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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF

SR-6J

APR 08 2019

Mr. Leo Brausch
Brausch Environmental, LLC
5318 Alexa Road
Charlotte, North Carolina 28277

Re: EPA Comments on Surface Water Sampling Work Plan for Indian Ridge Marsh
Remedial Investigation/Feasibility Study for Operable Unit 2
Lake Calumet Cluster Site, Chicago, Illinois

Dear Mr. Brausch:

The U.S. Environmental Protection Agency and the Illinois Environmental Protection Agency have reviewed the *Surface Water Sampling Work Plan for Indian Ridge Marsh (Work Plan)*, dated August 2018 for the Lake Calumet Cluster Site (Site) in Chicago, Illinois. The Work Plan, prepared by Arcadis, on behalf of the Lake Calumet Cluster Site Group, was submitted as part of the Operable Unit 2 Remedial Investigation/Feasibility Study being conducted at the Site.

Enclosed are EPA comments on the above referenced Work Plan. If you have any questions regarding this letter, please contact me at (312) 886-6151 or by e-mail at kolak.shari@epa.gov.

Sincerely,

Shari Kolak
Remedial Project Manager
Superfund Division

Enclosure

cc: Nicole Wilson (IEPA)

EPA COMMENTS
SURFACE WATER SAMPLING WORK PLAN FOR
INDIAN RIDGE MARSH DATED AUGUST 30, 2018
LAKE CALUMET CLUSTER SITE
CHICAGO, ILLINOIS

I. General Comments

Summary General Comment: The Lake Calumet Cluster Site (LCCS) Group should rethink the overall design and timing for implementation of a surface water sampling effort in North Indian Ridge Marsh (NIRM or the Study Area) until after sufficient hydraulic and hydrogeologic data can be collected and analyzed to support a sound sampling design. The current design does not have a sound basis. Results from a study such as that proposed in the *Surface Water Sampling Work Plan, Indian Ridge Marsh*, dated August 2018 (SWSWP) may be inconclusive and result in data that is less than defensible to achieve the intended project objectives.

II. Specific Comments

Comment 1: Section 2, Background – It is unclear in Section 2, Background, of the *Surface Water Sampling Work Plan, Indian Ridge Marsh*, dated August 2018 (SWSWP) where and if groundwater is exiting to surface water in the NIRM/Study Area from the LCCS/Site. Sources of relative recharge to the NIRM are not documented other than to mention the number of acres in the watershed as being 185 Acres. It is unclear how much of the surface water in the NIRM are expected to be contributed from the LCCS as opposed to other sources such as the watershed, industrial sources, or the Calumet River. The successful performance of the proposed study to determine if LCCS groundwater impacts NIRM, assumes that the primary source of recharge to the NIRM surface water is from the LCCS. This is unlikely, given the geographic location and the expected influence from other sources of recharge to the NIRM. More information is needed to substantiate the expected flow paths are from the Site to surface water in the Study Area. Data concerning groundwater to surface water potential flow paths need to be analyzed to confirm that sampling exclusively surface water in the Study Area will provide meaningful results. Sampling locations need to be identified that target potential discharges points based on a hydrogeologic and hydraulic model of the Site and the NIRM. Creation of a water balance and hydrogeologic and hydraulic model for the Site and surrounding areas are needed before it can be confirmed that contaminated groundwater from the Site is expected to primarily discharge to surface water in the NIRM. If groundwater gradients are not confirmed as upwards in the NIRM/Study Area the LCCS Group may need to consider sampling of groundwater beneath the Study Area to achieve the desired objective for the study of evaluating potential impacts from the Site to the Study Area.

Comment 2: Section 2, Background - During wet periods it is highly likely that recharge to the NIRM by other sources of water such as precipitation and the Calumet River will act to dilute the evidence of any influence to the NIRM from the Site. Therefore, the timing for any surface water sampling event in the NIRM needs to be carefully selected based on a sound hydraulic and hydrogeologic model. A simple hydraulic and a hydrogeologic model need to be prepared and presented as the basis for any sampling design in this section of the plan. The LCCS Group may

want to consider installing additional wells in the proposed Study Area and beneath the Site to obtain the necessary data to support a flow model for the Site and proposed Study area. The collection of additional water level data over time, use of geophysical surveys and tracer studies may also need to be considered prior to attempting to design a meaningful surface water and groundwater/pore water sampling event in the NIRM.

Comment 3: Section 3, Surface Water Collection Objectives – The objective of the SWSWP in the Study Area should also include an evaluation of potential impacts to shallow groundwater from the LCCS to the NIRM. Based on the fact that standing water is present in the marsh areas during much of the year, it is very likely that shallow groundwater gradients are downward. Therefore, sampling exclusively surface water in the Study Area may not identify any influences to surface water from contaminated groundwater from the Site to the NIRM. Unless confirmed otherwise, shallow groundwater should be considered as part of any study proposed to evaluate impacts from the Site to the Study Area. Groundwater gradients would need to be demonstrated to be upwards in the Study Area in order to consider limiting sampling to surface water and potentially pore water in the proposed Study Area. The magnitude of the gradients and expected flow directions must be considered before a sound sampling plan can be designed to evaluate impacts from the Site to surrounding water systems.

