Time-Critical Removal Action – Work Plan

Beck's Lake Site
South Bend, Indiana

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ACRONYMS AND ABBREVIATIONS

Acronym/ Abbreviation	Definition
ACA	Administrative Control Area
Amec Foster Wheeler	Amec Foster Wheeler Environment & Infrastructure, Inc.
AOC	Area of concern
ASAOC	Administrative Settlement Agreement and Order on Consent
ATSDR	Agency for Toxic Substances and Disease Registry
BEA	Brownfields Environmental Assessment
bgs	Below ground surface
BHHRA	Baseline Human Health Risk Assessment
CBRC	Charles Black Recreation Center
CDC	Center for Disease Control and Prevention
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
ESI	Expanded Site Inspection
FS	Feasibility Study
Ft	Feet
GPS	Global positioning system
HASP	Health and Safety Plan
Honeywell	Honeywell International, Inc.
HRS	Hazardous Ranking Score
IDEM	Indiana Department of Environmental Management
INDOT	Indiana Department of Transportation
ISM	Incremental sampling method
JPR	Jones Petrie Rafinski
LPA	LaSalle Park Area
mg/kg	Milligram(s) per kilogram
mg/m^3	Milligram(s) per cubic meter
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response
PCBs	Polychlorinated biphenyls
PPE	Personal protective equipment
PRP	Potentially responsible party
QA	Quality assurance
QAPP	Quality Assurance Project Plan

Acronym/ Abbreviation	Definition
QC	Quality control
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RML	Remediation management level
RSL	Residential Screening Level
SESC	Site erosion and sediment control
SJCHD	Saint Joseph County Health Department
SLERA	Screening Level Ecological Risk Assessment
SMP	Soil Management Plan
SOP	Standard operating procedure
SI	Supplemental Investigation
SSI	Screening Site Inspection
SVOC	Semi-volatile organic compound
SWPPP	Stormwater pollution prevention plan
TAL	Target Analyte List
TCRA	Time-Critical Removal Action
TMP	Traffic Management Plan
USEPA	United States Environmental Protection Agency
VOC	Volatile organic compound
Wood	Wood Environment & Infrastructure Solutions, Inc.
WSP	WSP USA

1.0 INTRODUCTION

Wood Environment and Infrastructure Solutions, Inc. (Wood; formerly Amec Foster Wheeler) has prepared this work plan on behalf of the City of South Bend and Honeywell International Inc. (Honeywell) to define the scope of work for a Time-Critical Removal Action (TCRA) and additional capping at the Beck's Lake National Priorities List (NPL) Site (Site). The location of the Site is presented on Figure 1. The scope of work presented in this work plan was outlined by the United States Environmental Protection Agency (USEPA) in an e-mail correspondence on June 12, 2020 to the City of South Bend and Honeywell, the potentially responsible parties (PRPs). This work plan has also been prepared in accordance with the USEPA comments dated May 21, 2021 to the *Work Plan – Time Critical Removal Action* (TCRA) document prepared by Wood and submitted to the USEPA on behalf of the PRPs on May 13, 2021.

The purpose of this TCRA is to address areas of concern (AOCs) identified by the USEPA and to accelerate the process toward de-listing of the Beck's Lake NPL Site. The 2015 Administrative Settlement Agreement and Order on Consent (ASAOC) between the USEPA and the PRPs addressed the performance of a remedial investigation (RI) to the limits of the LaSalle Park Area (LPA). Areas identified by USEPA at the LPA requiring remedial action to reduce potential future risk to park users were delineated during the 2016 RI and were further characterized during a supplemental investigation (SI) conducted at the LPA between November 18 and December 10, 2019. The 2019 SI was conducted in accordance with the USEPA approved, October 25, 2019, revised work plan (Wood, 2019). The 2019 SI focused on a "fill area" containing granular fill and metallic and construction-related waste that was identified during the 2016 RI at the LPA (Amec Foster Wheeler, 2017) and three AOCs where surface soil lead results were detected at concentrations exceeding 400 milligrams per kilogram (mg/kg). The proposed scope of work is to implement:

- TCRAs for areas delineated in the LPA during the 2016 RI and the 2019 SI where lead was detected in the top 1-foot of soil above 1,200 mg/kg. The soil in these areas will be excavated, backfilled and capped with 2-feet (ft) of imported soil, as requested by the USEPA.
- Install a 1-foot-thick cap of clean soil in areas of the LPA where lead was detected in the upper 1-foot of soil above 400 mg/kg (but below 1,200 mg/kg).
- TCRAs in two residential yard decision units where investigations by USEPA in 2017 and 2018 detected lead at concentrations above 400 mg/kg to a depth of 2-ft below ground surface (bgs) using the incremental sampling method (ISM). The yard decision unit soils will be excavated and backfilled with imported soil to match the existing grade.

This work will be performed under a TCRA ASAOC and Action Memorandum agreement currently being drafted by USEPA. Once the Removal Action ASAOC has been negotiated and approved, project planning and contracting will move forward, in accordance with this work plan (subject to USEPA approval).

2.0 SITE DESCRIPTION AND HISTORY

The LPA portion of the Beck's Lake Site is approximately 40 acres in size. It is bounded to the north by Linden Avenue, to the west by North Falcon Street, to the south by West Washington Street and to the east by the alley west of North Kaley Street. Since 2000, investigations performed by the Indiana Department of Environmental Management (IDEM) (2001, 2003, 2009) and USEPA (April and June 2013) have focused primarily on metals as the contaminants of concern in surface soil (affected media). The principal listing criteria in the May 2013 Hazardous Ranking System Scoring Documentation Record was surface soil arsenic concentrations exceeding three (3) times background concentrations.

2.1 Site Description

The LPA is a 40-acre municipal recreational park owned by the City of South Bend that lies within the NPL Site. It includes the Charles Black Recreation Center (CBRC), located on the southwest portion of the LPA (Figure 2). The LPA is primarily grass covered with large shade trees occurring along the north and south-central portions of the park. Playground structures, including a water splash pad and a climbing structure, are located primarily to the north and east of the CBRC. Paved tennis and basketball courts and a baseball diamond also occur to the east of the CBRC. Soccer fields are present on the north and central portions of the LPA. The LPA also features Beck's Lake, a walking trail and a sledding hill (Figure 2).

The area surrounding the LPA consists of industrial, commercial and residential properties. Residential neighborhoods border the LPA to the southeast, south and west and include LaSalle Park Homes, for which development was funded by the United States Department of Housing and Urban Development in the 1960s. Vacant land occurs to the north of the Site. A rail-line and industrial/commercial facilities occur further to the north and to the northeast of the LPA. Groundwater from the Site and bordering neighborhoods is not currently being used as a source of drinking water. The City of South Bend provides potable water (sourced from supplies outside the LPA) to adjacent Site residences.

Prior to development of the LPA, the Beck's Lake Site was reportedly used as a landfill from the 1930s and operated until the mid-1950s. Aerial photographs from 1938 and 1951 appear to show fill material being placed in the western half of what is now LaSalle Park (Amec Foster Wheeler, 2016). As part of its operation, the landfill was thought to accept waste material from numerous companies and individuals. Unpaved roads immediately west of North Falcon Street appear to lead to the western portion of the dump area. These roads traversed property where the LaSalle Park Homes housing development now resides. Aerial photographs dated 1951, 1957 and 1965 show housing units on the north side of Washington Street. These housing units were demolished around the mid- to late-1960s, when the City of South Bend acquired most of the Site property and developed it into a city park. During the 1960s, the former landfill area was also developed by grading and subsequent topsoil dressing to establish grass surface cover for use as a recreational/community park. In the mid-1960s, the existing, approximately 8-acre sized Beck's Lake was excavated for storm/surface water retention for the LaSalle Park development and the sledding hill was constructed west of Beck's Lake. Since this time, the LPA has been used as a public park.

2.2 Geologic/Hydrogeologic Setting

Beneath either asphalt or grass in LPA, the surface soil at the site is primarily silty sand with gravel. Subsurface soils primarily consist of poorly graded, fine sand with minor amounts of silt and gravel to depths of 20 to 35 ft bgs. Discontinuous sand/gravel zones and discontinuous

silt/clay lenses are dispersed throughout the fine-to-medium sand. A more continuous silt and clay unit underlies the fine-to-medium sand unit. This unit (termed the intermediate silt/clay unit) was encountered at depths of 13 to 35 ft bgs at the LPA, A sand and gravel unit underlies the intermediate silt/clay unit. This lower sand and gravel unit is typically encountered at 28 to 30 ft bgs and ranges in thickness from 10 to 15-ft in the vicinity of the site. The sand and gravel are underlain by bedrock, the Ellsworth Shale, which is encountered at a depth of more than 200 ft bgs in the area.

Groundwater flow direction and the relationship between Beck's Lake and groundwater were assessed during the RI. Shallow and deep groundwater flow was found to be directed to the north-northeast, moving away from the area where non-native fill was encountered and toward vacant land and the railroad transportation corridor to the north. Beck's Lake was found to be a shallow lake (predominantly less than 2-ft deep). It was reportedly built as a storm water retention pond with at least three storm water culverts that empty into it and with an overflow outfall located on the east side of the Lake. The surface of Beck's Lake was found to be slightly higher than groundwater elevations measured in nearby monitoring wells, suggesting that the lake provides recharge to groundwater.

Groundwater from below the LPA is not being used as a drinking water source and is protected from use by the St. Joseph County Code (Chapter 52 Water Regulations, 52.042: Siting of Wells Where Municipal is Available) and the area downgradient (north and northeast) of the park could be further protected against installation of a potable well by implementing and/or expanding the proposed Saint Joseph County Health Department (SJCHD) Administrative Control Areas (ACAs) (i.e., at and downgradient of the former Bendix facility and areas to the east of the LPA). The City of South Bend provides municipal drinking water to the area. The nearest municipal water supply well field is the Olive Street Well Field located approximately 5,000-ft to the south-southeast (up-gradient) of the LPA and the next closest well field is the Airport Wellfield, located approximately 7,500 to the north-northwest of the LPA (South Bend Water Works, 2014).

2.3 Previous Site Investigation

In April 1984, after USEPA received the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 103(c) notice, the Beck's Lake Site was entered in the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS). The following investigations have been performed at the LPA:

- A Screening Site Inspection (SSI) was conducted by the USEPA on April 20, 1988. On-site soil and sediments were sampled. The SSI was conducted to determine whether certain hazardous substances were present at the Site. The SSI report stated that there was a potential for hazardous substances to migrate from the Site soils. The hazardous substances detected in on-site soil samples above background levels included fluoranthene, pyrene, chrysene, chromium, lead, and manganese.
- On March 8, 1996, USEPA conducted an Expanded Site Inspection (ESI), and the Site was assigned a Hazardous Ranking Score (HRS) of 54.78. The score was based primarily on the potential of a groundwater release. However, no groundwater receptors appeared to exist within the groundwater flow pathway from the Site, and the Site was designated No Further Remedial Action Planned and subsequently archived.
- IDEM conducted sampling activities at the Site for a Brownfield Environmental Assessment (BEA) on October 16, 2001. The purpose of the BEA was to evaluate whether the Site would be suitable for redevelopment. Based on the detections of lead, arsenic and benzo(a)pyrene in samples collected during the BEA and a re-evaluation of health

threats posed, the Beck's Lake Site was recommended for re-entry into CERCLIS on April 1, 2004.

- On June 16, 2003, IDEM conducted sampling activities for a Site Reassessment at the Beck's Lake Site. A total of 22 surface soil samples were collected and analyzed for metals from the LPA and residential properties near the LPA. The final Site Reassessment report was submitted March 9, 2007. Arsenic, lead and chromium were identified at concentrations above three (3) times their highest respective background.
- In 2009, IDEM conducted ESI 2. A total of 32 surface soil samples and six subsurface soil samples were collected from the LPA and residential properties near the LPA; the samples were analyzed for metals. The subsurface soil samples were the first and only known subsurface soil samples collected at the LPA. In addition to lead and arsenic at concentrations of concern, zinc, barium, chromium, cadmium, copper, and silver were detected at concentrations above three (3) times their highest respective background concentration.
- On April 1, 2013, USEPA's contractor, Weston Solutions, Inc. submitted an HRS Documentation Record. Based on the results of the ESI 2 Report, the Site received an HRS score of 50.00 based on surface soil direct contact potential. The principal listing criteria for the NPL Site was surface soil arsenic concentrations exceeding three (3) times the applied background concentration of 9.7 milligrams per kilogram (mg/kg).
- In June 2013, USEPA's contractor, Weston Solutions, Inc., took 72 triplicate samples from 68 locations within the play area of the LPA. Areas evaluated are shown on Figure 2-1. The Beck's Lake Site Health Risk Site Assessment evaluation of the play areas was conducted to determine if there was any immediate risk to children playing in those specific areas. It was not intended as an evaluation of long-term exposure nor representative of the risk at the Site as a whole. The samples were taken from the top 3-inches of surface soil and were analyzed for target analyte list (TAL) metals. Results indicated no immediate risk to public under current recreational park land use.
- The Site was placed on the USEPA NPL on December 12, 2013. Bendix reported that it had emplaced wastes at the NPL Site at some point between 1944 and the mid-1950s (Notification Letter, St. Joseph County Health Department, 1984; Screening Site Inspection [SSI] Report, Ecology and Environment, Inc.,1989). Ownership of the property during this time period is not documented. Disposed wastes, as reported by Bendix, may have included organic and inorganic substances, solvents, heavy metals, acids/bases, asbestos containing material (asbestos), paint wastes, hydroxide sludge, soluble oils, chromic acid, wastewater treatment sludge, nickel waste, and foundry and cyanide wastes (103(c) CERCLA Notification, Bendix, 1984). Bendix was acquired by Allied Corporation in 1983, which in turn purchased and merged with Honeywell in 1999, keeping the Honeywell name. In the 1960s, the City of South Bend acquired ownership of the property that now contains Beck's Lake, and together with adjacent parcel(s) to the west, created the LPA.
- In 2015, an administrative order of consent (ASAOC) was negotiated and signed by the City of South Bend and Honeywell International Inc. to perform focused Remedial Investigation/Feasibility Study (RIFS) on the 40-acre LaSalle Park properties east of Falcon Street.
- After planning documents were approved by USEPA in 2016, the LPA Focused RI was completed by Amec Foster Wheeler and WSP USA (WSP; formerly WSP|Parsons Brinckerhoff). The 2016 RI included: geophysical surveys to identify fill areas, and the collection and analyses of 151 surface soil samples, 220 subsurface soil samples, 20 soil vapor samples (2 events), and 51 groundwater samples and collection and analysis of 13

sediment and 13 surface water samples from Beck's Lake (Amec Foster Wheeler, 2017). The RI included assessment of groundwater flow direction (directed toward the vacant land to the north-northwest of the LPA) and hydrology. An area of metallic and construction debris containing fill was identified by geophysical and soil boring investigations below the northern portion of the LPA (Figure 2). The primary contaminants of concern identified in surface soil (0-0.5 ft bgs) were arsenic and lead, and are summarized as follows:

- Arsenic was detected in surface soil at levels above the IDEM Recreational Park User soil direct contact screening level of 45 mg/kg near the CBRC at locations 14SS-1 (56 mg/kg) and 26SS-3 (120 mg/kg). Soil from the 26SS-3 location was subsequently removed during expansion activities at the CBRC in 2018 Arsenic generally was not detected at elevated levels in subsurface soil.
- Lead was detected in surface soil at levels above the IDEM Recreational Park User soil direct contact screening level of 800 mg/kg at locations 23SS-2 (2,300 mg/kg) and 25SS-4 (2,200 mg/kg). Lead was also detected in surface soil above the residential remediation management level (RML) of 400 mg/kg at location 15SS-2. These three areas of elevated surface soil lead concentrations were subsequently identified as AOC-1 through AOC-3 (Figure 2). Lead was also detected at levels exceeding IDEM Recreational Park User soil direct contact screening levels in deeper subsurface soil associated with the area of fill containing debris.

- The 2016 RI analytical results were used to perform a screening level ecological risk assessment (SLERA) and a baseline human health risk assessment (BHHRA) for sampled media at the LPA (Amec Foster Wheeler, 2017). The SLERA did not identify any risks requiring corrective action. The BHHRA considered three human health exposure areas in the LPA based on park use for the following identified potential receptors: current and future park visitors, current and future indoor and outdoor workers, future construction/utility workers and a hypothetical future resident. One of these exposure areas included the CBRC and associated playground structures and this exposure area also included the locations where the most elevated arsenic and lead surface soil results had been collected (i.e., AOC1 through AOC-3). The BHHRA evaluated cancer risk and non-cancer hazard for receptors and potential exposure pathways associated with the current and foreseeable future land uses and activities. In addition, some "Future Only" exposure scenarios have been evaluated (assuming that hypothetically, soils to a depth of 15 ft bgs could be excavated, mixed, and be placed at the land surface where they would be accessible to these receptors – an alternative to the typical surface soil exposure scenario). In addition, consumption of produce associated with Hypothetical Future Community Gardens and Hypothetical Future Residential Gardens has been evaluated. The results of the BHHRA concluded that no remedial action in the LPA is necessary at this time based on the below results:
    - Cumulative receptor cancer risks and hazard index are within or below the CERCLA acceptable cancer risk range (10^{-6} to 10^{-4}) and below the hazard index target of 1 for the Current and Continuing Future receptors (Park Visitors, Indoor Workers, and Outdoor Workers) for current conditions (exposure to surface soil, surface water, and sediment) at the LPA.
    - Potential hazards associated with lead exposure associated with surface soil for the Current and Continuing Future receptors (Park Visitors, Indoor Workers, and Outdoor Workers) are not of concern (estimated blood lead levels are

below the USEPA target level of 10 micrograms per deciliter (µg/dL) and the Center for Disease Control and Prevention (CDC) reference value of 5 µg/dL).

- Cumulative receptor cancer risk and cumulative receptor hazard index are above the CERCLA acceptable cancer risk range (10^{-6} to 10^{-4}) and above the target hazard index of 1 and/or the CDC blood lead level reference value of 5 µg/dL (but well below the USEPA target level of 10 µg/dL) for several "Future Only" receptor scenarios. However, the cancer risks associated with many of the exposure scenarios are likely substantially overestimated due to the assumption that all detected chromium in environmental media is in the hexavalent (carcinogenic) form. If the chromium at the LPA is predominantly in the trivalent form (non-carcinogenic), the cumulative receptor risks for almost all receptors would be reduced substantially.

- On October 26, 2016, ATSDR issued a letter to the USEPA requesting statistically representative surface soil samples from the residential areas to complete its statutorily mandated public health assessment (ATSDR, 2016). The USEPA issued a work assignment requesting that SulTRAC complete the sampling to support gathering the data needed for ATSDR's public health assessments, as well as to potentially to be used in an RI/feasibility study (FS).
- In 2017 and 2018, SulTRAC performed surface and near surface sampling on residential properties within the Beck's Lake Residential Site. A total of 27 property/property equivalents (78 yard/yard equivalents) were sampled for metals during the 2017 sampling event. In December 2018, SulTRAC performed additional subsurface investigation activities at 10 properties (11 platted parcels) to determine the western (lateral) edge of waste/non-native fill associated with the Beck's Lake NPL Site. Two (2) yard units were identified where lead was detected above 400 mg/kg down to a depth of 2 ft bgs in a Data Evaluation Summary Report (SulTRAC, 2019). While outside the scope of the ASAOC, the PRPs entered into a confidentiality agreement with USEPA that allowed the locations of yard units with ISM lead detections exceeding 400 mg/kg to be released (USEPA 2020). The PRPs have agreed to include remedial action to address the two impacted yard units in this Removal Action Work Plan despite the fact that a clear determination that the detected lead results are related to the Beck's Lake NPL Site (e.g., not from historical lead paint etc.), has not been made.
- In 2018 Jones Petrie Rafinski (JPR) performed a SI along the north Linden Road right of way. The purpose of the SI was to further assess surface soil, soil and groundwater conditions immediately beyond the edge of fill containing waste to the north of the LPA. During the 2016 Focused RI at the LPA, fill containing metallic and construction-related waste, as well as granular fill, was found to extend to the northern edges of the LPA. In the central portion of the LPA, waste containing fill was found to extend down into groundwater. This SI demonstrated that offsite groundwater quality is consistent with background conditions in the South Bend area and groundwater impacts appear to be restricted to areas where debris containing fill intercepts the water table (Wood, 2019[1]).
- In 2019, JPR implemented the approved Revised Work Plan (Wood, 2019[2]) to further characterize the "fill area" by collecting surface and near surface soils to a depth of 1-ft bgs for the presence of lead across the approximately 20 acres where waste containing fill was previously identified in the subsurface. As outlined in the approved RI Work Plan, additional, detailed delineation of lead in surface soil and near surface soil (i.e., 0 to 1-ft bgs) was performed in AOC-1 (Grid 15), AOC-2 (Grid-23) and AOC-3 (Grid-25), where lead was detected in surface soil at levels above 400 mg/kg (Amec Foster Wheeler, 2017). A total of 234 surface soil (0 to 0.5 ft bgs) and near surface soil samples (0.5 to 1-ft bgs)

were analyzed during the SI and are summarized in Table 1. Lead analytical sampling locations and results from the 2019 SI are shown on Figure 2 and presented with the 2016 RI surface soil lead results, provide the primary basis for TCRA and soil cap design.

The project objectives and implementation details as it related to the LPA and the two residential yard units are presented in the following sections.

3.0 PROJECT OBJECTIVES

This work plan has been prepared to complete remedial action at the LPA and in nearby residential yard units in a safe and efficient manner with the ultimate objective to further protect human health from potential future exposure to lead in soil at the Site. As indicated previously, the 2016 RI and 2019 SI soil sampling efforts identified areas within the LPA where levels of lead in the upper 1-foot of the soil column exceed 1,200 mg/kg and/or 400 mg/kg and are to be addressed, as requested by the USEPA, by the activities outlined in this work plan. Data collected during the 2016 RI and the 2019 SI delineated the areas to be addressed by TCRA and/or installation of a 1-foot-thick soil cap in the LPA (Figure 2). Additional TCRAs were identified by the USEPA and its contractor with respect to lead in the upper 2-ft of the soil column in two residential yard units to the west of the LPA (Figure 3).

This TCRA work will be performed under a Removal Action ASAOC to be entered by USEPA and the PRPs and Action Memorandum agreement to be prepared by USEPA. Once the Removal Action ASAOC has been negotiated and approved, project planning and contracting will move forward. This TCRA is consistent with remedies under CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Additional details with respect to these investigations and associated TCRA and/or soil cap installation to address them are provided below.

3.1 LPA Characterization and TCRA/Soil Cap Installation

The 2016 RI characterized surface soil (0 to 0.5 ft bgs) and subsurface soil on a gridded basis across the 40-acre LPA. The USEPA approved 2019 SI in the LPA was completed by JPR in 2019 with objectives to:

- Characterize lead in surface soil (0 to 0.5 ft bgs) and near surface soil (0.5 to 1 ft bgs) across the approximately 20 acres of the LPA where the 2016 RI identified waste containing fill in the subsurface; and
- Delineate the extent of lead in surface and near surface soil (to a depth of 1 ft bgs) in the three AOCs where lead was detected during the 2016 RI in surface soil at a concentration above 400 mg/kg.

A total of six areas were identified for TCRAs in the LPA based on USEPA requested action levels (i.e., lead in soil exceeding 1,200 mg/kg). The locations are depicted on Figure 2. The TCRA boundaries were extended by half the distance from the location of a lead result exceeding 1,200 mg/kg to the nearest sample location below the 1,200 mg/kg threshold, as recommended by the USEPA (e-mail correspondence June 5, 2020). The areas to be addressed are summarized as follows:

- At surface soil sample locations 12SS-1 and 11SS-1 in the north central portion of the LPA
- At surface soil sample location 17SS-1 in the central portion of the LPA
- At surface soil sample location 16SS-1 in AOC-1
- At surface soil sample location 23SS-2 in AOC-2
- At surface soil sample locations AOC3-4 and AOC3-7 in AOC-3.

At the indicated locations in the LPA where soil lead concentrations exceeded 1,200 mg/kg at depths of 0 to 1 ft bgs, the soil will be excavated for offsite disposal and replaced with 2-ft of clean backfill (Figure 2).

At locations in LPA that were identified with lead concentrations in surface soil exceeding 400 mg/kg, a 1-foot-thick, clean soil cover (cap) will be installed over the sampling location and will be extended to the nearest sampling location where lead was detected below 400 mg/kg. To maintain park-related uses (e.g., athletic field surfaces) the capping areal extent is expanded to include some soil sampling locations where lead was detected below the USEPA recommended 400 mg/kg soil lead capping threshold. The IDEM recommended allowable level for lead in a recreational park setting is 800 mg/kg. Grass cover will be re-established on the final grade by seeding and/or placement of sod (depending on the planned park use).

3.2 Residential Yard Unit Characterization and TCRA

The USEPA and its contractor collected soil samples from residential yard units near the LPA in October 2017. Surface soil samples (0 to 0.5 ft bgs) were collected from 78 residential yard units and near-surface soil samples were collected at 0.5-foot intervals from 0.5 to 3 ft bgs in 36 of the 78 residential yard units. Yard units were generally 5,000 square ft in area (SulTRAC, 2019).

Soil samples were collected from each yard unit thickness interval and analyzed for lead and arsenic using ISM. The ISM involves the collection of multiple soil samples from across the areal extent of the yard unit at the prescribed sampling intervals. The collected soil is then rigorously composited at and by the laboratory. ISM also typically involves replicate QA/QC analyses of the composited material. The resulting analytical results are then representative of the conditions in the entire “decision” unit.

Lead was detected at a concentration above 400 mg/kg in soil ISM results from 0 to 2-ft bgs in two of the residential yard decision units (SulTRAC, 2019; Figure 3). Soil in these two residential yard units will be excavated for offsite disposal down to 2-ft bgs. The excavations will be backfilled with clean backfill and grass cover will be re-established on the final grade by seeding and/or placement of sod.

4.0 Time-Critical Removal Action Plan

This section presents rationales for, and descriptions of anticipated field activities associated with the TCRA and soil cap installation activities at the LPA and residential properties.

Quality assurance (QA) and quality control (QC) protocols associated with sampling and analysis of barrow source media and liquids generated during decontamination for the TCRA are included in the LPA quality assurance project plan (QAPP) and the applicable Standard Operating Procedures provided in the 2016 Field Sampling Plan (Amec Foster Wheeler, 2015) and included as Appendix A. Health and safety protocols presented in the project specific Health and Safety Plan (HASP) will be followed to protect public and worker safety during implementation of TCRA and capping activities in compliance with the Occupational Safety and Health Administration (OSHA) regulations and protocols outlined in 29 C.F.R. Part 1910. JPR prepared the HASP for the activities specified in this work plan (JPR, 2021). The HASP has been submitted to the USEPA with this work plan.

A detailed discussion of pre-removal activities, site mobilization, excavation activities, capping activities, stockpiling, waste management and decontamination and the proposed schedule for implementation are presented in the following subsections.

4.1 Proposed Schedule

This subsection provides a general summary of tasks to be completed (pre-removal to post removal) and the proposed schedule, which is subject to change related to contracting procedures, contractor/stakeholder schedules and/or other unforeseen delays, to implement the TCRA work plan. Tasks and timelines are summarized as follows:

- Coordination Meeting – City of South Bend, will be performed within 3-weeks of USEPA approval of the ASAOC, the TCRA Work Plan and landfill selection approval.
- Bid advertisement / Pre-bid meeting (City of South Bend) and bid submittals to be completed within 8-weeks of the coordination meeting
- Contractor submittal review and procurement to be completed within 6-weeks of receipt of all bids.
- Contractor residential pre-construction meetings, pre-construction survey, utility locates, and backfill barrow source identification and testing will be completed within 4-weeks of contractor procurement. Any required permits will be completed and secured by the contractor during this period.
- Mobilization and TCRA work efforts (soil removal, backfilling and restoration) are estimated to be completed within 12-weeks of the completion of the prior tasks. This includes the collection and submittal of soil verification samples in residential yard units to the laboratory.
- A construction completion report will be prepared within 6-weeks of the receipt of the final, validated laboratory verification sample analytical results.

4.2 Pre-Removal Activities

This subsection provides a list of tasks that will be conducted prior to and as part of site mobilization. These tasks will be started prior to mobilization and will continue as the work progresses to completion.

4.2.1 City of South Bend Coordination Meeting

A planning meeting with the representatives of City of South Bend's Public Works, Police and Fire Departments and TCRA subcontractor will be scheduled. The purpose is to review conceptual project plans and discuss:

- Project sequencing.
- Any required permitting and notifications.
- Potential lane or street closures.
- Allowable days and hours of operations.
- Haul routes.
- Use of City water to support dust suppression and street cleaning.
- Review of air monitoring plan and contingency measures.

After this meeting, the TCRA subcontractor will finalize project plan submittals to capture all local ordinances or regulations required so that operations comply with all appropriate requirements. Minutes to document information and requirements discussed during this meeting will be prepared and submitted to the USEPA as part of monthly project reporting.

4.2.2 Submittals

Prior to the start of work, the TCRA subcontractor and their lower tier subcontractors that may have potential to contact lead impacted soil will provide documentation of current hazardous waste site operation training records and certifications and medical surveillance for their on-site personnel. The TCRA subcontractor will also prepare a HASP and Work Plan prior to the start of onsite activities. Additional pre-work submittals include barrow source identification and testing and a traffic management plan (TMP), which are detailed further in Sections 4.2.7 and 4.2.8, respectively.

4.2.3 Residential Pre-Construction Meetings

Once access to the two public housing yard units has been obtained, the project team will meet with the property owner and tenants to review the scope and details of project. A video or photo log will be made to document:

- Existing site conditions.
- Existing plant/tree/shrub inventory.
- Other existing landscape features.
- Condition of adjacent curbs, sidewalks, street, and driveways, if present.
- Existing utilities servicing adjacent buildings.
- Any drainage issues observed.

Following this meeting and review of on-site conditions, the TCRA subcontractor will make any modifications to the original design by updating the property-specific design drawing to document planned site restoration at completion. Minutes to document information and requirements discussed during this meeting will be prepared and submitted to the USEPA as part of monthly project reporting.

