REMEDIAL INVESTIGATION
WORK PLAN

FORMER CASCADE LAUNDRY
205 PROSPECT STREET
WHATCOM COUNTY PARCEL 380330111249
BELLINGHAM, WASHINGTON 98225
ECOLOGY FS ID: 21786898

For:
Sonja Max and Oliver Max
914 12th Street
Bellingham, Washington 98225

By:

Stratum Group
PO Box 2546
Bellingham, WA 98227
(360) 714-9409

May 24, 2016

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Stratum Group

PO Box 2546, Bellingham, WA 98227
Phone: (360) 714-9409

May 24, 2016

Sonja Max and Oliver Max
914 12th Street
Bellingham, Washington 98225

Re: Remedial Investigation and Feasibility Study Work Plan
Cascade Laundry
205 Prospect Street
Whatcom County Parcel 380330111249
Bellingham, Washington 98225
Ecology FS ID: 21786898

Dear Ms. Max and Mr. Max:

This work plan provides an outline for addressing the remaining data gaps for characterizing the soil and groundwater at the Cascade Laundry. The purpose of this work plan will be to provide the data needed to more fully characterize the groundwater at the site, determine the horizontal and vertical extent of contamination, and develop cleanup standards for the site. The information and data will lay the foundation for evaluating potential cleanup and remedial action options for the site.

The Cascade Laundry site is currently listed as a contaminated site with Washington State Department of Ecology. The site is listed as having soil and groundwater contamination due to petroleum products and tetrachloroethylene (PCE), a dry cleaning solvent.

Should you have any questions concerning this report, please do not hesitate to contact us at (360) 714-9409.

Sincerely,
Stratum Group

Kim Ninnemann, B.S., L.G.
Licensed Geologist

Dan McShane, M.Sc., L.E.G.
Licensed Engineering Geologist

1.0 INTRODUCTION

Stratum Group has prepared this work plan for the former Cascade Laundry property located at 205 Prospect Street in Bellingham, Washington. This work plan is prepared to outline the steps that need to be taken to complete a remedial investigation study. The purpose of a remedial investigation study is to collect sufficient information to characterize the site, such that a range of site specific cleanup actions can be developed.

The Cascade Laundry site, located in downtown Bellingham, was developed as a dry cleaning and laundry facility by at least 1932. The site use included clothes dying and leather tanning. The site conducted dry cleaning activities through 1971. Commercial laundry continued at the site through the early 2000s.

The site became listed as a contaminated site by the Washington State Department of Ecology (Ecology) in November 2010 based upon the presence petroleum products and halogenated organics in the soil and groundwater. Concentrations of gasoline-range petroleum hydrocarbons, tetrachloroethylene (PCE or PERC), and benzene have been identified in the soil and groundwater beneath the southwestern portion of the property, including beneath the southwestern portion of the building, at concentrations that exceed the Model Toxic Control Act Method A cleanup standards for unrestricted land use. Diesel and oil-range petroleum and xylenes have been identified within the soil at levels that exceed the Method A cleanup standards. Contamination on the site is suspected to be due to releases from a former dry cleaning solvent UST and piping and through former operations as a dry cleaner including possible releases to the soil through dumping or spills onto the site surface and into a sump discharge drain.

Previous preliminary site characterization studies were completed at the Cascade Laundry site between 2006 and 2012. Based upon our review of the available environmental reports a few data gaps were identified. This work plan provides an approach for collection of the additional site specific information to more fully characterize the site conditions and includes the following:

- Characterize the groundwater
- Further delineate the vertical and horizontal extent of soil and groundwater contamination
- Determine if vapor intrusion is present

This work plan lays out a plan for addressing these data gaps. Based upon the results of the remedial investigation findings and previous environmental sampling, cleanup standards can be developed and a cleanup action evaluation can be conducted.

2.0 SITE SETTING

The Cascade Laundry site is located along the west side of Prospect Street between Flora Street and Central Avenue in the downtown area of Bellingham, Washington. The site occupies one tax parcel that utilizes the address of 205 Prospect Street. The property is located in the northwest quarter of the

southwest quarter Section 30, Township 33 North, Range 3 West of Willamette Meridian. The location of the subject property is indicated in Figure 1.

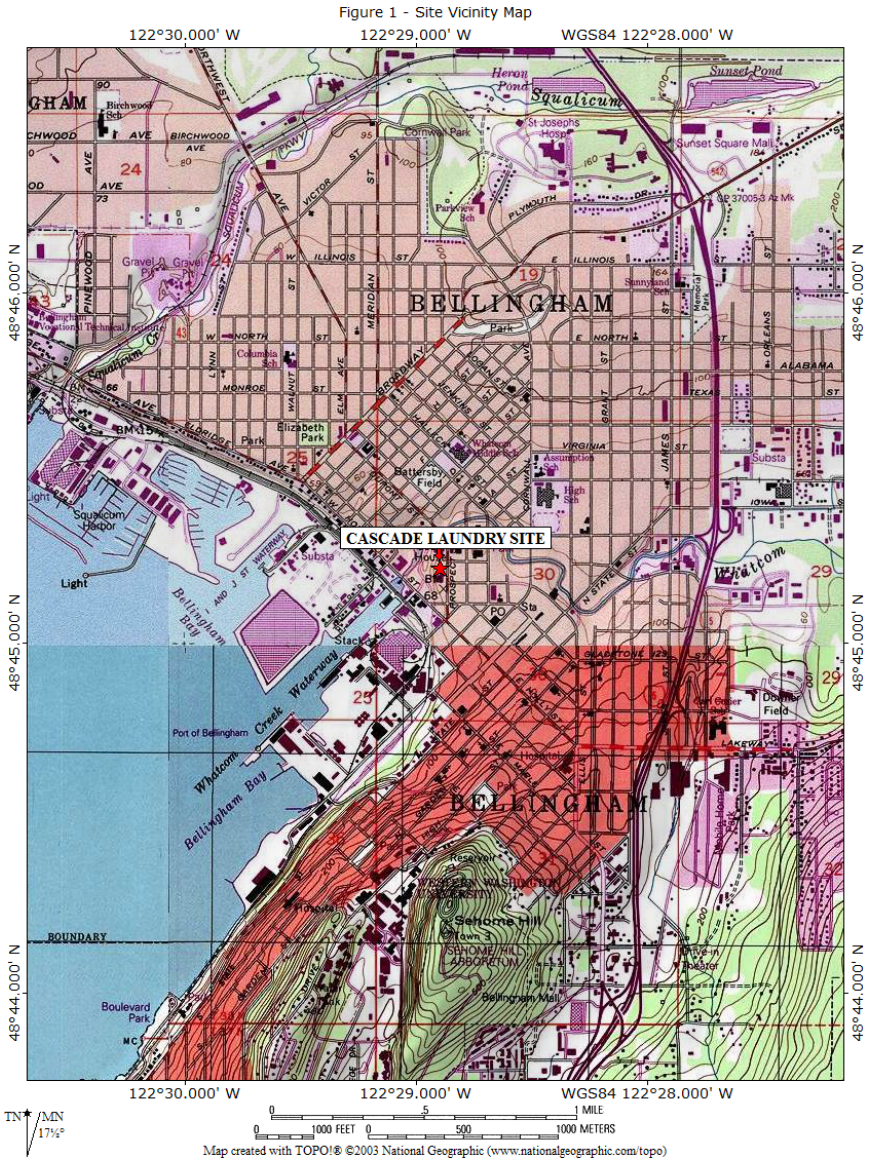


Figure 1. Site Vicinity Map

The site is developed within a two story building with a daylight basement. The building is largely vacant; however, the southeastern portion of the building has been remodeled into sculpture shop and plans are being developed to remodel the remainder of the building into a performing arts center.

