SITE INVESTIGATION WORKPLAN

Phase 2 Construction Area of the River Point District; Manitowoc, Wisconsin

1101 Buffalo Street
1110 Buffalo Street
1200 Buffalo Street

BRRTS ID:

02-36-585491	(Open ERP)
02-36-176478	(Closed ERP)
03-36-001962	(Closed LUST)
07-36-583000	(LGU Exemption/ General Property)

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1.0 INTRODUCTION

This Site Investigation Workplan has been prepared on behalf of the City of Manitowoc (hereinafter referred to as the City) and the Community Development Authority of the City of Manitowoc (CDA; current owner) by Stantec Consulting Services Inc. (Stantec) to satisfy ch. NR 700 Wisconsin Administrative Code (WAC) requirements and outline site investigation activities to be performed at the former railroad/industrial property located at 1101, 1110 and 1200 Buffalo Street in the City of Manitowoc, Wisconsin (herein referred to as the Property). Specifically, the purpose of this Site Investigation Workplan is to define the nature, degree, extent, and source(s) of contamination on the Property and to determine the need for (and provide information to support) additional investigation or remedial action where warranted.

2.0 PROPERTY INFORMATION

2.1 PROPERTY LOCATION

The Property is located in the southeast quarter of the southeast quarter of Section 19, Township 19 North, Range 24 East, and in the northeast quarter of the northeast quarter of Section 30, Township 19 North, Range 24 East, in the City of Manitowoc, Manitowoc County, Wisconsin. The Property consists of all or portions of 12 contiguous parcels of land totaling approximately 7.4 acres and forming the northwest and west-central portions of a larger 21-acre former railroad/industrial peninsula referred to locally as the "River Point District". The location of the 7.4-acre Property and the larger 21-acre River Point District relative to nearby topography is illustrated on Figure 1. The 12 parcels comprising the Property are shown on the orthophotograph provided as Figure 2 and include Parcel identification numbers (PINs) 173000, 173020, 173022, 173023, 173030, 173040, 173060, 173070, 173080, 173110, 173150 and 173170.

The approximate geographic coordinates of the center of the Property in the Wisconsin Transverse Mercator 1991 coordinate system are (X: 707019, Y: 405063); this was determined using the Wisconsin Department of Natural Resources (WDNR) Remediation and Redevelopment Sites Map at a scale of 1 to 495 (WDNR, 2022a).

The Property is located near the City's downtown commercial district and offers a unique opportunity for non-industrial, multi-use redevelopment as a destination area to catalyze meaningful economic growth in the City. The Property constitutes "Phase 2" of multiple phases of development planned for the River Point District. Conceptual River Point Property reuse features are detailed on Figure 3 and include road rights of way and other non-industrial reuses.

The start of Phase 2 construction activities at the Property is targeted for Fall 2022, with work continuing through 2023.

2.2 CONTACT INFORMATION

Contact information for the responsible party and environmental consulting firm are provided below.

RESPONSIBLE PARTY:
Community Development Authority of the City of Manitowoc (Property Owner)
City of Manitowoc
900 Quay Street
Manitowoc, WI 54220-4543

Contact:
Mr. Adam Tegen
Community Development Director
City of Manitowoc, Wisconsin
900 Quay Street
Manitowoc, WI 54220-4543
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Mequon, Wisconsin 53092

Contact:
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Sr. Brownfields Project Manager
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2.3 PROPERTY HISTORY

General Property Use
The Property is undeveloped and comprised of 7.4 acres of vacant former railroad/industrial land. The Property is zoned Central Business B-4. Surrounding properties are a mix of vacant land, rights-of-way, commercial and industrial land uses. Parcel numbers associated with the Property are illustrated on the orthophotograph provided as Figure 2.

Historic Property and Adjoining Property Uses
As described in the Stantec (2019a) Phase I Environmental Site Assessment (ESA), the Property appears undeveloped in 1835; however, the proximity of the peninsula to the Lake Michigan/Great Lakes shipping route facilitated initial large scale industrial transloading development of the River Point District by 1868. Although ownership records are not available, a panoramic map drawn in 1883 indicates the River Point District was fully developed and occupied by several large industrial-like buildings and smaller commercial-like buildings. The historic uses and occupancies of the Property in the 19th Century and 20th Century are depicted on Figure 4a and Figure 4b, respectively. Associated PINs are summarized below and grouped by historic use(s) documented in specific areas of the Property.

Southeast Portion of Property, Former Grain Elevator (PINs 173080 and 173150)
A grain elevator was constructed on the southeast portion of the Property (PIN 173080) between 1894 and 1900 ("17" on Figure 4b), with expansion onto the north-adjoining parcel (PIN 173150) between 1900 and 1919 by "Northern Grain Co". As noted in Stantec (2021a), the grain elevator fell into disrepair in the late 20th Century and was ultimately demolished in 2001. Rail operations remained at the Property until the early 2000s when the remaining steel rails were removed.

The south-adjoining parcels to the Property were developed for railroad use by 1895 and included a cinder pit, railroad roundhouse, turntable and coal shed ("4" through "7" on Figure 4b, respectively) and multiple spurs/tracks. This area constitutes "Area B-1" of the River Point District (Figure 2) and will be investigated under a separate Site Investigation Workplan.

Northeast Portion of Property, Former Bulk Petroleum Storage (PINs 173020, 173022, 173023, 173030, 173040, 173060, 173070, 173110 and 173170)
As illustrated on Figure 4a, the Property was largely occupied by residences and dwellings in the late 19th Century. Records suggest large portions of the Property were leased to a variety of bulk fuel storage companies operating under a variety of names during the early/mid-20th Century, including the Standard Oil Company bulk oil station on the Property. Historic Sanborn® fire insurance maps indicate use for bulk petroleum storage began between 1912 and 1919 when the Standard Oil Company installed four steel tanks, a 20,000-gallon iron oil tank, and a partially inground 20,000-gallon iron oil tank along a railroad spur present in the northwest portion of the Property. Records indicate most of the petroleum stored/handled at the Property was fuel oil. However, state records indicate a significant quantity of leaded and unleaded gasoline, diesel fuel, kerosene, and used/waste motor oil may have been stored in bulk. The locations of known historic features associated with bulk fuel storage by tenants are illustrated on Figure 4b. Bulk petroleum storage was consolidated by the Wingfield Oil Company (later renamed Holmes Oil Company) who continued to operate through the late 1990s. The Holmes Oil Corporation appears to have vacated the Property concurrent with removal of the final storage tanks by 1997. The large oil house depicted in the southeast portion of the Property on Figure 4b was demolished in the later portion of the 20th Century.

West Portion of Property, Former Railroad Use (PINs 173000 and 173170)
As illustrated on Figure 4a, several large buildings were present on and surrounding the west portion of the Property in the late 19th Century. As adapted from historic Sanborn® Fire Insurance Maps drawn in the late 19th Century, the west portion of the Property was once part of the Manitowoc River (Figure 4a). Placement of fill in the late 19th Century on the Property and nearby areas altered the bank of the Manitowoc River to its current location prior to acquisition of the River Point District by the Western Railroad Company on July 22, 1895. The majority of the Property was developed for railroad use by 1895 and included multiple spur lines depicted on Figure 4b and a rectangular warehouse ("35" on Figure 4b). The Property remained in railroad use through most of the 20th Century (Stantec, 2019a).

Property Ownership

Historic records indicate the Property was transferred from the Manitowoc Terminal Company to the Manitowoc and Western Railroad Company on July 22, 1895, which is consistent with railroad development in the late 19th Century. Assessor records suggest the Property was later transferred to the Soo Line Railroad Company and ultimately transferred to Wisconsin Central, Ltd. (WCL) sometime during the latter half of the 20th Century. Railroad use of the Property ceased in the 1980s and the Property was decommissioned in the 2000s. The CDA acquired the Property on April 12, 2019 for the purpose of blight elimination and subsequently received a Local Government Unit (LGU) Environmental Liability Exemption from WDNR on March 18, 2019 with a Bureau for Remediation and Redevelopment Site (BRRTS) activity number of 07-36-583000.

Since taking ownership, the CDA has maintained compliance with the required continuing obligations and no records have been identified indicating the CDA is considered potentially liable or known to be affiliated with any other person that is potentially liable for contamination at the Property.

3.0 SUMMARY OF PREVIOUS ENVIRONMENTAL INVESTIGATIONS

LUST Case Closure, Northeast Portion of Property
On November 11, 1994, a Leaking Underground Storage Tank (LUST) case (03-36-001962 HOLMES OIL CORP) was opened at 1110 Buffalo Street (northeast portion of the Property) when WDNR was notified of petroleum contamination to soil and groundwater in association with former bulk petroleum storage by "Holmes Oil Corp", listing "Wisconsin Central LTD" as the responsible party. Further sampling was performed and approximately 510 tons of petroleum-impacted soil was remedially excavated from three locations, and groundwater was monitored for four quarters post-excavation. The case was closed on October 17, 2005, with residual petroleum impacts to soil above NR 720 residual contaminant levels (RCLs) and for residual concentrations of petroleum constituents in groundwater greater the ES, as illustrated by Stantec in the closure documentation (WDNR, 2005). The extent of residual soil and groundwater impacts documented as part of this BRRTS case in relation to the Property are illustrated on Figure 5a and Figure 5b, respectively.

Stantec (2019a) Phase I ESA, River Point District
The Stantec (2019a) Phase I ESA performed for the greater River Point District identified the following recognized environmental conditions (RECs) associated with the Property:

- REC 1: Prior Railroad Use
- REC 2: Prior Industrial Use
- REC 3: Residual Impacts to Soil and Groundwater
- REC 4: Apparent Anthropogenic Fill
- REC 5: Storage/Dumping by Adjacent Property Owners
- REC 6: Residual Impacts to Soil and Groundwater from Nearby Properties

Stantec (2020a) Phase II ESA, River Point District
As summarized in the Stantec (2020a) Phase II ESA, between November 14 and November 20, 2018 and under supervision of Stantec, Probe Technologies, Inc (Probe Tech) advanced 46 soil borings at the River Point District property. On December 10, 2018, a supplemental drilling and sampling event was completed at the River Point District property; Probe Tech advanced 16 soil borings to confirm the presence and/or depth of fill at the Property. These investigations included sampling soils on the Property for volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), Resource Conservation and Recovery Act (RCRA) metals, and/or polychlorinated biphenyls (PCBs). Temporary and permanent groundwater monitoring wells were installed during the Phase II ESA and sampled for VOCs, PAHs, dissolved RCRA metals and/or per- and poly-fluorinated alkyl substances (PFAS). Sample locations are illustrated on Figure 6.

Soil. PCBs were detected in fill on the southeast-adjoining parcels, which was anticipated due to historical junk yard/metal scrap yard operations. Similar to previous investigations, select VOCs, PAHs, and heavy metals were detected in soil at concentrations greater than applicable NR 720 RCLs and/or BTVs across the Property. The Stantec (2020a) Phase II ESA identified multiple fill units, including a sitewide heterogeneous granular black anthropogenic fill unit of varying quality. Ubiquitous PAH and metals soil impacts were largely attributable to the granular anthropogenic fill across the Property, which is present in thicknesses of up to eight feet in some portions of the River Point District property (Figure 7). Previously documented soil impacts associated with prior bulk petroleum storage by previous tenants on the northeast portion of the Property were also confirmed (Figure 8).

Groundwater. Select VOC and PAH constituents were detected at concentrations greater than their respective ch. NR 140 WAC Preventive Action Limits (PALs) and Enforcement Standards (ESs) on the Property, and dissolved heavy metals were detected in groundwater at concentrations greater than applicable PALs. Impacts to groundwater in former bulk petroleum storage areas are consistent with previous investigations (Figure 9). PFAS was detected in groundwater at the Property at concentrations greater than the proposed individual and combined constituent PALs and/or ESs; this was also the case for the greater River Point District property (Figure 9).

AECOM (2020) Limited Site Investigation, North and East Portions of the River Point District
To confirm the presence of contaminants of concern (COCs) in groundwater detected in temporary wells installed and sampled as part of the Stantec (2020a) Phase II ESA, AECOM installed 15 ch. NR 141 WAC (NR 141)-compliant groundwater monitoring wells at the River Point District in March 2020, including eight on the Property (MW-13, MW-20, MW-24, MW-26, MW-28, MW-29, MW-30 and MW-31). Permanent well locations installed as a part of the AECOM (2020) investigation replaced the Stantec (2020a) temporary well locations in those areas, which were abandoned by AECOM in accordance with NR 141. The permanent wells were sampled for VOCs, PAHs and/or dissolved RCRA metals.

Select PAH constituents were detected at concentrations greater than the ES in Property monitoring well MW-28, and VOC constituent tetrachloroethene was present at concentrations greater than the PAL in monitoring wells MW-24 and MW-35); these wells were located in areas of former underground tank storage (Figure 4b). Arsenic was also detected at concentrations greater than the PAL in several wells sampled across the Property.

These results generally coincide with the previous Stantec (2020a) Phase II ESA investigation, with concentrations of COCs measured in the AECOM (2020) permanent wells similar to, or less than, those measured in the Stantec (2020a) temporary wells. This is consistent with expectations, as the proper development and purging of NR 141-compliant groundwater monitoring wells mitigates potential bias of elevated PAH and heavy metal constituents that may be present in colloidal materials, as is often seen in temporary well sampling.

Stantec (2020b) Construction Documentation Report, Northeast Portion of Property
On August 14th, 2020 and under supervision of Stantec, Veit & Company, Inc. (Veit) completed 11 test trenches/pits around the perimeter of building infrastructure in various locations on the Property (test pits TP-10 through TP-20; refer to Figure 6) to assess the depth of the footings and footing walls, the presence or absence of remaining petroleum infrastructure (i.e., piping), and determine if residual petroleum contamination was identifiable surrounding the slab features. Additionally, 16 exploratory test pits were completed in the vicinity of former documented tank locations on the Property to determine if concrete foundations, tanks or tank infrastructure (i.e., piping, saddles) remained below ground surface; no tanks or piping were observed in association with these exploratory test pits. Soil from one test pit performed along the western end of a former pump house slab with suspected contamination (TP-17) was screened with a photoionization detector (PID) and sampled for VOCs, semi-volatile organic compounds (SVOCs) and metals. The analytical results of this sampling are provided in the Stantec (2020c) Phase II ESA.

Between August 14th and 17th, 2020, Veit demolished the majority of the foundation features present on in this area of the River Point District, including the large oil house slab in the southeast portion of the Property. On August 31st, 2020, City of Manitowoc contractor Vinton Construction Co (Vinton) crushed approximately 618 cubic yards of concrete from the former slabs/structures, which was ultimately used as part of Phase 1 of the River Point District development in 2021.

Stantec (2020c) Phase II ESA, Northeast Portion of Property
As summarized in the Stantec (2020c) Phase II ESA, on September 9, 2020 and under supervision of Stantec, Horizon Construction and Exploration LLC (Horizon) advanced 10 soil borings to a maximum depth of 10 feet in areas of former structural impediments on the Property. Temporary wells were installed after the completion of each soil boring. Both soil and groundwater were sampled for VOCs, SVOCs, heavy metals, and/or total cyanide. Sample locations and identified impacts are illustrated on Figures 8 - 10.

Soil. Soils encountered beneath the former structural impediments on the Property in August 2020 were generally brown fill sand beneath the former slabs, black granular fill present near the natural ground surface, and native sands and clays at depth. Fill materials and soil contaminants/concentrations encountered as a part of this Phase II ESA are consistent with previous investigations performed for the River Point District, with the exception of fill material with Prussian blue coloration consistent with ferrocyanide salts in oxide box waste encountered in the north-central portion of the Property (PIN 173022) in sample locations SB-21 and SB-27 approximately 2.5 feet below ground surface. A separate investigation was subsequently performed by Stantec in June 2021 to delineate the extent of fill materials consistent with apparent oxide box waste using test pits

TP-17 through TP-35; the delineated extent of apparent oxide box waste on the Property is illustrated on Figure 10.

Groundwater. Groundwater contaminants/concentrations encountered as a part of this Phase II ESA are consistent with previous investigations performed for the River Point District, with the exception of total cyanide detections in eight of the 10 temporary groundwater monitoring wells installed/sampled on the Property in September 2020. Cyanide was not investigated by AECOM (2020) as a constituent of concern in March 2020. Additional cyanide investigation is warranted to confirm the presence and concentrations of free cyanide in groundwater from NR 141-compliant monitoring wells.

Stantec (2021b) NR716 Site Investigation Report, Phase 1 of River Point Development

As summarized in the Stantec (2021b) Site Investigation Report, between February and March 2021 and under supervision of Stantec, Horizon advanced 43 soil borings in the southeast-adjoining Phase 1 River Point Development Area. During this time, Horizon additionally installed 15 permanent groundwater monitoring wells. This investigation included sampling soils on the Property for VOCs, PAHs, RCRA metals, and/or PCBs. Existing and newly installed temporary and permanent groundwater monitoring wells were sampled for VOCs, PAHs, dissolved RCRA metals, PCBs and/or PFAS. Sample locations and identified impacts are illustrated on Figure 8 and Figure 9.

Soil. Consistent with previous investigations, concentrations of PCBs exceeded direct contact standards in fill materials encountered in the former junk yard/metal scrap yard on the southeast-adjoining parcels; native soils were sampled in these locations beneath the fill and did not exceed direct contact standards. Similar to previous investigations, select VOCs, PAHs and heavy metals were detected in soil at concentrations greater than applicable NR 720 RCLs and/or BTVs across the Phase 1 area, and were associated with the granular anthropogenic fill across the River Point District.

Groundwater. Select VOC, PAH and heavy metal constituents were detected at concentrations greater than their respective ch. NR 140 WAC PALs and ESs on the southeast-adjoining parcels. PFAS was detected in groundwater at concentrations greater than the proposed individual and combined PFAS PALs and/or ESs; this was also the case for the greater River Point District property.

4.0 SUMMARY OF BRRTS CASES AT THE PROPERTY

03-36-001962 HOLMES OIL CORP (Closed LUST)

This LUST case was opened in 1994 at 1110 Buffalo Street (northeast portion of the Property) when petroleum contamination to soil and groundwater was identified in association with former bulk petroleum storage by "Holmes Oil Corp", listing "Wisconsin Central LTD" as the responsible party. Approximately 510 tons of petroleum-impacted soil was remedially excavated from three locations, and groundwater was monitored for four quarters post-excavation. The case was closed in 2005 with residual petroleum impacts to soil above NR 720 RCLs and for residual concentrations of petroleum constituents in groundwater greater the ES. The extent of residual soil and groundwater impacts documented as part of this BRRTS case in relation to the Property are illustrated on Figure 5a and Figure 5b.

02-36-585491 RIVERPOINT DISTRICT (Open ERP)
This Environmental Repair Program (ERP) case was opened in 2020 after the completed Stantec (2020a) Phase II ESA from 2018 through 2019 was received by WDNR documenting contamination from several COCs at the larger River Point District property, including VOCs, PAHs, heavy metals and PFAS. The scope of this Site Investigation Workplan is intended to position this open ERP case towards closure for the Property (Phase 2 of the River Point District development). Past and future phases of work for the River Point District (i.e., Phase 1, Phase 3) are being investigated separately.

07-36-583000 RAILROAD PROPERTY (FORMER) (LGU/General Property)
This General Property listing documents that as of March 18, 2019, the CDA was granted state LGU environmental liability exemption for the River Point District after acquiring the River Point District for the purpose of blight elimination.

02-36-176478 W C L - TURNTABLE FORMER ROUNDHOUSE (Closed ERP)
The boundaries of this ERP case are *south* of the target Property, but this case is included in Section 4.0 of this SIWP due to the proximity of this case to Property parcels 173070, 173080, 173150, and 173000 (refer to Figure 2). This ERP case was opened in 1997 at the southwest corner of 11th Street and Buffalo Street (south-adjoining parcels to the Property) when WDNR was notified of contamination in association with operations of a former railroad turntable and roundhouse, listing "Soo Line Railroad" and "Canadian National Railway" as the responsible parties. Contamination from VOCs (chlorinated and petroleum) and PAHs to soil and/or groundwater were identified and delineated in subsequent investigations, and the case was closed in 2007 with continuing obligations to maintain a cap over the former roundhouse area ("Area B-1").

5.0 PHYSIOGRAPHICAL AND GEOLOGICAL SETTING

5.1 PROPERTY TOPOGRAPHY AND SURFACE WATER FLOW

The surface elevation at the Property ranges from approximately 594 to 588 feet above mean sea level (ft amsl), and ground surface decreases radially in an overall southwestern direction towards the Manitowoc River. Based on the topography, stormwater/surface water at the Property infiltrates the ground surface or is conveyed through a storm sewer to the Manitowoc River. The River Point District is bound to the north, west, and south by the Manitowoc River, which flows in an overall easterly direction towards Lake Michigan.