4.2.4 Pre-Construction Survey

The preconstruction survey shall establish control points on a minimum 20-by-20-foot grid and layout property-specific excavation areas within property boundaries. The control points will document physical features including sidewalks, curbs, driveways, patios, foundations, porches, etc. In addition, the survey will document preconstruction elevations and grades for the determination of target depths of the excavations. Additional grid points shall be located to mark changes in grade or surface material. JPR, an Indiana-licensed survey firm, will perform the perimeter survey of the TCRA areas and provide an elevation surveyed drawing to document prework conditions. Wood will provide global positioning system (GPS) turning points delineating each TCRA area shown on Figure 2 and Figure 3.

4.2.5 Utility Locating

The TCRA subcontractor will coordinate with the City of South Bend Public Works and Parks Department for a water and sewer utility locate relative to the TCRA Areas. The TCRA subcontractor shall contact Indiana811 by dialing 811 or 1-800-382-5544 at least two days prior to commencement of work in a given area. It shall be their responsibility to contact any other utility not in the Indiana811 system and verify their utility locations. A private subsurface utility location service will be subcontracted to perform subsurface survey on residential yard units. If other utilities (i.e., gas electric, telephone, etc.) need to be replaced or relocated in order to complete the TCRA, the TCRA subcontractor will coordinate these activities with the utility provider to minimize disturbance to service.

4.2.6 Landfill Approval for Excavated Soils

Existing site data will be used to obtain landfill acceptance of the lead impacted soil waste stream. PRPs will confirm with USEPA that the disposal facility meets requirements under 40 CFR § 300.440 (EPA Off-Site Rule), which provides that CERCLA wastes may only be placed in a facility in compliance with the Resource Conservation and Recovery Act (RCRA) or other applicable Federal or State requirements prior to mobilization. This landfill approval will allow for direct load out of excavated soils to eliminate need for the stockpiling excavated soils prior to transportation to the approved landfill. If necessary, additional landfill approvals will be in place prior to TCRA subcontractor mobilization.

4.2.7 Backfill Barrow Source Identification and Testing

The TCRA subcontractor will identify a barrow source for backfill sand and topsoil to be used for backfilling excavated areas and to install the additional 1-foot-thick, clean soil cap. Clean soils intended for backfill will be sampled by JPR as outlined in the current LPA Soil Management Plan (SMP) provided in Appendix B prior to use. These samples will be analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, pesticides, herbicides, and polychlorinated biphenyls (PCBs) at a rate of one sample per 500 cubic yards per source. Sample collection and laboratory testing protocols will comply with the testing specifications outlined in the LPA QAPP (WSP, 2017). Results will be compared to the June 2017 RSL values for residential soil, except for arsenic and lead where results will be compared to the IDEM Remediation Closure Guide (IDEM 2020) for soil exposure/direct contact (residential) value of 9.5 mg/kg and 200 mg/kg, respectively.

The Project Coordinator will review barrow source analytical results prior to the material being brought to the site and approve use of the fill materials. This will be required prior to TCRA subcontractor mobilization. Bills of ladings will be collected by JPR as barrow material is delivered to the site to keep a real-time tally of cubic yards of soil delivered per source (i.e., each residential yard unit and specific areas within the LPA). JPR will compile barrow source soil

sampling/documentation, in accordance with the requirements detailed in the SMP, throughout project execution.

4.2.8 Traffic Management

During the completion of soil excavation and capping, transportation and offloading activities will involve construction vehicles and trucks hauling materials to and from the TCRA areas through a residential area and the LPA. The TCRA subcontractor will be responsible for establishing safe and permissible traffic patterns to complete the work. The TMP will be developed to minimize disruption and inconvenience to the affected parties passing by or living in or near the work areas. The proposed traffic routes will be presented to and approved by City of South Bend Engineering Department prior to mobilization.

The TMP will conform to federal, state and local requirements depending on the roadway. To alert the general public of construction hazards, the following may be required or utilized as part of the TMP:

- Lane closure signs place in two locations before closure area.
- Slow moving equipment signs.
- Lane divider markings.
- Merge arrow lights.
- High level warning flag units.

The TMP will address transportation to the Site, delivery areas for construction equipment and supplies, truck filling and offloading locations to support the TCRA and subsequent transportation of waste away from the site. The TCRA subcontractor will be responsible for placement and maintenance of all traffic control devices in accordance with Indiana Department of Transportation (INDOT) Specification Standard 713.8.

4.3 Site Mobilization and Setup

Mobilization by the construction team will be managed by JPR, the construction management firm that will act as the PRP's representative, that is responsible for communication, coordination, site safety and project conformance to the Work Plan. Joseph Trojan from JPR will be the site superintendent and will communicate directly to Project Coordinator, Rick Brown, Veritas LLC. Site mobilization will not occur until all required permits and approvals have been obtained by the TCRA contractor and submitted for review and acceptance. Both JPR and the TCRA contractor will have full-time site superintendents responsible for site safety and adherence to project planning documents. Additional details regarding the roles, training and responsibilities of site workers are detailed in Section 4.4.

Site mobilization and setup includes tasks, equipment and personnel related to site safety, security, and preparation, emergency response contingency plan, and the preliminary project schedule. This includes:

- Permits and approval documentation provided by the TCRA contractor to JPR will be available onsite (electronically) during mobilization to the site and the implementation of the site work.
- Notification to emergency response agencies of project implementation plans.
- Posting of OSHA required notices and required safety programs and communication procedures.

- Temporary facilities for personnel will be staged by the existing fenced area (Figure 2). No onsite field office trailer is planned for the project.
- The existing fenced-in area will be used for equipment/personnel decontamination and temporary storage of decontamination water, construction supplies and personal protective equipment.
- If a barrow source staging area is required by the TCRA contractor, it will be constructed and protected by site erosion and sediment control (SESC) measures, in accordance with applicable local, State and/or federal rules and protected from public access by temporary snow fencing and signage.
- Complete pre-construction survey by a registered land surveyor to stake the extent of excavation areas. Stakes will be placed based on existing GPS unit coordinates of the six areas shown by magenta shading on Figure 2.
- Private and/or public utility locates will be completed following the pre-construction survey.

An effort will be made to limit any disturbance to the CBRC parking lot and/or building access during mobilization, setup and project execution. Additional details related to safety and security measures to be implemented on the LPA and/or residential yard units are detailed in Sections 4.5 to 4.6 and Section 4.7, respectively. The emergency response contingency plan is discussed in Section 4.9.

4.4 TCRA Organizational Structure and Responsibilities

This subsection describes the responsibilities for personnel during implementation of this scope of work.

4.4.1 Construction Project Manager

The Construction Project Manager (to be determined) will regularly interact with the Beck's Lake NPL Site Project Coordinator. The responsibilities of the Construction Project Manager include, but are not limited to:

- Overall management of construction activities, including coordination between TCRA contractors and utility companies
- Management of the site construction administrative activities
- Ensuring the project follows the Project Coordinator's guidance for proper implementation of the scope of work
- Assistance with waste characterization for offsite disposal of excavation spoils generated during these activities.

4.4.2 TCRA Subcontractor's Safety Officer

The responsibilities of the TCRA Contractor's Safety Officer(s) (to be determined) include, but are not limited to:

- The health and safety of the TCRA contractor's employees
- Implementation of soil exposure control measures
- Reporting to the Construction Project Manager.

The responsibility for approving contractor Health & Safety plans rests with the PRPs' consultants.

4.4.3 Site Workers

The responsibilities of the Site Workers include, but are not limited to:

- Performance of all work in a safe manner
- Adherence to the contractors' HASP
- Adherence to the soil exposure control measures.

4.4.4 JPR Site Superintendent

The JPR Site Superintendent (or designee) will serve as the environmental oversight consultant for this work and will report directly to the Project Coordinator. The responsibilities of the JPR Site Superintendent include but are not limited to:

- Provide daily and weekly updates to Project Coordinator, with real time updates as may be warranted
- Provide guidance to the Construction Project Manager during the TCRA construction activities
- Provide environmental monitoring/screening during construction to ensure compliance with the HASP, as required
- Monitor compliance with and support maintenance of exclusion zone(s) in active work areas
- Oversee implementation of dust control measures and air monitoring program in accordance with project planning documents
- Provide assistance with preparing a waste profile(s) for the accepting landfill(s) for excavation spoils
- Maintaining project records during implementation
- Oversight and documentation during the TCRA/soil cap implementation to verify proper implementation of the scope of work, including engineering controls

4.5 LPA Excavation Activities

TCRAs are to be performed on the LPA in the six (6) areas where soil lead levels have been detected above 1,200 mg/kg at a depth of 0 to 1 ft bgs (Figure 2). Execution of the TCRAs are detailed in sequence below:

- Temporary fencing will be installed around active work areas delineated during the pre-construction survey as a site control measure to create an exclusion zone. The temporary fenced working area will delineate the exclusion zone and create a physical barrier to deter the general public from accessing the work area. As an additional safety measure, signs will be posted along the fence perimeter and at CBRC to notify park users of the nature of the work and the exclusion zone, as previously employed at the Site (Amec Foster Wheeler, 2017).
- Only workers with site awareness training and adequate personal protective equipment (PPE) will be permitted to access the exclusion zone.
- Dust control measures will be implemented when warranted to control dust generated during earth work activities, in accordance with the SMP and as detailed in Section 5.4.
- The site safety officer will set up four (4) air monitoring stations around the perimeter of active work area as part of air monitoring plan, in accordance with the SMP and as detailed in Section 5.5.

- At the end of each workday, work areas will be secured by shuttering access to the temporary fencing area, and to the extent possible, excavations will be backfilled with clean barrow soil to further reduce potential safety hazards. The access gate to the existing fenced-in area will be locked and JPR and/or the TCRA Contractor's Safety Officer will verify that the work area is secure.
- In the LPA work areas, mature oak trees are present (e.g., Figure 2) that significantly contribute to the aesthetics of the park. If trees are to be removed, the tree and the stump/root ball will be removed prior to commencing excavation. If trees are to be left in-place, only 4-inches of soil will be excavated from below the tree's drip line. Hand digging and/or vacuum enhanced soil removal techniques will be used to remove loose soil from around exposed tree roots to minimize potential damage to the trees, when necessary. The applied soil cap outside of the drip line will be graded to avoid the development of a "water trap" in the tree root drip line that could damage and/or kill the tree. PRPs will confirm with USEPA that the disposal facility for LPA soils meets requirements under 40 CFR § 300.440 (EPA Off-Site Rule), which provides that CERCLA wastes may only be placed in a facility in compliance with the Resource Conservation and Recovery Act (RCRA) or other applicable Federal or State requirements prior to mobilization.
- In each area work area, a laser plane level station will be established to control depth of excavation. Soil from 0 to 1 ft bgs will be excavated and direct loaded into trucks for transportation. Transportation will be performed in accordance with the TMP for each work area.
- At the base of the excavation, the TCRA subcontractor will place a demarcation barrier consisting of a permeable geotextile fabric covering the work area. The demarcation barrier will be placed prior to the placement of clean backfill.
- Certified clean-fill barrow source(s) will be established prior to their delivery to the site in accordance with the approved SMP (Appendix B) and as described in Section 4.2.7. As indicated previously, clean soils intended for backfill will be sampled prior to use and analyzed for VOCs, SVOCs, metals, pesticides, herbicides, and PCBs at a rate of one sample per 500 cubic yards per source. Sample collection and laboratory testing protocols will comply with the testing specifications outlined in the LPA QAPP and Section 4.2.7 (WSP, 2017). Results will be compared to the June 2020 residential screening level (RSL) values for residential soil, except for arsenic and lead where results will be compared to the IDEM Remediation Closure Guide (IDEM 2012, revised in 2021) for soil exposure/direct contact (residential) value of 9.5 mg/kg and 200 mg/kg, respectively.
- Project Coordinator will review barrow source analytical results prior to the material being brought to the site and approve the use of the fill materials. This will be required prior to TCRA subcontractor mobilization. Bills of ladings will be collected by JPR as barrow material is delivered to the site to keep real-time tally of cubic yards of soil delivered per source and complete clean soil sampling/documentation requirements detailed in the SMP throughout project execution.
- To the extent practical, the portion of each TCRA that has been excavated will be backfilled, as described above, to match the original grade at the end of each workday. Placement of the additional 1-foot of capping material (i.e., above the original grade elevation) will then be completed in conjunction with the broader capping, backfilling and restoration activities described in Section 4.5.

4.6 Capping/Backfilling Activities

Placement of a 1-foot-thick, clean soil cap will be performed in the LPA in five areas where soil exceeds 400 mg/kg in the 0 to 1 ft bgs soil interval (Figure 2). As indicated previously, the

placement of clean fill at the 1-foot thickness level will extend from the point of the 400 mg/kg soil lead concentration exceedance to the nearest sampling location where soil lead results in the upper 1-foot of the soil column were below 400 mg/kg. The extent of capping has been extended as well in some areas to preserve current usability of park space (e.g., athletic fields). Soil cap installation details and the work sequence is described as follows:

- As part of the pre-construction survey by the registered land surveyor, stake corners of excavation areas based on existing GPS unit coordinates of the five (5) areas shown by light blue shading on Figure 2.
- Temporary fencing will be installed around active work areas as a site control measure to create an exclusion zone. The fenced working area will delineate the exclusion zone and create a physical barrier to deter the general public from accessing the work area. As an additional safety measure, signs will be posted along the fence perimeter to notify park users of the nature of the work and the exclusion zone, as previously employed at the Site (Amec Foster Wheeler, 2017). Only workers with site awareness training and adequate PPE will be permitted to access the exclusion zone. At the end of each workday, access gate(s) on the fence will be locked and the Contractor's Safety Officer will verify that the work area is secure.
- Dust control measures will be implemented when warranted to control dust generated during earth work activities, as described in Sections 4.4 and 5.4.
- The site safety officer will set up air four (4) monitoring stations around the perimeter of the active work area each day as part of air monitoring plan, in accordance with the SMP and as detailed in Section 5.4.
- JPR's site safety officer will set up air monitoring stations in active work area as part of air monitoring plan, as described in Sections 4.4 and 5.4.
- Management of soil cap placement around trees will be performed as described in Section 4.3, with every effort taken to avoid tree removal.
- The areas to be capped will be grubbed to remove vegetative cover. Then, a demarcation barrier consisting of a permeable geotextile fabric will be set above the grubbed area prior to the placement of 1-foot thick clean soil cap. Around the perimeter of each capped area a 4-to-1 slope will be used to tie cap into existing non-disturbed grade. The 1-foot cap thickness includes a minimum of 4-inches of topsoil that will be graded as a surface layer on the soil cap to re-establish grass.
- Certified clean-fill barrow source(s) will be established prior to any delivery to the site, as discussed in Section 4.4.
- Final restoration will include a grass cover on the final grade that will be re-established by hydroseeding and/or placement of sod, depending on the planned park use.
- A post-TCRA elevational survey will be performed by JPR to document the final grade.
- The TCRA areas detailed in Section 4.5 will also receive 1-foot cap as detailed above to allow for common grade at TCRA completion.

4.7 Residential TCRA Activities

Remedial actions to be performed on two (2) residential yard units where soils exceeding 400 mg/kg (0 to 2 ft bgs), see Figure 3, and are detailed and sequence below:

- USEPA reported the dimensions of residential yard units to be addressed under this TCRA are approximately 60 ft x 80 ft (SulTRAC, 2019). TCRAs will be performed at the two

residential yard units where lead was detected in the upper 2-ft of the soil column at levels 400 mg/kg to a depth of 2-ft (03-Q2 and 04-Q2), as shown on Figure 3.

- The perimeter of each yard unit will be marked by a registered land surveyor during a pre-construction survey.
- Temporary fencing will be installed around yard units as a site control measure to create an exclusion zone. The temporary fenced yard unit will delineate the exclusion zone and create a physical barrier to deter the general public from accessing the work area. As an additional safety measure, signs will be posted along the fence perimeter to notify residents of the nature of the work and the exclusion zone, as previously employed at the Site (Amec Foster Wheeler, 2017). Only workers with site awareness training and adequate PPE will be permitted to access the exclusion zone. At the end of each workday, access gate(s) on the temporary fence will shuttered as necessary and the access gate to the existing fenced-in area will be locked. The Contractor's Safety Officer will verify that the work area is secure.
- Dust control measures will be implemented when warranted to control dust generated during earth work activities, in accordance with the SMP and as detailed in Section 5.4.
- The site safety officer will set up air four (4) monitoring stations around the perimeter of active work area as part of air monitoring plan, in accordance with the SMP and as detailed in Section 5.4.
- Additional approval from the landfill may be required to accept soil waste from the residential properties. Due to access constraints, collection of additional waste characterization samples and waste profiling may be performed during the pre-construction survey (i.e., prior to initiation of the excavation work) to avoid the need for temporary staging of excavated soil during implementation of the TCRAs. PRPs will confirm with USEPA that the disposal facility meets requirements under 40 CFR § 300.440 (EPA Off-Site Rule), which provides that CERCLA wastes may only be placed in a facility in compliance with the RCRA or other applicable Federal or State requirements.
- Traffic control measures will be place along Falcon Street prior to mobilizing equipment to yard units for TCRA.
- Once landfill acceptance has been received, soil from 0 to 2 ft bgs will be excavated from each yard unit referenced above, and direct loaded into trucks for transportation to the approved landfill in accordance with the TMP.
    - A laser plane level station will be established to control and monitor the depth of each excavation.
    - Excavation in each yard unit will have a 1-to-1 sidewall slope away from existing structures (i.e., curbing, sidewalks, driveways and buildings).
    - If trees are present, excavations will have a 1-to-1 slope away from any tree's drip edge. Beneath the tree canopy only 4-inches of soils will be removed and replaced. Hand digging and/or vacuum enhanced soil removal techniques will be used to remove loose soil from around exposed tree roots and limit potential damage to the tree, as previously discussed.
- At the base of the excavation, a demarcation barrier consisting of a permeable geotextile fabric covering the work area prior to the placement of clean backfill.
- Certified clean-fill barrow source(s) will be established prior to any delivery to the site. In accordance with approved SMP (Appendix B), soil to be used as backfill will be sampled prior to use and analyzed for VOCs, SVOCs, metals, pesticides, herbicides, and PCBs at a rate of one sample per 500 cubic yards per source. Sample collection and laboratory

testing protocols will comply with the testing specifications outlined in the LPA QAPP (WSP, 2017). Results will be compared to the June 2020 RSL values for residential soil, except for arsenic where results will be compared to the IDEM Remediation Closure Guide (IDEM 2012, revised in 2021) for soil exposure/direct contact (residential) value of 9.5 mg/kg.

The Project Coordinator will review barrow source analytical results prior to the material being brought to the site and approval the use of the fill materials. This will be required prior to TCRA subcontractor mobilization. Bill of ladings will be collected by JPR as barrow material is delivered to the site to keep real-time tally of cubic yards of soil delivered per source and continue clean soil sampling/documentation requirements detailed in SMP throughout project execution.

- Each yard unit will be backfilled with certified-clean granular fill. This fill will be placed in six-inch lifts and compacted up to the original grade. This soil cap cover will include 3 to 4 inches of topsoil as the surface layer.
- Final restoration will include a grass cover on the final grade that will be re-established by hydroseeding and/or placement of sod, depending on the planned park use. This may also include extension of existing irrigation heads through and to the top of the clean soil cap.

4.8 Verification Samples

Soil verification samples details are presented below:

LPA TCRA Areas:

- The extent of excavation in TCRA areas in the LPA were delineated by surface and near surface soil sampling during the 2016 RI and the 2019 SI, as previously discussed and depicted on Figure 2 and presented in Table 1. Because each TCRA area will be covered with a 2-foot-thick, clean soil cap and an underlying demarcation layer will also be set prior to backfilling (to mitigate potential future exposure to underlying soil), no confirmatory soil samples will be collected from the base of the TCRA areas in the LPA.
- Because the TCRA areas in the LPA have been designed by the offset method recommended by the USEPA (e-mail correspondence June 5, 2020), half the distance from the detection exceeding 1,200 mg/kg and the nearest sample point below 1,200 mg/kg) and on top of the backfilled excavation the 1-foot-thick, clean soil cap will be extended to the nearest sampling point, no sidewall confirmatory sampling is planned along the perimeter of the TCRA areas in the LPA.

TCRA Residential Yard Units:

- Because residential yard units were assessed by the ISM, an exceedance of the 400 mg/kg applies to the entire yard unit (i.e., decision unit). Conversely, yard units with soil lead results below 400 mg/kg also require no remediation across the entire decision unit (Figure 3).
- To document lead concentrations in soil immediately beyond excavation limits, the EPA has requested verification soil samples be collected from each TCRA residential yard unit. Given the size of each residential yard units, approximately 60 ft by 80 ft. It is anticipated that four (4) sidewall 1-foot grab soil samples will be collect from each wall of the residential yard unit at the midpoint of the sidewall (i.e., 1-ft bgs) and four (4) additional grab samples will be collected from base of the excavation prior to placing demarcation barrier. Samples will be collected in accordance with SOP-F5 in Appendix A. Verification

soil samples will be analyzed by the laboratory for lead using QAPP specified method (Method 6020).

4.9 Contingency Plan

If conditions change from current known conditions, JPR superintendent will stop work and communicate change in condition to allow for new risk assessment of change in conditions by project team and to formulate additional engineering or institutional controls which may be warranted to complete scope of work safely protecting public health, workers and the environment. Prior to implementation contingency plan, the project coordinator will provide a summary of change in condition and resulting plan based on engineering evaluation to achieve project objectives.

Contractor submittals will include an emergency response plan in the event of spills or unintended releases from the Site. This may include preventative steps such as installation of temporary booms to protect nearby stormwater catch basins and daily inspections of equipment for potential leaks of fuel or other fluids. The emergency response plan will also require on-site spill kits to be readily available to address equipment-related spills/potential releases and will include details for spill reporting to local emergency response agencies and/or other applicable local, state or federal agencies.

4.10 Stockpiling

No stockpiling of excavated soils or barrow material is planned as part of this work.

4.11 Waste Management

As stated in the above sections, prior to mobilization, landfill acceptance and USEPA approval will be obtained to allow the direct load out of excavated material for direct transport to and disposal at the approved landfill. Water and material generated from decontamination will be staged in the existing fenced storage area and characterized for off-site disposal. PRPs will confirm with USEPA that the disposal facility meets requirements under 40 CFR § 300.440 (EPA Off-Site Rule), which provides that CERCLA wastes may only be placed in a facility in compliance with the RCRA or other applicable Federal or State requirements.

4.12 Decontamination

To prevent cross-contamination, measuring instruments and earth work equipment will be decontaminated before work begins and after completion of each TCRA area. A portable steam cleaner or pressure washer and an on-Site source of potable water will be used for decontamination. Decontamination will be performed as follows:

- Disposable PPE and sampling equipment will be managed according to the level of contamination encountered during field activities. PPE shall be decontaminated as per 29 CFR 1910.120(k). It is anticipated that all work will be conducted in Level D PPE and minimal decontamination will be required. Re-usable safety gear (i.e., boots) will be washed with soap and water prior to re-use or removing from the work zone. Alconox and/or Liquinox detergent and water will be used to clean grossly contaminated equipment and PPE in accordance with Field Equipment Cleaning and Decontamination Procedures SOP-F10 (Appendix A).
- Water derived from decontamination of equipment will be collected and temporarily stored in accordance with Small Equipment Decontamination standard operating procedure (SOP)-F12 (Appendix A).

- Excavation equipment will be steam cleaned before work begins and after work at each location in accordance with Heavy Equipment Decontamination SOP-F12 (Appendix A).
- All waste derived from gross decontamination will be collected and temporarily stored in INDOT-approved, 55-gallon drums or polyethylene tanks at the LPA for characterization in accordance with SOP-F12 (Appendix A) in the existing fenced-in IDW storage area.
- Disposable sampling equipment will be used to collect liquid waste characterization sample and to minimize the need to decontaminate equipment, in lieu of stainless-steel sampling equipment.
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- In general, PPE will be managed as non-hazardous solid waste, particularly if little contact occurs with the sampling medium and low levels of contaminants are involved. These disposable items will be double bagged and disposed of at solid waste landfill.

5.0 TCRA MONITORING AND MITIGATION MEASURES

This section presents monitoring and mitigation measures to be followed during implementation of this scope of work.

5.1 Removal and Backfill Quality Control

The JPR Site Superintendent will direct the construction manager as to the TCRA required in each area to the staked boundaries of the TCRA (completed during the pre-construction survey to horizontally delineate each TCRA area). The vertical extent of excavations will be monitored and documented by use of the elevation leveling station in each TCRA area. The JPR Site Superintendent will maintain a running tally of all manifested waste removed during TCRAs as well as running tallies of all backfill material brought to the site.

Bills of ladings will be collected by JPR as barrow material is delivered to the site to maintain a real-time tally of the volume of soil delivered to each TCRA area, to ensure clean soil sampling frequency and documentation requirements detailed in the SMP throughout project execution are met, and to ensure the backfill meets the certified clean specifications outlined in Sections 4.2.7 and 4.6.

5.2 Health and Safety Requirements

This project requires special health and safety precautions because it involves work near heavy machinery, work in areas accessible by the public, and will be potentially performed near overhead and underground utilities. Site activities will be coordinated with appropriate municipality personnel to minimize potential health and safety concerns for Site workers and the public. Prior to initiating TCRA activities, utility clearing procedures will be implemented and, if necessary, hand clearing and/or temporary utility re-locates will be performed, as indicated in Section 4.2.5.

All field activities will comply with the project-specific HASP prepared by each consulting firm and the TCRA subcontractor. Before field activities begin, all field personnel and subcontractors will read and sign the HASP, indicating that they understand the plan and agree to operate in accordance with requirements set forth in the document. All personnel and subcontractors performing any handling/removal of contaminated soils or that may come into contact with contaminated soils require 40-Hour hazardous waste and emergency response training. For subcontractors that may be laying sod on top of clean fill or planting bushes, flowers, etc. in clean fill, the 40-Hour HAZWOPER is not required. Proof of training must be filed with the signed HASP. A complete copy of the Site-specific plans, including the HASP, will be maintained onsite by the TCRA subcontractor's safety officer(s).

Daily tailgate meetings will be conducted by JPR Site Superintendent or his designee to review daily activities and activity hazard analysis for work to be implemented each day in the field. Daily tailgate meetings will be documented on a safety meeting log and in the Field Logbook (see Appendix A and Appendix C).

5.3 Dust Control Plan

Dust control is the primary method of mitigating dust emissions from the construction area. Soil will be wetted as necessary to ensure dust levels remain below action levels. The TCRA subcontractor's safety officer(s), the Construction Project Manager and JPR Site Superintendent will be responsible for determining the frequency and degree of water applications to control dust.

The TCRA subcontractor's safety officer(s) will coordinate with the Construction Project Manager to schedule water applications, as necessary. The water applications should not overly wet and degrade the working condition of the soil. Use of wetting agents will be considered.

Dust emissions will be monitored by JPR visually and with a real-time handheld monitoring instrument that will run continuously during excavation and backfilling activities. The monitoring instrument will be a DustTrak II Aerosol Monitor, or equivalent. The DustTrak II can measure dust over a range of 0.001 to 150 milligrams per cubic meter (mg/m^3). Dust emission monitoring logs will be maintained onsite using the forms provided in Appendix C. The JPR Site Superintendent will be responsible for ensuring dust monitoring measurements are recorded on the monitoring logs on an hourly frequency during active work periods. Dust monitoring will be performed in conjunction with the continuous air monitoring documented in Section 5.5.

The American Conference of Governmental Industrial Hygienists (ACGIH) suggests that airborne concentrations of nuisance dusts or "particulates not otherwise classified" should be kept below 3 mg/m^3 (respirable particles) and 10 mg/m^3 (inhalable particles) (2012). Using the ACGIH respirable particles criteria, an action level during construction activities will be established at 1.0 mg/m^3. Table 2 presents dust exposure safety calculations, determined using maximum metals concentrations in soil detected during the LPA RI and supplemental investigations at the Site (Wood, 2016 and Wood, 2019).

If the Construction Project Manager or the JPR Site Superintendent determines the dust levels are too high (i.e., at or above 1.0 mg/m^3), the TCRA subcontractor will be responsible for implementing active dust control measures.

If necessary, water will be applied to paved surfaces, including parking areas and roads that become tracked with construction/excavation soils. A water truck may be used to limit dust generation during periods of high truck traffic in the work area. When necessary, paved surfaces will be swept (mechanical street sweeper) to reduce dust generation and to prevent the tracking of soils onto public roads.

5.4 Air Monitoring Plan

Dust will be managed during soil disturbance activities to minimize the potential for airborne migration of affected materials and to be protective of employees, site workers, and properties adjacent to the construction area. Dust will be monitored visually and with a real-time handheld instrument with the goal of no visual emissions and measured levels at or below 1.0 mg/m^3.and will also include daily collection of perimeter air samples. Dust control measures such as mechanical street sweeping, soil wetting, and water trucks will be employed as needed to eliminate dust generation.

During TCRA operations, perimeter air sampling will be implemented around each TCRA area of active work. JPR will setup four (4) simultaneous air samplers with dedicated portable air sampling pumps around the fenced perimeter of the active work area. Real time air samples for respirable dust levels will be collected at four locations along the Site perimeter during TCRA operations. Three sampling locations will be positioned in a 180-degree arc in the down-wind direction from the site activities and one additional sampler will be placed in the upwind direction. Samplers will be secured approximately 4 to 5-ft above the ground surface (i.e., breathing zone). Each monitoring station will be equipped with a DustTrak II Aerosol Monitor, or equivalent. The DustTrak II can measure dust over a range of 0.001 to 150 milligrams per cubic meter (mg/m^3). The instrument measures within

range of project action level of 1.0 mg/m^3 and will be checked on an hourly basis throughout the workday. Readings at these stations will be recorded on the dust monitoring forms (Appendix C).

JPR will record each sampling location with a GPS unit for future reference. Weather data for the Site (i.e., wind speed, wind direction, temperature, and barometric pressure) will be recorded from the South Bend Airport (approximately 1.5 miles southwest of the Site) via National Weather Service radio and/or internet website.

Construction area personal air monitoring is not anticipated to be required for this site due to the limited scope of soil disturbance but may be used if site conditions suggest otherwise.