The subject property slopes to the west. The slope of the property increases toward the western property boundary, with a steep former shoreline slope along and adjacent to the western property boundary. The slope is vegetated and is approximately 35 feet high. The site has an elevation of

approximately 65 feet along Prospect Street and approximately 55 feet along its western boundary. Whatcom Creek estuary is located approximately 320 feet to the northwest and Whatcom Waterway is located approximately 500 feet west of the subject property.

An aerial photograph of the site and vicinity with the area of known contamination is presented in Figure 2, below.

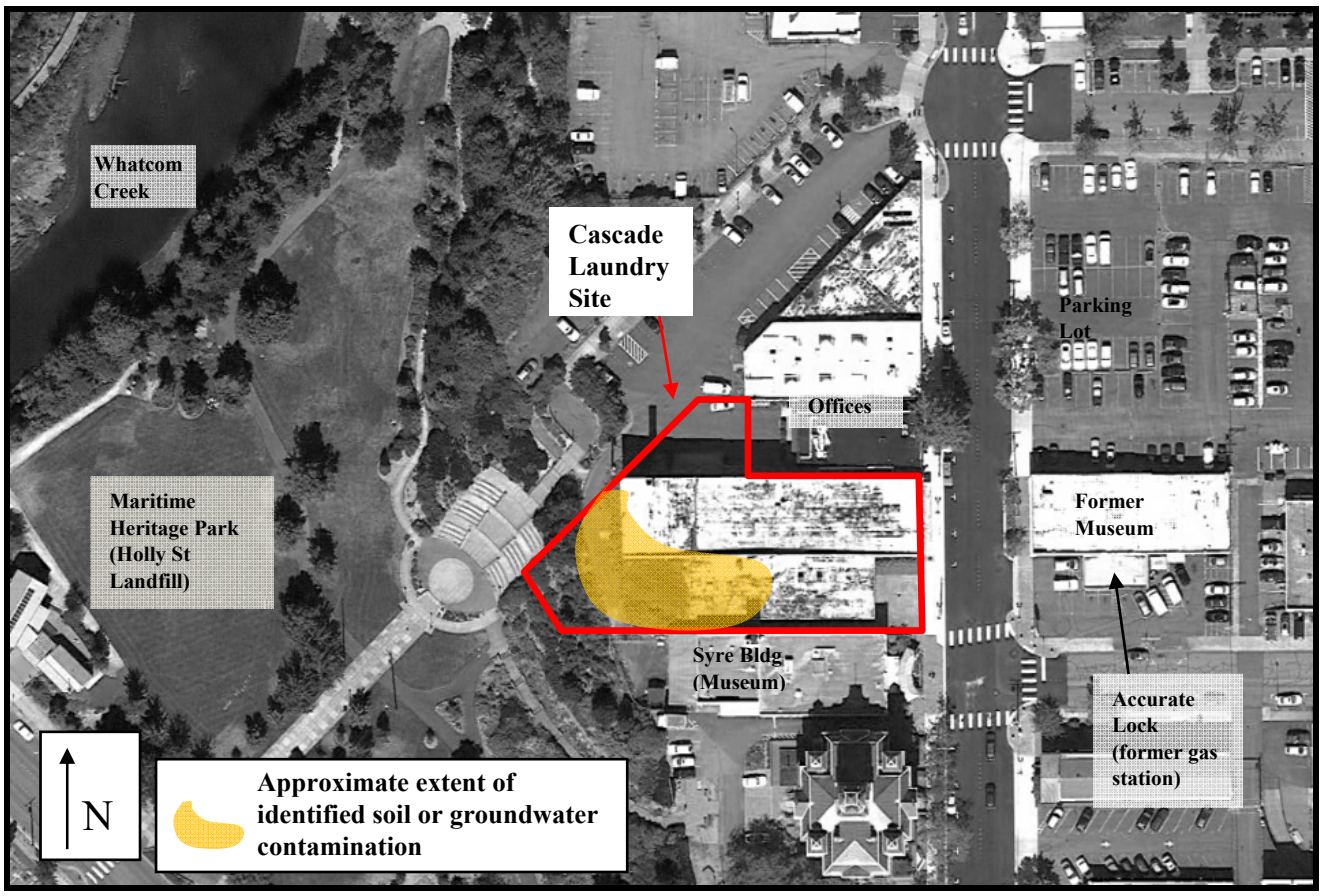


Figure 2. Aerial photo of site and surrounding land uses

A paved parking area, and a building utilized by a variety of offices bound the subject property to the north. The building, located at 209 Prospect Street, immediately north of the subject property shares a common wall with the subject property. Prospect Street bounds the subject property to the east. A small building utilized by Accurate Lock (200 Prospect Street) and a larger building that was formerly utilized as part of the Whatcom County Museum (206 Prospect Street) are located across Prospect Street from the subject property. The Accurate Lock property is a former gasoline station. The Syre Building, utilized by the Whatcom County Museum, bounds the subject property to the south. A vegetated slope and Maritime Heritage Park bound the subject property to the west. A portion of Maritime Heritage Park was utilized as a part of a municipal landfill in the 1940s and 1950s, known as the Holly Street Landfill. The site and vicinity is located in one of the oldest areas of Bellingham and

had been developed as early as the 1860s. A saw mill had been located along Whatcom Creek just to the west of the property and homes and other structures were located along the top of the bluff. Some disposal of waste material may have taken place along the edge of the bluff prior to the current development of the site.

2.1 Physical Setting

Environmental borings of the site to depths of up to 30 feet indicate that the site's underlying geology generally consists of silty clay, clayey silt, sandy clay and sandy silt. Layers of sand were identified in numerous borings. The sand units vary from 2 to 14 feet thick and some sandy zones have lenses of clay. The subsurface soils are consistent with the site's mapping within Bellingham glaciomarine drift (Lapen, 2000).

Fill material was identified in some of the borings on the west side of the property and included organic material and pieces of glass and charcoal. Fill is also located at the southwestern corner of the building, east of a concrete retaining wall. The fill material at this location was largely comprised of loose brown silty sand. Some bricks, pipes, and other miscellaneous debris is present within the fill material. Organic material, woody debris, and some brick fragments were identified in the upper 7 feet along the top of the slope, near the western property boundary.

No streams or surface water drainages are located on the subject property. The site is located approximately 550 feet east of the Whatcom Waterway and includes the upper portion of the original shoreline bluff above the creek estuary. No groundwater seeps have been observed along the bluff. Water was encountered between 12 to 17 feet depth below the ground surface during environmental sampling; however, based upon the lack of groundwater identified in borings completed within the vicinity during the same sampling event, the water encountered may be in isolated, discrete perched zones. Based upon the presence of the water within coarser grained layers in the subsurface, the perched water likely has a low flow and recharge rate, but details of groundwater conditions are not fully known as the water encountered was encountered during geo probe sampling.

