

**From:** Wentland, Thomas A - DNR  
**Sent:** Thursday, August 6, 2020 12:42 PM  
**To:** Sager, John E - DNR; Hunt, John T - DNR  
**Subject:** FW: Sheboygan Harbor and River Site - EPA Comments on 05/29/20 Draft SAP  
**Attachments:** Attach 1 Fields Team Comments on the SAP Sheboygan River Superfund Site.pdf; Attach 2 WI NR 716.pdf; Attach 3 Form 4400-316.pdf; Sheboygan Ltr Tecumseh SAP Comments 072720.pdf

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**From:** Van Donsel, Terese <[VanDonsel.Terese@epa.gov](mailto:VanDonsel.Terese@epa.gov)>  
**Sent:** Monday, July 27, 2020 11:13 AM  
**To:** Keith Egan <[Keith.Egan@sme-usa.com](mailto:Keith.Egan@sme-usa.com)>  
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**Subject:** Sheboygan Harbor and River Site - EPA Comments on 05/29/20 Draft SAP

Keith,

Attached, please find EPA's and WDNR's comments on the draft Sampling and Analysis dated 29 May 2020.

After you have a chance to read through the comments, please give me a call to discuss and we can then talk about potential dates for scheduling a call with the FIELDS team.

Thanks so much,

**Terese A. Van Donsel**

Remedial Project Manager

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Comments on the SAP Sheboygan River Superfund Site, Tecumseh Site  
Chuck Roth, Region 5 SEMD, FIELDS Group  
John Canar, Region 5 SEMD, FIELDS Group  
7/1/2020

The sample designs are broken down into 5 data gaps as determined by SME. The five areas for discussion are:

1. Western Parking Lot
2. The building slab and dewatering containment area
3. The PCB impacted area on the eastern side of the property
4. The north and east street right of ways (ROW)
5. North Rochester Park (with former landfill)
6. South Rochester Park

#### General Comment/Questions

The sampling objective for each data gap needs explaining.

Using VSP for means to generate numbers of sample locations is not likely appropriate. The sampling objectives need to be clearly defined first.

The purpose of the stepouts are not explained. Assigning stepouts on only high results introduce an inappropriate sampling bias.

We recommend revising the sample design for the West Parking Lot and Rochester Park incorporating Decision Units and Incremental or Geospatial Sampling (explained in more detail below). The FIELDS Group can explain the approach in detail and help develop a sample design.

#### Proposed Sampling (3.1)

1. Western Parking Lot (3.1.1.2 and Fig 3): 32 sample locations. 8 judgemental and 24 in a systematic grid.
  - Secondary Sampling (5.1.1.2)—15 ft stepouts if over 8.66 ppm; 15 and 30 foot stepouts if over 100 ppm.
2. The building slab and dewatering containment area: Sampling of asphalt (no soil)
3. The PCB impacted area on the eastern side of the property (3.1.3 and Fig 3): 9 sample locations.

- Secondary Sampling(5.1.1.4)—15 ft stepouts if over 100 ppm.
4. The north and east street right of ways (ROW) (3.1.4 and Fig 3): 40-45 ft between sample locations, 14 locations on Cleveland and 5 locations on Hickory
    - Secondary Sampling (5.1.2.2)—15 ft stepouts if over 8.66 ppm.
  5. North Rochester Park (with former landfill)(3.1.5, 3.1.5.1 and Fig 4): 8 sample locations in the identified former landfill. Four sample locations in each of two subareas of the northern portion of Rochester Park.
    - Secondary Sampling (5.1.2.4)—15 ft stepouts if over 8.66 ppm and 15 and 30 ft stepouts if over 100 ppm.
  6. South Rochester Park (3.1.5.2 and Fig 4): 16 sample locations. 16 gridded and 4 judgmental.
    - Secondary Sampling (5.1.2.4)—15 ft stepouts if over 8.66 ppm and 15 and 30 ft stepouts if over 100 ppm.

Comments on the sample design for each data gap.

Western Parking Lot: VSP used but the sampling does not appear to be for determining an average for the area. Recommend reassessing sampling effort based on sampling objectives. Secondary sampling objectives need to be explained. I'm not sure what the stepouts will add to the sample design. I would rather see more effort in understanding the overall distribution of PCBs at the site.

The building slab and dewatering containment area: Seems like some soil samples are needed.

The PCB impacted area on the eastern side of the property: The nine samples fill in spatial gaps and should help delineate the outer extents. Again, I'm not sure of the purpose of the secondary sampling.

The north and east street right of ways (ROW): The number of locations and spacing are sufficient but there is no stated objective for the secondary sampling. I would propose, instead of a possible secondary stepout sampling, to collect composite samples instead of discrete samples to address possible heterogeneity that may be discovered with the stepouts.

North and South Rochester Park (with former landfill): As with the western area, VSP has been used to determine a sample size for the park. However, given a sample size the samples are then distributed to selected areas. Given a biased sample placement, this isn't an appropriate method to determine sample size for this approach. Also, it isn't clear what the sampling objective is to evaluate if the number of sample locations are sufficient or properly located. The objectives should be clearly stated and the sample design explained as to how it will satisfy the objectives.

It makes sense, as in this proposal, to have a stratified sampled design between the former landfill and rest of the park since the distribution of PCBs are likely to be different in the two areas. I would include non-landfill areas with the southern section and sample at a different density than the landfill areas. Unless the primary sampling objective is only to provide an average concentration I would recommend determining the number of samples based on the expected distance between samples, for example, exposure units or decision units.

Secondary Sampling objectives are not explained and current proposal of 15 and 30 ft stepouts would not be appropriate for decision-making in the park.

Using an Incremental Sampling or Geospatial composite approach instead of discrete samples depending on sampling objectives: There are several advantages to using Incremental Composite or Geospatial sampling. These approaches begin with assigning decision units within each section of the site and compositing the samples within each decision unit. When using ICS or Geospatial Sampling we would recommend sampling a percentage of the decision units with triplicate samples to determine the variability within the decision units. Both the west side of the site and the park areas would benefit from this approach by providing a more comprehensive dataset without increased lab costs. Additionally, the data are likely to be better designed to make remediation decisions at both the decision unit and area (data gap) scales. Below is a brief explanation of the Geospatial Composite Sampling Design.

## Geospatial Sampling for Residential and Non-residential Sites

Geospatial Sampling uses a predetermined number of subsamples within each designated decision unit (DU), a process similar to Incremental Composite Sampling (ICS). Since decision units often vary in size, we recommend assigning the number of subsamples in each DU by maintaining a set distance between subsamples. All of the subsamples are with a DU are composited and a single sample is drawn from the composite. The result is analogous to the average of each DU.

Compared to ICS: ICS typically uses a very large number of sub-samples for the purpose of reducing the within DU variability. Often, the actual variability is not robustly measured. Geospatial Sampling uses triplicate samples on a subset of the planned DUs to measure and apply the variance to the estimates of the means of each DU. Since the variance is measured and utilized, the actual number of increments (sub-samples) is less important. However, a larger number of increments may reduce the size of the confidence interval used for decision-making.

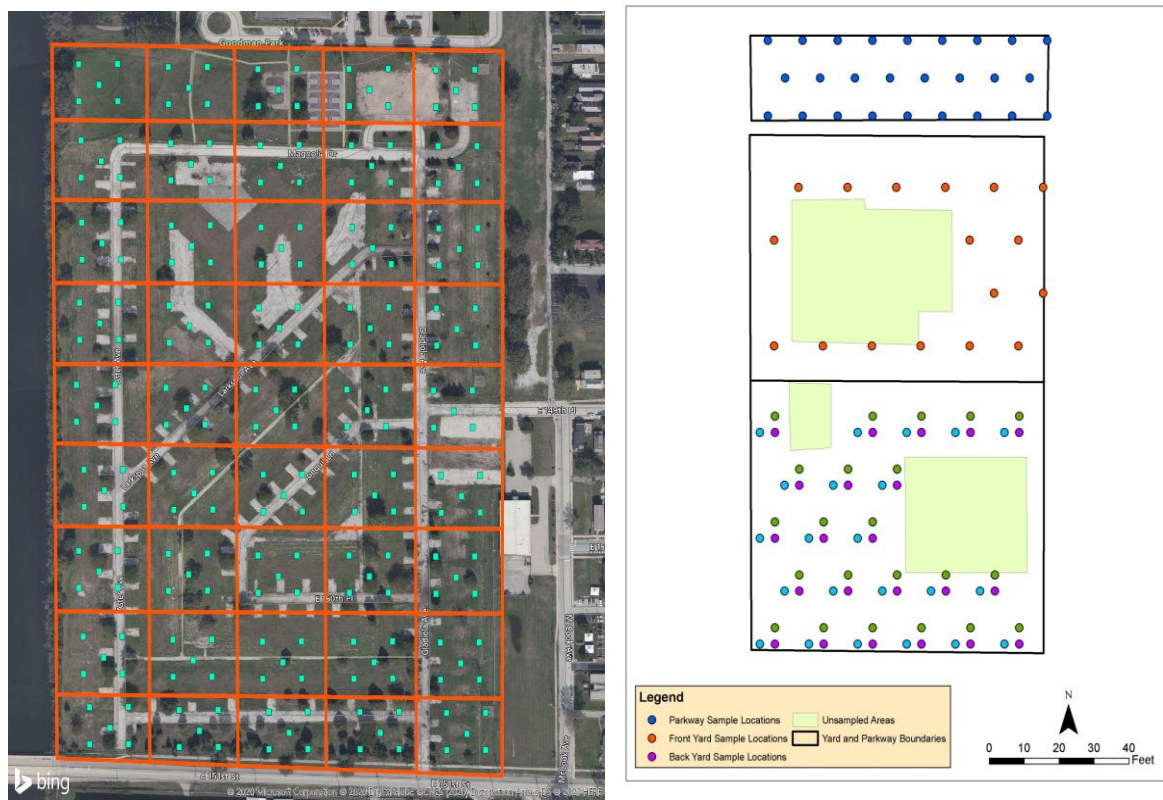


Figure 1a and 1b. The number of samples in a DU and the pattern of spacing can easily be modified to fit the sampling objectives. The sample design on the left has a total of 45 DUs with a “five on a die” sampling pattern. The sample location pattern can be varied but should be consistent between DUs. The sample design on the right has a larger number of subsamples and the number of subsamples in each DU is determined by a set distance between subsamples (subsampling numbers in each DU are proportional to the area of the DU).