5.5 Stormwater Management and Erosion Control

The TCRA subcontractor will be responsible for stormwater management. This project does require an erosion, sedimentation and pollution prevention plan (i.e., an SWPPP "Rule 5" Erosion Control Permit) in accordance with 2020, INDOT Standard Specifications Sections 107.15 for the work in LaSalle Park. The TCRA subcontractor shall be responsible for creating and maintaining an approved Rule 5 Plan with the St Joseph County Soil & Water Conservation District in accordance with the current "Indiana Storm Water Quality Manual". Permit mitigation measures shall be implemented to protect each TCRA work areas. City of South Bend specifications and requirements regarding erosion and sedimentation control and temporary erosion control shall be incorporated into the SWPPP.

5.6 TCRA Reporting

The Project Coordinator will host weekly project update calls with project personnel, PRP representatives and the USEPA and IDEM Project Managers and/or their designees. Weekly construction progress reports shall be prepared to document on-site TCRA progress. Upon completion of the TCRAs, soil cap installations, and subsequent restoration, a construction completion report will be prepared. This report will include a summary of the project chronology, weigh tickets and bills of lading for materials brought to and transported from the site to complete project as well as figures documenting the final disposition of the work areas.

6.0 REFERENCES

Amec Foster Wheeler, Inc., 2016a. "Focused LaSalle Park Area Remedial Investigation and Feasibility Study Work Plan". June 15, 2016.

Amec Foster Wheeler, Inc., 2016b. "Focused LaSalle Park Area Remedial Investigation and Feasibility Study Field Sampling Plan". June 15, 2016.

Amec Foster Wheeler, Inc., 2016c. "Focused LaSalle Park Area Remedial Investigation and Feasibility Study Health and Safety Plan". February 23, 2016.

Amec Foster Wheeler, Inc., 2017. "Focused LaSalle Park Area Remedial Investigation Report". August 7, 2017.

Bendix Corporation, March 28, 1984, "*103c CERCLA Notification for Beck's Lake Site".*

City of Elkhart, 2016. "Elkhart-South Bend Aquatic Community Monitoring – Annual Report 2015". April 2016.

Ecology and Environment, Inc., 1989[2]. *"Screening Site Inspection Report",* The Beck's Lake Site South Bend, Indiana. June 7, 1989, Page 3-2.

Ecology and Environment, Inc., 1989[3]. *"Screening Site Inspection Report, The Beck's Lake Site South Bend, Indiana"*. June 7, 1989, Page 5-3.

Indiana Department of Environmental Management (IDEM), 2012. "Remediation Closure Guide". March 22, 2012. Page 81.

IDEM, 2009[2]. *"Expanded Site Inspection 2 Report, Beck's Lake Site, South Bend, IN, St. Joseph County"*. December 20, 2009. Page 15.

IDEM, 2009[3]. *"Expanded Site Inspection 2 Report, Beck's Lake Site, South Bend, IN, St. Joseph County".* December 20, 2009. Appendix I.

IDEM, 2009[4]. *"Expanded Site Inspection 2 Report, Beck's Lake Site, South Bend, IN, St. Joseph County".* December 20, 2009. Page 14.

IDEM, 2017. Email from Ali Meils, Fish Tissue Contaminants Monitoring Program. Dated September 27, 2017, PCBs in Fish Tissue – IDEM Data Request, To: Kimball, Greg <Greg.Kimball@wsp.com>, Attachments: *Indiana Department of Environmental Management Office of Water Quality-Watershed Assessment and Planning Branch, Fish Tissues Results Summary – PCBs;* and *Indiana Department of Environmental Management Office of Water Quality-Watershed Assessment and Planning Branch, Fish Tissues Results Summary – Dioxins.*

IDNR, 1921. Record of Water Well. Reference Number 57128. January 1, 1921.

JPR, 2021. "Health and Safety Plan Beck's Lake NPL Site". August 2021.

Michiana Storm Water Partnership, 2010. *"St. Joseph County Watersheds and Receiving Waters"*. July 2010.

St. Joseph County Health Department (SJCHD), IDEM, 2017. Email from Mark Espich, SJCHD. Dated September 11, 2017, To: Trojan, Joseph <Joseph.Trojan@wsp.com>, Attachments: *ACA boundaries near LaSalle Park.*

SJCHD, March 28, 1984, *"Notification Letter to the Department of Public Works-South Bend Indiana"*.

United States Environmental Protection Agency (USEPA), 2015[1]. *"Administrative Settlement Agreement and Order on Consent (ASAOC) For Focused Remedial Investigation/Feasibility Study of The LaSalle Park Area of The Beck's Lake Site"*. October 2, 2015, Findings of Fact 15, page 6.

USEPA, 2015[2]. *"ASAOC For Focused Remedial Investigation/Feasibility Study of The LaSalle Park Area of The Beck's Lake Site"*. October 2, 2015, Findings of Fact 16, page 6.

USEPA, 2009. "*The National Study of Chemical Residues in Lake Fish Tissue"*. EPA 823-R-09-006, USEPA Office of Water, September 2009.

USEPA, 2006. "*Guidance on Systematic Planning Using the Data Quality Objectives Process"*. EPA QA/G-4, February 2006. EPA/240/B-06/001.

USEPA, 2003. "*Protecting Water Quality from Urban Runoff"*. EPA 841-F-03-003, USEPA Nonpoint Source Control Branch, February 2003.

USEPA, 2001. "*The Role of Screening Level Risk Assessments and Refining Contaminants of Concern in Baseline Ecological Risk Assessments*." USEPA ECO Update, Office of Solid Waste and Emergency Response. 540/F-01/014. June.

USEPA, 1998. "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA". Interim Final, October 1998.

USEPA, 1998. *Guidelines for Ecological Risk Assessment. Office of Research and Development*. EPA-630-R-95-002F. April.

USEPA, 1997. "*Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments."* EPA 540-R-97-006. June.

USEPA, 1993. "*Wildlife Exposure Factors Handbook*." EPA/600/R-93/187. December.

USEPA, 1992. "*Guide to Management of Investigation–Derived Wastes".* January 15, 1992.

USEPA, 1992b. "*Framework for Ecological Risk Assessment*." EPA-630-R-92-001. February.

USEPA. 1989a. "*Risk Assessment Guidance for Superfund. Volume I: Human health evaluation manual. Part A. Interim Final*. EPA/540/1-89/002. December.

USEPA, 1988. "*Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA"*. OSWER Directive 9355.3-01. EPA/540/G-89/004. October, 1988.

United States Geological Survey (USGS), 1995. "*Ground-Water Quality in Northeastern St. Joseph County, Indiana"*. USGS Water-Resources Investigations Report 95-4092, 1995.

WESTON Solutions, Inc., 2013[1]. "*Hazardous Ranking System Documentation Record".* March 2013, Page 24.

WESTON Solutions, Inc., 2013. *"Health Risk Site Assessment at LaSalle Park"*. July 29, 2013.

WSP|Parsons Brinckerhoff, 2016a. "Quality Assurance Project Plan Beck's Lake Site, LaSalle Park Area Focused Remedial Investigation / Feasibility Study". June 16, 2016.

WSP|Parsons Brinckerhoff, 2016b. "Health and Safety Plan Beck's Lake Site, LaSalle Park Area Focused Remedial Investigation / Feasibility Study". February 23, 2016.

TABLES

Table 1. 2019 Surface/Near Surface Soil Laboratory Analytical Lead Results
Beck's Lake NPL Site
South Bend, IN

June 2021

				Lab Method:	SW6020
				Analyte:	LEAD
				EPA RML (mg/kg):	400
				IDEM Recreation Park (mg/kg):	800
Location	**Sample ID**	**Sample Type**	**Sample Date**	**Sample Depth**	Result (mg/kg)
01SS-1	LPA01-SS-001 (0.0'-0.5')(20191118)	N	11/18/2019	0-0.5 ft.	46
	LPA01-SS-001 (0.5'-1.0')(20191118)	N	11/18/2019	0.5-1 ft.	55
01SS-2	LPA01-SS-002 (0.0'-0.5')(20191118)	N	11/18/2019	0-0.5 ft.	120
	LPA01-SS-002 (0.5'-1.0')(20191118)	N	11/18/2019	0.5-1 ft.	300
01SS-3	LPA01-SS-003 (0.0'-0.5')(20191118)	N	11/18/2019	0-0.5 ft.	39
	LPA01-SS-003 (0.5'-1.0')(20191118)	N	11/18/2019	0.5-1 ft.	30
02SS-3	LPA02-SS-003 (0.0'-0.5')(20191118)	N	11/18/2019	0-0.5 ft.	54
	LPA02-SS-003 (0.5'-1.0')(20191118)	N	11/18/2019	0.5-1 ft.	44
02SS-4	LPA02-SS-004 (0.0'-0.5')(20191118)	N	11/18/2019	0-0.5 ft.	55 J
	LPA02-SS-004 (0.5'-1.0')(20191118)	N	11/18/2019	0.5-1 ft.	72
03SS-1	LPA03-SS-001 (0.0'-0.5')(20191118)	N	11/18/2019	0-0.5 ft.	190
	LPA03-SS-001 (0.5'-1.0')(20191118)	N	11/18/2019	0.5-1 ft.	330
03SS-2	LPA03-SS-002 (0.0'-0.5')(20191119)	N	11/19/2019	0-0.5 ft.	57
	LPA03-SS-002 (0.5'-1.0')(20191119)	N	11/19/2019	0.5-1 ft.	25
03SS-3	LPA03-SS-003 (0.0'-0.5')(20191119)	N	11/19/2019	0-0.5 ft.	110
	LPA03-SS-003 (0.5'-1.0')(20191119)	N	11/19/2019	0.5-1 ft.	290
03SS-4	LPA03-SS-004 (0.0'-0.5')(20191119)	N	11/19/2019	0-0.5 ft.	100
	LPA03-SS-004 (0.5'-1.0')(20191119)	N	11/19/2019	0.5-1 ft.	77
04SS-1	LPA04-SS-001 (0.0'-0.5')(20191119)	N	11/19/2019	0-0.5 ft.	40
	LPA04-SS-001 (0.5'-1.0')(20191119)	N	11/19/2019	0.5-1 ft.	**450**
04SS-2	LPA04-SS-002 (0.0'-0.5')(20191119)	N	11/19/2019	0-0.5 ft.	85
	LPA04-SS-002 (0.5'-1.0')(20191119)	N	11/19/2019	0.5-1 ft.	240
04SS-3	LPA04-SS-003 (0.0'-0.5')(20191119)	N	11/19/2019	0-0.5 ft.	49
	LPA04-QD-001 (0.5'-1.0')(20191119)	FD	11/18/2019	0.5-1 ft.	40
	LPA04-SS-003 (0.5'-1.0')(20191119)	N	11/19/2019	0.5-1 ft.	37
04SS-4	LPA04-SS-004 (0.0'-0.5')(20191119)	N	11/18/2019	0-0.5 ft.	91
	LPA04-SS-004 (0.5'-1.0')(20191119)	N	11/19/2019	0.5-1 ft.	54
05SS-1	LPA05-SS-001 (0.0'-0.5')(20191119)	N	11/19/2019	0-0.5 ft.	15
	LPA05-SS-001 (0.5'-1.0')(20191119)	N	11/19/2019	0.5-1 ft.	55
05SS-2	LPA05-SS-002 (0.0'-0.5')(20191120)	N	11/20/2019	0-0.5 ft.	60
	LPA05-SS-002 (0.5'-1.0')(20191120)	N	11/20/2019	0.5-1 ft.	41
05SS-3	LPA05-SS-003 (0.0'-0.5')(20191120)	N	11/20/2019	0-0.5 ft.	59
	LPA05-SS-003 (0.5'-1.0')(20191120)	N	11/20/2019	0.5-1 ft.	170
05SS-4	LPA05-SS-004 (0.0'-0.5')(20191120)	N	11/20/2019	0-0.5 ft.	41
	LPA05-SS-004 (0.5'-1.0')(20191120)	N	11/20/2019	0.5-1 ft.	290
06SS-1	LPA06-SS-001 (0.0'-0.5')(20191122)	N	11/22/2019	0-0.5 ft.	58
	LPA06-SS-001 (0.5'-1.0')(20191122)	N	11/22/2019	0.5-1 ft.	130
06SS-2	LPA06-SS-002 (0.0'-0.5')(20191122)	N	11/22/2019	0-0.5 ft.	**410**
	LPA06-SS-002 (0.5'-1.0')(20191122)	N	11/22/2019	0.5-1 ft.	250
06SS-3	LPA06-SS-003 (0.0'-0.5')(20191122)	N	11/22/2019	0-0.5 ft.	48
	LPA06-SS-003 (0.5'-1.0')(20191122)	N	11/22/2019	0.5-1 ft.	49
06SS-4	LPA06-SS-004 (0.0'-0.5')(20191122)	N	11/22/2019	0-0.5 ft.	91
	LPA06-SS-004 (0.5'-1.0')(20191122)	N	11/22/2019	0.5-1 ft.	210
07SS-1	LPA07-SS-001 (0.0'-0.5')(20191120)	N	11/20/2019	0-0.5 ft.	200
	LPA07-SS-001 (0.5'-1.0')(20191120)	N	11/20/2019	0.5-1 ft.	220
07SS-2	LPA07-SS-002 (0.0'-0.5')(20191120)	N	11/20/2019	0-0.5 ft.	100
	LPA07-SS-002 (0.5'-1.0')(20191120)	N	11/20/2019	0.5-1 ft.	150
07SS-3	LPA07-SS-003 (0.0'-0.5')(20191120)	N	11/20/2019	0-0.5 ft.	58
	LPA07-SS-003 (0.5'-1.0')(20191120)	N	11/20/2019	0.5-1 ft.	41
07SS-4	LPA07-SS-004 (0.0'-0.5')(20191120)	N	11/20/2019	0-0.5 ft.	43
	LPA07-QD-002 (0.5'-1.0')(20191120)	FD	11/20/2019	0.5-1 ft.	21
	LPA07-SS-004 (0.5'-1.0')(20191120)	N	11/20/2019	0.5-1 ft.	18

Prepared by AKN 01/31/2021
Checked by LCM 01/31/2021

Table 1. 2019 Surface/Near Surface Soil Laboratory Analytical Lead Results
Beck's Lake NPL Site
South Bend, IN

				Lab Method:	SW6020
				Analyte:	LEAD
				EPA RML (mg/kg):	400
				IDEM Recreation Park (mg/kg):	800
Location	**Sample ID**	**Sample Type**	**Sample Date**	**Sample Depth**	Result (mg/kg)
08SS-1	LPA08-SS-001 (0.0'-0.5')(20191122)	N	11/22/2019	0-0.5 ft.	54
	LPA08-SS-001 (0.5'-1.0')(20191122)	N	11/22/2019	0.5-1 ft.	41
08SS-2	LPA08-SS-002 (0.0'-0.5')(20191122)	N	11/22/2019	0-0.5 ft.	52
	LPA08-SS-002 (0.5'-1.0')(20191122)	N	11/22/2019	0.5-1 ft.	82
08SS-3	LPA08-SS-003 (0.0'-0.5')(20191119)	N	11/22/2019	0-0.5 ft.	100
	LPA08-SS-003 (0.5'-1.0')(20191122)	N	11/22/2019	0.5-1 ft.	250
08SS-4	LPA08-SS-004 (0.0'-0.5')(20191122)	N	11/22/2019	0-0.5 ft.	43
	LPA08-SS-004 (0.5'-1.0')(20191122)	N	11/22/2019	0.5-1 ft.	19
09SS-1	LPA09-SS-001 (0.0'-0.5')(20191125)	N	11/25/2019	0-0.5 ft.	73
	LPA09-SS-001 (0.5'-1.0')(20191125)	N	11/25/2019	0.5-1 ft.	100
09SS-2	LPA09-SS-002 (0.0'-0.5')(20191125)	N	11/25/2019	0-0.5 ft.	140
	LPA09-QD-003 (0.5'-1.0')(20191125)	FD	11/25/2019	0.5-1 ft.	68
	LPA09-SS-002 (0.5'-1.0')(20191125)	N	11/25/2019	0.5-1 ft.	75 J
09SS-3	LPA09-SS-003 (0.0'-0.5')(20191125)	N	11/25/2019	0-0.5 ft.	120
	LPA09-SS-003 (0.5'-1.0')(20191125)	N	11/25/2019	0.5-1 ft.	**630 J**
09SS-4	LPA09-SS-004 (0.0'-0.5')(20191125)	N	11/25/2019	0-0.5 ft.	62
	LPA09-SS-004 (0.5'-1.0')(20191125)	N	11/25/2019	0.5-1 ft.	58
10SS-1	LPA10-SS-001 (0.0'-0.5')(20191125)	N	11/25/2019	0-0.5 ft.	86
	LPA10-SS-001 (0.5'-1.0')(20191125)	N	11/25/2019	0.5-1 ft.	82
10SS-2	LPA10-SS-002 (0.0'-0.5')(20191125)	N	11/25/2019	0-0.5 ft.	62
	LPA10-SS-002 (0.5'-1.0')(20191125)	N	11/25/2019	0.5-1 ft.	60
10SS-3	LPA10-SS-003 (0.0'-0.5')(20191125)	N	11/25/2019	0-0.5 ft.	110
	LPA10-SS-003 (0.5'-1.0')(20191125)	N	11/25/2019	0.5-1 ft.	180
10SS-4	LPA10-SS-004 (0.0'-0.5')(20191125)	N	11/25/2019	0-0.5 ft.	49
	LPA10-SS-004 (0.5'-1.0')(20191125)	N	11/25/2019	0.5-1 ft.	280
11SS-1	LPA11-SS-001 (0.0'-0.5')(20191126)	N	11/26/2019	0-0.5 ft.	75 J
	LPA11-SS-001 (0.5'-1.0')(20191126)	N	11/26/2019	0.5-1 ft.	**1700**
11SS-2	LPA11-SS-002 (0.0'-0.5')(20191126)	N	11/26/2019	0-0.5 ft.	120 J
	LPA11-SS-002 (0.5'-1.0')(20191126)	N	11/26/2019	0.5-1 ft.	57
11SS-3	LPA11-SS-003 (0.0'-0.5')(20191125)	N	11/25/2019	0-0.5 ft.	49
	LPA11-SS-003 (0.5'-1.0')(20191125)	N	11/25/2019	0.5-1 ft.	17
11SS-4	LPA11-SS-004 (0.0'-0.5')(20191126)	N	11/26/2019	0-0.5 ft.	66
	LPA11-QD-004 (0.5'-1.0')(20191126)	FD	11/26/2019	0.5-1 ft.	83
	LPA11-SS-004 (0.5'-1.0')(20191126)	N	11/26/2019	0.5-1 ft.	78
12SS-1	LPA12-SS-001 (0.0'-0.5')(20191126)	N	11/26/2019	0-0.5 ft.	200
	LPA12-SS-001 (0.5'-1.0')(20191126)	N	11/26/2019	0.5-1 ft.	**2100**
12SS-2	LPA12-SS-002 (0.0'-0.5')(20191126)	N	11/26/2019	0-0.5 ft.	91 J
	LPA12-SS-002 (0.5'-1.0')(20191126)	N	11/26/2019	0.5-1 ft.	93
12SS-3	LPA12-SS-003 (0.0'-0.5')(20191126)	N	11/26/2019	0-0.5 ft.	72
	LPA12-SS-003 (0.5'-1.0')(20191126)	N	11/26/2019	0.5-1 ft.	64
12SS-4	LPA12-SS-004 (0.0'-0.5')(20191126)	N	11/26/2019	0-0.5 ft.	57
	LPA12-SS-004 (0.5'-1.0')(20191126)	N	11/26/2019	0.5-1 ft.	69
13SS-1	LPA13-SS-001 (0.0'-0.5')(20191126)	N	11/26/2019	0-0.5 ft.	67
	LPA13-SS-001 (0.5'-1.0')(20191126)	N	11/26/2019	0.5-1 ft.	74
13SS-2	LPA13-SS-002 (0.0'-0.5') (20191202)	N	12/2/2019	0-0.5 ft.	140
	LPA13-SS-002 (0.5'-1.0') (20191202)	N	12/2/2019	0.5-1 ft.	100
13SS-3	LPA13-SS-003 (0.0'-0.5') (20191202)	N	12/2/2019	0-0.5 ft.	120
	LPA13-SS-003 (0.5'-1.0') (20191202)	N	12/2/2019	0.5-1 ft.	150
13SS-4	LPA13-SS-004 (0.0'-0.5') (20191202)	N	12/2/2019	0-0.5 ft.	110
	LPA13-SS-004 (0.5'-1.0') (20191202)	N	12/2/2019	0.5-1 ft.	190

Table 1. 2019 Surface/Near Surface Soil Laboratory Analytical Lead Results
Beck's Lake NPL Site
South Bend, IN

June 2021

				Lab Method:	SW6020
				Analyte:	LEAD
				EPA RML (mg/kg):	400
				IDEM Recreation Park (mg/kg):	800
Location	**Sample ID**	**Sample Type**	**Sample Date**	**Sample Depth**	Result (mg/kg)
15SS-1	LPA15-SS-001 (0.0'-0.5') (20191202)	N	12/2/2019	0-0.5 ft.	81
	LPA15-SS-001 (0.5'-1.0') (20191202)	N	12/2/2019	0.5-1 ft.	**5600 J**
15SS-2	LPA15-SS-002 (0.0'-0.5') (20191202)	N	12/2/2019	0-0.5 ft.	97
	LPA15-SS-002 (0.5'-1.0') (20191202)	N	12/2/2019	0.5-1 ft.	19
15SS-4	LPA15-SS-004 (0.0'-0.5') (20191202)	N	12/2/2019	0-0.5 ft.	56
	LPA15-QD-005 (0.5'-1.0') (20191202)	FD	12/2/2019	0.5-1 ft.	44
	LPA15-SS-004 (0.5'-1.0') (20191202)	N	12/2/2019	0.5-1 ft.	41
16SS-1	LPA16-SS-001 (0.0'-0.5') (20191202)	N	12/2/2019	0-0.5 ft.	44
	LPA16-SS-001 (0.5'-1.0') (20191202)	N	12/2/2019	0.5-1 ft.	52
16SS-2	LPA16-SS-002 (0.0'-0.5') (20191203)	N	12/3/2019	0-0.5 ft.	48
	LPA16-SS-002 (0.5'-1.0') (20191203)	N	12/3/2019	0.5-1 ft.	42
16SS-3	LPA16-SS-003 (0.0'-0.5') (20191203)	N	12/3/2019	0-0.5 ft.	300
	LPA16-SS-003 (0.5'-1.0') (20191203)	N	12/3/2019	0.5-1 ft.	94
16SS-4	LPA16-SS-004 (0.0'-0.5') (20191203)	N	12/3/2019	0-0.5 ft.	65
	LPA16-SS-004 (0.5'-1.0') (20191203)	N	12/3/2019	0.5-1 ft.	51
17SS-1	LPA17-SS-001 (0.0'-0.5') (20191204)	N	12/4/2019	0-0.5 ft.	170
	LPA17-SS-001 (0.5'-1.0') (20191204)	N	12/4/2019	0.5-1 ft.	**1500**
17SS-2	LPA17-SS-002 (0.0'-0.5') (20191204)	N	12/4/2019	0-0.5 ft.	**410**
	LPA17-SS-002 (0.5'-1.0') (20191204)	N	12/4/2019	0.5-1 ft.	**860**
17SS-3	LPA17-SS-003 (0.0'-0.5') (20191204)	N	12/4/2019	0-0.5 ft.	54
	LPA17-SS-003 (0.5'-1.0') (20191204)	N	12/4/2019	0.5-1 ft.	51
17SS-4	LPA17-SS-004 (0.0'-0.5') (20191204)	N	12/4/2019	0-0.5 ft.	35
	LPA17-SS-004 (0.5'-1.0') (20191204)	N	12/4/2019	0.5-1 ft.	24
18SS-1	LPA18-SS-001 (0.0'-0.5') (20191204)	N	12/4/2019	0-0.5 ft.	37
	LPA18-SS-001 (0.5'-1.0') (20191204)	N	12/4/2019	0.5-1 ft.	31
18SS-2	LPA18-SS-002 (0.0'-0.5') (20191204)	N	12/4/2019	0-0.5 ft.	56
	LPA18-QD-006 (0.5'-1.0') (20191204)	FD	12/4/2019	0.5-1 ft.	94
	LPA18-SS-002 (0.5'-1.0') (20191204)	N	12/4/2019	0.5-1 ft.	77
18SS-3	LPA18-SS-003 (0.0'-0.5') (20191205)	N	12/5/2019	0-0.5 ft.	290
	LPA18-SS-003 (0.5'-1.0') (20191205)	N	12/5/2019	0.5-1 ft.	110
18SS-4	LPA18-SS-004 (0.0'-0.5') (20191205)	N	12/5/2019	0-0.5 ft.	190
	LPA18-SS-004 (0.5'-1.0') (20191205)	N	12/5/2019	0.5-1 ft.	**950**
19SS-1	LPA19-SS-001 (0.0'-0.5') (20191206)	N	12/6/2019	0-0.5 ft.	83
	LPA19-SS-001 (0.5'-1.0') (20191206)	N	12/6/2019	0.5-1 ft.	75
19SS-2	LPA19-SS-002 (0.0'-0.5') (20191205)	N	12/5/2019	0-0.5 ft.	100
	LPA19-SS-002 (0.5'-1.0') (20191205)	N	12/5/2019	0.5-1 ft.	42
19SS-3	LPA19-SS-003 (0.0'-0.5') (20191205)	N	12/5/2019	0-0.5 ft.	40
	LPA19-SS-003 (0.5'-1.0') (20191205)	N	12/5/2019	0.5-1 ft.	36
19SS-4	LPA19-SS-004 (0.0'-0.5') (20191205)	N	12/5/2019	0-0.5 ft.	22
	LPA19-SS-004 (0.5'-1.0') (20191205)	N	12/5/2019	0.5-1 ft.	11
23SS-1	LPA23-SS-001 (0.0'-0.5') (20191206)	N	12/6/2019	0-0.5 ft.	51
	LPA23-SS-001 (0.5'-1.0') (20191206)	N	12/6/2019	0.5-1 ft.	46
24SS-1	LPA24-SS-001 (0.0'-0.5') (20191205)	N	12/5/2019	0-0.5 ft.	57
	LPA24-SS-001 (0.5'-1.0') (20191205)	N	12/5/2019	0.5-1 ft.	75
24SS-2	LPA24-SS-002 (0.0'-0.5') (20191206)	N	12/6/2019	0-0.5 ft.	150
	LPA24-SS-002 (0.5'-1.0') (20191206)	N	12/6/2019	0.5-1 ft.	130
24SS-4	LPA24-SS-004 (0.0'-0.5') (20191206)	N	12/6/2019	0-0.5 ft.	92
	LPA24-QD-007 (0.5'-1.0') (20191206)	FD	12/6/2019	0.5-1 ft.	150
	LPA24-SS-004 (0.5'-1.0') (20191206)	N	12/6/2019	0.5-1 ft.	110
25SS-1	LPA25-SS-001 (0.0'-0.5') (20191206)	N	12/6/2019	0-0.5 ft.	44
	LPA25-SS-001 (0.5'-1.0') (20191206)	N	12/6/2019	0.5-1 ft.	26
25SS-2	LPA25-SS-002 (0.0'-0.5') (20191206)	N	12/6/2019	0-0.5 ft.	28
	LPA25-SS-002 (0.5'-1.0') (20191206)	N	12/6/2019	0.5-1 ft.	25
25SS-3	LPA25-SS-003 (0.0'-0.5') (20191206)	N	12/6/2019	0-0.5 ft.	37
	LPA25-SS-003 (0.5'-1.0') (20191206)	N	12/6/2019	0.5-1 ft.	42

Table 1. 2019 Surface/Near Surface Soil Laboratory Analytical Lead Results
Beck's Lake NPL Site
South Bend, IN

