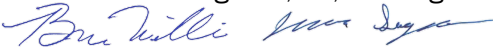

To: Sandra Treccani and Katie Larimer; Washington State Department of Ecology
From: Bruce D. Williams and Jedediah R. Sugalski, PE; GeoEngineers, Inc.
Date: January 14, 2020 
File: 0110-148-06
Subject: Riverfront Park Revitalization – North Bank

INTRODUCTION AND OBJECTIVE

Riverfront Park (the site) is currently undergoing redevelopment as part of a municipal bond approved in 2014. The North Bank project is the third phase of the multi-year, multi-phase redevelopment. This memorandum summarizes anticipated construction activities with respect to managing contaminated soil at the site. Riverfront Park and the North Bank are shown on the Vicinity Map, Figure 1 and Site Plan, Figure 2.

The North Bank project will redevelop an area previously used as multiple parking lots and where the Central Park Maintenance (CPM) building is located. New project features include a new CPM building, playground and wheel park along the northern boundary and a new parking area along Washington Street as shown on Conceptual Design: North Bank, Figure 3. A new basketball court is also planned near the center of the North Bank and a dry creek bed will run from north to south through the project site.

The objective of this memorandum is to describe the North Bank construction project in sufficient detail for you to render an opinion about the proposed approach. Construction plans include the reuse of on-site soil where chemical analysis from representative soil samples indicated concentrations of arsenic, cadmium, lead and/or polycyclic aromatic hydrocarbons (PAHs) were greater than the Model Toxics Control Act (MTCA) Method A cleanup levels for unrestricted land use (CULs).

Reuse of on-site soil will be based on meeting specific geotechnical criteria as described in our separate geotechnical report (GeoEngineers 2019a) and environmental criteria in accordance with the Riverfront Park Soil Management Plan (GeoEngineers 2016a). Specifically, the type(s) and concentration(s) of contaminant(s) present within excavated on-site soil will determine whether the soil is suitable for reuse, and where such material can be placed.

Proposed reuse of the soil and the planned construction techniques are designed to manage the soil in a manner that protects human health and the environment, complies with applicable regulations and provides a cost-effective solution. We request Washington State Department of Ecology's (Ecology) opinion of the proposed approach described in this memorandum through the Voluntary Cleanup Program (VCP), Site CSID 13026, VCP project number EA0318.

NORTH BANK SITE CHARACTERIZATION (CURRENT CONDITIONS)

The North Bank area of Riverfront Park proposed for redevelopment is generally bounded by Cataldo Avenue to the north, Mallon Avenue/Howard Street to the west, Washington Street to the east and the Spokane River to the south. The North Bank area was previously occupied by a former chemical storage building, converted to the CPM building for Riverfront Park and four structures including open pavilions and a restroom facility.

The area is generally unpaved and surface soil generally consists of sand and gravel. There is a paved parking lot to the south of the CPM building. Relatively few changes were made to the North Bank between Expo '74 and 2017 and much of the North Bank was primarily used as an unpaved parking lot adjacent to the park's green spaces.

In general, the project site is underlain by a mixture of man-made fill and natural soil deposits overlying basalt rock at variable depths. Historic uses of the site have resulted in significant modifications to subsurface conditions and landscape.

In-place soil in the North Bank area was characterized for environmental purposes by CH2MHill in 1999 (CH2M 1999a and b) and 2000 (CH2M 2000) and for environmental and geotechnical purposes by GeoEngineers in 2016 (GeoEngineers 2016e). Shallow bedrock is present at depths of approximately ½ to 3 feet below ground surface (bgs) near the outcrop. Soil thickness generally increases to the south and east away from the outcrop to depths in excess of 15 feet. Groundwater was encountered in one boring (DP-1) at about 3 feet bgs near the bedrock outcrop. The 2000 and 2016 assessments identified metals and PAHs in soil at the North Bank area greater than MTCA Method A Cleanup Levels. Diesel- and oil-range petroleum hydrocarbons greater than MTCA Method A Cleanup Levels were also identified in the North Bank area as part of the 2016 assessment activities.

Exploration Locations and chemical analytical results for the 1999 and 2000 are shown on Figure 4 and locations and results for the 2016, 2017 and 2019 sampling efforts are shown on Figure 5. Table I summarizes chemical analytical results greater than MTCA Method A Cleanup Levels for samples collected from the North Bank geotechnical and environmental assessments.