Groundwater depths measured in the adjacent Maritime Heritage Park site, located on the adjacent property to the west (also known as Holly Street landfill) indicate that groundwater is present on the park site at 12 to 13 feet below the ground surface of the park. These groundwater levels would correspond with a regional groundwater depth of approximately 43 feet below the ground surface at the subject property. Groundwater flow direction of groundwater at the monitoring wells within the park indicates flow to the northwest, toward Whatcom Creek (Landau, 1993).

3.0 SITE HISTORY

The subject property and vicinity was initially developed in approximately the 1850s as it is located near the earliest area of development along Bellingham Bay. A saw mill was built along the banks of Whatcom Creek to take advantage of the water power provided by the creek. An 1892 photograph of the site and vicinity indicates that a home was located on the subject property at that time.

The main structure of the existing building on the site was constructed on the site in 1922. The southern portion of the subject property was utilized as a car sales lot until approximately 1935.

Cascade Laundry began to utilize the subject property by at least 1932. An addition was added to the south side of the building in the 1966. Cascade Laundry utilized the building for cleaning clothing, rugs, and miscellaneous goods, dry cleaning, and dyeing fabric. The year that the dry cleaning operation began is unknown but is believed to have ended by 1971. The site remained in use as a commercial laundry facility through the early 2000s.

4.0 Previous Environmental Studies

Environmental investigations have taken place on the site, including tank removals, soil and groundwater investigations, and an indoor air quality sampling event. The site's environmental history is described in the following documents in chronological order:

- **1992:** *Underground Storage Tank Site Check/Site Assessment Checklist (Welch)*
  Documents the removal of a 500-gallon gasoline UST. No contamination identified

- **2006:** *Phase I and Phase II Environmental Site Assessment (Stratum Group)*
  Phase I report identified site's former use as a dry cleaner as a recognized environmental condition. Five test pits were completed around the south and west sides of the building. One underground dry cleaning tank and PCE contaminated soil identified near the southwest corner of the building.

- **2007:** *Phase II Environmental Borings (GeoEngineers)*
  Four borings were completed to depths of 29 feet. No petroleum contamination found in the soil or groundwater of the southeast corner of the property, closest to the adjacent former gasoline station. Gasoline-range petroleum, diesel/oil, and PCE was found in soil above the MTCA Method A cleanup standards between 15 and 29 feet deep along the top of the slope, west of the building.

- ***2010**: Tank Removal Report (Whatcom Environmental Services)*
  Documents the removal of a 3,200-gallon heating oil tank and a 300-gallon dry cleaning tank. No contamination was identified around the heating oil tank. Gasoline range petroleum, xylenes, and PCE at concentrations that exceed the MTCA Method A cleanup standards in the bottom and sidewalls of the excavation around the dry cleaning tank.

- **2011:** *Site Characterization Report (Whatcom Environmental Services)*
  Five borings completed around the exterior of the building to depths of up 30

feet depth. Gasoline-range petroleum, benzene, xylene and PCE were identified in the fill soil near the southwestern corner of the property at depths between 14 and 25 feet. Groundwater was encountered between 12 and 17 feet. Gasoline-range petroleum, benzene, and PCE were detected above the MTCA Method A cleanup standards.

- **2012:** *Site Characterization Report – Building Interior Soil Borings (Whatcom Environmental Services)*

  Four borings were extended through the floor of the Cascade Laundry building. One boring, located in the southern building addition, had exceedences of gasoline-range petroleum, benzene, ethylbenzene, and xylenes in the soil at 14.5-15.5 feet depth. PCE was detected above the cleanup standard in the groundwater within the two borings in the southern building addition.

- **2015:** *Environmental Baseline (Stratum Group*)

  Compilation of soil and groundwater data and maps completed for the Cascade Laundry site. Report includes samples of soil and water within an interior sump and results from an indoor air quality test. Soil in bottom of sump in the southwestern corner of the building had diesel and oil concentrations above the state cleanup standards. Some volatile organic compounds (VOCs) were detected in the air quality within the building. The report found the air quality to be protective of workers during an 8 hour work shift, per Washington State Labor and Industries permissible exposure limits; however the data is inconclusive as to the source of the VOCs. Figures from the report that summarize the site's subsurface conditions are provided below including the soil sample locations and results in Figures 3 and 4; the soil data in Table 1; and groundwater sample locations and groundwater results in Figure 5 and Table 2.