June 2021

				Lab Method:	SW6020
				Analyte:	LEAD
				EPA RML (mg/kg):	400
				IDEM Recreation Park (mg/kg):	800
Location	**Sample ID**	**Sample Type**	**Sample Date**	**Sample Depth**	Result (mg/kg)
31SS-1	LPA31-SS-001 (0.0'-0.5') (20191205)	N	12/5/2019	0-0.5 ft.	25
	LPA31-SS-001 (0.5'-1.0') (20191205)	N	12/5/2019	0.5-1 ft.	31
AOC1-1	LPAAOC1-SS-001 (0.0'-0.5')(20191209)	N	12/9/2019	0-0.5 ft.	54
	LPAAOC1-SS-001 (0.5'-1.0')(20191209)	N	12/9/2019	0.5-1 ft.	37
AOC1-2	LPAAOC1-SS-002 (0.0'-0.5')(20191209)	N	12/9/2019	0-0.5 ft.	45
	LPAAOC1-SS-002 (0.5'-1.0')(20191209)	N	12/9/2019	0.5-1 ft.	14
AOC1-3	LPAAOC1-SS-003 (0.0'-0.5')(20191209)	N	12/9/2019	0-0.5 ft.	38
	LPAAOC1-SS-003 (0.5'-1.0')(20191209)	N	12/9/2019	0.5-1 ft.	14
AOC1-4	LPAAOC1-SS-004 (0.0'-0.5')(20191209)	N	12/9/2019	0-0.5 ft.	36
	LPAAOC1-SS-004 (0.5'-1.0')(20191209)	N	12/9/2019	0.5-1 ft.	24
AOC1-5	LPAAOC1-SS-005 (0.0'-0.5')(20191209)	N	12/9/2019	0-0.5 ft.	24
	LPAAOC1-SS-005 (0.5'-1.0')(20191209)	N	12/9/2019	0.5-1 ft.	76
AOC1-6	LPAAOC1-SS-006 (0.0'-0.5')(20191209)	N	12/9/2019	0-0.5 ft.	110
	LPAAOC1-SS-006 (0.5'-1.0')(20191209)	N	12/9/2019	0.5-1 ft.	110
AOC1-7	LPAAOC1-SS-007 (0.0'-0.5')(20191209)	N	12/9/2019	0-0.5 ft.	91
	LPAAOC1-SS-007 (0.5'-1.0')(20191209)	N	12/9/2019	0.5-1 ft.	63
AOC1-8	LPAAOC1-SS-008 (0.0'-0.5')(20191209)	N	12/9/2019	0-0.5 ft.	110
	LPAAOC1-SS-008 (0.5'-1.0')(20191209)	N	12/9/2019	0.5-1 ft.	110
AOC1-9	LPAAOC1-SS-009 (0.0'-0.5')(20191209)	N	12/9/2019	0-0.5 ft.	200
	LPAAOC1-SS-009 (0.5'-1.0')(20191209)	N	12/9/2019	0.5-1 ft.	340
AOC1-10	LPAAOC1-SS-010 (0.0'-0.5')(20191209)	N	12/9/2019	0-0.5 ft.	38
	LPAAOC1-QD-001 (0.5'-1.0')(20191209)	FD	12/9/2019	0.5-1 ft.	17
	LPAAOC1-SS-010 (0.5'-1.0')(20191209)	N	12/9/2019	0.5-1 ft.	15
AOC1-11	LPAAOC1-SS-011 (0.0'-0.5')(20191209)	N	12/9/2019	0-0.5 ft.	100
	LPAAOC1-SS-011 (0.5'-1.0')(20191209)	N	12/9/2019	0.5-1 ft.	200
AOC1-12	LPAAOC1-SS-012 (0.0'-0.5')(20191209)	N	12/9/2019	0-0.5 ft.	55
	LPAAOC1-SS-012 (0.5'-1.0')(20191209)	N	12/9/2019	0.5-1 ft.	82
AOC2-1	LPAAOC2-SS-001 (0.0'-0.5')(20191209)	N	12/9/2019	0-0.5 ft.	69
	LPAAOC2-SS-001 (0.5'-1.0')(20191209)	N	12/9/2019	0.5-1 ft.	29
AOC2-2	LPAAOC2-SS-002 (0.0'-0.5')(20191209)	N	12/9/2019	0-0.5 ft.	120
	LPAAOC2-SS-002 (0.5'-1.0')(20191209)	N	12/9/2019	0.5-1 ft.	62
AOC2-3	LPAAOC2-SS-003 (0.0'-0.5')(20191209)	N	12/9/2019	0-0.5 ft.	76
	LPAAOC2-SS-003 (0.5'-1.0')(20191209)	N	12/9/2019	0.5-1 ft.	260
AOC2-4	LPAAOC2-SS-004 (0.0'-0.5')(20191209)	N	12/9/2019	0-0.5 ft.	67
	LPAAOC2-SS-004 (0.5'-1.0')(20191209)	N	12/9/2019	0.5-1 ft.	35
AOC2-5	LPAAOC2-SS-005 (0.0'-0.5')(20191209)	N	12/9/2019	0-0.5 ft.	**440 J**
	LPAAOC2-SS-005 (0.5'-1.0')(20191209)	N	12/9/2019	0.5-1 ft.	**820**
AOC2-6	LPAAOC2-SS-006 (0.0'-0.5')(20191209)	N	12/9/2019	0-0.5 ft.	60
	LPAAOC2-SS-006 (0.5'-1.0')(20191209)	N	12/9/2019	0.5-1 ft.	36
AOC2-7	LPAAOC2-SS-007 (0.0'-0.5')(20191209)	N	12/9/2019	0-0.5 ft.	130
	LPAAOC2-SS-007 (0.5'-1.0')(20191209)	N	12/9/2019	0.5-1 ft.	290
AOC2-8	LPAAOC2-SS-008 (0.0'-0.5')(20191209)	N	12/9/2019	0-0.5 ft.	160
	LPAAOC2-QD-002 (0.5'-1.0')(20191209)	FD	12/9/2019	0.5-1 ft.	300
	LPAAOC2-SS-008 (0.5'-1.0')(20191209)	N	12/9/2019	0.5-1 ft.	220
AOC2-9	LPAAOC2-SS-009 (0.0'-0.5')(20191209)	N	12/9/2019	0-0.5 ft.	84
	LPAAOC2-SS-009 (0.5'-1.0')(20191209)	N	12/9/2019	0.5-1 ft.	130
AOC2-10	LPAAOC2-SS-010 (0.0'-0.5')(20191209)	N	12/9/2019	0-0.5 ft.	96
	LPAAOC2-SS-010 (0.5'-1.0')(20191209)	N	12/9/2019	0.5-1 ft.	70
AOC2-11	LPAAOC2-SS-011 (0.0'-0.5')(20191209)	N	12/9/2019	0-0.5 ft.	98
	LPAAOC2-SS-011 (0.5'-1.0')(20191209)	N	12/9/2019	0.5-1 ft.	30
AOC2-12	LPAAOC2-SS-012 (0.0'-0.5')(20191209)	N	12/9/2019	0-0.5 ft.	96
	LPAAOC2-SS-012 (0.5'-1.0')(20191209)	N	12/9/2019	0.5-1 ft.	180

Table 1. 2019 Surface/Near Surface Soil Laboratory Analytical Lead Results
Beck's Lake NPL Site
South Bend, IN

				Lab Method:	SW6020
				Analyte:	LEAD
				EPA RML (mg/kg):	400
				IDEM Recreation Park (mg/kg):	800
Location	**Sample ID**	**Sample Type**	**Sample Date**	**Sample Depth**	Result (mg/kg)
AOC3-1	LPAAOC3-SS-001 (0.0'-0.5')(20191210)	N	12/10/2019	0-0.5 ft.	**1600**
	LPAAOC3-SS-001 (0.5'-1.0')(20191210)	N	12/10/2019	0.5-1 ft.	**720 J**
AOC3-2	LPAAOC3-SS-002 (0.0'-0.5')(20191210)	N	12/10/2019	0-0.5 ft.	180
	LPAAOC3-SS-002 (0.5'-1.0')(20191210)	N	12/10/2019	0.5-1 ft.	120
AOC3-3	LPAAOC3-SS-003 (0.0'-0.5')(20191210)	N	12/10/2019	0-0.5 ft.	100
	LPAAOC3-SS-003 (0.5'-1.0')(20191210)	N	12/10/2019	0.5-1 ft.	150
AOC3-4	LPAAOC3-SS-004 (0.0'-0.5')(20191210)	N	12/10/2019	0-0.5 ft.	65
	LPAAOC3-SS-004 (0.5'-1.0')(20191210)	N	12/10/2019	0.5-1 ft.	39
AOC3-5	LPAAOC3-SS-005 (0.0'-0.5')(20191210)	N	12/10/2019	0-0.5 ft.	250
	LPAAOC3-SS-005 (0.5'-1.0')(20191210)	N	12/10/2019	0.5-1 ft.	330
AOC3-6	LPAAOC3-SS-006 (0.0'-0.5')(20191210)	N	12/10/2019	0-0.5 ft.	73
	LPAAOC3-QD-003 (0.5'-1.0')(20191210)	FD	12/10/2019	0.5-1 ft.	**500**
	LPAAOC3-SS-006 (0.5'-1.0')(20191210)	N	12/10/2019	0.5-1 ft.	**500 J**
AOC3-7	LPAAOC3-SS-007 (0.0'-0.5')(20191210)	N	12/10/2019	0-0.5 ft.	**430**
	LPAAOC3-SS-007 (0.5'-1.0')(20191210)	N	12/10/2019	0.5-1 ft.	**6800 J**
AOC3-8	LPAAOC3-SS-008 (0.0'-0.5')(20191210)	N	12/10/2019	0-0.5 ft.	59
	LPAAOC3-SS-008 (0.5'-1.0')(20191210)	N	12/10/2019	0.5-1 ft.	51
AOC3-9	LPAAOC3-SS-009 (0.0'-0.5')(20191210)	N	12/10/2019	0-0.5 ft.	350
	LPAAOC3-SS-009 (0.5'-1.0')(20191210)	N	12/10/2019	0.5-1 ft.	**440**
AOC3-10	LPAAOC3-SS-010 (0.0'-0.5')(20191210)	N	12/10/2019	0-0.5 ft.	160
	LPAAOC3-SS-010 (0.5'-1.0')(20191210)	N	12/10/2019	0.5-1 ft.	130
AOC3-11	LPAAOC3-SS-011 (0.0'-0.5')(20191210)	N	12/10/2019	0-0.5 ft.	**530**
	LPAAOC3-SS-011 (0.5'-1.0')(20191210)	N	12/10/2019	0.5-1 ft.	**940**
AOC3-12	LPAAOC3-SS-012 (0.0'-0.5')(20191210)	N	12/10/2019	0-0.5 ft.	34
	LPAAOC3-SS-012 (0.5'-1.0')(20191210)	N	12/10/2019	0.5-1 ft.	28

Notes:

mg/kg - milligrams per kilogram
FD = Field Duplicate Sample.
N = Normal Environmental Sample.
U – Concentration was non-detect; Value presented represents laboratory reporting limit
J – Concentration is an estimated value
Yellow highlighted results are detected concentrations above the IDEM March 2019 Recreation Park criteria.
[BOLD] results are detected concentrations above the USEPA RML criteria.

Table 2- Dust Exposure Action Level Calculation
Based on Maximum Soil Concentration
Beck's Lake NPL Site
South Bend, IN

DUST EXPOSURE CALCULATION WORKSHEET					
DustLevel			Safety Factor for this site = 4		
Chemical	Exposure Limit (mg/m3)	Maximum Soil Concentration (mg/kg)	Exposure Limit Based on Single Compound (EL Mix, mg/m3)	Dust Quotient for Each Compound (level/limit)	Problem from Single Compound [3 mg/m3)/ELmix]
Aldrin	0.05	1.E-9	1.25E+13	2.00E-08	0.000
Aluminum	1	15,000	16.67	1.50E+04	0.180
Antimony	0.5	4.5	2.78E+4	9.00E+00	0.000
Arsenic	0.01	5.9	423.73	5.90E+02	0.007
Barium	0.5	900	138.89	1.80E+03	0.022
Beryllium	0.00005	0.99	12.63	1.98E+04	0.238
Cadmium	0.005	5.8	215.52	1.16E+03	0.014
Chromium	0.003	130	5.77	4.33E+04	0.520
Chrome (hex)	0.0002	1.E-9	5.E+10	5.00E-06	0.000
Cobalt	0.02	5.4	925.93	2.70E+02	0.003
Copper	1	240	1,041.67	2.40E+02	0.003
Lead	0.05	6,800	1.84	1.36E+05	1.632
Manganese	0.02	520	9.62	2.60E+04	0.312
Mercury	0.025	1.9	3,289.47	7.60E+01	0.001
Nickel	0.2	88	568.18	4.40E+02	0.005
Selenium	0.2	5.1	9,803.92	2.55E+01	0.000
Silver	0.01	2.9	862.07	2.90E+02	0.003
Vanadium	0.05	40	312.5	8.00E+02	0.010
Zinc	2	2,500	200.	1.25E+03	0.015
			Sum	2.47E+05	
		Dust Exposure Level at Mixture PEL =	1.012		2.965

EQUATIONS USED IN THIS CALCULATION

Dust action level = (For one dust)

$$\frac{(1E+6)(\text{Exposure Limit mg/m3})}{(\text{Concentration mg/kg})(\text{Safety Factor})}$$

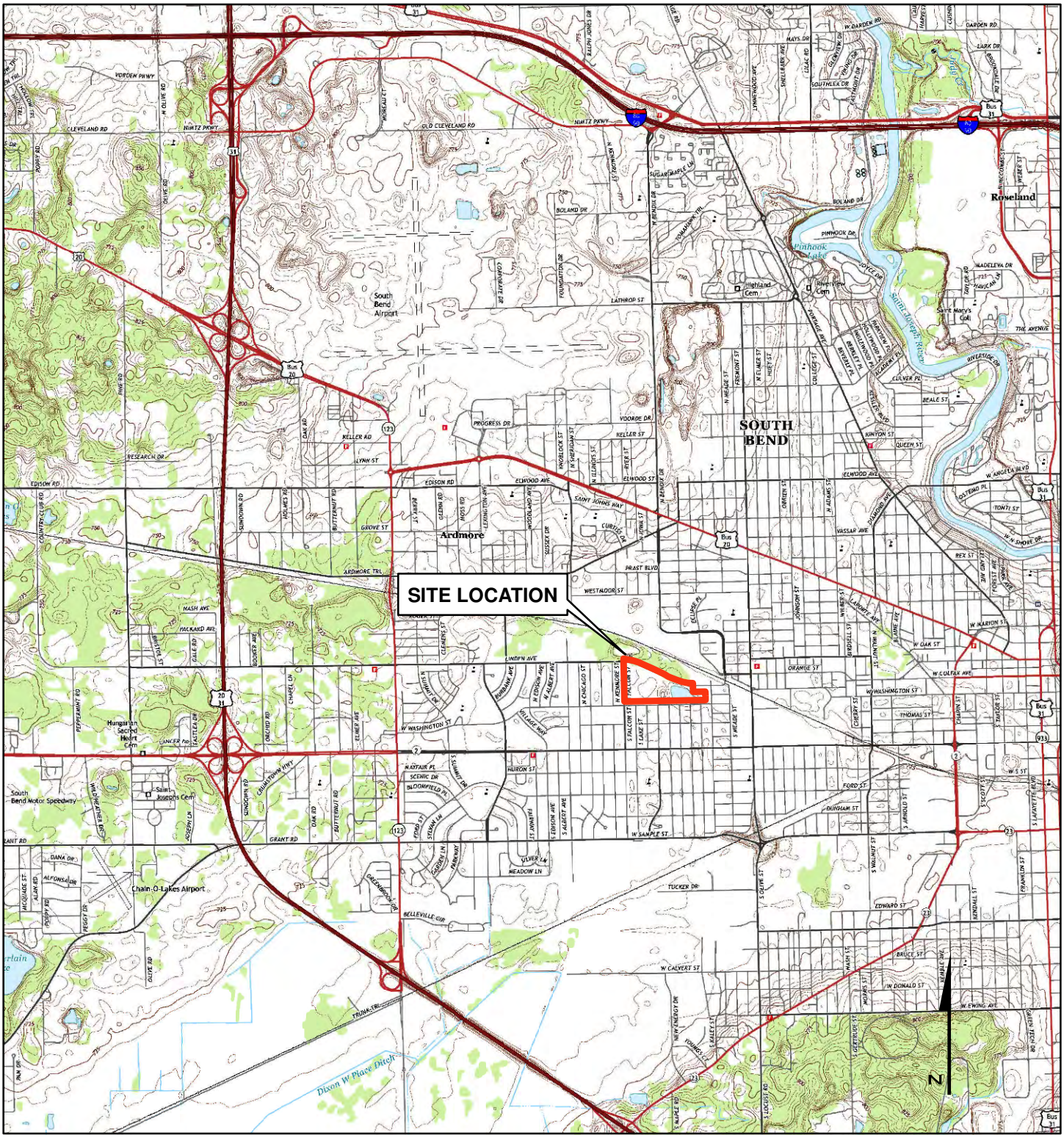
Dust action level = (For mixed dusts)

$$\frac{(1E+6) / (\text{Safety Factor})}{\text{Sum of } [(\text{Concentration mg/kg}) / (\text{Exposure Limit})]}$$

Prepared by SDM
Reviewed by CSK

FIGURES

Document Path: P:\HW - Beck's Lake\MACTEC Drawings & Prints\1115\Figure 1-1 - Site Location Map.mxd



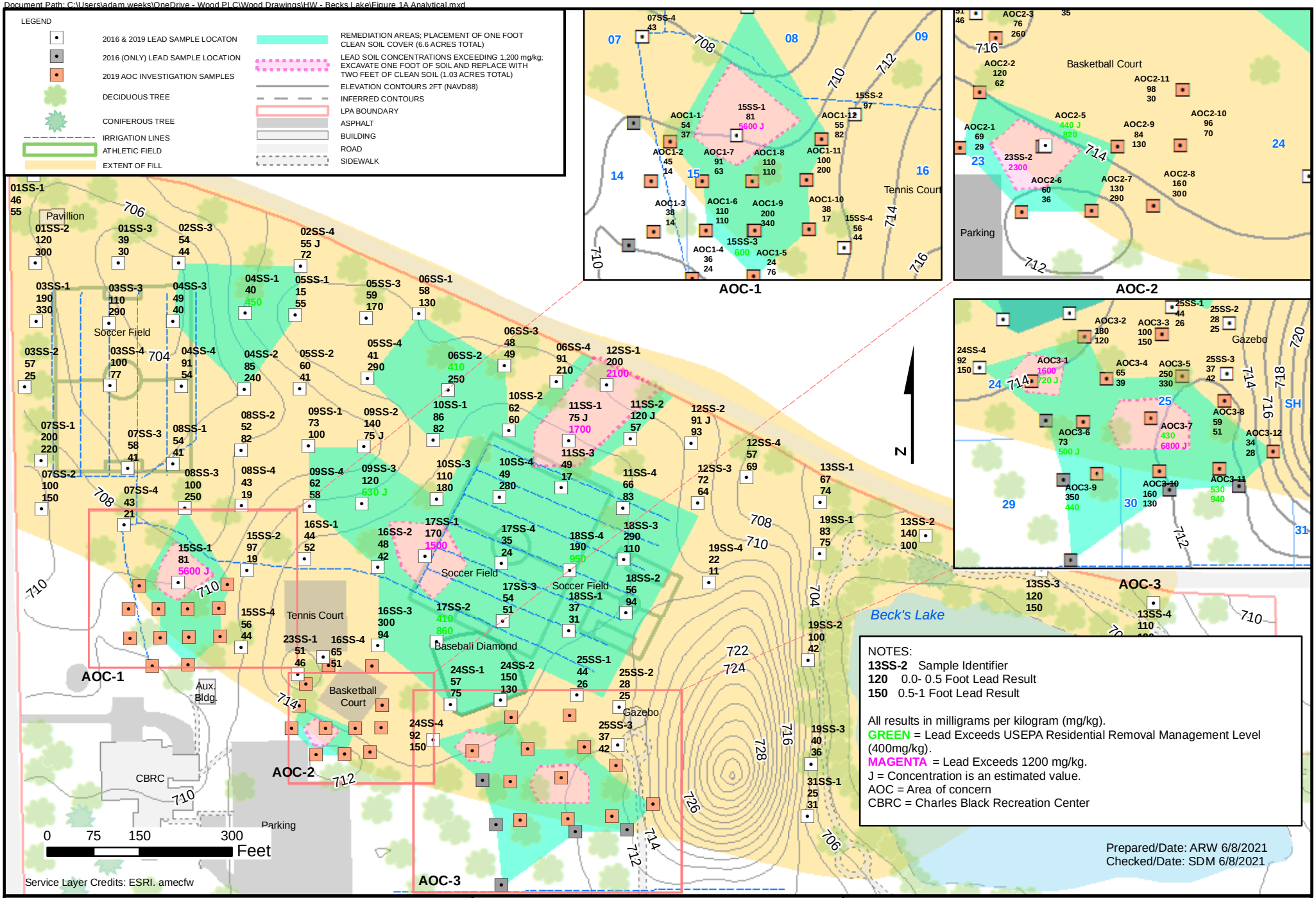
1 0.5 0 1 2
Miles

Prepared/Date: ARW 12/30/2015
Checked/Date: SDM 12/30/2015

Service Layer Credits: USGS

BECK'S LAKE SITE LASALLE PARK AREA SOUTH BEND, INDIANA	wood.	SITE LOCATION MAP FIGURE 1

Document Path: C:\Users\adam.weeks\OneDrive - Wood PLC\Wood Drawings\HW - Becks Lake\Figure 1A Analytical.mxd



NOTES:
13SS-2 Sample Identifier
120 0.0- 0.5 Foot Lead Result
150 0.5-1 Foot Lead Result

All results in milligrams per kilogram (mg/kg).
GREEN = Lead Exceeds USEPA Residential Removal Management Level (400mg/kg).
MAGENTA = Lead Exceeds 1200 mg/kg.
J = Concentration is an estimated value.
AOC = Area of concern
CBRC = Charles Black Recreation Center

Prepared/Date: ARW 6/8/2021
Checked/Date: SDM 6/8/2021

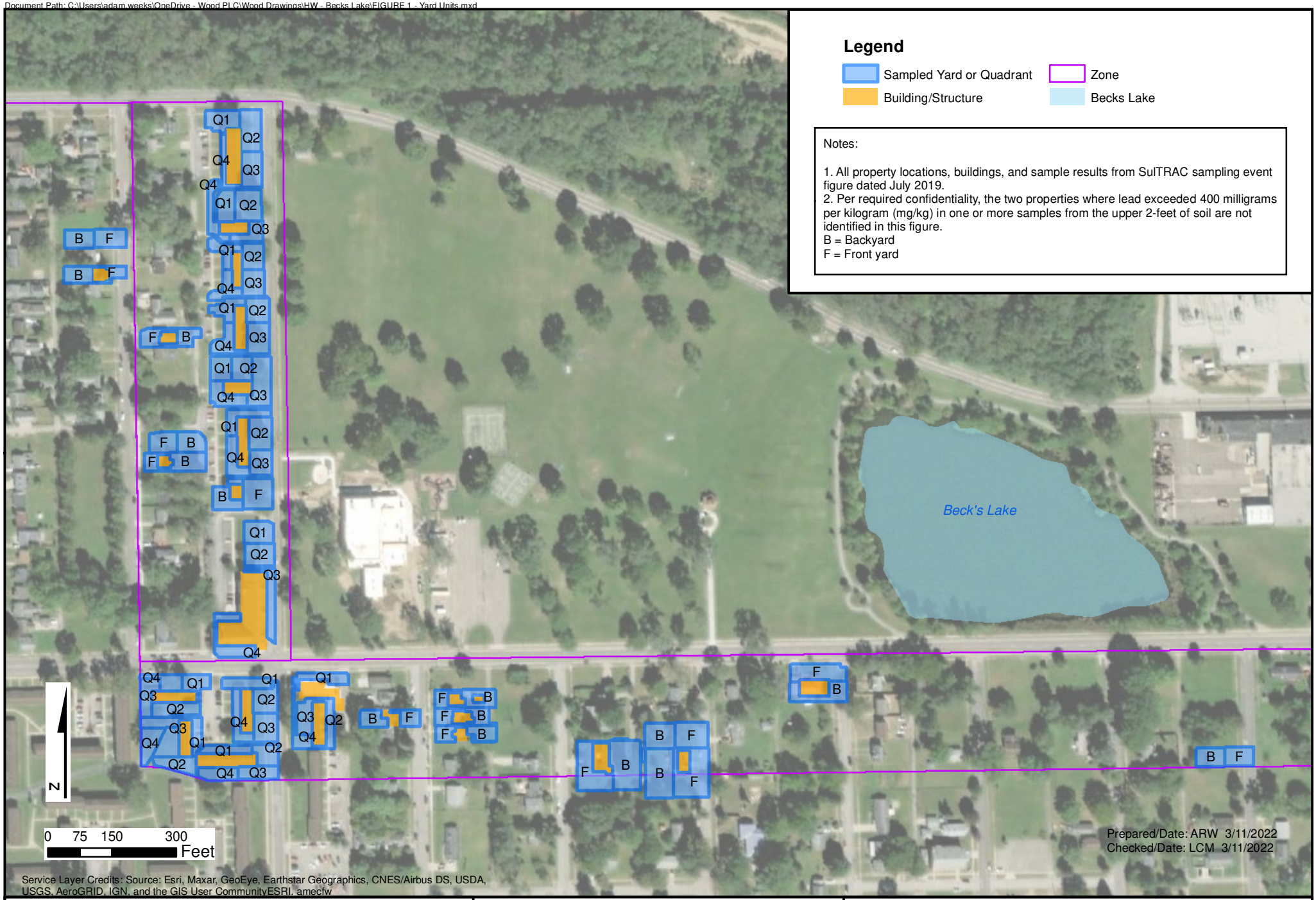
BECK'S LAKE SITE
LASALLE PARK AREA
SOUTH BEND, INDIANA

wood.

REMEDIAL ACTION PLAN
LASALLE PARK AREA

FIGURE 2

Document Path: C:\Users\adam.weeks\OneDrive - Wood PLC\Wood Drawings\HW - Becks Lake\FIGURE 1 - Yard Units.mxd



BECK'S LAKE SITE
LASALLE PARK AREA
SOUTH BEND, INDIANA

wood.

REMEDIAL ACTION PLAN
RESIDENTIAL YARD UNITS
(Revised 03/09/2022)
FIGURE 3

APPENDIX A

STANDARD OPERATING PROCEDURES

Surface Soil Sampling Procedures

This standard operating procedure (SOP) sets forth the field procedures for collecting surface soil samples in the field.

Prior to performing any intrusive activities at a site, verify that the proposed sample locations are not located in the immediate vicinity of underground utilities. When intrusive activities are to be undertaken, at a minimum:

- A public utility clearance service (e.g., Indiana811, Miss Dig811, etc.) must be notified at least 72 hours prior to beginning work.
- Subsurface utility clearance must be obtained prior to beginning any work activities if there is potential for utilities to be present within the work area.
- Utilities present (or 'cleared') in the area shall be documented and location noted in reference to other site landmarks in the Field Logbook or on the Field Map (see SOP-F15-*Recording Notes in Field Logbooks*).

The general procedures to be followed when collecting surface soil samples are outlined below.

Materials

The following equipment/materials will be available, as required, during surface soil sampling:

- Personal protective equipment (as required by the Project Health and Safety Plan [HASP])
- Cleaning and decontamination equipment (see SOP-F10, *Field Equipment Cleaning and Decontamination Procedures*)
- Pin flags
- Glass or stainless steel bowls, pans, and/or trays
- Appropriate sample containers
- Transport containers (cooler with ice) and packing, labeling, and shipping materials
- Chain-of-custody seals and forms
- Insulated coolers with ice
- Stainless steel bucket hand auger
- Stainless steel or disposable plastic scoop
- Spade (square-nosed)
- 6-foot rule and 100-foot measuring tape or electronic range finder
- Stainless steel or disposable plastic spatulas
- Digital camera
- Realtime Kinematic Global Positioning System (RTK GPS), or similar
- Table summarizing GPS coordinates for proposed sample locations
- Surface Soil Sample Record forms if specified in the Field Sample Plan (FSP)
- Field Logbook and Field Map

Surface Soil Sampling Procedures

The following procedures will be employed to collect surface soil samples:

1. Identify sample location as specified in the FSP / Work Plan.

2. Don personal protective equipment (as required by the HASP).
3. Position sampling device over the sampling location and record station position using a RTK GPS or similar, if applicable. Record other appropriate information, including sampling personnel, sample collection methods, and weather conditions. Include a sketch indicating location relative to prominent landmark features. Record information in the Field Logbook or on the Surface Soil Sampling Record, as necessary. Unless otherwise indicated in FSP, geographic surveys using RTK GPS with a minimum accuracy of 0.1 foot horizontally, collected in a decimal degree format in the North American Datum 1983 (NAD83) or World Geodetic System 1984 (WGS84) datum per the United States Environmental Protection Agency (USEPA) EPA Geospatial Metadata Technical Specification, and 0.2 foot vertically in the North American Vertical Datum (1988) (NAVD88).
4. Decontaminate the sampling equipment prior to initial use, between sampling at each transect, and at the completion of sampling in accordance with SOP-F10 *Field Equipment Cleaning Decontamination Procedures*. Decontamination will be completed at the respective sample location, and rinsate water will be contained in a Department of Transportation- (DOT-) approved container. Whenever possible, use of Lexan® or other disposable tubing or sampling equipment or direct collections of a discrete surface grab sample into appropriate laboratory supplied containers, is preferred to minimize equipment decontamination requirements / potential for cross-contamination.
5. If the sample location is in a vegetated area, remove the vegetation prior to sampling.
6. Using the appropriate sampling equipment (e.g., hand-driven split-spoon sampler, core sampler, push probe, Lexan® tube, hand auger) advance the sampler to the desired depth. Measure and record the depth of soil penetrated. Remove the sampler and record the amount (length) of soil recovered. Surface samples will be collected at each grid node, which would represent a five (5) foot by five (5) foot area from which five subsamples would be collected in a five-on-a-dice pattern. Each subsample will be collected from same depth interval. These subsamples will be composited into one sample, and a GPS point will be taken at the center of the sampling area. Retain soil from the desired discrete depth intervals by placing the soil in a laboratory-grade jar. Place the jars on ice if appropriate.
7. If an insufficient volume of soil was recovered for a discrete depth interval, complete an additional boring immediately adjacent to the original boring and obtain additional soil from the desired depth interval. Record percent recovery in the Field Logbook.
8. If a tube sample is obtained, cut and cap the tube, record the amount of soil recovered as described above, label the tube (note top), and place it in a temporary transport container or rack. If necessary, transfer samples to temporary field office or sample processing area.
9. If applicable, cut open acetate liners or Lexan® tubes and place the sample on a clean stainless steel tray or other dedicated work surface. Prior to cutting the liner, remove excess soil from the outside of the liner to prevent cross-contamination.
10. If sampling for volatile organic compounds (VOCs) is to be performed, refer to the FSP or Work Plan for specific sampling instructions prior to proceeding to remaining field screening, classification and/or compositing procedures in this SOP. Refer to SOP-F6-*Soil Sampling Procedure* for instructions on procurement of a discrete VOC soil sample.

11. Field screen soil samples with a photoionization detector (PID) if appropriate, SOP-F3 *Photoionization Detector Measurement Procedures*. Record the PID reading in the Field Logbook. Refer to HASP if appropriate additional actions are required.
12. Record the location, depth, Sample identifier and the following soil characteristics in the Field Logbook (SOP-F15, *Recording Notes in Field Logbooks*) or on the Surface Soil Sampling Record included in Appendix B of the FSP:
    - Unified Soil Classification System (USCS) description (American Society for Testing Materials [ASTM] D2488-09a *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)*;[www.ASTM.org])
    - Texture
    - Color
    - Presence of debris, if applicable
    - Presence of an oily sheen, if applicable
    - Biological structures
    - PID headspace result (SOP-F3 *Photoionization Detector Measurement Procedures)*
    - Odor (e.g., hydrogen sulfide)
13. If the core (or composite) is to be photographed, document photograph in the Photograph Log (Appendix B of the FSP) and photograph the core with a calibrated measure.
14. Remove and dispose of large rocks or other debris (e.g., twigs, grass, rocks, and roots).
15. If sample reduction is required prior to analysis, cone and quarter the sample as directed below (Steps 16 through 19, as summarized from ASTM D6051-01 *Standard Guide for Composite Sampling and Field Subsampling for Environmental Waste Management Activities*). For samples that will be submitted for analysis as is (from a discrete sample depth), skip to Step 20.
16. Empty sample (from the designated sample interval) into the stainless steel bowl.
17. Mix thoroughly using a stainless steel spatula, spoon, or trowel and pile into a cone.
18. Flatten cone with the spatula/spoon/trowel, spreading the material to a circular layer of uniform thickness. Divide into quarters by two lines intersecting at right angles at the center of the pile.
19. Discard two diagonally opposite quarters. Sweep clean the space occupied by the discarded quarters. The remaining quarters should be thoroughly mixed and further reduced by quartering if desired. “Quartering” may be performed several times to obtain the required sample size, as appropriate, for proper containerizing, preserving, and shipping for laboratory analysis. In addition, blind duplicate samples or matrix spike (MS) and matrix spike duplicate (MSD) samples may be prepared, consistent with the procedures outlined in the Quality Assurance Project Plan (QAPP).
20. For samples to be submitted for laboratory analysis, label, handle, pack, and ship the samples in accordance with SOP-F11 *Field Sample Handling, Packing, and Shipping Procedures.* For samples to be stored on-site, place the sample in a laboratory-grade jar and store as appropriate.
21. Restore the surface and mark the central sampling location with a labeled pin flag for future surveying, if warranted.