5.2 REGIONAL AND PROPERTY GEOLOGY

The Property is located in the area covered by the Laurentide Ice Sheet during the Wisconsin Glaciation (WGNHS, 2011) and is underlain by Silurian age bedrock of the Niagaran series. As described previously by others, surface soils consist of anthropogenic fill/reworked native soils, underlain by native sands and clays at depth.

5.3 REGIONAL AND PROPERTY HYDROGEOLOGY

Shallow groundwater is present in upper fill materials. The groundwater depth generally mirrors the ground surface elevation, with the elevation in groundwater decreasing from approximately 585.5 ft amsl on the east/northeast portion of the River Point District downward to approximately 582 ft amsl at the Manitowoc River. However, the elevation of the Manitowoc River likely influences the hydraulic head and potentiometric gradient of shallow groundwater. City Records do not suggest the current or historic presence of groundwater supply wells on or near the Property. Pathways for potential contaminant migration include via shallow groundwater in unconsolidated fill present across the Property, or by manmade disturbances (ex. utility lines).

6.0 SITE INVESTIGATION SCOPING

As required by Section NR 716.07 WAC, the following items were evaluated to ensure that the scope and detail of the field investigation were appropriate to the complexity of the Property:

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

   Refer to Section 2.3.

2. ***Knowledge of the type of contamination and the amount of the contamination.***

   Refer to Section 3.0.

3. ***History of previous hazardous substance discharges or environmental pollution.***

   Refer to Section 4.0.

4. ***Environmental media affected or potentially affected by the contamination.***

   Soil and groundwater are impacted at the Property; vapor has potential to be impacted at the Property.

5. ***Location of the Site or facility, and its proximity to other sources of contamination.***

   According to the WDNR GIS Registry, the following BRRTS cases were identified near the Property (in addition to the cases listed for the Property in Section 4.0):

   ERP Cases:
   - 02-36-588366 RIVER NORTH: Open, ~375 feet southeast
   - 02-36-000219 WPSC MANITOWOC MGP (ALT SF): Open, ~450 feet north
   - 02-36-576809 MANITOWOC PLUMBING SUPPLY (FORMER): Open, ~550 feet southeast
   - 02-36-577692 KERRY INC: Closed, ~375 feet south
   - 02-36-576709 RED ARROW PRODUCTS CO (FORMER): Closed, ~400 feet south

   LUST Cases:
   - 03-36-001210 JAEGER BAKERY: Closed, ~150 feet northeast
   - 03-36-001255 COLOR CRAFT GRAPHIC ARTS INC: Closed, ~500 feet northeast
   - 03-36-000165 BADGER CYCLE (VERN WICKMAN): Closed, ~550 feet southeast

6. ***Need for permission from property owners to allow access to the Site or facility and to adjacent or nearby properties.***

   All Property parcels are owned by the CDA. No offsite sampling is planned at this time. However, if offsite sampling is necessary, the appropriate access agreements will be obtained.

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

   There are no known impacts to public or private water supplies, buildings, or utilities. Residents of the City of Manitowoc receive potable water from Lake Michigan. There are no known public or private wells located within 1,200 feet of the Property (WDNR, 2022b).

8. ***Potential for impacts to any of the following: species, habitat or ecosystems sensitive to the contamination; wetlands; outstanding or exceptional resource waters; and sites or facilities of historical or archaeological significance.***

   The proposed investigative activities will be performed on the Property in a former heavy industrial area. There are no known potential impacts to threatened or endangered species; species, habitats or ecosystems sensitive to the contamination; outstanding or exceptional resource waters; or sites or facilities of historical or archaeological significance.

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

   No potential interim actions were determined to be necessary at the Property and it has not yet been determined what remedial actions will be necessary at the Property.

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

    No immediate or interim actions have been taken or are in progress at the Property. However, in 2018 and 2019, soil borings and temporary/permanent monitoring wells were installed by Stantec across the Property to evaluate soil and groundwater quality for the greater River Point District project area (Stantec, 2020a). Laboratory analysis of these samples identified non/petroleum contamination was present in soil and/or groundwater above regulatory standards. The WDNR was notified and an ERP case (BRRTS activity number 02-36-585491) was opened for the River Point District in March 2020.

    In March 2020, AECOM (2020) installed and sampled several permanent monitoring wells in the north and east portions of the River Point District as part of a groundwater assessment for the peninsula. Select VOC and PAH constituents were present at concentrations greater than the PAL and/or ES in three permanent wells sampled on the Property in March 2020 (MW-24, MW-28 and MW-35), in areas of former underground tank storage (Figure 4b). Arsenic was also detected at concentrations greater than the PAL in several wells sampled across the Property.

    In August and September 2020, Stantec (2020b, 2020c) facilitated the removal of structural impediments present at the Property and advanced several test pits, soil borings and temporary wells to assess soil/groundwater quality in these previously impeded areas. Fill materials and soil contaminants/concentrations encountered were consistent with previous investigations, with the exception of fill material with Prussian blue coloration consistent with ferrocyanide salts in oxide box waste encountered in the north-central portion of the Property in sample locations SB-21 and SB-27 approximately 2.5 feet below ground surface. A separate investigation was subsequently performed in June 2021 to delineate the extent of fill materials consistent with apparent oxide box waste (Figure 10). Groundwater contaminants/concentrations encountered were also consistent previous investigations, with the exception of total cyanide detections in in eight of the 10 temporary groundwater monitoring wells installed/sampled on the Property in September 2020.

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

    No other items were identified that may potentially impact the scope of this investigation.

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

    In April 2021 Stantec measured the hydraulic conductivity of the shallow unconfined aquifer of the southeast-adjoining Phase 1 Construction Area in by measuring the rate of water-level recovery in 10 wells installed at the Property in response to instantaneous water withdrawal and determined that the hydraulic conductivity ranged from 4.3×10^{-4} to 7.7×10^{-4} centimeters per second (cms) in this area, with an average of 5.2×10^{-4} cms (Stantec, 2021b). Similar values are anticipated at the Property.

7.0 SITE INVESTIGATION OVERVIEW

7.1 PROBLEM STATEMENT

Several investigations have been performed to date identifying contaminant impacts to soil and groundwater quality at the Property but not yet fully investigated or assessed. The goal of the investigative work is to define and delineate the extents of soil and groundwater contaminants identified as part of the previous investigations performed at the Property listed in Section 3.0 to facilitate non-industrial redevelopment per ch. NR 716 WAC requirements. Investigative work will include evaluation of soil and groundwater using permanent wells to further define/confirm the extents of contamination.

7.2 CONCEPTUAL SITE MODEL

The “Triad approach” for characterization and remediation of contaminated sites was developed by the Environmental Protection Agency and others with a goal of increasing confidence that project decisions about contaminant presence or absence, location, fate, exposure, and risk reduction choices, are made correctly and cost effectively. The foundation for site-related decisions that are both correct and optimized (from a cost-benefit standpoint) is the “Conceptual Site Model” (CSM) (Crumbling, 2004). CSM uses all available historical and current information to estimate:

- where contamination is (or might be) located;
- how much is (or might be) there;
- how variable concentrations may be and how much spatial patterning may be present;
- what is happening to contaminants as far as fate and migration;
- who might be exposed to contaminants or harmful degradation products; and,
- what might be done to manage risk by mitigating exposure.

Historic features of potential environmental concern are illustrated on Figures 4a and 4b. Identified impacts to soil and groundwater are illustrated on Figures 5 through 10. The following attributes are relevant to the Property and to defining the nature and extent of impacts.

River Point District/Property Wide Considerations

- As described in the Stantec (2019a) Phase I ESA, the Property appears undeveloped in 1835; however, the proximity of the peninsula to the Lake Michigan/Great Lakes shipping route facilitated initial large scale industrial transloading development by 1868. By 1883, the River Point District was fully developed and occupied by several large industrial-like buildings and smaller commercial-like buildings (Figure 4a). The River Point District was transferred from the Manitowoc Terminal Company to the Manitowoc and Western Railroad Company on July 22, 1895, which is consistent with railroad development in the late 19th Century. Railroad use of the Property ceased in the 1980s and the Property was decommissioned in the 2000s. The CDA acquired the Property in 2019 for the purpose of blight elimination and subsequently received a LGU Environmental Liability Exemption from WDNR (BRRTS # 07-36-583000).

- The Stantec (2020a) Phase II ESA completed for the River Point District property in late 2018 and early 2019 identified select VOCs, PAHs, and heavy metals in soil at concentrations greater than applicable NR 720 RCLs and/or BTVs across the Property. Ubiquitous PAH and metals soil impacts were largely attributable to the granular anthropogenic fill across the Property, which is present in thicknesses of up to eight feet in some portions of the River Point District property (Figure 7). Previously documented soil impacts associated with prior bulk petroleum storage by previous tenants were also confirmed (Figure 8). In groundwater, select VOC, PAH and dissolved metals constituents were detected at concentrations greater than their respective ch. NR 140 WAC PALs and/or ESs. Impacts to groundwater in former bulk petroleum storage areas are consistent with previous investigations (Figure 9). PFAS was detected in groundwater at concentrations greater than the proposed individual and combined constituent PALs and/or ESs at various sample locations and events (Stantec 2020a, 2021b) across the River Point District property.

Southeast Portion of Property, Former Grain Elevator

- A grain elevator was constructed on the southeast portion of the Property (PIN 173080) between 1894 and 1900 ("17" on Figure 4b), with expansion onto the north-adjoining parcel (PIN 173150) between 1900 and 1919 by "Northern Grain Co". As noted in Stantec (2021a), the grain elevator fell into disrepair in the late 20th Century and was ultimately demolished in 2001. Rail operations remained at the Property until the early 2000s when the remaining steel rails were removed.

- Sample location SB-37/TW-37 was performed in the area of the former grain elevator in 2018 (Figure 6). Near-surface soil was found to have no VOC detections; no deeper samples were collected at this location. Groundwater had dissolved arsenic present at a concentration greater than the PAL; no VOC or PAH constituents were detected. To date, cyanide and PFAS have not been sampled for at SB-37/TW-37. Temporary well TW-37 was damaged and subsequently abandoned in 2021.

Northeast Portion of Property, Former Bulk Petroleum Storage

- Large portions of the Property were leased to a variety of bulk fuel storage companies operating under a variety of names during the early/mid-20th Century. Bulk petroleum storage began between 1912 and 1919 when the Standard Oil Company installed four steel tanks, a 20,000-gallon iron oil tank, and a partially inground 20,000-gallon iron oil tank along a railroad spur present in the northwest portion of the Property; locations of known historic features associated with bulk fuel storage by tenants are illustrated on Figure 4b. Bulk petroleum storage was consolidated by the Wingfield Oil Company (later renamed Holmes Oil Company) who continued to operate through the late 1990s. The Holmes Oil Corporation appears to have vacated the Property concurrent with removal of the final storage tanks by 1997. The large oil house depicted in the southeast portion of the Property on Figure 4b was demolished in the later portion of the 20th Century.

- A closed LUST case (BRRTS # 03-36-001962) is documented for the northeast portion of the Property for petroleum contamination to soil and groundwater in association with former bulk petroleum storage by "Holmes Oil Corp". Approximately 510 tons of petroleum-impacted soil was remedially excavated, and the case was closed with residual petroleum impacts to soil above NR 720 RCLs and for residual concentrations of petroleum constituents in groundwater greater the ES. The extent of residual soil and groundwater impacts documented as part of this BRRTS case in relation to the Property are illustrated on Figures 5a and 5b. Permanent wells associated with this case were abandoned concurrent with case closure.

- The Stantec (2020a) Phase II ESA completed for the River Point District property in late 2018 and early 2019 identified heavy metal and petroleum impacts to soil and groundwater the Property, as well as tetrachloroethene in groundwater at a concentration greater than the PAL. Nine permanent wells were subsequently installed by Stantec and AECOM (2020) to confirm previous detections in groundwater on the Property with NR-141 compliant monitoring wells. Select PAH constituents were detected at concentrations greater than the ES in Property monitoring well MW-28, and VOC constituent tetrachloroethene was present at concentrations greater than the PAL in monitoring wells MW-24 and MW-35 in the most recent (2020) sampling event; these wells were located in areas of former underground tank storage (Figure 4b). Arsenic was also detected at concentrations greater than the PAL in several wells sampled across the Property.

- Between August 14th and 17th, 2020, Veit demolished the majority of the foundation features present in this area of the River Point District, including the large oil house slab in the southeast portion of the Property (Stantec 2020b) to facilitate soil and groundwater sampling in this area that could not previously be assessed. While performing test pits to search for evidence of former underground storage tanks in the central portion of the Property, fill material with Prussian blue coloration consistent with ferrocyanide salts in oxide box waste was encountered approximately 2.5 feet below ground surface. Shallow groundwater was encountered approximately three feet below ground surface in this pit and had the same blue color.

- On September 9, 2020, the Stantec (2020c) Phase II ESA advanced 10 soil borings/temporary wells in areas of former structural impediments on the Property. Soil and groundwater were sampled for VOCs, SVOCs, heavy metals, and/or total cyanide. Soils encountered beneath the former structural impediments on the Property in August 2020 were generally brown fill sand beneath the former slabs, black granular fill present near the natural ground surface, and native sands and clays at depth. Fill materials and soil contaminants/concentrations encountered as a part of this Phase II ESA are consistent with previous investigations performed for the River Point District, with the exception of fill material with Prussian blue coloration consistent with ferrocyanide salts in oxide box waste encountered in sample locations SB-21 and SB-27 (Figure 6), approximately 2.5 feet below ground surface. A separate investigation was subsequently performed by Stantec in June 2021 to delineate the extent of fill materials consistent with apparent oxide box waste. The results of this investigation are illustrated on Figure 10. In groundwater, contaminants/concentrations encountered as a part of the Stantec (2020c) Phase II ESA are consistent with previous investigations performed for the River Point District, with the exception of total cyanide detections in eight of the 10 temporary wells sampled in September 2020.

- Several permanent groundwater monitoring wells and temporary groundwater monitoring wells remain onsite; to date, none of these wells have been sampled for cyanide.

West Portion of Property, Former Railroad Use

- As adapted from historic Sanborn® Fire Insurance Maps drawn in the late 19th Century, the west portion of the Property was once part of the Manitowoc River (Figure 4a). Placement of fill in the late 19th Century on the Property and nearby areas altered the bank of the Manitowoc River to its current location prior to acquisition of the River Point District by the Western Railroad Company on July 22, 1895. The majority of the Property was developed for railroad use by 1895 and included multiple spur lines and a rectangular warehouse (“35” on Figure 4b). The Property remained in railroad use through most of the 20th Century (Stantec, 2019a).

- Sample locations performed on the west portion of the Property as part of the Stantec (2020a) Phase II ESA (SB-38/TW-38 through SB-44/MW-44) identified select PAHs and heavy metals in soil at concentrations greater than applicable NR 720 RCLs and/or BTVs, largely attributable to the granular anthropogenic fill across the Property (Figure 7 and Figure 8). No VOC or PCB constituents were detected in soil samples taken in this portion of the Property. In groundwater, dissolved metals and PAHs were detected in the west portion of the Property at concentrations greater than the PAL and/or ES. No VOC constituents were present in groundwater from wells sampled in this portion of the Property. PFAS was sampled in temporary well TW-38 and found to be present at a concentration exceeding the proposed individual and combined constituent ESs (Figure 9).

- Permanent well MW-44 and temporary wells TW-38, TW-40 and TW-42 remain onsite; to date, none of these wells have been sampled for cyanide.

South-Adjoining Parcels, Former Turntable & Roundhouse (Downgradient)

- The south-adjoining parcels to the Property (Area B-1) were developed for railroad use by 1895 and included a cinder pit, railroad roundhouse, turntable and coal shed (“4” through “7” on Figure 4b, respectively) and multiple spurs/tracks. A closed ERP case (BRRTS # 02-36-176478) is documented for Area B-1, the “WCL Turntable Former Roundhouse”. Closure documentation associated with case indicates there are residual impacts attributed to historical use as a roundhouse and turntable to soil from PAHs and petroleum VOCs (benzene), and residual impacts to groundwater from chlorinated solvents (cis-1,2-dichloroethylene, trichloroethylene, and vinyl chloride). A portion of Area B-1 is subject to a cap maintenance plan.

The extents of soil and groundwater impacts associated with the COCs discussed in the CSM for the Property (Stantec 2020a, 2020b, 2020c, 2021b; AECOM 2020) are illustrated on Figures 5 through 10. Potential COCs include VOCs, PAHs/SVOCs, RCRA metals, PCBs, cyanide, and PFAS.

8.0 PROPOSED SOIL ASSESSMENT

8.1 GENERAL

Proposed soil sampling locations and analyses are based on the environmental concerns and CSM detailed in Section 7.0. Diggers Hotline will be contacted to locate and mark the locations of registered utilities in the project area. A site-specific Health and Safety Plan (HASP) to be utilized by Stantec personnel during the assessment activities, is presented in Appendix A.

8.2 OBJECTIVES

Stantec will conduct soil sampling activities to further characterize the subsurface materials at the Property to facilitate future non-industrial redevelopment. This investigation will evaluate appropriate future actions, if any, to obtain closure from the WDNR per ch. NR 700 WAC. Standard Operating Procedures (SOPs) for tasks associated with this work plan are presented in the Quality Assurance Project Plan (QAPP; Stantec, 2015) and associated addenda (Stantec, 2016a, 2016b, 2016c, 2018a, 2018b, 2018c, 2019b, and 2019c).

Soil quality data will be compared to ch. NR 720 WAC soil standards for the direct contact pathway at industrial and non-industrial properties and to soil standards for the soil to groundwater exposure pathway.

8.3 SOIL BORING AND SUBSURFACE ASSESSMENT

As illustrated on Figure 11, the proposed soil assessment includes advancing up to 78 soil borings using direct-push dual-tube Geoprobe® drilling methods. Soil samples will be collected continuously from each borehole, and each borehole will extend downward to between five and 15 feet below ground surface (ft bgs), or until apparent native soils are encountered to evaluate the thickness of fill (where present) at each boring location. Actual locations may be adjusted based on accessibility and/or locations of underground utilities. Per section NR 141.25 WAC requirements, all borings will be decommissioned by filling with bentonite when the drilling and sampling are complete, and the surface repaired to match surrounding. Given the upland locations and minimal ground disturbance associated with the proposed soil borings, no control of erosion or structural repairs are anticipated.

The horizontal location and elevation of the ground surface at each soil boring will be surveyed by a registered professional land surveyor.

Soil sampling and field classification will be conducted according to SOP No. 02 (Stantec, 2015). Sample collection and laboratory analytical methods for soil samples, as well as the rationale for selecting sample locations and criteria to be used for selection of analyses, are presented in Table 1.

Soil samples will be collected continuously with four to five-foot samplers. Soil samples will be visually and physically examined by a Stantec field geologist, and observations made of the general soil type (percentages of gravel, sand, silt, and clay), any visible layering, evidence of non-native fill materials (with estimated percentages of these materials contained in the soil matrix), indications of chemical or other staining, odors, and any other distinctive features as described in SOP No. 02 (Stantec, 2015). In addition, pertinent observations noted during installation of the soil borings will be documented on the soil boring logs.

Soil samples will be field screened for the presence of VOCs using a PID as described in SOP No. 01 (Stantec, 2015). The PID will be calibrated daily in the field in accordance with the manufacturer's specifications per SOP No. 09 (Stantec, 2015).

Proposed soil samples are summarized on Table 1 and are targeted to confirm the magnitude of previous detections and delineate the horizontal and vertical extents of impacts to soil. Similar to work completed in the Phase 1 Construction Area, soil samples may be taken from native soil beneath the apparent shallow groundwater table to confirm upper granular fill materials have not leached metals and/or PAHs into lower native soils.

Soil samples will be collected and preserved in accordance with SOP No. 02 and Table 3 of the QAPP. All VOC (SW846 Method 8260B), PCB (SW846 Method 8082A), PAH/SVOC (SW846 Method 8270D), total and amenable cyanide (SW846 Method 9012B) and RCRA metal (SW846 Method 6010) samples will be placed in

laboratory-supplied containers (per SOP No. 02), preserved as appropriate, stored on ice, and submitted under chain-of-custody procedures to TestAmerica (Chicago, Illinois), a State of Wisconsin-certified laboratory for analysis as described in the QAPP using protocols outlined in SOP No. 07.

