Analysis of Brownfield Cleanup Alternatives, 130 East Sprague Avenue, Spokane, Washington 99202

October 13, 2021
Revised June 29, 2023

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Executive Summary

This report presents an Analysis of Brownfield Cleanup Alternatives (ABCA) for the remediation of soil impacts at 130 East Sprague Avenue in Spokane, Washington (the Site), depicted on **Figure 1**. Stantec understands the Client intends to acquire the Subject Property and redevelop it with a new facility.

Three remediation alternatives were retained following a preliminary screen of applicable remedial methods and technologies. The proposed base scope-of-work for each remedial alternative described in the following sections includes the installation of a perimeter fence; the removal of existing compacted gravel in the proposed excavation areas; the removal of the concrete pad in front of the open garage and replacement with compacted structural fill; abatement of regulated building materials identified in a 2020 Hazardous Materials Survey; and demolition of the Office Building, Garage Building, Workshop, and three-sided Pole Building. The base scope-of-work also includes the cost for the removal and backfill of an existing, partially exposed, assumed 500-gallon underground storage tank (UST) in the northwest corner of the Site. Alternative #1 includes excavation and disposal of potential Category 3 (heavy metals-impacted) soils and generation of a Site Management Plan. Alternative #2 includes the excavation and off-site disposal of all potentially impacted soils and impacted soils exceeding the Washington State Department of Ecology (Ecology) Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) from multiple target areas on the Site. Alternative #3A includes each component of Alternative #2 but with on-site stabilization of Category 3 soils via the direct application and mixing of a soil amendment prior to off-site disposal. An additional Alternative, #3B, includes the removal of all potential Category 2 soils from the site. This alternative only applies if all soils within all areas of concern are characterized as Category 2 soils. Groundwater has not been encountered at the Site during the Phase II Environmental Site Assessment (ESA) (Stantec 2021a) and Supplemental Phase II ESA (Stantec 2021b).

Ecology indicates Site closure can be obtained by removing the impacted soils in the gravel parking area and removing the remaining contaminated soils that are present beneath the existing buildings once they are demolished. Due to the planned redevelopment of the Site, the costs for removal and disposal, or for long-term management, of the contaminated soils located beneath the existing buildings are included within this ABCA.

Based on the extent of the impacted areas, the contaminants of concern, and the affected media, the recommended remedial approach, if no Category 3 soils are identified on-site, is Alternative #3B due to its ability to be implemented, cost, and general effectiveness.

If soil classification identifies Category 3 soils on-site, the preferred alternative would then become Alternative #2, disposing of both Category 3 and Category 2 soils without the added cost of stabilization.

ABBREVIATIONS

AACE	American Association of Cost Estimating
ABCA	Analysis of Brownfield Cleanup Alternatives
AOC	Area of Concern
BER	Business Environmental Risk
bgs	Below the Ground Surface
CULs	Cleanup Levels
Ecology	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
ESA	Environmental Site Assessment
ft^2	Square Feet
GRO	Gasoline Range Organics
HAZWOPER	Hazardous Waste Operations and Emergency Response
mg/kg	Milligrams Per Kilogram
MTCA	Model Toxics Control Act
OPC	Opinion of Probable Cost
PAH	Polycyclic Aromatic Hydrocarbon
RBM	Regulated Building Material
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
RRO	Residual Range Organics
Stantec	Stantec Consulting Services Inc.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient
UST	Underground Storage Tank
VCP	Voluntary Cleanup Program
VOC	Volatile Organic Compound
WAC	Washington Administrative Code

1.0 INTRODUCTION AND HISTORY

Stantec Consulting Services Inc. (Stantec) has prepared this Analysis of Brownfield Cleanup Alternatives (ABCA) for the property located at 130 East Sprague Avenue in Spokane, Washington (the Site), on behalf of Frontier Behavioral Health. The location of the Site is provided on **Figure 1**.

This ABCA report presents a practical remedial alternative that would reduce contaminant exposure to levels protective of human health and the environment based on site-specific conditions, technical feasibility, and preliminary cost evaluations. The ABCA was completed to meet the requirements of Washington Administrative Code (WAC) 173-340-380 of the Model Toxics Control Act (MTCA) regulation.

1.1 SITE DESCRIPTION

The Site consists of approximately 0.37 acres of land referred to by Spokane County as parcel ID #35202.0606, which is improved with a 4,200-square-foot (ft^2) Office and Garage Building and an attached 960 ft^2 Workshop on the northern half of the Site. The southern half of the Site is gravel-covered and used for property access, vehicle and equipment parking, and material storage on racks and within an approximately 360 ft^2 three-sided Pole Building. The Site is owned by Randall Gillingham and based on our understating is currently in use by Frontier Behavioral Health.

The Site is located at an elevation of approximately 1,930 feet above sea level and is generally flat. The ground surface in the vicinity of the Site slopes downward to the north-northwest toward the Spokane River located approximately 0.4 miles from the Site. The Site is bounded to the north by East Sprague Avenue followed by Honest in Ivory Bridal Shop, to the east by South Cowley Street followed by Penske Truck Rental and Curt's City Center Oil & Lube and Used Car, to the south by East 1st Avenue followed by a parking lot, and to the west by Community Pint, a beer sales business. The locations and layout of adjoining properties are shown on **Figure 2**.

1.2 SITE ASSESSMENT FINDINGS

Stantec previously performed a Phase I Environmental Site Assessment (ESA), Phase II ESA, and Supplemental Phase II ESA for the Site. The Phase I and II ESAs were completed on behalf of the City of Spokane and funded by a United States Environmental Protection Agency (EPA) brownfield grant. The Supplemental Phase II ESA was completed on behalf of the Sitton family, the prior Site owner. The results of the assessments are summarized below.

1.2.1 2020 Phase I Environmental Site Assessment

In June 2020, Stantec performed a Phase I ESA of the Site in conformance with the scope and limitations of ASTM International Practice E1527-13 (Stantec 2020). The assessment identified the following recognized environmental conditions (RECs) for the Site:

- **REC #1**: The presence of an approximately 500-gallon underground storage tank (UST) at the northwest corner of the Site with no documentation of its historical uses, contents, and integrity, and its potential to have resulted in a release of petroleum products to the environment is a REC for the Site.
- **REC #2**: The absence of records documenting the location, assessment, and removal of the 2,000-gallon gasoline UST and dispenser in the central portion of the Site and their potential to have resulted in a release of petroleum products to the environment is a REC for the Site.
- **REC #3**: The presence of a former gas station in close proximity to the Site (60 feet to the east), in combination with a lack of records documenting decommissioning and assessment of the associated former fueling system(s), is a REC for the Site.
- **REC #4**: The presence of a former gas station in close proximity to the Site (100 feet to the northeast), in combination with a lack of records documenting decommissioning and assessment of the associated former fueling system(s), is a REC for the Site.

The following business environmental risk (BER) relevant to redevelopment or reuse of the Site was identified during the Phase I ESA:

- **BER #1**: Based on when the Site's building was constructed (1958), there is the potential that regulated building materials (RBMs) were used in its construction, including asbestos-containing material and lead-based paint. The potential presence of these RBMs is a BER for the property due to the potential need to abate, remove, or manage these materials as part of future reuse or redevelopment activities, including renovation or demolition of the building.

Based on the identified RECs, Stantec recommended a Phase II ESA to further evaluate the presence/absence and magnitude of potential impacts at the Site.

1.2.2 2020 Phase II Environmental Site Assessment

In September 2020, Stantec performed a Phase II ESA (Stantec 2021a) of the Site with the following objectives:

1. Assess whether the historical use of the partially exposed UST in the slope at the northwest corner of the Site has resulted in a release of petroleum products or other hazardous materials to the subsurface of the Site (REC #1).
2. Assess whether the historical use of a 2,000-gallon gasoline UST and dispenser on the Site has resulted in a release of petroleum products or other hazardous materials to the subsurface of the Site (REC #2).
3. Assess whether potential releases from the historical retail gas stations to the northeast and east of the Site have resulted in impacts by petroleum products or other hazardous materials to the subsurface of the Site (RECs #3 and #4).
4. Assess the building of the Site for the presence of RBMs (BER #1).

To accomplish these objectives, soil samples were collected from locations considered most likely to have been impacted by historical site uses or activities. Samples were analyzed for the primary suspected contaminants to help evaluate whether impacts are present—and if present, at what magnitude. Stantec directed the advancement of 10 borings (designated BH01 through BH10) to depths of 1 to 7 feet below the ground surface (bgs), depending on bedrock refusal, for collection of two soil samples per boring. The boring locations are shown on **Figure 3**. Key findings are summarized as follows:

- A geophysical survey identified the approximate extents of a former 2,000-gallon UST in the south-central portion of the Site.
- Borings BH09 and BH10 advanced within the former 2,000-gallon UST cavity revealed that gasoline range organics (GRO) were not detected in any of the soil samples. This suggests that a significant release of GRO did not occur in this area of the Site. The only petroleum-derived volatile organic compound (VOC) detected in soil was benzene.
- Metals (arsenic, cadmium, and lead) were detected at concentrations that exceed MTCA Method A (Unrestricted Land Use) Cleanup Levels (CULs) in sample BH06 (2–3 feet), and residual range organics (RRO) were detected at a concentration that exceeds the MTCA Method A CUL in soil sample BH07 (0.5–1 foot).
- Polycyclic aromatic hydrocarbons (PAHs; benzo[a]pyrene and total Toxicity Equivalency Quotient [TEQ]) were also detected at concentrations that exceed the MTCA Method A CUL in multiple samples collected across the Site from borings BH04, BH06, BH07, BH09, and BH10.

No impacts of petroleum on the Site were determined based on the following conclusions:

- While the sample results from borings BH01 and BH02, completed on either side of the partially exposed UST, indicate a release of petroleum products (GRO, diesel range organics, RRO, and a few petroleum-derived VOCs), the detected concentrations are significantly less than the MTCA Method A CULs.
- Although the concentrations of benzo(a)pyrene and total TEQ in all three soil samples analyzed from borings BH09 and BH10 exceed MTCA Method A CULs, these appear to be attributable to pyrogenic sources unrelated to petroleum products (and in particular, gasoline) stored in the former UST.
- No evidence was found of impacts to soil at the property from undocumented releases at the former gas stations. The maximum GRO, diesel range organic, or RRO concentration measured in the sample locations closest to these stations (BH03, BH04, and BH05) was 24.9 mg/kg of RRO (versus a CUL of 2,000 mg/kg).