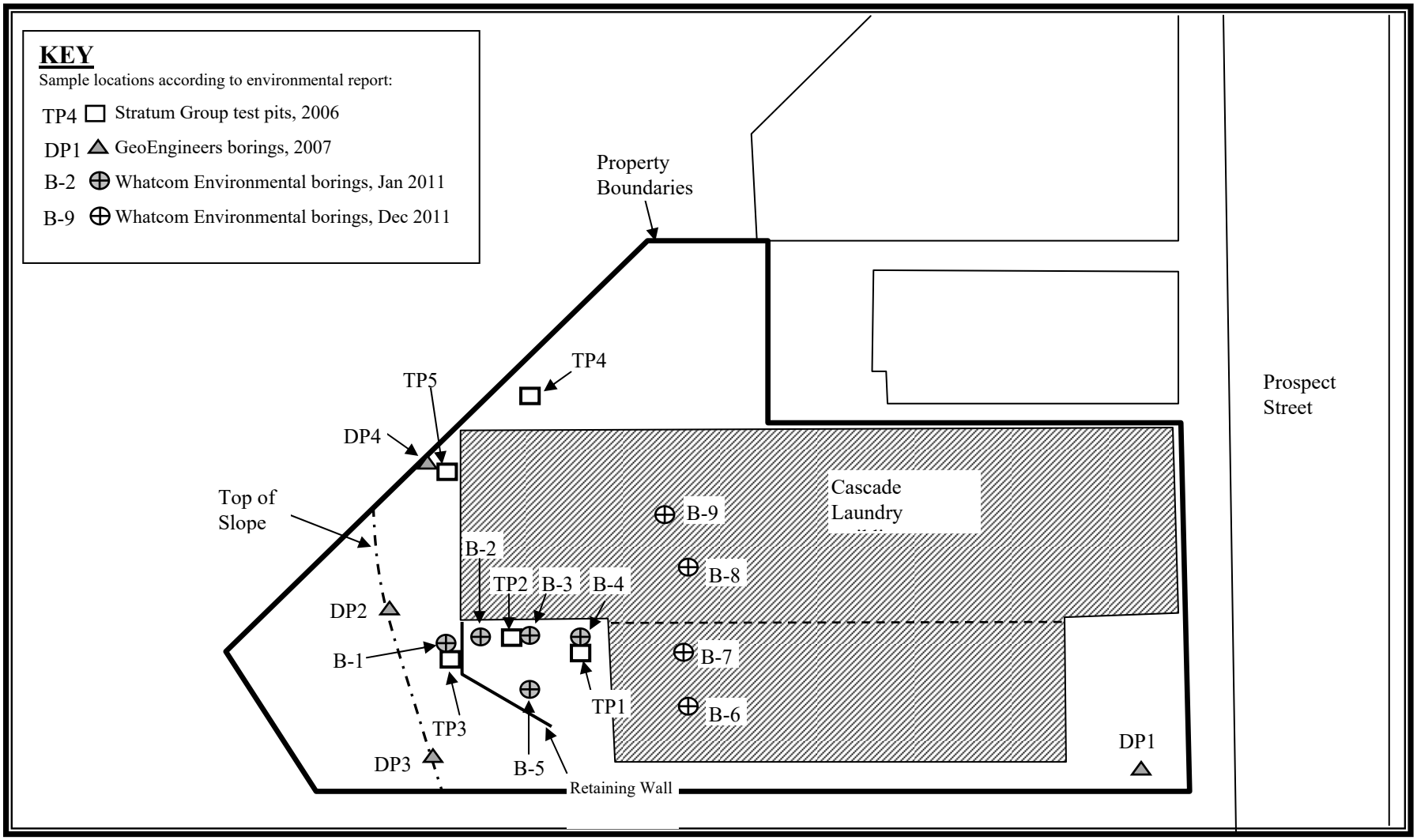


Figure 3. Compilation Map of Soil Sample Locations (Baseline Environmental, 2015)

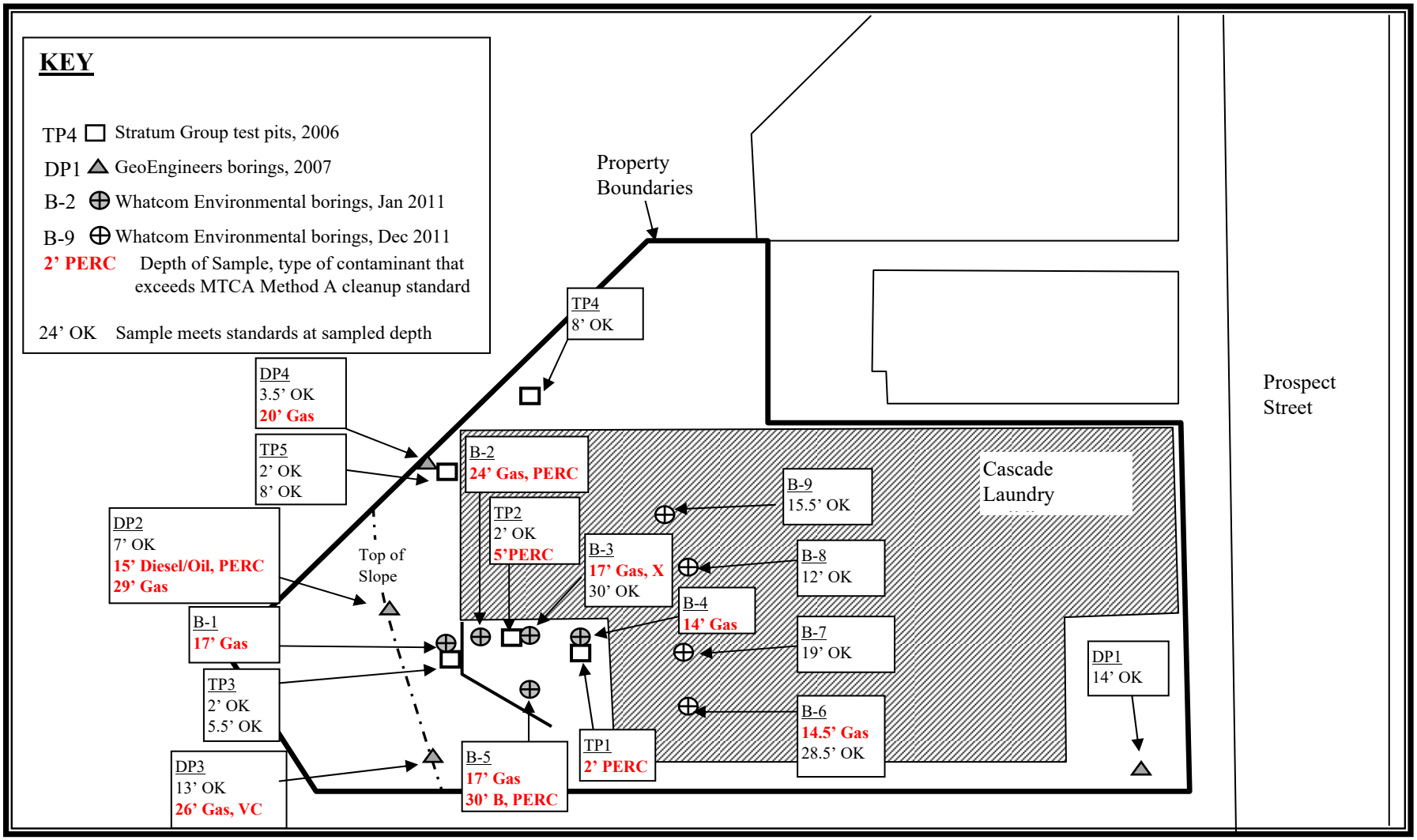


Figure 4. Soil Sample Exceedences above MTCA Method A (Baseline Environmental, 2015)

Table 1. Compilation of Soil Sample Data (2006-2012)

Sample Location		Sample Depth (feet)	Soil Contaminants (mg/kg)							
			Gas	**Diesel**	**Oil**	**Benzene**	**Ethylbenzene**	**Xylenes**	**PERC**	**Vinyl Chloride**
TP1	01	2	--	ND	70	--	--	--	**2.1**	ND
TP2	02	2	--	ND	ND	--	--	--	ND	ND
	03	5	--	ND	ND	--	--	--	**0.26**	ND
TP3	04	2	--	ND	84	--	--	--	0.023	ND
	05	5.5	--	ND	76	--	--	--	0.014	ND
TP4	06	8	--	ND	58	--	--	--	ND	ND
TP5	07	2	--	ND	ND	--	--	--	0.04	ND
	08	8	--	ND	ND	--	--	--	0.012	ND
DP1		14	ND	--	--	ND	ND	ND	--	--
DP2		7	ND	ND	ND	--	--	--	--	--
		15	83	**2,600**	**3,300**	ND	0.012	0.043	**1.1**	ND
		29	**110**	ND	ND	ND	ND	ND	ND	0.084
DP3		13	ND	ND	ND	--	--	--	--	--
		26	**930**	ND	ND	ND	1.2	ND	ND	**1.3**
DP4		3.5	ND	ND	ND	--	--	--	--	--
		20	**380**	ND	ND	ND	ND	ND	ND	ND
B-1		17-18	**1,500**	--	--	ND	2.9	6.8	0.029	--
B-2		24-25	**1,200**	--	--	ND	2.2	4.5	**45**	--
B-3		17-18	**1,300**	--	--	ND	4.0	**9.4**	0.038	--
B-3		30	ND	--	--	ND	ND	ND	0.024	--
B-4		14-15	**730**	--	--	ND	1.0	2.0	ND	--
B-5		17-18	**1,600**	--	--	ND	3.7	5.8	0.021	--
B-5		30	ND	--	--	**0.048**	ND	ND	**0.089**	--
B-6		14.5	**870**	--	--	**7.2**	2.1	**16**	**16**	--
B-6		28.5	ND	--	--	ND	ND	ND	ND	--
B-7		19	ND	--	--	ND	ND	ND	ND	--
B-8		12	ND	--	--	ND	ND	ND	ND	--
B-9		15.5	ND	--	--	ND	ND	ND	ND	--
MTCA Method A (mg/kg)			***30/100***	***2,000***		***0.03***	***7***	***9***	***0.05***	**--**
MTCA Method B (mg/kg)			***Not available***	***Not available***		***320***	***800***	***16,000***	***40***	***0.67-240***

