concentrations will be derived using USEPA guidance and algorithms. The screening level assessment will include a conceptual site model that will describe all potential exposure pathways.

(d) For Step 3, the assessment should identify the individual COCs or combination of COCs that exceed risk or hazard index limits. The assessment can explain how already planned remediation methods might mitigate those risks. But EPA is likely to require confirmation sampling (e.g., groundwater, soil contaminant sources) before concluding that no further action is required.

Response: Comment acknowledged. Step 3 of the screening assessment will be conducted as requested by the USEPA.

As indicated above, upon further discussion of these responses and concurrence with the proposed approaches herein, a final comment response letter will be prepared which will address all of USEPA comments. The final comment response letter will be submitted along with revised text, tables, and figures which will be incorporated into the January 2014 Report and submitted to the USEPA as the Final Additional Site Investigation Report. If you have any questions regarding ArcelorMittal's responses to USEPA's comments, please contact us at your convenience.

Sincerely,

ArcelorMittal USA

Keith Nagel
General Manager, Environmental Affairs and Real Estate

cc: Tom Barnett, ArcelorMittal USA
Cary Mathias, ArcelorMittal USA

References

Cohen, D.A., Greeman, T.K., and P.M. Buszka, 2002. *Surface-Water and Ground-Water Hydrology and Contaminant Detections in Ground Water for a Natural Resource Damage Assessment of the Indiana Harbor Canal and Nearshore Lake Michigan Watersheds, Northwestern Indiana*, U.S. Geological Survey Administrative Report, 135 pp.

USEPA, 2014. Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors available at: http://www.epa.gov/oswer/riskassessment/pdf/superfund-hh-exposure/OSWER-Directive-9200-1-120-ExposureFactors.pdf

USEPA, 2013. Superfund Risk Assessment: Human Health: Toxicity (Hazard Identification and Dose Response) http://www.epa.gov/oswer/riskassessment/superfund_toxicity.htm.

USEPA, 2011. Exposure Factors Handbook. Available at http://www.epa.gov/ncea/efh/pdfs/efh-complete.pdf

USEPA, 2003. Human Health Toxicity Values in Superfund Risk Assessments. Available athttp://www.epa.gov/oswer/riskassessment/pdf/hhmemo.pdf

USEPA, 1989. Risk Assessment Guidance for Superfund. Available at http://www.epa.gov/oswer/riskassessment/ragsa/pdf/rags_a.pdf