The Phase II ESA recommended additional soil sampling to delineate the impacts of metals in the sample from BH06 and RRO in the sample from BH07. Stantec recommended additional sampling for PAHs in addition to the other analytes given the observed concentrations throughout the Site.

1.2.3 2021 Supplemental Phase II Environmental Site Assessment

In July 2021, Stantec performed a Supplemental Phase II ESA of the Site and advanced 13 borings (designated BH100 through BH113) to depths of 0 to 4.25 feet bgs, depending on bedrock refusal, for collection of two soil samples per boring. The boring locations are shown on **Figure 3**. Key findings are summarized as follows:

- Lead was identified at concentrations that exceed the MTCA Method A CULs in the northwest corner of the gravel lot in borings BH102, BH103, and BH104 and in boring BH101, which was advanced beneath the Workshop building. In addition, arsenic and cadmium were detected in soil samples from boring BH102 at concentrations that exceed the MTCA Method A CULs.
- RRO were detected in six borings advanced in the gravel lot at concentrations that exceed the MTCA Method A CUL.

- Benzo(a)pyrene and total TEQ were detected in soil across the Site at concentrations that exceed the MTCA Method A CULs, except borings BH110 located on the east portion of the Site and BH113 collected beneath the Garage Building.

Based on the findings of the Phase II ESA, Stantec recommended an ABCA for the effective handling and abatement of near-surface soil impacts of heavy metals, RRO, and PAHs.

2.0 APPLICABLE REGULATIONS AND CLEANUP STANDARDS

Remediation of the Site will be conducted under the Washington State Department of Ecology's (Ecology's) Voluntary Cleanup Program (VCP). Cleanup actions performed under the VCP must provide adequate protection of human health and the environment based on the current and future uses of the Site.

2.1 CONTAMINANTS OF CONCERN

Based on the findings of the previous investigations for the Site, the site-specific contaminants of concern (**Figure 3)** include the following:

- Lead, arsenic, and cadmium in subsurface soil (samples from borings BH101, BH102, BH103, BH104, and BH06) at Area of Concern #1 (AOC-1).
- Total TEQ in subsurface soil in each of the borings in AOC-1 and Area of Concern #2 (AOC-2).
- Benzo(a)pyrene in subsurface soil in each of the borings in AOC-1 and AOC-2, except at BH100 and BH04.
- RRO in subsurface soil from borings BH103, BH104, BH106, BH107, BH108, BH109, and BH07.
- In addition, due to their proximity to AOC-1 and -2, it is assumed that there is a potential for contamination in the areas that were not accessible for boring or sampling beneath the Office and the "Open Garage" (collectively, potential AOC-3).

Analytical results exceeding MTCA CULs for contaminants of concern associated with each soil boring listed above are shown on **Figure 3**.

2.2 POTENTIAL RECEPTORS AND EXPOSURE PATHWAYS

Considering that remedial excavation and redevelopment activities are expected at the Site, construction workers, Site workers, neighbors, and trespassers have been identified as the most applicable potential human receptors.

Exposure to hazardous materials in Site soils by construction workers could occur during remediation, construction, and/or other activities that involve work at the Site through inhalation, ingestion, and/or dermal contact. Exposure of people on nearby properties to hazardous materials in Site soils could potentially occur during excavation work at the Site through inhalation of wind-blown particles.

Potential exposure during the remedial work will be managed with a site-specific health and safety plan and a community air monitoring plan designed to protect site workers and the public from fugitive emissions of contaminants of concern during the remedial activities. Due to the potential for hazardous waste due to heavy metals, site construction workers will require current Occupational Safety and Health Administration Hazardous Waste Operations and Emergency Response (HAZWOPER) certification.

A perimeter fence will be in place during remedial work to prevent the public from accessing the Site to mitigate that potential exposure pathway. Potential future exposures to residual contamination, if any, will be mitigated using institutional and engineering controls and a Site management plan. No potential impacts are anticipated to ecological receptors as part of this remedial effort.

2.3 CLEANUP STANDARDS

Contaminants of concern at the Site are defined as the substances for which the concentrations in soil exceed the associated MTCA Method A CULs as outlined in **Section 2.1**. The Method A CULs are for protection of human health via direct contact or the ingestion pathway and protection of groundwater via the soil-leaching-to-groundwater pathway.

Relevant regulations and cleanup standards for the Site are listed below:

- MTCA, WAC 173-340;
- MTCA Method A Soil CULs for Unrestricted Land Uses, Table 740-1 of WAC 173-340;
- Hazardous Waste Regulations, 40 Code of Federal Regulations 261.31;
- WAC Dangerous Waste Regulations Chapter 173-303;
- WAC Accreditation of Lead-Based Paint Training Programs and the Certification of Firms and Individuals Conducting Lead-Based Paint Activities and Renovation Chapter 365; and
- Section 112 of the Clean Air Act, National Emission Standards for Hazardous Air Pollutants.

2.4 CLEANUP GOALS

Stantec understands the Client intends to acquire the Site to remove all existing buildings and redevelop it with a new facility. Ecology indicates Site closure can be obtained by removing the impacted soils in the gravel parking area and removing the remaining contaminated soils that are present beneath the existing buildings once they are demolished. Due to the planned redevelopment of the Site, the costs for removal and disposal, or for long-term management, of the contaminated soils located beneath the existing buildings are included within this ABCA.

As such, the intention of the remedial alternatives is to achieve compliance with MTCA regulations and to remediate the Site to levels for unrestricted land use. This cleanup standard would increase the potential reuse options at the Site for the benefit of the Spokane community. The cleanup criteria are summarized in **Table 1**.

Applicable Regulations and Cleanup Standards

Table 1: Cleanup Criteria for Unrestricted Land Uses

Analytical Parameter	Analyte	MTCA Method A CUL
Metals	Arsenic Cadmium Lead	20 mg/kg 2 mg/kg 250 mg/kg
PAHs	Benzo(a)pyrene Total TEQ of cPAHs	0.1 mg/kg 0.1 mg/kg

mg/kg = milligrams per kilogram

3.0 CLEANUP ALTERNATIVES

3.1 CLEANUP ALTERNATIVES CONSIDERED

The nature and extent of contamination are presented in the Supplemental Phase II ESA (Stantec 2021b). The target excavation areas are depicted on **Figure 3** and outlined in **Table 2**.

Table 2: Description of Excavation Areas

Excavation Name	Area[1] (ft^2)	Contaminant Depth Interval[2] (feet bgs)
BH102, BH103, BH06	1,249	3.0
BH104	874	1.0
BH111, BH04	872	1.5
BH09, BH10 (oval)	237	7.0
BH106, BH 107 (everything surrounding BH09, BH10 excavation)	1,147	3.5
BH105	423	1.0
BH108, BH07	1,005	1.5
BH109	890	2.5
BH100, BH101	960	3.5
Office	800	Unknown
Open Garage (three-sided Pole Building)	360	Unknown

1. Areas measured in Figure 3 file on 07/20/2021.
2. Contaminant interval based on Supplemental Phase II ESA (Stantec 2021b) investigation results.

3.1.1 Base Scope-of-Work

The proposed scope-of-work for each remedial alternative described in the following sections includes the installation of a perimeter fence; removal and replacement of the concrete pad in front of the existing Open Garage in the southwest corner of the Site; removal of the abandoned 500-gallon UST in the northwest corner of the Site and associated backfill with clean imported fill; removal of the existing deteriorated compacted gravel to 4 inches below existing grade in the proposed excavation areas; abatement of regulated building materials identified in the 2020 Hazardous Materials Survey (Stantec 2021a); and demolition of the Office Building, Garage Building, Workshop, and three-sided Pole Building. This base remedial action (i.e., base scope-of-work described in this section) will be required regardless of the remedial alternative chosen and is referred to as the “base scope-of-work.”

The total estimated costs for the base scope of remedial work, including contingency, is approximately $105,071. The cost to perform the base scope-of-work is included with each alternative opinion of probable cost. Further details regarding costs are provided in **Table 4**.

3.1.2 Soil Management

Excavated soils will be managed and categorized using Ecology guidelines for contaminated soil as follows:

1. On-Site or Other Site Reuse

   - Category 1 Soils: Soils with contaminant concentrations less than the applicable MTCA CULs, including no evidence of residual levels of petroleum hydrocarbons that could have adverse impacts on the environment in some circumstances. These soils may be as backfill on the Site or at cleanup sites above the water table, fill in commercial or industrial areas above the water table, or fill in road and bridge embankment construction areas above the water table. These soils do contain detectable/quantifiable levels of petroleum hydrocarbons and/or other substances and are classified as non-hazardous waste. Their reuse on the Site, at other cleanup sites, or at other construction sites are subject to meeting the regulatory agency criteria for reuse.

2. Off-Site or Disposal

   - Category 2 Soils: Soils with moderate levels of residual petroleum contamination or other hazardous substances that could have adverse impacts on the environment and can only be reused in carefully controlled situations. These soils are classified as non-hazardous waste that exceeds MTCA Method A CULs. These soils will be disposed of at a non-hazardous waste receiving facility.
   - Category 3/Hazardous Soils: Soils with high levels of petroleum contamination or other hazardous substances with confirmed hazardous waste characteristics via laboratory testing. These soils will be disposed of at a hazardous waste receiving facility.

The ABCA does not consider the reuse of Category 1, Category 2, or Category 3 soils either on-site or at other potential sites due to the potential future liability of the owner/generator. The ABCA evaluation includes off-site disposal of all soils at either a permitted non-hazardous or hazardous waste receiving facility depending on waste characterization laboratory results.

3.1.3 Description of Alternatives

To address the management of impacted soil at the Site, three remedial alternatives were considered in addition to the base scope-of-work:

Cleanup Alternatives

- Alternative #1: Excavation and Off-Site Disposal of Potential Category 3 Soils at AOC-1.
- Alternative #2: Excavation and Off-Site Disposal of Category 2 and Potential Category 3 Soils at AOC-1, Excavation and Off-Site Disposal of Category 2 Soils at AOC-2, and Excavation and Off-Site Disposal of Potential Category 2 Soils at Potential AOC-3.
- Alternative #3A: Excavation, Stabilization, and Off-Site Disposal of Potential Category 3 Soils at AOC-1; Excavation and Off-Site Disposal of Category 2 Soils at AOC-2 and Excavation and Off-Site Disposal of Potential Category 2 Soils at Potential AOC-3.
- Alternative #3B: Excavation and Off-Site Disposal of Category 2 Soils at AOC-1, AOC-2, and Potential Category 2 Soils at Potential AOC-3 (same as Alternative #3A, in the event that no Category 3 soils are identified on-site).