Each soil sample will be assigned a sample identification number (SIN) based on the following format:

Sample Type	Label for Type of Sample	Location Number	Sample Interval (ft bgs)	SIN	Location ID
Soil boring	SB	1	(0-2)	SB-1 (0-2)	SB-1
Field Duplicate	FD	---	---	FD-1	---
Trip blank	TB	---	---	TB-1	---

Soil sampling equipment such as drilling tools will be decontaminated prior to arrival onsite and between each sampling location (SOP No. 08) to prevent sample cross-contamination. Soil cuttings generated during the subsurface investigation will be managed per SOP No. 10 (Stantec, 2015).

8.4 SPECIAL HANDLING CONSIDERATIONS AND QA/QC SAMPLES

Appropriate quality assurance and quality control procedures will be followed during investigative activities, including those specified in section NR 716.13 WAC, to ensure that accurate data will be collected. All soil samples will be collected and preserved in accordance with SOP No. 02 and Table 4 of the QAPP (Stantec, 2015). The laboratory will supply the appropriate containers with preservation chemicals as needed. Samples will be submitted to the laboratory as soon as possible after collection (i.e., daily).

Quality assurance/quality control (QA/QC) samples to be collected and analyzed will include trip blanks and field replicate/duplicate samples. Trip blanks prepared by the analytical laboratory will accompany the sample bottles from the time of shipment from the laboratory through the time the samples are returned for analysis. Trip blanks will be used to document any contamination detected in samples that may be attributable to shipping and field handling procedures or contaminated sample containers. Trip blanks will be provided by the laboratory and will be subject to the same handling and transportation procedures as the investigative samples.

De-identified field duplicate samples will be collected and analyzed to evaluate sample variability and overall data precision. Duplicate samples will be collected from soil borings and depth intervals representing the range of site conditions. Duplicate samples will be collected and analyzed for constituents at a rate of one sample for every 20 or fewer investigative samples.

Matrix spike/matrix spike duplicate samples will be collected and analyzed for constituents at a rate of one sample for every 20 or fewer investigative samples.

8.5 CHAIN-OF-CUSTODY

Chain-of-custody procedures will be utilized to track possession and handling of individual samples from the time of collection in the field through the time of delivery to the analytical laboratory. The chain-of-custody program will include use of sample labels, custody seals, field logbooks, chain-of-custody forms and laboratory logbooks. All chain-of-custody procedures will be performed in accordance with SOP No. 07 (Stantec, 2015).

8.6 FIELD LOGBOOK

An up-to-date field logbook will be maintained to document daily activities. The logbook will include a general list of tasks performed, additional data, or observations not listed on field data sheets and document communications with onsite personnel or visitors as these apply to the project.

9.0 GROUNDWATER ASSESSMENT

9.1 GENERAL

Proposed groundwater monitoring well sampling locations and analyses are based on the environmental concerns and CSM detailed in Section 7.0. A site-specific HASP, to be utilized by Stantec personnel during the assessment activities, is presented in Appendix A.

9.2 OBJECTIVES

Stantec will conduct groundwater sampling activities to characterize groundwater quality at the Property as necessary to facilitate proposed redevelopment. In addition, the sampling will determine appropriate future actions, if any, to obtain closure from the WDNR per the ch. NR 700 WAC. SOPs for tasks associated with this work plan are presented in the QAPP (Stantec, 2015) and associated addenda (Stantec, 2016a, 2016b, 2016c, 2018a, 2018b, 2018c, 2019b, and 2019c).

Groundwater quality data will be compared to ch. NR 140 WAC groundwater standards.

9.3 GROUNDWATER ASSESSMENT

As depicted on Table 2, the groundwater assessment will include sampling seven existing, temporary and permanent groundwater monitoring wells on the Property (MW-20, MW-24, MW-26, MW-28, MW-35, TW-36 and MW-72). In addition, as illustrated on Figure 11, 33 new permanent groundwater monitoring wells will be installed in conformance with NR 141 to confirm and delineate previously identified impacts. The depths for the new wells will depend on the actual depth at which groundwater is encountered at the Property but are anticipated to have a total depth of approximately 13 ft bgs. The wells will be constructed using two-inch diameter polyvinyl chloride casing with 10-foot long, 0.010-inch slotted screens.

The horizontal location, elevation of the ground surface, and top of casing for each newly installed temporary well and permanent well will be surveyed by a registered professional land surveyor.

Following installation and recovery, and prior to purging and collection of groundwater samples, the elevation of the groundwater table will be measured and the volume of water present within each well will be calculated using the procedures set forth in SOP No. 04 (Stantec, 2015). Groundwater elevation data will also be used to document the gradient in potentiometric surface.

The depth and thickness of floating (light) and/or sinking (dense) non-aqueous phase liquids, if present, will be measured using an interface probe. SOP No. 04 details the procedures that will be used to detect immiscible layers. The interface probe will be decontaminated in accordance with SOP No. 08 (Stantec, 2015).

Each well will be purged prior to sampling in accordance with SOP No. 04 (Stantec, 2015). If the geologic materials surrounding the well are low yielding, then the wells will be completely evacuated, and groundwater samples collected after the water level recovers sufficiently to provide the volume of water needed to fill sample containers for the desired analyses. The well may be purged using any of the following methods: a peristaltic pump, a low-flow Micro-Purge Sampling System (or equivalent), a Voss disposable polyethylene bailer (or equivalent), or a Waterra hand pump (or equivalent) or similar equipment. Non-disposable purging equipment will be decontaminated in accordance with SOP No. 08 (Stantec, 2015).

After purging, groundwater samples will be collected from all monitoring wells, as summarized on Table 2. All groundwater samples will be collected and preserved per SOP No. 04 (Stantec, 2015). PFAS samples will be collected and preserved per SOP No. 29. All VOC (SW846 Method 8260B), PCB (SW846 Method 8082A), PAH/SVOC (SW846 Method 8270D), free cyanide (SW846 Method 9012B) and dissolved/field-filtered RCRA metal (SW846 Method 6010) samples will be placed in laboratory-supplied containers (per SOP No. 04), preserved as appropriate, stored on ice, and submitted under chain-of-custody procedures to TestAmerica (Chicago, Illinois), a State of Wisconsin-certified laboratory for analysis as described in the QAPP using protocols outlined in SOP No. 07. Samples collected for PFAS (Non-EPA Method 537M) analysis will be placed

in laboratory-supplied HDPE sample jars without preservative, stored on ice, and sent under chain-of-custody procedures to Eurofins TestAmerica (Sacramento, CA).

Each groundwater sample will be assigned a SIN based on the following format:

Sample Type	Label for Type of Sample	Location Number	(SIN)	Location ID
Monitoring Well	MW	1	MW-1	MW-1
Temporary Well	TW	1	TW-1	TW-1
Field Duplicate	FD	---	FD-1	---
Equipment Blank	EB	---	EB-1	---
Trip Blank	TB	---	TB-1	---

Decontamination procedures for any non-dedicated or non-disposable equipment used for collection of groundwater samples will also be performed using the procedures set forth in SOP No. 08 (Stantec, 2015).

All equipment used in developing/purging wells and for collection of the PFAS samples will be PFAS-free and will be collected using the procedures set forth in SOP No. 29. Decontamination procedures for any non-dedicated or non-disposable equipment used for collection of groundwater samples will also be performed using the procedures set forth in SOP No. 08.

Purged groundwater generated during the investigation will be managed per SOP No. 10 (Stantec, 2015). When appropriate, the groundwater monitoring wells will be decommissioned in accordance with SOP No. 04 (Stantec, 2015) and sealed in accordance with ch. NR 141.25 WAC.

9.4 SPECIAL HANDLING CONSIDERATIONS AND QA/QC SAMPLES

Collection and preservation of groundwater samples for VOC analysis will be performed in accordance with SOP No. 04. Headspace should not be present in the sample container, thus minimizing the volatilization of organics from the sample. The laboratory will supply the pre-preserved 40-ml glass vials with Teflon™-lined lids. If multiple constituent samples are to be taken from the same well, PFAS samples will be collected first, and VOC samples will be collected last (SOP No. 29).

As summarized on Table 2, QA/QC samples to be collected and analyzed will include a trip blank, an equipment blank and a field duplicate sample.

Trip blanks prepared by the analytical laboratory will accompany the sample bottles from the time of shipment from the laboratory through the time the samples are returned for analysis. Trip blanks will be used to document any contamination detected in samples that may be attributable to shipping and field handling procedures, or contaminated sample containers. Trip blanks will be provided by the laboratory and will be subject to the same handling and transportation procedures as the investigative samples. At least one trip blank sample will accompany each shipping container that contains samples for VOC analysis.

An equipment blank will be collected at a rate of one per sampling event by pumping laboratory-supplied PFAS-free water into laboratory-supplied sample jars using the same collection methods and equipment used in collecting PFAS groundwater samples in accordance with SOP No. 29.

De-identified field duplicate samples will be collected and analyzed to evaluate sample variability and overall data precision. For groundwater samples, the duplicate samples will be “field replicate samples” collected at the same time from the same well. To the extent practicable, multiple bottles associated with a set of duplicate samples will be filled in two or three stages such that each bottle receives a portion of the water from each section of the bailer, or each interval of sample pump operation. In recognition that data for duplicate samples are most meaningful when there are detectable concentrations present of constituents of concern, if there are existing groundwater data, or other data by which to anticipate wells with greater levels of contamination, duplicate samples will be preferentially collected from wells where detectable concentrations of constituents of concern are most likely to be present. Otherwise, duplicate samples will be collected from a randomly selected well or wells. Duplicate samples will be collected and analyzed for constituents at a rate of one sample for every 20 or fewer investigative samples.

Matrix spike/matrix spike duplicate samples will be collected and analyzed for constituents at a rate of one sample for every 20 or fewer investigative samples.

9.5 CHAIN-OF-CUSTODY

Chain-of-custody procedures will be utilized to track possession and handling of individual samples from the time of collection in the field through the time of delivery to the analytical laboratory. The chain-of-custody program will include use of sample labels, custody seals, field logbooks, chain-of-custody forms, and laboratory logbooks. All chain-of-custody procedures will be performed in accordance with SOP No. 07 (Stantec, 2015).

9.6 FIELD LOGBOOK

An up-to-date field logbook will be maintained to document daily activities. The logbook will include a general list of tasks performed, additional data or observations not listed on field data sheets, and document communications with onsite personnel or visitors as these apply to the project.

10.0 SITE INVESTIGATION REPORT

Stantec will tabulate the data following completion of work proposed in Sections 8.0 and 9.0 of this Site Investigation Workplan to determine if identified impacts are fully delineated. Should additional sampling be warranted to complete the Site Investigation, additional soil and/or groundwater samples may be collected following methods outlined in Sections 8.0 and 9.0.

Once investigation activities are deemed complete and the COC extents are defined, Stantec will prepare a Site Investigation Report for the Property. The report will include sufficient text, tables, figures, field data, and laboratory reports to properly document the investigation activities.

11.0 SCHEDULE

Site Investigation scoping as required by Section NR 716.07 WAC has been completed as Section 6.0 of this Site Investigation Workplan. The soil and groundwater investigation activities outlined in Sections 8.0 and 9.0 are scheduled to be completed in March - May 2022. The laboratory results for soil samples should be available within two to three weeks of sampling. Stantec will review the laboratory results upon receipt and, if necessary, evaluate the need for additional sampling. Supplemental soil and/or groundwater sampling, if required, will be completed in May with the goal of submitting the Site Investigation Report to WDNR for review by June 2022.

12.0 CERTIFICATION STATEMENT

"I, Stuart Gross, 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, Wisconsin Administrative Code."

_____ February 17, 2022

Stuart Gross, PG No. 1201 Date

13.0 REFERENCES

AECOM, 2020, Former CN Property Limited Site Investigation, 200 North 10th Street & 1110 Buffalo Street, Manitowoc, WI, May 8, 2020.

Crumbling, 2004, The Triad Approach: A Catalyst for Maturing Remediation Practice, December 21, 2004.

Stantec, 2015, Quality Assurance Project Plan (Revision 0), Implementation of U.S. EPA Assessment Grants for Petroleum and Hazardous Substance Brownfields, City of Manitowoc, WI, U.S. EPA Cooperative Agreement Nos. BF- BF-00E01529-0, August 19, 2015.

Stantec, 2016a, Quality Assurance Project Plan Addendum 1, June 3, 2016.

Stantec, 2016b, Quality Assurance Project Plan Update and Addendum 2, August 15, 2016.

Stantec, 2016c, Quality Assurance Project Plan Update, October 18, 2016.

Stantec, 2018a, Quality Assurance Project Plan Update and Addendum 3, June 17, 2018.

Stantec, 2018b, QAPP 2018 Update - Current WDNR Laboratory Certificates, September 11, 2018.

Stantec, 2018c, Quality Assurance Project Plan Addendum, November 18, 2018.

Stantec, 2019a, 10th Street Railroad Property, Manitowoc, Wisconsin, Phase I Environmental Site Assessment, March 21, 2019.

Stantec, 2019b, Quality Assurance Project Plan Addendum, January 1, 2019.

Stantec, 2019c, Quality Assurance Project Plan Addendum, January 7, 2019.

Stantec, 2020a, Phase II Environmental Site Assessment, Riverpoint District; Manitowoc, Wisconsin, March 23, 2020.

Stantec, 2020b, Construction Documentation Report for Demolition and Removal of Structural Impediments, River Point District – Site 3, December 11, 2020.

Stantec, 2020c, Phase II Environmental Site Assessment, River Point District; Manitowoc, Wisconsin, Site 3, December 18, 2020.

Stantec, 2021a, Fire Department Response During Explosive Demolition of a Former Grain Elevator, 1101 Buffalo Street, River Point District – Phase I Construction Area; Manitowoc, Wisconsin, September 7, 2021.

Stantec, 2021b, NR 716 Site Investigation Report, River Point District Phase 1 Construction Area; Manitowoc, Wisconsin, July 19, 2021.

WDNR, 2005, 20051017_56_CO_Packet, available on BRRTS for activity number 03-36-001962, accessed by Whitney Cull (Stantec), January 27, 2022.

WDNR, 2022a, Wisconsin Department of Natural Resources RR Sites Map, accessed by Whitney Cull (Stantec), January 25, 2022.

WDNR, 2022b, Wisconsin Department of Natural Resources Well Construction Information System, accessed by Whitney Cull (Stantec), January 25, 2022.

WGNHS, 2011, Wisconsin Geological and Natural History Survey, “Lexicon of Pleistocene Stratigraphic Units of Wisconsin, Technical Report 1”, 2011.

14.0 LIMITATIONS

This Site Investigation Workplan was developed in accordance with generally accepted practices for the environmental consulting profession, undertaking similar studies at the same time and in the same geographical area as the work conducted by Stantec. Stantec observed the degree of care and skill that are generally exercised by the profession under similar circumstances and conditions. No other warranty is expressed or implied.

Stantec's observations, findings, and opinions should not be considered as scientific certainties, but only as opinion based upon our professional judgment concerning the significance of the data gathered during the development of the Site Investigation Workplan. Specifically, Stantec cannot represent that the Property does not contain or potentially contain any hazardous or toxic materials or other latent conditions beyond that identified by Stantec during the development of the Site Investigation Workplan. Additionally, due to limitations of the Site Investigation Workplan development process and the necessary use of data furnished by others, Stantec and its subcontractors cannot assume liability if actual conditions differ from the information presented in this Site Investigation Workplan.

FIGURES

Figure No.
1

Title
Site Investigation Area
and Regional Topography

Client/Project
Phase II Project Area
River Point District
City of Manitowoc

0 300 600 Feet

193708490
Prepared by HLB on 1/27/2022

N

Legend

- Site Investigation Project Area
- River Point District

Notes
1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet

Stantec

Figure No.
2

Title
Site Investigation Project Area
and Property Identification Numbers

Client/Project
Phase II Project Area
River Point District
City of Manitowoc

0 60 120 Feet

193708490
Prepared by HLB on 1/24/2022

N

Legend

- River Point District
- Parcel Identification Numbers
- Site Investigation Project Area
- "Area B1" - Future VPLE Area
- Phase I Construction Area

Notes
1. Coordinate System: NAD 1983 HARN WISCRS Manitowoc County Feet
2. Orthophotograph: Manitowoc County, 2020

Stantec

Figure No.
3
Title
Proposed Reuse and Proposed Engineered Barriers/Caps

Client/Project
Site Investigation Project Area
River Point District
City of Manitowoc

0 62.5 125 Feet

Prepared by HLB on 4/15/2021

N

Legend

- Site Investigation Project Area
- River Point District

Conceptual Reuse Plan

- Commercial
- Multi-Family Residential
- Non-Indistrial (Unknown)
- Rights of Way (Landscaping)
- Rights of Way (Road and Sidewalk)
- Rights of Way (Riverwalk)

Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Orthophotograph: Manitowoc County, 2017

Stantec

Figure No.
4a

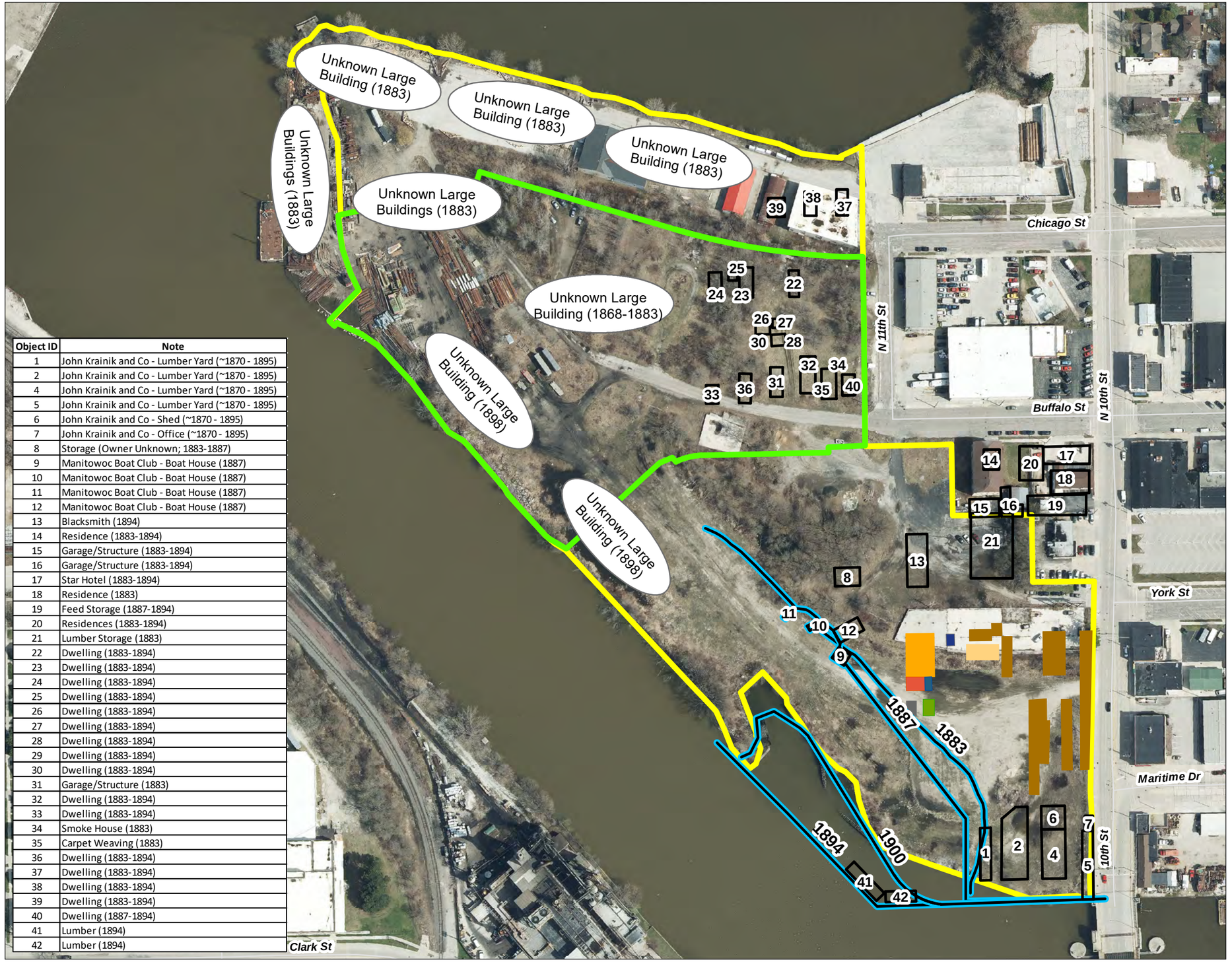
Title
19th Century Historic Site Features

