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March 15, 2021

Ms. Xiaochun Zhang  
Wisconsin Department of Natural Resources  
101 S. Webster Street  
Madison, WI 53703

Subject: Pre-Design Site Characterization Workplan  
Kewaunee Marsh Arsenic Contaminated Site (KMASS)  
BRRTS: #02-31-000508  
TRC Project No. 412027.0000 Phase 1

Dear Ms. Zhang:

This letter presents TRC Environmental Corporation's (TRC) Wis. Admin. Code § NR 716 Site Investigation Workplan for predesign studies for the Kewaunee Marsh Arsenic Contaminated Site (KMASS) near Kewaunee, Wisconsin (BRRTS: #02-31-000508).

TRC is pleased to be able to assist the WDNR with work to achieve the long-term remediation goals for the site.

If you have any questions as you complete your review, please feel free to contact me at 608-826-3663 or [KVater@trccompanies.com](mailto:KVater@trccompanies.com).

Sincerely,

TRC

A handwritten signature in black ink that reads "Katherine Vater". The signature is fluid and cursive.

Katherine Vater, PE  
Project Manager

Attachment



# Pre-Design Site Characterization Workplan

**Kewaunee Marsh Arsenic  
Contaminated Site (KMASS)  
Kewaunee, Wisconsin**

March 2021

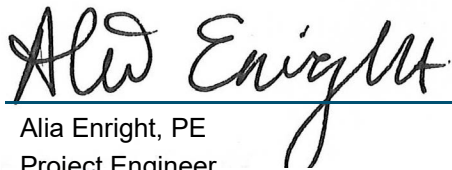
**BRRTS #02-31-000508**

**Prepared For:**

Wisconsin Department of Natural Resources  
(WDNR)  
101. S. Webster Street  
Madison, WI 53703

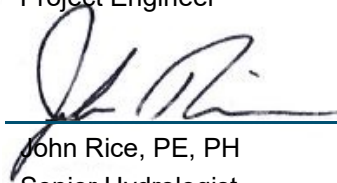
**Prepared By:**

TRC  
708 Heartland Trail, Suite 3000  
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Alia Enright, PE  
Project Engineer



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John Rice, PE, PH  
Senior Hydrologist



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Project Manager



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Senior Chemist

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## **APPENDICES**

- Appendix A: WDNR Scope of Work for Pre-Design Site Characterization  
Appendix B: Site-Specific Health and Safety Plan

## 1.0 Project Management Plan

As required by NR 716.09(2), the following information is provided:

1. **Site Address and Location:**

Besadny Wildlife Area, Kewaunee, Wisconsin  
Kewaunee County  
SW ¼ of SW ¼, Section 07, T23N R25E

2. **Responsible Party:**

BRRTS #02-31-000508  
Wisconsin Central Ltd.  
6250 N. River Rd.  
Rosemont, IL 60018

3. **WDNR Contact:**

Ms. Xiaochun Zhang  
101 S. Webster Street  
Madison, WI 53703

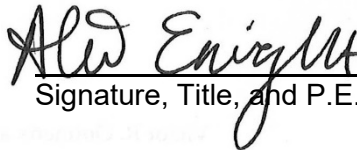
4. **Environmental Consultant to WDNR:**

TRC Environmental Corporation (TRC)  
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Attention: Katherine Vater, PE, Project Manager  
608-826-3663  
KVater@trccompanies.com

## 2.0 Certifications

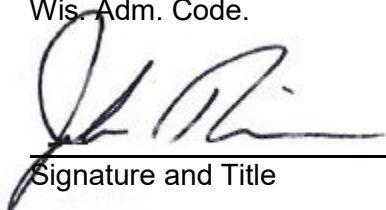
I, Alia Enright, hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.

 Project Engineer, E-47666  
Signature, Title, and P.E. Number



P.E. Stamp

I, John Rice, hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03(1), Wis. Adm. Code, am registered in accordance with the requirements of ch. GHSS 2, Wis. Adm. Code, or licensed in accordance with the requirements of ch. GHSS 3, Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.

 Senior Hydrologist  
Signature and Title

March 15, 2021  
Date

## 3.0 Introduction

### 3.1 Site Location

The Kewaunee Marsh Arsenic Contaminated Site (KMASS) is located inside a large meander of the Kewaunee River northwest of Kewaunee, Wisconsin within the state-owned C.D. Besadny Fish and Wildlife Area in the SW  $\frac{1}{4}$  of SW  $\frac{1}{4}$  of Section 07, Township 23N, Range 25E (Figure 1). Approximately 15-acres of the marsh are impacted with arsenic, and a historical release of herbicide or pesticide from a railcar derailment between 1938 and 1950 is thought to be the source of these impacts. The site is bounded to the east by the Kewaunee River, to the west and south by the Ahnapee State Trail (former railway), and to the north by additional C.D. Besadny Fish and Wildlife Area (Figure 2).

### 3.2 Background

The arsenic contamination was first discovered in 1993. Since then, site investigations, treatability studies, remedial evaluations, and interim actions have been completed by the former potentially responsible party (formerly known as Fox Valley and Western Railroad, Ltd., now Wisconsin Central Ltd.) and by the Wisconsin Department of Natural Resources (WDNR). The interim actions completed to date include construction of a chain-link fence to enclose the 15-acre site, placement of a 4-acre vegetative cap over an area with significant impacts, and in-situ treatment of approximately 3,000 cubic yards (cy) of the most highly impacted soil/sediment.

In July 2020, TRC prepared a focused Remedial Action Options Report (RAOR) for the site to assist the WDNR in achieving the long-term remediation goals for KMASS (TRC, 2020). Nine remedial options were evaluated based on soil/sediment and water data collected between 1994 and 2010 and treatability studies previously completed for the site. The site data contains high uncertainties in representing the current conditions because of the use of a variety of sampling methods over time, inconsistencies in the sampling coverage, and changing site conditions.

### 3.3 Purpose and Scope

As a result of the ROAR and uncertainties in existing site data, the WDNR developed a pre-design site characterization Scope of Work (SOW) on September 14, 2020 and responded to TRC questions on the SOW on September 23, 2020 (see Appendix A).

The purpose of the pre-design site characterization is to close data gaps, as needed to proceed with remedy selection and design, by performing the following general tasks:

- Site survey
- Soil/sediment sampling and analysis
- Determination of hazardous materials designation for solids, if any
- Surface water sampling and analysis
- Investigating a possible field test for arsenic in water

The pre-design site characterization workplan to complete the tasks is detailed in this document. The results of workplan tasks will be summarized in a Pre-Design Characterization Report.

## 4.0 Site Conditions

### 4.1 Site Geology and Hydrogeology

The site is located within the Kewaunee River watershed, a tributary to Lake Michigan. The property elevation is approximately 580 ft above mean sea level (WDNR, 2019). The following geologic and hydrogeologic information was included in a site summary memorandum compiled by WDNR:

*“[T]he contaminated area is located within the 100-yr floodplain of the Kewaunee River. The presence and depth of surface water in the marsh is not only precipitation and evapotranspiration dependent but also influenced by both the river flow and Lake Michigan water level. Therefore, redox potential in [soil/sediment] can change temporally and spatially. Groundwater at the site is in constant exchange with surface water within the site as well as between the marsh and Kewaunee River...”*

*...Surficial soil beneath the marsh consists of organic black peat ranging in thickness from 4 to 88 ft. Organic content within the peat is approximately 80%. Beneath the peat is a dark gray to grayish brown organic silt material containing between 8% and 20% organics. The organic silt ranges from 15 to 26 feet thick. Ground moraine clay underlies the peat deposits and ranges in thickness from 50 to 100 feet. Bedrock consists of undifferentiated dolomite and has not been encountered in any of the wells drilled on site.*

*The water table occurs at a depth of about 0 to 2 feet below ground surface and is primarily in contact with the peat layer. The groundwater elevation is directly controlled by the depth of the water in the Kewaunee River and Lake Michigan,” (WDNR, 2019).*

### 4.2 Current Conditions

The WDNR’s August 21, 2019 memo provided a detailed evaluation of the nature and extent of arsenic contamination in soil/sediment, groundwater, and surface water at the site. In the evaluation, the distribution of the area-weighted concentration and mass of arsenic in the marsh were estimated using the available data and the following concentration thresholds for arsenic in soil/sediment: 20 mg/kg, 50 mg/kg, 100 mg/kg, 500 mg/kg, and 1,000 mg/kg (WDNR, 2019).

For the RAOR (TRC, 2020), TRC used GIS spatial analysis tools to refine the interpolation of the arsenic isoconcentration contours in soil/sediment for 20 mg/kg, 50 mg/kg, 100 mg/kg, 500 mg/kg, and 1,000 mg/kg using the historical dataset. All soil/sediment data was used, regardless of age and whether the samples were collected before or after the site’s interim remedial actions. The soil/sediment data was segregated into five depth intervals based on the depth recorded at time of sampling (0’-2’, 2’-4’, 4’-6’, 6’-8’; and >8’). The resulting isoconcentration contours for the 0’-2’ interval are shown on Figure 3.



The extent of impacted soil/sediment presented on Figure 3 is based on data collected from several different investigations conducted between 1994 and 2010, which had varying objectives and sampling methods. The soil/sediment data is sparse at depths below 2-feet and the arsenic concentrations are anticipated to have changed and continue to change over time<sup>1</sup>. Therefore, a soil/sediment investigation is needed to define the current extent of arsenic impacts for final remedy selection.

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<sup>1</sup> Decreases in concentration were noted in sediment samples collected from similar areas over time (RMT, 2010; WDNR, 2018).

## 5.0 Pre-Design Site Characterization Plan

### 5.1 Site Survey

TRC will subcontract with Wisconsin Land Surveying, Inc., to conduct a land survey of the three areas approximated by the orange, green, and blue outlines in Figure 5.1. The survey will be completed to a precision of 0.5-foot vertical contour interval, using NAD83 US feet for the horizontal datum and NAVD 88 for the vertical datum. The topographic survey will be completed on approximately 50-foot grids using Trimble total station equipment.

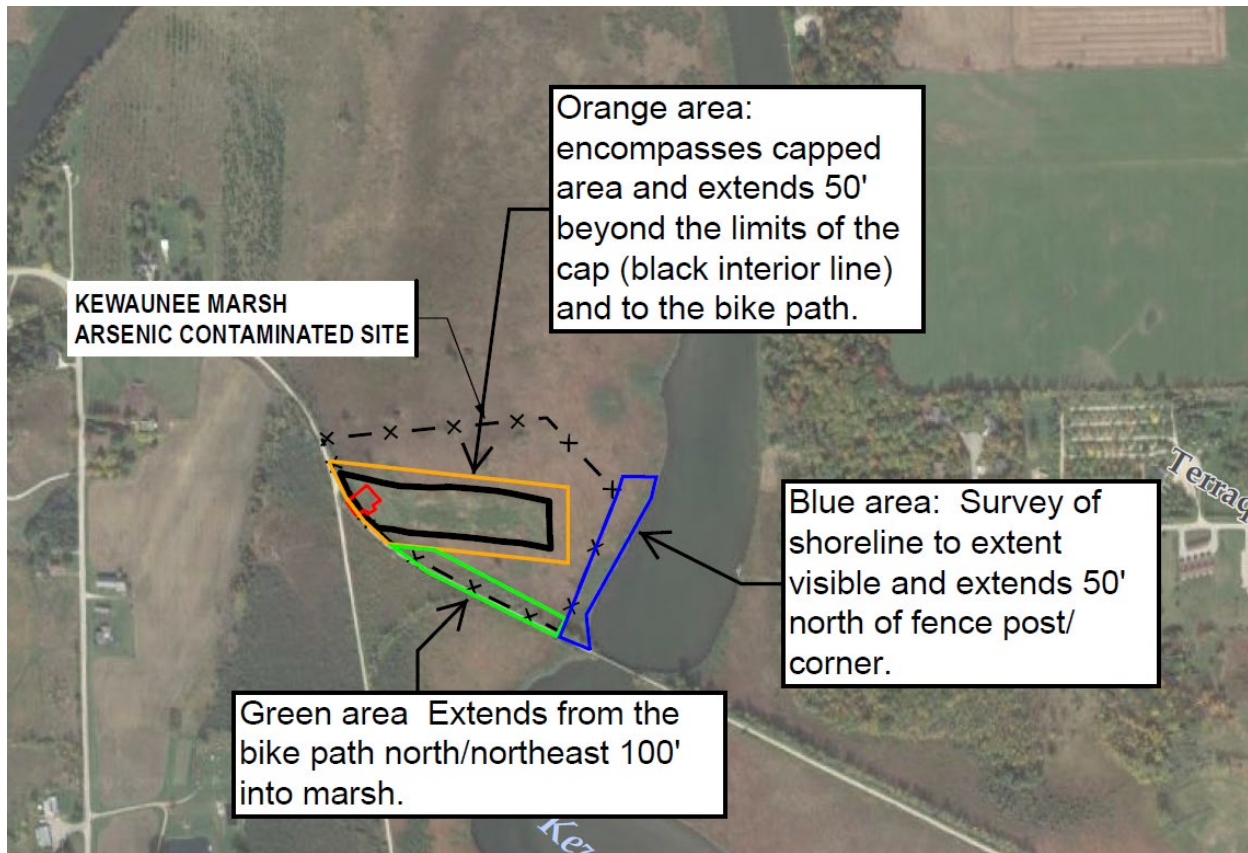


Figure 5.1: Land Survey Areas

### 5.2 Soil/Sediment Sampling

The soil/sediment investigation includes installation of soil/sediment borings as shown on Figure 3 and Table 1. The general soil/sediment sampling scope includes the following items.

- Install 57 investigative soil/sediment borings
  - 20 locations to 5 ft bgs.
  - 10 locations to 8 ft bgs.
  - 24 locations to 10 ft bgs.
  - 3 locations to 14 ft bgs.

- Install four field replicate soil/sediment borings (one to 5 ft bgs, one to 8 ft bgs, and two to 10 ft bgs).
- Collect field duplicate samples as indicated in Table 2.
- Homogenize the soil/sediment from each 2-foot interval.
  - If more than 2-feet of silt is encountered, underlying intervals of silt will not be containerized for laboratory analysis.<sup>2</sup>
- Collect soil/sediment samples from each 2-foot interval (or 1-foot interval for borings of total depth 5 feet) as shown in Table 2.
  - For toxicity characteristic leaching procedure analysis, multiple 2-foot intervals will be combined for laboratory analysis and will be labeled to reflect the intervals combined (e.g., 0-2 and 2-4 combined will be labeled 0-4) as listed in Table 2.
- Submit samples for laboratory analysis for arsenic and percent moisture, with a subset also analyzed for loss on ignition, grain size analysis, and toxicity characteristic leaching procedure for arsenic as listed in Table 1 and 2.
- Abandon each borehole following sampling.

### **5.2.1 Boring Installation and Soil/Sediment Sampling Methodology**

TRC will subcontract with On-Site Environmental Services, Inc. (OES) to install 500 feet of soil/sediment borings at the site using a track mounted Geoprobe<sup>®</sup> with the direct-push technology (DPT) drilling method. DPT are 2-inch diameter cores collected in disposable plastic liners. The 500 feet includes the proposed borings listed above in Section 5.2. The soil/sediment borings will be installed at the approximate locations shown on Figure 3.

Table 1 and 2 summarize the cores and associated analytical parameters and number of samples for analyses. Field replicates and duplicates are identified. The specific location of each boring may be modified if site specific conditions prevent access to the location or collection of samples. The modification will be based on professional judgment, field observations, lack of accessibility, and/or lack of recovery upon the first attempt. The basis of changing the location shall be documented.

The soil/sediment boring program is designed to extend through the peat and penetrate into the underlying silt at most, but not all, boring locations. The boring depths will be as shown in Table 2. The soil/sediment samples will be collected using a new, clear plastic sampling liner for each sample interval. The interval length for the direct push drilling method will be 4 or 5 feet, depending on the specific drilling equipment used.

A Russian Peat Core Sampler or similar sediment hand sampling tool will also be available for the soil/sediment sampling. This will be used as a contingency to hand sample up to five locations that cannot be accessed by OES equipment on the days of sampling. The depth of borings completed by hand will be based on the depth that can be achieved with the selected sampling device and site conditions.

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<sup>2</sup> Samples will be collected for laboratory analysis as show in Table 2. If samples cannot be collected as shown, TRC will contact WDNR to discuss potential changes.

Each soil/sediment-filled liner will be split open and the contents will be described in a field log in accordance with the Unified Soil Classification System (USCS). TRC will continuously log and photograph the cores. Then, soil/sediment from each 2-foot interval (or less) will be homogenized. Overlying vegetation (leaves, plant growth) will not be homogenized, but root structures will be included. To create homogenized samples, the soil/sediment from each sample interval will be placed into a clean plastic bag for mixing. A portion of the homogenized soil/sediment will be placed in appropriately labeled laboratory sample containers and placed on ice for transport to the laboratory. Each sample location will be photographed, logged with a GPS, and relevant field conditions will be recorded.

Boreholes will be abandoned in accordance with NR 141.25. The direct-push tooling will be removed, and the open portion of the borehole will be plugged using bentonite chips.

### **5.2.2 Soil/Sediment Sample Analyses**

Table 2 summarizes the number of cores and samples that will be analyzed for arsenic and percent moisture.

- **Arsenic & Percent Moisture:** The soil/sediment from each 2-foot interval (or less) will be homogenized. The samples (up to 300 total) will be submitted to Eurofins TestAmerica for arsenic and percent moisture analyses. Soil samples for arsenic and percent moisture will be filled first.

The sampling locations and depths for loss on ignition and grain size (sieve or sieve and hydrometer) analysis at Eurofins TestAmerica are defined in Table 2.

- **Loss on Ignition:** A total of 54 samples are proposed for analysis as shown on Table 2. Soil samples for loss on ignition for each 2-foot interval will be filled second.
- **Grain Size (Sieve/Sieve & Hydrometer):** A total of 31 samples are proposed to be analyzed for grain size as shown on Table 2. Grain size analysis will either be by sieve or by sieve and hydrometer. Soil samples for grain size analysis for each 2-foot interval will be filled third.

If insufficient sample volume is recovered to collect a planned sample for laboratory analysis, TRC and WDNR will coordinate during the field work to determine if an alternate sample should be analyzed in lieu of the planned sample.

### **5.2.3 Determination of Hazardous Materials**

Ten composite samples will be collected during the soil/sediment sampling and will be submitted to Eurofins TestAmerica for Toxicity Characterization Leaching Procedure (TCLP) testing for arsenic. Nine primary samples and one duplicate sample are planned as shown on Table 2. TCLP samples will also be analyzed for arsenic and percent moisture. The samples will be collected from the following areas:

- The soil/sediment previously treated in-situ (1 sample)
- Untreated soil/sediment where arsenic concentrations greater than 1,000 mg/kg were detected and located in the capped area (3 samples)

- Locations outside of the capped area (4 samples)
- Field duplicate (1 sample)

Materials for each sample will either be specified intervals or a composite of the entire core, as listed in the notes of Table 2. Any silt encountered beneath the lower-most peat interval will not be composited for TCLP analysis. If multiple intervals are combined, a separate laboratory container will be filled for TCLP analysis. In this case, these laboratory containers will be filled last and will be filled depending on the availability of remaining sample volume. If compositing samples does not result in sufficient sample volume, no additional drilling is planned.<sup>2</sup> The results will be evaluated to determine whether the materials currently present at the site is characteristically hazardous and the potential extent if any such materials are detected.

### **5.3 Surface Water Sampling**

Surface water samples will be collected across the site to represent the range of potential arsenic concentrations present at the site. The proposed sample collection locations are shown on Figure 3. The samples will be collected from the following areas:

- Within the cap area (2 samples)
- Northeast of the cap (1 sample)
- East/downstream of the cap (1 sample)
- South of the cap (2 samples, each within approximately 100 feet of the Ahnapee State Trail)
- Eastern edge of the site along the sloughs (1 sample each per 3 sloughs)
- Field duplicate (1 sample)

TRC will attempt to collect samples from the areas shown on Figure 3, provided the locations are accessible and surface water is sufficiently deep for sampling. Surface water will be defined as 6 inches or more of standing water. If sample locations are inaccessible due to field conditions (i.e. high river levels, insufficient water in the marsh, or dense vegetation) samples will be collected from a nearby location.

#### **5.3.1 Surface Water Sampling Methodology**

The surface water sample collection methodology is summarized below:

- Calibrate the water quality meter (YSI 556 or equivalent) at the start and end of the field day.
- If thin ice (less than 1 or 2 inches) is present at the site, the sampler will break ice. If ice greater than 2 inches is present, sampling will not be possible due to health and safety concerns.
- Samples will be collected as accessible depending on the density of vegetation.