- END OF PROCEDURE-

Soil Sampling Procedures

This standard operating procedure (SOP) sets forth the field procedures for collecting soil, samples in the field.

Prior to performing any intrusive activities at a Site, verify that the proposed sample locations are not located in the immediate vicinity of underground utilities. When intrusive activities are to be undertaken, at a minimum:

- A public utility clearance service (e.g., Indiana811, Miss Dig811 etc.) must be notified at least 72 hours prior to beginning work.
- Subsurface utility clearance must be obtained prior to beginning any work activities if there is potential for utilities to be present within the work area.
- Utilities present (or 'cleared') in the area shall be documented and location noted in reference to other Site landmarks in the Field Logbook or on the Field Map (see SOP-F15 *Recording Notes in Field Logbooks*).

The general procedures to be followed when collecting soil samples are outlined below.

Materials

The following equipment and materials, as required, will be available during soil sampling:

- Personal protective equipment (as required by the Health and Safety Plan [HASP])
- Cleaning and decontamination equipment (as specified in SOP-F10, *Field Equipment Cleaning and Decontamination Procedures*)
- Pin flags
- Glass or stainless steel bowls, pans, and/or trays
- Calibrated Field Scale (minimum precision 0.1 grams)
- Appropriate sample containers
- Transport containers (cooler with ice) and packing, labeling, and shipping materials
- Chain-of-custody seals and forms
- Split-spoon or macrocore sampler
- Acetate liner for macrocore sampler, if necessary
- Stainless steel bucket hand auger/Lexan® tube
- Stainless steel or disposable plastic scoop
- Spade (square-nosed)
- 6-foot rule and 100-foot measuring tape
- Stainless steel spatulas
- Digital camera
- Realtime Kinematic Global Positioning System (RTK GPS), or similar
- Table summarizing GPS coordinates for proposed sample locations
- Photoionization detector (PID)
- Soil Sample Record forms if specified in the Field Sample Plan (FSP)
- Field Logbook and Field Map

Soil Sampling Procedures

The following procedures will be employed to collect soil samples:

1. Don personal protective equipment (as required by the HASP).
2. Identify sample location as specified in the FSP.
3. Record the locations using a RTK GPS, if applicable. Geographic surveys using RTK GPS will be to a minimum accuracy of 0.1 foot horizontally, collected in a decimal degree format in the North American Datum 1983 (NAD83) or World Geodetic System 1984 (WGS84) datum per the United States Environmental Protection Agency (USEPA) Geospatial Metadata Technical Specification, and 0.2 foot vertically in the North American Vertical Datum (1988) (NAVD88).
4. In addition, provide written descriptions of sample locations with approximate distances to prominent landmarks. Note this information in the Field Logbook and provide approximate location on field map (SOP-F15, *Recording Notes in Field Logbooks*).
5. If the sample location is in a vegetated area, remove the vegetation prior to sampling.
6. Using the appropriate sampling equipment (e.g., split-spoon sampler, macrocore sampler, Lexan tube, hand auger) advance the sampler to the desired depth. Measure and record the depth of soil penetrated for each sample interval. Remove the sampler and record the amount (length) of soil recovered. Retain soil from the desired discrete depth intervals by placing the soil in a laboratory-grade jar. Place the jars on ice if appropriate. Soil samples collected for volatile organic compound (VOC) analysis will follow procedures for low-level analysis by USEPA Method 5035A which may include Encore™ Sampling (described below). VOC samples will not be composited.
7. If a macrocore sampler is used, remove the acetate liner from the sampler, record the amount of soil recovered as described above, cap and label the liner and place the liner in a temporary transport container, if necessary, prior to opening the liner (see also SOP-F7 *Geoprobe™ Soil and Groundwater Sampling Procedure*).
8. If an insufficient volume of soil was recovered for a discrete depth interval, complete an additional boring immediately adjacent to the original boring and obtain additional soil from the desired depth interval.
9. Transfer samples to field office/temporary field laboratory, if appropriate.
10. If sample compositing is required prior to analysis, remove the samples from the jars or other containers and place in a stainless steel/glass tray or bowl.
11. If applicable, cut open acetate liners and place the sample on a stainless steel tray. Prior to cutting the liner, remove excess soil from the outside of the liner to prevent cross-contamination.
12. Unless otherwise specified in the FSP, samples should be collected from discrete sampling intervals. Typically this will be from a 6-inch to 1-foot thick interval of interest and may be biased toward evidence of impact and/or soil layer boundaries (e.g., contact of a sand unit with an underlying clay). If sampling includes VOCs, the sample interval should correspond to the default vertical PID field screening interval.
13. If VOC sampling is to be performed, the discrete sample interval will be selected based upon intervals specified in the FSP, Work Plan or will be biased to areas of greatest suspected impact (e.g., field visual or olfactory evidence of impact). In order to minimize potential loss of VOCs, the sample should be procured immediately following opening of the sampling device and prior to further classification as described this SOP and in accordance with *Procedures for Low Level VOC Sampling – Method 5035*. Additional soil

samples may be collected from remaining core, if warranted, following field screening with a PID – see Step #14.

14. Field screen the soil samples with a PID, if appropriate (SOP-F3 *Photoionization Detector Measurement Procedures)*. PID field screening thickness intervals will vary based on data quality objectives. Typically, conduct PID screening at 6-inch thick intervals unless otherwise specified in the FSP or a distinct break in soil type occurs and/or soil sampling prior to PID screening limits available soil for screening. Record PID readings in the Field Logbook or on the Soil Boring Log, if applicable (Appendix B of the FSP). Depending on the magnitude of the PID reading, take appropriate action as specified in the HASP.
15. Record the location, depth, Sample identifier and the following soil characteristics in the field logbook (SOP-F15, *Recording Notes in Field Logbooks*) or on the Soil Sampling Record if included in Appendix B of the FSP:
    - Unified Soil Classification System (USCS) description (American Society for Testing Materials [ASTM] D2488-09a *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure*); [www.ASTM.org])
    - Texture
    - Color
    - Presence of debris, if applicable
    - Presence of an oily sheen, if applicable
    - Biological structures
    - PID headspace result (SOP-F3 *Photoionization Detector Measurement Procedures)*
    - Odor (e.g., hydrogen sulfide)
16. If the core (or composite) is to be photographed, photograph core with a calibrated measuring and document in the Photograph Log (Appendix B of the FSP).
17. Remove and disposed of large rocks or other debris (e.g., twigs, grass, rocks, and roots).
18. If samples are to be composited prior to analysis, follow Steps 18 through 22 below, as summarized from ASTM D6051-01 *Standard Guide for Composite Sampling and Field Subsampling for Environmental Waste Management Activities*. For samples that will be submitted for analysis as is (as discrete sample depth intervals), skip to Step 23.
19. For samples to be composited prior to analysis, select the samples from the discrete depth interval to be composited and place into a stainless steel bowl. Thoroughly homogenize the soil using a stainless steel spatula. If mixed in a pan, mix each quarter of the pan separately and then together in the middle of the pan. If mixed in a bowl, stir in a circular fashion occasionally turning the material over. Once homogenized, evenly spread the sample in a rectangular steel pan/tray. Then using a rectangular scoop, take multiple scoops in evenly spaced swaths along the short axis of the spread sample until the rectangular scoop is full. The scoop represents a subsample of equal volume. Place the subsample in a stainless steel/glass bowl or pan.
20. Repeat Step 18 for all samples to be composited prior to analysis. Place the remainder of soil not composited into a laboratory-grade sample jar for on-site storage. If a sample is selected for field analysis, the stored portion of that sample will be re-homogenized (in case of settling), spread in a rectangular pan/tray, and then split by dividing the spread sample into an equal number of increments and collecting alternate increments with a scoop until half the sample is segregated from the other half remaining on the pan/tray. One half will be used for field analysis and the other half will be stored in a laboratory-grade jar on-site.

21. Combine like depth increments from the individual samples to be composited into the stainless steel/glass bowl/pan and homogenize the composite sample per Step 18.
22. Once homogenized, spread the composited sample as described in Step 18, then split by dividing the spread sample into an equal number of increments and collecting alternate increments with a scoop until half the sample is segregated from the other half remaining on the pan/tray. One half of the soil will be used for field analysis and the other half will be placed into a laboratory-grade sample jar for on-site storage.
23. The samples may be further divided (using the techniques described above), as appropriate, for proper containerizing, preserving, and shipping for laboratory analysis. In addition, blind duplicate samples or matrix spike (MS) and matrix spike duplicate (MSD) samples may also be prepared, consistent with the procedures outlined in the Quality Assurance Project Plan (QAPP).
24. For samples to be submitted for laboratory analysis, label, handle, pack, and ship the samples in accordance with SOP-F11 *Field Sampling Handling, Packing, and Shipping Procedures.* For samples to be stored on-site, place the sample in a laboratory-grade jar and store as appropriate.
25. Restore the surface at the sampling location in accordance with state/access requirements, as applicable, and mark the location with a labeled pin flag for future surveying, if warranted.

Procedures for Low Level VOC Sampling - Method 5035

Sediment samples collected for VOC analysis must be handled in a manner which will minimize the loss of contaminants due to volatilization and biodegradation. Sample intervals will be biased toward intervals indicating field evidence of impact or as specified in the FSP or Work Plan. Samples for VOC analysis should be collected prior to field screening with a PID or field classification described previously to minimize potential VOC loss.

Sample Preparation Procedure

1. Sediment should be obtained from a fresh surface directly from the sampler following opening of the sampling device.
2. Use a stainless steel spatula or other clean instrument to peel a thin rind from the sample interval from which volatilization may have occurred. Use a direct coring device to obtain sample from the freshly exposed core interval as described below.

Field Preservative Sampling Methods

1. Calibrate the field scale prior to the start of sampling.
2. Pre-weighed, laboratory-provided vials will be used. The laboratory will specify the amount of soil/sediment required for each vial (e.g., 5-gram or 10-gram sample sizes). Record the type and lot of all preservatives used in the Field Logbook (SOP-F15-*Recording Notes in Field Logbooks*) prior to initiating sampling.
3. Laboratory provided kits will include a sample-dedicated coring device (e.g. Terra Core Sampler or cut syringe) which should be used to obtain a single soil sample; discard after sampling is complete.
4. Weigh each vial with preservative prior to collection of the sample and record the mass in the Field Logbook.
5. Weigh the sampling device.

6. Insert the sampling device into the center of the core at the freshly exposed sample interval. Reweigh the sampler with soil to ensure the amount of soil collected is within 10% of the target soil/sediment sample mass.
7. Open the sample vial and carefully extrude the sample from the sampling device into the preservative. If any preservative is lost or spilled during transfer, the sample and vial is to be discarded and Steps 4 through 6 will be repeated with fresh sample containers.
8. Seal vial and re-weigh with preservative and soil/sediment. Record the mass of soil/sediment obtained in the sampling device as well as the mass of vial, preservative and soil/sediment in the Field Logbook.
9. Label samples using existing laboratory applied labels – – **do not place new labels on pre-persevered, laboratory weighed vials**. Labels will include the sample location identifier and depth interval.
10. The following information will be recorded for each sample in your Field Logbook (SOP-F15, *Recording Notes in Field Logbooks*) or Soil Sample Record (FSP Appendix B):
    - Sample identifier
    - Date and time sample collected
    - Mass of each vial plus preservative collected (sealed, prior to collection)
    - Mass of soil cored to add to the preserved vial
    - Mass of vial, preservative and soil/sediment following extraction and re-sealing
    - Unique laboratory vial identifier (vial number or laboratory-determined vial mass)
11. Place samples on ice immediately after collection and ship or deliver to the laboratory following chain-of-custody protocols (SOP-F11-*Field Sample Handling, Packing and Shipping Procedures)* as soon as possible; some sample preservatives may require delivery to the laboratory within 24 hours of collection.
12. In addition to the soil/sediment sample collected for VOC analysis, soil/sediment must be collected and placed into an empty container for moisture content analysis. Moisture content determination is required to report the sample results on a dry basis. If soil/ sediment samples will be analyzed for other parameters, the moisture content can usually be taken from the other sample containers. However, when sampling for VOCs only, a small separate laboratory-supplied container must be filled.

Encore™ Sampling

1. Collect an approximate 5-gram sample using an Encore™ sampler or cut plastic syringe.
2. Place samples on ice immediately after collection and ship or deliver to the laboratory following chain-of-custody protocols (SOP-F11-*Field Sample Handling, Packing and Shipping Procedures)* as soon as possible. Samples in capped in Encore™ samplers should be delivered within 24 hours of collection.
3. In addition to the soil/sediment sample collected for VOC analysis, soil/sediment must be collected and placed into an empty container for moisture content analysis. Moisture content determination is required to report the sample results on a dry basis. If soil/sediment samples will be analyzed for other parameters, the moisture content can usually be taken from the other sample containers. However, when sampling for VOCs only, a small separate laboratory-supplied container must be filled.

- END OF PROCEDURE –

SOP-F6
Soil Sampling Procedure

Attachment 1:
Encore™ Specifications

Disposable En Core® Sampler Sampling Procedures

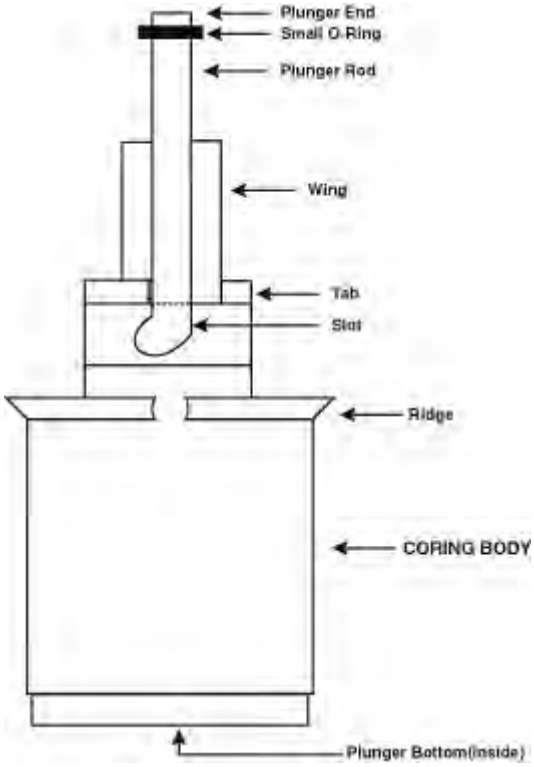
NOTE:

1. En Core Sampler is a Single Use device. It cannot be cleaned and/or reused.

2. En Core Sampler is designed to store soil. Do not use En Core Sampler to store solvent or free product!

3. En Core Sampler must be used with En Core® T-Handle and/or En Core® Extrusion Tool exclusively. (These items are sold separately.)

Using The En Core® T-Handle



Click to view larger image.

Before Taking Sample:

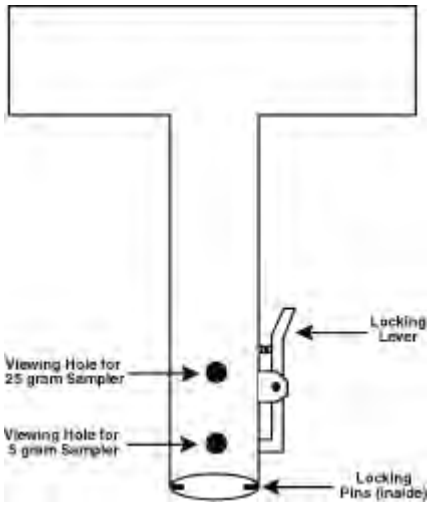
1. Hold coring body and push plunger rod down until small o-ring rests against tabs. This will assure that plunger moves freely.

2. Depress locking lever on En Core T-Handle. Place coring body, plunger end first, into open end of T-Handle, *aligning the (2) slots on the coring body with the (2) locking pins in the T-Handle*. Twist coring body clockwise to lock pins in slots. Check to ensure Sampler is locked in place. Sampler is ready for use.

Taking Sample:

3. Turn T-Handle with T-up and coring body down. This positions plunger bottom flush with bottom of coring body (ensure that plunger bottom is in position). Using T-Handle, push Sampler into soil until coring body is completely full. When full, small o-ring will be centered in T-Handle viewing hole. Remove Sampler from soil. Wipe excess soil from coring body exterior.

4. Cap coring body while it is still on T-handle. Push cap over flat area of ridge. ***Push and twist cap to lock arm in place. Cap must be seated to seal sampler (see diagram below).***



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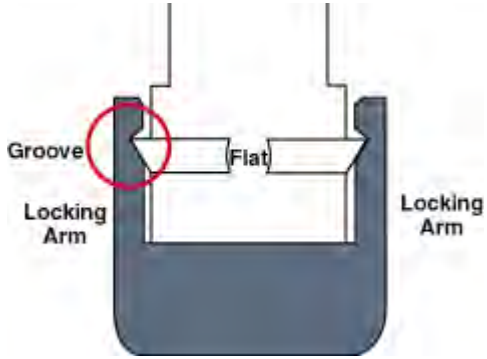
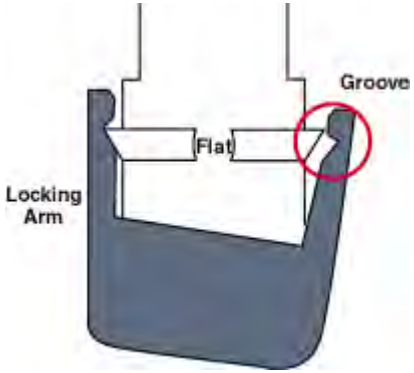
Sampler Correctly Capped **Sampler Incorrectly Capped**

Locking arm grooves seated over coring body ridge.



Cap appears crooked; locking arm grooves not fully seated over coring body ridge



Preparing Sampler For Shipment:

5. Remove the capped Sampler by depressing locking lever on T-Handle while twisting and pulling Sampler from T-Handle.

6. Lock plunger by rotating extended plunger rod fully counter-clockwise until wings rest firmly against tabs (see plunger diagram at right).

7. Attach completed label (from En Core Sampler bag) to cap on coring body.

8. Return full En Core Sampler to zipper bag. Seal bag and put on ice.

Field Equipment Cleaning and Decontamination Procedures

This standard operating procedure (SOP) sets forth the field procedures to be followed for cleaning and decontamination of equipment. Equipment cleaning areas will be located within or adjacent to a specific work area, as specified in the Project Health and Safety Plan (HASP). The sampling equipment may consist of soil/residuals sampling equipment, sediment sampling devices, surface water collection devices, groundwater sampling collection devices, water testing instruments, soil vapor sampling devices and other activity-specific sampling equipment. Non-disposable equipment will be cleaned after completion of each sampling interval/event. Cleaning procedures will be monitored by the performance of Quality Assurance/Quality Control (QA/QC) checks through sampling and analysis as described in the Quality Assurance Project Plan (QAPP).

The general procedures to be followed when cleaning and decontaminating field equipment are outlined below. Wherever possible, new or sample dedicated equipment is used to minimize decontamination chemical requirements/use and to minimize the potential for cross-contamination is preferred.

Materials

The following materials, as appropriate, shall be available during equipment cleaning:

- Personal protection equipment (as required in the HASP)
- Deionized water and tap water
- Non-phosphate soap (Alconox® or equivalent)
- Acetone, hexane, and/or nitric acid (See Decontamination of Smaller Sampling Equipment, below)
- High-pressure water/steam cleaning unit, if applicable
- Wash basins
- Brushes
- Plastic sheeting
- Aluminum foil
- Garbage bags
- Spray bottles
- Disposable latex or nitrile gloves, as applicable
- Containers for cleaning and containerization of rinsate water

Equipment Cleaning Procedures

Cleaning Station

Selecting a proper field equipment cleaning station location is important. It will be located away from the immediate work area so as not to adversely impact the cleaning procedure, but close enough to the sampling teams to keep equipment handling to a minimum.

A designated area will be established to conduct all cleaning at each work area of the site. If activities include the use of heavy equipment (e.g., drilling rig, excavator etc.); the location of a

dedicated "decontamination pad" may be specified in the Field Sample Plan (FSP) or Work Plan. All equipment such as drill rigs, backhoes, and other mobile equipment will receive an initial cleaning prior to use at the site. The frequency of subsequent cleaning while on-site will depend on the extent to which the equipment is used in relation to the collection of environmental samples.

Decontamination of Smaller Sampling Equipment

Decontamination will be completed at the respective sample location. The first step, a non-phosphate soap and tap water wash, is to remove all visible particulate matter and residual oil and grease. This may be preceded by a steam cleaning to facilitate solids removal. When samples are to be analyzed for organic constituents, the soap and tap water wash will be followed by a tap water rinse to remove the detergent, deionized water rinse, hexane rinse, acetone rinse, and deionized water triple rinse. Safety Data Sheets (SDS) for decontamination fluids are contained in the HASP. When analyzing for inorganic constituents, the soap and tap water wash will be followed by a nitric acid rinse and a distilled water triple rinse.

Dedicated wash basin/spray bottles should be used for each decontamination fluid used. All wash and rinseate water will be captured in appropriate, Department of Transportation (DOT)-approved containers if necessary, and disposed in accordance with SOP-F12-*Investigation Derived Waste Sampling Procedures*.

The field sampling equipment cleaning procedures used when analyzing for organic and inorganic constituents are as follows:

1. Non-phosphate soap (Alconox® or equivalent) and tap water wash
2. Tap water rinse
3. Deionized water rinse
4. Hexane rinse (organics only; if specified in the FSP)
5. Acetone rinse (organics only, if specified in the FSP) or nitric acid rinse (inorganics only)
6. Deionized water triple rinse

Decontamination of Heavy Equipment

Other equipment and material associated with sampling events will be cleaned prior to use. Heavy equipment, such as backhoes, may retain contaminants from other sources such as roadways or storage areas or material from previous job sites that were not adequately removed. For these reasons, it is important that these items be cleaned prior to use.

Two methods are used for cleaning heavy equipment: steam cleaning and manual scrubbing. Steam cleaning can remove visible debris. Because steam cleaners provide a high-pressure medium, they are very effective for solids removal. They are also easy to handle and generate low volumes of wash solutions.

A second method involves manual scrubbing of equipment using brushes and the procedures detailed above for decontamination of smaller sampling equipment. This procedure can be as effective as steam cleaning and is preferred in situations where steam cleaning fails to remove visible materials. Disadvantages to manual scrubbing are that it is labor intensive and it generates large volumes of wash and rinse solutions.

Heavy equipment will be thoroughly steam cleaned or manually scrubbed upon arrival on-site and when moved between sampling locations. Items in direct contact with sample media will be cleaned before changing sample locations.

Wash and rinsate water may be contained depending on the investigation area. See the QAPP for sampling guidelines to verify heavy equipment decontamination procedures.

Equipment Storage

All decontaminated sampling equipment will be stored in a clean environment and, where appropriate, the equipment will be covered with aluminum foil.

- END OF PROCEDURE-

Field Sample Handling, Packing, and Shipping Procedures

This standard operating procedure (SOP) sets forth the field procedures to be used when handling, packing, and shipping samples. This SOP describes the necessary equipment, field procedures, materials, sample handling, and documentation procedures necessary to handle and ship samples for chemical analysis. Appropriate sample containers, preservation methods, quality assurance (QA)/quality control (QC) requirements, and laboratory holding times for groundwater and soil samples are summarized in the Quality Assurance Project Plan (QAPP).

Sample bottles provided by the laboratory will be contaminant-free as specified in the United State Environmental Protection Agency's (USEPA's) Office of Solid Waste and Emergency Response (OSWER) Directive No. 9240.0-05, *Specifications and Guidance for Obtaining Contaminant-Free Sample Containers* (7/91). The laboratories will also supply analyte-free water, sample labels, and preservatives, as necessary. The field personnel will be responsible for properly labeling containers and preserving samples, as appropriate.

The procedures described in this SOP may be revised as required, dependent upon site conditions, equipment limitations, or limitations imposed by the procedure. The ultimate procedures employed will be documented in the project work plans or reports. If changes to the sampling procedures are required due to unanticipated field conditions, the changes will be discussed with the appropriate regulatory personnel prior to implementation and recorded in the Field Logbook and/or on appropriate sampling forms.

General procedures to follow when handling, packing and shipping samples are outlined below.

Materials

Equipment to be used during sample collection may include, but are not limited to, the following:

- Personal protective equipment as specified in the Health and Safety Plan (HASP)
- Appropriate decontamination equipment
- Disposable latex or nitrile gloves, as appropriate
- Indelible pens
- Shipping tape
- Sealable plastic bags
- Bubble wrap or other inert packing material
- Field Logbook
- Sample containers (laboratory supplied jars or sample bags)
- Sample labels
- Chain-of-custody forms and seals
- Insulated coolers with ice

Field Sample Handling, Packing, and Shipping Procedures

Handling

Samples will be handled as follows:

1. Collect the sample in the appropriate laboratory-supplied sample container or sample bag. Sample bags will only be used for solid (e.g., soil), unpreserved samples. Sample collection methods are described in media appropriate sampling SOPs.
2. Initiate chain-of-custody provided by the laboratory. Record each sample, including QA/QC samples on the chain-of-custody form.
3. Label each sample with the following:
   - Project number and client
   - Sample identification number
   - Sample medium
   - Collection mode (composite or grab)
   - Analysis required
   - Sample date
   - Sample time
   - Sampler's initials
   - Sample preservative (and lot/expiration number, as appropriate)
4. Decontaminate sample container exterior by wiping with a cloth.
5. Place the appropriate sample label, written in indelible ink, on each sample container.
6. Cover the label with clear packing tape to secure the label onto the container.
7. Re-check the caps on the sample containers to ensure that they are tightly sealed.
8. Place each sample container or package in individual sealable plastic bags and seal. Samples in glass containers that are being shipped to the laboratory must also be contained in bubble wrap or other protective media (see below).
9. Place sample on ice or similar chilling source immediately after sample collection.

Note: If the designated sampling person relinquishes the samples to other sampling or field personnel for packing or other purposes, the samplers will complete the chain-of-custody prior to releasing samples.

Packing

Samples will be packed for transportation and/or shipping in accordance with applicable Department of Transportation (DOT) procedures/labeling requirements; summarized as follows:

1. Using tape, secure the outside and inside of the drain plug at the bottom of the cooler that is used for sample transport.
2. Place inert packing material at the bottom of the cooler to prevent breakage.
3. Place plastic garbage bag or cooler liner in the cooler.
4. Place the sealed sample containers and package upright in the cooler. Do not mix different sample media in the same cooler. Include a temperature blank.
5. Pour wet ice into garbage bag or cooler liner with samples to ensure void spaces around sample containers are filled. Do not pack ice so tightly that it may prevent addition of sufficient cushioning material.
6. Fill the remaining space in the cooler with inert packing material.

7. Place the completed chain-of-custody forms in a large sealable plastic bag and tape the forms to the inside of the cooler lid. Chain-of-custody forms will be completed in accordance with the QAPP. The FSP or QAPP will specify whether non-standard turn-around times or laboratory level of data quality assurance beyond Level II are required.
8. Close the cooler lid and secure it with shipping tape, if shipped to the laboratory.
9. Mark the cooler on the outside with the following information: shipping address, return address, "Fragile" labels on the top and on one side, and arrows indicating "This Side Up" on two adjacent sides. If samples are shipped for Saturday delivery, include “Saturday Delivery” labels on the top and two adjacent sides. Also notify the laboratory sample receiving department to ensure staff will be available to receive and log samples. Additional DOT-mandated labeling may be required depending on the nature of samples collected.
10. Place signed and initialed custody seal tape over front and back of the cooler lid and cover with clear plastic tape.

Shipping

Samples will be shipped as follows:

1. All samples will be transported by a laboratory courier, an overnight carrier, or hand-delivered by field sampling personnel to the laboratory as soon as possible, ideally within 24 hours of the time of sample collection. Delivery to the laboratory may vary based upon sample hold times, which are summarized in the QAPP. Laboratory courier is the preferred shipment method for samples.
2. The following chain-of-custody procedures will apply to sample shipping:
   a. All pertinent information will be entered on the chain-of-custody form in the field. Assignment of the matrix spike/matrix spike duplicate (MS/MSD) and the analyses requested for each sample will be made.
   b. Relinquish the sample containers to the laboratory via laboratory courier, overnight carrier, or field sampling personnel delivery. The appropriate personnel will sign and date the chain-of-custody form to document the sample custody transfer. The signed and dated forms must be included in the cooler. The overnight carrier will not be required to sign the chain-of-custody forms. The sampler should retain the express carrier receipt or bill of lading; this document serves as an extension of the chain-of-custody during shipment.
   c. When the samples are received by the laboratory, the laboratory personnel shall complete the chain-of-custody forms by recording receipt of samples, measuring and recording the internal temperature of the shipping container, and comparing the sample identification numbers on the containers to the chain-of-custody form.
   d. A copy of the chain-of-custody form shall be returned from the laboratory to the Quality Assurance Manager (QAM) officer. The original shall be retained by the laboratory.
   e. A copy of the chain-of-custody form shall be reviewed by the QAM as soon as possible after submittal of the cooler to the laboratory to correct potential errors before the samples are logged in by the laboratory.