TABLE I. SUMMARY OF CHEMICAL ANALYTICAL RESULTS GREATER THAN MTCA METHOD A – IN-PLACE SOIL ON THE NORTH BANK

Parameter	MTCA Method A Cleanup Level	CH2MHill 1999 and 2000	GeoEngineers 2016
Arsenic (mg/kg)	20	None	None
Cadmium (mg/kg)	2	2 - 6	2.2 - 2.7
Lead (mg/kg)	250	342 - 3,420	390 - 1,300
Calculated cPAHs TEQ (µg/kg)	100	Not calculated	106 - 1,014
Lube Oil Range Hydrocarbons (mg/kg)	2,000	Less than 2,000	4,200
Diesel Range Hydrocarbons (mg/kg)	2,000	Less than 2,000	3,000

Notes:
 mg/kg = milligrams per kilogram, µg/kg = micrograms per kilogram
 cPAH = carcinogenic polycyclic aromatic hydrocarbons; TEQ = toxic equivalency

In March 2017, T. LaRiviere (Ice Ribbon project excavation subcontractor) excavated about 500 tons of petroleum contaminated soil (PCS) and railroad ties (treated wood waste) in preparation of creating the temporary North Bank stockpile (Figure 5). The excavated PCS and railroad ties were transported to Waste Management's Graham Road Landfill in Airway Heights, Washington for disposal. The remedial excavation measured about 135 feet long (east-west) by 48 feet wide (north-south) by about 3½ feet deep (average). In addition:

- Characterization samples collected from the northern extent of the excavation indicated residual PCS remained in irregularities against the basalt outcrop (RFPNB-2C, RFPNB-3C and RFPNB-4C).

- Sampling along the eastern extent of the excavation indicated PCS remained adjacent to and possibly under an existing concrete masonry unit (CMU) wall, which limited the extent of excavation (RFPNB-1C).
- A characterization sample collected at the western excavation extent indicated soil left in place was less than MTCA Method A cleanup levels for diesel and oil-range petroleum hydrocarbons (DRPH and ORPH) (RFPNB-5C).
- Characterization sampling of the southern excavation extent was incomplete because the excavation was backfilled before visually impacted PCS was removed. One sample (RFPNB-6C) collected along the southern excavation extent indicated PCS greater than MTCA Method A cleanup levels was left in place. On this basis, PCS remains in-place within the northeast portion of the site. In addition, multiple railroad ties were encountered during the excavation, and additional railroad ties are likely present throughout the North Bank.

In 2017 and 2018, the excavation was backfilled with soil transported from the Ice Ribbon and Loeff Carousel projects on the South Bank and the Howard Street Promenade, all within the limits of Riverfront Park. As the excavation was backfilled, the stockpile of soil was constructed in the area. Overall, approximately 25,000 cubic yards (CY) of soil was stockpiled on the North Bank and screened to approximately a 4-inch-minus soil type. Between August and September 2018, approximately 20,000 CY of screened soil from the stockpile was transported to the United States Pavilion (US Pavilion) and used as embankment fill for the revitalization project. The current stockpile contains approximately 3,000 to 5,000 CY and is placed above ground and parallel to the existing basalt bluff, as shown in Figure 5. This current stockpile is a combination of soil from the Ice Ribbon, Loeff Carousel and Howard Street Promenade construction projects. Additional PCS is located beneath the southern portion of the stockpile; the volume of the PCS is not known because neither the vertical nor lateral extent have been defined.

Soil borings were advanced at the North Bank in January 2019 (GeoEngineers 2019a). Soil samples below the observed fill (approximately 6 feet bgs) were collected during drilling and select samples were submitted for chemical analysis to characterize the natural flood deposits in and around the North Bank. Locations of the explorations are shown on Exploration Locations and Analytical Results: North Bank, Figure 5. Samples were collected from about 6½ to 10 feet bgs and one sample from location B-101, was collected from about 18½ to 20 feet bgs. The soil samples were submitted for chemical analysis in accordance with the Soil Management Plan (SMP) (GeoEngineers 2016a). Field screening of the samples generally did not indicate the presence of contamination.

Soil samples were submitted for analysis of PAHs and metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver). PAHs and metals contamination were not detected at concentrations greater than MTCA Method A Cleanup Levels at depths greater than 6 feet bgs. Soil chemical analytical results are summarized in attached Table 1.