- If possible, the sampler will position themselves such that they are not standing in the surface water body or can remain downstream of sample location to minimize turbidity. Sampler will submerge a cup or the sample collection jug beneath the water surface to collect the sample, with minimal turbidity, as possible.
- Document the depth of the water column present at each sample location using a calibrated rod.
- Sample will be collected where there is as little visually observable suspended sediment or turbidity as possible, but presence of suspended solids will not prohibit collection of samples.
- Collect a sample of at least 1.5 liters in volume in a plastic jug as a grab sample. Label the sample in the field. Samples will be carried back to the field vehicle and left outside in ambient temperatures.
- Samples will be unfiltered.
- Pour a portion of a sample into a cup and use the calibrated YSI to collect field measurements. Record field measurement of pH, conductivity, DO, ORP, and temperature. Rinse the YSI probe with DI water between collection of field measurements from each sample.
- Fill Eurofins TestAmerica laboratory containers using water from the jug. Retain the remaining surface water sample in the jug for Ursus Remediation Testing sample. The remaining sample for Ursus Remediation Testing should be at least 1 liter in volume.
- Label all laboratory containers and jugs with the appropriate sample identification as described in Section 5.4.5.
- Photograph each sample location and record relevant field conditions (surface cover, approximate water depth, and any visually observable turbidity).

### **5.3.2 Surface Water Sample Analyses**

Surface water samples will be split for analysis at both Eurofins TestAmerica and Ursus Remediation Testing. The pre-design site characterization sampling plan is summarized in Table 1. Samples sent to Eurofins TestAmerica will be analyzed for arsenic, iron, calcium, sulfate, and sulfide. Samples sent to Ursus Remediation Testing will be used to investigate field test methods for arsenic and tested for TSS, as described in Section 5.3.3.

### **5.3.3 Investigating Field Test Method for Arsenic in Water**

The split surface water samples collected at the site will be analyzed by Ursus Remediation Testing Laboratory for up to two field test kits for arsenic in water<sup>3</sup>. The arsenic field test kit evaluation will occur in a laboratory setting, where reaction time and solution temperature can be

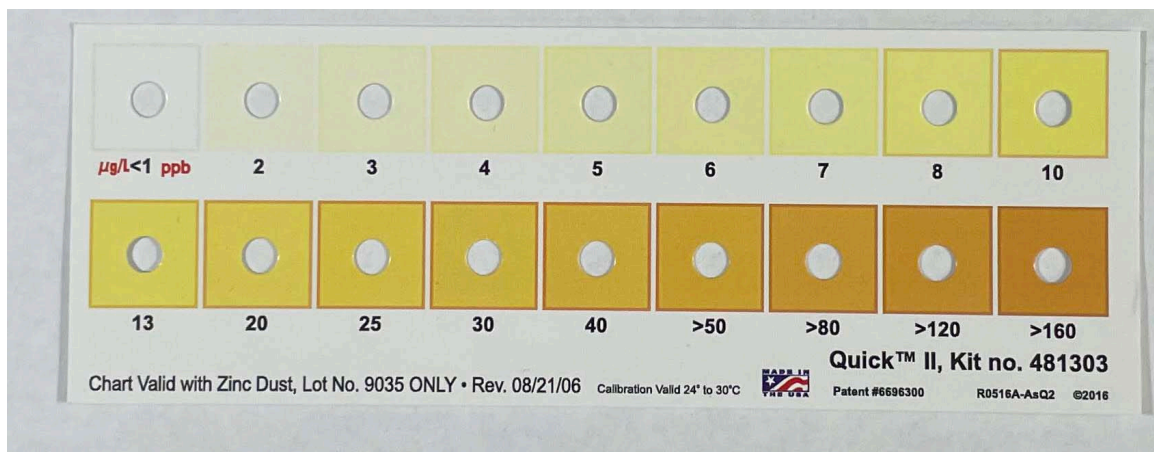
<sup>3</sup> There are several field test kits available for arsenic in water. Two studies have compared these test kits and ranked them according to reliability and ease of use (Spear, et al., 2006 and Reddy, et al., 2020). From these reviews, the Industrial Test Systems, Inc. Quick Arsenic II and Arsenic Econo-Quick test kits are recommended for WDNR's study based on their cost and availability in the market. The evaluation method described is based on the Quick Arsenic II temperatures and time periods. If the Quick Arsenic II results appear not to be workable from the initial steps of this evaluation, the Econo-Quick test will be tested (and the evaluation method will be modified as needed for temperatures and time periods).



controlled and evaluated. The precision of the field test kit will be evaluated by running replicates on each sample. The accuracy will be evaluated by comparing the field kit results to the results from Eurofins TestAmerica. The ease of use and effect of test conditions will be evaluated by using a concentration in the maximum sensitivity range for the test.

The specific evaluation methods are outlined below but may be modified during the testing if conditions warrant.

1. Purchase Quick™ Arsenic II test kit that covers arsenic concentration in a range of <1 to 40 ug/l and semi-quantitative range of >50, >80, >120, >160 ug/l as shown in Fig. 5.3.1.
2. Prior to the arrival of site samples at the lab, the Quick™ Arsenic II test kit from Industrial Test Systems, Inc. will be tested on arsenic standard of 7.5 ug/L (0.1 uM), 15, 30, 45, and 75.0 ug/L (1.0 uM) prepared from ACS sodium hydrogen arsenate. This is to familiarize the technician with the method as well as to check the accuracy and precision of the method on simple solutions. A standard curve will be created. Standard solution with arsenic concentrations of 7.5 and 45 ug/l will be tested three times each in attempt to evaluate standard deviation. If the standard deviation is greater than 20%, WDNR will be notified.
3. Site surface water samples will be stored in a refrigerator until testing, and then brought to room temperature for the testing itself.
4. Site samples will be analyzed for total suspended solids by filtering 100 mL of sample through a glass fiber filter and drying at 105°C to constant weight.
5. Analyze the 10 site samples with the test kit under recommended testing conditions of 10-12 minutes reaction time at 22-28°C or room temperature. Record the time and temperature for every sample analyzed. Samples will be run both straight and at different -dilution factors so that the concentration of each diluted sample will be less than 50 ug/l. Samples with initial concentration already less than 50 ug/l do not need to be tested with dilution. Two of the samples, one for a sample with a concentration below 50 ug/L (if any) and one sample that needs to be diluted will be analyzed 3 times each to provide a measure of reproducibility.



**Figure 5.3.1: Quick™ II Color Comparison Strip for 1 to 160 ug/L**

6. One sample with a concentration exceeding 100 ug/l will be used for a dilution series test. The sample should be diluted to achieve anticipated concentrations of 5, 10, 20, 30, 40 ug/l and then tested. One of the diluted samples in the middle of the concentration range will be run 3 times to evaluate reproducibility. If the standard deviation is greater than 20%, this will be reported to WDNR after completion of the test kit evaluation.
7. Evaluate the effect of testing conditions outside of the recommended ranges. Both reaction time and temperature will be evaluated. Two samples will be selected with concentrations less than 50 ug/l, after dilution if necessary. Evaluation of testing conditions will prioritize temperature (tests 4 and 5) over reaction time (tests 1, 2, and 3) depending on the quantity of test kits available and time remaining for the evaluation.

Test the two samples with the matrix shown in Table 5.3.1 below:

Test	Reaction Time (min)	Temperature
1, 2, 3	6, 8, 15	Room temperature (measured)
4 and 5	10-12	5°C and 15°C

**Table 5.3.1: Environmental Condition Controls**

8. The results and associated evaluation will be incorporated in the Pre-Design Characterization Report.

## 5.4 Quality Assurance and Quality Control (QA/QC) Plan

### 5.4.1 Meter Calibration, Operation, and Maintenance Procedures

For surface water sampling, the water quality meter (YSI 556 or equivalent) will be calibrated daily in accordance with manufacturer's instructions. Calibration will include a minimum of one calibration at the beginning of each sampling day, and a calibration check will be performed at the end of each sampling day.

The sampling meters will be operated and maintained according to the manufacturer's instructions. Maintenance activities performed during the fieldwork will be recorded in the field notes.

### 5.4.2 Decontamination of Equipment

Single-use sampling equipment and materials will be used wherever possible. Single-use equipment may include, but is not limited to, nitrile gloves, plastic sampling syringes, plastic bags, aluminum foil, and plastic core barrel liners. Non-single-use sampling equipment, such as direct-push cutting shoes and core barrels, will be decontaminated between uses by washing with a non-phosphate detergent solution (if allowable based on the material) and rinsing with potable water. The water quality meter will be rinsed with deionized water between surface water samples.

### 5.4.3 Field Records

Daily field activities and sampling data will be recorded on paper field forms or electronically on a field records application through use of a tablet, cellphone, or computer. Sample pictures will be captured as .jpg files using a tablet, cellphone, or camera.



#### **5.4.4 Sampling Locations**

The locations of soil/sediment borings and surface water samples will be logged using differential global positioning system (GPS) techniques. A Trimble Geoexplorer handheld GPS unit, with H-Star technology enabled (or equivalent), will be used to collect these locations. Where field conditions permit, carrier-phase signal data will be used for GPS data collection. When collecting GPS location data, field staff will continuously log a sample position until the predicted post-processed accuracy is better than 1 foot, or until 30 position readings have been collected. All data collected with the Trimble GPS unit will be post-processed through the software program Trimble Pathfinder Office using nearby reference station Global Navigation Satellite System (GNSS) reference data, as available. GPS and survey data will be projected into the State Plane coordinate system (NAD83, US Feet).

#### **5.4.5 Sample Identification**

Each sample collected from the site will be assigned a unique alpha-numeric sample descriptor identifying the sample location and depth, if applicable.

- **Soil/Sediment:** Each soil/sediment sample will be identified with “SS-2021-##(X-X)”, using a location number “##” followed by the sample depth interval “(X-X)” where the X’s signify the sample depth interval in feet below ground surface [e.g., SS-2021-01(0-2)].
- **Surface Water:** Each surface water sample location will be identified with “SW-2020-##”, using a location number “##” assigned sequentially in the order of sampling.
- **Quality Control Samples:** Each quality control sample (e.g., field duplicate) will be identified with the appropriate media/year descriptor (SS-2021- or SW-2020-), followed by the quality control sample type abbreviation (e.g., DUP), and then numbered sequentially. For example, the complete sample identifier for the first soil/sediment field duplicate collected would be “SS-2021-DUP01.”

Each field replicate will be identified with the appropriate media/year descriptor (SS-2021-XXR), followed by the primary sample number and a “R” to indicate replicate. For example, the complete field replicate sample identifier for the replicate to “SS-2021-21” will be “SS-2021-21R” and including the depth interval will be “SS-2021-21R(X-X)” where the X’s signify the sample depth interval in feet below ground surface.

#### **5.4.6 Sample Containers and Shipment**

Soil/sediment and surface water samples for laboratory analysis at Eurofins TestAmerica will be placed in the appropriate sample containers provided by the laboratory. Sample containers are prepared by the laboratory and are shipped directly to the TRC office for transport to the site. Sample containers will be placed on ice immediately after collection. Coolers will be packed securely with enough packing material to protect from accidental breakage, leaks, or spills during shipment, and with enough ice to last the duration of the trip for reasonable handling methods and shipping durations. Sample coolers will be shipped overnight to the Eurofins TestAmerica laboratory using proper chain of custody procedures.

Surface water samples for laboratory analysis at Ursus Remediation Testing will be retained in the surface water sampling jug, covered, and labeled after collection. These samples will be refrigerated at TRC Madison’s office until Ursus laboratory can pick-up the samples. Testing at

Ursus will not proceed until finalization of the Work Plan for the predesign studies by WDNR, but the maximum holding time will not exceed 30 days.

### 5.4.7 Laboratory Methods, Detection Limits, and Reporting Limits

Soil samples will be shipped to Eurofins TestAmerica laboratories for analysis. The analyses, hold time, test method, detection limit, reporting limit, and laboratory location are shown in Table 5.1 below.

**Table 5.1: Laboratory QA/QC Table**

Analysis	Media	Estimated Number of Samples	Hold Time	Test Method	Detection Limit	Reporting Limit	Eurofins TA (ETA) Laboratory Location
Arsenic	Soil/ Sediment	292	6 mo.	U.S. EPA 6010C	0.342 mg/Kg	1.0 mg/Kg	ETA Chicago
Percent Moisture	Soil/ Sediment	292	14 days	SM 2540G	0.10%	0.10%	ETA Chicago
Loss on Ignition	Soil/ Sediment	54	28 days	ASTM D7348-08	0.50%	0.50%	ETA Knoxville
Grain Size (Sieve)	Soil/ Sediment	21	NA	ASTM D422	NA	NA	ETA Burlington
Grain Size (Sieve & Hydrometer)	Soil/ Sediment	10	NA	ASTM D422	NA	NA	ETA Burlington
TCLP Arsenic	Soil/ Sediment	10	6 mo.	U.S. EPA 6010C	0.01 mg/L	0.05 mg/L	ETA Chicago

### 5.4.8 QA/QC Samples

Analytical quality assurance will be assessed through the collection of field duplicate QA/QC samples. The frequency for collection is specified below:

- Field Duplicates:** Field duplicate samples will be prepared by splitting a single sample into two separate sets of laboratory containers and will be used to evaluate sampling precision. Proposed duplicate sample locations are listed on Table 2 and will be submitted as blind duplicates to the laboratory. For surface water sampling, 1 blind field duplicate will be collected. For soil/sediment sampling, field duplicates will be collected at a rate of 10 percent of the primary samples.<sup>4</sup>
- Field Replicate:** A field replicate is a boring installed proximate to an investigative soil boring location that will be installed with the same methods and approach. Table 2 identifies the proposed replicate core locations. Logging and sample collection for laboratory analysis will match the investigative core and samples will be submitted separately from the investigative core. For surface water sampling, no field replicates will be collected. For soil/sediment sampling, four field replicates will be collected.<sup>4</sup>

<sup>4</sup> The quantity of field duplicate and field replicate samples was selected by WDNR. There are no Wisconsin Administrative Code requirements for field duplicate or field replicate samples for soil/sediment.

#### 5.4.9 Quick Arsenic II™ Test Procedure

The following procedure is adapted from Industrial Test Systems, Inc. (2017) procedure for use of the Quick Arsenic II™ test kit. The following procedure will be implemented during the evaluation of the field kit test with the laboratory analytical results for surface water samples.

1. For best results, the water temperature should be between 22°C to 28°C. Use a thermometer to verify the temperature of the sample.
2. To the Reaction Bottle, slowly add the water sample to the marked line on the bottle (100 mL).
3. Add 3 level pink spoons of the First Reagent (Quick™ II) to the Reaction Bottle. Cap the bottle securely with the black mixing cap and shake vigorously for 15 seconds.
4. Uncap the Reaction Bottle and add 3 level red spoons of the Second Reagent. Cap the bottle securely with black mixing cap and shake vigorously with bottle upright for 15 seconds. Allow the sample to sit for 2 minutes to minimize sulfide interference.
5. While the test is incubating for 2 minutes, prepare the turret cap as follows: (NOTE: The cap and turret must be dry. If the testing pad becomes wet the results will be inaccurate).
  - a. Open the packet and carefully remove the strip. While handling the strip avoid touching the Mercuric Bromide testing pad at one end of the strip.
  - b. Position either side of the testing pad over the orifice and press down the turret handle over the pad until it locks into position on the cap. Make certain the red turret with handle is fully closed. The red turret should be pressed level with the top of the cap to ensure all gas passes through the testing pad. To confirm that the testing pad completely covers the hole in the cap, visually inspect the orifice from under the cap. The turret cap is now ready for use in Step 7.
6. Uncap the Reaction Bottle and add 3 level white teaspoons of the Third Reagent. Cap the bottle securely with black mixing cap and shake vigorously for 5 seconds.
7. Remove the black cap from the Reaction Bottle and recap securely using the turret cap within 20 seconds. As you screw on the turret cap be careful not to splash the water or reagents on the testing pad. It is important that the testing pad remain dry during the test. Place the bottle in a well-ventilated area where it will not be disturbed. You should notice numerous small hydrogen gas bubbles generating from the tartaric acid and zinc dust reagents.
8. Start the timer and wait for ten minutes. Reaction generates small hydrogen bubbles.
9. After waiting ten minutes (but no longer than 12 minutes) pull the turret up. Carefully remove the test strip with the testing pad. Flatten the testing pad, if necessary, by gently pressing it between two clean pieces of paper. Use the Color Chart and match the color of the exposed side of the testing pad within the next 2 minutes (Color oxidizes when exposed to light. For best color matching use natural daylight, but do not use direct sunlight. The color can be preserved for a short time by returning the testing pad to the packet and keeping it out of light).
10. Record the result.

## **5.5 Site Safety Plan**

TRC has developed a site-specific health and safety plan which is included as Appendix B. The plan will be followed by TRC and its subcontractors to maintain worker safety while conducting pre-design site characterization activities at the site.

## **5.6 Waste Handling and Disposal Plan**

The investigation derived waste (IDW) streams generated during this investigation are expected to include:

- Soil/sediment cuttings/excess sample material,
- decontamination fluids, and
- general refuse (e.g., used personal protective equipment, single-use sampling equipment, and trash).

No IDW surface water will be generated during this sampling.

The IDW soil/sediment will be containerized in 55-gallon drums supplied by OES. OES will move the drums to an agreed upon location near the Ahnapee State Trail trailhead intersection with River Road; TRC will label the drums with the contents and sampling date; and WDNR will be responsible for coordination of and payment for disposal of the IDW under the state contract with Veolia Environmental Services.

General refuse will be collected in trash bags and placed in a waste dumpster.

## 6.0 Work Schedule and Reporting

### 6.1 Work Schedule

The work schedule below is based on an estimated start date, the project completion date in the WDNR's SOW, and the anticipated timeframe for the field sampling.

Item	Estimated Schedule
Contract Award Date	November 19, 2020
<b>Workplan</b>	
Draft to WDNR (15 days from contract)	December 4, 2020
Comments from WDNR (5 days after receipt of draft)	February 8, 2021
Revised Draft to WDNR (7 days after receipt of comments)	February 15, 2021
Comments from WDNR (7 days after receipt of revised draft)	March 1, 2021
Final Draft to WDNR	March 10, 2021
Comments from WDNR	March 11, 2021
Final Workplan to WDNR	March 12, 2021
<b>Field Work</b>	
Surface Water Sampling (1 day)	December 1, 2020
Surface Water Sampling Results from Lab (10 days after receipt)	December 16, 2020
Evaluation of As Field Test Methods for Water (approximately 2 weeks)	December 2020
Survey and Soil/Sediment Sampling (3 days)	March 2021
Soil/Sediment Sampling Results from Lab (15 days after receipt)	April 2021
<b>Reporting</b>	
Draft Pre-Design Characterization Report to WDNR	May 14, 2021
Comments from WDNR	May 31, 2021
Final Pre-Design Characterization Report to WDNR	June 15, 2021
<b>Project Management</b>	
Monthly progress report and invoices	December 2020 – July 2021

### 6.2 Reporting

TRC will prepare a Pre-Design Characterization Report that will include a summary of the work performed, field observations, survey data, boring logs, sample photos, analytical results, and laboratory evaluation of field test methods for arsenic in surface water. TRC will tabulate and evaluate the results of the site investigation. Final performance standards for implementing remediation have not been established for the site, but it is anticipated that the WDNR will select site performance standards following issuance of this report. Analytical results will be compared to the site performance standards if the WDNR provides them prior to development of the report.

The report will include five updated figures depicting the horizontal extent of arsenic contamination in the 2-foot depth intervals from 0 to 10+ feet, and up to four cross-sections depicting the geology and vertical extent of arsenic contamination across the site. The horizontal extent of arsenic

contamination will be interpolated using the new analytical data and the same process (GIS and professional judgement) documented in the 2020 RAOR. The cross-sections will be produced in Adobe Illustrator using the new boring logs, survey data, and interpolated extent of arsenic impacts and professional judgement. The benchmark arsenic concentrations will be 20 ppm, 100 ppm, 200 ppm, 500 ppm, and 1000 ppm.

