State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
2984 Shawano Avenue
Green Bay WI 54313-6727

Tony Evers, Governor
Preston D. Cole, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

June 22, 2022

TECUMSEH PRODUCTS COMPANY
ATTN: STAN GILHOOL, GENERAL COUNSEL
5683 HINES DRIVE
ANN ARBOR, MI 48108

[*Via Electronic Mail Only to* stan.gilhool@tecumseh.com]

Subject: Natural Recovery Monitoring Plan for Surface Water and Sediment Not Approved
HARP Site Long Term Monitoring, BRRTS # 02-08-587669

Dear Mr. Gilhool:

The Natural Recovery Monitoring Plan for Surface Water and Sediment dated December 22, 2021, submitted to the Department of Natural Resources (DNR), as required by the November 2018 Negotiated Agreement for the Hayton Area Remediation Project (HARP) Site Long Term Monitoring, is not approved.

The Natural Recovery Monitoring Plan for Surface Water and Sediment does not meet the requirements of Wis. Admin. Code ch. NR 724 and is missing necessary and pertinent information, as referenced in the attached comments. The comments provided are intended to refine the monitoring plan to improve the work product and assist with compliance with the regulations.

The comments should not be interpreted as all the requirements necessary to comply with Wis. Admin. Code ch. NR 724 for a natural recovery monitoring plan and ch. NR 726 for case closure. All relevant information should be included in the revision.

The Natural Recovery Monitoring Plan for Surface Water and Sediment must comply with Wis. Stat. ch. 292 and the Wis. Admin. Code ch. NR 700 rule series. As stated in Section XIV of the Negotiated Agreement, "[n]othing herein shall preclude the State from requiring Tecumseh to undertake other or additional environmental response actions at the Site that may otherwise be required of Tecumseh as a responsible party pursuant to Wis. Stats. ch. 292 and the Wis. Admin. Code ch. NR 700 administrative rule series."

Therefore, within 60 days of the date of this letter, by August 21, 2022, revise and re-submit the monitoring plan with a $425 long-term monitoring plan review fee.

Please contact me at (920) 510-8277 or by email at Sarah.Krueger@wisconsin.gov if you wish to discuss this further.

Sincerely

Sarah E Krueger

Sarah Krueger, P.G.
Project Manager, Northeast Region
Remediation & Redevelopment Program

Attachment: DNR Comments on the Natural Recovery Monitoring Plan for Surface Water and Sediment

HARP Site Long Term Monitoring, BRRTS # 02-08-587669

cc: Jason Smith, Tecumseh Products Co. – jason.smith@tecumseh.com
Chris Harvey, TRC - CHarvey@trccompanies.com
Phillip Bower, DNR – Phillip.Bower@wisconsin.gov

Number	Section	WDNR Comment	TRC Response	WDNR evaluation
3	3.3 Purpose	The monitoring plan should include a statement of the objective of the plan. Objective statements provide the basis for the overall monitoring plan and so should include key elements of decisions based on the data collected.	An objective statement has been added to the NRMP in Section 3.3. Text from Section 3.3: *"In consideration of the above information and with acknowledgement that the monitoring may be an iterative process, the objective of this NRMP is to evaluate the change in surface water and sediment concentrations and trends as an indicator of the overall effectiveness of the HARP remedial actions"*	The objective statement(s) should state the expected endpoints for water and sediment that form the basis for exit criteria i.e., case closure pursuant to Wis. Admin. Code ch. NR 726 . Additionally, shorter term objective(s) including how data will be evaluated following each sampling event e.g trend analysis. Currently, section 5.2 provides limited information as to how surface water will be evaluated; however, there is no discussion as to how sediment results will be evaluated, other than that "All data will be evaluated in accordance with the Negotiated Agreement." Section III.M, Long-Term Monitoring of Surface Water and Sediment, does not provide methods of evaluation, so additional information is necessary as both part of the objectives statement under Section 3.3 and Section 5.2 of the NRMP. Describe the assessment for both surface water and sediment that will be completed in each OU and the system as a whole.
5	4.1 SOW - Surface Water Sampling	PCBs in water are strongly correlated to temperature, suspended organic matter, and total suspended solids (TSS). Past United States Geological Survey (USGS) monitoring had shown orders of magnitude variation between sampling dates. The monitoring plan should develop a baseline of PCBs in surface water for HARP. The monitoring year should include monthly monitoring of PCBs in water during the expected peak water PCB concentration during the summer months of May through August.	Water samples will be collected in August, which would typically be the warmest water temperatures of the year and would represent a “worst case” concentration in surface water. The samples will also be analyzed for total organic carbon (TOC), dissolved organic carbon (DOC), and total suspended solids (TSS). Water temperature at the sample collection point will be obtained, recorded, and reported with the sample results. Section 4.4 of the NRMP was updated to reflect this comment. If additional sampling is warranted based on the August results, additional sampling may be recommended based on Wis. Admin. Code ch. NR 724, which says that the long-term monitoring plan can be iterative, where information collected may indicate the need for modification to the plan to include changes to evaluation, analysis, data collection or analytical methods, etc.	The point of the original comment is to develop a baseline for the NRMP that addesses variability due to temperature, suspended organic matter, and TSS. In order to establish a robust baseline DNR recommends monthly monitoring of PCBs in surface water during the expected peak water PCB concentration. DNR experience is that any changes in concentration are expected to be masked by environmental variance, and the USGS study does not support the conclusion that any single month provides a "worst case" concentration. The study did however discuss that multiple variables affect PCB concentration in surface water, including, temperature, suspended organic matter, and TSS. Planning for a single surface water sample from each location once every 3 years in the month of August will not neccessarily provide a "worst case" concentration, and will make the data difficult to use to assess any progress or trends with any level of significance. DNR recommends monthly surface water monitoring during the first sampling event with the sampling frequency to be re-evaluated as part of a monitoring report.