Each proposed action for each alternative is outlined in **Table 3**.

Table 3: Description of Alternatives

Proposed Remedial Action	Alternative #1	Alternative #2	Alternative #3A	Alternative #3B
Removal of 500-Gallon UST	X	X	X	X
Removal of Gravel	X	X	X	X
Abatement of RBMs	X	X	X	X
Existing Building Demolition	X	X	X	X
Excavation and Disposal of Potential Category 3 Soils	X	X	X	(assumed none on-site)
Excavation and Disposal of Category 2 Soils and Potential Category 2 Soils		X	X	X
On-Site Stabilization of Category 3 Soils for Off-Site Disposal as Non-Hazardous Waste			X	

3.1.4 Alternative #1: Excavation and Off-Site Disposal of Potential Category 3 Soils at AOC-1

This potential remedial alternative does not involve proactive remedial measures, except for the 500-gallon UST removal in the northwest corner of the Site and abatement of regulated building materials. Instead, this alternative relies on the assumption that the new buildings that will be built during redevelopment of the Site will act as a cap for the anticipated Category 2 soils on-site. If confirmed via waste characterization sampling and laboratory analyses in the area depicted on **Figure 3**, Category 3 soils will be excavated and disposed of to a Subtitle C landfill.

The volume of subsurface soil with exceedances of the federal hazardous threshold for lead were estimated as part of this ABCA. To provide a more conservative estimate, 100 percent of AOC-1 is assumed to be Category 3 since this alternative does not include characterization of soils. However, it is possible that soils in AOC-1 will only be Category 2 soils.

For the purposes of estimation of an opinion of probable cost (OPC) for this alternative, the following efforts were included:

- Establishment of an environmental covenant approved by Ecology and recorded with Spokane County to remediate contaminated soils located beneath the new buildings if they were to be demolished in the future with no plans for redevelopment. Future remediation costs are not included in this estimate;
- Excavation and disposal of potential Category 3 soils; and
- Generation of a Site management plan.

This alternative also includes the base scope-of-work as described in **Section 3.1.1**.

3.1.5 Alternative #2: Excavation and Off-Site Disposal of Category 2 and Potential Category 3 Soils at AOC-1, Excavation and Off-Site Disposal of Category 2 Soils at AOC-2, and Excavation and Off-Site Disposal of Potential Category 2 Soils at Potential AOC-3

This alternative would involve the excavation and off-site disposal of Category 2 soils, including the potential Category 2 soils located under the Office and Open Garage, and potential Category 3 soils from all target areas identified on **Figure 3** with exceedances of the MTCA Method A CULs as Category 2 or Category 3 soils. The existing Garage is assumed to cover soil that is non-hazardous with no exceedances due to the analytical results of boring BH113. This alternative includes the base scope-of-work as described in **Section 3.1.1**.

Soils would be excavated to bedrock in accordance with applicable local, state, and federal regulations. Prior to excavation, representative waste pre-characterization samples would be collected in place via direct-push technology from each of the proposed excavation areas and analyzed per the selected waste disposal facility's requirements to facilitate direct loading of trucks or roll-off containers rather than temporary on-site soil stockpiling. The analyte list is anticipated to contain toxicity characteristic leaching procedure (TCLP) VOCs, TCLP semi-volatile organic compounds, polychlorinated biphenyls, TCLP Resource Conservation and Recovery Act (RCRA) 8 metals, pH, flash, and reactivity but will be confirmed with the waste disposal facility.

The volume of subsurface soil with exceedances of the federal hazardous threshold for lead were estimated as part of this ABCA. For Alternative #1, 100 percent of AOC-1 is assumed to be Category 3 for a more conservative estimate since the alternative does not include characterization of soils. For Alternative #2, to provide a more accurate estimate, it is assumed that 10 percent of AOC-1 is characterized as Category 3 soils for disposal, and 90 percent will be characterized as Category 2 soils for disposal. This assumption is based on recent subsurface analytical results of the lead contamination in BH06. Appropriate disposal of these soils as Category 2 or Category 3 soils will be confirmed via waste characterization sampling conducted per the selected disposal facilities' requirements prior to excavation; however, the preliminary sampling results suggest that soils in AOC-1 may only be Category 2.

Additionally, it is assumed that 20 percent of the material below the Office in potential AOC-3 is characterized as Category 2 soils for disposal and that 80 percent are non-hazardous with no

exceedances. This assumption is based on borings BH05, -03, -113, -01, and -02 surrounding the Office with analytical results that were below guidelines. Based on the Category 2 soils detected in boring BH105 adjacent to the Open Garage, it is likely that some soils are non-hazardous with exceedances (Category 2). To provide a conservative estimate, it is assumed that 100 percent of material excavated beneath the Open Garage will be categorized as non-hazardous with exceedances (Category 2) for disposal. Appropriate disposal of these soils as Category 2 soils will be confirmed via waste characterization sampling conducted per the selected disposal facilities' requirements prior to excavation; however, the preliminary sampling results suggest that soils under the Office may be non-hazardous with no exceedances.

In addition to the base scope-of-work, it is estimated that a total of 962 cubic yards (1,444 tons) of soil will be excavated and disposed of as Category 2 soils (including potential Category 2 soils) and 7 cubic yards (10 tons) of soil will be excavated and disposed of as Category 3 soils if the waste characterization results exceed the EPA TCLP regulatory limits.

Due to the various target excavation areas and associated interpolations to achieve the defined target areas, a contingency of 10 percent was applied to soil volumes. Category 2 soils, approved by the disposal facility, would be disposed of at a licensed RCRA Subtitle D landfill. Category 3 soils, approved by the disposal facility, would be disposed of at a licensed RCRA Subtitle C landfill. The excavated areas, which would be exposed bedrock with little potential for erosion, would remain undisturbed until redevelopment and construction of the new proposed buildings begins.

3.1.6 Alternative #3A: Excavation, Stabilization, and Off-Site Disposal of Potential Category 3 Soils at AOC-1; Excavation and Off-Site Disposal of Category 2 Soils at AOC-2 and Excavation and Off-Site Disposal of Potential Category 2 Soils at Potential AOC-3

This alternative would involve the excavation and off-site disposal of Category 2 soils, including the potential Category 2 soils located under the Office and Open Garage, and potential Category 3 soils from all target areas on **Figure 3** with exceedances of the MTCA Method A CULs as Category 2 or Category 3 soils. The existing Garage is assumed to cover soil that is non-hazardous with no exceedances due to the analytical results of boring BH113. This alternative also includes the base scope-of-work. Soils would be excavated in accordance with applicable local, state, and federal regulations. Prior to excavation, representative waste pre-characterization samples would be collected in place via direct-push technology from each target excavation area and analyzed per the selected waste disposal facility's requirements to facilitate direct loading of trucks or roll-off containers rather than temporary on-site stockpiling.

Volumes of subsurface soil with exceedances of the federal hazardous threshold for lead were estimated as part of this ABCA. To provide a more accurate estimate, it was assumed that 10 percent of AOC-1 will be characterized as Category 3 soils for disposal, and 90 percent will be disposed of as Category 2 soils. This assumption is based on recent subsurface analytical results of the lead contamination in BH06. Soil characterization will be confirmed via waste characterization sampling. It is anticipated that soils in AOC-1 will be characterized as Category 2 and will be disposed of appropriately.

Additionally, it is assumed that 20 percent of the material below the Office in potential AOC-3 is characterized as Category 2 soils for disposal and that 80 percent are non-hazardous with no exceedances. This assumption is based on borings BH05, -03, -113, -01, and -02 surrounding the Office with analytical results that were below guidelines. Based on analytical results from samples from boring BH105 adjacent to the Open Garage, it is likely that some soils are non-hazardous with exceedances (Category 2). To provide a conservative estimate, it is assumed that 100 percent of material excavated beneath the Open Garage will be categorized as non-hazardous with exceedances (Category 2) for disposal. Appropriate disposal of these soils as Category 2 soils will be confirmed via waste characterization sampling conducted per the selected disposal facilities' requirements prior to excavation; however, based on the preliminary sampling results, soils under the Office may be non-hazardous with no exceedances.

It is estimated that a total of 962 cubic yards (1,444 tons) of soil will be excavated and disposed of as Category 2 soils (including potential Category 2 soils) should there be no TCLP regulatory limit exceedances.

Approximately 7 cubic yards (10 tons) of Category 3 soils would be excavated and chemically stabilized on-site if contaminants of concern exceedances are found, as described in the following paragraph. This alternative includes the same excavation areas and depths as Alternative #2.

Chemical stabilization via mixing an amendment into the soil has been successfully applied to soils impacted by a variety of metal contaminants. This process does not destroy or remove the metals but decreases their mobility and may reduce their toxicity. The purpose of this alternative is to reduce the cost related to disposal of soil that, if excavated without stabilization, would be subject to handling and disposal as a D008 (lead) characteristic hazardous waste (for which the estimated cost for transport, off-site treatment, and disposal at an RCRA Subtitle C facility would equal approximately $299/ton). For comparison purposes, Site soils that have been stabilized via an amendment mixing process can potentially be disposed of as non-hazardous waste at a Subtitle D Landfill outside of Spokane at a cost of approximately $59 per ton.

Stabilization chemicals most applied to metals-impacted soils include reagents such as cement, fly ash, slag, phosphorus-containing materials, clays, and other proprietary reagents such as Blastox®. Conventional excavation and mixing equipment can be utilized to mix the soil while blending in a reagent to stabilize the contaminant. Shallow soil can generally be mixed using equipment such as a bucket or mechanical mixing head (such as a Lange tool or with an Allu bucket), mounted to the end of a tracked excavator. The mixing process creates a relatively homogeneous soil matrix, reducing peak concentrations of contaminants within the mixed zone and promoting contact with the stabilization reagent. The soil mixing process generally results in a volume increase of at least 10 to 15 percent. Mixing the reagent into the soil while it is in place can avoid licensing and other requirements that pertain to on-site stabilization of Category 3 soils. If the soil is mixed in a pile or fully removed from the ground for mixing, other regulatory requirements would apply (including the need to perform the mixing within a "container").