CHARACTERIZATION OF SOIL STOCKPILED ON THE NORTH BANK

As part of the North Bank construction, soil stockpiled from the Ice Ribbon, Loeff Carrousel and Howard Street Promenade projects will be used to the extent possible at the North Bank. Remaining stockpiled soil will be exported to the Sportsplex project (only within parcel 35181.4206) or off-site for disposal at Waste Management's Graham Road Landfill. The contaminants greater than the MTCA Method A cleanup levels within

the stockpile (metals and PAHs) are the same contaminants found greater than MTCA Method A cleanup levels at the adjacent Sportsplex site. The current Riverfront Park and Sportsplex sites were both part of the industrial activities associated with historic rail use and contaminants at both sites are considered to be from the same generating sources and therefore are part of the same site in accordance with WAC 173-340-200. PAHs, cadmium and lead are present at both locations at concentrations greater than the MTCA Method A cleanup levels and appear to be randomly distributed at the site.

Table II summarizes chemical analytical results greater than MTCA Method A Cleanup Levels for samples collected from the Ice Ribbon (GeoEngineers 2016b), Loeff Carousel (GeoEngineers 2016c), parkwide environmental assessment (GeoEngineers 2016e) and Sportsplex Site (GeoEngineers 2019b).

The chemical concentrations listed in Table II represent anticipated chemicals of concern (COC) concentrations in the stockpiled soil at the site because the stockpiles was constructed using soil from various projects. Soil generated from the three projects were not separated and through processing, it is likely the stockpiled soil from the Ice Ribbon, Loeff Carrousel and Promenade projects was combined to form the current stockpile of soil. Considering the Ice Ribbon project was conducted earliest, soil at the base of the stockpile, and a considerable portion of the remaining stockpile, might predominantly be from the Ice Ribbon project. However, the stockpile was reworked numerous times, and without supporting documentation, it should be conservatively assumed the stockpile represents soil from multiple projects. Additional soil sampling of the stockpiled material has not been conducted because that soil was adequately characterized during initial assessment activities. Visual petroleum contamination was not observed as soil was moved to the stockpile location.

TABLE II. SUMMARY OF CHEMICAL ANALYTICAL RESULTS GREATER THAN MTCA METHOD A – REPRESENTATIVE OF STOCKPILED MATERIAL

Parameter	MTCA Method A Cleanup Level	Ice Ribbon	Loeff Carousel	Park Wide Soil Assessment	Sportsplex (Parcel 35181.4206)
Arsenic (mg/kg)	20	47	None	None	None
Cadmium (mg/kg)	2	6.8	None	2.2 – 15	11
Lead (mg/kg)	250	340 – 3,600	730	300 – 1,800	1,000
Calculated cPAHs TEQ (µg/kg)	100	109 – 1,296	111 – 28,210	106 – 4,690	106 – 153
Gasoline-Range Hydrocarbons (mg/kg)	100 ¹	None	None	None	None ²
Lube Oil-Range Hydrocarbons (mg/kg)	2,000	2,800	5,600	2,200 – 10,000	None ²
Diesel-Range Hydrocarbons (mg/kg)	2,000	None	None	3,000 – 7,400	None ²

Notes: ¹MTCA Method A cleanup level is 100 mg/kg when benzene is not present

²An independent cleanup action was conducted at the site in late 2019 to remove PCS from parcel 35181.4206. Before the cleanup action, gasoline-, diesel- and oil-range hydrocarbons were present at concentrations greater than the MTCA Method A cleanup level (GeoEngineers 2019c)

PROPOSED ACTION

Site preparation and earthwork operations will include: (1) demolishing and removing existing buildings; (2) demolishing and removing existing pavement and hardscape; (3) clearing, stripping and grubbing; (4) removing remaining PCS and disposing off site; (5) excavating and removing or relocating existing underground utilities; (6) site grading to establish pavement, hardscape and slab-on-grade floor subgrades; and (7) excavating to establish proposed foundation grades.

Site preparation and earthwork within the limits of the proposed improvements will require cutting and filling to establish proposed pavement and floor slab subgrades. Site preparation procedures, soil excavation, and placement and disposal of soil from the project will be handled in accordance with the Soil Management Plan. Parks proposes to utilize in-place contaminated fill, portions of the stockpiled soil, and/or clean imported fill to create the proposed final grade of the final North Bank design.

Initial Site Preparation

Existing surface and subsurface structures, such as foundations, slabs, active or abandoned underground utilities, potential remnant structures from previous site development, pavements and hardscape, will be excavated and transported off site for disposal at a permitted landfill facility as needed. Stockpiled soil from the Ice Ribbon, Loeff Carousal and Howard Street Promenade projects will be utilized as fill for the North Bank project and/or transported to tax parcel 35181.4206 within the neighboring Sportsplex project site. Parks will also remove the remaining PCS from the North Bank area by continuing the previous excavation to the south. PCS soil will be excavated downward to near bedrock as practicable and transported to Waste Management's Graham Road landfill. Attempts to remove PCS from the north and east portions will be conducted as practicable; however, the north extent of the prior excavation terminated at the basalt outcrop and the east extent terminated at the existing masonry wall. It is likely that some PCS will remain at the North Bank.