*sample results in red bold type exceed MTCA Method A or B cleanup standards; -- = analyte not tested; shaded boxes indicate sample exceeds MTCA Method A screening level

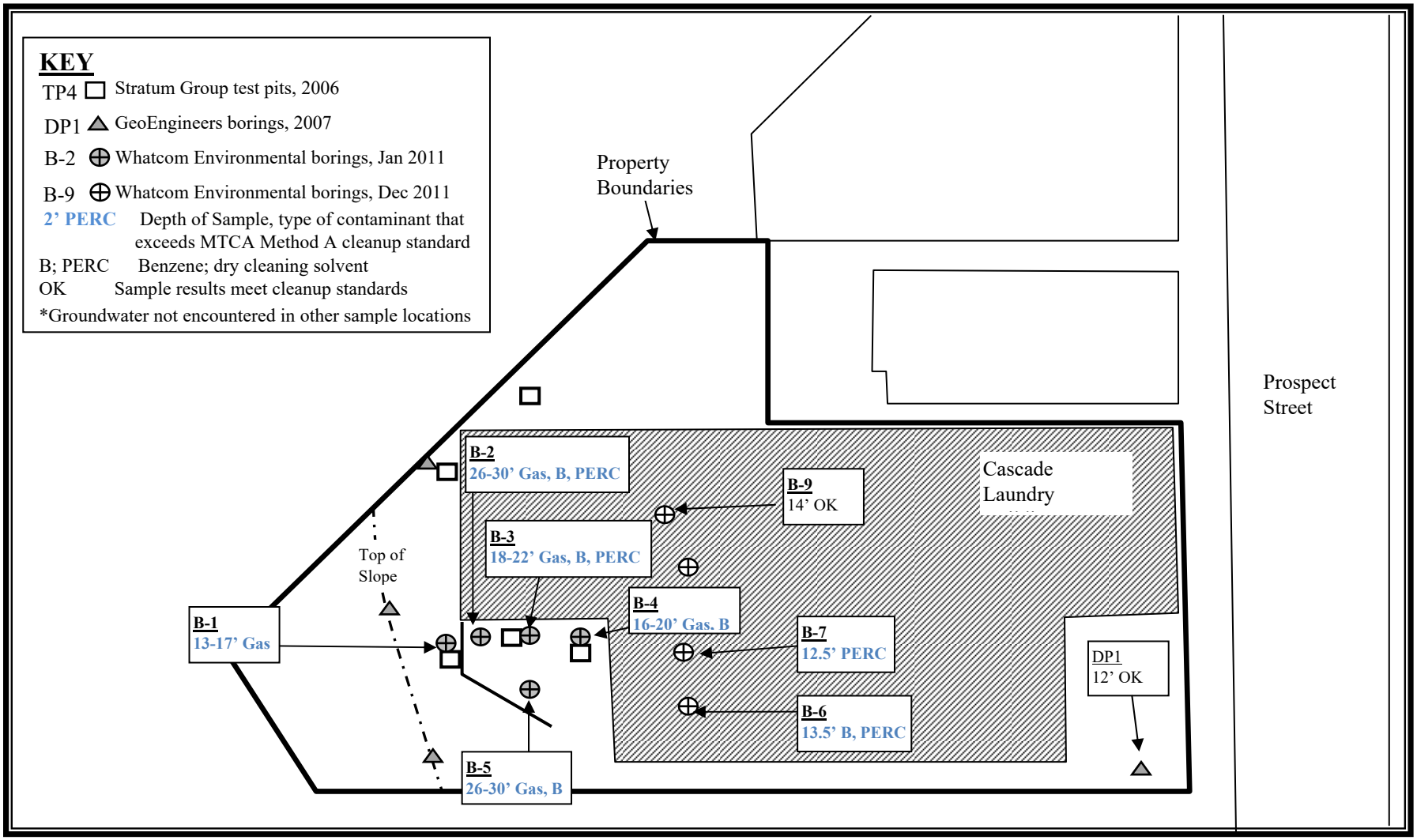


Figure 5. Groundwater Sample Locations with exceedences above MTCA Method A (Baseline Environmental, 2015)

Table 2. Compilation of Groundwater Sample Data

Sample Location	Sample Depth (feet)	Groundwater Contaminants (µg/L)					
		Gas	**Benzene**	**Toluene**	**Ethyl-benzene**	**Xylenes**	**PERC**
DP1	12	ND	ND	ND	ND	ND	--
B-1	13-17	**4,400**	ND	ND	36	44	ND
B-2	26-30	**13,000**	**21**	ND	66	97	**3,100**
B-3	18-22	**9,700**	**14**	26	180	360	**5.4**
B-4	16-20	**5,700**	**49**	11	55	55	3.9
B-5	26-30	**13,000**	**28**	51	200	340	4.4
B-6	~13.5[1]	320	**22**	3.9	18	8.2	**5.9**
B-7	~12.5[1]	ND	ND	2.3	ND	ND	**13**
B-9	~14[1]	ND	ND	1.0	ND	ND	ND
***MTCA Method A* (µg/L)**		***800/1,000***	***5***	***1,000***	***700***	***1,000***	***5***

1 = depth of the first water encountered. Depth of sample is unknown; *sample results in blue bold type exceed MTCA Method A or B cleanup standards; -- = analyte not tested; ND = analyte not detected; diesel, oil and vinyl chloride not analyzed; shaded boxes indicate sample exceeds MTCA Method A screening level

5.0 INITIAL EVALUATION

Soil and groundwater contamination has been confirmed on the site through previous investigations.

Initial investigations of the site utilized the MTCA Method A cleanup standards for unrestricted land use as preliminary screening levels. Contaminants identified on the site at concentrations above the MTCA Method A cleanup standards during previous investigations include petroleum products, dry cleaning solvent, and a break-down products of dry cleaning solvent. Table 3, below, identifies the individual contaminants identified in the soil and groundwater that have exceeded MTCA Method A screening levels. Other contaminants have been detected on the site, but do not exceed the screening levels.

Table 3. Site Specific Contaminants of Concern

Soil Contaminants	Groundwater Contaminants
• Gasoline-range petroleum (mineral spirits)$_a$ • Benzene • Xylenes • Diesel and oil-range petroleum • Tetrachloroethylene (PCE) • Vinyl chloride	• Gasoline-range petroleum • Benzene • Tetrachloroethlyene (PCE)

a = The gasoline-range hydrocarbons identified on the site are identified by the laboratory as mineral spirits in many of the lab notes. The presence of gasoline in the subsurface may therefore be associated with mineral spirits used as a cleaning agent (Stoddard solvent), rather than gasoline fuel.

Based on the presence of these contaminants on the site, these contaminants are considered to be

the site's contaminants of concern.