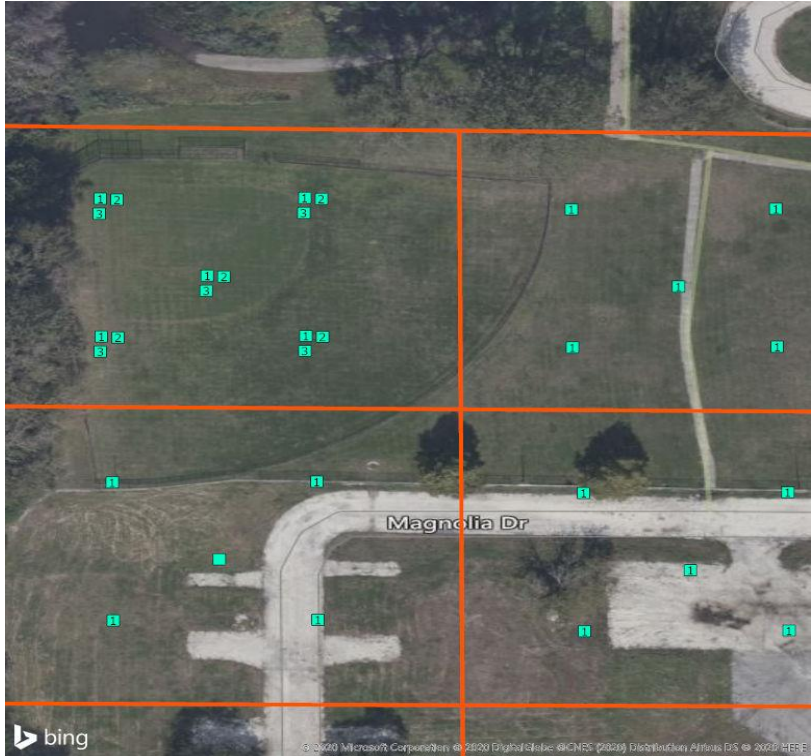


Figure 2. The variance of all of the DUs are determined from triplicate sampling in a subset of the DUs. In this example the triplicates are placed one meter to the East and one meter to the south. The DUs assigned for triplicates should be selected *a priori* but can be systematic, random or judgmental.



Figure 3. An example of the replicate sample locations

## Chapter NR 716

## SITE INVESTIGATIONS

NR 716.01	Purpose.
NR 716.02	Applicability.
NR 716.03	Definitions.
NR 716.05	General.
NR 716.07	Site investigation scoping.
NR 716.09	Site investigation work plan.

NR 716.11	Field investigation.
NR 716.13	Sampling and analysis requirements.
NR 716.14	Sample results notification requirements.
NR 716.15	Site investigation report.
NR 716.17	Additional requirements.

**Note:** Corrections made under s. 13.93 (2m) (b) 7., Stats., Register, February, 1997, No. 494.

**NR 716.01 Purpose.** The purpose of this chapter is to ensure that site investigations provide the information necessary to define the nature, degree and extent of contamination, define the source or sources of contamination, determine whether any interim actions, remedial actions, or both are necessary at the site or facility, and allow an interim or remedial action option to be selected that complies with applicable environmental laws. Nothing in this chapter shall be construed to require plans or reports that are more detailed or complex than is justified by the known scope of contamination or the complexity of the site or facility. This chapter is adopted pursuant to ss. 227.11 (2), 287.03 (1) (a), and 289.06, Stats., and ch. 292, Stats.

**History:** Cr. Register, April, 1994, No. 460, eff. 5-1-94; am. Register, February, 1996, No. 482, eff. 3-1-96; CR 12-023: am. Register October No. 694, eff. 11-1-13.

**NR 716.02 Applicability. (1)** This chapter applies to all site investigations required under s. NR 716.05 and conducted by:

(a) The department under the authority of ch. 292, Stats. In this chapter, where the term “responsible parties” appears, it shall be read to include “the department” where department-funded response action is being taken.

(b) Responsible parties at sites, facilities or portions of a site or facility that are subject to regulation under ch. 292, Stats., regardless of whether there is direct involvement or oversight by the department.

**Note:** This chapter does not apply to site assessments undertaken for the sole purpose of gathering information prior to knowledge or discovery of contamination. However, upon the discovery of a discharge of a hazardous substance during a site assessment, s. 292.11, Stats., and ch. NR 706 require the responsible party to immediately notify the department of the discharge.

(c) Persons undertaking actions in order to obtain the liability exemption under s. 292.15, Stats. In this chapter, where the term “responsible parties” appears, it shall be read to include “the voluntary party” or “person under contract with the voluntary party” where an action is being taken to comply with s. 292.15, Stats.

(d) Other persons seeking closure under NR 726.

(2) The department may exercise enforcement discretion on a case-by-case basis and choose to regulate a site, facility or a portion of a site or facility under only one of a number of potentially applicable statutory authorities. However, where overlapping restrictions or requirements apply, the more restrictive provision controls. The department shall, after receipt of a request from the responsible parties, provide a letter indicating which regulatory program or programs the department considers to be applicable to a site or facility.

**Note:** Sites or facilities or portions of a site or facility that are subject to regulation under ch. 292, Stats., may also be subject to regulation under other statutes, including the solid waste statutes in ch. 289, Stats., or the hazardous waste management act, ch. 291, Stats., and the administrative rules adopted pursuant to those statutes. In addition, federal authorities such as CERCLA, RCRA, or TSCA may also apply to a site or facility or portions of a site or facility. One portion of a site or facility may be regulated under a different statutory authority than other portions of that site or facility.

**Note:** Persons who wish to conduct response actions that will be consistent with the requirements of CERCLA and the National Contingency Plan (NCP) may request that the department enter into a contract with them pursuant to s. 292.31 or a negotiated agreement under s. 292.11 (7) (d), Stats. However, a CERCLA-quality

response action will likely require compliance with additional requirements beyond those contained in chs. NR 700 to 754 in order to be consistent with CERCLA and the NCP.

**History:** Cr. Register, April, 1994, No. 460, eff. 5-1-94; cr. (1) (c), Register, February, 1996, No. 482, eff. 3-1-96; CR 12-023: am. (1) (a) to (c), cr. (1) (d), am. (2) Register October No. 694, eff. 11-1-13.

**NR 716.03 Definitions.** In this chapter:

(1) “Batch of samples” means a group of samples collected during one discrete sampling event and stored and transported in a single shipping container, regardless of the number of samples in the group.

(2) “Equipment blank” means a sample of water which, prior to use, is known to be free of contaminants, and which is processed through the sampling equipment in the field in the same manner as the actual water sample to determine if field procedures introduce contaminants into the samples. This is also known as a “rinse blank” or a “field equipment blank.”

(3) “Immunoassay” means a test for the presence or concentration of a substance that relies on the reaction of one or more antibodies with the substance.

(4) “Investigative waste” means all solid and liquid wastes and contaminated environmental media resulting from activities conducted during a site investigation, immediate action, interim action, remedial action, or a monitoring or sampling event at a site or facility. Investigative wastes include soil from drill cuttings; drilling fluids; contaminated water from construction, purging, development and sampling of monitoring wells; and wash waters used during sampling or decontamination activities.

(6) “Piezometer” has the meaning specified in s. NR 141.05 (30).

**Note:** Section NR 141.05 (30) defines “piezometer” as “a groundwater monitoring well, sealed below the water table, installed for the specific purpose of determining either the elevation of the potentiometric surface or the physical, chemical, biological or radiological properties of groundwater at some point within the saturated zone or both.”

(7) “Potentiometric surface” has the meaning specified in s. NR 141.05 (31).

**Note:** Section NR 141.05 (31) defines “potentiometric surface” to mean “an imaginary surface representing the total head of groundwater and is the level to which water will rise in a well.”

(8) “Replicate sample” has the meaning specified in s. NR 149.03 (70).

**Note:** Section NR 149.03 (70) defines “replicate sample” to mean “2 or more substantially equal aliquots analyzed independently for the same parameter.” This is also known as a “duplicate.”