Grading and Excavation

To create the proposed final grade, existing on-site fill soil will be excavated and/or used as fill material in accordance with the Soil Management Plan. Excavation and handling of the existing on-site fill soil will be performed by contractors trained and qualified in working with contaminated soil. Reuse of on-site soil will be based on environmental criteria in accordance with the Soil Management Plan. Specifically, the type(s) and concentration(s) of contaminant(s) present within excavated on-site soil will determine whether the fill soil is suitable for reuse, and where such material can be placed. The Soil Management Plan outlines characterization methods and limitations on reuse from an environmental standpoint. Contaminated soil will be placed at least 12 inches beneath the final surface grade and above the mean high groundwater elevation. Within these limits, contaminated soil will be placed deeper, as practicable, to minimize potential surface erosion and resulting exposure.

Stormwater Considerations

Based on the results of our site explorations, laboratory testing and engineering analyses, it is our opinion that site soil conditions are favorable for on-site disposal of stormwater within the southeast portion of the site through swales, single-depth drywells and shallow infiltration systems, such as infiltration galleries or low-profile drywells, as generally outlined on Figure 5. The slope of the North Bank area will generally promote runoff to the southeast. Infiltration facilities will be designed and constructed away from contaminated soil. The following considerations will be incorporated into the final design:

- Swale bottoms installed in the parking lot will be located within natural flood gravel soils. Fill soil will be excavated from below bio-infiltration swales to expose natural soil deposits and replaced with free-draining imported soil. Existing fill soil should be removed laterally a distance of at least 5 feet from the sides of swales.
- Swales located near the playground that are installed over areas with shallow bedrock will be constructed with a low-permeability geomembrane liner. This will require placing a suitably thick treatment and storage layer of topsoil and drainage sand on top of the liner, and installing an underdrain tight-lined to a drywell.
- Drywells should be constructed such that the active barrel section is located entirely within natural flood gravel deposits. Portions of drywells that extend through existing site fill should only consist of non-perforated barrel sections.

As part of the project, subsurface stormwater piping will be installed near the dry creek bed to transfer stormwater from the adjacent Sportsplex roof drains (Sportsplex project is currently in the design phase) to the river.

Playground Considerations

The North Bank of Riverfront Park will include various playground equipment and activities. One of the features will be a fossil exploration area where glass reinforced concrete (GFRC) fossil castings will be secured by stainless steel pins and epoxy grout to a 4-inch thick concrete “rat slab” at the bottom of an activity area covered by 12 inches of silica sand (bunker sand). Children will be encouraged to explore the area and find the fossils by digging through the silica sand. The 4-inch thick rat slab in the fossil digging area will be installed above the underlying soil surface to prevent exposure to potential contaminants remaining in the underlying soil. The concrete slab will serve as a physical barrier to prevent exposure to site contaminants.

In addition to the fossil exploration area, there will also be playground features such as slides and climbing structures. As an additional physical barrier to potential contaminants under the playground, a poured in place resilient playground surfacing system (PIRPSS) will be installed. The surface will be constructed out of Styrene Butadiene Rubber (SBR), ethylene propylene diene monomer (EPDM) rubber or polyvinyl chloride (PVC) particles to form a cushioning material. The surfacing system will be porous and applied with a thickness of at least 1 inch. Additionally, synthetic turf fall zone surfacing will be installed over other areas of the playground to provide an additional barrier. Areas where the PIRPSS is installed will have at least 6 inches of clean soil installed over the existing subgrade to provide additional protection as the PIRPSS wears.

On-site Contaminated Fill Disposal

On-site fill soil that is not used to create the proposed final grade will be transported to the Sportsplex project for use as structural fill under the footprint of the building. If additional soil remains, it will be exported off site and disposed of at Waste Management’s Graham Road Facility.

SUMMARY

As part of the redevelopment of North Bank at Riverfront Park, on-site contaminated fill soil and the stockpiled soil with COCs (PAHs and metals) greater than MTCA Method A cleanup levels for unrestricted land use will be re-used as fill to create the proposed final grade. Fill soil and native soil contaminated with petroleum located

in the northeast portion of the North Bank will be excavated and disposed off-site. Fill material will not be used in stormwater disposal areas, except as described above. Fill soil re-use will comply with the existing Soil Management Plan. This is a cost-effective and beneficial use of the soil. Remaining soil will be transported to the Sportsplex project for use under the building footprint.