Number	Section	WDNR Comment	TRC Response	WDNR evaluation
6	4.1 SOW - Surface Water Sampling - Locations	Add reference or background surface water collection locations. An upstream reference location should be located on the South Branch of the Manitowoc River near Chilton. Jordan Creek above the HARP should also be sampled.	At this time no upstream sources of PCBs have been identified on Jordan Creek or upstream of HARP. In addition, sediment sampling indicates that sediment on the upstream end of the Mill Pond has low to non-detect PCB concentrations, indicating that there is no PCB source upstream of the Mill Pond on the South Branch of the Manitowoc River. Similarly, upstream sampling of Jordan Creek showed low or non-detect concentrations in sediment, just downstream from the New Holstein sewage treatment plant and upstream from the site. In both cases, we will assume that the background concentration is negligible. If the data suggest upstream contributions, we will consider adding one or both of the suggested background sampling locations.	Reference or background surface water collection locations should be analyzed as a means of distinuishing whether results within the site (OU1-OU5) are different from the background or reference locations. It's also important to assuring that any potential new discharge upstream of the site is not attributed to the reaches in question. These reference or background locations are particularly important because of atmospheric contributions that are detected in the congener method. Additionally, section 5.2, page 31 discusses comparing the surface water data to background levels, if no background or reference sampling locations are to be sampled the comparison will not be able to be completed. Add reference or background surface water collection locations. An upstream reference location should be located on the South Branch of the Manitowoc River near Chilton, and a second located on Jordan Creek above the HARP area. If data are consistent over muliple rounds of sampling, reduced or discontinued montioring of these locations could be proposed as part of a monitoring report.
7	4.1 SOW - In Channel Sediment Sampling	1. The sampling locations should be selected based on the existing post remedial action sampling. The following locations (see attached map) have shown elevated sediment PCBs and should be monitored for sediment PCBs in this plan: a. OU1: S4, S13 b. OU2: S6, S13 c. OU3: S3, S09 d. OU4: S3, RU 17C (vicinity) e. OU5: Past location of the 11 ppm PCB result, the proposed DS2 at Lemke Rd. Additional sampling locations in each OU should be selected based on field verified geomorphology i.e. poling survey. Representative areas of deposition e.g sediment trap, point bars, and quiescent areas, and impacted areas that were not remediated should be included in the in-channel sampling locations as part of the natural recovery monitoring. These sampling locations may be adjusted periodically with concurrence from DNR based on depositional rates determined with the poling surveys.	The purpose of this NRMP is to determine the ongoing protectiveness of the remedial actions conducted to date in HARP and to evaluate overall contaminant concentration trends. The success of those remedial actions were and are to be judged pursuant to the Negotiated Agreement and it's Three-Tier Closure Process (Exhibit D). That process does not judge success or failure based on single sample results; rather, a Surface Weighted Average Concentration approach is employed. To be consistent with the Negotiated Agreement (Exhibit G), we believe that the currently proposed locations are sufficient to evaluate trends in concentration. If concentrations show an upward trend, we will evaluate additional sampling locations.	Neither Section 3.3 nor Section 5.2 establish a means of evaluating the data produced as part of this NRMP. While the past sampling was intended to establish successful completion of the remedial action goals in each of the individual OUs, the purpose of this plan is to evaluate "the overall effectiveness of the HARP remedial actions" i.e. that the remedy is resulting in expected system recovery. Six sample locations to evaluate over 10 miles of waterway is insufficient to adequately characterize the effectiveness of past remedies. Additional sampling locations in each OU should be selected based on field verified geomorphology i.e. poling survey. Representative areas of deposition e.g sediment trap, point bars, and quiescent areas, and impacted areas that were not remediated should be included in the in-channel sampling locations as part of the natural recovery monitoring. These sampling locations may be adjusted periodically with concurrence from DNR based on depositional rates determined with the poling surveys.