(8m) “Responsible parties” means, in this chapter, those parties defined under s. NR 700.03 (51) as well as those parties identified under s. NR 716.02 (1).

(9) “Temperature blank” has the meaning specified in s. NR 149.03 (15) (c).

**Note:** Section NR 149.03 (15) (c) defines “temperature blank” to mean “a sample container, of at least 40 ml. capacity, filled with water and transported with each shipment of collected samples to determine the temperature of other samples in the shipment on arrival at a laboratory.”

(10) “Trip blank” means a sample of reagent grade water which is used to determine possible contamination of samples

from volatile organic chemicals while in transit to and from the laboratory.

(11) "Water table observation well" has the meaning specified in s. NR 141.05 (46).

**Note:** Section NR 141.05 (46) defines "water table observation well" to mean "any groundwater monitoring well, in which the screen or open borehole intersects a water table, which is installed for the specific purpose of determining either the elevation of the water table or the physical, chemical, biological or radiological properties of groundwater at the water table or both."

**History:** Cr. Register, April, 1994, No. 460, eff. 5-1-94; correction in (10) made under s. 13.93 (2m) (b) 7., Stats., Register, January, 2001, No. 541; CR 12-023: am. (2), r. (5), am. (8), cr. (8m), am. (9), (10) Register October No. 694, eff. 11-1-13.

**NR 716.05 General.** (1) When site-specific or facility-specific information indicates that soil, sediment, groundwater, surface water, air or other environmental media at a site or facility may have become contaminated, persons identified under sub. NR 716.02 (1) shall conduct a site investigation consistent with this chapter. Unless sub. (2) is applicable, responsible parties shall use the factors in s. NR 708.09 (1) (a) to (n) and (2) (a) to (c) to determine whether or not a site investigation is necessary.

(2) A site investigation is not required of the responsible parties at a site or facility, if:

(a) After notification to the department of a hazardous substance discharge in accordance with ch. NR 706, the department determines that no further action is required of the responsible parties, based on the factors in s. NR 708.09 (1) and (2).

(b) After completion of an immediate action, the department determines that no further action is required of the responsible parties, based on the factors in s. NR 708.09 (1) and (2).

**Note:** The appropriate review fee specified in ch. NR 749 must accompany any request for the department to review a specific document.

**History:** Cr. Register, April, 1994, No. 460, eff. 5-1-94; am. (2) (a), Register, February, 1997, No. 494, eff. 3-1-97; emerg. am. (1), eff. 5-18-00; am. (1), Register, January, 2001, No. 541, eff. 2-1-01; correction in (1) made under s. 13.93 (2m) (b) 7., Stats., Register, January, 2001, No. 541; CR 12-023: am. (1) Register October No. 694, eff. 11-1-13.

**NR 716.07 Site investigation scoping.** Prior to conducting the field component of a site investigation required under s. NR 716.05, responsible parties shall evaluate all of the following relevant items, considering the location of the site or facility, to ensure that the scope and detail of the field investigation are appropriate to the complexity of the site or facility:

(1) History of the site or facility, including industrial, commercial or other land uses that may have been associated with one or more hazardous substance discharges at the site or facility.

(2) Knowledge of the type of contamination and the amount of the contamination.

(3) History of previous hazardous substance discharges or environmental pollution.

(4) Environmental media affected or potentially affected by the contamination.

(5) Location of the site or facility, and its proximity to other sources of contamination.

(6) Need for permission from property owners to allow access to the site or facility and to adjacent or nearby properties.

(7) Potential or known impacts to receptors, including public and private water supplies; buildings and other cultural features; and utilities or other subsurface improvements. This evaluation shall include mapping the location of all water supply wells within a 1,200-foot radius of the outermost edge of contamination.

(8) Potential for impacts to any of the following:

(a) Species, habitat or ecosystems sensitive to the contamination.

(b) Wetlands, especially those in areas of special natural resource interest as designated in s. NR 103.04.

(c) Outstanding resource waters and exceptional resource waters as defined in ss. NR 102.10 and 102.11.

(d) Sites or facilities of historical or archaeological significance.

**Note:** Information on sites or facilities of historical or archaeological significance may be found at the following State Historical Society websites:

Wisconsin National Register of Historic Places: <http://preview.wisconsinhistory.org/Content.aspx?dsNav=Nrc:Id=4294966367.N:4294966612&dsNavOnly=N:4294966362>

Office of the State Archeologist: <http://www.wisconsinhistory.org/archaeology/osa/>.

(9) Potential interim and remedial actions applicable to the site or facility and the contamination.

(10) Immediate or interim actions already taken or in progress, including any evaluations made of whether an interim action is needed at the site or facility.

(11) Any other items, including climatological conditions and background water or soil quality information, that may affect the scope or conduct of the site investigation.

(12) The need to gather data to determine the hydraulic conductivity of materials where contaminated groundwater is found.

**History:** Cr. Register, April, 1994, No. 460, eff. 5-1-94; emerg. cr. (12), eff. 5-18-00; cr. (12), Register, January, 2001, No. 541, eff. 2-1-01; CR 12-023: renum. (8) (b) to (e) to (8) (a) to (d), am. (12) Register October No. 694, eff. 11-1-13.

**NR 716.09 Site investigation work plan.** (1) GENERAL. Unless otherwise directed by the department, in cases where a site investigation is required under s. NR 716.05, responsible parties shall submit a work plan to the department within 60 days of receiving notification that a site investigation is required, describing the intended scope and conduct of a field investigation. One paper copy and one electronic copy of the plan shall be submitted to the department, unless otherwise directed by the department, in accordance with s. NR 700.11 (3g).

**Note:** Guidance for Electronic Submittals for the GIS Registry outlines how electronic copies should be submitted in the Adobe Portable Document Format (PDF) on optical disk media. This guidance can be accessed at <http://dnr.wi.gov/files/PDF/pubs/r/RR690.pdf>.

(2) CONTENTS. The work plan shall include all of the following information, unless otherwise directed by the department:

(a) Site name, address, and location by quarter-quarter section, township, range and county, and the location information specified in s. NR 716.15 (5) (d).

**Note:** Section NR 716.15 (5) (d) requires submittal of Wisconsin Transverse Mercator (WTM) coordinates.

(b) Name and address of the responsible party or parties, and name and address of all consultants or contractors involved in the response action.

(c) Site location map, consisting of the applicable portion of a 1:24,000-scale topographic quadrangle published by the United States geological survey with the name of the quadrangle indicated, and a site layout map to approximate scale depicting the layout of buildings, roads, discharge location and other relevant features of the site.

(d) Information gathered during scoping of the project, including the applicable items in s. NR 716.07.

(e) Basic information on the physiographical and geological setting of the site necessary to choose sampling methods and locations, including:

1. The existing topography, including prominent topographic features.

2. The surface water drainage patterns and significant hydrologic features, such as surface waters, springs, surface water drainage basins, divides, wetlands and whether the site lies within a floodplain or floodway.

3. Texture and classification of surficial soils.

4. General nature and distribution of geologic materials, including the thickness and type of unconsolidated materials and the type and nature of bedrock.

5. General hydrogeologic information.

6. Potential hazardous substance migration pathways.



(f) Sampling and analysis strategy to be used during the field investigation, including:

1. A description of the investigative techniques to be used to characterize the site or facility.

2. Identification on a site layout map of the locations, both planimetric and vertical, from which samples of environmental media will be obtained. Where locations cannot be specified in advance, the work plan shall include a description of the strategy to be used for determining these locations in the field.

3. A description of sampling methods to be used, including methods for collecting, preserving and delivering samples, and leak detection methods.

4. An itemization of the parameters for which samples will be analyzed, as well as the analytical methods to be used and their method detection limits.

5. A description of quality control and quality assurance procedures to be used per sampling method, including the items specified in s. NR 716.13.

6. A description of the procedures to be used to prevent cross-contamination among samples.

7. A description of the type of investigative wastes that will be generated during the site investigation and how they will be collected, stored, transported and treated or disposed of.

8. A discussion of how the sampling and analysis results will be related to results of any previous investigations at the site or facility, and how the results will be used to determine the degree and extent of the contamination and the selection of a remedial action option including, where appropriate, natural attenuation.

(g) A description of other procedures to be used for site management, including erosion control and repair of structural, soil, or ground disturbance.

(h) A schedule for conducting the field investigation and reporting the results to the department.

**(3) DEPARTMENT REVIEW OF SUBMITTED WORK PLANS.** (a) The department may instruct responsible parties to proceed without departmental review of work plans submitted under this section.

(b) Responsible parties that are not instructed to proceed under par. (a) shall wait before initiating the field investigation until the department has approved or conditionally approved the work plan, except that if the department has not reviewed the work plan within 30 days after its receipt by the department, the responsible parties shall proceed with the field investigation.

(c) If the department disapproves a work plan submitted under this section, the department shall provide to the responsible parties, in writing, the basis for disapproval and a deadline for providing a revised work plan.

(d) The lack of a response from the department, after the department's receipt of a work plan, may not be construed to mean that the department has approved the work plan.

**Note:** The department will only provide an approval if a review was requested, and the appropriate fee was submitted.

**History:** Cr. Register, April, 1994, No. 460, eff. 5-1-94; r. and recr. (1), r. (3) (e), Register, April, 1995, No. 472, eff. 5-1-95; CR 12-023: am. (1), (2) (a), (f) 3., 5., 8., (g), (3) (b) Register October No. 694, eff. 11-1-13.

**NR 716.11 Field investigation.** (1) Responsible parties shall conduct a field investigation as part of each site investigation required under this chapter, unless the department directs otherwise.

(2) The field investigation shall be conducted in accordance with a work plan approved or conditionally approved by the department, unless the department has directed the responsible parties to proceed with a field investigation without department review of the investigation work plan.

(2g) The field investigation shall be initiated within 90 days of submittal of the work plan.

(2r) In cases where the responsible party pays a fee for department review of the work plan, the field investigation shall be initiated within 60 days after department approval of the work plan.

**Note:** The intent of this subsection is to be able to measure that progress is being made toward conducting a site investigation. Initiation may include preparatory measures to conducting the actual fieldwork.

(3) The purposes of the field investigation shall be to:

(a) Determine the nature, degree and extent, both areal and vertical, of the hazardous substances or environmental pollution in all affected media.

(b) Provide sufficient information to permit evaluation of interim options pursuant to ch. NR 708, and remedial action options pursuant to ch. NR 722, and to permit a determination to be made regarding whether any of the interim or remedial action options require a treatability study or other pilot-scale study.

(c) Provide sufficient information to determine the hydraulic conductivity of materials where contaminated groundwater is found.

(d) Provide an estimate, along with all necessary supporting information, of the mass of contamination in the source area. This includes sites involving free product or where natural attenuation is considered for part of the remedy.

**Note:** Methods and examples for estimating mass in the source zone, can be found in the following guidances: RR 699, Understanding Chlorinated Hydrocarbon Behavior in Groundwater: Investigation, Assessment and Limitations of Monitored Natural Attenuation at <http://dnr.wi.gov/files/PDF/pubs/rr/RR699.pdf>; and RR 614, Guidance on Natural Attenuation for Petroleum Releases, at <http://dnr.wi.gov/files/PDF/pubs/rr/RR614.pdf>.

**Note:** The intent of this paragraph is to address situations where a discrete area indicates a release of a hazardous substance. It is not intended for situations where there is no discrete source area, such as when there is area-wide contamination from aerial deposition, or widespread areas of fill such as foundry ash.

(4) Responsible parties shall extend the field investigation beyond the property boundaries of the source area as necessary to fully define the extent of the contamination. If the responsible parties are unable to complete the required investigation beyond the source property because a property owner refuses access, the responsible parties shall notify the department within 30 days of the refusal, and shall document in writing the efforts undertaken to gain access when requested by the department.

(5) The field investigation shall include an evaluation of all of the following items:

(a) Potential pathways for migration of the contamination, including drainage improvements, utility corridors, bedrock and permeable material or soil along which vapors, free product or contaminated water may flow.

(b) The impacts of the contamination upon receptors.

(c) The known or potential impacts of the contamination on any of the resources listed in s. NR 716.07 (8) that were identified during the scoping process as having the potential to be affected by the contamination.

(d) Surface and subsurface rock, soil and sediment characteristics, including physical, geochemical and biological properties that are likely to influence the type and rate of contaminant movement, or that are likely to affect the choice of a remedial action.

(e) The extent of contamination in the source area, in soil and saturated materials, and in groundwater.

**Note:** The intent of this requirement is to collect samples in the general area where the contaminant was released, where the concentrations are generally expected to be the greatest, and to determine the presence of non-aqueous phase liquids, including samples from the smear zone. For further information on the smear zone, copies of the department's guidance "Smear Zone Contamination" may be obtained by accessing the following web site: <http://dnr.wi.gov/files/PDF/pubs/rr/RR712.pdf> or from any regional office of the department, or by writing to the Department of Natural Resources, Bureau for Remediation and Redevelopment, P. O. Box 7921, Madison, Wisconsin 53707. This requirement is not intended to address sampling of landfill waste materials. In cases where clean soils exist between shallower contaminated soil, and groundwater, groundwater still needs to be assessed.

(f) The extent, both vertically and horizontally, of groundwater contamination. Piezometers shall be used to determine the vertical extent of contamination, as appropriate to the situation.

**Note:** The use of piezometers may not be appropriate for all situations, including at the source area, or where a documented upward gradient exists downgradient of a source area.

(g) The presence and concentration of vapors sub-slab, when investigation of soil, soil gas or groundwater indicates that vapors may migrate to the foundation of an occupied building, taking into account the biodegradability of vapors, preferential pathways of vapor movement, or other physical or chemical factors affecting vapor movement into occupied buildings.

(h) The presence and concentration of vapors in indoor air, when it is necessary to determine the impact on an occupied structure considering applicable attenuation factors, land use, building size and other site-specific factors that affect exposure to vapor.

**Note:** Indoor air samples are expected to be collected and analyzed in most cases where vapor migration into an occupied residential setting is likely. A residential setting may include single or multiple family housing, and educational, childcare, and elder care facilities. Sampling and analysis is conducted to determine levels of the contaminants of concern. Indoor air sampling is not recommended in locations where the contaminant of concern is currently used in commercial or industrial operations.

(6) Responsible parties shall manage investigative wastes in a manner that will not pose a threat to public health, safety, or welfare or the environment, and which is consistent with state and federal regulations.

(7) Responsible parties shall label all drums containing investigative wastes, including drill cuttings and purge water, with the Bureau for Remediation and Redevelopment Tracking System activity number for the site, the site name, boring or well number, initial date of collection, and the contents.

**History:** Cr. Register, April, 1994, No. 460, eff. 5-1-94; am. (3) (b), Register, April, 1995, No. 472, eff. 5-1-95; emerg. cr. (3) (c), am. (5) (a), eff. 5-18-00; cr. (3) (c), am. (5) (a), Register, January, 2001, No. 541, eff. 2-1-01; CR 12-023: cr. (2g), (2r), am. (3) (c), cr. (3) (d), (5) (e) to (h), (7) Register October No. 694, eff. 11-1-13.

### NR 716.13 Sampling and analysis requirements.

(1) Responsible parties shall use laboratory analyses of environmental media samples which are collected, handled and analyzed in compliance with subs. (2) to (17) to confirm the nature and extent and evaluate the impacts of contamination, if a field investigation is required under s. NR 716.11 (1). Analytical methods used shall be suitable for the matrix, type of analyte, expected level of analyte, regulatory limit, and potential interferences in the samples to be tested.

(2) All chemical and physical analyses for which accreditation is available under ch. NR 149 shall be conducted by a laboratory accredited under ch. NR 149.

(3) Responsible parties may use non-laboratory methods of sample analysis, including field screening with a photoionization detector or flame ionization detector, analysis with a field gas chromatograph, geophysical or downhole probe surveying, non-certified mobile laboratory analysis, immunoassays and other appropriate methods, to supplement the information derived from laboratory analysis of samples. If non-laboratory methods are used at a location from which a laboratory sample is collected, responsible parties shall use separate samples for the non-laboratory and the laboratory analyses, unless the target compound is not subject to loss or alteration through sample handling.

(4) All soil samples obtained during the field investigation for the purpose of defining the degree and extent of the contamination shall be discrete, not composite, samples, unless the department explicitly approves in advance composite sampling for a specific site situation.

(5) Maximum holding times for soils shall be in accordance with the sampling method, sample storage container, and analytical methods used.

(6) Responsible parties shall provide for the following quality control and quality assurance procedures, at a minimum, when collecting samples for laboratory analysis for a field investigation conducted under this chapter:

(a) Chain of custody shall be documented from the time of sample collection to the receipt of the sample by the analytical laboratory. Chain of custody documentation shall be in compliance

with ch. NR 149, and shall be submitted to the department with the sample results.

(b) For soil samples, one temperature blank for every shipping container of samples that require cooling for preservation, unless samples are received by the laboratory on ice, unless another temperature is required by the analytical method used.

(c) For water samples:

1. One replicate sample for every 10 or less samples.

2. One equipment blank for every 10 or less samples, unless dedicated sampling equipment is used to prevent cross-contamination.

3. One trip blank for each shipping container that contained volatile samples.

4. One temperature blank for every shipping container of samples that require cooling for preservation, unless samples are shipped on ice.

(d) Decontamination of all sampling instruments between each sampling event, unless dedicated or disposable sampling devices are used in a manner that prevents cross contamination or other unintended contamination of samples.

(7) Responsible parties shall ensure that the following items are documented during the field investigation and are made available to the department upon request:

(a) Procedures for sampling and all other routine activities associated with the site investigation.

(b) A log of all routine and non-routine maintenance and calibrations performed on all instruments used during the field investigation.

(c) Field notes describing in detail the sequence of activities that took place during the field investigation.

(8) For soil and water samples, the reporting limit for volatile organic compound analysis and petroleum volatile organic compound analysis shall be the method detection limit for the analytical method used. If the results are less than the method detection limit, the results shall be reported as less than the method detection limit, rather than no detect. Qualifiers used for the data shall also be reported.

**Note:** Section NR 140.16 (2) (c) requires that the analytical method selected meet one of the following criteria: 1) has a limit of detection and limit of quantitation below the preventive action limit or 2) produces the lowest available limit of detection and limit of quantitation if the limit of detection and limit of quantitation are above the preventive action limit. In addition, s. NR 140.14 (3) specifies whether a standard has been attained or exceeded if a preventive action limit or enforcement standard is equal to or less than the limit of quantitation.