## 7.0 References

- Industrial Test Systems, Inc. 2017. Quick Arsenic II™ Rapid Arsenic Test Kit Instruction Booklet. Revision: 11/07/17 by ITS Europe, LTD.
- Reddy, R., G. Rodriguez, T. Webster, M. Abedin, M. Karim, L. Raskin, and K. Hayes. 2020. Evaluation of arsenic field test kits for drinking water: Recommendations for improvement and implications for arsenic affected regions such as Bangladesh. *Water Research*. 170. 115325.
- RMT, Inc. 2010. Hot spot investigation documentation and remedial options analysis report. Kewaunee Marsh. Prepared for Wisconsin Department of Natural Resources. May 2010.
- Spear, J.M., Y. Shou, C. Cole, and Y. Xie. 2006. Evaluation of arsenic field test kits for drinking water analysis. *J. AWWA*. 98:12, 97-105.
- TRC. 2020. Kewaunee Marsh Arsenic Contaminated Site, BRRTS #02-31-000508. Remedial Action Options Report. July 20, 2020.
- WDNR. 2018. Site investigation summary and data package. Kewaunee Marsh Arsenic Spill Site, Kewaunee, WI. 02-31-000508. November 5, 2018.
- WDNR. 2019. Development of remedial action performance standards for arsenic cleanup at the Kewaunee Marsh Arsenic Contaminated Site. August 21, 2019.

**Table 1: Pre-Design Site Characterization Sampling Plan  
Kewaunee Marsh Arsenic Contaminated Site  
BRRTS #02-31-000508**

Sample Matrix	Estimated Sample Quantity	Sample ID	Parameters	Laboratory	Data Objective	Additional Details	
Surface Water	10	SW-2020-01 to SW-2020-09; SW-2020-DUP01	Arsenic, Iron, and Calcium Sulfate Sulfide	Eurofins TestAmerica	Site Characterization	<ul style="list-style-type: none"> <li>9 field samples</li> <li>1 duplicate</li> </ul>	
			Arsenic (field test kits <sup>(1)</sup> ), TSS	Ursus Remediation Testing	Implementability of Arsenic Field Test Kits	<ul style="list-style-type: none"> <li>9 field samples</li> <li>1 duplicate</li> </ul>	
Soil/ Sediment	292	SS-2021-01(X-X) to SS-2021-57(X-X)  (Xs signify sample depth interval)  (Replicate borings will be identified with a R after the number)  (Duplicate samples will be identified SS-2021-DUP01 (X-X), etc.)	Arsenic Percent Moisture	Eurofins TestAmerica	Site Characterization	<b>Borings:</b> <ul style="list-style-type: none"> <li>21 borings to 5 feet bgs (includes 1 replicate boring)</li> <li>11 borings to 8 feet bgs (includes 1 replicate boring)</li> <li>26 borings to 10 feet bgs (includes 2 replicate borings)</li> <li>3 borings 14 feet bgs</li> </ul> <b>Samples:</b> <ul style="list-style-type: none"> <li>Each 2-foot interval (or less)</li> <li>Underlying silt (up to 2-foot interval, where encountered)</li> <li>Duplicate samples as shown on Table 2</li> </ul>	
			Loss on Ignition				
			Grain Size (Sieve)				
			Grain Size (Sieve and Hydrometer)				
			Toxicity Characteristic Leaching Procedure (TCLP) for Arsenic		Waste Characterization	<b>Samples:</b> <ul style="list-style-type: none"> <li>Composite sample of boring, depth as shown on Table 2</li> <li>Underlying silt should not be composited</li> </ul>	
54							
21							
10							
10							

Prepared by: A. Enright 12/2020  
Checked by: K. Vater 3/2021



**Table 2: Proposed Soil Boring Locations and Analytical Sampling Plan  
Kewaunee Marsh Arsenic Contaminated Site  
BRRTS #02-31-000508**

Boring No.	TCLP Sample	Replicate Boring No.	Duplicate Samples	Boring ID	Sample IDs	Coordinates (NAD_1983_StatePlane_Wisconsin_South_FIPS_4803_Feet)				Core Length ft	Type and Quantity of Samples					Notes
						X_SFIPS	Y_SFIPS	Lat	Long		Arsenic	Loss On Ignition	Percent Moisture	TCLP Arsenic	Grain Size (Sieve) <sup>1</sup>	
1				SS-2021-01	SS-2021-01(0-2) SS-2021-01(2-4) SS-2021-01(4-5)	2616647.72	912330.5721	44.476506	-87.516846	5	3	1	3			LOI - 0-2'
2				SS-2021-02		2616553.858	912216.7361	44.476202	-87.517218	5	3		3			
3				SS-2021-03		2616537.494	912097.9041	44.475878	-87.517294	5	3	1	3	1		LOI - 0-2'; Grain size - 0-2'
4				SS-2021-04		2616527.498	912019.6234	44.475664	-87.517341	5	3		3			
5				SS-2021-05		2616522.721	911887.1795	44.475301	-87.517375	10	5		5			
6				SS-2021-06		2616683.936	912155.2245	44.476023	-87.516727	5	3		3			
7				SS-2021-07		2616609.039	912056.4206	44.475758	-87.517025	10	5	1	5			LOI - 0-2'
	X				SS-2021-07(0-X)						1		1	1		TCLP 0-??', composite only peat into sample and only top 5' (as long as there is sufficient sample volume)
8				SS-2021-08		2616607.61	911984.4093	44.475561	-87.517039	14	7	2	7			LOI - 0-2'; 2-4'; Complete boring to 14'
	X				SS-2021-08(0-X)						1		1	1		TCLP 0-??', composite only peat into sample and only top 10'
9				SS-2021-09		2616580.425	911936.0849	44.47543	-87.517148	14	7	7	7		7	Complete boring to 14'
10				SS-2021-10		2616675.634	911959.0427	44.475486	-87.516781	14	7	7	7	7		Complete boring to 14'
	X				SS-2021-10(0-X)						1		1	1		TCLP 0-??', composite only peat into sample and only top 10'
			X		SS-2021-DUP01 through SS-2021-DUP07						7	7	7			Primary Sample SS-2021-10
11				SS-2021-11		2616803.946	912083.9391	44.475818	-87.516276	5	3		3			
12				SS-2021-12		2616872.465	912137.6152	44.475959	-87.516007	8	4		4			
			X		SS-2021-DUP08 through SS-2021-DUP11						4		4			Primary Sample SS-2021-12
13				SS-2021-13		2616983.72	912249.7618	44.476257	-87.515568	5	3		3			
14				SS-2021-14		2616767.248	911980.4691	44.475537	-87.516428	10	5	1	5			LOI - 0-2'
15				SS-2021-15		2616666.816	911880.1446	44.47527	-87.516824	10	5		5			
		1		SS-2021-15R		2616682.265	911880.2065	44.475269	-87.516765	10	5		5			
16				SS-2021-16		2616800.543	911909.2789	44.475339	-87.516309	10	5	1	5	2		LOI - 0-2'; Grain size - 0-2' and 2-4'
	X				SS-2021-16(0-X)						1		1	1		TCLP 0-??', composite only peat into sample
	X		X		SS-2021-DUP12 through SS-2021-DUP14						1		1	1	2	TCLP, Arsenic, and Percent Moisture - DUP12 Primary Sample SS-2021-16(0-??') Grain Size 0-2 - DUP13 Grain Size 2-4 - DUP14 Primary Sample SS-2021-16
17				SS-2021-17		2616831.9	911955.2198	44.475462	-87.516183	10	5		5			
18				SS-2021-18		2616910.736	912031.8456	44.475666	-87.515873	10	5	2	5			LOI - 0-2'; 2-4'
	X				SS-2021-18(0-X)						1		1	1		TCLP 0-??', composite only peat into sample
19				SS-2021-19		2616941.282	911948.6861	44.475436	-87.515765	10	5		5			
20				SS-2021-20		2616836.75	911791.625	44.475013	-87.516183	8	4		4			
21				SS-2021-21		2616760.579	911792.0191	44.475021	-87.516475	8	4	4	4			
		2		SS-2021-21R		2616769.594	911778.1476	44.474982	-87.516442	8	4	4	4			
22				SS-2021-22		2616866.805	911712.6547	44.474795	-87.516077	8	4		4			
			X		SS-2021-DUP15 through SS-2021-DUP18						4		4			Primary sample SS-2021-22
23				SS-2021-23		2616947.751	911778.0007	44.474967	-87.51576	10	5		5			
	X				SS-2021-23(0-X)						1		1	1		TCLP 0-??', composite only peat into sample
24				SS-2021-24		2616947.176	911850.6935	44.475166	-87.515754	10	5		5			
25				SS-2021-25		2617010.939	911978.797	44.475512	-87.515495	10	5		5			
26				SS-2021-26		2617104.199	912023.3746	44.475627	-87.515133	10	5		5			
27				SS-2021-27		2617141.169	912119.4166	44.475887	-87.51498	5	3	1	3			LOI - 0-2'
		3		SS-2021-27R		2617123.588	912113.7727	44.475873	-87.515048	5	3		3			

**Table 2: Proposed Soil Boring Locations and Analytical Sampling Plan  
Kewaunee Marsh Arsenic Contaminated Site  
BRRS #02-31-000508**

Boring No.	TCLP Sample	Replicate Boring No.	Duplicate Samples	Boring ID	Sample IDs	Coordinates (NAD_1983_StatePlane_Wisconsin_South_FIPS_4803_Feet)				Core Length ft	Type and Quantity of Samples					Notes			
						X_SFIPS	Y_SFIPS	Lat	Long		Arsenic	Loss On Ignition	Percent Moisture	TCLP Arsenic	Grain Size (Sieve) <sup>1</sup>		Grain Size (Sieve & Hydrometer) <sup>2</sup>		
28				SS-2021-28		2617176.721	912205.5263	44.47612	-87.514834	5	3		3						
29				SS-2021-29		2617360.262	912205.5533	44.476105	-87.514132	5	3		3						
30				SS-2021-30		2617262.498	912128.3832	44.475902	-87.514515	5	3		3						
31				SS-2021-31		2617372.628	912087.2487	44.47578	-87.514098	5	3		3						
32				SS-2021-32		2617299.784	912040.508	44.475658	-87.514382	10	5		5						
33				SS-2021-33		2617344.126	911991.5957	44.47552	-87.514218	10	5		5						
34				SS-2021-34		2617245.536	911974.6248	44.475482	-87.514597	10	5	1	5			LOI - 0-2'			
	X			SS-2021-34(0-X)							1		1	1		TCLP 0-??', composite only peat into sample			
35				SS-2021-35		2617102.638	911883.8489	44.475245	-87.515155	10	5		5			Primary sample SS-2021-35			
			X	SS-2021-DUP19 through SS-2021-DUP23							5		5						
36				SS-2021-36		2617051.489	911831.6618	44.475106	-87.515357	10	5	2	5	5		LOI - 0-2', 2-4'			
37				SS-2021-37		2617044.814	911729.267	44.474826	-87.515394	10	5		5						
38				SS-2021-38		2616932.205	911667.7168	44.474666	-87.515832	8	4		4						
39				SS-2021-39		2617095.218	911598.0323	44.474462	-87.515216	10	5	2	5			LOI - 0-2', 2-4'			
40				SS-2021-40		2617143.057	911760.3354	44.474903	-87.515014	10	5		5						
	X			SS-2021-40(0-X)							1		1	1		TCLP 0-??', composite only peat into sample			
		4		SS-2021-40R		2617159.883	911761.0579	44.474903	-87.51495	10	5		5						
41				SS-2021-41		2617293.049	911839.3762	44.475107	-87.514431	10	5	2	5			LOI - 0-2', 2-4'			
42				SS-2021-42		2617345.457	911798.548	44.474991	-87.514235	10	5	2	5			LOI - 0-2', 2-4'			
43				SS-2021-43		2617288.326	911745.3592	44.47485	-87.51446	8	4		4						
44				SS-2021-44		2617240.499	911672.9145	44.474655	-87.514651	8	4	1	4	4		LOI - 0-2'			
45				SS-2021-45		2617263.175	911590.9896	44.474429	-87.514574	5	3		3						
46				SS-2021-46		2617383.885	911690.6654	44.474692	-87.5141	8	4		4						
	X			SS-2021-46(0-X)							1		1	1		TCLP 0-??', composite only peat into sample			
47				SS-2021-47		2617407.791	911771.9984	44.474913	-87.513999	8	4		4	2		Grain size - 0-2', 2-4'			
			X	SS-2021-DUP24 through SS-2021-DUP27							4		4		1	Primary sample SS-2021-47; DUP only on Grain Size 0-2'			
48				SS-2021-48		2617435.957	911880.0763	44.475207	-87.513879	8	4		4						
49				SS-2021-49		2617446.512	911955.2155	44.475412	-87.51383	10	5	2	5			LOI - 0-2', 2-4'			
50				SS-2021-50		2617581.193	912008.7394	44.475548	-87.513308	5	3	1	3			LOI - 0-2'			
51				SS-2021-51		2617502.866	911789.8829	44.474954	-87.513633	10	5	1	5			LOI - 0-2'			
52				SS-2021-52		2617435.054	911644.3515	44.474561	-87.513909	5	3		3						
53				SS-2021-53		2617395.258	911566.2335	44.47435	-87.514071	5	3	1	3			LOI - 0-2'			
54				SS-2021-54		2617316.096	911521.1167	44.474233	-87.514379	5	3		3						
55				SS-2021-55		2617529.442	912169.1844	44.475992	-87.513488	5	3		3						
56				SS-2021-56		2617617.199	911923.0005	44.47531	-87.51318	5	3		3						
57				SS-2021-57		2617564.393	911754.8753	44.474853	-87.513402	5	3		3						
										<b>Primary Borings (Total Core Length/Samples)</b>		462	250	43	250	9	19	9	
										<b>Replicate Borings (Total Core Length/Samples)</b>		33	17	4	17	0	0	0	
										<b>Duplicate Samples (No Duplicate Core Length)</b>		0	25	7	25	1	2	1	
										<b>Total (Core Length/Samples)</b>		<b>495</b>	<b>292</b>	<b>54</b>	<b>292</b>	<b>10</b>	<b>21</b>	<b>10</b>	

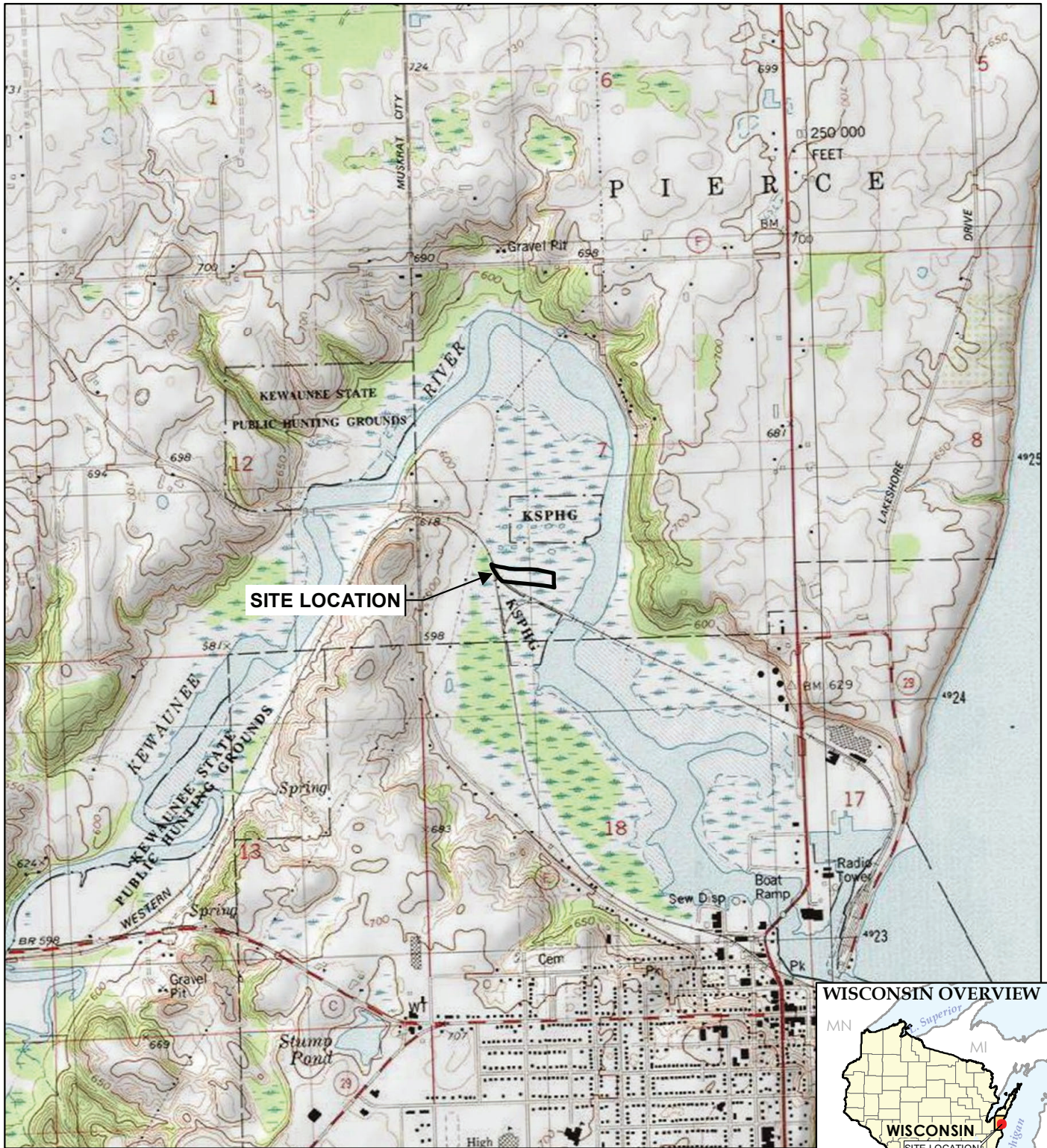
Notes:

1. If total number of Grain Size (Sieve) analyses is <15 (including duplicates), additional sample locations may be added.
2. If total number of Grain Size (Sieve & Hydrometer) analyses is <10 (including duplicates), additional sample locations may be added.

Prepared by: KAV 3/4/2021

Checked by: AEE 3/8/2021





BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.



708 Heartland Trail., Suite 3000  
Madison, WI 53717  
Phone: 608.826.3600

TRC - GIS

PROJECT: **WDNR**  
**KEWAUNEE MARSH ARSENIC CONTAMINATED SITE**  
**BRRTS #02-31-000508**

TITLE:  
**SITE LOCATOR MAP**

DRAWN BY:	A. ADAIR
CHECKED BY:	A. ENRIGHT
APPROVED BY:	K. VATER
DATE:	MARCH 2021
PROJ. NO.:	412027
FILE:	412027-PSL-001slm.mxd

**FIGURE 1**





**LEGEND**

- 1996 CAPPED AREA
- CHAIN LINK FENCE
- 2011 IN SITU TREATMENT AREA

**NOTES**

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO & PARTNERS, OCTOBER 2013.
2. MAP PROJECTION AND GRID COORDINATES ARE NAD83 STATE PLANE WISCONSIN CENTRAL, US SURVEY FEET.

1" = 1,000'  
 1:12,000

PROJECT:		<b>WDNR KEWAUNEE MARSH ARSENIC CONTAMINATED SITE BRRTS #02-31-000508</b>	
TITLE:			
<b>SITE LOCATION</b>			
DRAWN BY:	A. ADAIR	PROJ. NO.:	412027
CHECKED BY:	A. ENRIGHT	<b>FIGURE 2</b>	
APPROVED BY:	K. VATER		
DATE:	MARCH 2021		

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 Madison, WI 53717  
 Phone: 608.826.3600  
 www.trccompanies.com

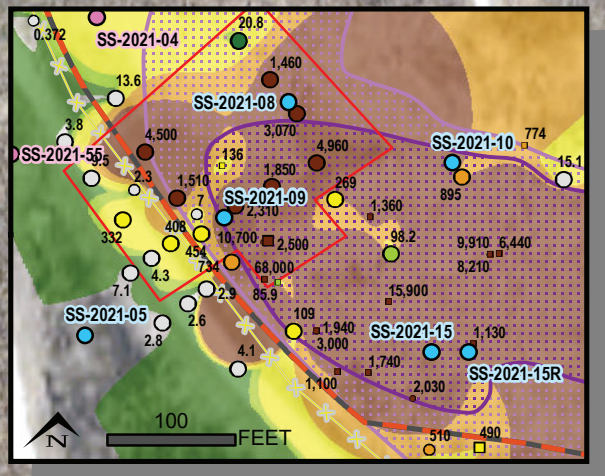
FILE NO: 412027-PSL-002.mxd



TRC - GIS  
 Coordinate System: NAD 1983 StatePlane Wisconsin Central FIPS 4802 Feet (Foot US)  
 Map Rotation:  
 Plot Date: 3/15/2021, 13:16:33 PM by RSUEMNICHT --LAYOUT:ANSI(B(11"x17"))  
 Path: S:\1-PROJECTS\WI\DNR\KewauneeMarsh\2021\_412027\412027-PSL-003.mxd

**INTERPOLATION NOTE:** BECAUSE OF THE VARIABILITY IN TIME, SAMPLING METHOD, AND DATA DENSITY THERE IS A HIGH DEGREE OF UNCERTAINTY WITH THE RESULTS FROM THE DATA INTERPOLATION. FOR AREAS WHERE THERE ARE A LIMITED NUMBER OF DATA POINTS, THE RESULTS FROM THE SPATIAL ANALYSIS MAY NOT ALIGN PERFECTLY BETWEEN EACH DEPTH INTERVAL.