The proposed North Bank improvements are expected to prevent dermal contact or ingestion of contaminated soil, which are the primary exposure pathways for site COCs. Stormwater infiltration through contaminated fill soil will be minimized by site grading and use of impermeable surfaces above contaminated fill. Engineered stormwater infiltration features will be installed in the southeast portion of the site and infiltration will not occur through the contaminated soil.

The primary COCs associated with the on-site contaminated fill soil include PAHs and metals. PAHs generally have an octanol-water partition coefficient (LogK_{ow}) greater than 5 (NTP 2016) which indicates they are hydrophobic and have higher soil adsorption properties. This indicates that PAHs tend to adsorb to soil particles and they are not readily mobilized into water. Toxicity Characteristic Leaching Procedure (TCLP) testing performed on three samples from the Ice Ribbon project further indicated that PAHs are not readily leached from the soil since PAH concentrations were less than laboratory reporting limits for each sample analyzed (GeoEngineers 2016b).

Multiple TCLP tests for arsenic, cadmium and lead (GeoEngineers 2016b, c and e) have indicated that the soil doesn't designate as a Washington state dangerous waste in accordance with Washington Administrative Code (WAC) 173-303. This TCLP testing also indicates that there is a lower probability of these heavy metals mobilizing from the soil and into groundwater.

North Bank construction will occur above the groundwater table and therefore migration of contamination from the soil and into groundwater is not anticipated. Where utilities are installed, including potable water sources, imported clean soil will be used to backfill the utility trenches.

REFERENCES

- CH2M HILL, Inc. 1999a. "Phase II Environmental Site Assessment Limited Subsurface Exploration, 'Howard Street Property.'" April 1999.
- CH2M HILL, Inc. 1999b. "Focused Subsurface Investigation Report of Findings, 'Howard Street Property.'" November 1999.
- GeoEngineers, Inc. 2016a. "Soil Management Plan, Riverfront Park Redevelopment, Spokane, Washington." GEI File No. 0110-148-04.
- GeoEngineers, Inc. 2016b. "Geotechnical Engineering Evaluation and Environmental Site Assessment, Riverfront Park Ice Ribbon and Skyride Facility, Spokane, Washington." GEI File No. 0110-148-04.
- GeoEngineers, Inc. 2016c. "Geotechnical Engineering Evaluation and Environmental Site Assessment, Riverfront Park Looff Carousel, Spokane, Washington." GEI File No. 0110-148-04.
- GeoEngineers, Inc. 2016d. "Soil Stockpile Management Plan " GEI File No. 0110-148-06.

GeoEngineers, Inc. 2016e. "Phase II Assessment Report, Riverfront Park, Spokane, Washington." GEI File No. 0110-148-06.

GeoEngineers, Inc. 2019a. "Geotechnical Engineering Evaluation and Limited Environmental Site Assessment, Riverfront Park North Bank Project, Spokane, Washington." GEI File No. 0110-148-14.

GeoEngineers, Inc. 2019b. "Geotechnical Engineering Evaluation Proposed Sportsplex Project, Spokane, Washington." GEI File No. 12088-006-03.

GeoEngineers, Inc. 2019c. "Petroleum Contaminated Soil Investigation and Removal, Sportsplex Project, Spokane, Washington." GEI File No. 12088-006-04.

NTP (National Toxicology Program). 2016. Report on Carcinogens, Fourteenth Edition.; Research Triangle Park, NC: U.S. Department of Health and Human Services, Public Health Service. <https://ntp.niehs.nih.gov/go/roc14/>.

Washington State Department of Ecology. 2007. Model Toxics Control Act Cleanup Regulations, Washington Administrative Code, Chapter 173-340.

Attachments:

Table 1. Soil Chemical Analytical Results – North Bank Geotechnical and Environmental Investigation

Figure 1. Vicinity Map

Figure 2. Site Plan

Figure 3. Conceptual Design: North Bank

Figure 4. Exploration Locations and Analytical Results: CH2M Hill 1999 and 2000

Figure 5. Exploration Locations and Analytical Results: GeoEngineers 2016, 2017 and 2019

Cc: Berry Ellison
City of Spokane, Parks and Recreation

Table 1
Soil Chemical Analytical Results¹
Riverfront Park - North Bank Geotechnical and Environmental Investigation
Spokane, Washington