Held or Non-Analyzed Samples

Samples which are to be held for future potential analyses will be indicated as such on the chain-of-custody form. Upon arrival at the laboratory, samples to be held will be logged by the laboratory and placed in cold storage until requested to be analyzed or disposed. These procedures will be employed in accordance with the QAPP, and samples will not be disposed prior to confirmation by the designated Amec Foster Wheeler Environment & Engineering, Inc. Chemist or Project Manager.

- END OF PROCEDURE-

Investigation-Derived Waste (IDW) Sampling

This standard operating procedure (SOP) sets forth the procedures for sampling soil and liquids produced by investigation activities, collectively known as investigation-derived waste (IDW). Samples of IDW may be collected and analyzed for characterization prior to transport and disposal, if needed. IDW sampling may not be required, depending on the investigation area from which materials were derived. The need for IDW characterization depends on disposal options. Depending on investigation area knowledge, IDW may be left at the boring/sampling location and will not need to be containerized. IDW handling is discussed in the Field Sampling Plan (FSP) and may be further discussed in the Work Plan. Sample analyses will be performed as outlined in the Quality Assurance Project Plan (QAPP). Detailed sampling procedures for solids and equipment decontamination procedures are contained in SOP-F6 *Soil Sampling Procedures* and SOP-F10 *Field Equipment Cleaning and Decontamination Procedures*, respectively.

These general procedures are to be followed when sampling of IDW for disposal purposes:

Materials

The following equipment and materials, as appropriate, will be available during IDW sampling:

- Personal protective equipment (as required by the Health and Safety Plan [HASP])
- Tools for opening and securing container lids
- Stainless steel bowl, pan, and/or tray
- Laboratory-grade sample bottles
- Sample labels and chain-of-custody forms
- Insulated coolers with ice
- Stainless steel spoon/spatula
- Coliwasa, bailer, or other liquid waste sampler
- Field Logbook and indelible pen

IDW Sampling Procedures

The IDW sampling method will depend on the container in which the material was stored during the investigation. IDW containers may include Department of Transportation- (DOT-) approved 55-gallon drums (soil or liquid) and/or covered dumpsters (“roll offs”) (soil only). The number of samples to be collected is shown in the following table.

Medium	Container	Number of Samples	Composite[2]
Soil/Solids	55-gallon drum	1[1]	1[1,2]
Soil/Solids	Dumpster	4	0
Liquid	55-gallon drum	1	1[3]

(1) Composite sample to be collected from varying, representative depths within container. If more than one drum is filled per location, one composite sample will be collected; the composite sample will consist of soil from each drum at the specific location.
(2) Each composite sample will be comprised of a minimum of four subsamples; composited as described below.
(3) Containerized liquid IDW is assumed to be fairly homogenous; therefore, a composite sample is not necessary. However, contents may require homogenization as described below.

The sampling procedure is as follows:

1. Don the required personal protective equipment in accordance with specific IDW source as presented in the HASP.
2. If IDW is present in drums, make sure that the drum(s) are properly labeled prior to sampling. Consult the HASP and the site Health and Safety Supervisor if unlabeled drums with unknown contents are present prior to proceeding to subsequent steps.
3. If the IDW container appears to be under pressure (bulging), do not remove the container lid and do not attempt to move the container. Clear the area and notify the site Health and Safety Supervisor of the situation. Secure the area with caution tape to prevent pedestrian access to the container.
4. Record identifying container information in the Field Logbook, including dumpster/drum number, amount of IDW in the container, IDW type, sample date, and IDW source.
5. If the container does not appear to be under pressure, open the cover/lid of the container.
6. For soils, a composite sample should account for potential heterogeneity within the drum. A minimum of four subsamples are required to make an adequate composite. If only one drum is present, the sample should be collected from varying depths within the container to obtain a representative sample via appropriate sampling equipment (e.g., hand-driven split-spoon sampler, macrocore sampler, or hand auger). If more than one drum is present, subsampling from each drum is required to take into account possible heterogeneities. Each subsample should consist of an equivalent mass/volume of soil. Subsamples may be collected, if appropriate, as drums are filled, subsamples obtained in this manner must be placed in a sealed container and transferred immediately to the IDW-dedicated ice filled cooler for temporary storage. Once all subsamples are collected, place them in a clean stainless steel tray or bowl. Thoroughly mix with a stainless steel spoon or spatula. Once homogenized, place a portion of the soil into laboratory-grade jars. Immediately place the jars on ice for temporary storage.
6. For liquids, one sample will be collected from the approximate midpoint of the container using a disposable Coliwasa, bailer, or other instrument so that a relatively discrete sample can be collected. For liquids which may contain solids which have settled or are otherwise non-homogeneous, it may be appropriate to stir the contents prior to sampling to redistribute solids or to sample individual liquid phases separately. Pour the sample directly into a laboratory-grade jar and immediately placed on ice for temporary storage.
7. Close and secure the lid/cover of the container.
8. Properly label, handle, pack, and ship the samples in accordance with SOP-F11 *Field Sample Handling, Packing, and Shipping Procedures.* Analytical parameters to be included in waste characterization will be determined based on the disposal facility requirements and IDW source.

- END OF PROCEDURE-

Recording Notes in Field Logbooks

This standard operating procedure (SOP) sets forth the procedures for recording field observations in Field Logbook, and as appropriate, on additional field maps and/or field data sheets/forms. The field logbook should contain detailed records of all the field activities, interviews of people, and observations of conditions at a site. Entries should be described in as much detail as possible so that personnel can accurately reconstruct, after the fact, activities and events during their performance of field assignments. Field logbooks are considered accountable documents in enforcement proceedings and may be subject to review. Therefore, the entries in the logbook must be accurate and detailed; and they must reflect the importance of the field events. Use of specific field forms to supplement the Field Logbook is specified in the Field Sampling Plan (FSP).

These general procedures for field documentation will ensure that logbook documentation for any field activity is correct, complete, and adequate.

Materials

The following equipment and materials, as appropriate, will be available during IDW sampling:

- Field Logbook
- Field Maps
- FSP/Work Plan
- Site Specific Health and Safety Plan (HASP)
- Ball point pen or other permanent ink writing utensil
- Clipboard / protective case
- Engineer's ruler/scale

Field Logbook physical requirements

Field Logbooks should be bound (sewn) with water-resistant and acid-proof covers; they should have preprinted lines and wide columns. They should be approximately 7½- by 4½-inches or 8½- by 11-inches in size. Loose-leaf sheets are not acceptable for field notes. If notes are written on loose paper, they must be transcribed as soon as possible into a regular field logbook by the same person who recorded the notes.

Field data sheets specified for use in the FSP will be 8½- by 11-inches in size, "three hole punched" and will be contained and organized chronologically within a site-dedicated three-ring binder. If multiple field data sheets are used, the forms will be organized in the field binder by form type and then chronologically ordered.

General Guidelines

Field Log book procedures are as follows:

- A separate field logbook must be maintained for each project. If a site consists of multiple sub-sites or areas of concerns (AOCs), designate a separate logbook for each AOC. For special tasks, such as periodic well water-level measurements, data from

multiple AOCs may be entered into one logbook that contains only one type of information (e.g., system operation data).

- All logbooks must be bound and contain consecutively numbered pages.
- No pages can be removed from the logbook for any purpose.
- All field activities, meetings, photographs, and names of personnel must be recorded in the site field logbook.
- Each field logbook pertaining to a site or AOC should be assigned a serial number based on the date the logbook is issued to the project manager. The first issued logbook should be assigned number "1", the next number "2", etc. The Project Manager is to maintain a record of all logbooks issued under the project.
- All information must be entered with a ballpoint pen with waterproof ink. Do not use pens with "wet ink," because the ink may wash out if the paper gets wet. Pencils are not permissible for field notes because information can be erased. The entries should be written dark enough so that the logbook can be easily photocopied.
- Do not enter information in the logbook that is not related to the project. The language used in the logbook should be factual and objective.
- Begin a new page for each day's notes.
- Write notes on every line of the logbook. If a subject changes and an additional blank space is necessary to make the new subject title stand out, skip one line before beginning the new subject. Do not skip any pages or parts of pages unless a day's activity ends in the middle of a page.
- Draw and initial a diagonal line on any blank spaces of four lines or more to prevent unauthorized entries.

Format

Cover

Write the following information in clear capital letters on the front cover of each logbook using a Sharpie® or similar type permanent ink marker:

- Logbook identification number
- The serial number of the logbook (assigned by the Project Manager)
- Name of the site, city, and state
- Name of AOC, if applicable
- Beginning and end dates of activities contained within the Field Logbook

Spine

The spine of the logbook should contain an abbreviated version of the information on the cover: for example, "1, Col. Ave., Hastings, 5/2012 - 8/2012" written using a permanent ink marker.

Cover Page

Write the following information with a Sharpie® or other permanent ink marker:

- Logbook identification number
- The serial number of the logbook (assigned by the Project Manager)
- Name of the site, city, and state

- Name of AOC, if applicable
- Project Number
- Beginning and end dates of activities contained within the Field Logbook
- "Reward if Found"
- Amec Foster Wheeler, City, State and phone contact number

Field Logbook Contents

General Records

Enter the following information at the beginning of each day or whenever warranted during the course of a day:

- Date
- Starting time
- Specific location
- General weather conditions and approximate temperature
- Names of personnel present at the site, noting the affiliation(s) and designation(s) of all personnel
- Changes in instructions or activities at the site
- Time and summary of daily team safety meeting/audit "Tailgate"
- Levels of personal protective clothing and equipment
- Performance of equipment calibration, results and calibration solutions used.
- A general title of the first task undertaken (for example, well installation at MW-11, decontamination at borehole BH-11, groundwater sampling at MW-11)
- All activities should include a basic Site sketch of the area where work is being performed. Approximate scale for all diagrams. If this can't be done, write "not to scale" on the diagram or refer, in the Field Logbook to a field map if used (note: a dedicated field map must be referenced in the Field Logbook and included with the Field Notes in the project file). Indicate the north direction on all maps and cross-sections. Label features on each diagram. If work is being performed at a location not previously surveyed, distances to a minimum of two known or mapped locations should be measured (i.e. "two-tape"). When possible, two-taping should be performed to references that are more orthoganol to each other (e.g., 1. East/west and 2. North/south of the work location).
- Corrections, if necessary, including a single line through the entry being corrected will be initial and dated in the logbook.
- The person recording notes will apply their initials after the last entry on each page. No information is to be entered in the area following these initials.
- At the end of the day, signature of the person recording notes and date at the bottom of the last page. Indicate the end of the work day by writing "Left site at (time)." A diagonal line must be drawn across any remaining blank space at the bottom of this last page.

Photographs

The following information should be recorded in the logbook after taking a photograph:

- Time, date, location, direction, and, if appropriate, weather conditions
- Description of the subject photographed and the reason for taking the picture
- Sequential number of the photograph
- Name of the photographer.

If a Photo Log Form is used to (see Attachment B of this FSP), the Field Logbook will reference the use of the form and the form shall contain, at a minimum, the previously noted information.

Sampling

Media specific sample collection procedures should be consulted prior to and during the collections of samples. The following information should be entered into the logbook when collecting samples:

- Pre-sampling/collocated instrument reading/on-site measurement data (pH, temperature, specific conductivity, depth to water, photoionization detector [PID] reading etc.)
- Location description and type of sample (water, sediment, soil gas, etc.)
- Name(s) of sampler(s)
- Collection time (include purge start time for water or soil gas sampling)
- Designation of sample as a grab or composite sample
- Type of preservative(s) used (include Lot/Expiration, when appropriate)
- Note any additional quality assurance/quality control samples collected, if appropriate
- Field observations (odors, colors, weather, etc.)
- Preliminary sample description

If sampling SOP deviations were required, note the deviation, rationale for the deviation and note appropriate approvals that allowed the deviation to occur in the Field Logbook. If the deviation occurred at the request of a third party (e.g., regulator or authorized client representative), the signature of the third party should accompany the change in work documented in the Field Logbook.

If pre-printed field data forms are used (see Appendix B of the FSP), data should be entered on these pre-printed forms rather than into Field Logbooks. However, note in the logbook that the field data are recorded on separate forms. The information recorded on the form(s) may be supplemented in the Field Logbook, if appropriate.

If a data logger is used to record and preserve field results, the date and time of the logger will be synchronized to local time prior to initiation of data collection. Data logging must include site-specific information (e.g., project number) and data will be stored and managed in way that can be readily downloaded in a format consistent with field sampling forms (see Attachment B of the FSP). When applicable, at least the last two measurements should be manually recorded in the Field Logbook to ensure data is not 'lost' and data logging results can be verified – the Field Logbook will note the file name in the data logger corresponding to the field results. Raw (digital) and downloaded data logging files will be maintained in the project file and reviewed per quality assurance protocols as outlined in the QAPP.

Custody

Custody of field logbooks must be maintained at all times. Field personnel must keep the logbooks in a secure place (locked car, trailer, or field office) when the logbook is not in personal possession. Logbooks are official project documents and must be treated as such.

- END OF PROCEDURE-

APPENDIX B

APPROVED SOIL MANAGEMENT PLAN

Wood Environment & Infrastructure Solutions Inc.

August 6, 2018

SOIL MANAGEMENT PLAN ADDENDUM – BECK'S LAKE NPL / LASALLE PARK AREA

This document is an addendum to the existing Soil Management Plan (SMP) that was approved by the U.S. Environmental Protection Agency (EPA) on August 21, 2017 for the construction activities at the Charles Black Recreation Center (CBRC). A copy of the SMP for the CBRC construction is included as Attachment A. The existing SMP has been implemented by the Respondents to manage soils disturbed during construction at the CBRC which began in October 2017 and will continue until construction completion in early fall 2018. The area covered under the existing SMP includes an approximate six-acre area located in the southwest corner of the LaSalle Park property (i.e., remedial investigation sampling grid cells 14, 15, 21, 22, 26, and 27 presented in attached Figure 1) referred to as the Expedited Area (EA).

The anticipated construction activities at the CBRC resulting in soil disturbance and incorporated in the existing SMP included grading, installation of footings, extension of utilities, tree planting and landscaping, and installation of irrigation lines. It was not anticipated that soil would be disturbed at depths exceeding four feet below ground surface (bgs). However, installation of new water and sewer lines required excavation to depths of approximately 8 feet bgs.

In the existing SMP, potential exposure routes for human receptors to chemicals of concern (COCs) in soil included inadvertent ingestion (e.g., hand-to-mouth activities associated with smoking or eating), dermal contact, and inhalation. The baseline human health risk assessment (BHHRA) included in the EA Remedial Investigation (EA-RI) documented only inhalation exposure to manganese and to a lesser extent, arsenic, as chemicals which may pose a human health risk during the proposed construction and future use of the expanded CBRC. The inhalation exposure route in the EA-RI BHHRA was defined for construction workers when soil is most likely to generate airborne particulates during periods of earth work related to the CBRC construction. Per the SMP, the inhalation exposure route is monitored to prevent unintended exposure during the construction activities. Engineering controls such as wetting to minimize dust generation and appropriate breathing protection could be employed to prevent exposure. The original SMP established a dust target level of 1.5 mg/m3 to be protective of construction workers and the public to exposure of manganese and arsenic.

As part of this SMP Addendum, the area for which the existing SMP applies will be enlarged to include the entire property boundary of the LaSalle Park Area (LPA) and includes sampling grid cells 1 through 32, the sledding hill and Beck's Lake; refer to Figure 1. As such, the COCs and site-specific dust action levels required revision.

The COCs for the full LPA were identified based on potential human health risks quantified and discussed in the BHHRA section of the EPA approved RI Report (August 11, 2017). Only aluminum, arsenic, cadmium, and manganese were found in surface and subsurface soils at concentrations which could be a potential human health risk by inhalation during potential future soil disturbance activities at the site.

Total chromium was considered a COC for incidental ingestion, dermal contact, and inhalation. However total chromium was evaluated as hexavalent chromium in the BHHRA. Recent chromium data collected within fill outside of the boundary of the LPA by the EPA, as part of the Agency for Toxic Substances and Disease Registry (ATSDR) investigation of nearby residential properties, concluded that concentrations of hexavalent chromium were not detected within the total chromium component. Therefore, hexavalent chromium is considered to comprise only a small portion of the total chromium concentrations. The other chromium species in total chromium, trivalent chromium, is much less toxic than hexavalent chromium. If total chromium is evaluated as trivalent chromium, it would not have been selected as a COC within the risk assessment. Therefore, since recent data suggests that total chromium is likely to be predominantly trivalent chromium (not hexavalent), total chromium is not considered a COC in this addendum.

Lead is present at elevated concentrations in subsurface soil at the Site, and, in limited instances, at elevated concentrations in surface soils. Some of these elevated concentrations are in or near areas of proposed construction activities. To mitigate potential exposures to other chemicals that have been identified as COCs, the SMP requires PPE (including coveralls, gloves, and safety glasses) to limit direct contact exposures, and monitoring and, if necessary, mitigation of respirable dust to limit inhalation exposures. These measures will also be protective for potential exposure to soil containing elevated lead concentrations. The construction activities covered in the SMP are planned to be short (i.e., on the order of weeks) in contrast to more typical construction worker exposure duration assumptions. Further, soil that is excavated or disturbed at the Site will be managed by first stockpiling and covering it, then characterizing it, and finally disposing of it off-site. Then these areas will be covered with a demarcation layer (e.g., snow fencing or coloured geotextile) and backfilled with imported clean fill sand and topsoil. As such, any soil disturbances will not result in the potential for increased future exposure to contamination at the Site.

Analytical results of select analytes for surface soil sampling activities are presented on Figure 2. Analytical results of select analytes for subsurface soil sampling activities are presented on Figure 3. Analytical results for select analytes for groundwater sampling activities are presented on Figure 4.

Since the construction workers will be utilizing Level D personal protective equipment (hard hat, steel-toed boots, etc.), the exposure pathway associated with this SMP Addendum is limited to inhalation. Dust emissions will be monitored visually and with a real-time handheld monitor at least twice per day - once in the morning and a second time in the afternoon during active soil disturbance. The monitoring instrument will be a DustTrak II Aerosol Monitor, or equivalent. The DustTrak II can measure dust over a range of 0.001 to 150 milligrams per cubic meter (mg/m^3).

The American Conference of Governmental Industrial Hygienists (ACGIH) suggests that airborne concentrations of nuisance dusts or “particulates not otherwise classified” should be kept below 3 mg/m^3, respirable particles, and 10 mg/m^3, inhalable particles, (TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents, Biological Exposure Indices, Appendix B. 2012). Using the ACGIH respirable particles criteria in conjunction with Occupational Safety and Health Administration (OSHA) permissible exposure limits (PELs) and maximum observed soil COC concentrations, site-specific dust exposure action levels during construction activities have been established. For work to a maximum depth of 5 feet bgs, the site-specific dust exposure action level was determined to be 1.3 mg/m^3. For work extending below a depth of 5 feet bgs to a maximum depth of 15 feet bgs, the site-specific dust exposure level was determined to be 1.0 mg/m^3. The site-specific

dust exposure action levels will be used to maintain dust levels well below the potential dust exposure limit calculations for the mixture of COCs (aluminium, arsenic, cadmium, and manganese). A dust exposure calculation worksheet is included as Attachment B. If the Construction Project Manager or the Project Coordinator determines the dust levels are too high or are measured at or above the 1.0 mg/m^3 or 1.3 mg/m^3 thresholds, as appropriate, the contractor will be responsible for employing dust control measures.

Groundwater is not anticipated to be encountered during any of the planned construction/maintenance activities. Although construction activities are not anticipated to encounter groundwater, the only construction worker groundwater COC identified in the BHHRA section of the RI was the inhalation of volatile cyanide, which was evaluated assuming the conservative toxicity values for hydrogen cyanide. The maximum modelled concentration of cyanide as hydrogen cyanide in excavation air within the BHHRA was 0.176 mg/m^3, and the occupational health standard recommended by OSHA is 5.2 mg/m^3. Therefore, any excavation impacting groundwater is unlikely to cause concentrations within excavation trench air above occupational health standards.

In addition to the current construction activities associated with the CBRC expansion, the following known construction/maintenance activities are planned across the LaSalle Park property:

1) Installation of an irrigation system for the soccer fields located across the northern and central portions of the park. The water supply line will be set below the frost line (i.e., 36 inches bgs). The water supply line could be installed concurrent with the installation of the water line for the planned drinking water fountains described in bullet item 5. The main feed lines will be set at a depth of 18 inches bgs and the sprinkler feed lines will be set at a depth of 12 inches bgs. All irrigation lines will be "blown-out" each fall to prevent the build-up of ice within the irrigation system piping network. The irrigation piping will be constructed of Schedule 40 polyvinyl chloride (PVC). The irrigation system layout is indicated on Figure 1. Following EPA/IDEM approval, installation of the irrigation system is planned to begin in June 2018.

2) An old slide, which is currently unsafe, needs to be removed from the park. The new slide will be located north of the CBRC within the EA. The removal will result in extraction of 12-inch footers and filling in the resultant holes with clean fill. The installation of the new slide will involve the installation of new footers set at a maximum depth of 16 inches bgs. The location of the slide removal/replacement is indicated on Figure 1.

3) A pavilion, located at the northwest corner of the park, will be removed due to its dilapidated condition. This activity will result in the removal of 26-inch and 8-inch deep footers and filling in the resultant holes with clean fill. The location of the pavilion removal is indicated on Figure 1.

4) A new pavilion is planned to be installed west of the tennis courts within the EA. During new pavilion construction, base preparation will result in sod and soil removal to a depth of 8 inches across a 24 foot by 24-foot area. Multiple footers will be auger-drilled to a depth of 24 inches bgs. In addition, 200 feet of electrical conduit will need to be installed to a depth of 24 inches bgs to supply electric power to the new pavilion. The location of the new pavilion and grill area is indicated on Figure 1.

5) Two drinking water fountains are planned to be installed with one located at the south end of the westernmost soccer field and one located adjacent to the new pavilion. The source of water will be from the City of South Bend municipal water supply. Footers for each of the water fountains will be hand dug to a depth of 12 inches bgs. The water supply lines to the fountains will be constructed of Schedule 40 PVC and will be set at a depth of 36 inches bgs. The supply lines to the fountains will be "blown-out" each fall to prevent the build-up of ice within the fountain system piping network. The location of the two proposed drinking water fountains are indicated on Figure 1.

6) Several landscaping activities are planned across the park including planting of shrubs and flowers (hand digging 12 to 16 inches bgs), tree stump grinding (20 inches bgs), and tree installations (24 inches bgs).

Construction methods that minimize soil disturbance will be utilized where practicable, including directional drilling, vibratory plowing or similar methods. Since directional boring of the water line will result in the piping being in contact with potentially contaminated soil, the water supply lines for the drinking fountains will be installed via trenching. A coloured geotextile will be placed to line the trench as a demarcation layer. Clean fill will be placed within the demarcation layer and around the piping to reduce the potential for contaminant permeation into the water lines. Clean fill will be installed to ensure a minimum separation of 4-inches between the pipe and the geotextile. Any soil brought to the surface via any of the planned soil disturbance activities described herein will be temporarily staged (placed onto and subsequently covered with plastic sheeting) pending offsite disposal arrangements as previously described in the SMP. The remaining backfill to grade will consist of clean fill sand and topsoil (verified by analytical testing at a frequency of one sample per 500 cubic yards). In addition, all piping will be pressure tested prior to backfilling to insure the integrity of the connections and piping systems. A 6- inch to 8-inch diameter gravel bed will be placed to a depth of approximately 1 ft bgs adjacent to water fountains to allow unused water from the fountains to drain to the subsurface.

No construction or maintenance work involving surface or subsurface soil disturbance will be conducted within the LaSalle Park property boundaries without a minimum 48-hour notice given to the Project Coordinator of the planned activity. This allows arrangements to be made for onsite monitoring associated with the SMP implementation. This SMP Addendum encompasses the planned activities outlined herein. Any future soil disturbance work, not described herein, will require subsequent addendums to the SMP which must be approved by EPA and IDEM prior to implementation.

FIGURE 1

Areas of Future Soil Disturbance Work

LEGEND

- LASALLE PARK AREA BOUNDARY
- 01 SAMPLING GRID / IDENTIFIER
- SURFACE SOIL SAMPLE LOCATION
- SOIL BORING LOCATION
- EXTENT OF NON-NATIVE FILL
- PROPOSED IMPROVEMENT AREA
- PROPOSED SOCCER FIELD IRRIGATION SYSTEM SPRINKLER HEAD
- PROPOSED SOCCER FIELD IRRIGATION SYSTEM WATER LINE
- W PROPOSED WATER FOUNTAIN LOCATION
- PROPOSED WATER FOUNTAIN WATER LINE LOCATION
- UE PROPOSED UNDERGROUND ELECTRIC LINE LOCATION

N

0 200 400

APPX. SCALE IN FEET

PAVILION REMOVAL

LASALLE PARK HOMES

FALCON STREET

SOCCER FIELD

NEW PAVILION W/GRILL

TENNIS COURT

SLIDE REMOVAL/ REPLACEMENT

SPLASH PAD

PLAYGROUND

BASKET-BALL COURT

BASEBALL DIAMOND

SOCCER FIELD

CHARLES BLACK RECREATION CENTER

NEOS 360 INSTALLATION (Postponed)

PAVED PARKING LOT

SOUTHERN PLAYGROUND

GAZEBO

SLEDDING HILL

SOCCER FIELD

SOCCER FIELD

SOCCER FIELD

WALKWAY

WALKWAY

BECK'S LAKE

SH

LINDEN AVENUE

COLFAX AVENUE

HOLLAND STREET

KALEY STREET

RESIDENTIAL

WEST WASHINGTON STREET

RESIDENTIAL | LAKE STREET | RESIDENTIAL | IOWA STREET | RESIDENTIAL | KENTUCKY STREET | RESIDENTIAL | DUNDEE STREET | RESIDENTIAL | CAMDEN STREET | RESIDENTIAL | LIBERTY STREET | RESIDENTIAL | BENDIX DRIVE | RESIDENTIAL

B

T:\CADD\Client\City of South Bend\IN - South Bend\314011068\CAD\314110068-017.dwg 5/29/2018 2:42 PM Burgocr

Drawn By: CRB 5/29/18
Checked: RJT
Approved: RTB
DWG Name: 314I1068-017

BECK'S LAKE LaSALLE PARK AREA
SOUTH BEND, INDIANA

PREPARED FOR
CITY OF SOUTH BEND AND
HONEYWELL INTERNATIONAL INC.

FIGURE 1

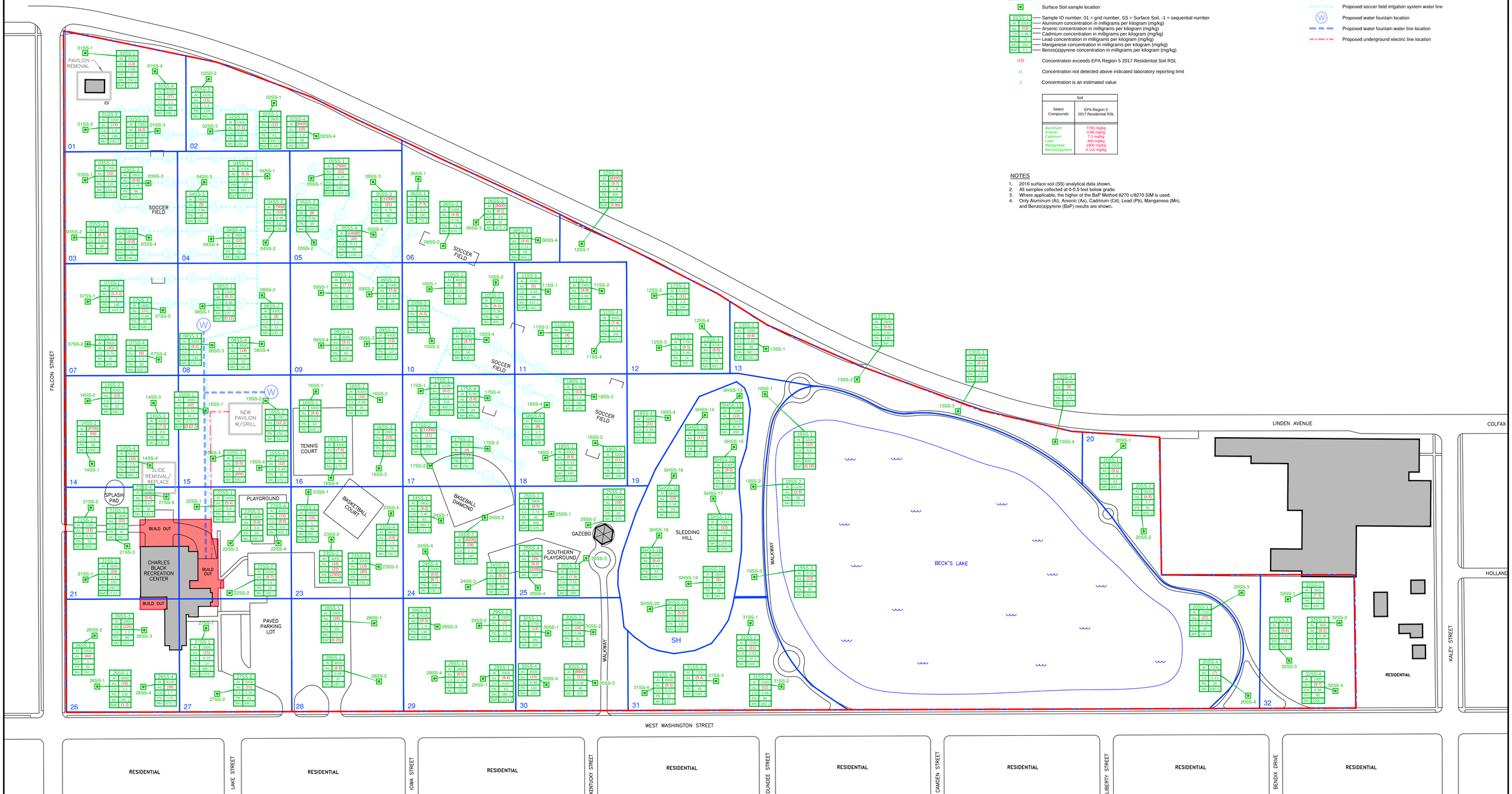
AREAS OF FUTURE
SOIL DISTURBANCE WORK

WSP USA Inc.
54520 NORTHERN AVENUE
UNIT A
SOUTH BEND, IN 46635
TEL: +1 574.287.2282

FIGURE 2

Select Surface Soil Sample Results

D



WSP USA Inc.
54520 NORTHERN AVENUE
UNIT A
SOUTH BEND, INDIANA 46635
TEL: +1 574.287.2282

FIGURE 2

SELECT SURFACE SOIL SAMPLE RESULTS

BECK'S LAKE LaSALLE PARK AREA
SOUTH BEND, INDIANA

PREPARED FOR
CITY OF SOUTH BEND AND
HONEYWELL INTERNATIONAL INC.