Client/Project
Phase II Project Area
River Point District
City of Manitowoc

0 125 250 Feet

193708490
Prepared by HLB on 1/27/2022

N



Object ID	Note
1	John Krainik and Co - Lumber Yard (~1870 - 1895)
2	John Krainik and Co - Lumber Yard (~1870 - 1895)
4	John Krainik and Co - Lumber Yard (~1870 - 1895)
5	John Krainik and Co - Lumber Yard (~1870 - 1895)
6	John Krainik and Co - Shed (~1870 - 1895)
7	John Krainik and Co - Office (~1870 - 1895)
8	Storage (Owner Unknown; 1883-1887)
9	Manitowoc Boat Club - Boat House (1887)
10	Manitowoc Boat Club - Boat House (1887)
11	Manitowoc Boat Club - Boat House (1887)
12	Manitowoc Boat Club - Boat House (1887)
13	Blacksmith (1894)
14	Residence (1883-1894)
15	Garage/Structure (1883-1894)
16	Garage/Structure (1883-1894)
17	Star Hotel (1883-1894)
18	Residence (1883)
19	Feed Storage (1887-1894)
20	Residences (1883-1894)
21	Lumber Storage (1883)
22	Dwelling (1883-1894)
23	Dwelling (1883-1894)
24	Dwelling (1883-1894)
25	Dwelling (1883-1894)
26	Dwelling (1883-1894)
27	Dwelling (1883-1894)
28	Dwelling (1883-1894)
29	Dwelling (1883-1894)
30	Dwelling (1883-1894)
31	Garage/Structure (1883)
32	Dwelling (1883-1894)
33	Dwelling (1883-1894)
34	Smoke House (1883)
35	Carpet Weaving (1883)
36	Dwelling (1883-1894)
37	Dwelling (1883-1894)
38	Dwelling (1883-1894)
39	Dwelling (1883-1894)
40	Dwelling (1887-1894)
41	Lumber (1894)
42	Lumber (1894)

Legend

- Site Investigation Project
- Additional Site Features (see table)
- Bank of the Manitowoc River

Carl Zander Planing Mill and Factory (~1870s-1895)

- Drying House
- Engine Room
- Lumber
- Planing Mill
- Warehouse
- Shavings
- Shed
- Steam Boxes

- River Point District

Notes
1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Historic Site features illustrated on this figure were digitized from multiple historic maps/sources, including City Assessor files, WDNR files, and Sanborn (R) Fire Insurance Maps. These features are provided for illustration purposes only; Stantec makes no warranty as to the accuracy of these features.
3. Orthophotograph: Manitowoc County, 2020

Stantec

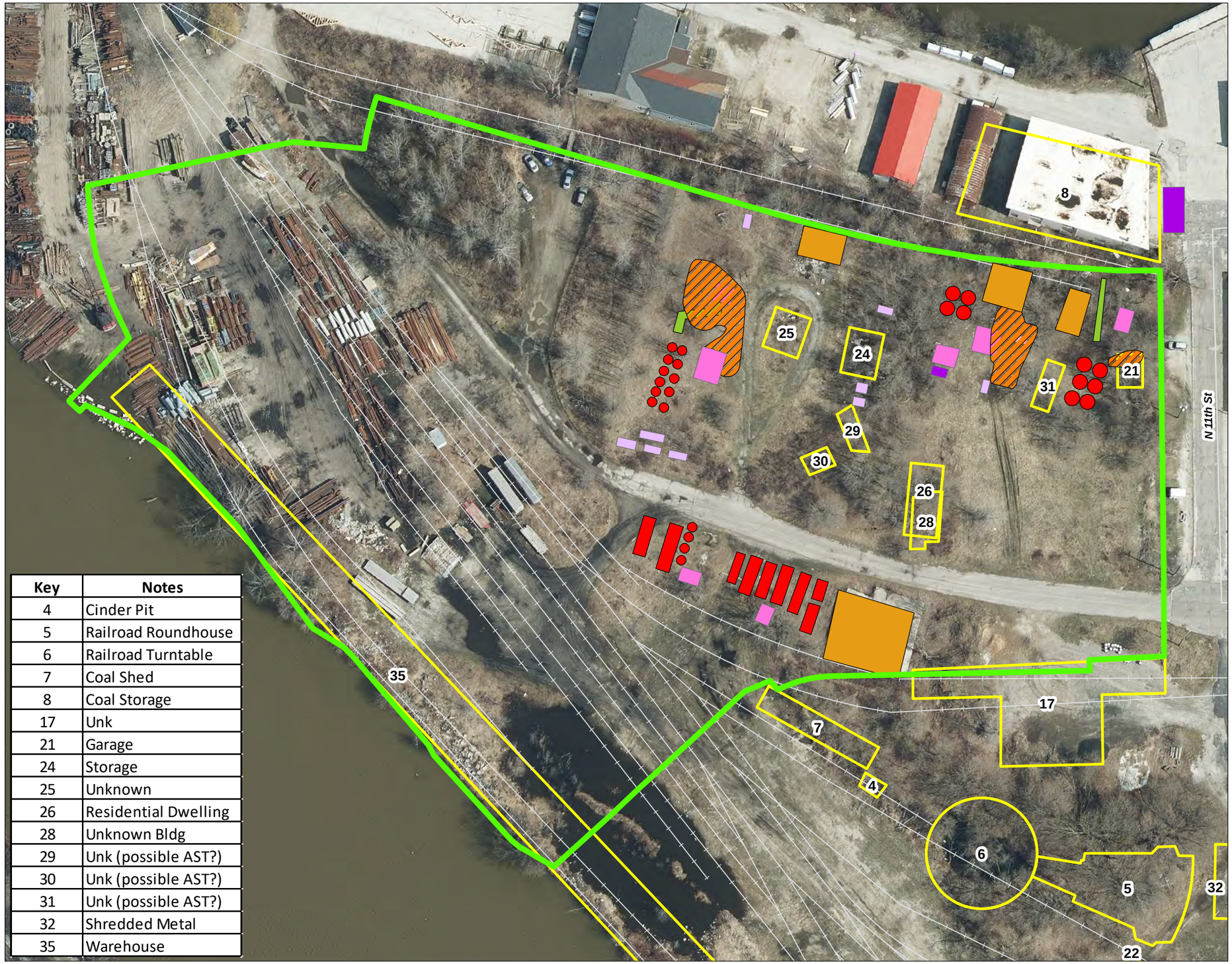
Figure No.
4b

Title
20th Century Historic Site Features

Client/Project
Phase II Project Area
River Point District
City of Manitowoc

0 62.5 125 Feet

193708490
Prepared by HLB on 1/27/2022



Key	Notes
4	Cinder Pit
5	Railroad Roundhouse
6	Railroad Turntable
7	Coal Shed
8	Coal Storage
17	Unk
21	Garage
24	Storage
25	Unknown
26	Residential Dwelling
28	Unknown Bldg
29	Unk (possible AST?)
30	Unk (possible AST?)
31	Unk (possible AST?)
32	Shredded Metal
35	Warehouse

Legend

- Site Investigation Project Area
- Historic Site Features (see table for details)
- Railroad Spurs

N

Prior Site Features (City Records)

- Oil House (4)
- Oil Tank (AST) (34)
- Pump House (5)
- UST (2)

Additional Site Features (WDNR Files)

- Former UST (10)
- Product Piping (2)
- Pump House (2)
- Soil Excavation (3)

Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Historic Site features illustrated on this figure were digitized from multiple historic maps/sources, including City Assessor files, WDNR files, and Sanborn (R) Fire Insurance Maps. These features are provided for illustration purposes only; Stantec makes no warranty as to the accuracy of these features.
3. Orthophotograph: Manitowoc County, 2020

Stantec

Figure 5a - Residual Soil Contamination, BRRTS #03-36-001962 Holmes Oil*

**Source: "Figure 3" of BRRTS Closure Documentation (WDNR, 2005).*

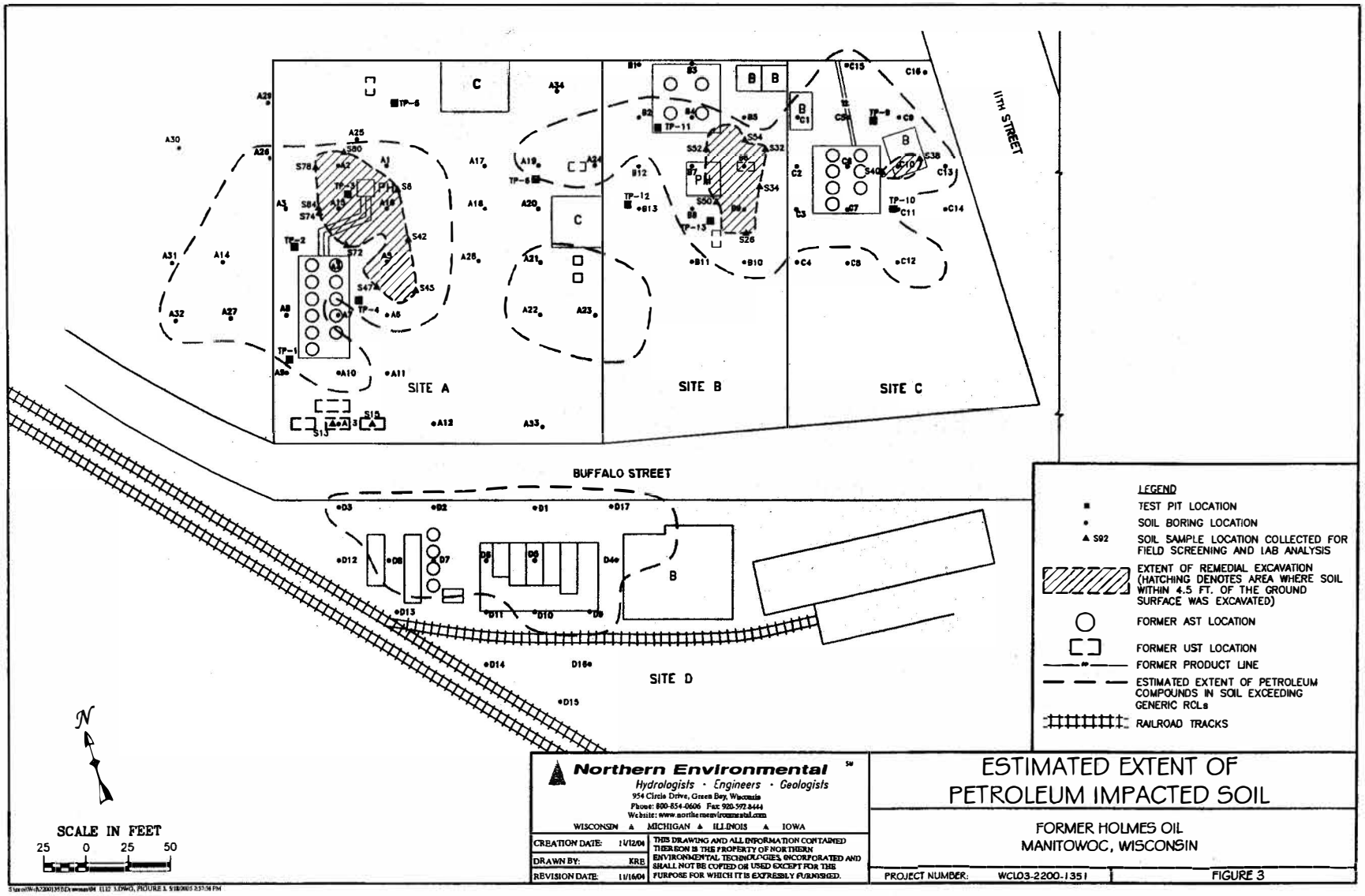
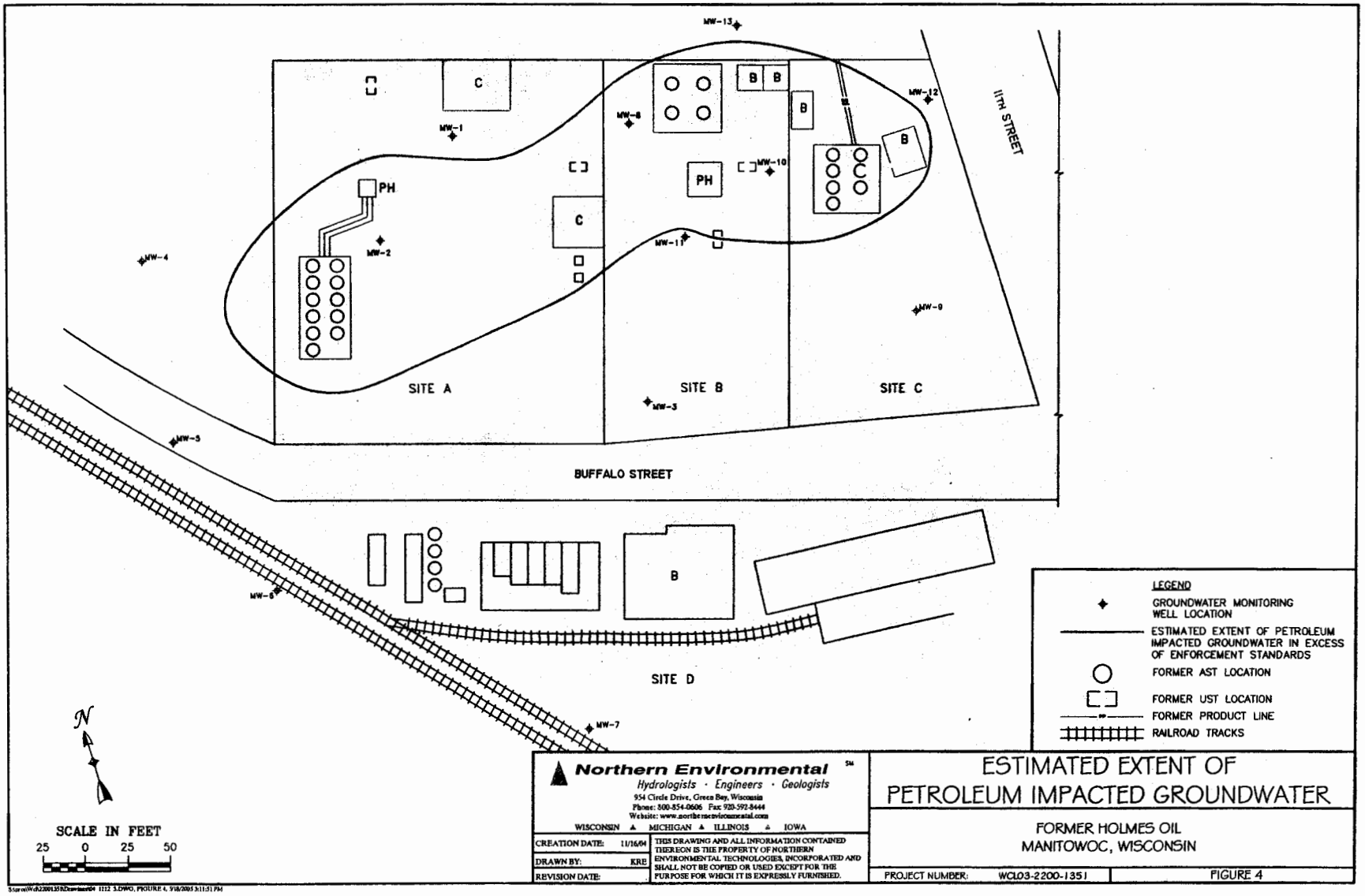


Figure 5b - Residual Groundwater Contamination, BRRTS #03-36-001962 Holmes Oil*

**Source: "Figure 4" of BRRTS Closure Documentation (WDNR, 2005).*



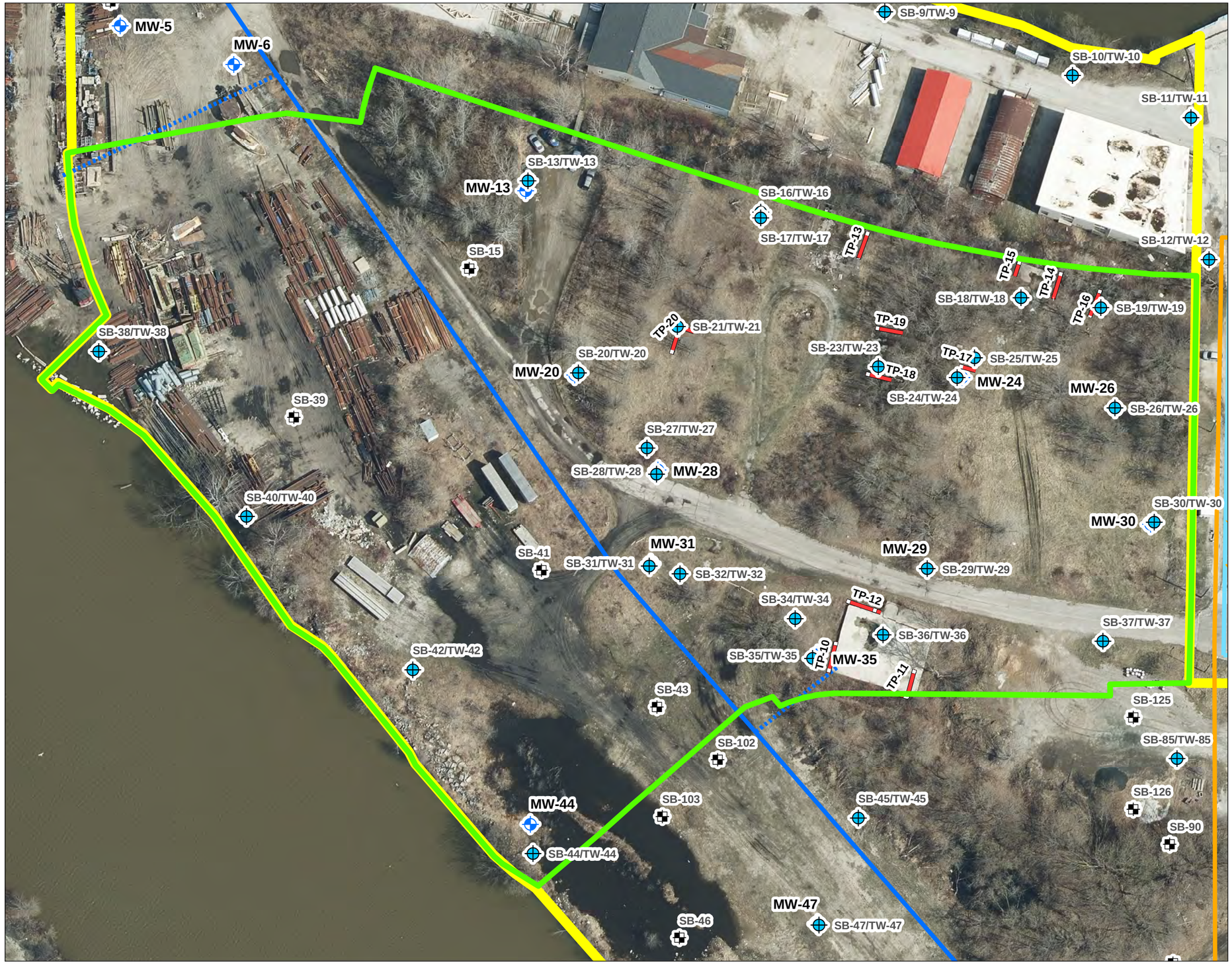


Figure No.
6

Title
Previous Sample Locations
and Site Utilities

Client/Project
Phase II Project Area
River Point District
City of Manitowoc

193708490
Prepared by HLB on 1/27/2022

0 50 100 Feet

N

Legend

- Site Investigation Project Area
- River Point District
- Potable Water Conveyance System
- Potable Water Lateral
- Sanitary Conveyance System
- Sanitary Lateral
- Stormwater Conveyance System

Prior Sample Locations

- Soil Boring
- Soil Boring/Temp Well
- Monitoring Wells
- Test Pits

Notes
1. Coordinate System: NAD 1983 HARN WISCRS Manitowoc County Feet
2. Orthophotograph: Manitowoc County, 2020

Stantec

Figure No.
7

Title
Extent and Thickness of Granular Fill Unit

Client/Project
Phase II Project Area
River Point District
City of Manitowoc

0 130 260 Feet

193708490
Prepared by HLB on 1/27/2022

N

Legend

- Site Investigation Project Area
- River Point District

Thickness of Granular Fill

(Feet)

- 7 - 8
- 6 - 7
- 5 - 6
- 4 - 5
- 3 - 4
- 2 - 3
- 1 - 2
- 0 - 1

Notes
1. Coordinate System: NAD 1983 HARN WISCRS Manitowoc County Feet
2. Orthophotograph: Manitowoc County, 2020