**CAP AREA NOTE:** THE CONCENTRATIONS INTERPOLATED IN THE CAPPED AREA ARE ASSUMED TO BE CONSERVATIVE (I.E. HIGH). WITH THE EXCEPTION OF HOT SPOT AREA NEAR THE TRAIL, THE SAMPLES WITHIN THE CAPPED AREA HAVING ARSENIC >1,000 PPM WERE COLLECTED PRIOR TO THE CAP BEING IN PLACE. MORE RECENT (POST-CAP) DATA COLLECTED FROM THE UPPER 0-2' OF THE CAP GENERALLY HAVE LOWER CONCENTRATIONS OF ARSENIC.



**LEGEND**

- PROPOSED SAMPLE > 5 FEET
- PROPOSED SAMPLE 5 FEET
- ✕ SURFACE WATER SAMPLE
- ✕✕✕ FENCE
- 1996 CAPPED AREA
- 1993 HISTORICAL STRESSED VEGETATION
- 1993 HISTORICAL VERY STRESSED VEGETATION
- 2011 IN SITU TREATMENT AREA

ARSENIC CONCENTRATION (PPM) – NOTE 4 – DEPTH 0-2' BGS

- <20
- 20 - <50
- 50 - <100
- 100 - <500
- 500 - <1,000
- >1,000

**NOTES**

1. BASE MAP IMAGERY FROM KEWAUNEE COUNTY, 2019.
2. MAP PROJECTION AND GRID COORDINATES ARE NAD83 STATE PLANE WISCONSIN CENTRAL US SURVEY FEET.
3. SOIL/SEDIMENT SAMPLES COLLECTED DURING VARIOUS SAMPLING EVENTS BETWEEN 1994 AND 2010. THE COMPILED DATA WAS PROVIDED BY WDNR TO TRC IN SEPTEMBER 2019.
4. COLORS FOR ARSENIC CONCENTRATIONS APPLY TO THE SAMPLE POINTS AND THE RESULTS FROM THE GIS SPATIAL ANALYSIS. THE NATURAL NEIGHBOR METHOD WAS USED IN GIS TO INTERPOLATE ARSENIC CONCENTRATIONS IN SEDIMENT AT THE SITE, AND POST-PROCESSING WAS COMPLETED TO ADJUST SOME OF THE BOUNDARIES TO FIT THE CONCEPTUAL SITE MODEL. SEE JAN. 2020 MEMO FOR ADDITIONAL DETAILS.

0 150 300 Feet

1" = 150'  
1:1,800

N

PROJECT: **WDNR  
KEWAUNEE MARSH ARSENIC CONTAMINATED SITE  
BRRTS #02-31-000508**

TITLE: **PROPOSED SAMPLING LOCATIONS OVERLAYING  
SOIL/SEDIMENT ARSENIC CONCENTRATIONS**

DRAWN BY: R. SUEMNICHT	PROJ NO.: 412027
CHECKED BY: A. ENRIGHT	
APPROVED BY: K. VATER	<b>FIGURE 3</b>
DATE: MARCH 2021	

708 Heartland Trail, Suite 3000  
Madison, WI 53717  
Phone: 608.826.3600  
www.trcsolutions.com

FILE NO.: 412027-PSL-003.mxd



## **Appendix A: WDNR Scope of Work for Pre-Design Site Characterization**

**Scope of Work**  
**Pre-design Site Characterization**  
**Kewaunee Marsh Arsenic Contaminated Site (KMASS)**  
**BRRTS# 02-31-000508**  
**Wisconsin Department of Natural Resources**  
**Remediation and Redevelopment Program**  
**September 10, 2020**

This Scope of Work (SOW) sets forth the requirements to perform continued professional services at the Kewaunee Marsh Arsenic Contaminated Site.

## **1. INTRODUCTION**

The Kewaunee Marsh Arsenic Contaminated Site (KMASS Site) includes approximately 15-acres of arsenic-impacted marsh, located inside a large meander of the Kewaunee River northwest of the City of Kewaunee, Wisconsin. The site is portion of the state-owned C.D. Besadny Fish and Wildlife Area (Fig. 1).

A historical release of arsenate salts from a railcar derailment around the 1940s is thought to be the source of the impact. The arsenic contamination was first discovered in 1993. Since then, site investigation, treatability study, remedial evaluation, and interim action have been completed by the former potentially responsible party (Fox Valley and Western Railroad, Ltd) and by the Wisconsin Department of Natural Resources (WDNR). The interim actions completed to date include construction of a chain-link fence to enclose a 15-acre area, placement of vegetative cap over a 4-acre area with significant impacts, and in-situ treatment of approximately 3,000 cubic yards (cy) of the most highly impacted soil/sediment. The fence and cap were constructed in 1996 and the in-situ treatment was completed in 2011, respectively.

The recent surface water and groundwater sampling results revealed that the interim cap has degraded and is no longer functioning as a direct contact barrier. The pilot in-situ treatment project did not indicate probable success for full scale implementation. The Department determined to reevaluate remedial options in 2019. By July 2020, a focused remedial action options report (RAOR) was completed by the Department's contractor. A total of nine options were evaluated, including capping, in-situ treatment management, removal and various combinations of these three technologies. The evaluation was based on existing data and referenced to two performance standards or arsenic residual concentration levels of 100 mg/kg and 1,000 mg/kg in soil/sediment. The existing soil/sediment data used to determine the horizontal and vertical extent of arsenic contamination and the footprints of the residual concentration levels were collected between 1994 and 2010. The data contains high uncertainties in representing the current condition because a variety of sampling methods were used for different objectives. For instance, spatially in some areas core samples collected while only surface samples were collected in other locations. The most recent samples collected in 2010 were limited to a 0.3-acre area. Although the data are sufficient for comparison of remedial options, data gaps exist that need to be addressed prior to remedial design.

To address the data gap, understanding the site hydrogeologic condition is important. Previous investigations indicated that the surficial soil/sediment beneath the marsh consists of organic black peat ranging in thickness from 4 to 8 ft. Organic content within the peat is approximately 80%. Beneath the peat is a dark grey to greyish brown organic silt material containing 8 to 20% organics. The thickness of the organic silt ranges from 15 to 26 ft thick. Ground moraine clay underlies the peat deposits and ranges in thickness from 50 to 100 feet. Bedrock consists of undifferentiated dolomite and has not been encountered in any of the wells drilled on site.

The water table occurs at a depth of about 0 to 2 feet below ground surface and is primarily in contact with the peat layer. The groundwater elevation and surface water depth are directly controlled by the depth of the water in the Keweenaw River and Lake Michigan. The most eastbound area of the site may be submerged due to current high-water level in the river and lake.

## **2. PURPOSE OF THIS SCOPE OF WORK**

This Scope of Work (SOW) sets forth the requirements to perform professional services by TRC. The proposal for this project is a continuation of the Remedial Action Options evaluation completed by TRC in July 2020. The evaluation identified data gap and this scope work is then prepared to close essential remaining data gap and complete a pre-design site characterization at the Keweenaw Marsh Arsenic Contaminated Site. Fig.2 shows the approximate boundary of this characterization work which includes areas outside of the fence where historical sample results showed elevated arsenic concentration.

## **3. REQUESTED SCOPE OF WORK**

In general, the scope of work for this contract includes preparing a detailed workplan, conducting field work, and completing the site characterization report. The consultant shall propose the most appropriate procedures and methodologies to conduct the work and use qualified personnel applicable to meet the needs of the project. Specific tasks associated with the scope are listed below. If the consultant proposes additional or alternative tasks in order to use more cost-effective approaches, the Department will consider accordingly.

### **3.1. Workplan**

A workplan shall be prepared in accordance with the requirements of ch. NR 716 and any additional information provided in this scope of work. At a minimum, the work plan shall include a description of the procedures to accomplish tasks, documentation of field observation, and project schedule as follows:

#### **3.1.1. Site Survey and Probing**

Prior to sampling, a land survey should be conducted with appropriate technique and instrument. Using GPS or equivalent techniques to record the horizontal location. Marsh surface shall be surveyed in reference to a datum. Either as part of the survey work or sample collection, probing the soil/sediment to identify soil stratigraphy and soft sediment deposit for sampling purpose and for future design need.

#### **3.1.2. Soil/Sediment Sampling**

Development of sampling plan shall consider the data gaps for delineation of vertical and horizontal extent of contamination. Other special considerations shall include site specific conditions such as the existing interim cover and in-situ treated material for placing sampling locations. Placing cores along transects running south to north and parallel to the Keweenaw River is recommended. The plan should provide justification of the selected sampling technology and sampling location.

Based on past investigation results, cores shall be collected through the peat materials and advanced 1ft to organic silt layer from all locations. The justification for this request is based on vertical profile of arsenic along with the geographic information (Fig. 3) as provided in the "Hot Spot Investigation" report (RMT, 2010). The report is available on the Department's Bureau for Remediation and Redevelopment Tracking System (BRRTS) on the Web (BOTW). Each core shall be segmented into multiple layers from surface to bottom of the core for analyses unless only a shallow peat layer is present or a validated field analysis can determine that low arsenic



concentration is present in soil/sediment deeper than the surface segment. Then no deeper samples need to be collected for laboratory analysis but all surface samples should be analyzed. In general, it is anticipated that five 2-ft segments or samples will be generated from each location. TRC shall use previous knowledge and best professional judgment to estimate the number of samples because the thickness of cores will vary spatially. The final segments or samples per core will be determined on site based on stratigraphy. The consultant is encouraged to communicate with the Department during sampling.

The work plan should also include the procedures to log field observations such as

- presence of standing surface water
- core recovery
- physical appearance
- soil/sediment property
- presence of cap materials if the core is located in the capped area,
- materials other than soil/sediment particles such as plant roots.

All samples should be photographed. Sample locations should have coordinates recorded with reference datum identified.

TRC shall describe appropriate preservation, packaging, and shipment of samples for analyses.

#### 3.1.3. Surface Water Sampling

Surface water samples will be collected for development of field testing methods. Characterize surface water to determine an appropriate treatment process, such as precipitation or other techniques, necessary to comply with requirements for discharging treated water back to the Marsh or the Kewaunee River. Samples should be spatially distributed so the results will cover a large range of concentrations of arsenic based on previous results if applicable. TRC shall describe appropriate preservation, packaging, and shipment of samples for analyses.

#### 3.1.4. Investigating field test method for arsenic

Review and investigate if a field test method for arsenic is applicable for aqueous and solid phase for the site. Discuss pros and cons. If it is a valid method for the site, develop a sampling and testing plan that needs minimum time and effort to validate and confirm that the laboratory and field test results are comparable. Split samples from the same segment of a core should be used for both field test and laboratory analyses. The goal is to evaluate if field testing can replace laboratory analysis in a manner that is defensible for use during and after implementation of a selected remedial action.

#### 3.1.5. Determination of hazardous materials

Review the previous arsenic TCLP results to determine if additional testing is needed for hazardous material characterization. If needed, plan for the tests. Composite samples will be required. Also, up to two samples are recommend for collection from the in-situ treated area to evaluate if the materials have remained as non-hazardous.

#### 3.1.6. Sample analyses

The workplan shall provide an estimate of the number of samples to be collected for arsenic as the primary parameter and other auxiliary parameters for the purpose of defining the extent of contamination and developing water treatment system, respectively. Identify DNR approved laboratories proposed for sample analysis for specific parameters. Table 1 summarizes recommended parameters for both aqueous and solid phase materials for the site. TRC can provide recommendations for alternatives and additional parameters for the Department to approve.

3.1.7. Quality Assurance and Quality Control Plan (QA/QC)

A Quality Assurance/Quality Control (QA/QC) Plan shall be developed and submitted for this project. It shall include but not be limited to methods of survey, soil/sediment and surface water sample collection and laboratory analyses, field test, sample preservation techniques, chain of custody procedures, and decontamination procedures for sampling equipment. Maintenance and calibration of all sampling equipment shall be included. The quality assurance and quality control procedures shall be described as required in s. NR 716.09(2)(f)5, Wis. Adm. Code, and shall meet the requirements of s. NR 716.13, Wis. Adm. Code. The plan shall provide information on duplicate samples, field replicates, detection limits, field and trip blanks, and matrix spike analysis. The plan shall also identify the proposed laboratory contracted for sample analyses. The plan shall be submitted to the DNR within 15 days of contract authorization and shall be approved by the DNR prior to performing any sampling.

**Table 1. Analytical parameters**

<b>Media</b>	<b>Parameters</b>	<b>Number of samples</b>	<b>Comments</b>
Soil/sediment	arsenic, water content, loss on ignition, grain size distribution, parameters for disposal on commercial landfill	TRC to propose in the workplan	Flexible for recommendation for the Department approval
Water	arsenic, pH, sulfur, iron, calcium and other parameters for treatment process	Up to 10 samples	Flexible for recommendation for different treatment techniques
Soil/sediment	TCLP for arsenic	Determine if there is a need to conduct the procedures after reviewing the previous test results	Materials from the in-situ treated materials is of specific interest

3.1.8. Site Safety Plan

A Site Safety Plan shall be developed and followed by TRC and subcontractors. The Site Safety Plan shall reference all current Occupational Health and Safety Administration standards for worker safety. The consultant is solely responsible for site safety of its personnel, subcontractors and any bystanders. The consultant is not responsible for liability, claims and costs arising from activities of DNR personnel or its proxy. DNR may review the plan but will not approve or disapprove it. The plan shall be submitted as part of workplan; however, it may be submitted prior to the start of field work.

3.1.9. Waste Handling and Disposal Plan

This plan shall address waste management activities for all potential waste to be generated during investigation at the site. TRC shall incorporate actions to minimize the generation of hazardous waste. Hazardous wastes must be handled through the State’s Hazardous Waste contractor, Veolia Environmental Services.

3.1.10. Work Schedule

As part of the work plan, TRC shall provide a schedule for conducting the scope of work. At minimum, provide a timeline for major tasks such as workplan, field work with sampling start-up and completion date, laboratory analyses, and submittal of draft and final report.

### **3.2. Field Work and Sample Analyses**

TRC shall supply adequate personnel to conduct survey and probing and to collect samples that include taking field notes, processing samples for shipment, and preparing sample documentation and chain-of-custody forms. The consultant shall also be responsible for providing containers appropriate for the preservation and shipment of the samples to appropriate laboratories for analysis. Plan accordingly to the local weather and site condition for the field work as defined in the workplan. Use of a boat is anticipated to access submerged areas for sediment sample collection if deep surface water is present. Inform the Department 5 days before the start of field work.

#### **3.2.1. Land survey and probing**

TRC shall use the most cost-effective and accurate methods to perform a land survey and soil/sediment probing in the area as shown in Fig. 2. Follow the workplan and document field observations that are relevant to sampling and needed for remedial design.

#### **3.2.2. Sample collection and submittal**

TRC shall use appropriate sampling methods to collect aqueous and solid samples from the site. Ensure materials are well homogenized to be representative of the sample interval before placing the material in sample containers for submitting the sample for analysis. Understand the specific requirements by contracting laboratory before shipment of samples.

### **3.3. Pre-design Site Characterization report**

Within reasonable days upon completion of field work and analyses, the consultant shall submit an investigative report to the Department following general requirements in accordance with NR716.15. In addition, the report needs to include figures of the updated extent of arsenic contamination at the site based on GIS analyses with the newly obtained data.

## **4. PROJECT SCHEDULE AND DELIVERABLES**

TRC is expected to provide a schedule to complete all tasks as identified in this scope of work by June 15, 2021 including a final report submitted to the Department as listed in Table 2.

A final report should be submitted at the completion of the project. The report will include evaluation of survey data and analytical results completed under this contract. If field testing for arsenic is conducted, the report needs to include comparison of both the field and laboratory analysis data for the split samples and evaluate the correlation of the results from the two methods. Provide updated figures depicting the horizontal and vertical extent of arsenic contamination by using GIS tool. In addition to the report, all the data should be submitted in electronic format, such as in excel format for chemical and physical data and figures in GIS.

The report and data should be submitted to

Wisconsin Department of Natural Resources  
Remediation & Redevelopment Program  
ATTN: Xiaochun Zhang  
P.O. Box 7921 – RR/5  
Madison, WI 53707-7921

Electronic transfer of the data and report is preferred under this contract. If the file size exceeds the capacity on both the consultant's and Department's systems, an FTP or equivalent option should be identified for transferring the information.

## **Appendix B: Site-Specific Health and Safety Plan**

# TRC Environmental and Infrastructure Sector Site-Specific Health and Safety Risk Assessment (RA) Template

(Required for all TRC field projects.)

## 1. General Information

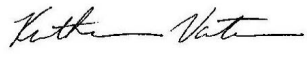
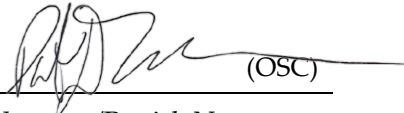
Business Unit:  Environmental ECR

Client Name: Wisconsin Department of Natural Resources      Project #: 412027.Phase 2      Task #: 000001

Project Name: Kewaunee Marsh PreDesign      Project Manager: Katherine Vater

Street Address: WDNR Land Adjacent to 4172 County Road E      City, State, ZIP: Kewaunee, WI 54216

Prepared By: Wesley Braga      Date: 11/25/2020

Approved By:  (PM)      Approved By:  (OSC)  
Katherine Vater      Meredith Westover/Patrick Novara

Date: 11-30-2020

Date: 11-25-2020

**Proposed Date(s) of Work:** Winter 2020 to Winter 2021

**Proposed Scope of Work On Site** (provide specific details, i.e., number of borings/wells, samples, etc.):

The project work will be completed in two phases. Phase one will be to collect surface water samples from various locations within the Marsh using a peristaltic pump for sample collection. Water will be run through a flow through cell and attached water quality meter to collect temperature, conductivity, pH, DO, and ORP prior to sampling. Water depth at sample points will be less than 2 feet and sampler will use waders to reach sample points. Surface water will be bottled and sent to labs for arsenic (total), iron (total), calcium (total), sulfate, and sulfide analysis.

Phase 2 will consist of an undetermined number of Geoprobe borings to 10' bgs in the area surrounding the marsh. Soil samples will be collected and analyzed for similar parameters as the surface water. On-Site Environmental is the planned geoprobe subcontractor at this time.

### TRC Role(s) On Site:

- TRC Staff Will Not Be On Site (RA is for subcontractor information only)
- Resident Project Representative (e.g., RPR, "Observe and Document")
- Construction Manager (e.g., CM, Managing/General Contractor)
- Representative for Client (e.g., "Agent for Owner")
- General On-site Consulting/Engineering Services
- Other

Soil Sampling

Solid Waste Sampling

Liquid Waste Sampling

# TRC Environmental and Infrastructure Sector Site-Specific Health and Safety Risk Assessment (RA) Template

(Required for all TRC field projects.)

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> Groundwater Sampling | <input checked="" type="checkbox"/> Surface Water Sampling | <input type="checkbox"/> Wastewater Sampling |
| <input type="checkbox"/> Sediment Sampling    | <input type="checkbox"/> Surveying                         | <input type="checkbox"/> Specify             |

Major Project Tasks	TRC Task	Subcontractor Task	Minimum PPE Level Required see HSP for details (suggested levels for Subcontractor work)				
1. Surface Water Sampling	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> D	<input type="checkbox"/> C	<input type="checkbox"/> B	<input type="checkbox"/> A
2. Geoprobe operation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> D	<input type="checkbox"/> C	<input type="checkbox"/> B	<input type="checkbox"/> A
3. Soil Sampling	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> D	<input type="checkbox"/> C	<input type="checkbox"/> B	<input type="checkbox"/> A

## 2. Contingency Planning

LOCAL EMERGENCY RESOURCES:	
Ambulance: 911	Emergency Room: 911
Police: 911	Fire Department: 911
USEPA Contact: <input type="checkbox"/> N/A <input type="checkbox"/> Specify:	Poison Control Center: 1-800-222-1222 <input type="checkbox"/> Specify:
WorkCare (Early Incident Intervention): 888-449-7787	
Other (client services offered, etc.):	

SITE RESOURCES:			
Drinking Water Supply	<input type="checkbox"/> TRC	<input type="checkbox"/> Subcontractor	<input type="checkbox"/> Client
Wash Water Supply	<input type="checkbox"/> TRC	<input type="checkbox"/> Subcontractor	<input type="checkbox"/> Client
Telephone – Land Line		<input type="checkbox"/> Subcontractor	<input type="checkbox"/> Client
Telephone - Cellular	<input checked="" type="checkbox"/> TRC	<input type="checkbox"/> Subcontractor	
First Aid Kit	<input checked="" type="checkbox"/> TRC	<input type="checkbox"/> Subcontractor	
Fire Extinguisher	<input checked="" type="checkbox"/> TRC	<input type="checkbox"/> Subcontractor	<input type="checkbox"/> Client
Emergency Shower	<input type="checkbox"/> TRC	<input type="checkbox"/> Subcontractor	<input type="checkbox"/> Client
Eye Wash	<input checked="" type="checkbox"/> TRC	<input type="checkbox"/> Subcontractor	<input type="checkbox"/> Client
Other:	<input type="checkbox"/> TRC	<input type="checkbox"/> Subcontractor	<input type="checkbox"/> Client

# TRC Environmental and Infrastructure Sector Site-Specific Health and Safety Risk Assessment (RA) Template

(Required for all TRC field projects.)