Analyte and Parameter	MTCA Method A Cleanup level ²	Spokane Basin Background Metal Concentration ³	Units	Sample ID, Depth and Date			
				B-101 B-101 (6-7.5') 1/8/2019	B-101 B-101 (18.5-20') 1/8/2019	B-102 B-102 (8.5-10') 1/8/2019	B-103 B-103 (6-7.5') 1/8/2019
Total Petroleum Hydrocarbons⁴							
Diesel-range hydrocarbons	2,000	NE	mg/Kg				
Lube Oil-range hydrocarbons	2,000	NE	mg/Kg				
Gasoline-range hydrocarbons	100	NE	mg/Kg				
Metals⁵							
Arsenic	20	9.34	mg/Kg	5.0	5.4	5.6	6.5
Barium	NE	NE	mg/Kg	72	29	66	54
Cadmium	2	0.7	mg/Kg	0.041 U	0.054 U	0.049 U	0.049 U
Chromium ⁶	2,000	17.8	mg/Kg	11	6.9	11	10
Lead	250	14.9	mg/Kg	9.7	6.1	37	28
TCLP Lead ⁷	5 ⁷	NE	mg/L	--	--	--	
Mercury	2,000	20	µg/kg	8.5	2.9 U	28	29
Selenium	NE	NE	mg/Kg	2.3	2.8 U	2.5 U	2.5 U
Silver	NE	NE	mg/Kg	0.093 U	0.19	0.14	0.11
PAHs⁸							
1-Methylnaphthalene	NE	NE	µg/kg	2.3 U	2.2 U	2.3	2.3 U
2-Methylnaphthalene	NE	NE	µg/kg	3.3 U	3.1 U	3.3 U	3.2 U
Naphthalene	5,000	NE	µg/kg	2.3 U	2.1 U	2.8	2.2 U
Acenaphthene	NE	NE	µg/kg	2.7 U	2.5 U	2.7 U	2.6 U
Acenaphthylene	NE	NE	µg/kg	3.5 U	3.3 U	3.5 U	3.4 U
Anthracene	NE	NE	µg/kg	2.9	2.0 U	5.1	2.1 U
Benzo(a)anthracene	NE	NE	µg/kg	5.5	2.1 U	12	5.8
Benzo(a)pyrene	100	NE	µg/kg	6.1	4.2 U	12	5.9
Benzo(b)fluoranthene	NE	NE	µg/kg	7.3	3.5 U	16	8.2
Benzo(g,h,i)perylene	NE	NE	µg/kg	3.2	2.3 U	6.5	3.4

Analyte and Parameter	MTCA Method A Cleanup level ²	Spokane Basin Background Metal Concentration ³	Units	Sample ID, Depth and Date			
				B-101 B-101 (6-7.5') 1/8/2019	B-101 B-101 (18.5-20') 1/8/2019	B-102 B-102 (8.5-10') 1/8/2019	B-103 B-103 (6-7.5') 1/8/2019
Benzo(k)fluoranthene	NE	NE	µg/kg	3.4	2.5 U	6.4	3.8
Chrysene	NE	NE	µg/kg	5.7	1.5 U	13	5.8
Dibenzo(a,h)anthracene	NE	NE	µg/kg	3.0 U	2.8 U	3.0 U	2.9 U
Fluoranthene	NE	NE	µg/kg	11	2.5 U	22	10
Fluorene	NE	NE	µg/kg	2.3 U	2.2 U	2.3 U	2.3 U
Indeno(1,2,3-c,d)pyrene	NE	NE	µg/kg	3.1 U	2.9 U	6.0	3.1
Phenanthrene	NE	NE	µg/kg	9.5	3.6 U	18	4.3
Pyrene	NE	NE	µg/kg	12	3.8 U	24	10
Total cPAH TEQ ⁹ (ND=0.5RL) ¹⁰	100	NE	µg/kg	8.1	ND	16.3	8.2

Notes

¹Samples analyzed by TestAmerica Laboratories, Inc. located in Spokane Valley, Washington.

²Model Toxics Control Act (MTCA) Method A unrestricted land use cleanup levels (CUL).

³Background metals concentrations in soil based on the Washington State Department of Ecology (Ecology) natural background 90th percentile value for the Spokane basin (Ecology 1994)

⁴Total petroleum hydrocarbon analyzed by EPA Method TPH-HCID

⁵Metals analyzed using EPA Method 6010C. Mercury by EPA Method 7471B.

⁶Chromium III cleanup level. MTCA Method A cleanup level for Chromium VI is 19 mg/kg.