Stantec

Figure No.
8

Title

Soil Impacts in Addition to Sitewide Grandular Fill

Client/Project
Site Investigation Project Area
River Point District
City of Manitowoc

0 62.5 125 Feet

Prepared by HLB on 4/19/2021

Legend

- Site Investigation Project Area
- River Point District

Previous Sample Location

- Monitoring Well
- River Staff Guage
- Soil Boring
- Soil Boring / Temp Well

N

Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Historic Site features illustrated on this figure were digitized from multiple historic maps/sources, including City Assessor files, WDNR files, and Sanborn (R) Fire Insurance Maps. These features are provided for illustration purposes only; Stantec makes no warranty as to the accuracy of these features.
3. Orthophotograph: Manitowoc County, 2017

Stantec

Figure No.
9

Title
Extent of Groundwater Impacts

Client/Project
Site Investigation Project Area
River Point District
City of Manitowoc

0 62.5 125 Feet

Prepared by HLB on 1/28/2022

Legend

- Site Investigation Project Area
- Groundwater Elevation (ft amls)
- River Point District

Identified Groundwater Impacts

- Polycyclic Aromatic Hydrocarbons
- Chlorinated VOCs
- Petroleum VOCs

Previous Sample Locations

- Monitoring Well
- Soil Boring / Temp Well

N

Notes
1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Orthophotograph: Manitowoc County, 2020
3. VOC = volatile organic compounds; PFAS = per and polyflourinated alkyl substances

Stantec

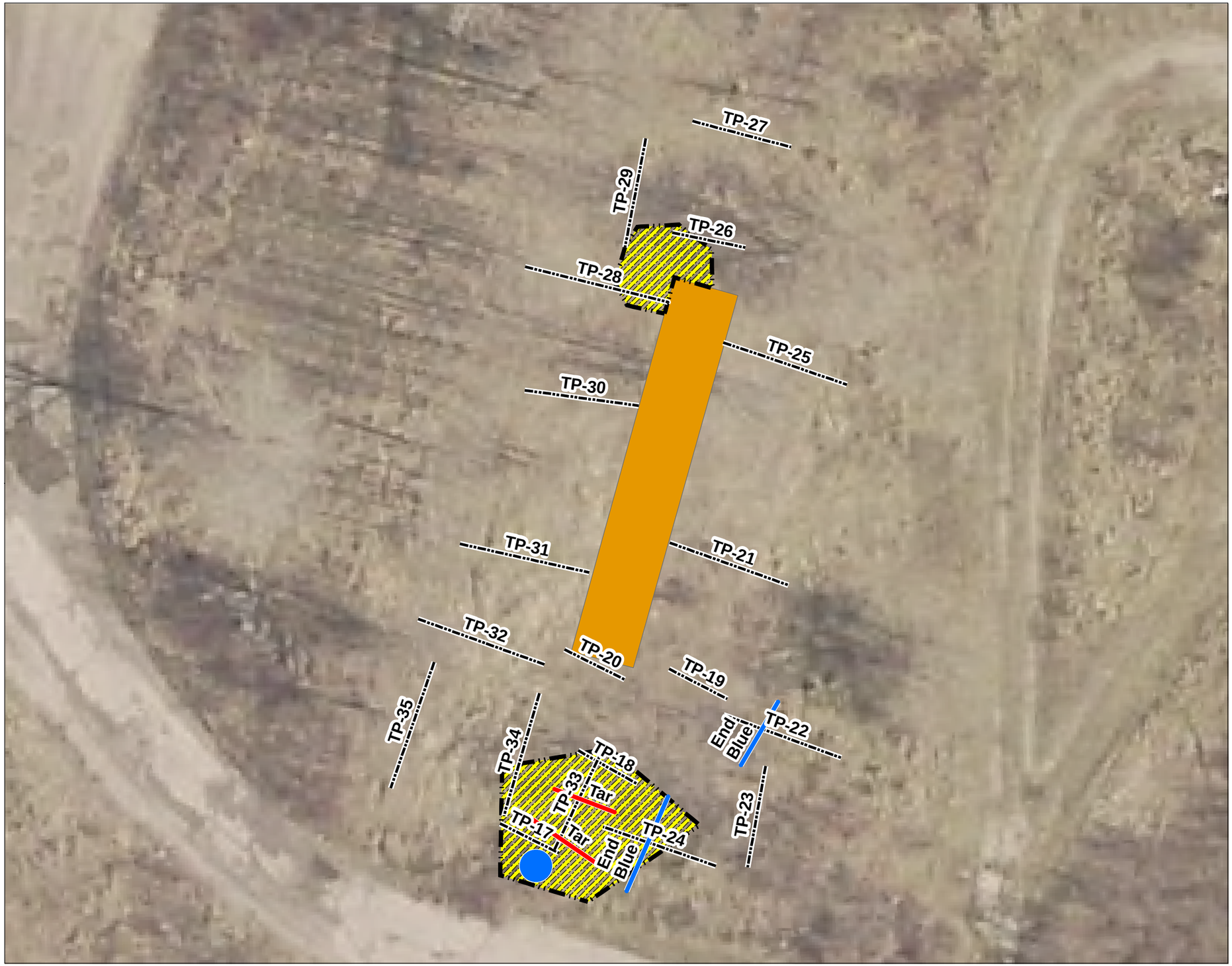


Figure No.
10

Title
Extent of Apparent Oxide Box Waste

Client/Project
River Point District Site 3
1110 Buffalo Street
City of Manitowoc

0 12.5 25 Feet

Prepared by HLB on 3/25/2020

N

Legend

Test Pit Notes
- End Blue
- Tar

Supplemental Test Pits
- Supplemental Test Pits

Remaining Features
- Concrete Slab
- Oxide Box Waste
- Water Valve

Notes
1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Historic Site features illustrated on this figure were digitized from multiple historic maps/sources, including City Assessor files, WDNR files, and Sanborn (R) Fire Insurance Maps. These features are provided for illustration purposes only; Stantec makes no warranty as to the accuracy of these features.
3. Orthophotograph: Manitowoc County, 2017

Stantec

Figure No.
11
Title
Proposed Soil Sample Locations and Conceptual Reuse Plan

Client/Project
Site Investigation Project Area
River Point District
City of Manitowoc

0 62.5 125 Feet

Prepared by HLB on 4/15/2021

Legend

Proposed Sample Locations

- Soil Boring/Monitoring Well (33)
- Soil Boring (45)
- Site Investigation Project

Conceptual Reuse Plan

- Commercial
- Multi-Family Residential
- Non-Indistrial (Unknown)
- Rights of Way (Landscaping)
- Rights of Way (Road and Sidewalk)
- Rights of Way (Riverwalk)

N

Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Orthophotograph: Manitowoc County, 2017

Stantec

TABLES

Table 1: Proposed Laboratory Analysis for Soil
River Point District, Phase 2, Manitowoc, Wisconsin
Site Investigation Workplan

Soil Boring ID	Nearby SB ID (if applicable)	Sample Depth (feet)	Estimated Boring Depth (feet)	Rationale	VOCs (8260B)	PAHs (8270D)	PCBs (8082A)	Cyanide (9012B)	Metals (6010)
SB-135/MW-135	-	(1) Fill; (1) Above GWT or Native	10	Sample soil southeast of MW-6 to evaluate soil quality along the northern Property boundary.	2	2	-	-	2
SB-136/MW-136	-	(1) Fill; (1) Above GWT or Native	10	Sample soil in the northwestern corner of the Property to evaluate soil quality in the area of proposed landscaping.	2	2	-	-	2
SB-137	-	(1) Fill; (1) Above GWT or Native	10	Sample soil in the northwestern portion of the Property to evaluate soil quality in the area of proposed landscaping.	2	2	-	-	2
SB-138	-	(1) Fill; (1) Above GWT or Native	10	Sample soil in the northwestern portion of the Property to evaulate soil quality in the proposed road right of way.	2	2	1	-	2
SB-139/MW-139	SB-38/MW-38	(1) 3-3.5 or 3.5-4 NATIVE	5	Sample soil adjacent to former sample location SB-38/MW-38 in the northwest portion of the Property to investigate deeper/native soil quality.	1	1	-	-	1
SB-140/MW-140	-	(1) 1-3 FILL; (1) Above GWT or Native	10	Sample soil east of former sample location SB-38/MW-38 to delineate metals/PAH impacts, and to evaluate soil quality in the area of proposed commercial development.	2	2	-	-	2
SB-141	-	(1) 1-3 FILL; (1) Above GWT or Native	10	Sample soil between former sample locations SB-38/MW-38 and SB-40/MW-40 to delineate metals/PAH impacts, and to evaluate soil quality in the northwest portion of the Property.	2	2	-	-	2
SB-142	-	(1) Fill; (1) Above GWT or Native	10	Sample soil in the west-central portion of the Property to evaulate soil quality in the proposed road right of way.	2	2	1	-	2
SB-143/MW-143	-	(1) Fill; (1) Above GWT or Native	10	Sample soil west of former sample location SB-20/MW-20 to investigate fill and deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	1 (above GWT)	2
SB-144/MW-144	SB-40/MW-40	(1) 3-3.5 or 3.5-4 Native	5	Sample soil adjacent to former sample location SB-40/TW-40 on the western portion of the Property to investigate deeper/native soil quality.	1	1	-	-	1
SB-145	-	(1) 1-3 FILL; (1) Above GWT or Native	10	Sample soil northeast of former sample location SB-40/TW-40 to delineate metals/PAH impacts, and to evaluate soil quality in the area of proposed commercial development.	2	2	-	-	2
SB-146	-	(1) 1-3 FILL; (1) Above GWT or Native	10	Sample soil between former sample locations SB-40/MW-40 and SB-42/MW-42 to delineate metals/PAH impacts, and to evaluate soil quality in the western portion of the Property.	2	2	-	-	2
SB-147/MW-147	-	(1) 1-3 FILL; (1) Above GWT or Native	10	Sample soil east of former sample location SB-40/TW-40 to delineate metals/PAH impacts, and to evaluate soil quality in the area of proposed commercial development.	2	2	-	-	2
SB-148	-	(1) 1.5 - 2.5 FILL; (1) Above GWT or Native	10	Sample soil in the central portion of the Property to evaulate soil quality in the proposed road right of way.	2	2	-	-	2
SB-149/MW-149	-	(1) 0-2 (or >PID); (1) Above GWT or Native	10	Sample soil west of former sample location SB-27/TW-27 to evaluate VOC shallow/deep VOC impacts, and to delineate lead, SVOC and cyanide impacts to deeper/native soil near former underground storage tanks in the area of proposed non-industrial redevelopment.	2	2 (SVOCs)	-	2	2 (Pb only)
SB-150/MW-150	SB-42/MW-42	(1) 2 - 3.25 FILL; (1) Above GWT or Native	5	Sample soil adjacent to former location SB-42/MW-42 on the western portion of the River Point peninsula to confirm absence of VOC impacts in fill, and to to investigate deeper/native soil quality in the southwestern portion of the Property.	2	1	-	-	1 (As & Pb)
SB-151/MW-151	-	(1) 1.5 - 2.5 FILL; (1) Above GWT or Native	10	Sample soil southwest of former sample locations SB-27/TW-27 & SB-28/MW-28 to delineate metals, SVOC and cyanide impacts, and to evaluate soil quality in the proposed road right of way.	2	2 (SVOCs)	1	1 (above GWT)	2
SB-152	-	(1) 2 - 3.25 FILL; (1) Above GWT or Native	5	Sample soil southeast of former sample location SB-42/MW-42 to delineate metal/PAH impacts, and to evaluate soil quality in the southwestern portion of the Property.	2	2	-	-	2 (As & Pb)
SB-153/MW-153	-	(1) 2 - 3.25 FILL; (1) Above GWT or Native	5	Sample soil east of former location SB-42/MW-42 on the western portion of the River Point peninsula to delineate metal/PAH impacts, and to evaluate soil quality in the area of proposed commercial development.	2	2	-	-	2 (As & Pb)
SB-154/MW-154	-	(1) 0.25 - 2 FILL; (1) Above GWT or Native	10	Sample soil southwest of former sample locations SB-31/MW-31 & SB-32/TW-32 to delineate metal, PAH and VOC impacts to soil, and to evaluate soil quality in the proposed road right of way.	2	2	-	2	2
SB-155/MW-155	SB-32/MW-32	(1) 4.5 - 5 FILL; (1) Above GWT or Native	10	Sample soil adjacent to former sample location SB-32/TW-32 to investigate cyanide impacts to fill, and to investigate deeper/native soil quality in the area of proposed non-industrial redevelopment.	1	1	-	2	1
SB-156/MW-156	-	(1) 0.25 - 2 FILL; (1) 4.5 - 5 FILL; (1) Above GWT or Native	10	Sample soil south of former sample locations SB-31/MW-31 & SB-32/TW-32 to delineate metal, PAH and VOC impacts to soil, and to evaluate soil quality in the area of proposed non-industrial development.	3	3	-	1 (above GWT)	2
SB-157/MW-157	SB-34/MW-34	(1) 4.5 - 5 FILL; (1) Above GWT or Native	10	Sample soil adjacent to former sample location SB-34/TW-34 to evaluate lead and PAH impacts to fill, and to investigate deeper/native soil quality in the proposed road right of way.	1	2	1	1 (above GWT)	2 (Pb only)
SB-158/MW-158	-	(1) 3 - 3.75 FILL; (1) 7 - 8 FILL; (1) Above GWT or Native	10	Sample soil south of former sample locations SB-31/MW-31 & SB-32/TW-32, and southwest of former sample location SB-34/TW-34 to evaluate metal/PAH/VOC impacts to fill, and to investigate deeper/native soil quality in the proposed road right of way.	3	3	1	1 (above GWT)	3
SB-159/MW-159	-	(1) 3 - 3.75 FILL; (1) 7 - 8 FILL; (1) Above GWT or Native	10	Sample soil southwest of former sample locations SB-34/TW-34 & SB-35/MW-35 to delineate metal/PAHVOC impacts to fill, and to investigate deeper/native soil quality in the proposed road right of way.	3	3	-	2	3
SB-160	SB-35/MW-35	(1) 6 - 7 FILL; (1) 7 - 8 FILL; (1) Above GWT or Native	10	Sample soil adjacent to former sample location SB-35/MW-35 to investigate metal and PAH impacts to fill, and to investigate deeper/native soil quality in the proposed right of way.	2	3	-	2	3
SB-161	SB-36/TW-36	(1) 1 - 2 NATIVE	5	Sample soil adjacent to former sample location SB-36/TW-36 to investigate cyanide impacts to soil quality in the proposed right of way.	-	-	-	1	-
SB-162/MW-162	-	(1) 3 - 3.75 FILL; (1) 7 - 8 FILL; (1) Above GWT or Native	10	Sample soil southeast of former sample locations SB-34/TW-34 & SB-35/MW-35 to delineate metal/PAHVOC impacts to fill, and to investigate deeper/native soil quality in the proposed road right of way.	3	3	-	2	3
SB-163/MW-163	-	(1) Fill; (1) Above GWT or Native	10	Sample soil east of former sample location SB-36/TW-36 to evaluate fill and deeper/native soil quality in the propoposed right of way.	2	2	1	1 (above GWT)	2
SB-164	SB-37/TW-37	(1) Fill; (1) Above GWT or Native	10	Sample soil adjacent to former sample location SB-37/TW-37 to investigate metal and PAH impacts to fill, and to investigate deeper/native soil quality in the proposed right of way.	1	2	-	-	2

Table 1: Proposed Laboratory Analysis for Soil
River Point District, Phase 2, Manitowoc, Wisconsin
Site Investigation Workplan

Soil Boring ID	Nearby SB ID (if applicable)	Sample Depth (feet)	Estimated Boring Depth (feet)	Rationale	VOCs (8260B)	PAHs (8270D)	PCBs (8082A)	Cyanide (9012B)	Metals (6010)
SB-165/TW-165	-	(1) Fill; (1) Above GWT or Native	10	Sample soil south of former sample location SB-37/TW-37 to evaluate fill and deeper/native soil quality in the proposed right of way.	2	2	1	1 (above GWT)	2
SB-166/MW-166	-	(1) Fill; (1) Above GWT or Native	10	Sample soil northwest of former sample locations SB-13TW-13 and SB-15 to evaluate fill and deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	1 (above GWT)	2
SB-167	SB-13/TW-13	(1) 3 - 4 FILL; (1) Above GWT or Native	10	Sample soil adjacent to former sample location SB-13/TW-13 to investigate deeper/native soil quality in the area of proposed non-industrial redevelopment.	-	-	-	2	2 (As only)
SB-168	-	(1) Fill; (1) Above GWT or Native	10	Sample soil west of former sample locations SB-16/TW-16 and SB-17/TW-17 to delineate lead and VOC impacts to fill, and to investigate deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	-	2
SB-169/MW-169	SB-16/TW-16; SB-17-TW-17	(1) 5 - 6 NATIVE	10	Sample soil adjacent to former sample locations SB-16/TW-16 and SB-17/TW-17 to delineate lead impacts to deeper/native soil near a former underground storage tank in the area of proposed non-industrial redevelopment.	-	-	-	-	1 (Pb only)
SB-170	-	(1) 0-2 NATIVE; (1) Above GWT or Native	10	Sample soil east of former sample locations SB-16/TW-16 and SB-17/TW-17 to delineate lead and VOC impacts to fill, and to investigate deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	-	2
SB-171/MW-171	SB-19/TW-19	(1) 0 - 1 FILL; (1) Above GWT or Native	5	Sample soil adjacent to former sample location SB-19/TW-19 to investigate cyanide impacts to soil quality in the area of proposed non-industrial redevelopment.	-	-	-	2	-
SB-172	SB-15	(1) Fill; (1) Above GWT or Native	5	Sample soil adjacent to former sample location SB-15 to investigate fill and deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	-	2
SB-173	-	(1) 3-5 (or >PID); (1) Above GWT or Native	10	Sample soil west of former sample location SB-21/TW-21 to delineate metal/PAH impacts to fill, and to investigate deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	1 (above GWT)	2
SB-174/MW-174	SB-21/TW-21	(1) 3-5 (or >PID); (1) 6 - 8 NATIVE; (1) 8 - 10 NATIVE	10	Sample soil adjacent to former sample location SB-21/TW-21 to evaluate shallow/deep VOC impacts, and to delineate lead, PAH and cyanide impacts to deeper/native soil near former bulk petroleum storage in the area of proposed non-industrial redevelopment.	3	2	-	2	2 (Pb only)
SB-175	-	(1) Fill; (1) Above GWT or Native	10	Sample soil southeast of former sample locations SB-16/TW-16 and SB-17/TW-17 to delineate lead and VOC impacts impacts to deeper/native soil near a former underground storage tank in the area of proposed non-industrial redevelopment.	2	2	-	-	2
SB-176/MW-176	SB-23/TW-23	(1) 3-4.5 NATIVE	5	Sample soil adjacent to former sample location SB-23/TW-23 to delineate PAH impacts to deeper/native soil quality in an area of former storage and proposed non-industrial redevelopment.	-	1	-	-	-
SB-177	-	(1) 0 - 1 FILL; (1) Fill (or >PID); (1) Above GWT or Native	10	Sample soil west of former sample locations SB-24/MW-24 and SB-25/TW-25 to delineate PAH, VOC, lead and PCB impacts to soil near a former pump house in the area of proposed non-industrial redevelopment.	3	3	2	-	3 (Pb only)
SB-178/MW-178	-	(1) 0 - 1 FILL; (1) 2.5-3(or >PID); (1)10-12(or <PID)	15	Sample soil north of former sample location SB-25/TW-25 to delineate PAH and VOC impacts to soil near former bulk petroleum storage and a former pump house in the area of proposed non-industrial redevelopment.	3	3	-	-	-
SB-179/MW-179	SB-25/TW-25	(1) 8-10(or >PID); (1)10-12(or <PID)	15	Sample soil adjacent to former sample location SB-25/TW-25 to delineate PAH and VOC impacts to deeper/native soil near a former pump house in the area of proposed non-industrial redevelopment.	2	2	2	-	-
SB-180	-	(1) 2.5-3(or >PID); (1) Above GWT or Native	15	Sample soil east of former sample location SB-25/TW-25 and west of SB-26/MW-26 to delineate PAH, VOC and metals impacts to soil near former bulk petroleum storage and a former pump house in the area of proposed non-industrial redevelopment.	2	2	2	-	2
SB-181	SB-26/MW-26	(1) 3.5-5 NATIVE	5	Sample soil adjacent to former sample location SB-26/MW-26 to evaluate VOC impacts and delineate lead impacts to deeper/native soil near former bulk petroleum storage in the area of proposed non-industrial redevelopment.	1	-	-	-	1
SB-182	SB-24/MW-24	(1) 7-9 (or >PID); (1)10-12(or <PID)	15	Sample soil adjacent to former sample location SB-24/MW-24 to delineate lead, PAH, VOC and PCB impacts to deeper/native soil near a former underground storage tank in the area of proposed non-industrial redevelopment.	2	2	1	-	2 (Pb only)
SB-183	SB-20/MW-20	(1) Fill; (1) Above GWT or Native	10	Sample soil adjacent to former sample location SB-20/MW-20 to investigate fill and deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	1 (above GWT)	2
SB-184	-	(1) 3-5 (or >PID); (1) Above GWT or Native	10	Sample soil southwest of former sample location SB-21/TW-21 to evaluate shallow/deep VOC impacts, and to delineate lead, PAH and cyanide impacts to deeper/native soil near former bulk petroleum storage in the area of proposed non-industrial redevelopment.	2	2	-	2	2
SB-185/MW-185	-	(1) 3-5 (or >PID); (1) Above GWT or Native	10	Sample soil southeast of former sample location SB-21/TW-21 to evaluate shallow/deep VOC impacts, and to delineate lead, PAH and cyanide impacts to deeper/native soil near former bulk petroleum storage in the area of proposed non-industrial redevelopment.	2	2	-	2	2
SB-186	-	(1) 0 - 1 FILL; (1) 3-4.5 NATIVE	5	Sample soil southwest of former sample location SB-23/TW-23 to delineate PAH impacts to deeper/native soil quality in the area of proposed non-industrial redevelopment.	-	2	-	-	-
SB-187/MW-187	-	(1) Fill (or >PID); (1) Above GWT or Native	10	Sample soil southwest of former sample location SB-24/MW-24 to delineate PAH, VOC, lead and PCB impacts to soil near former onsite storage tanks in the area of proposed non-industrial redevelopment.	2	2	2	-	2
SB-188	-	(1) Fill (or >PID); (1) Above GWT or Native	10	Sample soil south of former sample location SB-24/MW-24 to delineate lead, PAH, VOC and PCB impacts to deeper/native soil near former underground storage tanks in the area of proposed non-industrial redevelopment.	2	2	2	-	2
SB-189/MW-189	SB-27/TW-27	(1) 0-2 (or >PID); (1) 8 - 9 NATIVE; (1) 9 - 10 NATIVE	10	Sample soil adjacent to former sample location SB-27/TW-27 to evaluate VOC shallow/deep VOC impacts, and to delineate lead, SVOC and cyanide impacts to deeper/native soil near former underground storage tanks in the area of proposed non-industrial redevelopment.	3	2 (SVOCs)	-	2	2 (Pb only)
SB-190	SB-28/MW-28	(1) 6.5-7.5 Native	10	Sample soil adjacent to former sample location SB-28/MW-28 to evaluate VOC and cyanide impacts, and delineate PAH impacts to deeper/native soil near former underground storage tanks in the area of proposed non-industrial redevelopment.	1	1 (SVOCs)	-	1	-
SB-191	-	(1) 0-2 (or >PID); (1) Above GWT or Native	10	Sample soil east of former sample locations SB-27/TW-27 and SB-28/MW-28 to evaluate VOC shallow/deep VOC impacts, and to delineate lead, SVOC and cyanide impacts to deeper/native soil near former underground storage tanks in the area of proposed non-industrial redevelopment.	2	2 (SVOCs)	-	2	2 (Pb only)
SB-192	-	(1) Fill; (1) Above GWT or Native	5	Sample soil northwest of former sample location SB-29/MW-29 to evaluate fill and deeper/native soil quality near former onsite storage tanks in the area of proposed non-industrial redevelopment.	2	2	-	-	2
SB-193	-	(1) Fill; (1) Above GWT or Native	5	Sample soil northeast of former sample location SB-29/MW-29 to evaluate fill and deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	-	2
SB-194	-	(1) Fill; (1) Above GWT or Native	5	Sample soil southwest of former sample location SB-26/TW-26 to evaluate fill and deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	-	2