Future soil and groundwater samples collected from the site should be analyzed for NWTPH-GX to evaluate for gasoline range petroleum, NWTPH-DX to evaluate for diesel and oil range petroleum, EPA-8021 to evaluate for benzene and xylenes, and halogenated volatile organic compounds to evaluate for dry cleaning solvent PCE and its breakdown products, including vinyl chloride.

6.0 REMEDIAL INVESTIGATION TASKS

6.1 Ground Water Characterization

Previous studies have identified groundwater contamination within the southwestern portion of the site and beneath the southwestern portion of the site's building. The depth to the groundwater has been measured between 12 and 30 feet; however, the groundwater depth has not been consistent throughout the site or throughout a sampling event, which indicates the presence of perched layers of groundwater.

A groundwater characterization should be conducted to evaluate the following:

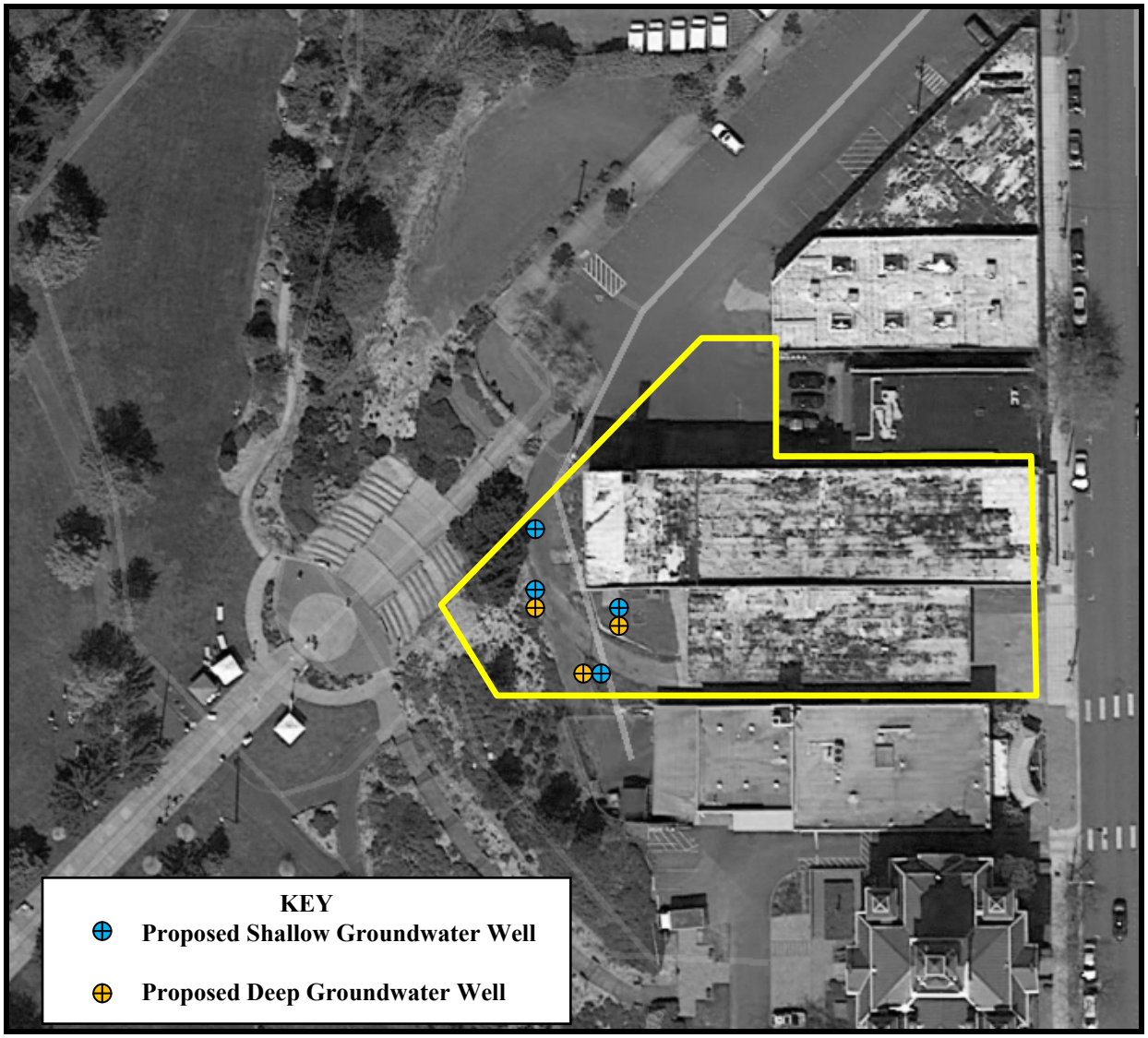
- Depth of perched groundwater
- Depth of regional groundwater
- Groundwater flow direction
- Determine recharge rates for perched groundwater wells to determine if they are considered potable water
- Groundwater quality

6.1.1 Installation of Onsite Groundwater Monitoring Wells

We recommend that four shallow groundwater monitoring wells be installed on the Cascade Laundry property. The wells should be drilled and screened within the first groundwater zones encountered. Wells will be installed around the exterior of the site where previous groundwater contamination has been identified, or groundwater contamination is potentially present.

To evaluate the regional groundwater table for contamination, we recommend that three deep monitoring wells be installed on the site. The purpose of the deep monitoring wells is to evaluate the vertical extent of groundwater contamination at the site. These monitoring wells should be installed into the area's aquifer, located approximately 45 feet below the Cascade Laundry's ground surface. Wells should be screened for 20 feet from the top of the aquifer.

The recommended monitoring well locations are provided in Figure 6, below



Location of proposed groundwater monitoring wells on the Cascade Laundry site

Following installation of groundwater monitoring wells, the wells should be developed and the groundwater quality should be sampled. In addition, the monitoring wells should be surveyed so that the depth of water measurements can be used to determine groundwater flow directions.

6.1.2 Potable versus Non-Potable Groundwater

Department of Ecology considers all water to be drinking water or potential drinking water as the most beneficial use of groundwater. Groundwater is considered non-potable if the groundwater is not used for drinking water purposes, will not ever be used for drinking water purposes and no potential down gradient properties will utilize the groundwater for drinking

water purposes.
Whether the site's groundwater is considered potable or non-potable will be a significant factor in determining the cleanup standard for the groundwater at the site. Following installation and data gathering from onsite monitoring wells, it can be determined whether efforts should be conducted to verify if the site's groundwater is non-potable.

MTCA regulations require that the following information be documented in order to eliminate groundwater as a requirement for cleanup (WAC 173-340-720 (2)):

- Groundwater does not currently serve as a drinking water source
- Groundwater is not a potential future source of drinking water (must meet one of the following reasons)
    - Low yield (≤ 0.5 gal/min)
    - Natural background levels of organic or inorganic constituents are high (i.e. total dissolved solids at ≥10,000 mg/L)
    - Recovery of groundwater for drinking purposes is technically impossible (depth or location)
- Department of Ecology determines it is unlikely for contaminated water to travel to groundwater that may be used as drinking water

Another consideration is that the adjoining landfill site should preclude the permitting of drinking water wells as drinking water wells are not permitted within 1,000 feet of a landfill.

If groundwater is determined to be non-potable, the groundwater may not need to be remediated; however, site's groundwater quality must not negatively impact other contaminant pathways, such as indoor air quality through vapor intrusion or have other pathways of impacts to human health or ecological health.