EMERGENCY CONTACTS:	
TRC Technical Contact:	Katherine Vater 608/826-3663 (work) 608/807-8968 (cell)
TRC Project Manager (PM):	Katherine Vater 608/826-3663 (work) 608/807-8968 (cell)
TRC National Safety Director (Mike Glenn): – Confined Space Permits – Air Monitoring Plans – Scaffolding Permits – Hot Work Permits – Lockout/Tagout Permits – Demolition Plan Approval	Mike Glenn 949/972-7347 (work) 949/697-7418 (cell)
Radiation Safety Officer (RSO):	John Hanson 608/826-3630 (work) 608/220-2502 (cell - emergency only) 608/222-4588 (home - emergency only)
TRC Office Safety Coordinator (OSC): – Excavation Permits – Traffic Control Plan Approval – Lighting Plan Approval	Meredith Westover 608/826-3667 (work) 608/358-5035 (cell)
TRC Field Contact:	Andy Stehn 608/826-3665 (work) 608/807-8112 (cell)
Contractor Contact:	On-Site (Kim Kapugi) (608) 837-8992
Client Contact:	

**Emergency Route** (provide detailed directions and/or attach a map):

The emergency route should be driven at least once before fieldwork begins, to verify that the planned route is feasible. Hospitals or clinics identified for emergency medical care should also be contacted, to verify that emergency care is provided at that location. Verify the exact location of the medical facility during this call.

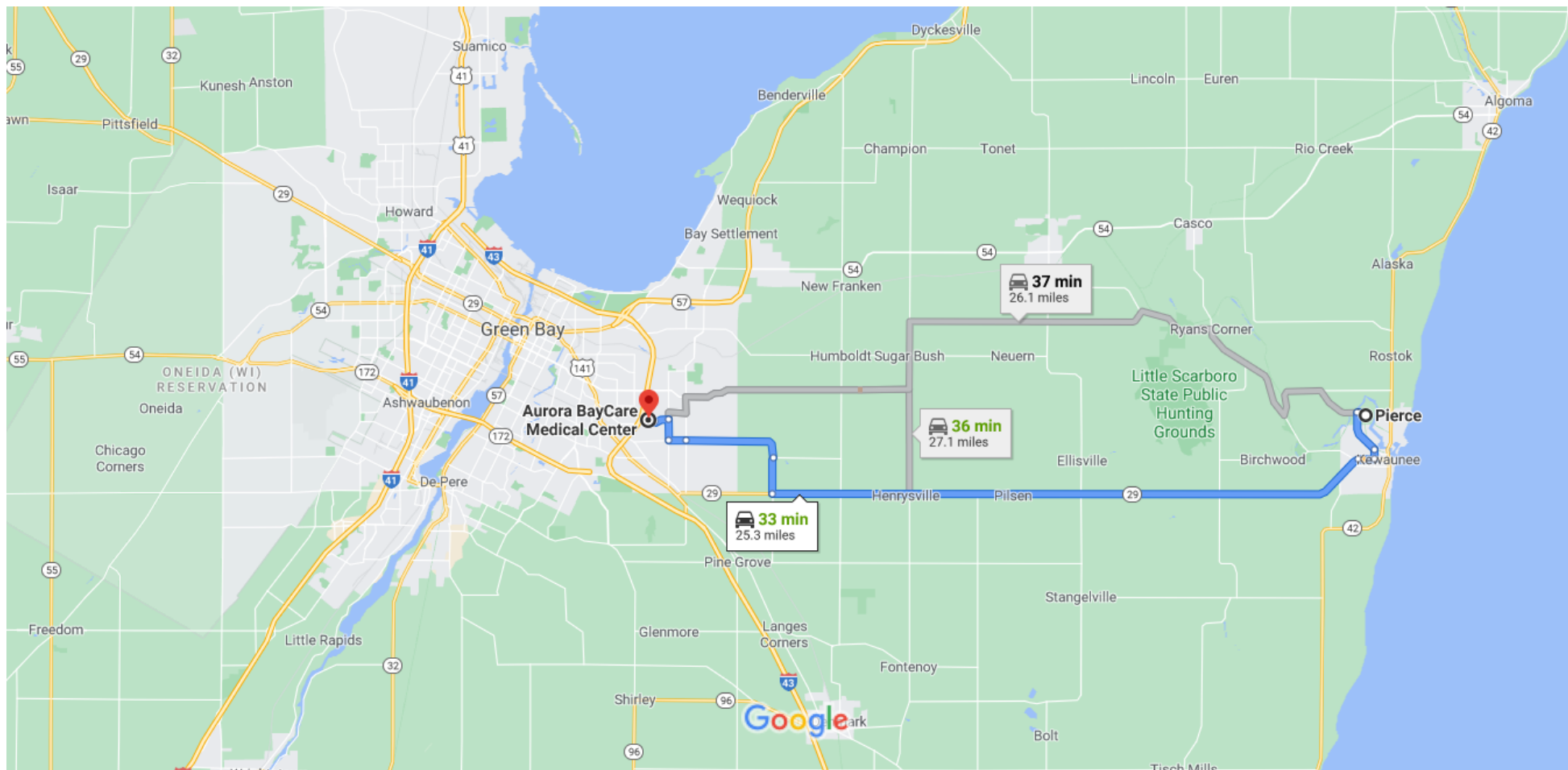
Hospital:     Aurora BayCare Medical Center     Other:  
                  2845 Greenbrier Rd  
                  Green Bay, WI 54311

Phone No.:   920-288-8000



# Pierce, Wisconsin to Aurora BayCare Medical Center

Drive 25.3 miles, 33 min



Map data ©2020 2 mi

## Pierce

Wisconsin



### Take County Rd E to Ellis St in Kewaunee

4 min (1.6 mi)




- ↑ 1. Head southwest on County Rd E toward River Rd

381 ft











-  2. Turn left onto County Rd E/River Rd  
\_\_\_\_\_ 1.3 mi
-  3. Turn right onto 1st St  
\_\_\_\_\_ 0.3 mi

#### Follow WI-29 W/WI-29 Trunk W to Phillips Rd in Eaton


- \_\_\_\_\_ 20 min (17.9 mi)
-  4. Turn right onto Ellis St  
\_\_\_\_\_ 0.5 mi
  -  5. Ellis St turns slightly left and becomes WI-29  
W/WI-29 Trunk W/Marquette Dr  
 [Continue to follow WI-29 W/WI-29 Trunk W](#)  
\_\_\_\_\_ 17.5 mi

#### Continue on Phillips Rd to your destination in Green Bay

- \_\_\_\_\_ 10 min (5.8 mi)
-  6. Turn right onto Phillips Rd  
\_\_\_\_\_ 1.1 mi
  -  7. Turn left onto County Trunk Hwy JJ/Phillips Rd  
 [Continue to follow County Trunk Hwy JJ](#)  
\_\_\_\_\_ 2.9 mi
  -  8. At the traffic circle, continue straight onto Eaton Rd  
\_\_\_\_\_ 0.5 mi
  -  9. At the traffic circle, take the 1st exit onto Ontario Rd  
\_\_\_\_\_ 0.6 mi
  -  10. Turn left onto Greenbrier Rd  
\_\_\_\_\_ 0.4 mi
  -  11. Turn right onto Hubble Dr  
\_\_\_\_\_ 220 ft
  -  12. Turn left  
\_\_\_\_\_ 463 ft

 13. Turn right

0.1 mi

 14. Turn left

 Destination will be on the right

144 ft

## Aurora BayCare Medical Center

2845 Greenbrier Rd, Green Bay, WI 54311

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

# TRC Environmental and Infrastructure Sector Site-Specific Health and Safety Risk Assessment (RA) Template

(Required for all TRC field projects.)

## Emergency Procedures:

If an emergency develops at the site, the first responder should take the following course of action:

- Notify the proper emergency services for assistance.
- Notify other personnel at the site.
- As soon as possible, contact the TRC Safety Manager to inform them of the incident.
- Prepare a summary report of the incident for the client representative as required.

## Non-Emergency Incident Procedures:

If a non-emergency incident occurs at the site, the employee(s) should take the following course of action:

- Stop all work.
- Notify other personnel at the site.
- As soon as possible, contact the TRC Safety and Project Manager to inform them of the incident.
- Call WorkCare (888-449-7787)
- Prepare a summary report of the incident for the client representative as required.

## Emergency Equipment Required On Site:

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> First Aid Kit      | <input checked="" type="checkbox"/> Fire Extinguisher |
| <input checked="" type="checkbox"/> Emergency Eye Wash | <input type="checkbox"/> Spill Control Media          |
| <input type="checkbox"/> Emergency Shower              | <input type="checkbox"/> Other:                       |

## Investigation of Near Miss Incident and Initial Report of Incident/Exposure:

TRC employees are required to report any incident, near miss, or injury, as soon as possible, by contacting the following:

- |  |   |  |
|--|---|--|
| <input checked="" type="checkbox"/> Office Safety Coordinator or TRC<br>National Safety Director – Mike Glenn<br>(949 972-7237 work / 949 697-7418 cell) | <input checked="" type="checkbox"/> Notify supervisor | <input checked="" type="checkbox"/> Notify project manager |
| <input type="checkbox"/> Notify client<br>(name):<br>(phone number)  | <input type="checkbox"/> Complete client report:      |  |

The incident report submittal operator will obtain the necessary information from the employee and enter the information into the H&S incident database. All appropriate H&S, HR, and legal staff will be notified and will follow up as necessary.

Note: Pursuant to TRC's "Drug and Alcohol-Free Workplace" policy (#TRC Academy Course #900013753), TRC may require employees or subcontractors to be tested upon reasonable suspicion, following accidents or incidents during work activities, or during travel to or from a project site. Client policies may be more stringent in regard to procedures following an accident. Project managers must be aware of these and inform employees and subcontractors of any additional requirements.

# TRC Environmental and Infrastructure Sector Site-Specific Health and Safety Risk Assessment (RA) Template

(Required for all TRC field projects.)

## 3. Site Classification

Identification of Potential Hazards	YES	NO	SITE TYPE <sup>(1)</sup>
1. Is the work a Phase I ESA (i.e., supervised plant walk-through, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
2. Is the work being performed solely by a subcontractor (i.e., TRC not on site)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
3. Is the work just a supervised inspection for process evaluation, other inspections, meetings, records review, or a tour?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
4.* Is the work completely absent any chemical, physical, biological, or radiological hazards which would require a site specific health and safety plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1
5. Does the work include any mandatory client H&S requirements?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1, 2, or 3
6. Does the project include on-site work other than office type areas?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2 or 3
7. Does the proposed work scope involve any of the following:			
Known and controlled chemical or biological hazards	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2
Unprotected work at elevation (fall protection required)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2
Invasive activities (i.e., Phase II ESA, UST Removal, sampling, etc.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2 or 3
Exposure to ionizing radiation (i.e., using nuclear gauges, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2 or 3
Open excavations/trenches (competent person may be required on site)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2 or 3
Confined space entry (permit may be required)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2 or 3
The use of scaffolding (qualified inspections are required)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2 or 3
Heavy equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2 or 3
Facility maintenance (O&M, piping, electrical, lockout/tagout, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2 or 3
Underground utilities may be encountered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2 or 3
Overhead utilities may be encountered	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2 or 3
Stack testing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2 or 3
Geotechnical drilling	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2 or 3
Demolition Activities with known or suspected contamination	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2 or 3
Unknown or uncontrolled chemical or biological hazards	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3
Known and uncontrolled chemical or biological hazards	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3
Waste sampling	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3
Construction activities with known or suspected contamination	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3
Remedial activities (RCRA, CERCLA, EnviroBlend <sup>®</sup> , Oxigent, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3
8. Is the work regulated by 29 CFR 1910.120 (OSHA) or 30 CFR (MSHA)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3
9. Is the work regulated by NPL, CERCLA, RCRA, TSD, or SARA?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3

<sup>(1)</sup> Denotes typical site level (based on activities).

### Site Type Designation:

- Type 1** Known and controlled hazards associated with consulting/engineering services
- Type 2** Known and controlled hazards, but with invasive, hazardous activities and/or civil/mechanical construction related services, or sampling
- Type 3** Unknown and/or uncontrolled hazards associated with corrective action clean-up, and/or remediation of hazardous substances

# TRC Environmental and Infrastructure Sector Site-Specific Health and Safety Risk Assessment (RA) Template

(Required for all TRC field projects.)

## 4. Site Characterization

Client Requirement(s) <sup>1</sup> :	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Site Orientation	<input type="checkbox"/> H&S Orientation
	<input type="checkbox"/> Permits or Other Requirements (specify and attach, if available):		
Site Information:	<input checked="" type="checkbox"/> Map/Diagram (attach)	<input type="checkbox"/> Map/Diagram Unavailable	
	<input type="checkbox"/> Inactive Site	<input type="checkbox"/> Active Site (specify below)	
General Environmental Concerns:	<input checked="" type="checkbox"/> Contaminated Water	<input type="checkbox"/> Wastewater	<input type="checkbox"/> Dust
	<input checked="" type="checkbox"/> Contaminated Soil	<input type="checkbox"/> Solid Waste	<input type="checkbox"/> Noise
	<input type="checkbox"/> Contaminated Air	<input type="checkbox"/> Waterways	<input type="checkbox"/> Other:
Site Security/Access Control:	<input checked="" type="checkbox"/> None	<input type="checkbox"/> On Site	
	<input type="checkbox"/> Other (explain):		
Amenities Available for Work:	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Waste Storage	<input type="checkbox"/> Restrooms
	<input type="checkbox"/> Tools/Equipment Storage	<input type="checkbox"/> Office/Trailer Space	<input type="checkbox"/> Supplies Storage
Utilities Available For Work:	<input checked="" type="checkbox"/> None	<input type="checkbox"/> As Listed:	
Medical Services Available:	<input checked="" type="checkbox"/> None On Site	<input type="checkbox"/> As Listed:	
Facility Alarms/Signals:	<input checked="" type="checkbox"/> None	<input type="checkbox"/> As Listed:	
Traffic/Parking/Railway Issues:	<input type="checkbox"/> None	<input checked="" type="checkbox"/> As Listed (On-Site/Off-Site): Access to the site is along a bike path that will require a vehicle to drive on.	
<input type="checkbox"/> Permits Required (specify) <sup>2</sup> :	<input type="checkbox"/> TRC:	<input type="checkbox"/> Local:	<input type="checkbox"/> State:
	<input type="checkbox"/> Federal:	<input type="checkbox"/> Other:	<input type="checkbox"/> N/A
<input checked="" type="checkbox"/> Utility Locate Service(s):	<input type="checkbox"/> On Site	<input type="checkbox"/> Client	<input type="checkbox"/> Other:
	<input type="checkbox"/> Off Site	<input checked="" type="checkbox"/> Diggers Hotline	<input type="checkbox"/> One Call
		<input type="checkbox"/> Julie, Inc.	<input type="checkbox"/> N/A

<sup>1</sup> If relying on the client for any specific hazard identification and control, implemented control and effectiveness should be documented prior to beginning any work activities. This is recommended for all field projects.

<sup>2</sup> Permit examples: Utilities (electrical, water, gas, etc.); Excavations; Explosives; Cranes; Burning; Fuel storage; Traffic control; Hoists; Cutting; Welding; Demolition; Confined space; Restricted access areas; etc.

**Detailed Physical Description of Site/Facility:**  Map/Diagram Attached

**Site Activities/Current Operations:**  None  As Specified:

**Other Concurrent Site Activities, Work, and/or Other Adjacent Hazards or Concerns:**

- None      As Specified:
- |                                      |                                  |                                   |                                  |
|--------------------------------------|----------------------------------|-----------------------------------|----------------------------------|
| <input type="checkbox"/> Schools     | <input type="checkbox"/> Daycare | <input type="checkbox"/> Hospital | <input type="checkbox"/> Airport |
| <input type="checkbox"/> Residential | <input type="checkbox"/> Offices | <input type="checkbox"/> Shopping | <input type="checkbox"/> Other   |



TRC - GIS  
 Coordinate System: NAD 1983 StatePlane Wisconsin Central FIPS 4802 Feet (Foot US)  
 Map Rotation:  
 Plot Date: 5/21/2020, 16:36:12 PM by RSUEMNICTH -- LAYOUT: ANSIBI(11"x17")  
 Path: S:\1-PROJECTS\WI\_DNR\KewauneeMarsh\2019\_344583\344583-RAOR-004.mxd

**INTERPOLATION NOTE:** BECAUSE OF THE VARIABILITY IN TIME, SAMPLING METHOD, AND DATA DENSITY THERE IS A HIGH DEGREE OF UNCERTAINTY WITH THE RESULTS FROM THE DATA INTERPOLATION. FOR AREAS WHERE THERE ARE A LIMITED NUMBER OF DATA POINTS, THE RESULTS FROM THE SPATIAL ANALYSIS MAY NOT ALIGN PERFECTLY BETWEEN EACH DEPTH INTERVAL.

**CAP AREA NOTE:** THE CONCENTRATIONS INTERPOLATED IN THE CAPPED AREA ARE ASSUMED TO BE CONSERVATIVE (I.E. HIGH). WITH THE EXCEPTION OF HOT SPOT AREA NEAR THE TRAIL, THE SAMPLES WITHIN THE CAPPED AREA HAVING ARSENIC >1,000 PPM WERE COLLECTED PRIOR TO THE CAP BEING IN PLACE. MORE RECENT (POST-CAP) DATA COLLECTED FROM THE UPPER 0-2' OF THE CAP GENERALLY HAVE LOWER CONCENTRATIONS OF ARSENIC.

**LEGEND**

- FENCE
- 1996 CAPPED AREA
- 1993 HISTORICAL STRESSED VEGETATION
- 1993 HISTORICAL VERY STRESSED VEGETATION
- 2011 IN SITU TREATMENT AREA

**ARSENIC CONCENTRATION (ppm) - NOTE 4**

- <20
- 20 - <50
- 50 - <100
- 100 - <500
- 500 - <1,000
- >1,000

**GRAB SYMBOL SIZE BASED ON DATE RANGE**

- PRE-2000 SAMPLE
- 2000-2008 SAMPLE
- POST-2008 SAMPLE

**CORE SYMBOL SIZE BASED ON DATE RANGE**

- PRE-2000 SAMPLE
- 2000-2008 SAMPLE
- POST-2008 SAMPLE

- NOTES**
1. BASE MAP IMAGERY FROM KEWAUNEE COUNTY, 2019.
  2. MAP PROJECTION AND GRID COORDINATES ARE NAD83 STATE PLANE WISCONSIN CENTRAL, US SURVEY FEET.
  3. SOIL/SEDIMENT SAMPLES COLLECTED DURING VARIOUS SAMPLING EVENTS BETWEEN 1994 AND 2010. THE COMPILED DATA WAS PROVIDED BY WDNR TO TRC IN SEPTEMBER 2019.
  4. COLORS FOR ARSENIC CONCENTRATIONS APPLY TO THE SAMPLE POINTS AND THE RESULTS FROM THE GIS SPATIAL ANALYSIS. THE NATURAL NEIGHBOR METHOD WAS USED IN GIS TO INTERPOLATE ARSENIC CONCENTRATIONS IN SEDIMENT AT THE SITE, AND POST-PROCESSING WAS COMPLETED TO ADJUST SOME OF THE BOUNDARIES TO FIT THE CONCEPTUAL SITE MODEL. SEE JAN. 2020 MEMO FOR ADDITIONAL DETAILS.