**Note:** Chapter NR 720 specifies whether a soil cleanup standard has been exceeded if the standard is at or below the limit of quantitation.

(9) Responsible parties shall ensure that drinking water samples are collected, handled and analyzed according to the procedures specified in ch. NR 809.

(10) Responsible parties shall ensure that groundwater samples are collected and handled according to the procedures specified in s. NR 140.16 (1), unless the department approves the use of an alternative procedure. The department may approve the use of an alternative procedure from one of the authoritative sources listed in ch. NR 149 Appendix III, or an alternate test procedure approved by the U.S. EPA, or, if the department determines that an appropriate procedure is not available, from another source. Alternative procedures may include the most recent published method, or an older published version deemed acceptable by the department on the basis of the objectives of the data collection. Responsible parties shall select an analytical method that is suitable for the matrix, type of analyte, expected level of analyte, regulatory limit, and potential interferences in the sample to be tested.

**Note:** Examples of suitable analytical methods for VOCs and PVOCs in groundwater include EPA methods 5030B/8260B, EPA Method 8310 or 8270C-SIM or 8270D-SIM for PAHs, EPA method 3510C/8082A or 3520C/8082A for PCBs, EPA Method 3020A/6020A or 3010A/6020A for Pb, EPA Method 3020A/6020A for Cd, and EPA Method 1664 (Revision B) for oil and grease.

(11) Soil samples collected for analysis of volatile organic compounds for compliance with chs. NR 700 to 754 shall be pre-

served immediately after collection to minimize volatilization of contaminants from the sample to the greatest extent possible. Preservation techniques used shall be according to the analytical method to be used. Sampling techniques shall be used that minimize volatilization from the sample. Extraction techniques shall be according to the analytical method selected. Analytical methods used shall be suitable for the matrix, type of analyte, expected level of analyte, regulatory limit, and potential interferences in the samples to be tested.

**Note:** Suitable preservation, extraction and analytical methods include those found in method SW 5035A in "Test Methods for Evaluating Solid Waste (SW-846)," and in the "Modified GRO, Method for Determining Gasoline Range Organics" (GRO for screening purposes). Other techniques may be found in the List of Authoritative Sources, ch. NR 149 Appendix III.

(12) Responsible parties shall ensure that other samples taken for analysis are collected, handled and analyzed according to the procedures specified in "SW-846: Test Methods for Evaluating Solid Waste", "The Third Edition of SW 846, as amended by Final Updates I, II, IIA, IIB, III, IIIA, IIIB, and IV," published by the U.S. EPA, unless the department approves the use of an alternative procedure. The department may approve the use of an alternative procedure from one of the authoritative sources listed in ch. NR 149 Appendix III, an alternate test procedure approved by the U.S. EPA, or, if the department determines that an appropriate procedure is neither available from "SW-846: Test Methods for Evaluating Solid Waste" nor from one of the authoritative sources listed in ch. NR 149 Appendix III, from another source.

**Note:** Copies of "SW-846: Test Methods for Evaluating Solid Waste" are available for inspection at the offices of the department of natural resources, the secretary of state, and the revisor of statutes. Copies may be obtained from the Government Printing Office, Room 190, Federal Building, 517 East Wisconsin Avenue, Milwaukee, WI 53202 and may be accessed at the following web site: <http://www.epa.gov/epaoswer/hazwaste/test/main.htm>. Other suitable procedures may include revised SW-846 methods found at the EPA Office of Solid Waste Methods Web Site.

(13) Responsible parties shall collect samples and provide an analysis for the geochemical indicators and parameters, where natural attenuation is potentially a remedy or part of a remedy. These may include dissolved oxygen, nitrate, dissolved manganese, total and ferrous iron, sulfate and methane, alkalinity, oxidation reduction potential, pH, temperature, and conductivity.

(14) (a) Responsible parties shall inspect monitoring wells installed for field investigations conducted under this chapter at least annually to verify the integrity of the well labels, lock and seal, and to determine whether the wells are providing a conduit to the subsurface, and shall take action to repair or abandon the well if necessary in accordance with ch. NR 141.

(b) Flush mounted wells shall include a magnet placed in the void between the cover and the annular space seal. In cases where flush-mounted wells are not used, wells installed in areas potentially subject to damage from vehicle traffic shall include appropriate protective traffic posts next to the well.

**Note:** Traffic posts can vary in design. Normally, properly anchored concrete filled metal posts should be used to protect wells. The magnet may aid in locating wells for abandonment.

(15) Responsible parties shall measure and record to the nearest 0.01 foot the static water level elevation in each groundwater monitoring well prior to obtaining a groundwater sample from the well. The measurement point shall be the top of the well casing and shall be identified on the well itself if the top of the casing is not level.

**Note:** Section NR 141.065 (2) requires that the top of the well casing be referenced to the nearest benchmark for the national geodetic survey datum to an accuracy of 0.01 feet.

(16) Where site investigation data or other information indicate it is appropriate, or when directed to do so by the department, responsible parties shall make a good faith effort to sample public or private water supply wells as part of a regular monitoring program or to determine the extent of groundwater contamination, or both. Private and public water supply wells to be sampled shall include:

(a) Those wells that are known or suspected to be affected by the groundwater contamination.

(b) Other wells that the department determines have the potential to be affected by the groundwater contamination.

(17) If the responsible parties are unable to sample a public or private well because the property owner refuses access, the responsible parties shall notify the department within 30 days of the refusal, and shall document in writing the efforts undertaken to gain access when requested by the department.

**History:** Cr. Register, April, 1994, No. 460, eff. 5-1-94; CR 12-023: r. and recr. Register October No. 694, eff. 11-1-13.

**NR 716.14 Sample results notification requirements.** (1) **SAMPLES FROM WATER SUPPLY WELLS.** Responsible parties shall report all water supply well sampling results to the department and to the well owner, and occupant as applicable, within 10 business days after receiving the sampling results. The report to the department shall include the Wisconsin unique well number for drinking water wells, a preliminary analysis of the cause and significance of any contaminant concentrations observed in the samples and an identification of any substances that attain or exceed ch. NR 140 preventive action limits, as well as any other substances observed in the samples for which there are no ch. NR 140 groundwater quality standards. The responsible party shall notify both the remediation and redevelopment project manager and the regional drinking and groundwater specialist or water supply engineer of all water supply well sample results.

**Note:** The appropriate remediation and redevelopment project manager can be determined for the site in question at <http://dnr.wi.gov/topic/Brownfields/documents/rrr/county.pdf>. The appropriate regional drinking and groundwater specialist or water supply engineer can be determined by viewing the staff listing at <http://dnr.wi.gov/topic/DrinkingWater/contact.html>.

**Note:** The department will provide information to well owners of the results of sampling in accordance with manual code 4822.1.

(2) **SAMPLES FROM OTHER MEDIA.** Responsible parties shall report all sampling results other than those for water supply wells, to the department and to the property owner, and occupants as appropriate, of the property from which the samples were collected, including the source property owner if the person conducting the investigation is not the property owner, within 10 business days of receiving the sample results.

(a) The report to the department shall include a preliminary analysis of the cause and significance of any contaminant concentrations observed in the sample, a list of names and addresses of those receiving a sampling notification, and the date of the sampling event and mailing.

(b) The written notification to an affected property owner, and occupant as appropriate, shall include information about how additional information may be obtained, in accordance with s. NR 714.05 (5). The department may waive the notification of occupants in limited situations, upon request.

(c) In addition, the notification to the property owners, and occupants as appropriate, shall include all the following information, in a letter or using a form provided by the department:

1. Responsible party name, address, and phone number.
2. Site name and source property address.
3. Department BRRTS number.
4. Department contact person name and phone number.
5. Reason for sampling, which may include routine sampling, and sampling to determine an immediate health concern, including the ingestion, inhalation, and dermal contact pathways.
6. Contaminant type.
7. Sample type, which may include groundwater, soil, sediment, soil vapor, outdoor or ambient air, and indoor air.
8. A map showing the sampling locations, which meets the requirements of s. NR 716.15 (4).
9. Collection date, specific contaminant levels per location, and whether the sample results attain or exceed state standards. A data table shall be used when multiple sample results are included.

10. A copy of the results from the laboratory attached to the notification.

**Note:** Notification of sampling results is intended for those samples taken from a property including results from both routine and long-term monitoring and those of a more immediate health or welfare concern to a property owner, or occupant as appropriate. Examples of sampling to determine the presence of an immediate public health or welfare concern are from potable wells, indoor air, surface soil, and soil vapor beneath an occupied structure. "All sampling results" means the results that show detections of contaminants as well as those that do not show detections.

**Note:** Assistance in evaluating the impact and meaning of the sample results may be requested of the department project manager or drinking water staff, or from staff with the Division of Public Health, with the Department of Health Services.

**Note:** The notification to occupants is not intended for situations where there are multiple units or a frequent change in occupancy.

**Note:** The form on which to provide sample results, "Sample Results Notification," Form 4400-249, can be found at <http://dnr.wi.gov/topic/Brownfields/Pubs.html>.

(3) The department may approve of a different notification schedule on a case-by-case basis.