⁷Washington dangerous waste regulations (WAC 173-303) toxicity characteristic leaching procedure (TCLP) limit for lead is 5.0 mg/L.

⁸Polycyclic aromatic hydrocarbons analyzed using EPA Method 8270DSIM.

⁹Carcinogenic PAH (cPAH) toxic equivalency (TEQ) calculated using toxicity equivalency factors (TEF) from MTCA Table 708-2, based on methodology described in MTCA Cleanup Regulation Washington Administrative Code (WAC) 173-340-708.

¹⁰The TEQ reported was calculated using half the laboratory reporting limits for cPAHs less than method detection limits.

¹¹Sample USP-4(3.5-5') was analyzed for volatile organic compounds (VOCs) by Environmental Protection Agency (EPA) Method 8260; the sample did not have detections of VOCs greater than laboratory reporting limits.

mg/kg = milligrams per kilogram; mg/L = milligrams per liter; NE = not established; µg/kg = micrograms per kilogram;

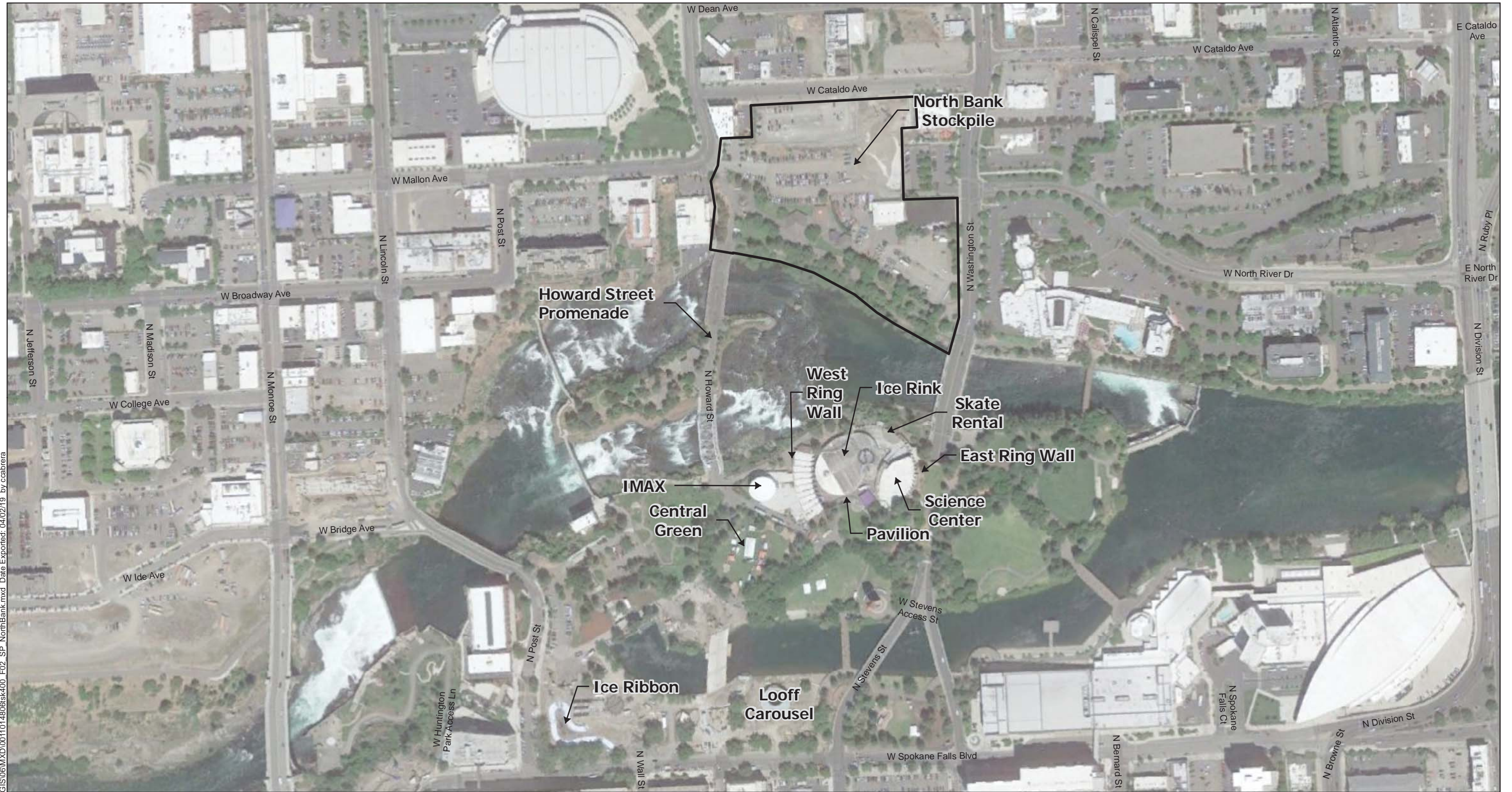
U = analyte was not detected above the method detection limit.