PROJECT: **WDNR**  
**KEWAUNEE MARSH ARSENIC CONTAMINATED SITE**  
**BRRTS #02-31-000508**

TITLE: **SOIL/SEDIMENT ARSENIC CONCENTRATIONS**  
**0-2' INTERVAL**

DRAWN BY: R. SUEMNICTH PROJ NO.: 344583.0002

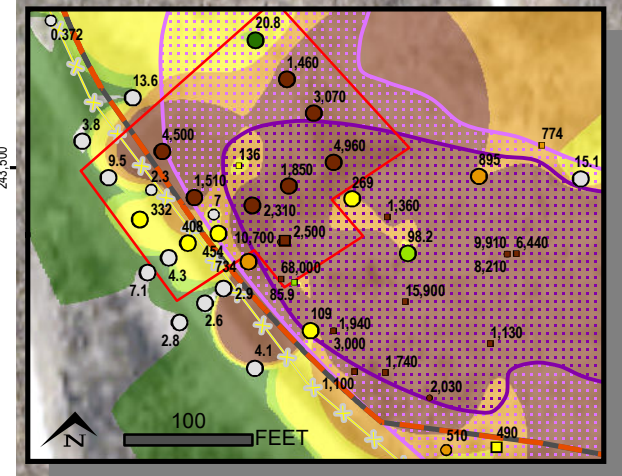
CHECKED BY: APPROVED BY: **FIGURE 4**

DATE: MAY 2020

**TRC**

708 Heartland Trail, Suite 3000  
 Madison, WI 53717  
 Phone: 608.826.3600  
 www.trcsolutions.com

FILE NO.: 344583-RAOR-004.mxd



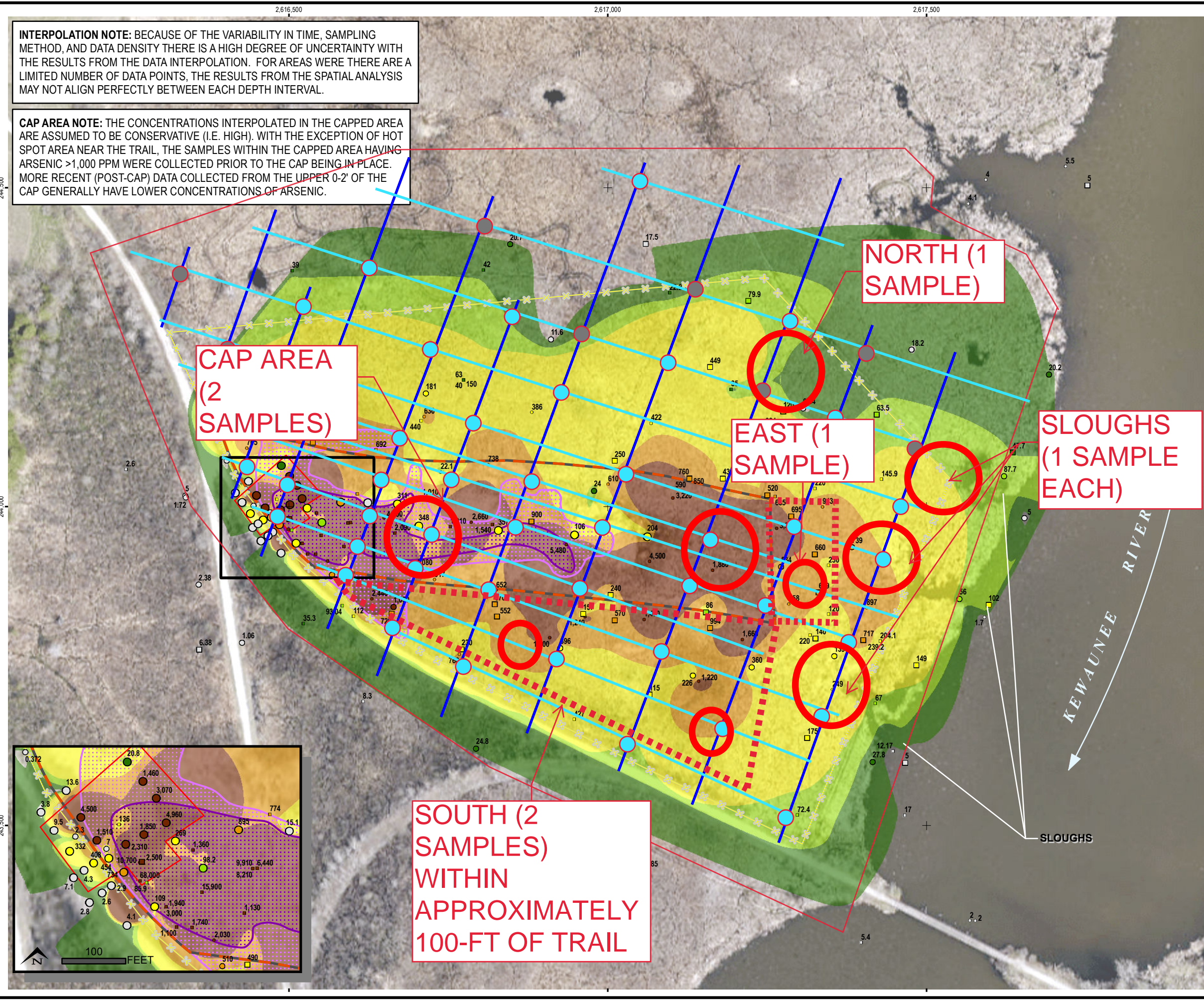
**CAP AREA**  
**(2**  
**SAMPLES)**

**NORTH (1**  
**SAMPLE)**

**EAST (1**  
**SAMPLE)**

**SLOUGHS**  
**(1 SAMPLE**  
**EACH)**

**SOUTH (2**  
**SAMPLES)**  
**WITHIN**  
**APPROXIMATELY**  
**100-FT OF TRAIL**





# TRC Environmental and Infrastructure Sector Site-Specific Health and Safety Risk Assessment (RA) Template

(Required for all TRC field projects.)

## 5. Hazard Evaluation

### Potential Chemical, Biological, or Radiological Hazards

Complete <sup>(1)</sup> Substance Name (be specific)	Specific Applicable OSHA Standard (if any)	Physical State <sup>(2)</sup> (S, L, G, Aq, Vap, F, P)	Max. <sup>(3)</sup> Conc. Level Per Physical State	Potential Routes of Exposure <sup>(4)</sup> (Inh, Ing, Abs, Con, Ext)	Warning Properties (G, P, N)	General <sup>(5)</sup> Control Measures (Eng., Admin., PPE)	IP <sup>(6)</sup> (eV)	VP <sup>(6)</sup> (mm HG)	LEL <sup>(6)</sup> (%)	UEL <sup>(6)</sup> (%)	IDLH <sup>(7)</sup>	ACGIH TLV (C, ST, TWA) <sup>(8)</sup> (R) or (T) <sup>(9)</sup>	OSHA PEL (C, ST, TWA) <sup>(8)</sup> (R) or (T) <sup>(9)</sup>
Arsenic	1910.1025	S, Aq	unknown	Inh, Ing, Abs, Con	N	Eng, Admin, PPE	NA	0	NA	NA	100 mg/m <sup>3</sup>	0.01 mg/m <sup>3</sup>	0.010 mg/m <sup>3</sup>

- (1) Use OSHA regulated name, not elemental forms. If available, attach MSDS. Identify any sample preservative or O&M chemicals or subcontractor chemicals in this table also.
- (2) S = Solids, L = Liquid, G = Gas, Aq = Aqueous, Vap = Vapor, F = Fume, P = Airborne Particulate
- (3) If available, attach laboratory results or summary tables.
- (4) Inh = Inhalation Hazard, Ing = Ingestion Hazard, Abs = Absorption Hazard, Con = Contact Hazard, Ext = External Exposure Hazard
- (5) See the following sections for detailed control measures: personal protection equipment (PPE), Air Monitoring (Admin), or Site Control (Admin and Eng.).
- (6) IP = Ionization Potential, VP = Vapor Pressure, LEL = Lower Explosive Limit, UEL = Upper Explosive Limit, N/A = Not Applicable, N.D. = Not Determined
- (7) IDLH = Immediately Dangerous to Life and Health. NEVER enter IDLH conditions on site without proper respiratory protection.
- (8) C = Ceiling Value, ST = Short-Term Exposure Limit, TWA = Time-Weighted Average, None Est. = None Established
- (9) R = Respirable Limit, T = Total Limit
- (10) Warning Properties: Good (G), Poor (P), None (N)

# TRC Environmental and Infrastructure Sector Site-Specific Health and Safety Risk Assessment (RA) Template

(Required for all TRC field projects.)

## 5. Hazard Evaluation (continued)

### Site Specific Physical Hazards

HAZARD	SPECIFIC CONTROL MEASURE
Vehicular Traffic	<p>TRC personnel shall follow all applicable state and federal traffic laws while traveling to and from the site, and while working on the site.</p> <p>In particular the following laws should be followed:</p> <ul style="list-style-type: none"> <li>– speed limits,</li> <li>– parking restrictions,</li> <li>– use of wipers and lights during precipitation events,</li> <li>– no cell phone use, etc.</li> </ul> <p>Be aware of traffic patterns associated with local businesses near the work site. Allow traffic to enter and exit the businesses in such a manner to avoid creating traffic hazards, back-ups, delays, or potential accident situations.</p> <p>Practice defensive driving while in route to and from the site.</p>
Surface water sampling	<p>Sampler will stay in water less than 2 feet in depth and waders will be worn while accessing sampling locations.</p>
Geoprobe operation	<p>Subcontractor will wear all required PPE during machine operation and ensure TRC employees are aware of emergency shut off protocols.</p>
Soil sampling	<p>All required hand and eye protection will be worn while handling potentially contaminated sample material. Glass sample jars will be handled with care and inspected for cracked or broken areas prior to using.</p>



# TRC Environmental and Infrastructure Sector Site-Specific Health and Safety Risk Assessment (RA) Template

(Required for all TRC field projects.)

## Other Common Physical Hazards

(modify as needed, but include with all project hazard assessments)


<input checked="" type="checkbox"/>	PHYSICAL HAZARD	GENERAL CONTROL MEASURE
<input checked="" type="checkbox"/>	Briars or Thistles	Be aware of any briars or thistles on site. Wear appropriate clothing and gloves. Avoid contact with briars or thistles whenever possible.
<input checked="" type="checkbox"/>	Cold Stress	Work schedules may be modified when temperatures are below 20° F as measured by the wind chill factor. Take frequent breaks to warm up. Drink plenty of fluids. Wear appropriate clothing, and monitor for cold stress symptoms (frostbite, hypothermia, etc.).
<input checked="" type="checkbox"/>	Field Equipment	If field equipment is heavy or awkward to carry, get assistance or use carts to help move around the site.
<input checked="" type="checkbox"/>	Field Vehicle	TRC personnel shall follow all applicable state and federal traffic laws while traveling to and from the site, and while working on the site. In particular the following laws should be followed: speed limits, parking restrictions, use of wipers and lights during precipitation events, no cell phone use, etc.  It is the responsibility of the driver to verify that all safety equipment on the vehicle is working properly before they drive the vehicle. In particular the following items should be checked: tire pressure, tire tread, windshield wipers, windshield washer, headlights, tail lights, brake lights, spare tire, fire extinguisher, first aid kit, etc.
<input checked="" type="checkbox"/>	Flooded Areas	Do not drive through flooded areas or standing water. Do not wade into moving water, or water deeper than 2 feet without adequate assistance.
<input checked="" type="checkbox"/>	Flying Debris/ Eye Injuries	Be aware of any flying debris on site and wear protective eyewear when necessary.
<input checked="" type="checkbox"/>	Hand Tools	Use only the appropriate hand protection and tool for the task at hand. Use the tool(s) as designed, described, and intended by the manufacturer.
<input checked="" type="checkbox"/>	Heavy Equipment	Contractor is responsible for safe operation of equipment. All mobile heavy equipment must have a functioning backup alarm, and operators must comply with equipment manufacturer's instructions. Maintain proper distance and remain in line of sight of operator and out of reach of equipment. Isolate equipment swings, if possible. Make eye contact with the equipment operator before approaching the equipment. Understand and review hand signals, and wear safety vest, if necessary.
<input checked="" type="checkbox"/>	Heavy Lifting	Use proper lifting procedures and equipment when handling heavy objects such as drums, manhole covers, tank covers, etc.
<input checked="" type="checkbox"/>	Housekeeping	All field vehicles, job trailers, and field offices will be properly cleaned and organized to prevent cluttered work and storage areas.
<input checked="" type="checkbox"/>	Hunters/Firing Range, etc.	Be aware of surrounding activities that may involve hunting, firearms, etc. that may not be in your immediate area, but could be create an unsafe work environment.
<input checked="" type="checkbox"/>	Insects (ticks, bees, spiders, etc.)	Site workers with known allergies to insect bites should carry their own medication. In case of emergencies, inform fellow workers of any severe allergies. Use insect repellent as necessary, and as specifically allowed on site. If possible, wear long-sleeved shirts and pants. If appropriate, check for ticks at the end of each day. Have other appropriate first aid supplies handy for bites.
<input checked="" type="checkbox"/>	Noise	Hearing protection must be worn when noise levels exceed 85 dBA in the work area. If you need to raise your voice to be heard at the work site, then hearing protection should be worn. Hearing protection will be worn near drill rigs.

# TRC Environmental and Infrastructure Sector Site-Specific Health and Safety Risk Assessment (RA) Template

(Required for all TRC field projects.)

## Other Common Physical Hazards

(modify as needed, but include with all project hazard assessments)

<input checked="" type="checkbox"/>	PHYSICAL HAZARD	GENERAL CONTROL MEASURE
<input checked="" type="checkbox"/>	Pedestrian Traffic (public, client, workers)	Be aware of pedestrian traffic patterns and, route traffic around the exclusion zone(s), as necessary, to avoid distractions and the potential for exposures or accidents. Use appropriate barricades and caution tape to mark work areas.
<input checked="" type="checkbox"/>	Poisonous Plants	<p>Be able to identify any local poisonous plants and avoid them if possible, or wear protective clothing, including long pants, long-sleeved shirts, hats and gloves. When removing potentially exposed clothing or PPE, the clothing or PPE should be carefully and thoroughly washed or decontaminated. If exposed to plants, immediately cleanse the area with soap and water. If sign or symptoms appear use Zanfel or other treatments.</p> <div style="text-align: center;">  <p style="display: flex; justify-content: space-around; font-size: small;"> <span>Poison Ivy</span> <span>Poison Oak</span> <span>Poison Sumac</span> <span>Wild Parsnip</span> </p> </div>
<input checked="" type="checkbox"/>	Power Washing Equipment	Stay clear of the power washing nozzles and equipment.
<input checked="" type="checkbox"/>	Sample Preservative Chemicals:	Wear safety glasses and nitrile gloves when adding preservative chemicals to sample bottles or vials. Have clean wash water nearby.
<input checked="" type="checkbox"/>	Severe Weather	Work may be suspended if dangerous weather conditions (lightening, tornadoes, high winds, heavy rain, freezing rain, etc.) occur. If lightning is noted by onsite personnel (and thunder is heard less than 30 seconds later), outdoor work will cease until the storm passes (at least 30 minutes after the last thunder clap). Be aware of changing weather conditions, and be prepared to take shelter as necessary. Potential shelters should be identified prior to beginning work.
<input checked="" type="checkbox"/>	Sharp Objects	Wear appropriate cut resistant gloves when handling sharp objects, and use appropriate equipment to move objects.
<input checked="" type="checkbox"/>	Slippery Ground/Surfaces	Exercise caution, especially on slopes, field trailer floors and stairs, after a precipitation event. Use slip resistant boots, or implement surface preparations to eliminate the slippery nature of the surface prior to accessing the area. Spill control measures and general housekeeping should be utilized to help prevent slipping on wet floors, wet pavement, and general work areas.
<input checked="" type="checkbox"/>	Slips, Trips, and Falls:	Maintain clear walkways for work areas.

# TRC Environmental and Infrastructure Sector Site-Specific Health and Safety Risk Assessment (RA) Template

(Required for all TRC field projects.)

## Other Common Physical Hazards

(modify as needed, but include with all project hazard assessments)

<input checked="" type="checkbox"/>	PHYSICAL HAZARD	GENERAL CONTROL MEASURE
<input checked="" type="checkbox"/>	Steep Slopes or Banks	Pay attention to footing and walking. Stay a safe distance from unstable or extremely steep slopes. Wear appropriate footwear. Be aware of potential slope or bank failures. Heavy equipment should not be operated on or near unstable slopes or banks.
<input checked="" type="checkbox"/>	Surface Water	Working next to or on, bodies of water shall be done using the buddy system. Staff shall wear USCG-approved personal floatation devices when on or adjacent to bodies of water.  Work under this project is to remain away from surface water and only approach ponded water of less than 2-feet in depth.
<input checked="" type="checkbox"/>	Terrain	Uneven or steep terrain can cause hazardous conditions for walking and transporting equipment around the site. Site personnel should use caution when working on uneven surfaces, and they should avoid working down-slope from heavy equipment, or materials being moved or stored.
<input checked="" type="checkbox"/>	Traffic (client, contractors, public, semi-trucks, forklifts, etc.)	Obey all posted speed limits. Park in designated areas only. Be aware of traffic patterns on site, and during access to the site. Use orange traffic cones and barrier warning tape, as needed, or if within 25 feet of the right-of-way. TRC personnel must wear safety vests when working in or near traffic areas.
<input checked="" type="checkbox"/>	Trip Hazards (wires, cords, hoses, debris, corn stubble, uneven surfaces, etc.)	Temporary wires, cords, hoses, etc., should be properly located, marked, and protected to help prevent tripping and disruption to work activities. Trip hazards are particularly a problem early in the morning, late in the day, or under other poor lighting conditions.
<input checked="" type="checkbox"/>	Uneven Surfaces	Be aware of uneven walking or driving surfaces and exercise caution when moving around the site.
<input checked="" type="checkbox"/>	Waterways	Exercise caution near, around, or in waterways. Harnesses should be worn when working in, or within 4 feet of, the waterway, especially when attempting to sample from shore or a boat or barge. All applicable laws and regulations will be followed when navigating a boat or barge to and from a work site.



# TRC Environmental and Infrastructure Sector Site-Specific Health and Safety Plan (HASP) Template

(Required for all Type 2 and 3 projects.)

Any required construction/demolition activities:  No  Yes **If Yes, complete Section 2**

## 2. Construction Tasks: [work tasks to be performed by TRC staff or TRC subcontractors]

### Civil

- Sewer (utility)
- Water (utility)
- Electric (utility)
- Communications (utility)
- Siding
- Roofing
- Drywall
- Flooring
- Ceilings
- Casework
- Masonry
- Escalator
  
- Others
- Others
- Others

- Steel (erection)
- Pre-cast (erection)
- Concrete (erection)
- Re-bar
- Elevator
- Fireproofing
- Windows
- Landscaping
- Painting
- Insulation
- Doors
- Finish Concrete

### Mechanical

- Insulation
- Millwright
- Fire Protection
- Boiler
- Industrial Ventilation
- Steel Fabrication/Erection
- Other**
- Electrical
- Demolition (attach a detailed "**Demolition Plan**")

### Estimated Direct-Hire TRC Employees:

Home Office:  Not Applicable  Specify:

Craft Labor:  Not Applicable  Specify:

Craft

Quantity

Craft

Quantity

# TRC Environmental and Infrastructure Sector Site-Specific Health and Safety Plan (HASP) Template

(Required for all Type 2 and 3 projects.)