6.2 Horizontal and Vertical Extent of Contamination

Limited horizontal and vertical boundaries of the soil and groundwater contamination on the site have been determined through previous environmental studies on the subject parcel. Previous investigations indicate that the contamination is limited to the western and southern areas within the property boundaries, including beneath the southern building addition. No contamination has been identified through the floor of the main portion of the building, the southeastern corner of the property, or along the northern wall of the building.

The main data gaps regarding the horizontal extent of contamination are the extent of soil and groundwater are to the west and south of the subject property. Some limits on determining the horizontal extent of contamination is due to previous drilling only taking place within the property's boundary lines, the steep slopes along the western property boundary, and a landfill being located on the adjacent property to the west.

The main data gap regarding the vertical extent of contamination is the lack of consistent information regarding the groundwater quality and the depth of groundwater impacts.

6.2.1 Extent of Soil Contamination

Previous environmental borings have identified soil contamination from 0 to 30 feet depth near the southwestern corner of the building, along the western access road, and beneath the western portion of the building's southern addition. No soil sampling has been completed below 30 feet; however two soil samples at 30 feet depth meet state cleanup standards.

We recommend that the vertical extent of soil contamination be further delineated through collection of soil samples during the drilling of groundwater wells on the site. We recommend that soil samples be collected at five feet intervals during all monitoring well installations to create a consistent soil contamination profile. Collection of soil samples during drilling of the deeper wells will provide a vertical profile of the contamination. A few soil samples should be analyzed to determine the product characterization (carbon fractionation) of the petroleum product found within the soil for cleanup standard calculations.

Additional soil samples may be needed on the adjacent properties to the south and/or west to delineate the horizontal extent of contamination beyond the site's property boundaries. Approval by adjacent property owners would be needed for off-site sampling and locations would be determined based upon onsite sampling results and accessibility.

6.2.2 Extent of Groundwater Contamination

Groundwater contamination has been identified between 12.5 to 30 feet depth during previous sampling events. The groundwater descriptions, based upon our report review, have been described as perched groundwater within sandy lenses. For example groundwater samples were collected between 18-22 feet in Boring 1 and between 26-30 feet depth in Boring 5 during a 2011 sampling event by Whatcom Environmental. The borings were located only approximately 16 feet apart; however the groundwater depths varied by approximately 8 feet.

The vertical extent of the groundwater contamination will be evaluated through drilling of proposed shallow and deeper groundwater monitoring wells.

To determine the horizontal extent of the groundwater contamination, additional monitoring wells may need to be extended through the adjacent properties to the west and south. Approval by adjacent property owners would be needed for off-site sampling and locations would be determined based upon onsite sampling results and accessibility.

6.3 Development of Cleanup Standards for Soil and Groundwater

Cleanup standards for the Cascade Laundry site have not been developed. Thus far, all environmental studies have utilized the MTCA Method A cleanup standards as a screening tool to identify potential contaminants of concern.

Additional research, sampling and evaluation should be conducted to create proposed cleanup standards for the Cascade Laundry site. Proposed cleanup standards should be reviewed and approved by Ecology. Development of site specific cleanup standards is necessary to define the areas of the site that will require cleanup actions.

Cleanup standards should be developed that are protective of human health and ecological receptors. In addition, the cleanup standards should be developed to protect the most beneficial use of the site.

The following sections describe steps that should be taken to determine appropriate cleanup standards. These steps determine the pathways for potential exposure to contaminants, whether soil, plant and/or wildlife will need to be protected, and an evaluation of cleanup standard options. In addition, the points of compliance at which the cleanup standards must be met need to be determined.

6.3.1 Cleanup Standard Comparison

The Model Toxic Control Act has multiple options for developing cleanup standards: Method A, Method B (standard or modified), or Method C.

Method A cleanup standards have been developed for the most common contaminants for protection of human health. Method A standards are used at sites where relatively few hazardous substances are present and cleanup actions are routine. Terrestrial ecological evaluations must be conducted as part of the Method A process. Protection of ecological receptors may result in more stringent soil cleanup standards than the Method A. Site cleaned up to Method A cleanup standards can be used without further restrictions.

Method B is considered the universal method for determining cleanup standards for all media on a site and is applicable to all sites. Risk assessment equations were developed to calculate Method B cleanup standards using standard default formulas and assumptions. The Method B risk assessments can also be modified using site specific information to develop modified Method B cleanup standards. Method B cleanup standards must be at least as stringent as: a) concentrations developed under state and federal law; b) cause no adverse effects to protection and propagation of aquatic life or terrestrial ecological receptors; c) cause no acute or chronic toxic effects on humans, such that additive health effects do not cause a total excess lifetime cancer risk of one in one hundred thousand (hazard index ≤ 1); d) does not include individual

contaminant standards that pose a lifetime cancer risk of one in one million in humans; and e) eliminates or minimizes potential for food chain contamination for humans. Site cleaned up to Method B cleanup standards can be used without further restrictions.

Development of Method B cleanup standards for petroleum products requires analysis of the soil into equal carbon fractions using VPH/EPH methods. Based upon the presence of petroleum products on the site and potential use of Method B cleanup standards, we recommend that soil samples be collected and analyzed using VPH/EPH methods to determine product composition for use in Ecology's fate and transport models.

Method C cleanup standards are developed for industrial properties. Sites cleanup up to Method C cleanup standards require a restrictive covenant.

Based upon our initial evaluation, the site should utilize Method A or Method B cleanup standards, as it is located within a commercial area of downtown Bellingham and is not considered industrial property needed for Method C. Method A, Method B, cleanup standards protective of ecological receptors, and applicable state and federal laws regarding cleanup standards should be compared for each media. A combination of standards can proposed for final cleanup standards. We recommend that the site's Ecology site manager review the proposed cleanup standards prior to any remedial action to meet these standards.