Table 1: Proposed Laboratory Analysis for Soil
River Point District, Phase 2, Manitowoc, Wisconsin
Site Investigation Workplan

Soil Boring ID	Nearby SB ID (if applicable)	Sample Depth (feet)	Estimated Boring Depth (feet)	Rationale	VOCs (8260B)	PAHs (8270D)	PCBs (8082A)	Cyanide (9012B)	Metals (6010)
SB-195	-	(1) Fill; (1) Above GWT or Native	5	Sample soil south of former sample location SB-26/TW-26 to evaluate fill and deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	-	2
SB-196	-	(1) Fill; (1) Above GWT or Native	5	Sample soil west of former sample location SB-30/TW-30 to evaluate fill and deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	-	2
SB-197	-	(1) Fill; (1) Above GWT or Native	5	Sample soil southwest of former sample location SB-30/TW-30 to evaluate fill and deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	-	2
SB-198	-	(1) Fill; (1) Above GWT or Native	10	Sample soil in the eastern portion of the Property to evaluate fill and deeper/native soil quality near former underground storage tanks in the area of proposed non-industrial redevelopment.	2	2	-	-	2
SB-199/MW-199	-	(1) Fill; (1) Above GWT or Native	10	Sample soil in the eastern portion of the Property to evaluate fill and deeper/native soil quality in the footprint of a former dwelling in the area of proposed non-industrial redevelopment.	2	2	-	-	2
SB-200	-	(1) Fill; (1) Above GWT or Native	5	Sample soil east of former sample location SB-29/TW-29 to evaluate fill and deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	-	2
SB-201	-	(1) Fill; (1) Above GWT or Native	5	Sample soil west of former sample location SB-29/TW-29 to evaluate fill and deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	-	2
SB-202	-	(1) Fill; (1) Above GWT or Native	10	Sample soil in the area of former aboveground oil storage to evaluate fill and deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	-	2
SB-203	-	(1) Fill; (1) Above GWT or Native	5	Sample soil southwest of former sample location SB-23/TW-23 to evaluate fill and deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	1 (above GWT)	2
SB-204/MW-204	-	(1) Fill; (1) Above GWT or Native	10	Sample soil northeast of former sample location SB-32/TW-32 to evaluate fill and deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	1 (above GWT)	2
SB-205	-	(1) Fill; (1) Above GWT or Native	10	Sample soil in the area of former aboveground oil storage to evaluate fill and deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	-	2
SB-206/MW-206	-	(1) Fill; (1) Above GWT or Native	10	Sample soil in the area of a former structure on the north end of the Property to evaluate fill and deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	1 (above GWT)	2
SB-207	-	(1) Fill; (1) Above GWT or Native	10	Sample soil in the area of a former test pit (#2) performed on the Property that encountered hydrocarbon odor to evaluate fill and deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	-	2
SB-208	-	(1) Fill; (1) Above GWT or Native	10	Sample soil in the area of a former test pit (#6) performed on the Property that encountered hydrocarbon odor to evaluate fill and deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	-	2
SB-209	-	(1) Fill; (1) Above GWT or Native	10	Sample soil in the area of a former test pit (#6) performed on the Property that encountered hydrocarbon odor to evaluate fill and deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	-	2
SB-210	-	(1) Fill; (1) Above GWT or Native	10	Sample soil in the area of a former test pit (#9) performed on the Property that encountered hydrocarbon odor to evaluate fill and deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	2	2
SB-211	-	(1) Fill; (1) Above GWT or Native	10	Sample soil in the area of a former test pit (#15) performed on the Property that encountered hydrocarbon odor to evaluate fill and deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	-	2
SB-212	-	(1) Fill; (1) Above GWT or Native	10	Sample soil in the area of a former test pit (#16) performed on the Property that encountered hydrocarbon odor to evaluate fill and deeper/native soil quality in the area of proposed non-industrial redevelopment.	2	2	-	-	2
Estimated number of investigative samples to be analyzed					145	147	18	43	141
Trip Blank				Field and Laboratory QAQC Sample	4	0	0	0	0
Equipment Blank				Assess data collection techniques	0	0	0	0	0
Matrix Spike/Matrix Spike Duplicate				Assess the influence of the matrix on lab results	3	0	0	0	0
Field Duplicate				Assess the quality of the data and collection techniques	8	8	0	0	8
Estimated number of QAQC samples to be analyzed					15	8	0	0	8
Estimated number of samples to be analyzed					160	155	18	43	149

Notes:
As = Arsenic
GWT = Groundwater table
QAQC = Quality Assurance Quality Control
VOC = Volatile Organic Compounds
PAH = Polycyclic Aromatic Hydrocarbons
Pb = Lead
PCB = Polychlorinated Biphenyls
PID = Photoionization Detector (value)
SVOC = Semi-Volatile Organic Compounds
(8260B) = Laboratory analytical method (SW-846)

Table 2: Proposed Laboratory Analysis for Groundwater
River Point District, Phase 2, Manitowoc, Wisconsin
Site Investigation Workplan

Well ID	Nearby Well ID (if applicable)	Estimated Well Depth (feet)	Rationale	VOCs (8260B)	PAHs (8270D)	PCBs (8082A)	PFAS (537M)	Cyanide (9012B)	Metals (6010)
Existing Monitoring Wells									
MW-20	MW-20	13	Sample existing permanent well MW-20 to confirm arsenic detections in groundwater, and to evaluate cyanide impacts to groundwater quality in the northwestern portion of the Property.	-	-	-	-	1	1 (As only)
MW-24	MW-24	13	Sample existing permanent well MW-24 to confirm VOC and arsenic detections in groundwater, and to evaluate SVOC impacts to groundwater quality in the northeastern portion of the Property.	1	1 (SVOCs)	-	-	-	1 (As only)
MW-26	MW-26	13	Sample existing permanent well MW-26 to confirm arsenic and PFAS detections in groundwater, and to evaluate cyanide and SVOC impacts to groundwater quality in the northeastern portion of the Property.	-	1 (SVOCs)	-	1	1	1 (As only)
MW-28	MW-28	13	Sample existing permanent well MW-28 to confirm SVOC detections in groundwater, and to evaluate cyanide impacts to groundwater quality in the northeastern portion of the Property.	-	1 (SVOCs)	-	-	1	-
MW-35	MW-35	13	Sample existing permanent well MW-35 to confirm VOC detections in groundwater, and to evaluate cyanide impacts to groundwater quality in the central portion of the Property.	1	-	-	-	1	-
TW-36	TW-36	13	Sample existing temporary well TW-36 to confirm cyanide impacts to groundwater quality in the central portion of the Property.	-	-	-	-	1	-
MW-72	MW-72	13	Sample existing permanent well MW-72 to evaluate cyanide impacts to groundwater quality in the central portion of the Property.	-	-	-	-	1	-
Monitoring Wells to be Installed in Current/Former Temporary Well Locations									
MW-139	TW-38	13	Install a new permanent well in place of existing temporary well TW-38 to confirm arsenic, PAH and PFAS detections in groundwater in the northwestern portion of the Property.	-	1	-	1	-	1 (As only)
MW-144	TW-40	13	Install a new permanent well in place of existing temporary well TW-40 to confirm arsenic, lead and PAH detections in groundwater along the western Property boundary.	-	1	-	-	-	1 (As & Pb)
MW-150	TW-42	13	Install a permanent well in place of existing temporary well TW-42 to confirm arsenic, lead and PAH detections in groundwater along the southwestern Property boundary.	-	1	-	-	-	1 (As & Pb)
MW-155	TW-32	13	Install a permanent well in place of existing temporary well TW-32 to confirm VOC, PAH and cyanide detections in groundwater in the central portion of the Property.	1	1	-	-	1	-
MW-157	TW-34	13	Install a permanent well in place of existing temporary well TW-34 to confirm VOC, arsenic and cyanide detections in groundwater in the southeastern portion of the Property.	1	-	-	-	1	1 (As only)
MW-169	TW-17	13	Install a new permanent well in place of existing temporary well TW-17 to confirm arsenic detections in groundwater in the northern portion of the Property.	-	-	-	-	-	1 (As only)
MW-171	TW-19	13	Install a new permanent well in place of existing temporary well TW-19 to confirm VOC and cyanide detections, and to evaluate groundwater quality in the northeastern corner of the Property.	1	-	-	1	1	-
MW-174	TW-21	13	Install a new permanent well in place of existing temporary well TW-21 to confirm arsenic, lead, SVOC and cyanide detections in groundwater, and to evaluate groundwater quality in the north-central portion of the Property.	1	1 (SVOCs)	-	-	1	1 (As & Pb)
MW-176	TW-23	13	Install a new permanent well in place of existing temporary well TW-23 to confirm arsenic detections in groundwater in the northern portion of the Property.	-	-	-	-	-	1 (As only)
MW-179	TW-25	13	Install a new permanent well in place of existing temporary well TW-25 to confirm arsenic, lead, VOC and SVOC detections in groundwater in the northern portion of the Property.	1	1 (SVOCs)	-	-	1	1 (As & Pb)
MW-189	TW-27	13	Install a new permanent well in place of existing temporary well TW-27 to confirm arsenic, lead, PAH and cyanide detections in groundwater, and to evaluate groundwater quality in the central portion of the Property.	1	1	-	-	1	1 (As & Pb)
Monitoring Wells to be Installed in New Locations									
MW-135	-	13	Install a permanent well southeast of existing monitoring well MW-6 to evaluate groundwater quality along the northern Property boundary.	1	1	-	1	-	1
MW-136	-	13	Install a permanent well north of former temporary well location TW-38 (new well MW-139) to evaluate groundwater in the northwest portion of the Property.	1	1	-	1	-	1
MW-140	-	13	Install a permanent well east of former temporary well location TW-38 (new well MW-139) to delineate arsenic, PAH and PFAS impacts to groundwater, and to evaluate groundwater quality in the western portion of the Property.	1	1	-	1	-	1
MW-143	-	13	Install a permanent well west of existing monitoring well MW-20 to evaluate groundwater quality in the west-central portion of the Property.	1	1	-	-	1	1
MW-147	-	13	Install a permanent well east of former temporary well location TW-40 (new well MW-144) to evaluate groundwater quality in the western portion of the Property.	1	1	-	-	-	1 (As & Pb)
MW-149	-	13	Install a permanent well south of existing well MW-20 and west of existing temporary well location TW-27 (new well MW-189) to confirm delineate arsenic, lead, PAH and cyanide impacts to groundwater, and to evaluate groundwater quality in the west-central portion of the Property.	1	1	-	-	1	1 (As & Pb)
MW-151	-	13	Install a permanent well southwest of existing temporary well location TW-27 (new well MW-189) & existing well MW-28 to delineate arsenic, lead, PAH and cyanide impacts to groundwater, and to evaluate groundwater quality in the west-central portion of the Property.	1	1	-	-	1	1 (As & Pb)
MW-153	-	13	Install a permanent well east of former temporary well location TW-42 (new well MW-150) to delineate arsenic, lead and PAH impacts to groundwater, and to evaluate groundwater quality in the southern portion of the Property.	1	1	-	-	-	1 (As & Pb)
MW-154	-	13	Install a permanent well southwest of existing well MW-31 & former temporary well location TW-32 (new well MW-155) to delineate VOC and PAH impacts to groundwater in the south-central portion of the Property.	1	1	-	-	-	-
MW-156	-	13	Install a permanent well south of existing well MW-31 & former temporary well location TW-32 (new well MW-155) to delineate VOC, PAH and cyanide impacts to groundwater in the south-central portion of the Property.	1	1	-	-	-	-
MW-158	-	13	Install a permanent well south of existing well MW-31 & former temporary well location TW-32 (new well MW-155), and southwest of existing well MW-35 & former temporary well location TW-34 (new well MW-157) to evaulate groundwater quality in the southern portion of the Property	1	1	-	-	-	1 (As only)
MW-159	-	13	Install a permanent well southwest of existing well MW-35 and former temporary well location TW-34 (new well MW-157) to delineate arsenic, VOC and cyanide impacts to groundwater in the southern portion of the Property.	1	-	-	1	1	1 (As only)
MW-162	-	13	Install a permanent well southeast of existing well MW-35 and south of former temporary well location TW-36 to delineate arsenic, VOC and cyanide impacts to groundwater in the southeastern portion of the Property.	1	-	-	-	1	1 (As only)

Table 2: Proposed Laboratory Analysis for Groundwater
River Point District, Phase 2, Manitowoc, Wisconsin
Site Investigation Workplan

Well ID	Nearby Well ID (if applicable)	Estimated Well Depth (feet)	Rationale	VOCs (8260B)	PAHs (8270D)	PCBs (8082A)	PFAS (537M)	Cyanide (9012B)	Metals (6010)
MW-163	-	13	Install a permanent well east former temporary well location TW-34 (new well MW-157) to evaluate groundwater quality in the southeastern portion of the Property.	1	1	-	-	1	1 (As only)
MW-165	-	13	Install a permanent well south of former temporary well location TW-37 to evaluate groundwater quality in the eastern portion of the Property.	1	1	1	1	-	1 (As only)
MW-166	-	13	Install a permanent well northwest of permanent well location MW-13 to evaluate groundwater quality in the northwestern portion of the Property.	1	1	-	1	-	1
MW-178	-	13	Install a permanent well north of former temporary well location TW-25 (new well MW-179) to delineate arsenic, lead, VOC and SVOC detections, and to evaluate groundwater quality in the northeastern portion of the Property.	1	1 (SVOCs)	-	-	-	1 (As & Pb)
MW-185	-	13	Install a permanent well northeast of former temporary well location TW-27 (new well MW-189) and permanent well location MW-28 to delineate arsenic, lead and PAH detections, and to evaluate groundwater quality in the north-central portion of the Property.	1	1	-	-	1	1 (As & Pb)
MW-187	-	13	Install a permanent well southwest of former temporary well location TW-25 (new well MW-179) to delineate arsenic, lead, VOC and SVOC detections, and to evaluate groundwater quality in the northeastern portion of the Property.	1	1 (SVOCs)	-	-	-	1 (As & Pb)
MW-199	-	13	Install a permanent well in the eastern portion of the Property to evaluate groundwater quality in the footprint of a former dwelling in the area of proposed non-industrial redevelopment.	1	1	-	-	1	1
MW-204	-	13	Sample soil northeast of former temporary well location TW-32 (new well MW-155) to evaluate groundwater quality in the area of proposed non-industrial redevelopment.	1	1	-	-	1	1
MW-206	-	13	Install a permanent well northwest of former temporary well location TW-23 (new well MW-176) to evaluate groundwater quality in the north-central portion of the Property.	1	1	-	-	-	1
Estimated number of investigative samples to be analyzed				30	20	1	9	21	32
Trip Blank			Field and Laboratory QAQC Sample	2	0	0	0	0	0
Equipment Blank			Assess data collection techniques	0	0	0	1	0	0
Matrix Spike/Matrix Spike Duplicate			Assess the influence of the matrix on lab results	2	0	0	0	0	0
Field Duplicate			Assess the quality of the data and collection techniques	2	2	0	0	0	2
Estimated number of QAQC samples to be analyzed				6	2	0	1	0	2
Estimated number of samples to be analyzed				36	22	1	10	21	34

Notes:
As = Arsenic
QAQC = Quality Assurance Quality Control
VOC = Volatile Organic Compounds
PAH = Polycyclic Aromatic Hydrocarbons
Pb = Lead
PCB = Polychlorinated Biphenyls
PFAS = Per- and Polyfluoroalkyl Substances
SVOC = Semi-Volatile Organic Compounds
(8260B) = Laboratory analytical method (SW-846)

APPENDICES

APPENDIX A
Site-Specific Health and Safety Plan

Risk Management Strategy (RMS1)

- **If the project requires fieldwork a HASP or RMS1 must be completed.**
- **If the scope of work for a project that originally did not involve field work changes to include field work, an RMS1 form must be completed and reviewed with employees before field work begins.**
- **Although the RMS1 is intended to be part of the desktop planning process for a project, please be aware that the RMS1 must be carried as a field resource as well, to complement use of the RMS2 – Field Level Risk Assessment.**

Date: February 15, 2022	This form expires 1 year from the date of creation
Project / proposal number: *193708490*	**Project name:** Site Investigation – Phase 2, River Point District
Location: 1101, 1110 and 1200 Buffalo Street, Manitowoc, Wisconsin	

Project description (Companies involved, what, where, when)

In Spring 2022, Stantec, CornerPoint LLC (CornerPoint; surveyor) and Horizon Construction and Exploration LLC (Horizon; drilling contractor) will be ready to start work at Phase 2 of River Point District development located at the addresses above to facilitate Site Investigation activities. Horizon to blind drill/install up to 33, 2" monitoring wells, and perform up to 78 soil boring to a maximum depth of 15 feet below ground surface. CornerPoint to survey in soil boring/well locations after performed/constructed. Stantec to sample soil and/or groundwater (from existing and newly installed wells) for analysis of volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs) or semi-volatile organic compounds (SVOCs), heavy metals, cyanide, and/or per- and polyfluoroalkyl substances (PFAS).