Under this alternative and assuming the stabilization chemical is Blastox®, approximately 1 ton of the amendment would be applied to previously identified Category 3 soils. Following the mixing process, an estimated 12 tons of soils would be added (resulting from the mixing process) to the existing 1,840 tons of Category 2 soils and disposed of off-site as Category 2 soils. The excavated areas, which would be exposed bedrock with little potential for erosion, would remain undisturbed until redevelopment and construction of the new proposed buildings begins.

3.1.7 Alternative #3B: Excavation and Off-Site Disposal of Category 2 Soils at AOC-1, AOC-2, and Potential Category 2 Soils at Potential AOC-3

This alternative would involve the excavation and off-site disposal of all areas of concern identified on **Figure 3**. This alternative includes the base scope-of-work. This alternative is applicable if soils sampled in all areas of concern are all determined to be Category 2 soils. The characterization of all soils as Category 2 would result in the soils being excavated and disposed of at a local Subtitle D landfill facility. The existing Garage is assumed to cover soil that is non-hazardous with no exceedances due to the analytical results of boring BH113. Prior to excavation, representative waste pre-characterization samples would be collected in place via direct-push technology from each target excavation area and analyzed per the selected waste disposal facility's requirements to facilitate direct loading of trucks or roll-off containers rather than temporary on-site stockpiling.

For this alternative, it is assumed that 100 percent of the soils in AOC-1 would be classified as Category 2 soils for disposal. Additionally, it is assumed that 20 percent of the material below the Office in potential AOC-3 is characterized as Category 2 soils for disposal and that 80 percent are non-hazardous with no exceedances. This assumption is based on borings BH05, -03, -113, -01, and -02 surrounding the Office with analytical results that were below guidelines. Based on analytical results from samples from boring BH105 adjacent to the Open Garage, it is likely that some soils are non-hazardous with exceedances (Category 2). To provide a conservative estimate, it is assumed that 100 percent of material excavated beneath the Open Garage will be categorized as non-hazardous with exceedances (Category 2) for disposal. Appropriate disposal of these soils as Category 2 soils will be confirmed via waste characterization sampling conducted per the selected disposal facilities' requirements prior to excavation; however, based on the preliminary sampling results, soils under the Office may be non-hazardous with no exceedances.

It is estimated that a total of 969 cubic yards (1,454 tons) of soil would be excavated and disposed of as Category 2 soils (including potential Category 2 soils), should there be no TCLP regulatory limit exceedances. The excavated areas, which would be exposed bedrock with little potential for erosion, would remain undisturbed until redevelopment and construction of the new proposed buildings begins.

3.2 EVALUATION OF CLEANUP ALTERNATIVES

Potential cleanup alternatives are evaluated herein based on the following criteria: effectiveness, implementation feasibility, remedial costs, and general reasonableness. **Tables 5** and **6** provide a breakdown of applicable costs and assumptions.

3.2.1 Alternative #1: Excavation and Off-Site Disposal of Potential Category 3 Soils at AOC-1

Effectiveness – This alternative is considered an effective method to limit exposure and manage contaminated soils at the Site. The contaminants of concern would be contained to an area above existing basalt bedrock, which will be capped with proposed future buildings. It does little to address the toxicity, mobility, or volume of contamination on the Site. The implementation of this alternative would not achieve the cleanup goal of unrestricted residential land use for the future development of the Site.

Implementation Feasibility – This alternative would be easily implemented using relatively routine construction methods.

Remedial Costs – Containing contaminants of concern to an area above existing basalt bedrock, which will be capped with proposed future buildings at the Site, is the most cost-effective option as shown on **Table 5**. The total estimated cost for this alternative is approximately $174,000. This cost includes the base scope-of-services and removal and disposal of Category 3 soils that exceed the MTCA Method A CULs. The cost also includes premium wages for HAZWOPER-certified contractor(s), consultant oversight, and development of a Site management plan.

General Reasonableness – This alternative limits the potential reuse of the Site, as the contaminated soils are retained on-site. This may require long-term management of the contaminated soils since they would not be removed from the Site unless the new buildings were removed in the future and not replaced. This alternative is generally not recommended, as it poses potential exposure risk, and future redevelopment could require remediating remaining contamination.

3.2.2 Alternative #2: Excavation and Off-Site Disposal of Category 2 and Potential Category 3 Soils at AOC-1, Excavation and Off-Site Disposal of Category 2 Soils at AOC-2, and Excavation and Off-Site Disposal of Potential Category 2 Soils at Potential AOC-3

Effectiveness – Comprehensive soil excavation and off-site disposal would be highly effective since it would remove potentially hazardous and impacted soils and would utilize an approved off-site disposal facility for final disposition.

Implementation Feasibility – This alternative would be easily implemented using relatively routine construction methods.

Remedial Costs – This alternative is estimated to cost approximately $265,800, which includes the base scope-of-work. This alternative would remove and dispose of impacted soils that exceed the MTCA Method A CULs at the Site.

General Reasonableness – This alternative would not require long-term management of the contaminated soils since they would be removed from the Site. This alternative provides the owner with flexibility for continued operations of the Site and completes the remediation following demolition of the existing buildings and removes requirements for future restrictions on redevelopment.

3.2.3 Alternative #3A: Excavation, Stabilization, and Off-Site Disposal of Potential Category 3 Soils at AOC-1; Excavation and Off-Site Disposal of Category 2 Soils at AOC-2 and Excavation and Off-Site Disposal of Potential Category 2 Soils at Potential AOC-3

Effectiveness – Comprehensive soil excavation and off-site disposal is highly effective since it removes potentially hazardous and impacted soils and utilizes an approved off-site disposal facility for final disposition.

Implementation Feasibility – This alternative would be easily implemented using relatively routine construction methods. The implementation feasibility for this alternative is the same as Alternative #2, except that Category 3 soils would be pre-stabilized on-site prior to off-site disposal as Category 2 soils.

Remedial Costs – This alternative would be less cost-effective than Alternative #2. Pre-stabilization of the Category 3 soils on-site would reduce Category 3 soil transportation and disposal costs if exceedances are found; however, the shipping cost for the stabilization chemical Blastox® drastically increases the cost. This alternative is estimated to cost approximately $271,000 including the base scope-of-work if Category 3 soils are found. This alternative would remove and dispose of contaminated soils that exceed the MTCA Method A CULs.

General Reasonableness – Like Alternative #2, this alternative provides the owner with flexibility for future redevelopment by including the demolition of the Site buildings, followed by removing both Category 2 and 3 soils. This alternative would remove approximately the same total volume soil from the Site when compared to Alternative #2. However, all soil would be disposed as Category 2 instead of disposing some as Category 3 at hazardous disposal unit costs. Additional steps are required for this alternative as well since the soils would need to be stabilized.

3.2.4 Alternative #3B: Excavation and Off-Site Disposal of Category 2 Soils at AOC-1, AOC-2, and Potential Category 2 Soils at Potential AOC-3

Effectiveness – Comprehensive soil excavation and off-site disposal is highly effective since it removes potentially hazardous and contaminated soils and utilizes an approved off-site disposal facility for final disposition.

Implementation Feasibility – This alternative would be easily implemented using relatively routine construction methods. The implementation feasibility for this alternative is the same as Alternative #2, except that all soils from the Site will be disposed of at a local Subtitle D landfill.

Remedial Costs – This alternative would be more cost-effective than Alternative #2 because Category 2 soils are reasonably inexpensive to dispose of properly. This alternative is estimated to cost approximately $264,800, including the base scope-of-work. This alternative would remove and dispose of contaminated soils that exceed the MTCA Method A CULs.

General Reasonableness – As with Alternative #2, this alternative provides the owner with flexibility for future redevelopment by including the demolition of the Site buildings followed by removing contaminated soils. This alternative would remove comparable quantities of soils from the Site, as compared to Alternatives #2 and #3A, at a lower cost and more quickly.

4.0 RECOMMENDED CLEANUP ALTERNATIVE

The recommended cleanup alternative, if no Category 3 soils are identified on-site, is Alternative #3B: Excavation and Off-Site Disposal of Category 2 Soils at AOC-1, AOC-2, and the Potential AOC-3. Based on work in the vicinity of the Site, it is possible that all soils will be classified as Category 2. This alternative is the second most cost-effective alternative while effectively providing the owner with flexibility with redevelopment options.

If soil classification identifies Category 3 soils on-site, the preferred alternative would then become #2, disposing of both Category 3 and Category 2 soils without the added cost of stabilization.

5.0 OPINION OF PROBABLE COST LIMITATIONS

The OPC presented herein represents a Class 5 estimate as defined by the American Association of Cost Estimating (AACE) International. The AACE defines a Class 5 estimate as follows:

Class 5 estimates are generally prepared based on very limited information and subsequently have wide accuracy ranges. They are often prepared for strategic planning purposes, market studies, assessment of viability, project location studies, and long-range capital planning. Virtually all Class 5 estimates use stochastic estimating methods such as cost curves, capacity factors, and other parametric techniques. Expected accuracy ranges are from -20 percent to -50 percent on the low side and 30 percent to 100 percent on the high side, depending on technological complexity of the project, appropriate reference information, and the inclusion of an appropriate contingency determination. Ranges could exceed those shown in unusual circumstances.

Stantec has used its professional judgement given the available information and our experience with similar remedial techniques on other sites. Accordingly, the Client agrees that Stantec cannot and does not make any warranty, promise, guarantee, or representation, either expressed or implied, that proposals, bids, project construction costs, or cost of operation or maintenance will not vary substantially from this good-faith cost estimate.

Data gaps remain in terms of fully delineating the horizontal extent of subsurface impacts. Accordingly, the extent and magnitude of subsurface impacts requiring remediation upon which the OPC has been developed is unknown. Therefore, the final extent of excavation, and resultant costs, will be dependent upon the collection and laboratory analyses of confirmatory soil samples at the time of excavation.