6.3.2 Conceptual Site Model and Potential Contaminant Pathways

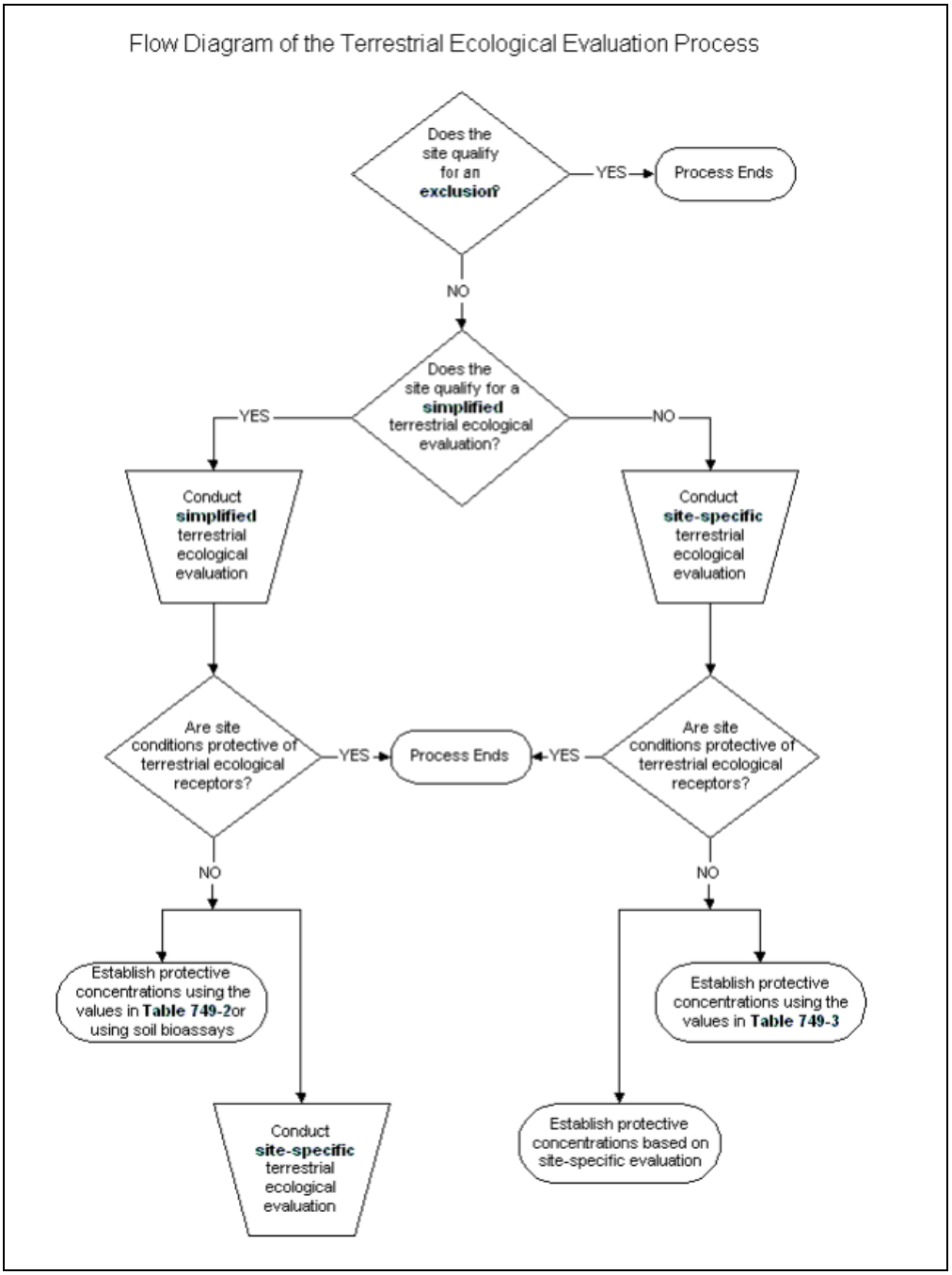
A conceptual site model should be developed using existing site data and information collected during the remedial investigation to determine the potential sources of contaminants, potentially affected media, potential migration pathways, and potential exposure pathways to contaminants for humans and/or ecological receptors. A conceptual site diagram should be developed to provide a visual representation of the contaminant pathways.

The potential contaminant pathways (i.e. direct contact, ingestion, inhalation, leaching) should be defined to develop cleanup standards for all receptors and media.

6.3.3 Terrestrial Ecological Evaluation

A terrestrial ecological evaluation (TEE) is required to be conducted for the Cascade Laundry site as part of the Model Toxic Control Act. The TEE is used to determine if contaminated soil poses a risk to land-based soil biota, plants, and/or wildlife. If a risk is present, cleanup standards for each ecological receptor should be developed.

The TEE should be conducted using the MTCA regulations (WAC 173-340-7490 through 173-340-7494) and guidance documents available through the Department of Ecology website. A diagram of the terrestrial ecological process is provided below.



Department of Ecology
(http://www.ecy.wa.gov/programs/tcp/policies/terrestrial/TEEHome.htm#TEE Flow Diagram)

Our initial evaluation indicates that the site does not qualify for an exclusion from the TEE.

Additional assessment should be conducted to determine if the site requires a simplified TEE or a site specific TEE through consulting with Department of Ecology personnel.

6.3.4 Points of Compliance

Following development of cleanup standards, procedures should be developed to demonstrate compliance with the cleanup standards. Points of compliance are locations where the cleanup standards must be met.

Standard points of compliance for soil and groundwater is throughout the horizontal extent of the site, to depths where the contamination may have reached.

Points of compliance for both soil and groundwater shall be developed during the remedial investigation study. Following sampling and/or cleanup, if the site meets the cleanup standards at the points of compliance, the site can be considered for a "no further action" determination.

6.4 Vapor Intrusion Evaluation

Indoor air quality sampling, conducted within the Cascade Laundry building in October 2014, identified five volatile organic compounds that exceeded the MTCA Method B risk assessment screening levels for indoor air quality (benzene, carbon tetrachloride, TCE, PERC, and chloroform). Based upon these results, these chemicals were identified as potential contaminants of concern; however, the results of the study indicated that the indoor air quality sampling did not separate the potential sources of the contamination such as: outdoor air contamination that has entered the building, an indoor contamination source, and/or contaminated air that has migrated from the contaminated soil via vapor intrusion. Therefore, the source of the indoor air contaminants is inconclusive.

To further evaluate the potential for the indoor air contaminants to be from vapor intrusion, additional evaluation and/or sampling should be conducted.

Initially, the data available for the site should be analyzed using the Johnson Ettinger model. Groundwater data collected through the floor of the building can be modeled to determine if the concentrations pose a risk to indoor air quality. If the data indicates a continued risk of vapor intrusion, sampling will be needed.

The indoor sampling could include sub-slab soil gas sampling or a combined sub-slab, indoor air, and ambient air sampling event.

7.0 PROPOSED PLAN OF ACTION

To complete the aforementioned work plan actions, we recommend the following plan of action.

1. Enter the Cascade Laundry Site into Ecology's Voluntary Cleanup Program, including submittal of the Environmental Baseline and Remedial Action Work Plan documents for review
   Meet with Ecology to discuss site and work plan action items
2. Install shallow and deep groundwater monitoring wells
   a. Collect soil samples at 5 feet depth intervals throughout each well location for analysis of contaminants of concern
      Collect at least two samples for carbon fractionation for Method B cleanup standard modeling
   b. Have monitoring wells surveyed, so that groundwater flow direction can be modeled
   c. Collect depth to groundwater data and groundwater quality samples (1 – 4 sampling events)
3. Compile potential cleanup standards for the site (i.e., terrestrial evaluation, compilation of state and federal laws, Method A standards, and calculate Method B standards using site specific information)
4. Determine if additional off-site soil and groundwater samples are needed
5. Conduct vapor intrusion evaluation
6. Compile remedial investigation/site characterization report

8.0 REMEDIAL INVESTIGATION REPORT

A summary report should be developed that describes the findings of the actions taken during the remedial investigation report. The final report will include a conceptual site model, results of any soil, groundwater and/or air sampling events, and a determination of applicable cleanup standards. The report will include pictures, figures, maps, laboratory reports, calculations and other supporting documentation.

The conclusions of the remedial investigation report, particularly the proposed cleanup standards, will help guide the options for clean up action at the site. Cleanup action options can be presented in a feasibility study that includes an overview of available cleanup technologies and practices, a cost analysis for the cleanup alternatives, and details regarding the proposed cleanup alternatives that would be most cost effective and appropriate for the site.