### 3. Applicable Safety Standards or Regulations:

Federal OSHA

State OSHA

Owner/Client

#### Specific Standards:

Specific Standards:	29 CFR 1910 (OSHA)	29 CFR 1926 (Other Regulations)
<input checked="" type="checkbox"/> Medical Services and First Aid	1910.151	1926.50
<input checked="" type="checkbox"/> Hazard Communication (HAZCOM)	1910.1200	1926.59
<input type="checkbox"/> Lead Exposure	1910.1025	1926.62
<input checked="" type="checkbox"/> HAZWOPER	1910.120	1926.65
<input checked="" type="checkbox"/> Personal Protective Equipment (PPE)	1910.132-138	1926.95-107
<input type="checkbox"/> Respiratory Protection	1910.134	1926.103
<input type="checkbox"/> Ventilation	1910.94	1926.57
<input type="checkbox"/> Noise Exposure	1910.95	1926.52
<input type="checkbox"/> Illumination	N/A	1926.56
<input type="checkbox"/> Fire Protection	1910.157	1926.24 and 150-155
<input type="checkbox"/> Sanitation	1910.141	1926.51
<input type="checkbox"/> Materials Handling (rigging, etc.)	1910.176	1926.250-251
<input type="checkbox"/> Welding/Cutting	1910.251-255	1926.350-354
<input type="checkbox"/> Lockout/Tagout	1910.147	1926.417
<input type="checkbox"/> Electrical (flexible cords, etc.)	1910.305	1926.400-449
<input type="checkbox"/> Scaffolding	1910.28-29	1926.450-454
<input type="checkbox"/> Fall Protection (elevated work)	1910.23-29, 1910.66-68	1926.104-107; 500-503
<input type="checkbox"/> Ladders/Stairways	1910.25-27	1926.1050 and 1060
<input type="checkbox"/> Cranes, Derricks, Hoists, Elevators, etc.	1910.179-181	1926.550-555
<input type="checkbox"/> Aerial Lifts	1910.66-68	1926.556
<input type="checkbox"/> Earth Moving Equipment	N/A	1926.602
<input type="checkbox"/> Powered Industrial Trucks (forklifts)	1910.178	1926.602
<input type="checkbox"/> Excavations and Trenching	N/A	1926.650-652
<input type="checkbox"/> Concrete and Masonry	N/A	1926.700-706
<input type="checkbox"/> Steel Erection	N/A	1926.750-761
<input type="checkbox"/> Demolition	N/A	1926.850-860
<input type="checkbox"/> Asbestos	1910.1001	1926.1101
<input type="checkbox"/> Confined Space Entry	1910.146	1926.21
<input type="checkbox"/> Commercial Diving	1910.401-441	1926.1071-1092
<input type="checkbox"/> Compressed Gases	1910.101-105	N/A
<input type="checkbox"/> Ionizing Radiation	1910.1096	1926.53
<input type="checkbox"/> Benzene	1910.1028	1926.1128
<input type="checkbox"/> Cadmium	1910.1027	1926.1127
<input type="checkbox"/> Tools - Hand and Power	N/A	1926.300-307
<input type="checkbox"/> Blasting and Using Explosives	N/A	1926.900-914

# TRC Environmental and Infrastructure Sector Site-Specific Health and Safety Plan (HASP) Template

(Required for all Type 2 and 3 projects.)

## 4. Training Required (\* required for all "Type 3" sites; but minimum recommended)

Check "A" if training required for everyone, and check "T" if training required for specific task.

A	T	SUBJECT	REFERENCE	
			29 CFR 1910	29 CFR 1926 or Other
<input type="checkbox"/>	<input checked="" type="checkbox"/>	HAZWOPER 40 hour*	1910.120	1926.65
<input type="checkbox"/>	<input checked="" type="checkbox"/>	3-Day HAZWOPER Supervised On-Site*	1910.120	1926.65
<input type="checkbox"/>	<input checked="" type="checkbox"/>	8-Hour HAZWOPER Refresher*	1910.120	1926.65
<input type="checkbox"/>	<input checked="" type="checkbox"/>	8-Hour Supervisor HAZWOPER*	1910.120	1926.65
<input type="checkbox"/>	<input checked="" type="checkbox"/>	First Aid, CPR*	1910.151	1926.23,.50
<input type="checkbox"/>	<input type="checkbox"/>	Respiratory Protection	1910.134	1926.103
<input type="checkbox"/>	<input type="checkbox"/>	Confined Space <input type="checkbox"/> Permit attached	1910.146	1926.21
<input type="checkbox"/>	<input type="checkbox"/>	Mine Safety (MSHA)	N/A	30 CFR 48.8
<input type="checkbox"/>	<input type="checkbox"/>	Lockout/Tagout <input type="checkbox"/> Permit attached	1910.147	1926.417
<input type="checkbox"/>	<input type="checkbox"/>	Bloodborne Pathogens	1910.1030	N/A
<input type="checkbox"/>	<input type="checkbox"/>	Noise Exposure	1910.95	1926.52
<input type="checkbox"/>	<input type="checkbox"/>	Competent Person	N/A	1926.32,.450,.650
<input type="checkbox"/>	<input type="checkbox"/>	Construction Health and Safety OSHA 10-Hour	N/A	1926.21
<input type="checkbox"/>	<input type="checkbox"/>	Demolition	N/A	1926.850
<input type="checkbox"/>	<input type="checkbox"/>	Excavations <input type="checkbox"/> Permit attached	N/A	1926.650-652
<input type="checkbox"/>	<input type="checkbox"/>	Electrical Work	1910.332	1926.400-.449
<input type="checkbox"/>	<input type="checkbox"/>	Ladders/Stairways	N/A	1926.1050-1060
<input type="checkbox"/>	<input type="checkbox"/>	Scaffolding	1910.28	1926.450-454
<input type="checkbox"/>	<input type="checkbox"/>	Fall Protection	1910.23-29; 1910.66-68	1926.104,.501
<input type="checkbox"/>	<input type="checkbox"/>	Commercial Diving	1910.410	1926.1071-1092
<input type="checkbox"/>	<input type="checkbox"/>	Hot Work <input type="checkbox"/> Permit attached	1910.251-255	1926.350
<input type="checkbox"/>	<input type="checkbox"/>	Lead Awareness	1910.1025	1926.62
<input type="checkbox"/>	<input type="checkbox"/>	Asbestos Awareness	1910.1001	1926.1101
<input type="checkbox"/>	<input type="checkbox"/>	Cadmium	1910.1027	1926.1127
<input type="checkbox"/>	<input type="checkbox"/>	Benzene	1910.1028	1926.1128
<input type="checkbox"/>	<input type="checkbox"/>	Ionizing Radiation	1910.1096	1926.53; 10 CFR 19.12
<input type="checkbox"/>	<input type="checkbox"/>	Troxler or NITON Gauge User	1910.1096	10 CFR 19.12
<input type="checkbox"/>	<input type="checkbox"/>	Radiation Safety Program	1910.1096	10 CFR 20.1101
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Hazard Communication (HAZCOM)	1910.1200	1926.59
<input type="checkbox"/>	<input type="checkbox"/>	DOT Hazardous Materials Shipping	1910.1201	49 CFR 172.704
<input checked="" type="checkbox"/>	<input type="checkbox"/>	TRC Hand Protection		
<input checked="" type="checkbox"/>	<input type="checkbox"/>	TRC Defensive Driving		

Client-specific training:  Not Applicable  Specify

Site-specific orientation:  Not Applicable  Specify

Competent person:  Not Applicable  Specify

Direct-hire employee training/certification:  Not Applicable  Specify

# TRC Environmental and Infrastructure Sector Site-Specific Health and Safety Plan (HASP) Template

(Required for all Type 2 and 3 projects.)

## 5. Medical Surveillance

**Surveillance Required:** \* required for all "Type 3" sites; baseline is minimum recommended

\*\* Specify frequency below

	<b>29 CFR 1910</b>	<b>29 CFR 1926 or Other</b>
<input checked="" type="checkbox"/> HAZWOPER Physical - Baseline*	1910.120	1926.65
<input type="checkbox"/> HAZWOPER Physical – Annual	1910.120	1926.65
<input checked="" type="checkbox"/> HAZWOPER Physical - Biennial*	1910.120	1926.65
<input type="checkbox"/> OSHA Respiratory Protection Questionnaire	1910.134	1926.103
<input type="checkbox"/> Respiratory Certification Exam	1910.134	1926.103
<input type="checkbox"/> Arsenic (urine) **	1910.1018	N/A
<input type="checkbox"/> Asbestos **	1910.1001	1926.1101
<input type="checkbox"/> Cadmium (blood) **	1910.1027	1926.1127
<input type="checkbox"/> Lead/ZPP (blood) **	1910.1025	1926.62
<input type="checkbox"/> Mercury (blood) **	N/A	N/A
<input type="checkbox"/> PCB **	N/A	N/A
<input type="checkbox"/> Vinyl Chloride **	1910.1017	1926.117
<input type="checkbox"/> Hepatitis B Vaccine (series) **	1910.1030	N/A
<input type="checkbox"/> Tetanus/Diphtheria	N/A	Stay Current
<input type="checkbox"/> Stress Test	N/A	Only as requested
<input type="checkbox"/> Visual Acuity Test	N/A	Only as requested
<input type="checkbox"/> Hearing Test (Audiometry)	N/A	Only as requested
<input type="checkbox"/> Pulmonary Function	N/A	Only as requested

Client-specific drug testing<sup>1</sup>:       Not Applicable    Specify

Client-specific medical monitoring<sup>1</sup>:    Not Applicable    Specify

Site-specific medical monitoring:       Not Applicable    Specify

\*\*Frequency of medical monitoring:    Not Applicable    Specify

<sup>1</sup> Client required drug testing or medical monitoring should be coordinated through the CHSM.

Note: TRC has a "Drug and Alcohol-Free Workplace" policy (#TRC Academy Course #900013753). TRC may require employees or subcontractors to be tested upon reasonable suspicion, following accidents or incidents during work activities, or during travel to or from a project site. Client policies may be more stringent in regard to procedures following an accident. Project managers must be aware of these and inform employees and subcontractors of any additional requirements.



# TRC Environmental and Infrastructure Sector Site-Specific Health and Safety Plan (HASP) Template

(Required for all Type 2 and 3 projects.)

## 6. Personal Protective Equipment (PPE)

Based on evaluation of potential hazards, the following levels of personal protection have been designated for the applicable work tasks:

Specific TRC Job Task or Function	Minimum Level of Protection			
TRC Site Visitors—Must be escorted	<input checked="" type="checkbox"/> D			
Surface water sampling	<input checked="" type="checkbox"/> D	<input type="checkbox"/> C	<input type="checkbox"/> B	<input type="checkbox"/> A
Soil Sampling	<input checked="" type="checkbox"/> D	<input type="checkbox"/> C	<input type="checkbox"/> B	<input type="checkbox"/> A
	<input type="checkbox"/> D	<input type="checkbox"/> C	<input type="checkbox"/> B	<input type="checkbox"/> A
	<input type="checkbox"/> D	<input type="checkbox"/> C	<input type="checkbox"/> B	<input type="checkbox"/> A
	<input type="checkbox"/> D	<input type="checkbox"/> C	<input type="checkbox"/> B	<input type="checkbox"/> A

Criteria for changing protection levels are as follows:

EVACUATION <sup>(2)</sup> or PROTECTION LEVEL CHANGE <sup>(3)</sup> CRITERIA	APPROVALS REQUIRED <sup>(1)</sup>		
	OHSO	OSC	DIR H&S
Site Evacuation Plan: <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Specify or Attach Plan:			
Change to Level D when: <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Specify	<input checked="" type="checkbox"/>		
Change to Level C when: <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Specify	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Change to Level B when: <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Specify	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Change to Level A when: <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Specify	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

<sup>(1)</sup> OHSO: On-Site Health and Safety Officer

OSC: Office Safety Coordinator or TRC Safety Manager

Dir H&S: TRC Health and Safety Director

<sup>(2)</sup> General Recommendations: Evacuate the area when LEL readings are >10% LEL in the atmosphere, or when PID readings are greater than the PEL in the breathing zone.

<sup>(3)</sup> General Recommendation: To Level C when PID readings are greater than the PEL in the breathing zone. To Level B or A only after detailed evaluation and planning.

Note: Changes to the level of protection shall be made only after the required approvals are obtained. All changes shall be recorded in the field log and reported to the Project Manager as soon as possible. TRC's H&S goal is to avoid using respiratory protection unless it is absolutely necessary or required. Administrative controls or engineering controls should always be considered as a means to reduce potential exposures, before PPE is required or considered.

PPE REQUIRED BY ALL PERSONNEL AT <u>ALL TIMES</u> ON THE WORK SITE			
<input type="checkbox"/> Hard Hat	<input checked="" type="checkbox"/> Safety Shoes / Boots	<input checked="" type="checkbox"/> Eye Protection	<input type="checkbox"/> Safety Vest
(when not conducting surface water sampling)			<input type="checkbox"/> Safety Pants
PPE WHICH SHOULD BE <u>AVAILABLE</u> FOR PERSONNEL AT ALL TIMES ON THE WORK SITE			
<input checked="" type="checkbox"/> Hand Protection	<input type="checkbox"/> Protection Clothing	<input type="checkbox"/> Respiratory Protection	<input checked="" type="checkbox"/> Hearing Protection
<input type="checkbox"/> Kevlar	<input type="checkbox"/> Tyvex	<input type="checkbox"/> APR Particulate	<input checked="" type="checkbox"/> Hard Hat
<input type="checkbox"/> Nitrile	<input type="checkbox"/> Coveralls	<input type="checkbox"/> APR Chemical Cartridge	

# TRC Environmental and Infrastructure Sector Site-Specific Health and Safety Plan (HASP) Template

(Required for all Type 2 and 3 projects.)

## 7. Air Monitoring<sup>(1)</sup>

The following monitoring instruments shall be used on site to measure airborne contaminant concentrations in either the breathing zone, or as part of the overall site **Air Monitoring Plan** (attach detailed plan):

MONITORING EQUIPMENT	LOCATION OF MONITORING	FREQUENCY OF MONITORING	ACTION LEVELS
<input type="checkbox"/> Combustible Gas Indicator	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> Monitoring Plan Attached <input type="checkbox"/> Confined Space <input type="checkbox"/> Specify	<input type="checkbox"/> Continuously when potential combustible gases or lack of oxygen are suspected. <input type="checkbox"/> Specify	5-10% LEL: continue with caution > 10 % LEL: evacuate the area <input type="checkbox"/> Specify
<input type="checkbox"/> O <sub>2</sub> Monitor <input type="checkbox"/> CO Monitor <input type="checkbox"/> H <sub>2</sub> S Monitor	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> Confined Space <input type="checkbox"/> Specify	<input type="checkbox"/> Continuously when excess oxygen (>22.5%) or lack of oxygen (<19.5%) are suspected. <input type="checkbox"/> Specify	< 19.5% Oxygen: evacuate the area; supplied air may be needed > 22.5% Oxygen: evacuate the area; potential fire hazard <input type="checkbox"/> Specify
<input type="checkbox"/> Colorimetric Tubes  Type:  Type:  Type:	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> Specify <input type="checkbox"/> Sample Container  <input type="checkbox"/> Confined Space <input type="checkbox"/> Specify	<input type="checkbox"/> Periodically during sampling for analytical purposes only <input type="checkbox"/> Whenever noticeable odor is present <input type="checkbox"/> Specify	<input type="checkbox"/> Specify
<input checked="" type="checkbox"/> PID  Lamp Needed: <input type="checkbox"/> 9.8 eV <input checked="" type="checkbox"/> 10.6 eV <input type="checkbox"/> 11.7 eV  Calibration Gas:     Isobutylene  Correction Factor:	<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Sample Container <input type="checkbox"/> Confined Space <input type="checkbox"/> Specify	<input checked="" type="checkbox"/> Periodically during sampling for analytical purposes only <input type="checkbox"/> Specify  <input type="checkbox"/> Specify  <input type="checkbox"/> Specify	<input type="checkbox"/> Specify
<input type="checkbox"/> FID	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> Specify	<input type="checkbox"/> Specify	<input type="checkbox"/> Specify
<input type="checkbox"/> Mini-RAM	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> Specify	<input type="checkbox"/> Specify	<input type="checkbox"/> Specify
<input type="checkbox"/> Other:	<input type="checkbox"/> Specify	<input type="checkbox"/> Specify	<input type="checkbox"/> Specify
<input type="checkbox"/> Laboratory Supported  <input type="checkbox"/> Personal <input type="checkbox"/> Area <input type="checkbox"/> Perimeter	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> Specify	<input type="checkbox"/> Specify	<input type="checkbox"/> Specify

<sup>(1)</sup> Whenever air monitoring is required to be performed, a detailed **Air-Monitoring Plan** should be developed and attached to the HSP. The plan should include **Monitoring Locations**, **Frequency of Readings**, and any **Action Levels** being used to control the work site.

# TRC Environmental and Infrastructure Sector Site-Specific Health and Safety Plan (HASP) Template

(Required for all Type 2 and 3 projects.)

## 8. Site Controls and Work Zones (describe in detail)

**Facility Alarms or Signals:**  Not Applicable  Specify

**Work Permits Required:**  Not Applicable  Specify

**Work Traffic Issues:**  Not Applicable  Specify

**Parking Issues:**  Not Applicable  Specify

**Railway Traffic Issues:**  Not Applicable  Specify

### Support Zone(s):

TRC field vehicle  Job Trailer On Site  Other:

### Contamination Reduction Zone(s):

Field vehicle  Facility restroom/utility room  Other:

### Exclusion Zone(s):

Area immediately surrounding work area. Utilize cones, barricades or other means to delineation work areas to prevent unnecessary entry by others. Entire site is fenced to restrict access from the public.

Other:

### Site Entry Procedures:

Notify Site H&S Representative.

Read H&S Plan and sign Acknowledgment Statement

Check in with the facility contact person  Specify

Check in with facility security guard.  Specify

Wear proper personal protective equipment.

Attend facility orientation  Specify

Conduct daily safety meeting (document).

Other:  Specify

# TRC Environmental and Infrastructure Sector Site-Specific Health and Safety Plan (HASP) Template

(Required for all Type 2 and 3 projects.)

## Decontamination Procedures:

Personnel: Samplers

**Example:** If severe contamination is expected, or the work was performed in Level A, Level B, or Level C, a specific and detailed decontamination procedure should be written to address the appropriate contamination. If work was performed in Level D or Modified Level D, and minimal contamination is expected, follow standard decontamination procedures, and good personal hygiene. Disposable PPE should be removed, contained, and disposed in an appropriate manner. Prior arrangements should be made if disposal is planned for at the project site. Site workers should plan and stage for wash water and soap at the site, prior to beginning the work. Site workers should wash hands and any exposed skin extremely well with soap and water, prior to leaving the contamination reduction zone, eating, drinking, driving, or leaving the site. Any soiled or contaminated clothing should be removed and handled appropriately, by either washing as soon as possible, or if necessary, disposing. Soiled or contaminated clothing should be carefully bagged prior to disposal or washing, to reduce potential exposure.

## Equipment:

**Example:** Single use equipment will be used for sample collection at the site so decontamination will be minimal. The flow through cell used for field parameter collection during surface water sampling will be flushed with clean water to remove any debris in between sampling locations. Geoprobe equipment will be decontaminated using a pressure washer between sampling locations.

## Disposal of Investigation-derived Material:

- Leave on site for disposal.
- Other: Surface water will be discharge back into marsh during sampling. Excess soil will be thin spread on site.

## Work Limitations (time of day, buddy system, etc.):

- Buddy system required for some tasks Specify
- Work will be performed during daylight hours only
- Work will be performed using artificial light.  
Describe or attach a lighting plan:
- No eating, drinking, or smoking in contamination reduction zone(s) or exclusion zone(s)
- When temperatures are either above 80°F or below 20°F, work schedules may be modified
- Other site-specific limitations:

# TRC Environmental and Infrastructure Sector Site-Specific Health and Safety Plan (HASP) Template


(Required for all Type 2 and 3 projects.)

## Radiation Safety:

- Radiation information is not applicable to this project.
- Notify RSO.
- Wear dosimeter badge when handling gauge.
- Post applicable radiation signs and documents.
- Post emergency numbers.
- Provide at least two lock systems for overnight storage.
- Maintain storage at least 15 feet from full-time workstations.
- Block, brace, and securely lock the gauge during “all” transportation.
- Limit “public” exposure to gauge while in use.
- Provide sketch of gauge storage to RSO.





	<b>TRC HEALTH AND SAFETY MANAGEMENT SYSTEM</b>		EHS Policy
	DOCUMENT TITLE: Pandemic Program		Management System Procedures
	DOCUMENT NUMBER: CP052	Revision Number: 9	Compliance Programs
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**Attachment A**  
**CP052.1 Field Guidelines COVID-19**

**1. ASSESSING FIELD ACTIVITIES FOR COVID-19 RISK**


Following TRC’s health and safety management system, work activities should be assessed to identify possible hazards and the precautions necessary to mitigate risk to an acceptable level, including risks associated with COVID-19. TRC is following the US Occupational Safety and Health Administration’s (OSHA) risk assessment guidance for COVID-19. Project-specific controls that are developed through the risk assessment process must be communicated to project employees and also listed in the project Health and Safety Plan.

**1.1. Risk Assessment**

To determine appropriate precautions, OSHA has divided job tasks into four risk exposure levels: very high, high, medium, and lower risk. The majority of TRC’s work is considered Low risk.