6.0 REFERENCES

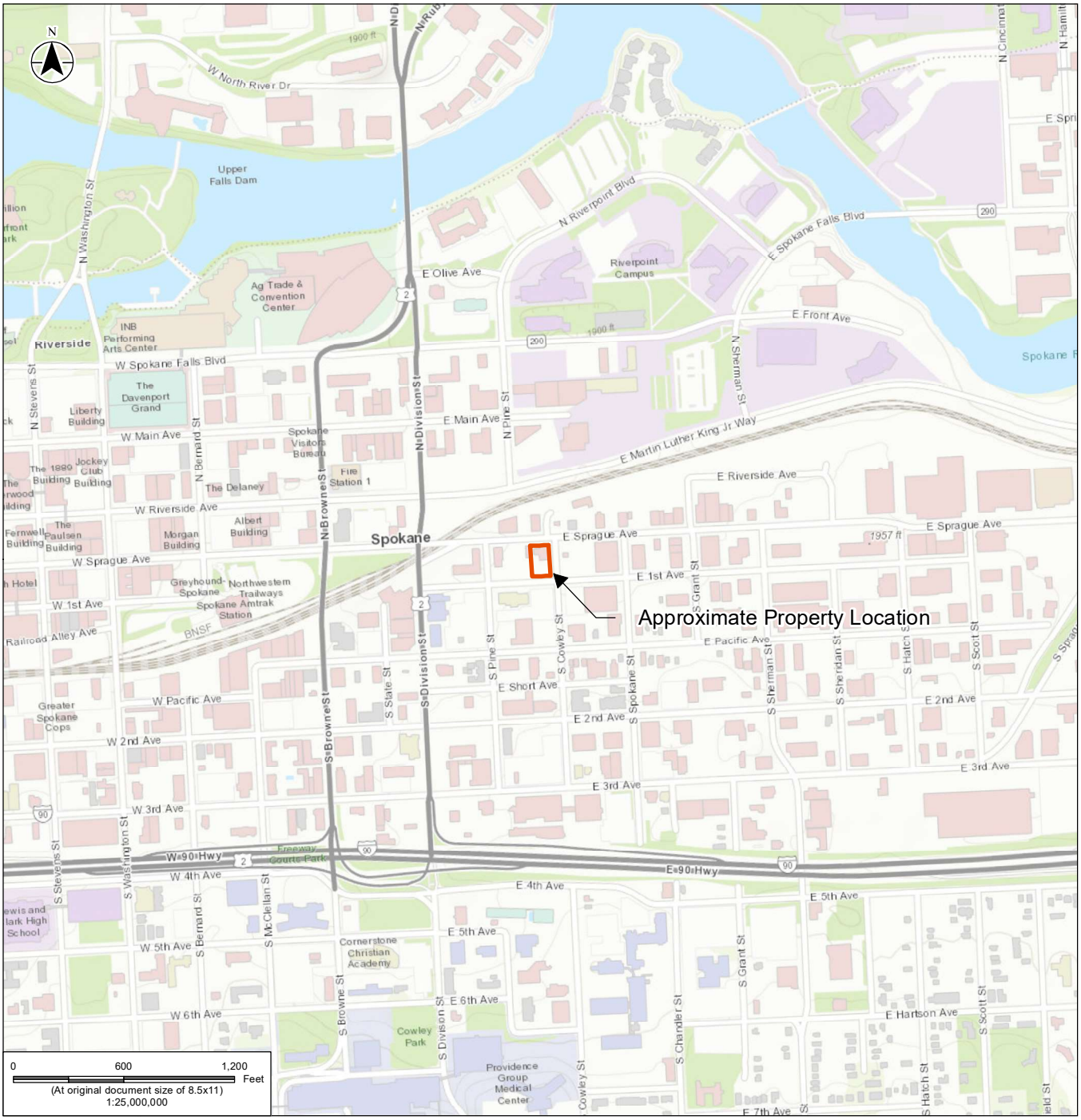
EPA. 2008. “Framework for Investigating Asbestos-Contaminated Superfund Sites.” Office of Solid Waste and Emergency Response Directive #9200.0-88.

Stantec. 2020. “Phase I Environmental Site Assessment, Spokane Roofing, 130 East Sprague Avenue, Spokane, Washington 99202.” June.

———. 2021a. “Phase II Environmental Site Assessment, Spokane Roofing, 130 East Sprague Avenue, Spokane, Washington 99202.” February 28.

———. 2021b. “Supplemental Phase II Environmental Site Assessment, Spokane Roofing, 130 East Sprague Avenue, Spokane, Washington 99202.”

FIGURES



Approximate Property Boundary

Notes

1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
2. Data Sources: Spokane County GIS
3. Background: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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Project Location
Spokane Roofing Company
130 East Sprague Avenue, Spokane, WA

Client/Project 185751443
Spokane Roofing Company
Analysis of Brownfield Cleanup Alternatives

Title
Property Location Map

Figure No.
1

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

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Legend

- Approximate Property Boundary
- Gravel Parking Area

Notes

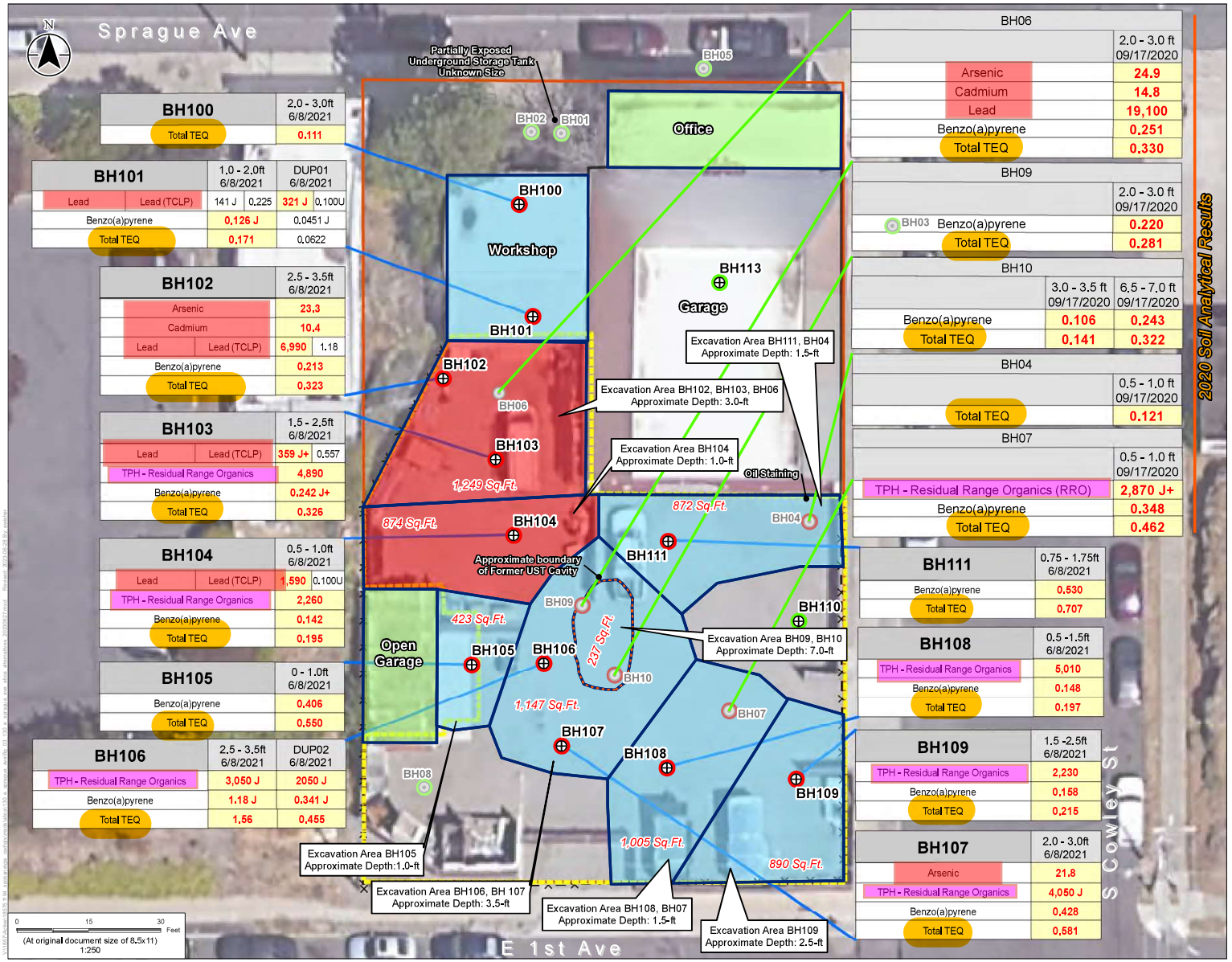
1. Coordinate System: NAD 1983 HARN StatePlane Washington North FIPS 4601 Feet
2. Data Sources: Spokane County GIS
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Project Location
Spokane Roofing
130 East Sprague Avenue, Spokane, WA

Client/Project 185751443
City of Spokane
EPA Brownfield Coalition Assessment Grant
Analysis of Brownfield Cleanup Alternatives

Title
Property Layout and Vicinity

Figure No.
2



BH100	2.0 - 3.0ft 6/8/2021
Total TEQ	0.111

BH101	1.0 - 2.0ft 6/8/2021		DUP01 6/8/2021	
Lead	Lead (TCLP)	141 J	0.225	321 J	0.100U
Benzo(a)pyrene		0.126 J		0.0451 J	
Total TEQ		0.171		0.0622	

BH102	2.5 - 3.5ft 6/8/2021	
Arsenic		23.3
Cadmium		10.4
Lead	Lead (TCLP)	6,990	1.18
Benzo(a)pyrene		0.213
Total TEQ		0.323

BH103	1.5 - 2.5ft 6/8/2021	
Lead	Lead (TCLP)	359 J+	0.557
TPH - Residual Range Organics		4,890
Benzo(a)pyrene		0.242 J+
Total TEQ		0.326

BH104	0.5 - 1.0ft 6/8/2021	
Lead	Lead (TCLP)	1,590	0.100U
TPH - Residual Range Organics		2,260
Benzo(a)pyrene		0.142
Total TEQ		0.195

BH105	0 - 1.0ft 6/8/2021
Benzo(a)pyrene	0.406
Total TEQ	0.550

BH106	2.5 - 3.5ft 6/8/2021	DUP02 6/8/2021
TPH - Residual Range Organics	3,050 J	2050 J
Benzo(a)pyrene	1.18 J	0.341 J
Total TEQ	1.56	0.455

BH06	2.0 - 3.0 ft 09/17/2020
Arsenic	24.9
Cadmium	14.8
Lead	19,100
Benzo(a)pyrene	0.251
Total TEQ	0.330

BH09	2.0 - 3.0 ft 09/17/2020
Benzo(a)pyrene	0.220
Total TEQ	0.281

BH10	3.0 - 3.5 ft 09/17/2020	6.5 - 7.0 ft 09/17/2020
Benzo(a)pyrene	0.106	0.243
Total TEQ	0.141	0.322