Bold indicates that the analyte was detected above the method detection limit.

Bold and shaded indicates that the analyte was detected above the MTCA Method A CUL.

Gold shading indicates the reporting limit was greater than or equal to the MTCA Method A CUL.

Blue shading indicates the reported concentration was greater than twice the Spokane basin background concentration (Ecology 1994).



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Notes:

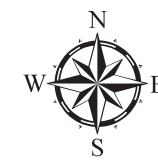
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: June 2017 image from Google Earth Pro.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Legend

North Bank Approximate Limits of Improvement



Site Plan	
Riverfront Park Spokane, Washington	
	Figure 2



Not to Scale

Notes:

1. The locations of all features shown are approximate.
 2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document.
- GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Conceptual Design: North Bank

Riverfront Park
Spokane, Washington



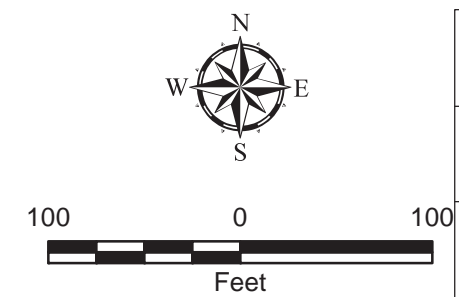
Figure 3



P:\0101148\GIS\06\MXD\0011014806_F04_ Exceedances_NBOntestFillByOthers.mxd Date Exported: 08/28/19 by ccabrera

Notes:
 1. The locations of all features shown are approximate.
 2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
 3. Locations identified as TP-1 through TP-14 completed by CH2M Hill in 2000.
 Data Source: Current Imagery flown by Spokane Regional Orthophoto Consortium.
 Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

- Legend**
- Contaminated – Concentration greater than MTCA Method A Cleanup Level for one or more COC analyzed
 - Contaminated – COCs were not detected, however laboratory reporting limits were greater than the MTCA Method A Cleanup levels
 - Impacted – Concentration less than MTCA Method A Cleanup Levels and greater than laboratory reporting limits or twice the available background metals concentration for each COC analyzed
 - Clean – Concentration less than laboratory reporting limits or near available background metals concentrations for each COC analyzed
 - Test Pit Soil Sample Not Analyzed
 - North Bank Approximate Limits of Improvement
 - TPH
 - Metals
 - ▲ PAH



Exploration Locations and Analytical Results: CH2M Hill 1999 and 2000	
Riverfront Park Spokane, Washington	
	Figure 4

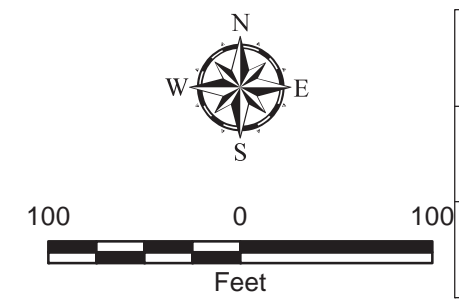


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Notes:
 1. The locations of all features shown are approximate.
 2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
 3. Locations identified as TP-1 through TP-14 completed by CH2M Hill in 2000.
 Data Source: Current Imagery flown by Spokane Regional Orthophoto Consortium.
 Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Legend

● Contaminated – Concentration greater than MTCA Method A Cleanup Level for one or more COC analyzed	 TPH
● Contaminated – COCs were not detected, however laboratory reporting limits were greater than the MTCA Method A Cleanup levels	 Metals
● Impacted – Concentration less than MTCA Method A Cleanup Levels and greater than laboratory reporting limits or twice the available background metals concentration for each COC analyzed	 PAH
● Clean – Concentration less than laboratory reporting limits or near available background metals concentrations for each COC analyzed	 Stockpile Approximate Extent
 Approximate Limits of Remedial Excavation	 Approximate Location of Proposed Skate Bowl
 North Bank Approximate Limits of Improvement	 Approximate Area Recommended for Stormwater Infiltration
	 Approximate Location of Proposed Vertical Play Structure



**Exploration Locations and Analytical Results:
 GeoEngineers 2016, 2017 and 2019**

Riverfront Park
 Spokane, Washington

Figure 5