Number	Section	WDNR Comment	TRC Response	WDNR evaluation
10	4.4 Surface Water Sample collection	Water samples must be analyzed for PCB congeners, total organic carbon (TOC), dissolved organic carbon (DOC), chlorophyl, and TSS. Water temperature at the sample collection point must be obtained, recorded, and reported with the sample results. Based on DNR's experience with water PCB data for the Fox River project, incorporating a field blank is strongly encouraged to account for potential bias. The procedure for collecting a field blank should be similar to what's used for low level mercury (i.e. pouring reagent water from one bottle into the sample bottle to account for any atmospheric contributions.)	The samples will be analyzed for PCB congeners, total organic carbon (TOC), dissolved organic carbon (DOC), and total suspended solids (TSS). Also, a field blank will be collected by pouring reagent water from one bottle into the sample bottle to account for any atmospheric contributions. Section 4.4 of the NRMP and Sections 2.4.1 and 2.4.3 of the QAPP have been updated. Chlorophyll was not added to the list of analytes for water since this analysis is redundant to the DOC and TOC analysis. The concentration of chlorophyll gives an indication of the amount of photosynthetic activity (i.e., live plant or algae matter) in the sample and not a direct measure of DOC or TOC. Since PCBs are hydrophobic and transported primarily on organic matter regardless of whether it is actively producing chlorophyll, these analyses (i.e., DOC and TOC) are more useful than an indirect measure such as chlorophyll.	Chlorophyll is not entirely redundant with TOC and DOC and will aid in the interpretation of these results. It gives an indication of the relative amount of carbon associated with biological activity in the TOC measurement. At this time chlorophyll can be left off the list of analytes; this issue may be revisited at a later date.
12	4.5.2 Sediment Sample Collection	50% of sediment sample locations must be sampled by both a ponar grab sampler (or approved equivalent) and with a core sampler for comparison of the results.	As discussed with you on October 27, 2021, shallow (i.e., 0-6 inches) samples will be collected with a ponar or equivalent sampler. The deeper sample interval(s) (i.e., 6-18 inches) will be collected from the core. The 0-6 inch interval of the core will be discarded and properly disposed. Sections 4.5.2 and 4.5.3 of the NRMP have been updated to reflect this comment	Dependent on the type of sampler used the bite depth may not reflect the full 0-6 inch interval, e.g. a standard ponar has a bite depth of approximately 3.5 inches. Rather than discarding the top 6 inch interval, it should be processed and held for future analysis if needed, based on the sample results from the ponar and deeper intervals to provide additional clarification of the full 0-6 inch interval. It is understood that the core and the grab sample will not be at the exact same location within the stream transect but based on the close proximity the data would still be useful to define the full column. Should the soft sediment contain 3 or more inches of the 18-30 inch interval that sediment should be analyzed and not discarded. Additionally, while transect is used thoughout the document, the sampling strategy is for a single sample location, not a transect, and surface water samples will not be collected along a transect. Please remove transect from the report.

Number	Section	WDNR Comment	TRC Response	WDNR evaluation
				Based on the sediment sampling results from 2005 to 2016 in the Hayton Millpond presented in the OU5 SIWP, it appears that deeper intervals have increasing trends which indicates there is still likely transport of sediment throughout the system. Additionally, the 2006 OU2 Lower and OU3 Sampling Results Tech Memo concluded "that the system is too dynamic for older data to be used reliably". This provides further justification for the request of a comprehensive poling survey and an increased sediment sampling interval for long term monitoring of the site. Poling data from approximately 240 feet of a 10 mile investigation area representing approximatly 0.5% of the investigation area, as presented in Section 4.5.1, is insufficient to characterize the sediment deposits throughout the investigation area. At minimum provide a comprehensive survey of the entire investigation area prior to sampling to refine the sample locations as discussed in the DNR response to the comment 7 above. Subsequent poling surveys over the following two years may be completed by resurveying several of the depositional areas in each OU identified in the initial comprehensive survey. Based on the results of 3 years of poling data the sediment sampling frequency of once every 3 years will be reevaluated for it's effectiveness to evaluate "the overall effectiveness of the HARP remedial actions". As discussed in the DNR response to the comment 5 response, DNR recommends annual monthly surface water monitoring during the first sampling event with the sampling frequency to be re-evaluated as part of a monitoring report.
16	5.1 Schedule	Surface water and sediment require a more frequent sampling interval than every three years in conjunction with fish tissue monitoring. Initially a baseline shall be established for sediment thickness, surface water and sediment concentrations. The baseline can be used to help establish and evaluate the sampling frequency. Absent an understanding of the deposition rates in the waterway, DNR recommends annual poling and evaluation of sediment thickness. DNR also recommends annual sediment and surface water sampling for a minimum of three years. Poling and sampling frequency may be adjusted with concurrence from DNR based on evaluation of the data. Surface water and sediment sampling will still be required at the time of fish tissue sampling regardless of the frequency prescribed in the Natural Recovery Monitoring Plan and shall be included in the future Fish Tissue Monitoring Plan per items 20 and 21 of Exhibit G of the Negotiated Agreement.	TRC has performed remediation documentation sampling on each section of the creeks that showed stable to declining trends in sediment concentrations after approved remedial actions. This sampling has shown that sediment concentrations do not change quickly and that sampling at a frequency of every three years (at the time of fish tissue sampling) will be adequate to assess the long-term trend in sediment thickness and in concentration of PCBs in surface water and sediment. Sediment poling will be performed for the first three years of sampling to document the stability of the creek sediment. The text has been updated in Section 4.5.1 of the NRMP	