BH04	0.5 - 1.0 ft 09/17/2020
Total TEQ	0.121

BH07	0.5 - 1.0 ft 09/17/2020
TPH - Residual Range Organics (RRO)	2,870 J+
Benzo(a)pyrene	0.348
Total TEQ	0.462

BH111	0.75 - 1.75ft 6/8/2021
Benzo(a)pyrene	0.530
Total TEQ	0.707

BH108	0.5 -1.5ft 6/8/2021
TPH - Residual Range Organics	5,010
Benzo(a)pyrene	0.148
Total TEQ	0.197

BH109	1.5 -2.5ft 6/8/2021
TPH - Residual Range Organics	2,230
Benzo(a)pyrene	0.158
Total TEQ	0.215

BH107	2.0 - 3.0ft 6/8/2021
Arsenic	21.8
TPH - Residual Range Organics	4,050 J
Benzo(a)pyrene	0.428
Total TEQ	0.581

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Legend
- AOC 1 (Category 2 and Potential Category 3 Soils)
- AOC 2 (Category 2 Soils)
- Potential AOC-3 (Potential Category 2 Soils)
- Soil Sampling Location (Stantec 2021)
- Gravel Parking Area
- Previous Soil Sampling Location (Stantec 2020)
- Soil Parameters Tested Were Below Guidelines
- One or More Soil Parameters Tested Exceed Guidelines
- Concentration Exceeds MTCA Method A Cleanup Levels
- Approximate Property Boundary

Sample ID / Sample Depth (feet)/ Sample Date

BH104	0.5 - 1.0ft 6/8/2021	
Lead	Lead (TCLP)	1,590	0.100U
TPH - Residual Range Organics		2,260
Benzo(a)pyrene		0.142
Total TEQ		0.195

Parameter / Concentration in mg/kg

Washington Department of Ecology Model Toxics Control Act Cleanup Levels

Parameter	Units	MTCA Method A CUL
Cadmium	mg/kg	2
Arsenic	mg/kg	20
Lead / Lead (TCLP)	mg/kg	250 / nv
Benzo(a)pyrene	mg/kg	0.1
TPH - Residual Range Organics	mg/kg	2,000
Total TEQ	mg/kg	0.1

Notes
1. Coordinate System: NAD 1983 UTM Zone 11N
2. Orthoimagery: Google (7/18/2019). [Spokane, WA]. Retrieved May 18, 2020, from https://earth.google.com/web/@47.65696462,-117.40860040,796.42005677
3. mg/kg = milligrams per kilogram
4. J = The reported result is an estimated value.
5. J+ = The analyte was positively identified; the associated numerical value is an estimated quantity that may be biased high.
6. U = The analyte was not detected above the method detection limit.
7. nv = No standard/guideline value.
8. TCLP = Toxicity Characteristic Leaching Procedure
9. TEQ = Toxicity Equivalence Concentration
10. TEF = Toxicity Equivalence Factor
11. TEQ Values = cPAH concentration x TEF
12. TPH = Total Petroleum Hydrocarbons
13. MTCA CULs = Washington Department of Ecology Model Toxics Control Act Cleanup Levels
14. Method A = Method A Unrestricted Land Use - Soil (February 2021)
15. Remaining soils under the existing Workshop and Garage to remain in place until future development of the site

Project Location
Spokane Roofing
130 East Sprague Avenue, Spokane, WA

Client/Project 185751443
City of Spokane
EPA Brownfield Coalition Assessment Grant
Analysis of Brownfield Cleanup Alternatives

Title
Proposed Remedial Excavation Areas (Alternatives)

Figure No.
3

TABLES

Table 4: Base Scope
Analysis of Brownfield Cleanup Alternatives
130 East Sprague Avenue, Spokane, WA

Description	Quantity	Unit	Unit Cost	Cost	Notes/Assumptions
Base Scope of Services					
Concrete Pad Removal and Replacement	3	CY	$ 308.19	$ 910	RS Means 033053404700, 024113175400
Aggregate trucking	136	Ton	$ 14.44	$ 1,968	RS Means 030513251150 - Aggregate trucking 10 mile trip
Removal of existing deteriorated compacted gravel (4" bgs)	90	CY	$ 76.70	$ 6,903	Project Experience
Removal of 500 gallon UST	500	Gal	$ 6.49	$ 3,245	RS Means 026510300390
Import, place and compact clean, granular backfill soils into excavations up to existing grade.	13	CY	$ 33.30	$ 416	RS Means 312323141000. 312323240700, 312323200554, project experience.
Preparation of asbestos containment area	6,230	SF	$ 0.38	$ 2,367	RS Means 028213420100 pre-cleaning, HEPA vacuum and wet wipe
Vinyl asbestos tile and mastic material removal	1,300	SF	$ 1.91	$ 2,483	RS Means 028213435000
Asbestos window glazing removal	30	SF	$ 1.02	$ 31	RS Means 028213463500
Asbestos shingle roofing removal	4,700	SF	$ 1.22	$ 5,734	RS Means 028213438200
Asbestos panel board removal	200	SF	$ 1.30	$ 260	RS Means 028213438000
Asbestos waste packing, handling & disposal	1,038	EA	$ 36.60	$ 38,003	RS Means 028213472000 per 3 CF drum, containerize bagged material in drums
Remove fluorescent fixtures	58	EA	$ 22.84	$ 1,325	RS Means 260505505000 electrical demolition
Hazardous waste cleanup/pickup/disposal	15	Mile	$ 4.25	$ 64	RS Means 028120101260 includes transportation
Building demolition	98,480	CF	$ 0.42	$ 41,362	RS Means 024116130600 includes 20 mile haul, excludes foundation demo
Base Scope Contingency					
Base Scope Subtotal				**$ 105,071**	

Table 5: Preliminary Opinion of Probable Costs
Analysis of Brownfield Cleanup Alternatives
130 East Sprague Avenue, Spokane, WA