- **Very High:** Exposure risk jobs are those with high potential for exposure to known or suspected sources of COVID-19 during specific medical, postmortem, or laboratory procedures. Workers in this category include healthcare workers and healthcare or laboratory personnel collecting or handling specimens from known or suspected COVID-19 patients.
  - **Precautions:** TRC does not engage in Very High-risk work.
- **High:** Exposure risk jobs are those with high potential for exposure to known or suspected sources of COVID-19. Workers in this category include healthcare delivery and support staff (e.g., doctors, nurses, and other hospital staff who must enter patients’ rooms) exposed to known or suspected COVID-19 patients.
  - **Precautions:** TRC does not engage in High-risk work.
- **Medium:** Exposure risk jobs include those that require frequent and/or close contact with (i.e., within 6 feet of) people who may be infected with COVID-19, but who are not known or suspected COVID-19 patients. In areas without ongoing community transmission, workers in this risk group may have frequent contact with travelers who may return from international locations with widespread COVID-19 transmission. In areas where there is ongoing community transmission, workers in this category may have contact be with the general public (e.g., in schools, high-population-density work environments, and some high-volume retail settings).
  - **Precautions**
    - Continue to follow the CDC’s guidelines for social distancing and hand hygiene.
    - Where appropriate, limit client and third-party access to the worksite or restrict access to only certain workplace areas.
    - Consider strategies to minimize face-to-face contact (e.g., drive through windows, phone-based communication, telework).




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- Employees and Project Managers with medium exposure risk may need to wear some combination of gloves (i.e., nitrile), a face mask (or ½ mask tight-fitting respirator), and/or a face shield or goggles. PPE ensembles for workers in the medium exposure risk category will vary by work task, the results of the hazard assessment, and the types of exposures workers have on the job.
- **Lower:** Exposure risk (caution) jobs are those that do not require contact with people known to be, or suspected of being, infected with COVID-19 nor frequent close contact with (i.e., within 6 feet of) the general public. Workers in this category have minimal occupational contact with the public and other coworkers.
  - **Precautions** – While OSHA does not recommend specific controls for Low-risk work, TRC will continue to follow the CDC’s primary precautions including social distancing and hand hygiene.


## 1.2. Best Practices

TRC has identified additional best practices that can be used to further mitigate potential exposure to COVID-19. In addition, the CDC’s COVID-19 guidelines which include social distancing and hand hygiene, the following options should be considered.

- **Travel**
  - Drive in separate vehicles
    - If vehicle has two passengers, both passengers should wear face coverings
  - Consider completing tasks alone
  - Sanitize your hands after using the fuel pump
  - Sanitize interior surfaces of rental vehicles
  - Driving instead of flying
- **Project Sites**
  - Use disposable chemical resistant gloves (i.e., nitrile) when disinfectant wipes are not available
  - Schedule work during “off hours” when less people are around
  - Wait until 3 days after last person left the area, if possible
  - Wear a face covering if you can’t work alone
    - Ensure proper planning and hydration is considered during pre-task planning to limit potential of heat illness while wearing a face covering
  - Consider using a ½ mask tight-fitting respirator when N95 masks are not available (if deemed appropriate)
  - Contact clients via telephone or video conference instead of face-to-face meetings

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- If you need to enter a home or office that is occupied, please consider the following.
  - Conduct a survey of the occupants to identify if there are any individuals who are have COVID-19 symptoms or are at high risk.
  - Wear a face covering or N95/KN95
  - Wear nitrile gloves
  - If you are going into an area with older or individuals with compromised health, please consider wearing Tyvek.
  - All PPE should be removed and disposed of after you leave each location to reduce the chances of cross contamination.
  - This is not an all-inclusive list but some of the recognized best practices and the Corporate EHS Team should be consulted to help develop a plan.
- **Construction sites**
  - Avoid “tailgate meetings” or “water cooler meetings” without following social distancing protocols
  - Avoid sharing pens/pencils
  - Safety Meetings should be held in groups of 10 or less and should observe 6’ personal distance
  - Face coverings are recommended to be worn by TRC and their subcontractors
  - Stagger lunch times to minimize social gatherings; consider eating in separate areas
  - All lunch waste, bottles and cans should be disposed of immediately after use
  - Never share PPE (hard hats, high visibility vests, personal floatation device, safety glasses, etc.
  - Avoid community coffee pots in field offices
  - Provide disposable paper cups at drinking stations
  - Wear gloves when operating equipment and if possible, limit one operator to a piece of equipment. Sanitize controls after use
  - No sharing hand tools
  - Set up hand cleaning or sanitizing stations at various locations on the site, ideally near port-o-lets
  - Put your clothing directly in the washing machine at the end of shift
  - Limit number of workers in confined spaces as much as possible
  - Use telephones or Teams meetings to avoid face-to-face meetings when possible

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## 2. SYMPTOMS AND PRECAUTIONS FOR COVID-19


### 2.1. Background

The 2019 novel coronavirus, or COVID-19, is a new respiratory virus first identified in Wuhan, Hubei Province, China. It's called a "novel" — or new — coronavirus, because it is a coronavirus that has not been previously identified.

Both the COVID-19 and influenza (flu) are respiratory illnesses, which have similar symptoms. Both are contagious and both can be mild or severe, even fatal in rare cases. The key difference between the novel coronavirus and influenza is we know what to expect from the flu.

### 2.2. Symptoms and Steps to Follow If You Develop Symptoms

Symptoms and Warning Signs	Take the following steps
<p>Symptoms may appear <b>2-14 days after exposure</b> to the virus. People with these symptoms may have COVID-19:</p> <ul style="list-style-type: none"> <li>• <b>Fever (<math>\geq 100.4^{\circ}\text{F}</math>) or chills</b></li> <li>• <b>Cough</b></li> <li>• <b>Shortness of breath or difficulty breathing</b></li> <li>• <b>Fatigue</b></li> <li>• <b>Muscle or body aches</b></li> <li>• <b>Headache</b></li> <li>• <b>New loss of taste or smell</b></li> <li>• <b>Sore throat</b></li> <li>• <b>Congestion or runny nose</b></li> <li>• <b>Nausea or vomiting</b></li> <li>• <b>Diarrhea</b></li> </ul> <p>This list is not all inclusive. Refer to the CDC Website for additional information.</p>	<ol style="list-style-type: none"> <li>1. Notify your field and direct supervisor that you feel ill.</li> <li>2. Supervisor shall notify Office Practice Leader/Practice Leader, Mike Glenn (949-697-7418), and your HR Business Partner immediately.</li> <li>3. Immediately isolate yourself and return to your place of lodging (return home if nearby).</li> <li>4. Contact your personal healthcare provider asap (consider using the Cigna app) for evaluation and follow their instructions.</li> <li>5. Update your field and direct supervisor of your health and work status (e.g., when you expect to return to work).</li> <li>6. If you're diagnosed with COVID-19 or are instructed to self-quarantine, notify Mike Glenn (949-697-7418) and your HR Business Partner immediately. This communication will be treated as confidential.</li> </ol>


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Symptoms and Warning Signs	Take the following steps
<p>If you develop any of the following <b>emergency warning signs</b>:</p> <ul style="list-style-type: none"> <li>• <b>Trouble breathing</b></li> <li>• <b>Persistent pain or pressure in the chest</b></li> <li>• <b>New confusion</b></li> <li>• <b>Inability to wake or stay awake</b></li> <li>• <b>Bluish lips or face</b></li> </ul> <p>This list is not all inclusive so please consult with your medical provider for further guidance.</p>	<ol style="list-style-type: none"> <li>1. Get medical attention immediately.</li> <li>2. If you're diagnosed with COVID-19, notify Mike Glenn (949-697-7418) and your HR Business Partner immediately. This communication will be treated as confidential.</li> </ol>

Source: CDC COVID-19 Symptoms <https://www.cdc.gov/coronavirus/2019-ncov/about/symptoms.html>

### 2.3. COVID-19 Self-Quarantine and Return to Work Process

- The SVP, Director of Corporate EHS and/or the Director, Corporate EHS and Compliance will facilitate a self-quarantine and return to work process for employees that have been impacted by the COVID-19. Employees will be placed into one of three categories based on their exposure to the pandemic.
  - **Category 1:** Employee reporting symptoms and/or receives negative test result of COVID-19.
  - **Category 2:** Employee suspects exposure to COVID-19 but does not develop symptoms.
  - **Category 3:** Employee receives a positive test for COVID-19.
- No matter the category all employees shall notify a member of the Corporate EHS Team regarding the development of symptoms, suspected exposure or positive test. Upon notification to the Corporate EHS Team will notify HR and work the employees Supervisor/Project Manager to make appropriate client notifications.
- Employees of each category will be required to quarantine for the appropriate amount of time based on the medical opinion of a third-party medical provider and the best available guidance from government agencies such the Center for Disease Control (CDC).
- Prior to returning to work after a quarantine has been issued to an employee, the employee shall receive a medical clearance from his/her third-party medical provider and provide a copy the Corporate EHS Team. Examples for each category are listed here:
  - **Category 1:** Employee must receive clearance to return to work from third party medical provider (WorkCare is an option for employees).
  - **Category 2:** Employee can return work following quarantine period of 14 days provided they remain symptom free. Telephonic healthcare provider such as WorkCare may be optional.

	<b>TRC HEALTH AND SAFETY MANAGEMENT SYSTEM</b>		EHS Policy
	DOCUMENT TITLE: Pandemic Program		Management System Procedures
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- **Category 3:** Recovered employee, must be symptom free without medication for at least 72 hours and at least 10 days from initial symptoms, provides Safety and HR clearance from third party medical provider prior to returning to work.

#### 2.4. Transmission


COVID-19 can be spread from person to person through droplets caused by an infected person coughing, sneezing or talking and can be spread by an infected person for several days before their symptoms appear.

#### 2.5. Precautions

- Wear face coverings in settings where social distancing measure are difficult to maintain.
- Practice Social Distancing
  - Practice social distancing by avoiding large gatherings and maintaining distance (at least 6 feet) from others when possible.
  - Do not share eating or drinking utensils, avoid close conversation, and other direct physical contact like hand shaking. “Close contact” does not include activities such as walking by a person or briefly sitting across an office.
- Hand Hygiene
  - According to the CDC, washing hands with soap and water is the best way to get rid of germs in most situations. If soap and water are not readily available, you can use an alcohol-based hand sanitizer that contains at least 60% alcohol. You can tell if the sanitizer contains at least 60% alcohol by looking at the product label.
- Practice good respiratory hygiene – covering mouth and nose when coughing or sneezing, using tissues and disposing of them correctly.
- Obtain immunizations recommended by healthcare providers to help avoid disease.
- Early self-isolation of those feeling unwell, feverish and having other symptoms of flu.
- Avoiding touching your eyes, nose or mouth.
- Frequently disinfect all areas that are likely to have frequent hand contact (like doorknobs, faucets, handrails).

#### 2.6. Client Meetings/Interactions

Be aware of any restrictions or requirements that clients have in place regarding visiting client facilities or attending meetings. Verify with supervisor/project managers prior to visiting client facilities or meetings in person.

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**Attachment B**  
**CP052.2 COVID-19 Questionnaire for Onsite Workers**

The safety of our employees and their families, subcontractors, clients, and visitors is TRC’s highest priority. As the COVID-19 pandemic continues to evolve and spread, TRC will continue to monitor the CDC, WHO, and local agencies in order to provide up-to-date information to protect all of those in our community.

To prevent the spread of COVID-19 and reduce the potential risk of exposure to our employees, subcontractors, and visitors, we request all personnel involved with on-site project-related work complete this assessment questionnaire. This questionnaire will be completed upon arrival to the jobsite and prior to conducting any job-related tasks. Your participation is important to help us take precautionary measures to protect you and everyone on our team.

Date: \_\_\_\_\_

Name: \_\_\_\_\_

Company/Organization: \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone Number: \_\_\_\_\_

Project Name: \_\_\_\_\_

1. Do you have signs of a fever or measured temperature equal to or above 100.4°F, a dry cough, tiredness, or trouble breathing within the past 72 hours?  
 Yes  No
  
2. Have you had “close contact” with an individual diagnosed with COVID-19? “Close contact” means living in the same household as a person who has tested positive for COVID-19, caring for a person who has tested positive for COVID-19, being within 6 feet of a person who has tested positive for COVID-19 for 15 minutes or more, or coming in direct contact with secretions (for example, sharing utensils or being coughed on) from a person who has tested positive for COVID-19 while the person was symptomatic.  
 Yes  No
  
3. Have you, or anyone inside your residence been exposed to someone else who is currently being quarantined by a doctor or a local public health official?  
 Yes  No

Be aware that your client may have additional requirements as well. Please consult the [COVID-19 Client Documents](#) on TRCNet to review your client’s guidance. Only personnel who answer “No” to all questions listed above will be granted site access. **Copies of completed questionnaires are to be maintained onsite with the HASP and project documents. If the answer is “Yes” to question 1, please contact your Supervisor, Office Practice Leader/OPL, Mike Glenn, and your HR Business Partner.**



# INCIDENT NOTIFICATION REPORT

*(To be completed immediately after an Injury, Illness, Incident or Significant Near Miss by Employee's Supervisor and Employee involved)*

Incident Category	
<input type="checkbox"/> Injury/Illness	<input type="checkbox"/> Near Miss/Loss
<input type="checkbox"/> Property Damage	<input type="checkbox"/> Other
1 Incident Location:	_____
2 Project #:	_____
3 Client:	_____
4 Date Incident Occurred:	_____ Time: _____
5 Date Incident Reported:	_____ Time: _____
TRC Employee Information	
6 Name:	_____ Phone: _____
7 Office:	_____ Address: _____
8 Supervisor Name:	_____ Phone: _____
9 Title or Occupation:	_____
10 Sector/Practice:	_____
Incident Description	
11 Task Performed/Description of Incident:	_____ _____ _____
12 Conditions at the Time of Incident (weather, lighting, etc.):	_____
13 Description of Property Damage:	_____
Employee Injury or Illness Description	
14 Describe the Injury or Illness:	_____ _____ _____
15 First Aid/Medical Treatment Administered:	_____ _____ _____
16 Was WorkCare Contacted? <input type="checkbox"/> Yes <input type="checkbox"/> No	
17 Name of Doctor's Office, Clinic or Hospital:	_____
18 Address:	_____ Phone: _____



# INCIDENT NOTIFICATION REPORT

*(To be completed immediately after an Injury, Illness, Incident or Significant Near Miss by Employee's Supervisor and Employee involved)*

Subcontractor Involvement			
19	Was a subcontractor involved?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
20	Name of Company:	_____	
21	Address:	_____	
22	Contact Name:	_____	Phone: _____
23	Description of the Incident:	_____	
Witness Information			
24	Were there witnesses to the incident?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
25	Name(s)	Address(es)	Number(s)
_____			
_____			
Immediate Corrective Actions			
26	Describe the Immediate Corrective Actions Taken:		
Supervisor: _____		Signature: _____	Date: _____
Employee: _____		Signature: _____	Date: _____



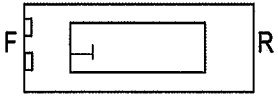


# AUTO INCIDENT REPORT

## EMPLOYEE INFORMATION (V-1):

Name: \_\_\_\_\_ Phone: ( ) \_\_\_\_\_  
 Sector/Practice: \_\_\_\_\_ Office Location: \_\_\_\_\_  
 Supervisor's Name: \_\_\_\_\_ Supervisor's Phone: ( ) \_\_\_\_\_  
 Project #: \_\_\_\_\_ Client's Name: \_\_\_\_\_  
 Driver's License #: \_\_\_\_\_ State: \_\_\_\_\_

## VEHICLE INFORMATION (V-1):

Year/Make/Model of Vehicle: \_\_\_\_\_  
 License Plate #: \_\_\_\_\_ Vehicle ID # (VIN): \_\_\_\_\_  
 Circle Point of Contact:  Was Vehicle Drivable?  Yes  No  
 Personal:  Yes Rental:  Yes Fleet:  Yes  
 Rental Company (Use Drop List): \_\_\_\_\_

## INCIDENT INFORMATION:

Date of Incident: \_\_\_\_\_ Time of Incident: \_\_\_\_\_ A.M. \_\_\_\_\_ P.M. Photos Taken:  Yes  No  
 Location of Incident: \_\_\_\_\_ City: \_\_\_\_\_  
 Were The Authorities Contacted? Police:  Yes  No Ambulance:  Yes  No Fire:  Yes  No  
 Name of Police Dept: \_\_\_\_\_ Case #: \_\_\_\_\_ Officer Name: \_\_\_\_\_  
 Were Citations Issued?  Yes  No If Yes, To Whom? \_\_\_\_\_  
 Citation Number: \_\_\_\_\_  
 Were There Any Witnesses?  Yes  No If Yes, Please Provide Name, Address and Phone Below:  
 Witness Name: \_\_\_\_\_ Witness Phone: ( ) \_\_\_\_\_  
 Witness Address: \_\_\_\_\_  
 Traffic Conditions (i.e., heavy, light): \_\_\_\_\_ Weather Conditions (i.e., dry, wet, ice, fog): \_\_\_\_\_  
 WorkCare Contacted?  Yes  No  
 TRC Driver Injured?  Yes  No Medical Treatment Received?  Yes  No  
 Front Seat Passenger Injured?  Yes  No Medical Treatment Received?  Yes  No  
 Rear Driver Side Passenger Injured?  Yes  No Medical Treatment Received?  Yes  No  
 Rear Passenger Side Passenger Injured?  Yes  No Medical Treatment Received?  Yes  No  
 Describe Injuries: \_\_\_\_\_  
 Describe Damage to Property Other Than Motor Vehicles (i.e., guardrails, mailboxes, etc.): \_\_\_\_\_



# AUTO INCIDENT REPORT

## OTHER DRIVER & VEHICLE INFORMATION (V-2):

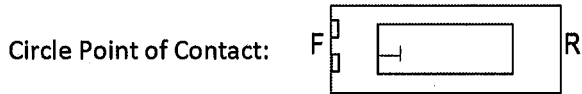
Driver's Name: \_\_\_\_\_ Driver's Phone: ( ) \_\_\_\_\_

Driver's Address: \_\_\_\_\_

Owner's Name (if different than driver): \_\_\_\_\_ Owner's Phone: ( ) \_\_\_\_\_

Owner's Address: \_\_\_\_\_

Year/Make/Model of Vehicle: \_\_\_\_\_ License Plate #: \_\_\_\_\_ State: \_\_\_\_\_



Was Vehicle Drivable?  Yes  No

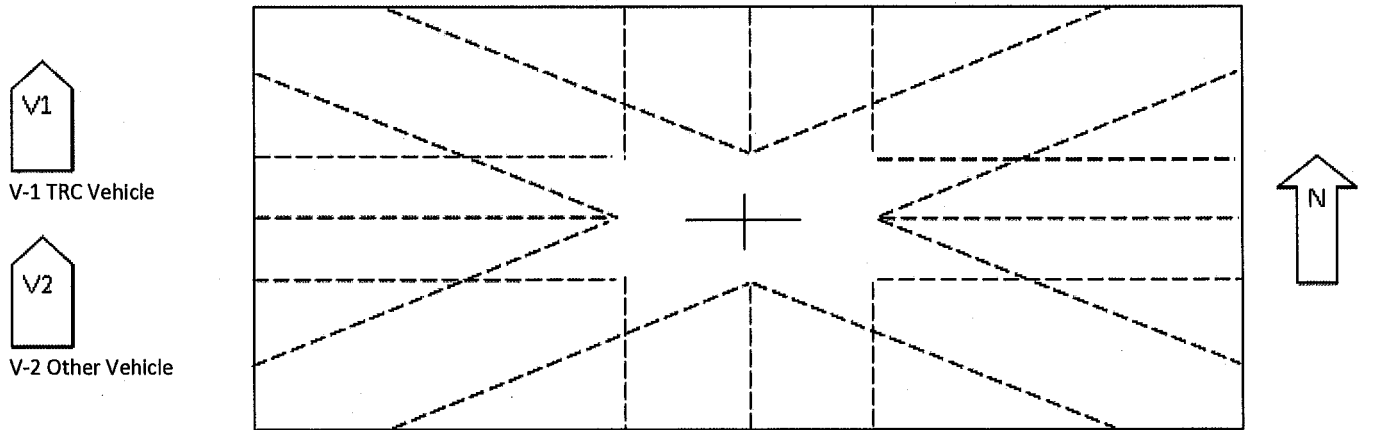
Insurance Company Name: \_\_\_\_\_ Policy Number: \_\_\_\_\_

Insurance Company Phone: ( ) \_\_\_\_\_ Number of Passengers in Vehicle: \_\_\_\_\_

List Persons Injured: \_\_\_\_\_

Were Any Other Vehicles Involved in Incident?  Yes  No If yes, provide details below:

PLEASE DESCRIBE THE INCIDENT AND COMPLETE THE DIAGRAM BELOW. Be sure to indicate as many details as possible (i.e., How many lanes in each direction; Were there any turn lanes; What kind of traffic controls were there – light, stop sign, yield sign, Positions of vehicles on Impact).



Completed By: \_\_\_\_\_ Signature: \_\_\_\_\_