**Note:** In cases where routine monitoring is conducted, and where results are not expected to be of immediate health or welfare concern, the department may consider other schedules, such as quarterly or with the semi-annual status reports to be sufficient.

(4) The responsible party shall take the actions necessary to ensure any new occupants are also informed of the pertinent information required under s. NR 716.14 (2) (c).

**History:** CR 12-023; cr. Register October No. 694, eff. 11-1-13.

**NR 716.15 Site investigation report. (1) REPORT REQUIREMENT.** (a) *Timeline.* Unless otherwise approved by the department, responsible parties shall submit a site investigation report to the department within 60 days after completion of the field investigation and receipt of laboratory data.

(b) *Number of copies.* One paper copy and one electronic copy of the report shall be submitted to the department, unless otherwise directed by the department, in accordance with s. NR 700.11 (3g).

**Note:** Electronic copies should be submitted in the Adobe Portable Document Format (PDF) on optical disk media. Guidance on electronic submittals can be accessed at <http://dnr.wi.gov/files/PDF/pubs/tr/RR690.pdf>.

**Note:** The department strongly recommends the use of 2-sided copies for the paper copy of the report, and the use of accordion folders for larger reports instead of 3-ring binders, to help address file space issues.

(2) **REPORT CONTENTS.** The site investigation report shall include all of the following information required under this subsection, and under subs. (3) to (6):

(a) *Cover letter.* A letter referencing the department's identification number for the site or facility and stating the purpose of the submittal and the desired department action or response.

(b) *Executive summary.* A brief narrative describing the site investigation results, conclusions and recommendations for future actions, and the certification required under s. NR 712.09.

(c) *General information.* 1. Project title and purpose.

2. Name, address, e-mail address, and telephone number of the present property owner, lessee, operator, and any individual or company responsible for the contamination.

3. Name, address, e-mail address, and telephone number of any consultants or contractors involved with the response action at the site or facility.

4. Site or facility name, address, and location by quarter-quarter section, township, range, and county, along with the Wisconsin Transverse Mercator coordinates for the site. The location of the property and the contamination shall be given in sufficient detail to allow department personnel to inspect the property and the contaminated area.

**Note:** The requirements for locating monitoring wells are contained in s. NR 141.065. Specifically regarding areal location, this section requires that the wells be shown on a plan map with a grid system that is located according to latitude and longitude, or according to a state plane coordinate system. The plan map must show the exact location of the installed well on a horizontal grid system which is accurate to within one foot.

5. Location maps which meet the requirements of sub. (4).

6. In addition to any other site layout maps, one site layout map which depicts the site's property boundaries, named and

unnamed roads or access points, surface water features, underground utilities, buildings, public and private wells, land uses on adjacent properties, and known and potential hazardous substance sources.

7. The geographic positions of all properties within and partially within the contaminated site boundaries, which have been directly located or interpolated from other features on a base map of 1:24000 scale or finer, or which were obtained using differentially corrected global positioning system data or another method of similar or superior accuracy that have been approved by the department. The geographic position data shall be obtained and submitted to the department in accordance with the requirements in sub. (5) (d).

(d) *Background information.* Descriptions of the following:

1. Activities or events at or near the site or facility which had the potential to affect public health, safety, or welfare or the environment, including time, duration, type, and amounts of hazardous substance discharges.

2. Any previous discharges or response actions and the relevant dates.

3. Response action activities to date, with references to any previous reports concerning response action activities on the site or facility.

4. Any other information relevant to the response action.

(e) *Methods of investigation.* Descriptions of investigative techniques used to characterize the site or facility, including subsurface boring and probe methods; monitoring well construction, installation, and development procedures; well and aquifer testing methods; modeling techniques; sample collection, handling, and analysis techniques; and leak detection methods. Where procedures were performed in accordance with methods described in a work plan for the same investigation that was previously submitted to the department or in exact accordance with published departmental guidance, the site investigation report may omit detailed descriptions by referring to the work plan or the departmental guidance in which the methods were described. Where procedures differed from methods described in the work plan, the site investigation report shall include a description of the procedures used.

(3) **RESULTS.** The site investigation report shall include a detailed narrative description of the results of the site investigation, references to all appropriate visual aids under sub. (4), and shall include all of the following:

(a) The information collected during the scoping stage of the investigation conducted pursuant to s. NR 716.07.

(b) A description of the sequence of activities that took place during the site investigation.

(c) All field measurements, observations, and sampling data generated during the site investigation, including data from non-laboratory sample analyses. Laboratory data shall include laboratory name, location from which each sample was obtained, date each sample was obtained, date each sample was extracted and analyzed, analytical method used by the laboratory, parameters tested for, the method detection limit, the analytical result for each sample, and whether other compounds not specifically tested for were observed in significant quantities. Relevant and significant sample results and field measurements shall be compiled in tabular form and at corresponding sampling locations noted on a site layout map.

(d) Where laboratory results are significantly inconsistent with field observations or non-laboratory method results, a clear evaluation of the reason for the inconsistency and an indication of whether resampling or additional quality control procedures are needed.

(e) For sites or facilities with 3 or more water table observation wells, a discussion of the depth to the water table, groundwater flow directions, rates, and any variations.

(f) A discussion of the stratigraphy of the site. Identify soil and rock types at the site and the contaminant source location. Include a description of moisture contents, high and low water table elevations, and the location of any smear zone.

(g) A discussion of the contaminants and impacts on each environmental medium.

(h) Interpretations of the data generated at the site or facility sufficient to characterize the geologic and hydrogeologic characteristics of the site or facility, the areal and vertical degree and extent of hazardous substances in all environmental media, and the impacts of the contamination to all potential receptors.

(i) The hydraulic conductivity of materials where contaminated groundwater is found.

**(4) VISUAL AIDS.** The site investigation report shall include all maps, figures, tables, graphs, photographs, and completed forms that are necessary to clarify and support results and interpretations. Visual aids shall present information in legible formats, shall be referenced in the report text, and shall meet all of the following requirements:

(a) *General Requirements.* Maps, plan sheets, drawings, cross sections and fence diagrams shall:

1. Be of appropriate scale to show all required details with sufficient clarity.

2. Have a figure number, title, north arrow, and legend of all symbols used, contain graphic horizontal and vertical scales, specify drafting or origination dates, and indicate the source if not an original design.

**Note:** The source means the company or name of the original preparer of the visual aid.

3. Use national geodetic survey data as the basis for all elevations.

4. Use a distinguishing symbol, such as a dashed line or question mark, to depict inferred or questionable data.

(b) *Water table and potentiometric surface maps.* For water table maps and potentiometric surface maps, depict water level elevations measured on the same day, indicate the date of measurement on the map, and indicate apparent flow direction.

1. For sites or facilities with 3 or more water table observation wells, include a map depicting the elevation of the water table and the apparent direction of groundwater flow, with additional water table maps as necessary to depict significant variations in water table elevation or groundwater flow direction.

2. For potentiometric surface maps, additionally depict measurements taken from piezometers with similar screen lengths that intersect the same geologic zone and depth, and indicate any vertical gradients as well as the location and type of any confining layers. For sites with 3 or more piezometers, include a potentiometric surface map, with the apparent direction of groundwater flow, with additional potentiometric maps as necessary to depict significant variation in levels or flow direction.

(c) *Isoconcentration maps.* For isoconcentration maps, depict the hazardous substances, concentrations, the environmental medium, the date measured and the unit of measurement. Submit isoconcentration maps of hazardous substance concentrations in each environmental medium, as appropriate to the scope and complexity of the site and where sufficient data are available to estimate meaningful isoconcentrations. For groundwater, use the appropriate groundwater elevation map as the base map.

(d) *Cross sections.* For sites or facilities with 2 or more soil borings, include one or more geologic cross sections.

1. Cross sections shall include a reduced inset diagram of the site layout map indicating the location of the cross section transect, and shall indicate the dates of measurements, stratigraphy, screened intervals of monitoring wells, and water table surface.

2. Include the locations of any confining units; the contaminant source location, vertical and horizontal extent of contamination in both soil and groundwater, and highest and lowest water table and piezometric elevations and screen lengths, as applicable.

(e) *Tables.* Tables shall meet all of the following requirements:

1. Include a table number, title and an explanation of any footnotes marked in the body of the table.

2. Include units of measurement when displaying measured data. When an environmental standard exists for the contaminant, the unit of measurement shall be the same as that used by the department to express the environmental standard.

3. Indicate measurement or sample collection date when displaying measured data or data derived from sampling.

4. Indicate which results equal or exceed environmental standards when displaying analytical results of tests on environmental media for which standards exist.

5. Indicate depth and soil type for soil sample summary tables.

6. For groundwater elevation tables, indicate each well's top and bottom screen elevation.

(f) *Photographs.* Photographs shall be in color, of sufficient size to clearly represent the purpose of the photograph, and shall be labeled by the date, orientation and topic.

(g) *Well and borehole documentation.* All forms shall be completed in accordance with the directions for the applicable form. All of the following department forms, shall be used, where applicable to the site or facility:

1. 4400-89, groundwater monitoring well information.

2. 4400-113A, monitoring well construction.

3. 4400-113B, monitoring well development.

4. 4400-122, soil boring log information.

5. 3300-5B, well/drillhole/borehole abandonment.