Description	Quantity	Unit	Unit Cost	Cost	Notes/Assumptions
Base Scope of Services					
Remove and Replace existing concrete pad in front of Open Garage	3	CY	$ 308.19	$ 910	RS Means 033053404700 (replace), 024113175400 (remove)
Aggregate trucking for Perimeter Fence	136	Ton	$ 14.44	$ 1,968	RS Means 030513251150 - Aggregate trucking 10 mile trip
Removal of existing deteriorated compacted gravel (4" bgs) in excavation areas	90	CY	$ 76.70	$ 6,903	Project Experience
Removal of UST (500 Gal)	500	Gal	$ 6.49	$ 3,245	RS Means 026510300390
Import, place and compact clean, granular backfill soils into UST excavation up to existing grade.	13	CY	$ 33.30	$ 416	RS Means 312323141000. 312323240700, 312323200554, project experience.
Preparation of asbestos containment area	6,230	SF	$ 0.38	$ 2,367	RS Means 028213420100 pre-cleaning, HEPA vacuum and wet wipe
Vinyl asbestos tile and mastic material removal	1,300	SF	$ 1.91	$ 2,483	RS Means 028213435000 bulk removal
Asbestos window glazing removal	30	SF	$ 1.02	$ 31	RS Means 028213463500 incl. decontamination and structural demolition
Asbestos shingle roofing removal	4,700	SF	$ 1.22	$ 5,734	RS Means 028213438200 bulk removal
Asbestos panel board removal	200	SF	$ 1.30	$ 260	RS Means 028213438000 bulk removal
Asbestos waste packing, handling & disposal	1,038	EA	$ 36.60	$ 38,003	RS Means 028213472000 per 3 CF drum, containerize bagged material in drums
Remove fluorescent fixtures	58	EA	$ 22.84	$ 1,325	RS Means 260505505000 electrical demolition
Hazardous waste cleanup/pickup/disposal	15	Mile	$ 4.25	$ 64	RS Means 028120101260 includes transportation
Building demolition	98,480	CF	$ 0.42	$ 41,362	RS Means 024116130600 includes 20 mile haul, excludes foundation demo
Base Scope Contingency					
Base Scope Subtotal				**$ 105,071**	
Alternative 1 - Excavation and Off-Site Disposal of Potential Category 3 Soils at AOC-1					
Generation of Site Management Plan	1	LS	$ 12,000.00	$ 12,000	Project experience
Excavation and loading for transport hazardous soils (100% of AOC-1)	69	CY	$ 11.80	$ 811	Project experience, RS Means
Transportation & disposal of hazardous soil to Subtitle C landfill	103	TON	$ 372	$ 38,321	2020 Waste Management Estimate with contingency
Consultant oversight & reporting	1	LS	$ 17,700.00	$ 17,700	Project experience
Alternative Subtotal				**$ 68,832**	
Base Scope of Services				***$ 105,071***	
Alternative Total				**$ 174,000**	
Alternative 2 - Excavation and Off-Site Disposal of Category 2 and Potential Category 3 Soils at AOC-1, Excavation and Off-Site Disposal of Category 2 Soils at AOC-2, and Excavation and Off-Site Disposal of Potential Category 2 Soils at Potential AOC-3					
Contractor mobilization/demobilization	1	LS	$ 5,500.29	$ 5,500	4% of task total
Waste characterization collection via geoprobe	1	LS	$ 1,770.00	$ 1,770	Project experience
Waste characterization laboratory analysis (AOC-1, AOC-2, Potential AOC-3)	2	EA	$ 885.00	$ 1,770	Stantec Alpha MSA Rates
Confirmatory soil laboratory analysis (analyte with exceedance only, each area)	15	EA	$ 531.00	$ 7,965	Project experience (single analyte for each excavation only, five for each excavation)(AOC-1, AOC-2, Potential AOC-3)
Consultant oversight & reporting	1	LS	$ 17,700.00	$ 17,700	Project experience
Non-Haz Category 2 (AOC-1+AOC-2)					
Excavation and loading for transport non-hazardous soils (AOC-1+AOC-2)	329	CY	$ 11.80	$ 3,878	Project experience, RS Means
Transport & disposal of non-hazardous soil to local Subtitle D landfill (AOC-1+AOC-2)	493	TON	$ 77	$ 37,807	2020 Waste Management Estimate with contingency
Excavation and loading for transport non-hazardous soils (90% of AOC-1)	62	CY	$ 12	$ 730	Project experience, RS Means
Transportation & disposal of non-hazardous soil to local Subtitle D landfill (90% of AOC-1)	93	TON	$ 77	$ 7,117	2020 Waste Management Estimate with contingency
Haz Potential Category 3 (AOC-1)					
Excavation and loading for transport hazardous soils (10% of AOC-1)	7	CY	$ 11.80	$ 81	Project experience, RS Means
Transportation & disposal of hazardous soil to Subtitle C landfill (10% of AOC-1)	10	TON	$ 372	$ 3,832	2020 Waste Management Estimate with contingency
Non-Haz Potential Category 2 (Potential AOC-3)					
Excavation and loading for transport non-hazardous soils (Potential AOC-3)	572	CY	$ 11.80	$ 6,750	Project experience, RS Means
Transport & disposal of non-hazardous soil to local Subtitle D landfill (Potential AOC-3)	858	TON	$ 77	$ 65,809	2020 Waste Management Estimate with contingency
Alternative Subtotal				**$ 160,708**	
Base Scope Services				***$ 105,071***	
Alternative Total				**$ 265,800**	
Alternative 3A - Excavation, Stabilization and Off-Site Disposal of Potential Category 3 Soils at AOC-1. Excavation and Off-Site Disposal of Category 2 Soils at AOC-2 and Excavation and Off-Site Disposal of Potential Category 2 Soils at Potential AOC-3					
Contractor mobilization/demobilization	1	LS	$ 5,698.52	$ 5,699	4% of task total
Waste characterization collection via geoprobe	1	LS	$ 1,770.00	$ 1,770	Project experience
Waste characterization laboratory analysis (AOC-1, AOC-2, Potential AOC-3)	3	EA	$ 885.00	$ 2,655	Stantec Alpha MSA Rates
Confirmatory soil laboratory analysis (analyte with exceedance only, each area)	15	EA	$ 531.00	$ 7,965	Project experience (single analyte for each excavation only, five for each excavation)(AOC-1, AOC-2, Potential AOC-3)
Consultant oversight & reporting	1	LS	$ 17,700.00	$ 17,700	Project experience
Non-Haz Category 2 (AOC-1+AOC-2)					
Excavation and loading for transport non-hazardous soils (AOC-1+AOC-2)	329	CY	$ 11.80	$ 3,878	Project experience, RS Means
Transportation & disposal of non-hazardous soil to local Subtitle D landfill (AOC-2)	493	TON	$ 76.70	$ 37,807	2020 Waste Management Estimate
Excavation and loading for transport non-hazardous soils (90% of AOC-1)	62	CY	$ 11.80	$ 730	Project experience, RS Means
Transportation & disposal of non-hazardous soil to local Subtitle D landfill (90% of AOC-1)	93	TON	$ 76.70	$ 7,117	2020 Waste Management Estimate
Haz Potential Category 3 (AOC-1)					
Excavation and preparation for on-site stabilization (10% of AOC-1)	7	CY	$ 11.80	$ 81	Project experience, RS Means
Application and mixing of soil amendment (AOC-1)	0.69	CY	$ 14.16	$ 10	Project experience
Transportation & disposal of stabilized non-hazardous soil to local Subtitle D landfill (10% of AOC-1)	10	TON	$ 76.70	$ 791	2020 Waste Management Estimate
Blastox Soil Amendment Cost	0.058	TON	$ 383.50	$ 22	From manufacturer
Blastox shipping costs	1.0	EA	$ 7,080.00	$ 7,080	From manufacturer
Non-Haz Potential Category 2 (Potential AOC-3)					
Excavation and loading for transport non-hazardous soils (Potential AOC-3)	572	CY	$ 11.80	$ 6,750	Project experience, RS Means
Transport & disposal of non-hazardous soil to local Subtitle D landfill (Potential AOC-3)	858	TON	$ 77	$ 65,809	2020 Waste Management Estimate with contingency
Alternative Subtotal				**$ 165,861**	
Base Scope of Services				**$ 105,071**	
Alternative Total				**$ 271,000**	
Alternative 3B - Excavation and Off-Site Disposal of Category 2 Soils at AOC-1, AOC-2, and Potential Category 2 Soils at Potential AOC-3					
Contractor mobilization/demobilization	1	LS	$ 5,461.24	$ 5,461	4% of task total
Waste characterization collection via geoprobe	1	LS	$ 2,950.00	$ 2,950	Project experience
Waste characterization laboratory analysis (AOC-1, AOC-2, Potential AOC-3)	3	EA	$ 885.00	$ 2,655	Stantec Alpha MSA Rates
Confirmatory soil laboratory analysis (analyte with exceedance only, each area)	15	EA	$ 531.00	$ 7,965	Project experience (single analyte for each excavation only, five for each excavation)(AOC-1, AOC-2, Potential AOC-3)
Consultant oversight & reporting	1	LS	$ 17,700.00	$ 17,700	Project experience
Non-Haz Category 2 (AOC-1+AOC-2)					
Excavation and loading for transport non-hazardous soils (AOC-1+AOC-2)	397	CY	$ 11.80	$ 4,689	Project experience, RS Means
Transportation & disposal of non-hazardous soil to local Subtitle D landfill (AOC-1+AOC-2)	596	TON	$ 77	$ 45,714	2020 Waste Management Estimate with contingency
Non-Haz Potential Category 2 (Potential AOC-3)					
Excavation and loading for transport non-hazardous soils (Potential AOC-3)	572	CY	$ 11.80	$ 6,750	Project experience, RS Means
Transport & disposal of non-hazardous soil to local Subtitle D landfill (Potential AOC-3)	858	TON	$ 77	$ 65,809	2020 Waste Management Estimate with contingency
Alternative Subtotal				**$ 159,692**	
Base Scope of Services				**$ 105,071**	
Alternative Total				**$ 264,800**	

Table 6: Costing Assumptions
Analysis of Brownfield Cleanup Alternatives
130 East Sprague Avenue, Spokane, WA

6/29/2023

Determination of Extent of Remedial Areas of Concern

- Each excavation area footprint is based on a limited surface and subsurface sampling program performed as a part of a 2020 Phase I ESA, 2021 Phase II Environmental Site Assessment (ESA) and Supplemental Phase II ESA by Stantec; Enviro-Logic Inc. 1990, 1991, and 1992 Quarterly Reports, Phase 1 Report, Phase II Report, and Tank Removal Report; and Howard Consultants, Inc. 1994 and 1995 Limited Phase II and Site Soil Remediation Report. Interpolation was utilized to estimate the extent of excavations.

Soil Excavation and Off-Site Disposal

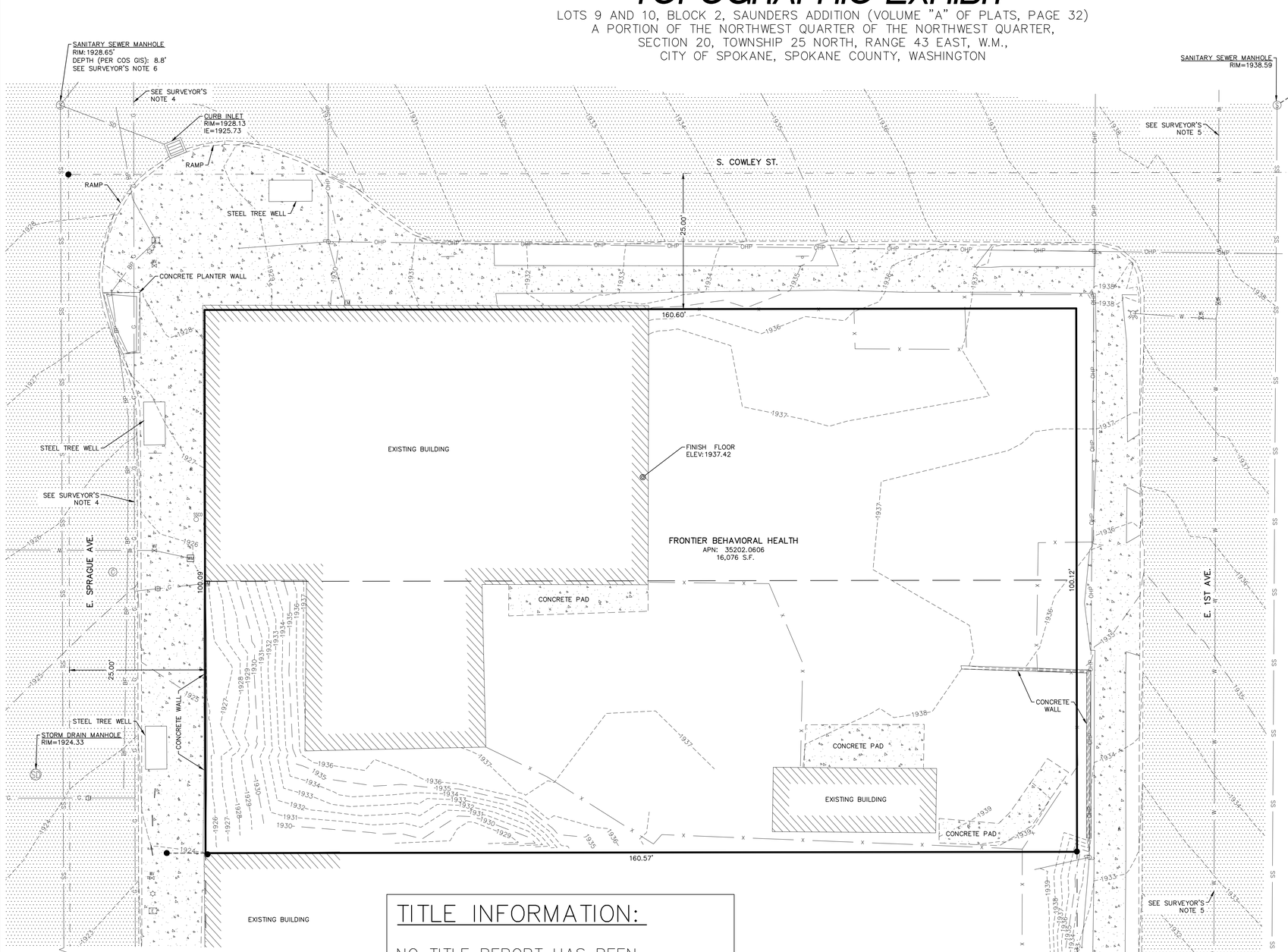
- TCLP analyses were completed for boring locations where lead values exceeded hazardous quantities in order to gain a further understanding of the contaminants on site. during the Stantec Phase II ESA. Based on totals data and the "rule of 20s", it is likely that site soils are non-hazardous. To provide a conservative estimate, it is assumed that 90% of material excavated will be categorized as non-hazardous while 10% of excavated material will be characterized as hazardous for disposal. Confirmation of waste characteristics and proper disposal would be evaluated during the testing and laboratory analyses of waste characterization samples at the time of remedial construction. If determined to be a characteristic hazardous waste, disposal costs will increase.
- Based on the results of borings installed during the Stantec Phase II ESA surrounding the Office, it is likely that the soils are non-hazardous with no exceedances. To provide a conservative estimate, it is assumed that 20% of material excavated will be categorized as non-hazardous with exceedances (Category 2) for disposal. Based on the results of borings nearby the Open Garage (3-sided pole building), it is likely that some soils are non-hazardous with exceedances (Category 2). To provide a conservative estimate, it is assumed that 100% of material excavated will be categorized as non-hazardous with exceedances (Category 2) for disposal. Confirmation of waste characteristics and proper disposal would be evaluated during the testing and laboratory analyses of waste characterization samples at the time of remedial construction. If additional soil is classified as Category 2 or 3, disposal costs will increase.
- No excavation area will extend beyond the limits of the boundary of the Site.
- Excavation volumes assume vertical sidewalls due to limited excavation depths.
- No shoring of excavations will be required to protect structures or utilities.
- Transportation and disposal costs include delivery fee including 1 hour of direct loading, per diem driver rate, roll-off liner, transportation, and disposal at a permitted facility.
- No groundwater and/or stormwater collection, management, treatment and disposal is included.
- No abandonment or replacement of existing utilities will be required.
- Confirmatory soil samples will be collected from each sidewall of each excavation area prior to backfill. Confirmatory samples will only be collected for the analyte for which the boring exceeded MTCA CULs.
- Excavation of competent rock is not included within this OPC. Contaminants existing within bedrock will not be removed and will remain in place.
- Ecology indicates site closure can be obtained by removing the impacted soils in the gravel yard and filing a covenant with Spokane County to remove the remaining soil under the existing Workshop and Garage when the buildings are demolished in the future. Due to the planned redevelopment of the Site, the costs for removal and disposal of the contaminated soils located beneath the existing buildings are included within this ABCA.