Does this project involve fieldwork?	**Yes** - continue with this form
Is this project remote work?	**No**
What method of communication will be used?	☒ Cell Phone ☐ Satellite Phone ☐ Spot Messenger ☐ Other:
Is there a call in – call out system?	**No**
Are there any unique security concerns?	**No**
Will workers on this project cross state/provincial/national borders or require staff to work in different states/provinces or countries?	**No**
Is Stantec the Constructor/Prime Contractor?	**Yes -** please contact the HSSE Advisor or Manager for the province, state or country that your staff are working in for guidance on HSSE regulations.
Is Stantec hiring subcontractors?	**Yes -** please confirm that your subcontractor is prequalified. If you have any questions, please email subcontractors@stantec.com.
Will Stantec staff or subcontractors be working alone?	**Yes -** provide guidance from SWP 118
Client/Constructor HSSE training to abide by?	**No**
Client/Constructor HSSE program to abide by?	**No**
Is this work taking place outside of North America?	**No**

List the major tasks associated with this project.

1. Drive to, from and around Site
2. Stantec to confirm public utility locates prior to ground disturbance
3. Horizon to blind drill/install up to 33 permanent wells
4. Horizon to perform up to 78 soil borings, and abandon immediately upon completion
5. Stantec to sample soil from borings and groundwater from wells for VOCs, PCBs, PAHs/SVOCs, metals, cyanide and/or PFAS
6. CornerPoint to survey in "as built" soil boring/well locations

7. Click here to enter text
8. Click here to enter text
9. Click here to enter text
10. Click here to enter text

Identify critical risk(s) that staff may encounter on this project.

Driving	Working at Heights	Traffic Control	Wildlife, Insects, and Vegetation	Mobile and Heavy Equipment	Environments with Water or Ice
Yes	No	No	Yes	Yes	Yes
Ground Disturbance	**Ergonomic Hazards and Manual Handling**	**Hazardous Materials and Environments**	**Control of Hazardous Energy**	**Hot Work**	**Confined Spaces**
Yes	Yes	Yes	No	No	No

When assessing energy sources please consider task and site wide hazards including activities, time of day, time of year and project stages

Please identify SWPs below that apply to your project:

☒ SWP 107 – First Aid
☐ SWP 103 – WHMIS (CA)
☒ SWP 104 – HAZCOM (US)
☒ SWP 105 – PPE

		Hazards	Applicable SWPs, forms, SOPS	Specialized training beyond the SWPs	Specific Site Controls
Thermal					
	☒	Cold Stress	☒ SWP 514 - Working on or Near Ice ☒ SWP 114 - Working in Cold Environments ☐ SWP 113 - Heat Stress ☐ SWP 414, 414a – Hot Work Enter additional SWPs, SOPs	Enter specialized training	Dress warmly and take periodic breaks in heated vehicle where warranted. Wear PPE designed for warmth, in addition to PPE for chemical protection (ex. knit gloves underneath nitrile gloves to keep fingers warm). Wear traction aids on shoes if icy.
	☐	Heat Stress			
	☐	Hot work			
	☐	Hot surfaces			
	☒	Cold surfaces			
	☐	Other:			
Chemical					
	☐	Oxygen deficient atmosphere	☐ SWP 409 - Respiratory Protection ☐ SWP 411, 411a, 411b, 411c – Confined Space Entry ☐ SWP 304 - Asbestos Safety ☐ SWP 309 - Silica Awareness ☐ SWP 312 - Fueling Gasoline Engines ☒ SWP 305 - Benzene Safety ☒ SWP 315 - Arsenic Safety ☐ SWP 319 - Hydrogen Fluoride / Hydrofluoric Acid Safety	Enter specialized training	Soil/groundwater at the Site known to have VOC, PAH/SVOC, PCB, cyanide, metals and PFAS contamination. Wear nitrile gloves whenever handling soil/groundwater samples, along with safety glasses.
	☐	Asbestos			
	☐	Acids			
	☐	Caustics			
	☒	Volatile organic compounds			
	☒	Heavy metals			
	☐	Silica			
	☒	Polycyclic Aromatic Hydrocarbons (PAH)			
	☐	Pesticides			
	☐	Herbicides			
	☒	PCBs			

	☒	Petroleum hydrocarbons	☐ SWP 519 - Post-Disaster Building Entry Enter additional SWPs, SOPs		
	☒	Solvents/Flammables			
	☐	H_2S (Hydrogen sulfide)			
	☒	Lead			
	☒	Arsenic			
	☒	Benzene			
	☐	Hydrogen fluoride / Hydrofluoric acid			
	☐	Other:			
Biological					
	☐	Bacterial cultures	☐ SWP 409 - Respiratory Protection ☐ SWP 314 - Working Around Hazardous Waste and Waste Water ☐ SWP 108 - Bloodborne Pathogens ☒ SWP 508 - Wildlife Encounters ☐ SWP 102 - Workplace Violence ☐ SWP 510 - Working in Abandoned Buildings ☐ SWP 519 - Post-Disaster Building Entry Enter additional SWPs, SOPs	Enter specialized training	Watch for wildlife. Site mostly cleared, but still some areas present with remnants of vegetation. This work is being performed during a pandemic (COVID-19). Cloth or disposable masks should be available for Stantec and contractor personnel for use in cases where six feet or more distance is not attainable, for entering public spaces (ex. gas stations), etc. If any worker onsite has symptoms of COVID-19, has travelled internationally or has interfaced with a person that has positively tested for COVID-19 in the past 14 days, they will not be admitted to this Site. Further COVID-19 guidance is included as an attachment to this form.
	☐	Domestic waste			
	☐	Medical waste			
	☐	Wastewater			
	☐	Sewage			
	☐	Bloodborne pathogens			
	☒	Wildlife			
	☐	Domestic animals (dogs, cattle)			
	☐	Poison ivy			
	☐	Poison oak			
	☐	Giant Hogweed			
	☐	Wild parsnip			
	☐	Bees / wasps / hornets			
	☐	Ticks			
	☐	Black flies			
	☐	Other stinging or biting insects			
	☐	Pedestrians / onlookers			
	☐	Protesters			
	☒	Other:COVID-19			
	☐	Other:			
	☐	Other:			
	☐	Other:			
Radiation					
	☐	Nuclear densometers	☐ SWP 502, 502a-q (CA) - Radiation Safety Program Field Manual for Portable Gauges (Canada) ☐ SWP 516, 516a-e (US) - Radiation Safety (US) Enter additional SWPs, SOPs	Enter specialized training	
	☐	NORMs			
	☐	Microwave			
	☐	Sunburn			
	☐	Other:			
Noise					
	☒	Impact	Enter additional SWPs, SOPs	Enter specialized training	Wear earplugs or earmuffs when working in the vicinity of loud machinery, particularly during soil boring drilling.
	☒	Mobile equipment			
	☐	Manual equipment			
	☒	Vibration			

	☐	Stationary equipment			
	☐	Impact on communications			
	☐	Other:			
Gravity					
	☒	Slip / Trip / Fall	☐ SWP 201 - Fall Protection / Working at Heights ☐ SWP 202 - Ladder Safety ☐ SWP 203 - Aerial Work Platform ☐ SWP 205 - Scaffold Safety ☐ SWP 208 - Hoisting and Lifting ☐ SWP 510 - Working in Abandoned Buildings Enter additional SWPs, SOPs	Enter specialized training	Wear safety toed boots with at least a 6” ankle for support onsite. Keep focus on path and off of phone/maps while walking. Wear traction aids on boots if conditions are icy.
	☐	Work from heights			
	☐	Falling objects			
	☐	Other:			
Motion					
	☐	ATV	☐ SWP 507 - Aircraft Safety ☒ SWP 124, 124a, 124b – Safe Driving ☒ SWP 216 - Working Near Mobile Equipment ☐ SWP 217, 217a – Forklift Operation ☐ SWP 407, 407a, 407b, 407c – Traffic Control and Protection Planning ☐ SWP 505, 505a, 505b, 505c, 505d - Off Road Vehicles ☐ SWP 506 - Rail Safety ☒ SWP 115 - Material Handling and Safe Lifting ☐ SWP 125 - Workstation Ergonomics ☐ SWP 513 - Boat and Water Safety Enter additional SWPs, SOPs	Enter specialized training	Green defensive driving in transit to/from/around Site, keep distance (10’ minimum) from mobile equipment; wear hi-vis clothing/hard hat at all times during drilling activities.
	☐	ARGO			
	☐	Snowmobile			
	☐	Aircraft (fixed wing or rotary)			
	☐	UAVs/Drones			
	☐	Working near traffic			
	☒	Automobile/truck/trailer			
	☐	Elevated work platform			
	☐	Construction equipment			
	☐	Pedestrians			
	☐	Cyclists			
	☐	Rail			
	☒	Lifting			
	☐	Pushing/Pulling			
	☒	Bending			
	☒	Posture/position			
	☐	Twisting			
	☐	Watercraft / water			
	☒	Walking/Hiking			
	☐	Climbing			
	☐	Other:			
Mechanical					
	☒	Wrap points	☒ SWP 416 - Supervision of Contracted Drilling Activities ☐ SWP 518, 518a – Using a Chainsaw ☒ SWP 206 - Hand and Portable Power Tools	Enter specialized training	Keep distance from mobile equipment operated by contractors (i.e., drill rig).
	☒	Shear points			
	☒	Pinch points			
	☐	Freewheeling point			
	☐	Chains			
	☒	Cables			

	☐ Cutting edges ☐ Blades ☒ Rotating parts (e.g., drill/auger) ☐ Other:	☐ SWP 517 - Safe Machete Use ☐ SWP 408, 408a, 408b, 408c – Lock, Tag & Try ☒ SWP 216 - Working Near Mobile Equipment ☐ SWP 510 - Working in Abandoned Buildings Enter additional SWPs, SOPs		
Electrical					
	☐ Power and communication lines ☐ Static charge and lightning ☐ Wiring ☐ Batteries ☐ GFCI cords/plugs ☐ Lighting levels ☐ Double insulated tools ☒ Wet environment ☐ Exposed circuits ☐ Other:	☒ SWP 213, 213a, 213b, 213c – Utility Clearance ☐ SWP 406, 406a, 406b – Electrical Safety Program ☐ SWP 408, 408a, 408b, 408c – Lock, Tag & Try ☐ SWP 504 - Backpack and Boat Mounted Electro-Fishing ☐ SWP 519 - Post-Disaster Building Entry Enter additional SWPs, SOPs	Enter specialized training	Confirm that utilities have been located and cleared prior to drilling work.
Pressure					
	☒ Hydraulic systems ☐ Pneumatic systems ☐ Steam ☐ Vacuum ☐ Cylinders ☐ Excavations and spoil piles ☐ Other:	☐ SWP 215 - Supervision of Hydro-Excavation Activities ☐ SWP 310 - Compressed Gas Cylinders ☐ SWP 214 - Entering Excavations and Trenches Enter additional SWPs, SOPs	Enter specialized training	Stantec personnel to maintain distance from drilling equipment.

PPE	REQ'd	If you need assistance to answer these questions, please contact an HSSE advisor or HSSE manager
Head (CSA/ANSI)	☒	**Choose a Type and Class:** ☒ Type 1 (no side impact) ☐ Type 2 (side impact) ☐ Class E (rated for 20000 volts) ☐ Class G (rated for 2200 volts) ☐ Class C (no electrical rating) ☐ Other
Eye/face (CSA/ANSI)	☒	☒ safety glasses with rigid side shields ☒ polarized safety glasses with rigid side shields ☐ goggles ☐ spoggles ☐ safety glasses and face shield ☐ goggles and face shield ☐ UV glasses, UV shield
Hand	☒	**Hazard Protection** ☐ Abrasion ☐ Cut ☐ Vibration ☐ Puncture ☐ FR (flame resistant) ☐ Arc Flash ☒ Chemical ☐ Impact ☒ Cold ☐ Heat ☐ Other:

		Glove Type ☒ Nitrile ☐ Leather ☒ Cotton ☐ High Performance Polyethylene ☐ Polyurethane ☐ Kevlar ☐ Latex ☐ PVC ☐ Neoprene ☐ Viton ☐ Other:
Foot (6" minimum ankle support)	☒	☒ CSA Green triangle and orange omega boots (CA) / ASTM / ANSI boots (US) ☐ CSA Green triangle and orange omega rubber boots (CA) / ASTM / ANSI rubber boots (US) ☐ CSA Green triangle and orange omega waders (CA) / ASTM / ANSI waders boots (US) ☐ Traction Aids
High visibility clothing	☒	Class 1 - not used ☒ Class 2 (under 80km/h / 50 mph and daylight) ☐ Class 3 (over 80km/h / 50 mph and/or twilight/dark)
Hearing	☒	☒ Ear plugs ☒ Ear muffs ☐Ear plugs and muffs
Coveralls	☐	☐ Standard ☐ FR (Flame Resistant) – Type: ☐ Tyvek (disposable) ☐ Chemical resistant
Respiratory	☐	☐ N95 (dust mask) ☐ 1/2 mask - Cartridge type: - Filter type: ☐ Full face - Cartridge type: - Filter type: ☐ PAPR - Cartridge type: - Filter type:
Fall arrest/limit	☐	**Fall arrest harness (verify capacity)** ☐ Class A (fall arrest) ☐ Class D (controlled descent) ☐ Class E (evacuation) ☐ Class L (ladder) ☐ Class P (positioning) **Lanyard** ☐ 6' with shock absorber (verify capacity) ☐ 4' with shock absorber (verify capacity) ☐ 6' Y with shock absorber (verify capacity) ☐ 6' with NO shock absorber (verify capacity) for use on aerial lifts ☐ 4' with NO shock absorber (verify capacity) for use on aerial lifts **Additional equipment** ☐ Rope Grab ☐ Rope ☐ Self-retracting lifeline – ☐ Type 1 ☐ Type 2 ☐ Type 3 ☐ Tripod ☐ Retrieval winch ☐ Anchorage connector ☐ Beam anchor ☐ Vertical or horizontal lifeline ☐ Carabiner ☐ Suspension trauma straps
Flotation device	☐	☐ Lifejacket ☐ Floater Jacket ☐ PFD - Type: ☐ PFD inflatable ☐ Survival Suit
Other	☒	Photoionization Detector (PID) to be used as a vapor screening tool. Cloth mask to be utilized in situations where social distancing cannot be achieved.

EMERGENCY RESOURCES

(NOTE: This plan is not adequate for working at heights or confined space activities. A separate plan is required, please contact your Regional HSSE Manager or Advisor)

Site emergency number: 911

Fire Department: Manitowoc Fire & Rescue, 911 Franklin Street. (920) 686 - 6540

Ambulance:	Manitowoc Fire & Rescue, 911 Franklin Street. (920) 686 - 6540	**Spill Response:**	National Response Center (NRC). 1 (800) 424 – 8802.
Police:	Manitowoc Police Dept., 910 Jay Street. (920) 686 - 6500	**Regional HR:**	US Central - Ricardo Carlos Perez - (512) 469-5330
Workers' Compensation Claim Coordinator:	US - Melissa Helton - cell 513-720-3706		
OSEC:	Kurt Rubsam – (262) 402 - 8153		
Public Relations:	US Central – Laura Krinke (612) 712-2072		
HSSE Manager:	US Central – Wes Cline (916) 281-7459		

First aid facilities are located:	In Vehicle
First aiders on site:	Whitney Cull
Fire extinguisher are located:	In Vehicle
SDS are located:	N/A
Eyewash station is located:	N/A
Spill response equipment is located:	N/A

Incident reporting protocol based on work location (Select USA and / or Canada and / or International)

Incident Reporting Protocol US

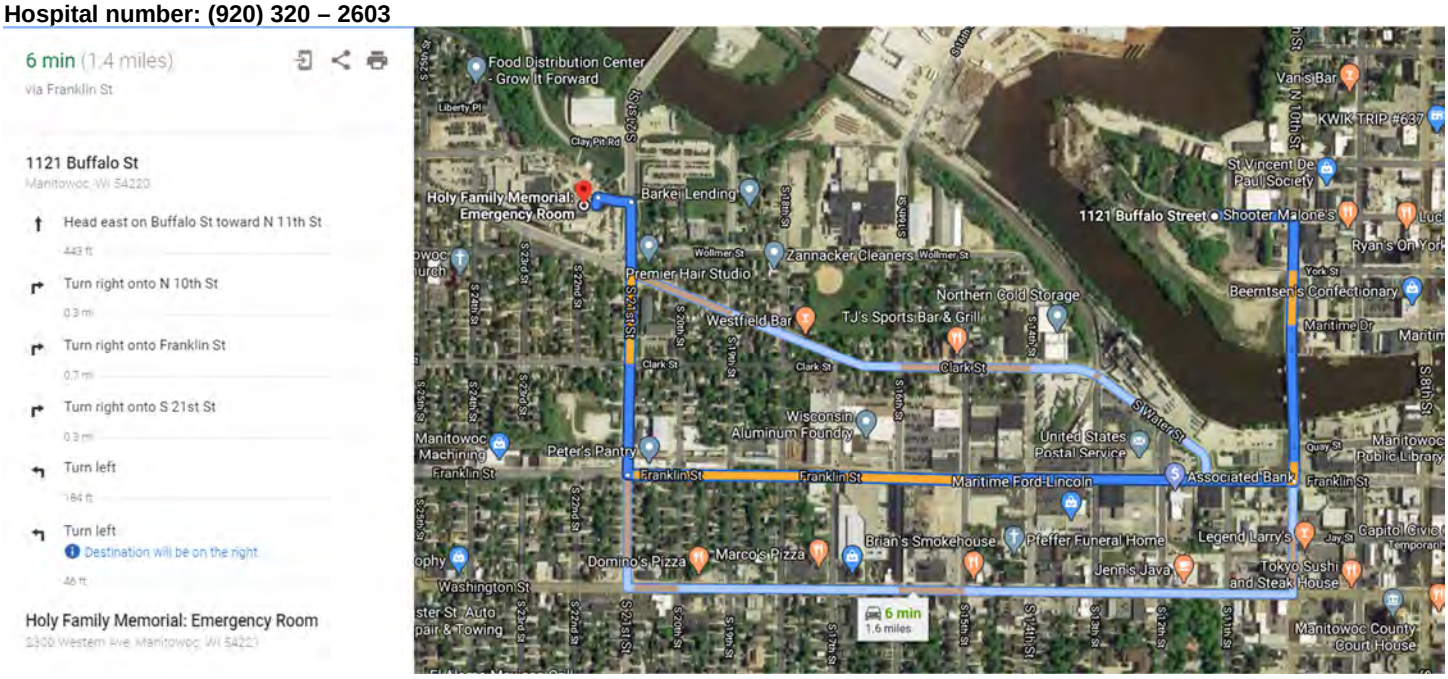
IMMEDIATE ACTIONS

1. Keeping safety in mind, care for injured people (if applicable) and stabilize the scene.
2. For life threatening injuries, **immediately contact 911**. Accompany the injured employee to the medical facility whenever possible.
3. Call **WorkCare (24-hour service): 1-888-449-7787** for work-related symptoms or injuries, and speak to a medical professional for guidance and treatment options.
4. Make voice contact with your supervisor within 1 hour or less of the incident occurring. Leaving a voicemail does not count. If you cannot contact your supervisor, contact the HSSE Manager or HSSE Advisor for your region.
5. Supervisors must immediately contact their HSSE Manager or HSSE Advisor by phone to discuss incident severity and determine if further notifications (internal or external) are required.
6. When an employee is guided by WorkCare to obtain medical assistance, or the employee requests medical attention for a non-life-threatening injury, and after alerting the supervisor; the employee must **immediately call Melissa Helton, Stantec's US WC Claims Coordinator at 513-720-3706** for assistance.
7. In most cases WorkCare will provide guidance about which clinic is available and provide directions. Some job sites already have prescribed clinics such as US Healthworks. Here is a link accessing additional clinic locations: Clinic Search link.
8. Additional notifications may be required based on the client requirements.