**Note:** Copies of these well and borehole documentation forms may be obtained from the following internet sites:

[http://dnr.wi.gov/topic/Groundwater/documents/forms/4400\\_89.pdf](http://dnr.wi.gov/topic/Groundwater/documents/forms/4400_89.pdf),

[http://dnr.wi.gov/topic/Groundwater/documents/forms/4400\\_113\\_1\\_2.pdf](http://dnr.wi.gov/topic/Groundwater/documents/forms/4400_113_1_2.pdf),

[http://dnr.wi.gov/topic/Groundwater/documents/forms/4400\\_122.pdf](http://dnr.wi.gov/topic/Groundwater/documents/forms/4400_122.pdf),

<http://dnr.wi.gov/topic/DrinkingWater/documents/forms/3300005.pdf>

(h) *Well construction permits.* Any department of transportation well construction permit for a well, constructed in a right-of-way, shall be submitted with the well construction form.

**(5) DEED AND LOCATIONAL INFORMATION.** All of the following information shall be included in the site investigation report for each property within or partially within the contaminated site boundaries:

(a) A copy of the most recent deed, which includes the legal description.

(b) A copy of the certified survey map or the relevant portion of the recorded plat map for those properties where the legal description in the most recent deed refers to a certified survey map or a recorded plat map.

(c) The parcel identification numbers for each property.

(d) Geographic position. All geographic position data shall be obtained and submitted to the department in the site investigation report in accordance with the following requirements:

1. 'Format.' For properties that are not more than 200 feet wide or long, a single point geographic position shall be obtained at least 40 feet within the boundaries of the property, or as close to the center of the property as possible if the property is less than 80 feet wide or long. For properties that are more than 200 feet wide or long, coordinates describing the approximate location of the property's boundaries, forming a polygon, shall be obtained.

2. 'Coordinate system.' Geographic position data shall be originally collected in Wisconsin Transverse Mercator '91 or projected onto Wisconsin Transverse Mercator '91.

**Note:** Information about the Wisconsin Transverse Mercator '91 projection is available on the internet at <http://dnr.wi.gov/maps/gis/wtm8391.html>.

3. 'Acceptable methods.' Acceptable methods for obtaining geographic position data include direct location or interpolation from other features on a base map of 1:24000 scale or finer, differentially corrected global positioning system data, or other methods capable of similar or superior accuracy that have been approved by the department.

4. 'Required information.' The following information is required for all properties: the name of the county where the property is located, the collection method used, and the scale or resolution of original source of geographic position for on-screen digitizing.

**(6) CONCLUSIONS AND RECOMMENDATIONS.** The site investigation report shall include a summary of the results from the site investigation, and recommendations for further response actions necessary to protect public health, safety, and welfare and the environment, and to meet the requirements of chs. NR 700 to 726.

**History:** Cr. Register, April, 1994, No. 460, eff. 5-1-94; r. and recr. (1), r. (2), renun. (3) to be (2), Register, April, 1995, No. 472, eff. 5-1-95; emerg. am. (1), cr. (2) (g) 9., eff. 5-18-00; r. and recr. (1), cr. (2) (g) 9., Register, January, 2001, No. 541, eff. 2-1-01; CR 00-111; renun. (2) (j) to be (2) (L) and cr. (2) (d) 7., (j), and (k), Register October 2001 No. 550, eff. 11-1-01; CR 12-023; r. and recr. Register October No. 694, eff. 11-1-13.

**NR 716.17 Additional requirements.** (1) When warranted by the complexity of the site or facility or the severity of the actual or potential environmental or public health impacts which

may be caused by the contamination, the department may impose additional site investigation requirements upon responsible parties beyond those specifically described in this chapter. The department shall communicate any additional investigation requirements to the responsible parties in writing and shall explain why the additional requirements are needed.

(2) The department may require that treatability studies be conducted as part of the site investigation, where appropriate for the purpose of demonstrating that an interim action or remedial option will meet the remedy selection criteria in ch. NR 708 or 722.

(3) When a site investigation conducted under this chapter indicates that an immediate, interim or remedial action is necessary, the responsible parties shall identify, evaluate and select an immediate or interim action in accordance with ch. NR 708 or a remedial action in accordance with ch. NR 722.

(4) When a site investigation conducted under this chapter indicates that, based on the criteria in s. NR 726.05, no further action is necessary to protect public health, safety, or welfare or the environment, the responsible parties may request that the department close the case in accordance with ch. NR 726.

**History:** Cr. Register, April, 1994, No. 460, eff. 5-1-94; am. (2) and (3), Register, April, 1995, No. 472, eff. 5-1-95; CR 12-023; am. (4) Register October No. 694, eff. 11-1-13.

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

**Via Electronic Mail Only**

July 27, 2020

Mr. Keith Egan  
Chief Consultant  
SME  
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RE: Sheboygan Harbor and River Superfund Site - EPA Review of 29 May 2020 Draft  
Sampling and Analysis Plan for the former Tecumseh Products Company Property in  
Sheboygan Falls, WI

Dear Mr. Egan:

The U.S. Environmental Protection Agency (EPA) and the Wisconsin Department of Natural Resources (WDNR) have reviewed the Sampling and Analysis Plan (SAP) (Revision 1) dated 29 May 2020 for the former Tecumseh Products Co (Tecumseh) site in Sheboygan Falls, Wisconsin. EPA's and WDNR's primary comments on the SAP are provided below. Supplemental comments on sample design from EPA's Field Environmental Decision Support (FIELDS) Team are provided as an attachment.

**EPA General Comments:**

1. General: There has been no decision regarding a cleanup approach to address the contamination found in 2016 and 2018 and for contamination which might be identified as part of follow-up investigations to resolve PRS's identified data gaps. With the 2016/2018 information showing high levels of PCBs in site soils and the questions raised by the data gap analysis, it is necessary to first identify the extent of contamination and only then can we determine an appropriate path forward.
2. General: While EPA appreciates PRS's willingness to take actions to address the very high levels of contamination, the SAP and its decision matrices cannot pre-select cleanup standards. The SAP is to guide sampling; it is not a de facto decision document. SAP decisions should be limited to what actions need to be taken to fully delineate the contamination.
3. General: PRS is assuming that the cleanup approach will primarily be containment and is incorrectly utilizing the Principal Threat Waste (PTW) threshold as the cutoff for what will be removed vice what will be contained. While at most sites with extensive soil contamination there is often some component of containment and control of low-



concentration materials, PRS cannot preemptively establish the cleanup plan and design its sampling plan to meet those goals.

4. General: EPA recommends a conference call with its Field Environmental Decision Support (FIELDS) Team to discuss the attached comments and recommendations. The team specializes in optimizing field sampling and maximizing the utility of the data to be gathered.
5. General: Given the dramatically expanded scope beyond the Tecumseh property and the need to add additional parameters (see comment 7 below), a QAPP update will be necessary. We can schedule a “pre-QAPP call” with the R5 data quality team to identify specifically which worksheets will need to be updated.
6. General: The BBL External Sources Technical Memorandum also contained valuable facility drawings of the former plant in Appendices D, and I. Of special note are the 1978 Donohue & Associates Site Survey, and 1989 Donohue survey plat of the former manufacturing plant. They each show electrical transformer station locations, on the east side of the building, and on the north side of the building, which may correlate to the current hot spots. Those transformer pad locations should be added as pertinent features to the existing site maps. Also of interest is the building floor drain and trenches figure.
7. Section 2.1, Site History, first paragraph: What is the location of the former burn pit? Has that area ever been sampled for dioxins/furans? Was any dioxin/furan sampling ever done at the site? If no, then dioxin/furan analyses should be added and the QAPP should be updated to include this work.
8. Section 2.2 Current Conditions, third paragraph: This statement is not accurate. PCBs on the north side of the former dewatering pad have not been fully vertically delineated. The 2016 sample locations not vertically delineated consist of location S14S15 - bottommost concentration is 791 ppm PCBs, and S151E - bottommost concentration is 2.41 ppm PCBs. The 2018 sample locations not fully vertically delineated consist of S14-S15A - bottommost concentration at 8-10 feet is 185 ppm PCBs.
9. Section 2.2, Current Conditions, fourth paragraph: The text states, “Ten soil borings were completed on the eastern portion of Rochester Park and near the Site.” Were there samples taken from the eastern portion of the site, or should the sentence have referenced the western portion of the site?
10. Section 2.3 Planned Site Assessment: A pavement evaluation of the former building slab and dewatering pad is premature. EPA has not authorized the slab for containment of the underlying soil. If soil underneath is found to be contaminated, the asphalt and/or concrete may need to be broken up to access soil for removal.
11. Section 3.1, Environmental Sampling Plan, first paragraph: The statement at the end of paragraph is a mischaracterization. PTW guidance was referenced as part of a discussion about PRS’s proposal to contain contaminated soils at the site. The PTW guidance established a presumption that high levels of PCBs should be removed and not contained. The PTW guidance in no way establishes a removal standard whereby anything below the level could be contained, and it was never referred to in such a manner. This correction needs to be made throughout the document, for example in Section 3.1.3 where the PTW threshold is referred to as the cleanup standard for what would be removed. The full extent of contamination needs to be assessed before EPA and WDNR can evaluate cleanup options for the property.