General Assumptions

- A total 18% inflation rate was applied to all line items not found from RS Means to account for inflation from the original prices in 2020 to 2023 (i.e. approximately 6%/year).
- A 10% contingency was applied to soil volumes for Alternatives 2 and 3 due to the larger scale of the site excavations and limited sampling performed prior to remedial implementation.
- A bird and bat guano survey has not been performed at the Site based on the information provided to Stantec. This potentially hazardous waste stream has not been considered as part of this ABCA.
- No building historical preservation costs have been included.
- Contractor(s) will have full, unfettered access to the building during remedial work.
- Soil density is assumed to be 1.5 Tons/CY.
- The OPC was prepared prior to remedial design and without the formal solicitation of contractor bids, and are therefore based upon related project experience, RSMeans 2023 Cost Estimating Software with open shop costs of Spokane Washington, anticipated field conditions, and the estimated scope of work.
- Project-specific unit rates will need to be developed once regulatory review and approval processes are completed.
- Contractor mobilization is assumed to be four percent of total task cost.
- No sales tax is applied to project costing with the exception of state and local taxes for transportation and disposal of soil wastes.
- No groundwater remediation is proposed as part of this ABCA.
- Confirmatory soil sampling from each excavation area will only include the analyte which exhibited exceedances of applicable thresholds (Ex: BH102 and BH103; Arsenic, Lead and Cadmium, etc..)
- Additional hazardous buildings materials survey and follow-up visits will not be required and associated costs have not been factored into probable costs.
- Non-hazardous soil will be transported and disposed to Waste Management's Graham Road Landfill located in Medical Lake, WA.
- The redevelopment plan for the Property includes the removal of all existing buildings to redevelop it with a new facility.
- Stantec will dispose of IDW that was generated during the Phase II ESA.
- No sub slab depressurization systems are proposed as part of this ABCA.
- Asphalt trucking assumed 10 miles at 30 MPH average speed. Asphalt thickness 4" total.
- Based on visual observations, the northwest tank diameter is estimated to be 4 feet and 500 gallons in capacity. It has been assumed that this tank can be removed without impacting the Workshop foundation's structural integrity. In addition, existing Phase I assessments show no other USTs existing on site.
- Based on a phone call to the Kootenai County Prairie Transfer Station (208-446-1430) on 6/20/2023, only asbestos materials need to be disposed of as hazardous waste. Therefore, the lead-based paint and PCB ballasts can be disposed of with the rest of the building materials. Mercury fluorescent tubes will need to be disposed of as universal waste.
- No costs for addressing any present regulated building materials in the Workshop have been included within this ABCA.

TOPOGRAPHIC EXHIBIT

LOTS 9 AND 10, BLOCK 2, SAUNDERS ADDITION (VOLUME "A" OF PLATS, PAGE 32)
A PORTION OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER,
SECTION 20, TOWNSHIP 25 NORTH, RANGE 43 EAST, W.M.,
CITY OF SPOKANE, SPOKANE COUNTY, WASHINGTON



ELEVATION DATUM

NAVD88 ESTABLISHED FROM GPS OBSERVATION ON LOCAL CONTROL POINTS USING THE WASHINGTON STATE REFERENCE NETWORK.

SITE TBM

SET MAG NAIL W/WASHER IN CURB, ±46 FEET SOUTHEAST OF SEWER MANHOLE IN THE INTERSECTION OF COWLEY STREET AND 1ST AVENUE.

ELEVATION: 1938.18

TITLE INFORMATION:

NO TITLE REPORT HAS BEEN PROVIDED TO OR REVIEWED BY THE SURVEYOR IN CONJUNCTION WITH THIS SURVEY. IT IS HIGHLY RECOMMENDED THAT A TITLE REPORT BE OBTAINED AND REVIEWED TO ENSURE ANY AND ALL MAPPABLE ENCUMBRANCES ARE IDENTIFIED.

GRAPHIC SCALE

10 0 5 10 20

(IN FEET)
1 inch = 10 ft.
CONTOUR INTERVAL: 1 FT.

LEGEND

- ASPHALT
- BUILDING
- SIDEWALK
- CONCRETE
- PARCEL BOUNDARY LINE
- EXISTING PROPERTY LINE
- EXISTING RIGHT OF WAY LINE
- RIGHT-OF-WAY MONUMENT LINE
- ORIGINAL PLAT LINE
- ROAD CENTER LINE
- CURB
- MAJOR CONTOUR
- MINOR CONTOUR
- SANITARY SEWER LINE
- FENCE LINE
- OVERHEAD POWER LINE
- BURIED POWER LINE
- WALL
- SANITARY SEWER MANHOLE
- SANITARY SEWER CLEANOUT
- ELECTRIC METER
- ELECTRICAL HANDHOLE
- POWER POLE
- GUY ANCHOR
- LIGHT POLE
- WATER VALVE
- FIRE HYDRANT
- WATER METER
- GAS METER
- GAS VALVE
- COMMUNICATION MANHOLE
- SIGN
- CATCH BASIN
- FOUND MONUMENT

SURVEYOR NOTES:

1. THE BOUNDARY SHOWN IS PER LEGAL DESCRIPTIONS, RECORD OF SURVEY'S AND PLATS AND FOUND MONUMENTATION WITH IN THE AREA. THIS MAP DOES NOT REPRESENT A BOUNDARY SURVEY, NO PROPERTY CORNERS WERE SET.
2. THE CONTOURS SHOWN ARE DERIVED FROM DIRECT FIELD OBSERVATIONS AND COMPLY WITH THE NATIONAL MAPPING STANDARDS, OF ONE-HALF THE CONTOUR INTERVAL SHOWN.
3. THE PURPOSE OF THE SURVEY IS TO PROVIDE OWNER AND CONSULTANTS A REPRESENTATION OF GENERAL SITE FEATURES AS OBTAINED ON THE DATE OF FIELD SURVEY, SEPTEMBER, 2023.
4. THE GAS LINES SHOWN HEREON ARE LOCATED PER SURFACE EVIDENCE (VALVE LOCATIONS), AND MAP DATA PROVIDED BY AVISTA UTILITIES 12/18/2023.
5. THE WATERLINE LOCATIONS SHOWN HEREON ARE PER SURFACE EVIDENCE (VALVE LOCATIONS), AND CITY OF SPOKANE GIS (COS GIS). IN ADDITION TO THE WATERLINES SHOWN HEREON, A 24" WATER TRANSMISSION MAIN RUNS IN THE EASTERN PORTION OF S. COWLEY ST. AND IN THE NORTHERN PORTION OF E. SPRAGUE AVENUE (OUTSIDE OF TOPOGRAPHIC SURVEY SCOPE).
6. SEWER MANHOLE DEPTHS ARE PER CITY OF SPOKANE GIS (COS GIS). MANHOLE DEPTHS WERE NOT MEASURED IN THE FIELD DUE TO TRAFFIC AND LOCKED LIDS.

UTILITY STATEMENT:

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION, INCLUDING PAINT MARKINGS PROVIDED FROM AN OUTSIDE UTILITY LOCATE COMPANY AND/OR EXISTING DRAWINGS AND RECORDS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED, ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. ALL UNDERGROUND UTILITIES NEED TO BE VERIFIED FOR DEPTH AND ACCURACY.

SURVEYOR'S CERTIFICATE

I, TROY A. CARLSON, PLS 48373, DO HEREBY CERTIFY THAT THIS TOPOGRAPHIC MAP WAS PREPARED BY ME OR UNDER MY DIRECTION IN ACCORDANCE WITH WAC 332-130-145.

TROY A. CARLSON
PLS 48373

TROY A. CARLSON — STATE OF WASHINGTON — 48373 — REGISTERED PROFESSIONAL LAND SURVEYOR

SEC.20, T.25N, R.43E., W.M.

No.	DESC. / DATE	BY
5		
4		
3		
2		
1	ADDED WTR/SWR LINES	MCG

storhaug
civil engineering | planning
landscape architecture | surveying
510 east third avenue | spokane, wa | 99202
509.242.1000 | www.storhauginc.com

SHEET TITLE: TOPOGRAPHIC EXHIBIT

PROJECT TITLE: 130 E. SPRAGUE AVE. SPOKANE, WA

SEAL

DATE	12/19/2023
DRAWN	DKM
CHECKED	TAC
PROJECT NUMBER	23-377
DRAWING NO.	1 OF 1
	TOPO

X-23-377-BM.dwg 24x36 (TOPO)