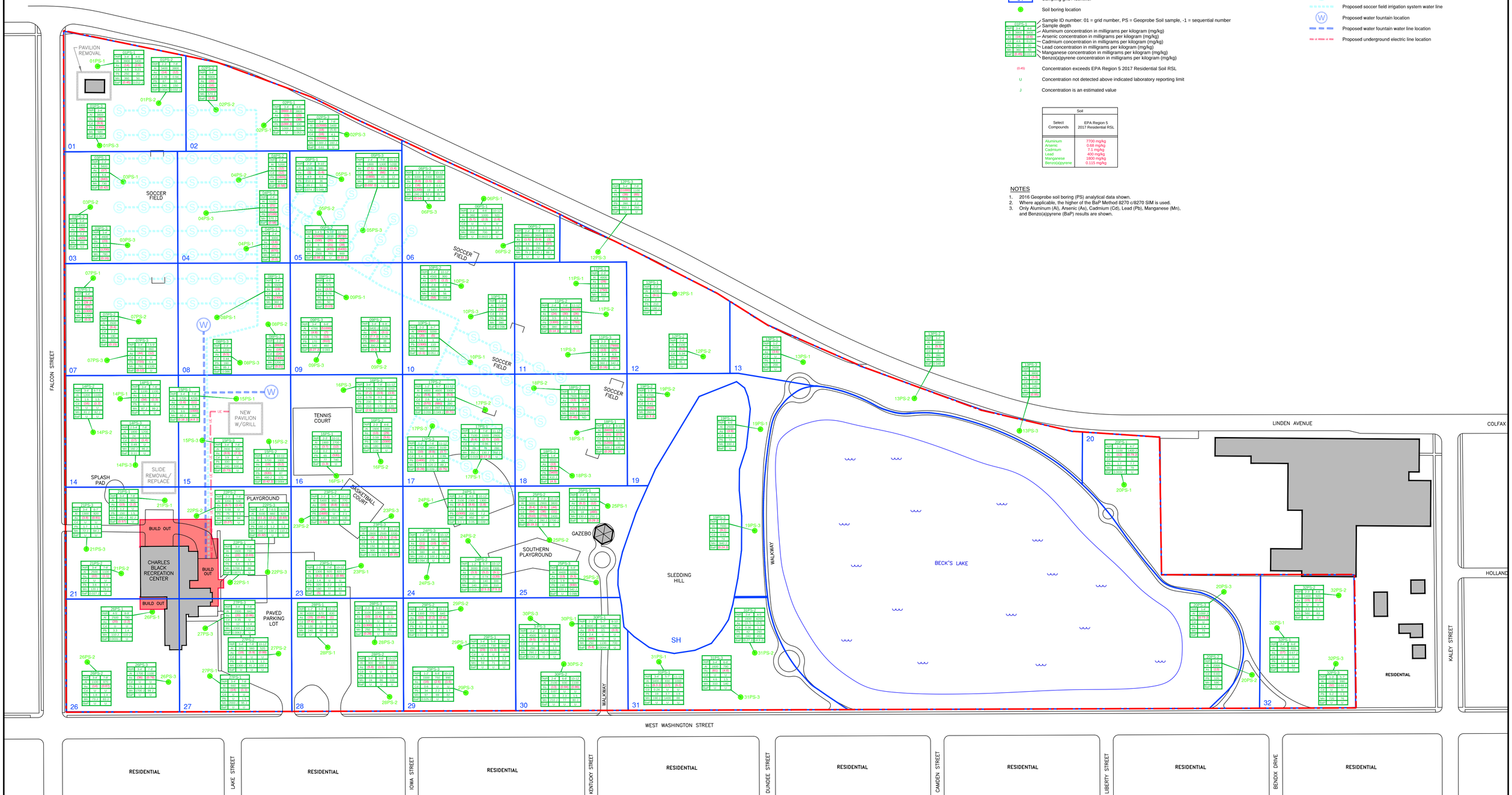
Drawn By: CRB 6/13/18
Checked:
Approved:
DWG Name: 31411068-019

SCALE IN FEET
0 80 160

FIGURE 3

Select Subsurface Soil Sample Results

D



LEGEND

- LaSalle park area boundary
- 01 — Sampling grid / identifier
- Soil boring location
- Sample ID number: 01 = grid number, PS = Geoprobe Soil sample, -1 = sequential number
- Sample depth
- Aluminum concentration in milligrams per kilogram (mg/kg)
- Arsenic concentration in milligrams per kilogram (mg/kg)
- Cadmium concentration in milligrams per kilogram (mg/kg)
- Lead concentration in milligrams per kilogram (mg/kg)
- Manganese concentration in milligrams per kilogram (mg/kg)
- Benzo(a)pyrene concentration in milligrams per kilogram (mg/kg)
- (0.45) — Concentration exceeds EPA Region 5 2017 Residential Soil RSL
- U — Concentration not detected above indicated laboratory reporting limit
- J — Concentration is an estimated value

Soil	
Select Compounds	EPA Region 5 2017 Residential RSL
Aluminum	7700 mg/kg
Arsenic	0.68 mg/kg
Cadmium	7.1 mg/kg
Lead	400 mg/kg
Manganese	1800 mg/kg
Benzo(a)pyrene	0.115 mg/kg

- Proposed improvement area
- Proposed soccer field irrigation system sprinkler head
- Proposed soccer field irrigation system water line
- Proposed water fountain location
- Proposed water fountain water line location
- Proposed underground electric line location

NOTES

1. 2016 Geoprobe soil boring (PS) analytical data shown.
2. Where applicable, the higher of the BaP Method 8270 c/8270 SIM is used.
3. Only Aluminum (Al), Arsenic (As), Cadmium (Cd), Lead (Pb), Manganese (Mn), and Benzo(a)pyrene (BaP) results are shown.

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TEL: +1 574.287.2282

FIGURE 3

SELECT SUBSURFACE SOIL SAMPLE RESULTS

BECK'S LAKE LaSALLE PARK AREA
SOUTH BEND, INDIANA

PREPARED FOR
CITY OF SOUTH BEND AND
HONEYWELL INTERNATIONAL INC.

Drawn By: CRB 6/13/18
Checked:
Approved:
DWG Name: 314I1068-020

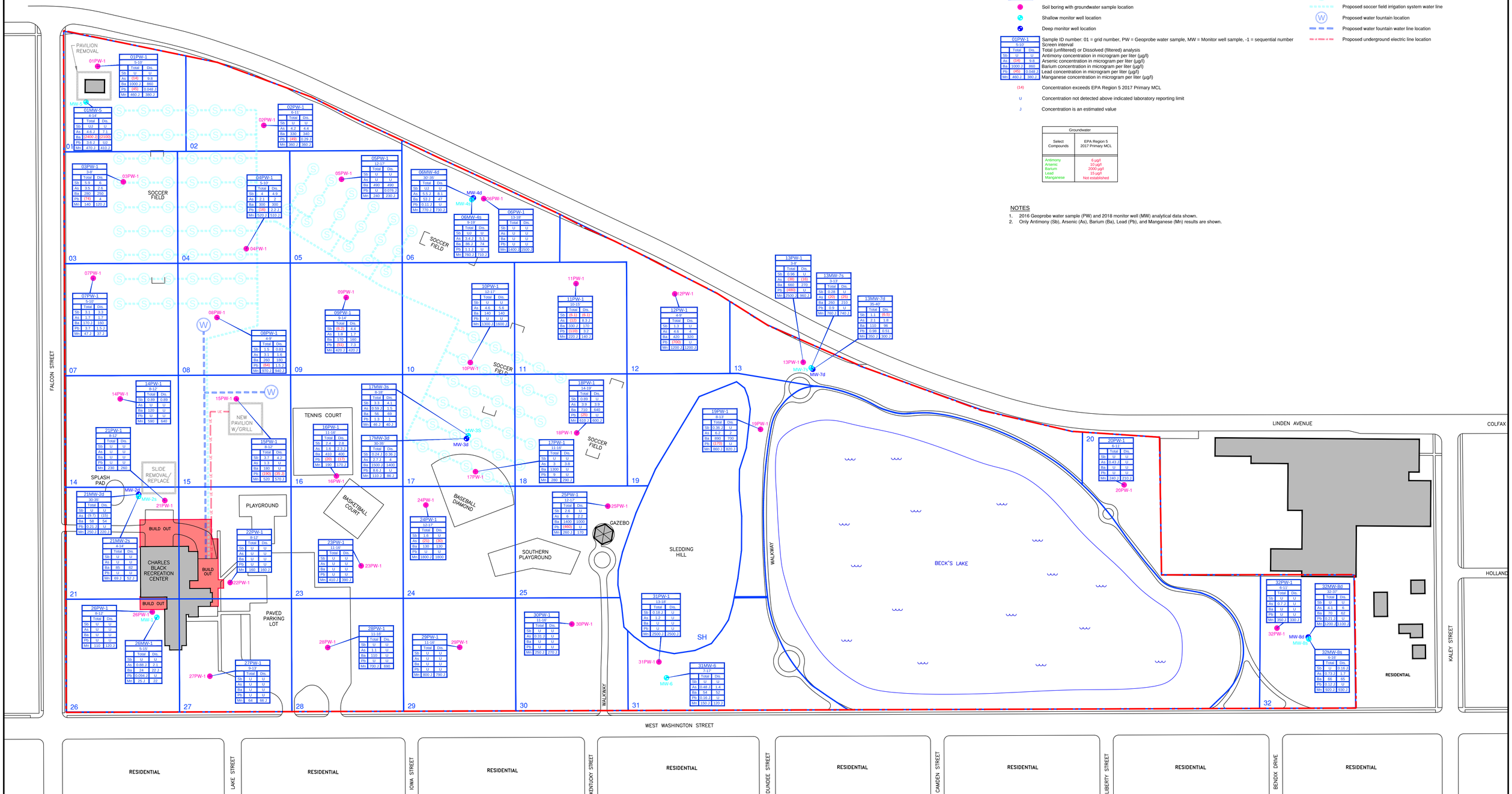
SCALE IN FEET
0 80 160

N

FIGURE 4

Select Groundwater Sample Results

D



LEGEND

- LaSalle park area boundary
- 01 — Sampling grid / identifier
- Soil boring with groundwater sample location
- Shallow monitor well location
- Deep monitor well location
- Proposed improvement area
- Proposed soccer field irrigation system sprinkler head
- Proposed soccer field irrigation system water line
- Proposed water fountain location
- Proposed water fountain water line location
- Proposed underground electric line location

01PW-1	
5-10	
Total	Dis.
Sb	U	U
As	(14)	9.8
Ba	1000 J	660
Pb	(40)	0.048 J
Mn	460 J	380 J

- 01PW-1 — Sample ID number: 01 = grid number, PW = Geoprobe water sample, MW = Monitor well sample, -1 = sequential number
- 5-10 — Screen interval
- Total — Total (unfiltered) or Dissolved (filtered) analysis
- Sb — Antimony concentration in microgram per liter (µg/l)
- As — Arsenic concentration in microgram per liter (µg/l)
- Ba — Barium concentration in microgram per liter (µg/l)
- Pb — Lead concentration in microgram per liter (µg/l)
- Mn — Manganese concentration in microgram per liter (µg/l)
- (14) — Concentration exceeds EPA Region 5 2017 Primary MCL
- U — Concentration not detected above indicated laboratory reporting limit
- J — Concentration is an estimated value

Groundwater	
Select Compounds	EPA Region 5 2017 Primary MCL
Antimony	6 µg/l
Arsenic	10 µg/l
Barium	2000 µg/l
Lead	15 µg/l
Manganese	Not established

NOTES

1. 2016 Geoprobe water sample (PW) and 2018 monitor well (MW) analytical data shown.
2. Only Antimony (Sb), Arsenic (As), Barium (Ba), Lead (Pb), and Manganese (Mn) results are shown.

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FIGURE 4

SELECT GROUNDWATER SAMPLE RESULTS

BECK'S LAKE LaSALLE PARK AREA SOUTH BEND, INDIANA

PREPARED FOR
CITY OF SOUTH BEND AND
HONEYWELL INTERNATIONAL INC.

Drawn By: CRB 6/13/18
Checked:
Approved:
DWG Name: 31411068-021

SCALE IN FEET
0 80 160

N

ATTACHMENT A

Soil Management Plan for the CBRC Expansion

SOIL MANAGEMENT PLAN

LASALLE PARK AREA,
BECK'S LAKE NPL
SOUTH BEND, INDIANA

SOIL MANAGEMENT PLAN

LASALLE PARK AREA, BECK'S LAKE NPL SOUTH BEND, INDIANA

PROJECT NO.: 186103-3735
DATE: AUGUST 2017

WSP USA

WSP.COM

Our ref.: 186103-3735

U.S. Environmental Protection Agency, Region 5, Superfund Division

77 W. Jackson Boulevard (SR-6J)
Chicago, IL 60604-3507

Ms. Jenny Davison:

Enclosed please find the Soil Management Plan for construction activities at the Charles Black Recreation Center at the LaSalle Park in South Bend, Indiana.

Kind regards,

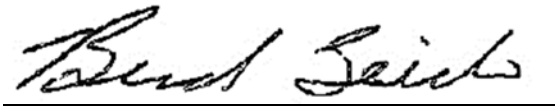
R. Joseph Trojan
Project Coordinator

rjt/bl
Encl.

CC :
Jessica Fliss, Indiana Department of Environmental Management
Stephen Studer, Krieg Devault
Kerry Dziubek, Arnold & Porter Kaye Scholer LLP
Chuck Geadelmann, Honeywell International Inc.
Steve Murray, Amec Foster Wheeler

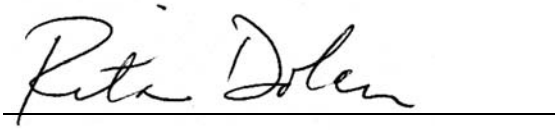
SIGNATURES

PREPARED BY



Brad Leick. P.E.
Technical Associate

REVIEWED BY



Rita Dolan, P.E.
Senior Environmental Manager

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FIGURES

APPENDIX

1 INTRODUCTION

1.1 PURPOSE AND OBJECTIVES

WSP USA (WSP) has prepared this Soil Management Plan (SMP) on behalf of the City of South Bend and Honeywell International Inc. (the Respondents) for the expansion of the Charles Black Recreation Center (CBRC) in the LaSalle Park Area (LPA) of the Beck's Lake National Priorities List (NPL) Site in South Bend, Indiana (Site). The CBRC is within an investigation area called the Expedited Area (EA), which is not a formally recognized operating unit, but was created solely for the purposes of expediting the investigation of potential impacts to soil, groundwater and vapor in the immediate vicinity of the CBRC. The results of the EA investigation were submitted to the U.S. Environmental Protection Agency, Region 5, (EPA) as a draft Remediation Investigation (RI) Report (DRAFT Focused LaSalle Park Area Remedial Investigation Report - Expedited Area, March 27, 2017 [EA-RI], Amec Foster Wheeler Environment & Infrastructure, Inc., 2017). The Draft EA-RI report will be incorporated into the Final RI Report for the LPA.

As described in the EA-RI, this SMP does not include groundwater or vapor risk mitigation as these exposure pathways do not present a risk to construction workers or to the general public during site activities (EA-RI). Footings for the construction of the CBRC are not anticipated to exceed four to five feet below ground surface (bgs). Recent site groundwater elevations at the EA have been measured at approximately eight to nine feet bgs. As described in the EA-RI, soil vapor samples collected within the EA did not contain volatile organic compound (VOC) levels above the calculated screening levels for soil vapor.

The purpose of this SMP is to provide information, procedures, and requirements for management of potentially affected soil and debris that may be encountered, disturbed, or excavated as part of construction related to the expansion of the CBRC. The overall objective of the SMP is to provide processes and procedures necessary to protect human health during the disturbance of land related to the expansion of the CBRC. Specific objectives of the SMP include:

- Inform contractors and subcontractors of the potential presence of residually-impacted environmental media in the EA and the proposed build out area (Figure 1);
- Provide risk mitigation measures during construction and excavation activities to eliminate or control direct contact and inhalation exposure pathways for disturbed soils;
- Provide plans and procedures for management of excavation spoils during construction and excavation activities;

Contractors and subcontractors subject to this SMP are responsible for environmental health and safety during execution of their work, and the health and safety of their employees during all activities performed for this project. In addition, each individual worker is responsible for his or her own health and safety and for adherence to associated health and safety plans.

2 BACKGROUND

The NPL Site is located in the southwest portion of the City of South Bend, Indiana (Figure 1) and includes LaSalle Park, a 40-acre municipal park which features the CBRC and Beck's Lake. The NPL Site was originally a swampy area and may have once been the headwaters of the Kankakee River (USEPA, 2015). It is believed that approximately 15 acres of the NPL Site was used as an open style dump that allegedly accepted household waste, construction debris and industrial wastes (Bendix, 1984).

The EA occupies six acres in the southwest corner of LaSalle Park (Figure 2). The EA is primarily developed land that includes the CBRC and the main parking area for LaSalle Park. Where it is not developed, the EA is grass and tree covered. The CBRC features a gymnasium, community room, kitchen, computer lab, weight room and game room and offers community programming and services to children and seniors. The CBRC is a slab-on-grade building with a footprint of approximately 16,000 square feet. The City of South Bend plans to expand the footprint of the CBRC by approximately 17,000 square feet in 2017 (Figure 2). The City of South Bend intends to hire a contractor to implement the construction of the CBRC expansion.

In order to expedite construction of this community development project, investigation activities proposed near the CBRC were completed during the initial phases of the LaSalle Park Area Remedial Investigation.

Chemicals of potential concern (COPCs) were identified based on potential human health risks quantified and discussed in the baseline human health risk assessment (BHHRA) section of the EA-RI Report, and include 14 metals, five semi-volatile organic compounds (SVOCs), and cyanide in surface soil, subsurface soil and groundwater. Of the COPCs identified, only arsenic and manganese were found in surface and subsurface soil at concentrations which suggest a potential human health risk related to the CBRC buildout. The exposure route and receptor identified in the BHHRA is the inhalation pathway for the construction worker. No chemicals were identified in groundwater or soil vapor at concentrations that pose a human health risk under the planned CBRC build out exposure scenarios. Figures 3, 4, and 5 present soil and groundwater sample results collected in the EA during the RI.

3 RISK MITIGATION MEASURES

3.1 APPLICABILITY

This SMP is being implemented by the Respondents to manage soils disturbed during build out construction of the CBRC. It is anticipated that surficial soils will be disturbed during build out grading and during installation of footings for the addition to the CBRC. It is not anticipated that any soil will be disturbed below four to five feet of the existing ground surface. Other construction related activities that may disturb soils during the build out of the CBRC include tree planting and landscaping, installation of irrigation lines, and extension of site utilities.

Potential exposure routes for human receptors to potential COPCs in soil include inadvertent ingestion (e.g., hand-to-mouth activities associated with smoking or eating), dermal contact, and inhalation. The BHHRA in the EA-RI only documents inhalation exposure to manganese and to a lesser extent, arsenic, as chemicals which may pose a human health risk related to the proposed build out and future use of the expanded CBRC. The exposure route, as outlined in the conceptual site model and the BHHRA in the RI, is defined for construction workers when soil is most likely to generate airborne particulates during periods of earth work related to the CBRC build out. This exposure route, however, can be readily monitored to ensure unintended exposure during the activities does not occur. Engineering controls such as wetting to minimize dust generation, dust monitoring, and appropriate breathing protection can be employed to prevent exposure.

3.2 SOIL MANAGEMENT STANDARDS

The soil management standards applicable to the construction of the CBRC are summarized in the baseline human health risk assessment (BHHRA) in the EA-RI. The BHHRA was performed using the EPA Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) guidance for risk assessment and the Indiana Department of Environmental Management (IDEM) guidance, including, but not limited to the USEPA risk assessment guidance and directives summarized in Appendix I of the EA-RI. Only arsenic and manganese were found in soil at concentrations that pose a potential human health risk related to the CBRC expansion (EA-RI). The exposure route of greatest concern is the inhalation (i.e., dust) pathway for the construction worker. The planned future use of the property does not include residential use.

3.3 ORGANIZATION STRUCTURE AND RESPONSIBILITIES

The following personnel at the Site will have responsibility for implementation of this SMP.

3.3.1 CONSTRUCTION PROJECT MANAGER

The Construction Project Manager will regularly interact with the Beck's Lake NPL Site Project Coordinator (WSP Project Coordinator). The responsibilities of the Construction Project Manager include, but are not limited to, overall management of construction activities, including coordination between construction management contractors and utility companies, management of the site construction administrative activities, following the WSP Project Coordinator's guidance for proper implementation of the SMP, and assistance with waste characterization for offsite diposal of excavation spoils generated from the CBRC build out.

3.3.2 CONTRACTOR'S SAFETY OFFICER

The responsibilities of the Contractor's Safety Officer(s) include, but are not limited to, the health and safety of the contractor's employees, the implementation of soil exposure control measures, and reporting to the Construction Project Manager. The responsibility for approving contractor Health & Safety plans rests with contractor management.

3.3.3 SITE WORKERS

The responsibilities of the Site Workers include, but are not limited to, performance of all work in a safe manner, adherence to the contractors' health and safety plan (HASP), and adherence to the soil exposure control measures.

3.3.4 WSP PROJECT COORDINATOR

The WSP Project Coordinator (or designee) will serve as the environmental consultant on site. The responsibilities of the WSP Project Coordinator include but are not limited to:

- Providing guidance to the Construction Project Manager during the construction build out regarding implementation of the SMP.
- Providing environmental monitoring/screening during construction, as required.
- Providing assistance with preparing a waste profile(s) for the accepting landfill(s) for excavation spoils.
- Oversight and documentation during the construction build out to verify proper implementation of the SMP, including the engineering controls.

3.4 MINIMUM MEASURES

The following minimum measures are intended to reduce the potential for exposure to impacted soils at the build out area during construction and construction-related activities. The minimum measures include proper hygiene to prevent accidental ingestion of soil,

personal protective equipment to limit direct skin and eye contact, and implementing dust control procedures.

3.4.1 HYGIENE

Proper hygiene should be followed by construction workers to reduce the accidental ingestion of site soils. Personal hygiene practices include following proper smoking, eating, and drinking procedures, and decontamination of personal protective equipment and tools prior to leaving the construction area. Smoking, eating, and drinking should occur only in specific areas designated for each activity. Proper hygiene includes limiting contact of hands to the face or mouth, washing hands prior to eating or drinking during breaks and at the end of the day, and field cleaning of clothes and boots at the end of the day.

Contractors and sub-contractors should provide and maintain with adequate supplies, at no cost to the worker, gloves, hand wipes, waterless cleaning soap (or similar), and access to hand washing stations.

3.4.2 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) should be worn at all times. It is the responsibility of the Contractor's Safety Officer to ensure PPE is adequate for the job and is properly worn. PPE worn for work during soil excavation and transportation activities shall be modified Level D and include steel-toed boots, safety glasses, and a hard hat. Additional PPE may be required by individual contractors.

The use of dust masks is not aniticipated to be required:however, if dust control measures identified in Section 3.4.3 do not fully limit dust generation, dust masks and/or air monitoring may be employed.

3.4.3 DUST CONTROL

Dust control is the primary method of mitigating dust emissions from the construction area. Soil will be wetted as necessary to maintain dust formation below action levels. The general contractor and WSP Project Coordinator will be responsible for determining the frequency and degree of water applications to control dust. The general contractor should coordinate with the Construction Project Manager to schedule water applications. The water applications should not overly wet and degrade the working condition of the soil. Use of wetting agents will be considered.

Dust emissions will be monitored visually and with a real-time handheld monitoring instrument at least twice per day; once in the morning and a second time in the afternoon. The monitoring instrument will be a DustTrak II Aerosol Monitor, or equivalent. The DustTrak II can measure dust over a range of 0.001 to 150 milligrams per cubic meter (mg/ m^3).

The American Conference of Governmental Industrial Hygienists (ACGIH) suggests that airborne concentrations of nuisance dusts or "particulates not otherwise classified" should be kept below 3 mg/m^3, respirable particles, and 10 mg/ m^3, inhalable particles, (TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents, Biological Exposure Indices, Appendix B. 2012). Using the ACGIH respirable particles criteria, an action level during construction activities will be established at 1.5 mg/ m^3. This will maintain a dust level well below the potential dust exposure limit calculation for arsenic and manganese of 20.8 mg/m^3 and 21.7 mg/m^3 respectively, which were based on the maximum detected concentrations in soil of 120 milligrams per kilogram (mg/kg) and 2,300 mg/kg respectively. Dust exposure limit calculations are presented in Appendix B.

If the Construction Project Manager or the WSP Project Coordinator determines the dust levels are too high, or are measured at or above 1.5 mg/ m^3, the contractor will be responsible for employing dust control.

If necessary, water will be applied to paved surfaces, including parking areas and roads that become tracked with construction/excavation soils. A water truck may be used to limit dust generation during periods of high truck traffic in the construction area. When necessary, paved surfaces will be swept (mechanical street sweeper) to reduce dust generation and to prevent the tracking of soils onto public roads.

3.5 SOIL MANAGEMENT

All EA soils, including topsoil, disturbed during build out construction of the CBRC will be transported to an EPA pre-approved CERCLA waste off-site licensed landfill for proper disposal. Since soil segregation is not necessary, analytical soil sampling will occur only for waste profiling purposes and will follow the requirements set forth by the EPA off-site disposal coordinator and the disposal facility during the waste characterization and profiling process.

Soils will either be direct loaded into covered trucks for transport or will be stockpiled for later disposal. Stockpiled soils will be placed on plastic sheeting and bermed within a secured area and will be covered with plastic sheeting to prevent dust generation.

3.5.1 EXCAVATED SOIL CHARACTERIZATION AND HANDLING

Excavated soils will be sampled for waste characterization purposes only. Excavated soils will be transported and disposed of by a qualified subcontractor. Waste characterization parameters and frequency will be dictated by the disposal requirements of the EPA and the approved landfill accepting the excavation spoils. EPA will be notified of analytical results and landfill information prior to disposal.

3.5.2 CONTINGENCY PLANNING

If unexpected conditions are encountered during earthwork, such as discovery of large amounts of fill material, soil staining, or strong odors originating from soils, work should cease until the WSP Project Coordinator is notified. If further investigation is necessary, the WSP Project Coordinator should review the site conditions and provide recommendations, which may include segregating the suspect soils and collecting analytical samples for soil characterization.

3.6 DECONTAMINATION PLAN

Equipment used during the excavation of soils should be properly decontaminated before leaving the construction area. Decontamination includes brushing, seeping, and removal of dust and soil from equipment. A decontamination area will be constructed to provide space for wet or dry decontamination methods. Dry methods should be used to remove any large accumulations of soil on equipment. If further decontamination is needed, wet methods may then be used. Any accumulated soil removed by decontamination will be disposed of with the excavated spoils. Decontamination tools should be cleaned or discarded.

Construction worker PPE should also be decontaminated prior to workers leaving the Site at the end of each shift. Reusable PPE such as boots and gloves should be decontaminated with wet methods, while disposable PPE should be disposed of as solid waste.

3.7 SITE ACCESS AND SECURITY

Site access is the responsibility of the Construction Project Manager during construction and will be limited to construction personnel. If necessary, the Construction Project Manager will establish requirements for visitors entering the Site. As described in Section 4.1, an exclusion zone will be delineated using temporary chain-linked fencing. All construction personnel and visitors admitted to the exclusion zone should have proper training, made aware of the soil exposure pathways, and wear proper PPE. The entire work area will be closed off from public access during construction and will be properly secured after hours to ensure the general public is not exposed to soils or dust.

3.8 TRAINING

Site training is required to access the exclusion zone and will be set forth in the Contractor's HASP. A contractor is any company that is engaged in work related to the expansion of the CBRC. All contractors who perform work within the exclusion zone or handle site soils should develop a HASP that adequately addresses health and safety concerns for workers under their supervision.

All workers with the potential for exposure to soils should receive awareness training of this SMP during site orientation. At a minimum, each worker will be briefed on all relevant health and safety requirements before performing site work. Safety practices for employees who manage soil and debris are to be incorporated into the Contractor's HASP. A training log sheet acknowledging that each worker is aware of and understands this SMP should be used for record keeping purposes (Appendix A).

3.9 MONITORING

Dust will be managed during disturbance activities to minimize the potential for airborne migration of affected materials and to be protective of employees, site workers, and properties adjacent to the construction area. Dust will be monitored visually and with a real-time handheld instrument with the goal of no visual emissions and measured levels at or below 1.5 mg/m^3. Dust control measures such as mechanical street sweeping, soil wetting, and water trucks will be employed as needed to eliminate dust generation. Construction area personal air monitoring is not anticipated to be required for this site due to the limited scope of soil disturbance, but may be used if site conditions suggest otherwise.

4 INSTITUTIONAL AND ENGINEERING CONTROLS

4.1 FENCED WORK AREA

The entire work area will be enclosed with temporary chain-linked fencing to create an exclusion zone. The fenced working area will delineate the exclusion zone and create a physical barrier to deter the general public from accessing the work area. Only workers with site awareness training and adequate PPE will be permitted to access the exclusion zone. At the end of each work day, access gate(s) on the fence will be locked and the Contractor's Safety Officer will verify that the work area is secure.