Comment 4: Section 3, Surface Water Collection Objectives – Reference to the specific data quality assessment (DQA) protocols to be used to evaluate potential impacts from the Site to the IRM should be provided. The DQA protocols should be provided in the Uniform Federal Policy Quality Assurance Project Plan (UFP -QAPP) as required under the 2013 Operable Unit 2 Administrative Order on Consent.

Comment 5: Section 3, Surface Water Collection Objectives - In this section and in Table 1 of this SWSWP, an analytical data reduction process was applied to limit those analytes that will be used to evaluate potential impacts from the Site to surface water in the Study Area. The process proposes pairing down the target analyte list by selecting only those analytes that have consistently been detected in each of the four former groundwater sampling events. However, there is a concern that there is a need for additional wells and sampling on the Site and in the Study Area. Additional well data may change the list of target analytes. Additional parameters may also need to be added to confirm expected flow paths and to identify potential contributions to the wetlands from other sources. Until more is known about the flow paths between the Site and the proposed Study Area, it appears that the reduction of target analytes should be delayed for Site to Study Area comparisons until more is known and the intended data reduction protocols are clearly defined. Some additional basic water quality parameters and or intrinsic isotopic tracers may need to be considered as well to verify the flow model for the Site and surrounding environs.

General Comment 4: Section 3, Surface Water Collection Objectives – The list of screening criteria used in Appendix A to determine a list of constituents for this sampling are insufficient. There are a number of analytes detected that do not have either Illinois or USEPA water quality standards or criteria. Further evaluation of the data needs for making data comparisons between the Site and the Study Area are needed.

Comment 6: Section 4, Sampling Design – In this section, the hydraulic and hydrogeologic data used to establish the design basis needs to be discussed. Groundwater gradient and flow direction data along with surface water measurements and other relevant data need to be presented in the context of a site-specific hydrogeologic and hydraulic model for the Site and Study Area. Preferential flow paths and potential source area water contributions need to be discussed. The type of data needed to support the study design basis should include, but not be limited to seasonal aerial photo interpretations, staff gauge measurements on the Site and in the Study Area, water level and chemical data from paired multi-level wells along the boundary with the Study Area and the Site.

Comment 7: Section 4, Sampling Design - The monitoring wells located along the boundary of the LCCS and the Study Area may not be comparable or representative of water expected to surface in the Study Area from LCCS. Water levels are near the surface in wells along the boundary between the LCCS and the Study Area, while screened intervals are much lower in most of these wells. For example, in MW-6, groundwater is at the surface, while the screened interval is in the waste at between 12 and 22 feet below ground surface (Reference: *Appendix E, Technical Memorandum: Groundwater Assessment, Lake Calumet Cluster Site Operable Unit 2, July 2017*). Groundwater at the surface in this well may be representative of precipitation which is the most likely water to be actively discharging to the Study Area unless vertical upward gradients can be shown to be present in the Study Area. The presence of upward gradients in the Study Area is unlikely given the apparent amount of recharge expected into the marshes surrounding the Site. Use of shallow wells screened just below the water table on the Site and in the Study Area may be needed to evaluate the representativeness of the existing well data for comparison to surface water in the Study Area. Unless upward gradients are evidenced in the shallow groundwater in the Study Area, deeper wells (e.g., existing piezometers) in addition to surface water samples may be needed to monitor for potential impacts from the LCCS. Geophysical and tracer study data could also be useful in determining where and when surface water or deeper pore water sampling is the most appropriate method of sampling at a specific location and depth.

Comment 8: Section 4.1, Sampling Locations – Additional reference locations should be selected from areas in the northern portion of the Study Area near the inlet to the NIRM. In addition, the rationale (e.g., current sources) for the selected reference locations shown on Figure 3, should be provided. Also, investigative samples of surface water (and potentially groundwater) should be focused where preferential pathways are expected to be present. For example, in the northeast corner of the LCCS where pump test data suggest the presence of high conductivities in the waste or in areas where consequence drainages cut the LCCS and may act to channel surface water and shallow groundwater into the Study Area. Localized drainages are evidenced in aerial photographs of the Site and could create localized areas with upward gradients in the Study Area. As previously noted, geophysical or tracer study data could also be useful in determining where the investigative samples in the Study Area should be taken.

Comment 9: Section 5, Schedule and Reporting – It is very likely that hydraulic and hydrogeologic conditions change at the Site during alternating seasonal episodes of wet and dry conditions. Real-time monitoring of changes in water levels in the Study Area and in related groundwater are needed before the best time for sampling can be determined. In most cases, to

limit dilution from runoff, surface water sampling in marsh areas are generally performed during periods of low flow (dry season). The exact time for sampling should be evaluated through the collection of continuous water elevation data. Timing of sampling efforts should also consider weather forecasts prior to conducting any sampling.