Maps are provided to the nearest medical clinic or hospital

Holy Family Memorial: Emergency Room, 2300 Western Avenue, Manitowoc, WI (see map on following page):

Hospital number: (920) 320 – 2603



PROJECT CONTACT INFORMATION

Title	Name	Company	Phone Number
Stantec Office	Mequon, Wisconsin	Stantec	(262) 241 - 4466
Project Manager	Harris Byers	Stantec	(414) 581 - 6476
Project Site Safety	Whitney Cull	Stantec	(262) 219 - 4740
Client or Owner	Adam Tegen	City of Manitowoc – Community Dev. Director	(920) 686 - 6931
Stantec After-Hours Number	Click here to enter text	Click here to enter text	Phone Number
Other: (specify)	Click here to enter text	Click here to enter text	Phone Number
Other: (specify)	Click here to enter text	Click here to enter text	Phone Number

Approvals

By signing this approval, the Project Manager is acknowledging that (s)he has communicated the hazards, controls, required PPE and applicable SWPs to the employees working on this project. It also indicates that the Project Manager has verified that employees have all the equipment required to work safely, that the equipment is in working order, and that the employees have the knowledge required to operate/use this equipment.

Prepared by:	Whitney Cull	Whitney Cull	2/15/2022
	Print Name	Signature	Date
Reviewed by: *(not author)*	Harris Byers	Harris L Byers	2/15/2022
	Print Name	Signature	Date
Approved by PM:	Harris Byers	Harris L Byers	2/15/2022
	Print Name	Signature	Date

Employee Review

Risk Management Strategy (RMS1)

All employees conducting field work on this project will review the Risk Management Strategy (RMS1) and sign below acknowledging that they have been advised of the hazards, controls, PPE, and other safety equipment required, and have reviewed the applicable SWPs. Employees in the field who identify additional hazards not listed above will notify the project manager of the hazard, and prior to proceeding, will confirm the controls that will be used. Document any on-site changes and communications using the RMS2 as appropriate; see section 4.4 of the HSSE Program Manual on Management of Change.

Please designate Team Lead for field activities below.

Reviewed by:	Whitney Cull	Whitney Cull	2/15/2022
	Print Name (Team Lead Field)	Signature	Date
	Click here to enter text.		Click here to enter a date.
	Print Name	Signature	Date
	Click here to enter text.		Click here to enter a date.
	Print Name	Signature	Date
	Click here to enter text.		Click here to enter a date.
	Print Name	Signature	Date
	Click here to enter text.		Click here to enter a date.
	Print Name	Signature	Date

Stantec COVID-19 Field Guidance and Best Practices

NOTE: RECENT CHANGES ARE HIGHLIGHTED IN YELLOW

The COVID-19 pandemic is rapidly evolving, and Stantec's Pandemic Committee continues to work diligently to secure guidance from global and regional health authorities to help protect the health and safety of our employees and minimize the spread of the virus. They provide regular updates to employees through Stantec's internal communications platform (The Lens) which allow us to continue to serve our clients. Our people are at the heart of everything we do; they give our work purpose and deliver the critical support our clients require. Supporting our employees' health and the health of those around them is entrenched in our corporate values. Stantec's Pandemic Committee has instituted a number of precautionary measures to promote continued health and mitigate the chance of virus spread. All employees are encouraged to refer to The Lens for the most up to date guidance.

This document is intended to provide guidance on managing the risks associated with COVID-19 for those that perform or direct **field work**.

This guidance should be incorporated as part of existing or new project Risk Management Strategy (RMS1) or Health and Safety Plans (HASPs).

Symptoms

Those who are infected with COVID-19 may have little to no symptoms. Symptoms may take up to 14 days to appear after exposure to COVID-19. A person may not realize they have symptoms of COVID-19 because they are similar to a cold or flu. Symptoms have included: fever, cough, and difficulty breathing.

Worksite Considerations

For those working on project sites or in client settings, Stantec team members will work to uphold our company standards and work transparently with clients to coordinate approaches where appropriate. Relevant topics include, but are not limited to:

1. Social Distancing
2. Communication
3. Fitness for Duty
4. Safety Plans
5. Work at Remote sites
6. Emergency Responses

1. Social Distancing

Heath authorities are recommending social distancing to slow the spread of the virus. Social distancing includes voluntary avoidance of crowded places as defined by government agencies where exposure risks are increased. Experts also recommend staying a minimum of 2 metres (6 feet) away from others.

Project sites under the care and control of Stantec are asked to follow the direction of regional government and health agencies regarding social distancing or other measures. Field employees are asked to practice social distancing at toolbox meetings, in break or lunchrooms, site trailers, and vehicles. Confined spaces can also present unique challenges with respect to COVID-19 controls. When Stantec staff are requested to enter a confined space, and where possible and safe to do so, staff should request to not have others in the space with them while they conduct their work.

Minimize activities where groups of workers congregate. If reasonably practicable, conduct toolbox meetings outside, practice social distancing, and keep group sizes small.

Stantec staff will travel alone in vehicles when on Stantec business unless the work is covered by a variance. Two variance options are available:

- Business Line variances for certain work categories (i.e. land surveying, remote biological surveys). The HSSE Manager for the BOU and the BL will work together to prepare and submit a plan to the HSSE Director for approval.

- Project level variances for one-off project requirements. For this scenario, the project team will prepare and submit a plan to the Regional HSSE Manager and appropriate RBL for joint review and feedback. Once finalized, it will be sent to the HSSE Director for approval.

Final approvals will also be shared with the appropriate Regional Leader(s) and HSSE Manager(s).

When two individuals have been permitted to travel in a vehicle through the Stantec variance process, do not use the air recirculation feature in the vehicle, and when practicable, open windows to provide continual replacement of cabin air with fresh air.

Where possible, adjust work planning to maximize social distancing between workers, teams, and site personnel. This may include staggering meal and break times to avoid large gatherings of workers. If workers are required to sign in and out of a site, assign one individual to add the names to the sheet or permit to minimize the possibility of spreading the virus.

If a meeting must take place in-person onsite, the location must be large enough to permit 2 metres (6 feet) of separation between attendees; surfaces will be wiped down prior to convening the meeting; hand sanitizer and wipes must be available to all participants; invitees will be asked not to attend if they are not feeling well; person-to-person contact must be avoided (shaking hands, etc.); and all attendees are reminded to cover any coughs or sneezes using the crook of their arm.

The CDC, WHO and PHAC are recommending cloth face coverings be worn (covering the nose and mouth) to protect people around you if you may be infected but do not have symptoms. A cloth face covering should be worn in settings where other social distancing measures are difficult to or cannot be maintained (e.g. you cannot maintain 2 metres/ 6 feet at all times). This practice does not replace social distancing and is instead meant to be an additional control. If your task required the use of an N95 mask to protect you from workplace hazards before the outbreak of the pandemic, you should continue to wear the N95 mask while conducting your task. Any personal protective equipment, including face coverings of all types, should always be assessed, worn, and maintained as per the manufacturer's instructions.

The cloth face coverings recommended are not surgical masks or N-95 respirators.

According to these organizations, cloth face coverings should:

1) Fit snugly but comfortably against the side of the face
2) Be secured with ties or ear loops
3) Include multiple layers of fabric
4) Allow for breathing without restriction
5) Be able to be laundered and machine dried without damage or change to shape

Before donning a cloth face covering, wash your hands thoroughly. Cover your mouth and nose and ensure there are no gaps between your face and the face covering. Avoid touching the face covering with your hands while you are wearing it; if you do, clean your hands with alcohol-based hand rub or soap and water. Replace the face covering with a new one as soon as it is damp.

When removing your face covering handle it by the straps and place it in a sealable container until it can be laundered. Launder cloth masks using the warmest water and appropriate detergent for the items and dry the coverings completely. The CDC indicates that standard laundering will remove the virus, use of bleach or a disinfectant is not required. Allow laundered face coverings to dry before reuse.

For any staff wanting to wear a cloth face covering at work or out in the community, please use the link to the website below for instructions on how to make one.

If access to a client site requires a cloth face covering, please speak to your supervisor to approve associated expenses.

https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/diy-cloth-face-coverings.html

2. Communication

Our COVID-19 response follows CDC, WHO, and PHAC guidelines. If our practices are not aligned with client practices, employees are to meet with their project manager and supervisor to discuss the differences and determine an appropriate solution to continue supporting our clients. Please seek the support of HSSE as needed.

Differences in plans may affect our level of service, project schedule, and resourcing of construction laborers, materials, or other resources. We often have contractual obligations to formally notify our clients of these situations in order to be entitled to schedule or cost relief, and often these notices must be submitted within a short period of time. If you have questions, please contact regional counsel for support.

Project managers, in cooperation with our clients, will need to determine the appropriate staffing and resources for field offices while maintaining social distancing. Project teams are asked to maintain open lines of communication with their client contacts, request a copy of changes to site safety protocols (including fit for duty), and communicate any updates to the project team.

In the event that a Stantec employee has a confirmed diagnosis or exhibits symptoms of COVID-19 and interacted with a client (either in office settings or on project sites), the project team will connect with the Stantec Regional Crisis Team who will communicate with the client.

Stantec

3. Fitness for Duty

As part of the **fitness for duty** checks documented on the Field Level Risk Assessment (RMS2) form, Stantec field employees are asked to verify that any personnel who will be visiting or conducting any work on a Stantec work site:

- Do not have any of the following symptoms: fever (no matter how mild), new onset or an exacerbation of chronic cough, or difficulty breathing; or
- Have not travelled outside their home country within the last 14 days; or
- Have not had close contact with a confirmed or probable COVID-19 case or a person who has been outside your home country in the last 14 days.

There are prepared speaking notes and a *Field Level Risk Assessment Fit for Duty COVID-19 Guidance* tool to assist field employees to verify worker fitness for duty related to COVID-19.

4. Safety Plans

Incorporate the guidance below into existing and new project Risk Management Strategy (RMS1) or Health and Safety Plans (HASPs).

- Notify BC leadership of ongoing field work so that local orders or directives can be communicated to field personnel in a timely manner. These may require project managers to determine which tasks are deemed critical and which tasks can be deferred.
- Maintain a current call down list for all field-based employees.
- For projects that extend beyond a single day, verify that the site is tidied up and left in a safe and secure condition. Project teams may not be able to return to the project site based on government orders or directives. In addition, where logistically feasible, plan on traveling home at the end of the workday rather than staying in a hotel. Be mindful of local maximum allowable work hours per day or per week.
- Discuss projects that require employees to enter a residential structure with BC leadership if the work is deemed critical or if it can be deferred. When entering a residential structure, communicate expectations ahead of scheduled visits, practice social distancing at the door, and ask the following questions.
    - Do you have any of the following symptoms: fever (no matter how mild), new onset or an exacerbation of chronic cough, or difficulty breathing; and
    - Have you travelled outside the home country within the last 14 days; and
    - Have you had close contact with a confirmed or probable COVID-19 case or a person who has been outside your home country in the last 14 days?
        - If yes to any of the above, do not enter the residence and call your PM to discuss this once you have excused yourself from the residence

- Where possible, employees are encouraged to pack meals and snacks as needed for the project duration and avoid visiting stores and restaurants. If necessary, modify your schedule to avoid restaurants and public restrooms during peak (i.e., crowded, periods to minimize contact with the public). Use drive-through service for food pick-up if available.

Personal Hygiene and Wellness

The following personal hygiene and wellness practices are recommended to prevent or control the transmission of bacteria and/or viruses:

- Wash your hands with soap and water for at least 20 seconds after using toilet facilities, before and after eating, after handling potentially contaminated or infectious materials, after removing hand protection and other PPE, and after sneezing, coughing, or touching your face. When soap and water is not available use an alcohol-based hand sanitizer.
- Avoid touching your eyes, nose, and mouth with unwashed hands.
- Cover your mouth and nose when coughing or sneezing with a tissue or crook of your elbow. Throw the used tissue in the trash and wash your hands.
- Maintain lunchroom facilities through cleaning and disinfecting objects and surfaces. Leave contaminated tools, materials, or clothing outside.
- Maintain vehicles through regular cleaning and disinfecting of surfaces.
- Do not share tools or equipment (e.g. cell phones, shovels, etc.) between employees without disinfecting them first.
- Avoid handling common use items such as pens and clipboards; equip each worker with their own. If it is necessary to have common use items, include them in the cleaning and disinfecting cycle outlined below.
- Avoid unnecessary, unprotected contact with wild or farm animals, and wash hands immediately if contact does occur.
- Get vaccinated against seasonal influenza viruses.
- Get adequate rest, eat a healthy, balanced diet, and stay hydrated.
- Don’t share personal items that can’t be disinfected. Furthermore, any protective clothing or other safety device that is worn next to the skin must be cleaned and disinfected prior to use by another employee.

Cleaning and Disinfecting

COVID-19 can survive on different surfaces but can be killed by most cleaners and disinfectants. To prevent transmission of COVID-19 while cleaning, good hygiene measures and consistent use of appropriate personal protective equipment is recommended.

Cleaning refers to the removal of germs, dirt, and impurities from surfaces. Cleaning does not kill germs, but by removing them, it lowers their numbers and the risk of spreading infection.

Disinfecting refers to using chemicals to kill germs on surfaces. This process does not necessarily clean dirty surfaces or remove germs, but by killing germs on a surface after cleaning, it can further lower the risk of spreading infection.

Practice routine cleaning of frequently touched surfaces (for example: vehicle door handles, interior of vehicle such as steering wheel and control panel, equipment controls, handles, stair railings, toilet facility doors, etc.) with household cleaners and disinfectants that are appropriate for the surface, following label instructions. Labels contain instructions for safe and effective use of the cleaning product including precautions you should take, such as wearing gloves and making sure you have good ventilation during use. It is recommended to clean and disinfect high touch surfaces a minimum of twice daily.

It is important to keep vehicles clean. Do not transfer items between vehicles and limit the transfer of objects between the vehicle and the office. Each vehicle should have an ample supply of clean tissues and hand sanitizer, as well as cleaning supplies and disinfectants. Clean vehicles after each use and wear appropriate personal protective equipment (PPE) when cleaning. When possible, use disposable gloves and masks that may be required for cleaning and disinfecting. Rental vehicles are to be cleaned prior to use, and when possible, use Stantec preferred vehicle rental agencies that have a COVID-19 cleaning protocol in place. All passengers are to clean their hands before touching common areas of the vehicle.

What you should know:

- Commonly used cleaners and disinfectants are effective against COVID-19.
- Frequently touched surfaces are most likely to be contaminated.
- Check the expiry date of products you use and always follow manufacturer's instructions.

If surfaces are dirty, they need to be cleaned using a detergent or soap and water prior to disinfection. For disinfection, refer to a list of products from the American Chemistry Council.

Please refer to the Cleaning and Disinfecting document on the Lens for additional guidance.

Drinking Water

A reasonable supply of potable drinking water is to be kept readily accessible at the project site for the use of workers. Drinking water is to be supplied from a piping system, individual servings or from a clean, covered container with a drain faucet or pump. Workers will be given a sanitary means of drinking the drinking water and must not be required to share a common drinking container. If using water coolers to provide drinking water, wear clean gloves to operate the spigot and verify that a clean source of disposable cups is available. Verify that the cooler is cleaned and sanitized on a regular basis. If using bottled water sources, have employees take measures such as labeling bottles to avoid drinking out of someone else's bottle.

Toilet Facilities

Toilet facilities will be provided or arranged for workers before work has started at the project and workers will be provided reasonable access to these facilities. Project teams need to consider local closures of restaurants and other establishments when deciding on reasonable access to these facilities. The location of the toilet facilities will be posted in a conspicuous location. The toilet facilities will be serviced,

cleaned, and sanitized on a regular basis to maintain them in a clean and sanitary condition. All toilet facilities will have toilet paper available at each toilet.

For toilets that are not connected to a sanitary sewer system, provide the user privacy and protection from weather and from falling objects. The toilets are to be illuminated by natural or artificial light, have adequate ventilation, and have a self-closing door that can be locked from the inside. If the facility is intended for use by female workers, a disposal receptacle for sanitary napkins will be provided. If the toilet facility is intended for use by males only or by females only, it must have a sign indicating that fact.

If a project is being carried out in a remote unpopulated area and it is not reasonably practicable to provide toilet facilities as described above, other types of toilet facilities that come as close as possible to having the features of non-sewered flush toilet facilities will be provided instead, and must be located to provide the user privacy. The minimum number of toilet facilities will be dependent on the gender and number of workers regularly employed on the project and be determined by local legislation.

Clean-up Facilities

Each toilet facility must be provided with its own clean-up facility. Each clean-up facility will meet the following requirements:

- A wash basin with both hot and cold running water if reasonably possible.
- Soap or an alcohol-based hand cleaner.
- Paper towels or a hand dryer. If paper towels are provided, there shall be a waste disposal receptacle nearby.
- If it is not reasonably possible to have a wash basin with running water at a clean-up facility, alcohol-based hand cleanser will be provided instead.

Workers who handle or use corrosive, poisonous or other substances likely to endanger their health will be provided with washing facilities with clean water, soap and individual paper towels.

5. Work at Remote Sites

Working at remote sites presents unique challenges. Items to consider and address in the Risk Management Strategy (RMS1) or Health and Safety Plan (HASP) include:

- Pre-mobilization
    - Each employee needs to review the *Field Level Risk Assessment Fit for Duty COVID-19 Guidance* document.
- Transportation
    - How the employees are accessing the site, by vehicle, airplane or helicopter, and what methods of social distancing they will have with their means of transportation; if reasonable, have the employees access the site via their own vehicle.
- Emergency response
    - A protocol needs to be developed should an employee show signs, or symptoms associated with COVID-19 which includes how they will access medical advice and how they will be evacuated out in case of an emergency. If employees are accessing

the site via airplane or helicopter, they may not be allowed access to the airplane or helicopter to evacuate out if they are experiencing any signs or symptoms of COVID-19.

- Accommodations
    - Research the accommodations available, plan for each employee to have their own private lodging to assist with social distancing. If staying in a camp setting, request the camp COVID-19 protocol and review it to ensure it meets Stantec's standard as a minimum. If there is no standard available, the Project Manager will need to discuss Stantec's requirements with the client / camp director.
- Food and water
    - Research the dining options, choose food that is either full service or pre-bagged instead of self-serve buffet style.
    - Determine how staff will access potable water
- Cleaning
    - Employees will need to have ready access to tissues and disinfecting wipes.

6. Emergency Response

If you experience signs or symptoms of illness, distance yourself from others and notify your supervisor. Your supervisor will work with the Regional Crisis Team to help manage the response.

This guidance document does not address every situation with our projects related to COVID-19 precautionary measures. Additional communication through The Lens as the situation evolves. If there are any questions or situations not currently addressed by any of the available resources found on The Lens, please reach out to your supervisor, project manager, or Regional HSSE resource.

Fit for Duty COVID-19 Guidance

Pre-mobilization fit for duty questions for Stantec field personnel

1. Do you have any of the following symptoms: fever (no matter how mild), new onset or an exacerbation of chronic cough, or difficulty breathing?
2. Have you traveled outside your home country in the last 14 days?
3. Have you had close contact* with a confirmed or probable COVID-19 case or a person who has been outside your home country in the last 14 days?

If you answer **NO** to all questions, you can mobilize to the project field site.
If you answer **YES** to any of the above questions, or you choose to not answer, please consult with your supervisor prior to mobilizing to the project field site.

Field Level Risk Assessment

Questions for non-Stantec personnel accessing field sites under Stantec control

"*Hello. As you are aware, COVID-19, also known as the novel coronavirus, was declared a global pandemic on March 11, 2020 by the World Health Organization (WHO). The COVID-19 situation continues to evolve and Stantec is now conducting active fit for duty affirmations prior to allowing access to this site."*

1. Do you have any of the following symptoms: fever (no matter how mild), new onset or an exacerbation of chronic cough, or difficulty breathing?
2. Have you traveled outside your home country in the last 14 days?
3. Have you had close contact* with a confirmed or probable COVID-19 case or a person who has been outside your home country in the last 14 days?

If the individual answers **NO** to all questions, site access can be granted.
If the individual answers **YES** to any of the above questions, or refuses to answer, do not allow them access and consult with your supervisor, project manager and/or Regional Leader.

"Thank you for your honesty and understanding. While at this Stantec project site please adhere to social distancing to the fullest extent possible. Social distancing means staying 2 metres (6 feet) away from others and avoiding crowds. Please advise Stantec if your task requires you to be within 2 metres (6 feet) of another individual."

* **Close contact** is defined as a person who:
- Provided care for the individual, including healthcare workers, family members or other caregivers, or who had other similar close physical contact with the person without consistent and appropriate use of personal protective equipment OR
- Lived with or otherwise had close prolonged contact (within 2 metres/6 feet) with the person while the person was infectious OR
- Had direct contact with infectious bodily fluids of the person (e.g., was coughed or sneezed on) while not wearing recommended personal protective equipment.