12. Section 3.1, Environmental Sampling Plan, third paragraph: Does PRS have the specific data and sample locations that are the basis of the 1995 Environ risk assessment floodplain discussions?
13. Section 3.1, Environmental Sampling Plan, fourth paragraph: The text in the 4<sup>th</sup> paragraph states, “SME developed a recreational standard based on US EPA risk calculations...” The SAP is meant to outline the sampling approach, not develop and select cleanup standards. The sampling approach must provide the data necessary to allow EPA and WDNR to fully evaluate the extent of the contamination. EPA needs to be able to see PCBs down to 1 ppm total PCBs so that the extent of the problem can be fully understood. PRS cannot pre-select a cleanup standard of 18 ppm as part of the SAP. EPA will coordinate with PRS independently on the evaluation of risk, screening of ARARs, and the development of alternatives.
14. Section 3.1.1.2, VSP Fixed Threshold Analysis, first paragraph: Why is a commercial/industrial cleanup standard of 8.66 ppm being used? No cleanup standard has been selected, and even if one had been, commercial/industrial would not be appropriate given the anticipated use of the property as a park.
15. Section 3.2.1 Soil Sampling Procedures: Suggest identifying sampling areas by their respective Data Gap Area numbering for clarity.
16. Section 3.2.1, Soil Sampling Procedures: PAH and metals sampling is proposed for only the top 0.5’. Consider gathering supplemental volume from the 0.5-2’ interval in case surface samples are positive and vertical delineation is required.
17. Section 3.2.2 Asphalt Sampling Procedures: This sampling does not seem to meet the data gap objective identified. Objective should be to analyze the soil underneath the impervious surfaces at locations based on both a statistical approach and knowledge of historical operations.
18. Section 3.3.1.1 Former Dewatering Containment Area (Data Gap #2): A key indicator of asphalt deterioration is “wide cracks in the surface”. Please define “wide”.
19. Section 4.2 Geotechnical Analysis Plan: Clarify what data will be produced by the geotechnical analysis. Only visual observations? What are the deterioration factors?
20. Section 5.1 Environmental Data Evaluation and Reporting: Request photo logs of borings/samples analyzed and archived prior to homogenization.
21. Table 1: Verify the Sample IDs properly correlate with the Sample Target description and respective figures. For instance, PL1 through PL8 are not located along western berm per Figure 3. Also, suggest adding the respective Data Gap Area numbering within the Sample Target description.

### **Specific Data Gap Comments:**

#### EPA Comments on Data Gap #1

22. Per section 3.1.1.2, the alpha and beta errors were set as 5% and 50% respectively. However, the use case example in VSP User Manual (Section 3.2.1) states that a beta value of 1% is recommended by the EPA (EPA 2000a, Guidance for the Data Quality Objectives Process - QA/G-4. EPA/600/R-96/055, Office of Environmental Information, U.S. Environmental Protection Agency, Washington, D.C). Please provide justification for using a large beta value of 50%.

23. In Appendix A, sensitivity analysis for West Parking Lot area, it looks like an action level (AL=100) was used as input. This is not an appropriate parameter, as decision making will likely address concentrations as low as 1 ppm total PCBs.
24. In Appendix A, the input standard deviation is 19.22 for sample count analysis performed using all available data. This does not match the standard deviation of 59.66 ppm specified in section 3.1.1.2.

#### EPA Comments on Data Gap #2

25. Data Gap #2 should be revised from determining the current condition and integrity of the former concrete building slab and asphalt dewatering pad to charactering the contamination underneath the concrete and asphalt, to full vertical extent.
26. Section 3.1.2: Change the section header, Data Gap #2 is the soil under the concrete and asphalt. Approximately 50 to 60 samples through the concrete/asphalt are needed, maybe more heavy on the known hotspots on east and north, and they need to be deep. In the 2018 sampling event, SME had 14 locations on the east side and 1 on the north side in which the bottommost interval was over 10 ppm PCBs - thus not vertically delineated. Deepest interval collected in 2018 was either 6-8, or sometimes 8 - 10. Location S9-IN-S9S10 had 6,430 ppm at 8-10 feet deep.

#### EPA Comments on Data Gap #3

27. It is assumed that a high level of PCB contamination exists under the former concrete building slab; in fact, NAPL may exist under the slab. Focus on historical accounts of how waste drain oil was handled during plant manufacturing (see drawings of floor drains and trenches). The data gap is more than just the condition/integrity of the former concrete foundation, and overlying asphalt pad that covers part (not all) of it. The data gap is the extent of contamination underneath the building (including full vertical extent), to detectable PCB levels. As with the remainder of the site, delineate for a screening criteria of 1 ppm PCBs.
28. Section 3.1.3 Sampling Rationale for the Eastern Portion of the Site (Data Gap #3): We suggest many more samples on the east portion of the site. The 2018 data event did not vertically delineate the PCB contamination. 14 locations were above 10 ppm PCB at the bottommost sample interval. These sample locations consist of S9-2EA, S9-1N-S9S10, S9-2S-4E, S9-3S, S9-3E, S9-5E, S9-5E, S9-S10-1E, BP3, S1001E, S1002E, S92S5E, S93S2E, SBP1, and SBP8. In addition, Table 1 indicates the sample rationale to be for lateral delineation; however vertical delineation is also required and therefore the sample interval should extend past 4 and 6 feet.

#### EPA Comments on Data Gap #4

29. Define extent of contamination (both laterally and vertically) to 1 ppm, not to a presumed preliminary remedial goal.

#### EPA Comments on Data Gap #5

30. Similar to the Data Gap #1 assumption, please provide justification for using high beta values of 10%.
31. Recommend running a separate sample count analysis for the northern portion of the park using Std Dev of sample results collected from Southern Portion of the park.

32. PRS may not pre-select a cleanup standard. The SAP needs to direct sampling to provide visibility to 1 ppm total PCBs.
33. Recommend verifying the extent of the historic landfill. Currently the sample location coverage does not address the northern portion of the data gap area as shown in Figure 4.
34. Suggest relocating locations OPAL1 and OPAL2 off of impervious surfaces.

#### EPA Comments on Data Gap # 6

35. Similar to Data Gap #1 assumption, provide justification for using high beta values of 10%. Recommend repeating the sampling count analysis using existing data and sequential sampling option in VSP to perform a separate sample count analysis for Data Gap #6
36. Why is the sampling approach in southern portion of the park different compared to the northern part of the park? Both areas should be vertically delineated to groundwater table.
37. As noted previously, PRS cannot pre-select a cleanup standard as part of the SAP. EPA will coordinate with PRS independently on the evaluation of risk, screening of ARARs, and the development of alternatives.
38. Suggest relocating locations OPA11 and OPA15 off of impervious surfaces.

#### **EPA Comments on SOPs:**

39. Recommend relabeling as Field Operating Procedures and relabeling 1 through X. Currently no SOP 3, SOP 5, SOP 8, or SOP 11.
40. SME SOP 1, Soil and Groundwater Sampling Using Direct-Push Methods
  - Include requirement to call both public utility locate (811 service) and clear individual boring locations using a third-party utility locator.
  - Photos should be collected of each soil core.
  - Borehole abandonment procedures should be included.
41. SME SOP 2, Soil Sampling with a Hand Auger
  - Include requirement to call both public utility locate (811 service) and clear individual boring locations using a third-party utility locator.
  - Photos should be collected of each soil core.
42. SME SOP 12A, Investigative Derived Wastes
  - Procedure 1 indicates excess soil may be returned to the associated borehole. Soil cuttings generated as part of these investigations should be containerized in 55-gallon DOT-approved drums and sampled for characterization, transport and disposal.
  - Procedures 2, and 3 indicate that purge water, development water, and decontamination water may be returned to the associated borehole. This is only acceptable for demonstrably non-detect groundwater. Purge water, development water, and decontamination water generated as part of these investigations should be containerized in 55-gallon DOT-approved drums and sampled for characterization, transport and disposal.

**WDNR General Comments:**

43. WDNR reviewed the draft SAP and noted that State concurrence with future use of the property is contingent on attainment of cleanup standards that are consistent with State Applicable or Relevant and Appropriate Requirements (ARARs). WDNR further noted that remediation needs to be completed in accordance with Wisconsin Administrative Code Chapter NR 700 series requirements in order to receive State of Wisconsin concurrence with site closure. WDNR provided a copy of NR 716 and a copy of Form 4400-316 (the Site Investigation Work Plan Preparation Checklist), both of which are attached.

As noted previously, EPA requests that PRS participate in a conference call with the FIELDS Team to discuss the sample design. It may be possible to optimize the sampling approach to get more statistically defensible data out of the field effort. I will contact you within the next several days to schedule the call.

EPA requests that PRS revise the SAP within 45 days of your receipt of this letter. If warranted based on the conference call with the Fields Team, EPA may modify the timeline for the SAP revision.

Please don't hesitate to contact me at 312-353-6564 if you have any questions or would like to set up a conference call to discuss the comments.

Sincerely,

*Terese A. Van Donsel*

Terese A. Van Donsel  
Remedial Project Manager

Attachment: (1) Comments on the SAP, Sheboygan River Superfund Site, Tecumseh Site, EPA R5 Fields Team, 7/1/2000  
(2) Wisconsin Chapter NR 716  
(3) Form 4400-316

cc: Richard Nagle (EPA, via e-mail only)  
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