4.2 CLEAN SOIL CAPPING

Large-scale clean soil capping will not be needed in the construction area. It is anticpated that nearly all soil disturbing activities will occur within the footprint of the addition to the CBRC. Clean soil capping may be required in areas adjacent to the new addition footprint where the topsoil is stripped and removed to create a suitable work surface. In these areas a minimum of 12-inches of clean topsoil will be placed over the sub-soil prior to landscaping or re-seeding the area with grass. Clean soils intended for backfill will be sampled prior to use and analyzed for VOCs, SVOCs, metals, pesticides, herbicides, and PCBs at a rate of one sample per 500 cubic yards per source. Results will be compared to the June 2017 RSL values for residential soil, except for arsenic where results will be compared to the IDEM Remediation Closure Guide (IDEM 2012) for soil exposure/direct contact (residential) value of 9.5 mg/kg.

5 TERMINATION

This SMP is intended only for construction activities related to the expansion of the CBRC. Future soil management or remediation will be conducted as needed following completion of the Final LPA RI and in accordance with future remedial work plans.

REFERENCES

Amec Foster Wheeler Environment & Infrastructure, Inc., 2017. *DRAFT Focused LaSalle Park Area Remedial Investigation Report – Expedited Area.* March 27.

American Conference of Governmental Industrial Hygienists (ACGIH). 2012 TLVs and BEIs. Threshold Limit Values for Chemical Substances and Physical Agents, Biological Exposure Indices, Appendix B.

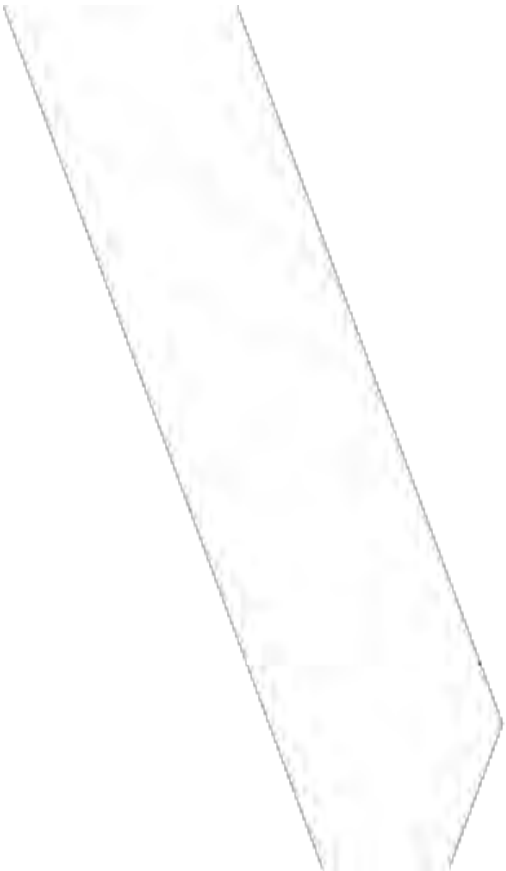
Bendix Corporation. 1984 *103c CERCLA Notification for Beck's Lake Site. March 28.*

Indiana Department of Environment and Health (IDEM), 2012. *Remediation Closure Guide*. March 22, with correction July 9, 2012.

United States Environmental Protection Agency (USEPA), 2015. *Administrative Settlement Agreement and Order On Consent (ASAOC) For Focused Remedial Investigation/Feasibility Study Of The LaSalle Park Area Of The Beck's Lake Site*. October 2.

ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
BHHRA	baseline human health risk assessment
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CBRC	Charles Black Recreation Center
COPC	chemicals of potential concern
EA	Expedited Area
EPA	U.S. Environmental Protection Agency
HASP	health and safety plan
IDEM	Indiana Department of Environmental Management
LPA	LaSalle Park Area
mg/m^3	milligrams per cubic meter
mg/kg	milligrams per kilograms
NPL	National Priorities List
PPE	personal protective equipment
RI	Remedial Investigation
SMP	Soil Management Plan
SVOC	semi-volatile organic compound
VOC	volatile organic compound



FIGURES

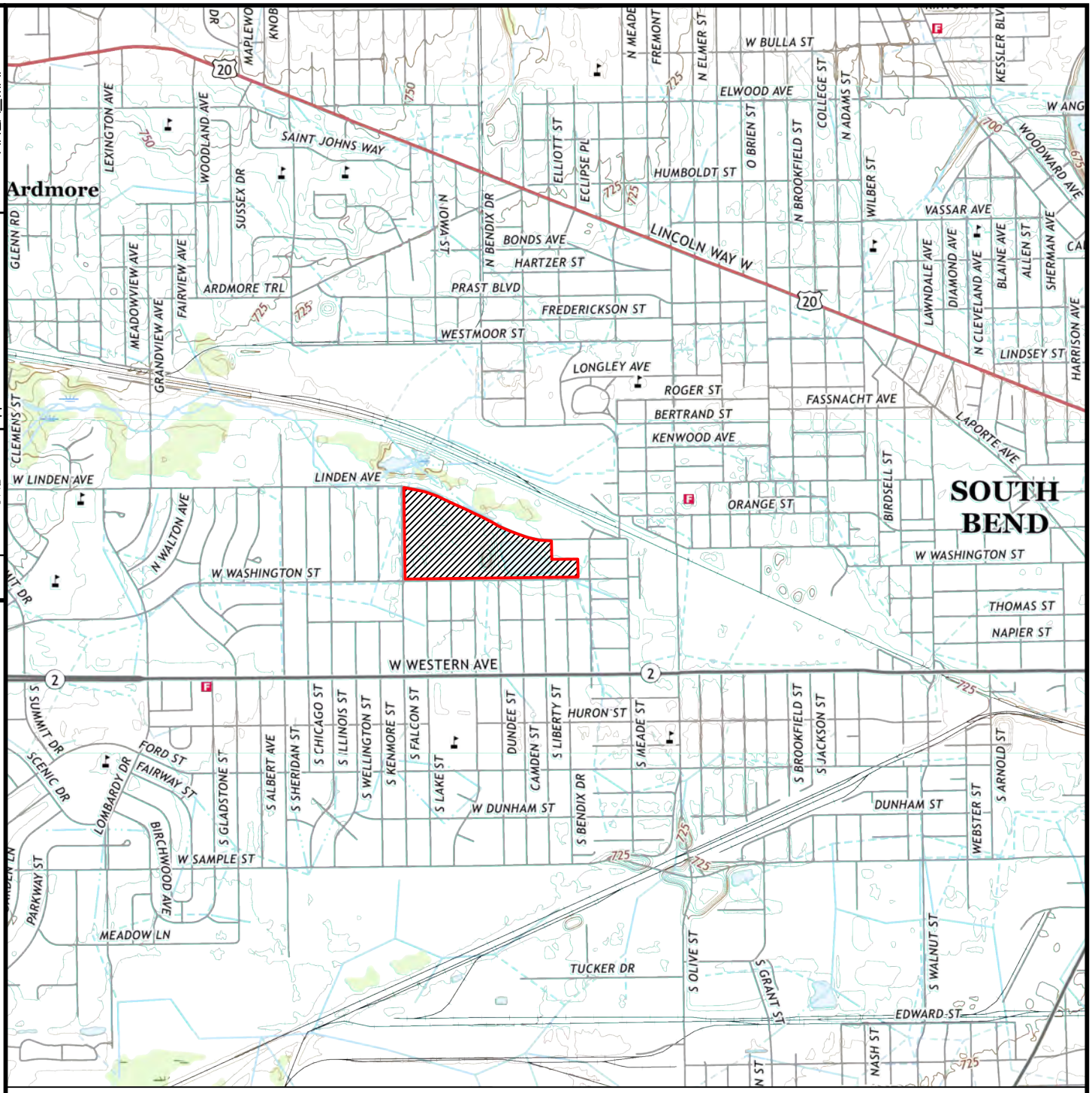
DWG Name: AREA_MAP

Checked:

Approved:

Drawn By: CRB

A



SCALE 1:24000

1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

LEGEND

LaSALLE PARK AREA

N

WSP USA Inc. 54520 NORTHERN AVE. UNIT A SOUTH BEND, IN 46635 TEL: +1 574.287.2282	FIGURE 1 AREA MAP	BECK'S LAKE SITE LaSALLE PARK AREA SOUTH BEND, INDIANA

B

07 08 09

14 15 16

21 22 23

26 27 28

GRASS

SPLASH PAD

MW-2S

PLAYGROUND

TENNIS COURT

DRIVEWAY

PROPOSED BUILD OUT

CHARLES BLACK RECREATION CENTER

MW-1

PAVED PARKING LOT

LASALLE PARK HOMES

FALCON STREET

WEST WASHINGTON STREET

RESIDENTIAL

LAKE STREET

LEGEND

- Expedited investigation area boundary
- 01 Sampling grid / identifier
- Construction limits
- Soil boring with groundwater sample location
- Soil boring location
- Surface soil sample location
- Monitoring well location

APPX. SCALE IN FEET

0 60

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FIGURE 2

SITE MAP
EXPEDITED AREA

BECK'S LAKE SITE
LaSALLE PARK AREA
SOUTH BEND, INDIANA

Drawn By: CRB 6/1/17
Checked:
Approved:
DWG Name: SITE_MAP

B

07 08 09

14SS-2
As [13]
Pb 92
Mn 940 J

15SS-1
As [42]
Pb 44 J
Mn 670 J
BaP [0.63 J]

15SS-2
As [12 J]
Pb 150 J
Mn 510 J

14SS-3
As [7.2]
Pb 89
Mn 530 J

GRASS

14SS-1
As (56)
Pb 96
Mn [2000 J]
BaP 0.067 U

14SS-4
As [10]
Pb 320
Mn 880 J

15SS-3
As [5.9]
Pb [600]
Mn 690 J

15SS-4
As [12]
Pb 81
Mn 370 J

TENNIS COURT

21SS-4
As [5.6]
Pb 54
Mn 230 J

22SS-1
As [5.4]
Pb 31
Mn 440 J
BaP 0.035 U

14 15 16

21SS-2
As [15]
Pb 55
Mn [1800 J]

SPLASH PAD

PLAYGROUND

22SS-4
As [12]
Pb 120
Mn 920 J

GRASS

DRIVEWAY

PROPOSED BUILD OUT

22SS-3
As [5.6]
Pb 68
Mn 390 J

21SS-1
As [23]
Pb 100
Mn 380 J
BaP [0.11]

21SS-3
As [22]
Pb 42
Mn 390 J

CHARLES BLACK RECREATION CENTER

22SS-2
As [9.7]
Pb 29
Mn 780 J

21 22 23

26SS-2
As [42]
Pb 91
Mn 350 J

26SS-3
As (120)
Pb 96
Mn 520 J

27SS-1
As [11]
Pb 14
Mn 880 J
BaP 0.075 J

PAVED PARKING LOT

26SS-1
As [18]
Pb 230
Mn 280 J
BaP (1.3)

26SS-4
As [28]
Pb 170
Mn 970 J

27SS-2
As [11]
Pb 43
Mn 840 J

26 27 28

LASALLE PARK HOMES

FALCON STREET

WEST WASHINGTON STREET

RESIDENTIAL

LAKE STREET

RESIDENTIAL

LEGEND

- Expedited investigation area boundary
- 01 — Sampling grid / identifier
- Construction limits
- Surface Soil sample location
- 14SS-1 — Sample ID number: 14 = grid number, SS = Surface Soil, -1 = sequential number
- As (56) — Arsenic concentration in milligrams per kilogram (mg/kg)
- Pb 96 — Lead concentration in milligrams per kilogram (mg/kg)
- Mn [2000 J] — Manganese concentration in milligrams per kilogram (mg/kg)
- BaP 0.067 U — Benzo(a)pyrene concentration in milligrams per kilogram (mg/kg)
- (56) — Concentration exceeds IDEM OLQ 2017 Recreational Park User Soil Direct Contact Screening Level
- [310] — Concentration exceeds EPA Region 5 2016 (or most current) Residential Soil RSL
- U — Concentration not detected above indicated laboratory reporting limit
- J — Concentration is an estimated value

Soil		
Select Compounds	EPA Region 5 2016 (or most current) Residential RSL	IDEM OLQ 2017 Recreational Park User Soil Direct Contact Screening Level
Arsenic	0.68 mg/kg	9.5 mg/kg
Lead	400 mg/kg	400 mg/kg
Manganese	1800 mg/kg	2500 mg/kg
Benzo(a)pyrene	0.115 mg/kg	0.22 mg/kg

NOTES

1. All samples collected at 0-0.5 feet below grade
2. Where applicable, the higher of the BaP Method 8270 c/8270 SIM is used
3. Only Arsenic (As), Lead (Pb), Manganese (Mn), and Benzo(a)pyrene (BaP) results are shown

N

APPX. SCALE IN FEET
0 60

WSP USA Inc.
54520 NORTHERN AVE.
UNIT A
SOUTH BEND, IN 46635
TEL: +1 574.287.2282

FIGURE 3

SELECT SURFACE SOIL RESULTS
EXPEDITED AREA

BECK'S LAKE SITE
LaSALLE PARK AREA
SOUTH BEND, INDIANA

Drawn By: CRB 6/1/17
Checked:
Approved:
DWG Name: SURFACE

B

14PS-2		
Depth	3'-4'	6'-7.5'
As	[16]	[1.2]
Pb	1.6	1.5
Mn	81 J	82 J
BaP	ND	ND

14PS-1		
Depth	3'-4'	7'-8'
As	[34]	[1.3]
Pb	1.6	2.2
Mn	87 J	99 J
BaP	ND	ND

14PS-3		
Depth	2.5'-4'	7'-8'
As	[17]	[1.4]
Pb	24	1.5
Mn	160 J	86 J
BaP	0.11	ND

15PS-1		
Depth	3'-4'	7'-8'
As	[1.6]	[11]
Pb	9.6	(1500)
Mn	60 J	390
BaP	[0.16 J]	(4.8 J)

15PS-2		
Depth	3'-4'	10'-11'
As	[19]	[3.2]
Pb	[630]	87
Mn	490 J	170
BaP	(1.2)	ND

15PS-3		
Depth	3'-4'	7'-8'
As	[8.9]	[7.3]
Pb	330	3.5 U
Mn	240	930 J
BaP	[0.73]	ND

21PS-1		
Depth	3'-4'	7'-8'
As	[13]	[1.2]
Pb	150	1.5
Mn	160 J	82 J
BaP	[0.57]	ND

22PS-2		
Depth	2'-3'	7'-8'
As	[6.7]	[1.4]
Pb	75	1.3
Mn	190	94
BaP	[0.27]	ND

21PS-2		
Depth	3'-4'	7'-8'
As	[22]	[1.1]
Pb	3.6	1.4
Mn	120 J	85 J
BaP	0.027 J	ND

21PS-3		
Depth	3'-4'	6'-7'
As	[3.8]	[0.81]
Pb	1.7	1.5
Mn	72 J	94 J
BaP	ND	ND

22PS-3			
Depth	3'-4'	7'-8.5'	11'-12'
As	[11 J]	[2.2]	[0.83]
Pb	160 J	1.2	1.2
Mn	340 J	130 J	110 J
BaP	[0.32]	ND	ND

22PS-1		
Depth	3'-4'	7'-8'
As	[22]	[0.83]
Pb	6.4	1.3
Mn	1700	86
BaP	ND	ND

26PS-1		
Depth	4'-5'	8'-9'
As	[20]	[1.2]
Pb	3.3	1.4
Mn	110 J	110 J
BaP	0.0031 J	ND

27PS-3		
Depth	3'-4'	7'-8'
As	[20]	[0.86]
Pb	12	1.4
Mn	[2300 J]	100 J
BaP	0.0063 J	ND

27PS-2			
Depth	3'-4'	7'-8'	10'-12'
As	[19]	[5.9]	[0.89]
Pb	ND	1.5	1.1
Mn	1300	91 J	100 J
BaP	ND	ND	ND

26PS-2		
Depth	3'-4'	7'-8'
As	[14]	[0.87]
Pb	1.8	1.4
Mn	73 J	83 J
BaP	ND	ND

26PS-3		
Depth	3'-4'	7'-8'
As	[36]	[0.78]
Pb	1.9	2.3
Mn	1700	99 J
BaP	ND	ND

27PS-1		
Depth	3'-4'	7'-8'
As	[14]	[1.1]
Pb	ND	1.5
Mn	[2000]	95 J
BaP	ND	ND

07 08 09 14 15 16 21 22 23 26 27 28

GRASS
SPLASH PAD
PLAYGROUND
TENNIS COURT
DRIVEWAY
PROPOSED BUILD OUT
CHARLES BLACK RECREATION CENTER
PAVED PARKING LOT
LASALLE PARK HOMES
FALCON STREET
WEST WASHINGTON STREET
RESIDENTIAL
LAKE STREET

LEGEND

- Expedited investigation area boundary
- 01 — Sampling grid / identifier
- Construction limits
- Soil boring with groundwater sample location
- Soil boring location

15PS-1		
Depth	3'-4'	7'-8'
As	[1.6]	[11]
Pb	9.6	(1500)
Mn	60 J	390
BaP	[0.16 J]	(4.8 J)

- Sample ID number: 15 = grid number, PS = Geoprobe Soil sample, -1 = sequential number
- Sample depth
- Arsenic concentration in milligrams per kilogram
- Lead concentration in milligrams per kilogram
- Manganese concentration in milligrams per kilogram
- Benzo(a)pyrene concentration in milligrams per kilogram
- (1500) — Concentration exceeds IDEM OLQ 2017 Recreational Park User Soil Direct Contact Screening Level
- [11] — Concentration exceeds EPA Region 5 2016 (or most current) Residential Soil RSL
- ND — Concentration not detected above laboratory reporting limit
- J — Concentration is an estimated value

Soil		
Select Compounds	EPA Region 5 2016 (or most current) Residential RSL	IDEM OLQ 2017 Recreational Park User Soil Direct Contact Screening Level
Arsenic	0.68 mg/kg	9.5 mg/kg
Lead	400 mg/kg	400 mg/kg
Manganese	1800 mg/kg	2500 mg/kg
Benzo(a)pyrene	0.115 mg/kg	0.22 mg/kg

NOTES

1. All samples collected at 0-0.5 feet below grade
2. Where applicable, the higher of the BaP Method 8270 c/8270 SIM is used
3. Only Arsenic (As), Lead (Pb), Manganese (Mn), and Benzo(a)pyrene (BaP) results are shown

N

APPX. SCALE IN FEET
0 60

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FIGURE 4

SELECT SUBSURFACE SOIL RESULTS
EXPEDITED AREA

BECK'S LAKE SITE
LaSALLE PARK AREA
SOUTH BEND, INDIANA

Drawn By: CRB 6/1/17
Checked:
Approved:
DWG Name: SUBSURFACE

B

07 08 09

14PW-1
8'-12'

	Total	Dis.
As	1 U	1 U
Pb	3 U	3 U
Mn	(590)	(640)

15PW-1
8'-12'

	Total	Dis.
As	[1.3]	1 U
Pb	(190)	(35)
Mn	(520)	(570)

GRASS

GRASS

TENNIS COURT

MW-2S
4'-14'

	Total	Dis.
As	0.12 U	1 UJ
Pb	3 U	3 UJ
Mn	260	260 J

21PW-1
8'-12'

	Total	Dis.
As	1 U	1 U
Pb	3 U	3 U
Mn	230	260

14 15 16

SPLASH PAD

MW-2S

GRASS

PLAYGROUND

LASALLE PARK HOMES

FALCON STREET

DRIVEWAY

PROPOSED BUILD OUT

GRASS

CHARLES BLACK RECREATION CENTER

PROPOSED BUILD OUT

22PW-1 (DUP)
8'-12'

	Total	Dis.
As	1 U	1 U
Pb	3 U	3 U
Mn	160	160

21 22 23

PROPOSED BUILD OUT

26PW-1
8'-12'

	Total	Dis.
As	1 U	1 U
Pb	3 U	3 U
Mn	110	120

MW-1

MW-1
5'-15'

	Total	Dis.
As	0.12 U	1 UJ
Pb	3 U	3 UJ
Mn	200	200 J

PAVED PARKING LOT

PAVED PARKING LOT

GRASS

27PW-1
9'-13'

	Total	Dis.
As	1 U	1 U
Pb	3 U	3 U
Mn	64	66

GRASS

26 27 28

WEST WASHINGTON STREET

RESIDENTIAL

LAKE STREET

RESIDENTIAL

LEGEND

- Expedited investigation area boundary
- 01 — Sampling grid / identifier
- Construction limits
- Soil boring with groundwater sample location
- Monitoring well location
- 15PW-1 (8'-12'; Total / Dis.: As [1.3] / 1 U; Pb (190) / (35); Mn (520) / (570)) — Sample ID number: 15 = grid number, PS = Geoprobe Water sample, -1 = sequential number; Screen interval; Total (unfiltered) or Dissolved (filtered) analysis; Arsenic concentration in micrograms per liter; Lead concentration in micrograms per liter; Manganese concentration in micrograms per liter
- (190) — Concentration exceeds IDEM OLQ 2017 Tapwater Residential Screening Level
- [1.3] — Concentration exceeds EPA Region 5 2016 Tapwater RSL
- U — Concentration not detected above indicated laboratory reporting limit
- J — Concentration is an estimated value

Water		
Select Compounds	EPA Region 5 2016 Tapwater RSL	IDEM OLQ 2017 Tapwater Residential Screening Level
Arsenic	0.052 ug/l	10 ug/l
Lead	15 ug/l	15 ug/l
Manganese	430 ug/l	430 ug/l

N

APPX. SCALE IN FEET

0 60

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UNIT A
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TEL: +1 574.287.2282

FIGURE 5

SELECT SHALLOW GROUNDWATER RESULTS
EXPEDITED AREA

BECK'S LAKE SITE
LaSALLE PARK AREA
SOUTH BEND, INDIANA

Drawn By: CRB 6/1/17
Checked:
Approved:
DWG Name: GROUNDWATER

APPENDIX A SMP ACKNOWLEDGEMENT FORM

SMP Acknowledgement Form

Proposed Charles Black Community Recreation Center Buildout
South Bend, Indiana

I have been informed of the existence of the above referenced Soil Mangement Plan (SMP), dated August 2017, in effect for construction and excavation activities at the subject property, have access to the SMP, and have read, understood, and agree to comply with the SMP provisions for work activities at this site.

Name (Printed)	Signature	Date

APPENDIX B DUST EXPOSURE LIMIT CALCULATIONS

DUST EXPOSURE CALCULATION WORKSHEET					
DustLevel			Safety Factor for this site = 4		
Chemical	Exposure Limit (mg/m3)	Maximum Soil Concentration (mg/kg)	Exposure Limit Based on Single Compound (EL Mix, mg/m3)	Dust Quotient for Each Compound (level/limit)	Exposure from Single Compound [1.5 mg/m3)/ELmix]
Arsenic	0.01	120	20.83	1.20E+04	0.072
Manganese	0.2	2,300	21.74	1.15E+04	0.069
Sum				2.35E+04	
Dust Exposure Level at Mixture PEL =			10.638		0.282

EQUATIONS USED IN THIS CALCULATION

Dust action level = (For one dust)

$$\frac{(1E+6)(\text{Exposure Limit mg/m3})}{(\text{Concentration mg/kg})(\text{Safety Factor})}$$

Dust action level = (For mixed dusts)

$$\frac{(1E+6) / (\text{Safety Factor})}{\text{Sum of } [(\text{Concentration mg/kg}) / (\text{Exposure Limit})]}$$

Author: Amec Foster Wheeler

ATTACHMENT B

Dust Exposure Calculation Worksheet

DUST EXPOSURE CALCULATION WORKSHEET - Site-Wide

DustLevel — Safety Factor for this site = 4

Chemical (a)	Occupational Exposure Limit (b) (mg/m^3)	Maximum Detected Soil Concentration (mg/kg)	Exposure Limit Based on Single Compound (c) EL_{mix} (mg/m^3)
0-5 ft Soil			
ALUMINUM	1	15000	16.7
ARSENIC	0.01	120	21
CADMIUM	0.002	89	5.6
MANGANESE	0.02	2500	2.0
Sum			
Dust Exposure Level at Mixture PEL (d) =			1.3
0-15 ft Soil			
ALUMINUM	1	51000	4.9
ARSENIC	0.01	120	21
CADMIUM	0.002	120	4.2
MANGANESE	0.02	2800	1.8
Sum			
Dust Exposure Level at Mixture PEL (d) =			1.0

Prepared by: KALS 5/11/2018

Checked by: ARQ 5/14/18

Notes:

(a) Chemicals of Concern for the inhalation of soil particulates pathway in the BHHRA are included. Although total chromium was evaluated as hexavalent chromium in the BHHRA, site-specific testing indicated total chromium was not primarily hexavalent chromium. Total chromium would not have been a COC in the BHHRA if it were evaluated as trivalent chromium, therefore chromium has not been included in this worksheet.

(b) Although OSHA PELs remain in effect, it is strongly encouraged by OSHA that workplaces use more protective values that have been provided in annotated Z tables: https://www.osha.gov/dsg/annotated-pels/index.html
For the purpose of this evaluation, typically the ACGIH 2018 Threshold Limit Values (TLVs) were selected.
Respiratory TLVs were selected if available. These correspond to measured concentrations of 2.5 um in diameter.
Total chromium has been evaluated as Hexavalent Chromium.

(c) Dust action level = (For one dust)

$$\frac{(1E+6)(\text{Exposure Limit (mg/m3)})}{(\text{Concentration (mg/kg)})(\text{Safety Factor})}$$

OSHA Standard Interpretations, Standard Number: 1910.120.
https://www.osha.gov/laws-regs/standardinterpretations/1993-03-24

(d) Dust action level = (For mixed dusts)

$$\frac{(1E+6) / (\text{Safety Factor})}{\text{Sum of [(Concentration (mg/kg)) / (Exposure Limit)]}}$$

SPECIAL NOTE - At current maximum concentrations of lead in soil observed across the site, there is no reason to assume worker exposure to lead would cause an unacceptable risk given typical exposure.

APPENDIX C

FIELD FORMS

Date: _____

Project Name: _____

Project Number: _____

INSTRUMENT CALIBRATION RECORD

Calibration Performed By: _____

Calibration Checked By: _____

Instrument	Serial Number	Owner*	Standard					Units	Time	Comments
			Type	Conc.	Reading**	Lot No.	Expiration			
☐ PID			Isobutylene					ppmv		
☐ FID			Zero gas					ppmv		
pH Meter			Low					SU		
			Intermediate					SU		
			High					SU		
Cond. Meter			Low					mS/cm		
			High					mS/cm		
Temp. Meter			Therm.					°C		
Redox Meter			Zobell					mV		(usually 231 +/- 10 mV)
Dis. Oxygen			Ambient Air					mg/L		Air Temp:
Turbidity			Low					NTU		
			High					NTU		
4-gas Meter			O_2					ppmv		
			CO					ppmv		
			H_2S					ppmv		
			LEL (as CH4)					%		

Materials Record	Instrument Make and Serial Number	Comments
Water Source:		
Trip Blank Water Source:		
Sample Preservatives Source:		
Disposable Filter Type:		
Calibration Fluids/Standards Source:		

Notes:

* Indicate if the instrument is rented and from whom. If instrument is precalibrated before receipt for use, obtain calibration sheets for the record.

**If the meter reading is not within acceptable criteria, clean or replace probe and re-calibrate, or use a different meter if available. The Project Manager should be notified of the problem and acceptability of the out-of-calibration instrument should be obtained from the Project Principal before it is used.

SURFACE SOIL SAMPLING LOG

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Project: **Site Location:**

Project Number:

Sample ID	Depth	Composite (Y/N)*	Method/ Equipment	Sample Time	Analysis	Additional QA/QC Samples

*Indicate number of subsamples used to generate composite

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SURFACE SOIL / SEDIMENT SAMPLING RECORD

SAMPLE NO: _____
SAMPLE DATE: _____
SAMPLE TIME: _____

SITE / SAMPLE LOCATION

SITE NAME: _____ PROJECT NUMBER: _____

PERSONNEL PRESENT: _____

ACTIVITY START: _____ ACTIVITY END: _____

WEATHER: _____

SAMPLE LOCATION *(see Note 1)* : _____

_____

_____

SAMPLING PROCEDURES

EQUIPMENT USED FOR COLLECTION: _____

SAMPLING PROCEDURES *(Including decontamination procedures)* : _____

_____

_____

_____

SAMPLE DESCRIPTION *(see Note 2)* : _____

_____

_____

FIELD SCREENING

PI METER ID:

Ambient Air: _____ ppm

Sample Location: _____ ppm

Jar Headspace: _____ ppm

Other *(type)* : _____

Results: _____

ANALYTICAL PARAMETERS

ANALYSIS	METHOD	NUMBER OF BOTTLES, VOLUME, AND TYPE	BOTTLE LOT	PRESERVATIVE	COOL TO 4°C ?
					Y N
					Y N
					Y N
					Y N
					Y N

LOCATION SKETCH

NOTES:

NAME *(print)* : _____

SIGNATURE: _____

NOTES:
1. Include angle and distance from permanent marker, sample depth; and for sediments, height of overlying water column.
2. Include soil type, gradation or plasticity, consistency, moisture, color, structure, USCS symbol, and other relevant observations.

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EXCAVATION SAMPLING RECORD

EXCAVATION/SAMPLE LOCATION SKETCH

SITE NAME: _____ PROJECT NUMBER: _____

EXCAVATION ID: _____

PLAN VIEW OF EXCAVATION WITH SAMPLE LOCATION

SCALE: 1 INCH = _____ FEET

CROSS-SECTION OF EXCAVATION WITH SAMPLE LOCATION

VERTICAL SCALE: 1 INCH = _____ FEET

HORIZONTAL SCALE: 1 INCH = _____ FEET

Input photos showing specifics of the project

Photo 1: Input description for the photo.

Photo 2:

Photo 3:

Photo 4:

Chain of Custody Record

amec foster wheeler

Client Contact	Project Manager:	Site Contact:	Date:	COC No:
Company:	Tel/Fax:	Lab Contact:	Carrier:	_____ of _____ COCs
Address:	Analysis Turnaround Time			Laboratory:
City/State/Zip:	Calendar (C) or Work Days (W) _____			
Phone:	TAT if different from Below _____			Address:
Fax:	☐ 2 weeks			
Project Name/Number:	☐ 1 week			
Site Location:	☐ 2 days			Phone Number:
Lab PO #:	☐ 1 day			Samplers:

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample																	Sample Specific Notes:

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification

☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown*

Sample Disposal

☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For _____ Months*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time: