Aspect
A Geosyntec Company

November 11, 2024

Jack Hebron
Evergreen Treatment Services
1700 Airport Way South
Seattle, Washington

Re: Analysis of Brownfields Cleanup Alternatives – Preliminary Evaluation
Evergreen Treatment Services, 1700 Airport Way South, Seattle, Washington

1 Introduction and Background

This Analysis of Brownfields Cleanup Alternatives (ABCA) was prepared by Aspect Consulting, a Geosyntec Company (Aspect), on behalf of Evergreen Treatment Services (ETS). ETS owns and operates a treatment facility at 1700 Airport Way South in Seattle, Washington. This ABCA fulfils one of the components of pursuit of an United States Environmental Protection Agency (EPA) Brownfields Grant, which ETS is pursuing with the goal of building a new treatment facility.

1.1 Site Location

The Site is located at 1700 Airport Way South in Seattle, Washington (King County tax parcel number 7666-20-2855; herein referred to as the "Site" or "Subject Property"). The Subject Property is shown on Figure 1.

1.2 Forecasted Climate Conditions

Current and projected local and regional climatological characteristics were assessed based on the Washington State Department of Ecology's (Ecology's) Sustainable Remediation guidance (Ecology publication No. 17-09-052). The following sources were reviewed: the 2022 Washington State Climate Summary from the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI), climate projections presented on the Washington State Department of Health (WADOH) Environmental Health Disparities (EHD) Map, and Federal Emergency Management Agency (FEMA) flood maps.

The NOAA NCEI 2022 Washington State Climate Summary (Attachment A) indicates that average near-surface air temperatures in Washington have increased by approximately 2 degrees Fahrenheit (°F) since the beginning of the twentieth century and are projected to continue increasing through the year 2100, resulting in fewer freezing days (maximum daily temperature less than 32°F) and additional hot days (maximum daily temperature greater than 90°F) over time. The projected change in total annual precipitation is uncertain, but changes in seasonal patterns are projected to result in decreasing precipitation during summer and increasing precipitation during winter. Winter snowpack volumes across the state are projected to decrease as precipitation is projected to increasingly fall as rain instead of snow due to increasing average temperatures. These changes in precipitation patterns would decrease water availability during summer and increase the risk of spring flooding. Heavy rainfall events (greater than 2 inches of precipitation in western Washington) are projected to occur with increased frequency, which would increase flood risk relative to historical patterns. Since 1900, global mean sea level has risen by approximately 7–8 inches and is likely to increase an additional 1–4 feet by 2100. Rising sea levels will increase the frequency of tidal floods and seawater incursion on coastal sites.

The WADOH EHD map presents statistics reflecting the projected changes in average temperature and average precipitation for the 30-year period centered around 2050 (2036 to 2065) relative to a historical baseline period (1976 to 2005). The Washington Tracking Network (WTN) Information by Location (IBL) Tool collates data for each census tract in Washington and ranks them from 1 (low) to 10 (high) based on the indicators, themes, and final scores tracked by the WTN. Projected changes in key climate parameters tracked by the WTN for King County Census Track 53033009300, which includes the Subject Property, are summarized below.

Change in Annual Cooling Degree Days	460
Change in Annual Cooling Degree Days IBL Rank:	8
Change in Annual Heating Degree Days	-1241
Change in Annual Heating Degree Days IBL Rank	8
Annual Days Over 99th Percentile Historical Temperature Threshold	27
Annual Days Over 99th Percentile Historical Temperature Threshold IBL Rank	6
Change in Annual Precipitation	0.051266458 inches
Change in Annual Precipitation IBL Rank	9

Relative to the rest of Washington, the Site is projected to experience a moderately high decrease in cool weather, a moderately high increase in hot weather, and a high increase in annual precipitation.

The FEMA Flood Insurance Rate Map (FIRM) depicts areas impacted by flooding at least once every 100 years (1 percent annual chance flood) according to historical data and modeling. The map shows that the Site is in an area of minimal flood hazard. Projected changes in seasonal precipitation patterns may increase the annual chance of flood. A “FIRMette” for the Site is included in Attachment B.

1.3 Previous Environmental Reports

A total of three environmental reports were prepared prior to Evergreen Treatment Services’ (ETS) involvement in the Subject Property (additional environmental studies were completed by ETS, as outlined in Section 1.4). The environmental work in the 1990s and 2000s was completed by Northwest EnviroService Inc (NWES), the prior owner and operator of the Subject Property (more recently known as Emerald Recycling).

1. Northwest EnviroService Inc 1995, Interim Status Closure Plan, Western Blower Property, 1995.

2. Northwest EnviroService Inc, 1996, RCRA Closure Sampling Results, Western Blower Property, 1996.

3. Northwest EnviroService Inc, 2004, RCRA Facility Investigation Report, Revised Final, Northwest EnviroService, Inc., Airport Way South Facility, Seattle, Washington, April 2004.

NWES used the Subject Property for storage; prior to that, it was mostly used by Western Blower, a manufacturer of industrial fans and blower equipment.

From 1987 to 1995, NWES operated a hazardous waste treatment and storage facility that occupied 1.3 acres between Airport Way South and Interstate 5, spanning from South Atlantic Street to the north and South Holgate Street to the south. The main treatment part of this facility occupied the property immediately north of the Subject Property, but it also extended onto and included the Subject Property. NWES operations were regulated by the Ecology under the Resource Conservation and Recovery Act (RCRA).

In 1995, NWES discontinued its hazardous-waste operations and started RCRA closure of the hazardous-waste handling aspect of the facility. Since their use of the Western Blower Property was limited, closure of this portion of the property was conducted separately from the remainder of the property to the north where more hazardous-waste handling (aka oil recycling) activities were focused. The following provides a summary of NWES's use of the Subject Property, as provided in the 1995 and 1996 NWES reports, and closure activities completed in 1995. The Interim Action Closure Plan focuses on the Subject Property.

Little information in the 1995 and 1996 NWES reports provides specifics on site use, or chemical handling or storage. NWES states in the reports that Subject Property use included "administrative and warehouse activities," and that "sealed and containerized wastes were unloaded from trucks at the load/unload dock and transported to the north-adjacent NWES property for processing." A loading dock near the center of the Subject Property building was used for loading and unloading hazardous waste. Containerized waste was then transferred to the north-adjacent parcel, also owned by NWES, for processing. NWES used the Subject Property warehouse space to store pumps, hoses, and other equipment. The north warehouse also had an area for repairing pumps, including a parts washer. The north warehouse is also referred to as the "Stores Building." King County tax assessor records indicate that the southern portion of the south wing of this building included laboratory space for organic and inorganic sample preparation, most likely for waste disposal characterization.

The 1995 Closure Plan stated the following activities were to be completed for site closure:

- Remove waste inventory
- Decontaminate of site concrete, sumps, tanks, and equipment
- Dispose of contaminated materials
- Collect samples to certify completion of closure

The language in the 1995 report does not provide details about specific storage tanks or sumps to be decontaminated on the Subject Property. The 1996 report provides results from the post-closure sample collection that included three concrete samples, two shallow soil samples, and two groundwater samples from wells MW-1 and MW-2. Concrete samples had elevated metals concentrations with cadmium at 200 milligrams/kilogram (mg/kg). The Washington State Model Toxics Control Act (MTCA) cleanup level (CUL) for cadmium for unrestricted site use is 2 mg/kg. Arsenic, total petroleum hydrocarbons (TPH), and benzo(a)pyrene (BaP) were detected in soil samples with only BaP exceeding MTCA Method A CUL at that time of 0.1 mg/kg (the current MTCA Method A cleanup level for BaP is 0.19 mg/kg). Manganese was detected in groundwater at a concentration of 3,400 micrograms/liter (µg/L), which has a drinking water standard of 2,200 µg/L.

In 1997, Ecology provided an opinion that no further action or investigation would be required for site closure (at the Subject Property; Ecology, 2017); however, a restrictive covenant would need to be placed on the property. The restrictive covenant has the following stipulations:

- The property shall be used in compliance with General Industrial 2 zoning classification per City of Seattle ordinances.
- Property groundwater shall not be used for domestic, agricultural, industrial, or any other use.
- Existing structures cannot be altered or modified in any manner that may result in the release or exposure to the environment of contaminated soils or concrete, without prior Ecology approval.
- Existing paved surface must be maintained to prevent the release or exposure to the environment of contaminated soils or concrete. Any activity that would pierce or damage the surface is prohibited, without prior Ecology approval.

These environmental (aka restrictive) covenant requirements will need to be upheld and honored during a transfer of ownership from NWES to ETS.

1.4 Site Assessment Findings

Since 2018, Aspect has provided environmental support for property acquisition, as well as soil, groundwater, and soil gas evaluations and regulatory and future property use advice. Our work is summarized in the following reports:

- Aspect Consulting, LLC (Aspect), 2019a, Phase I Environmental Site Assessment (ESA) Report, 1700 Airport Way S, Seattle, WA, February 19, 2019.
- Aspect Consulting, LLC (Aspect), 2019b, Phase II Environmental Site Assessment Report, 1700 Airport Way South, Seattle, WA, February 11, 2019.
- Aspect Consulting, LLC (Aspect), 2020, Sump Cleanout, Stormwater System Inspection, and Soil Gas Sampling Memorandum - 1700 Airport Way South, Seattle, Washington, September 30, 2020.
- Aspect Consulting, LLC (Aspect), 2021, Phase I Environmental Site Assessment Report, 1700 Airport Way S, Seattle, WA, April 6, 2021.

- Aspect Consulting, a Geosyntec Company (Aspect), 2024, Preconstruction Environmental Actions and Next Steps, 1700 Airport Way South, Seattle, Washington, June 27, 2024.

The recognized environmental concerns (RECs) identified in Aspect's Phase I ESA (Aspect, 2019a) include historical manufacturing operations by Western Blower Company and hazardous and nonhazardous waste handling by NWES, as well as former used-oil waste handling in the northern warehouse of the Subject Property. These property-use activities indicated a potential for petroleum, solvents, and metals contamination to soil and/or groundwater at the Subject Property from on-property potential sources, and a risk for vapor encroachment or intrusion to the Subject Property structures.

Based on the RECs identified in the Phase I ESA, Aspect completed a Phase II ESA (Aspect, 2019b) consisting of soil, groundwater, and soil gas sampling and testing in order to

- evaluate the presence and nature of volatile contaminants of potential concern (COPCs) in soil gas beneath the Subject Property;
- evaluate the potential presence of soil contamination associated with current or past sources of contamination on the Subject Property or nearby adjacent properties; and
- evaluate the potential presence of groundwater contamination associated with current or past sources of contamination on the Subject Property or nearby upgradient properties.

The Phase II ESA included installation of four permanent groundwater monitoring wells (AMW-1 through AMW-4; Figure 2) on and off the Subject Property and completion of four temporary soil gas sampling points. Soil, groundwater, and soil gas samples were collected and submitted for laboratory analysis. Soil observed in the borings included fill material up to a depth of 15 to 19 feet below ground surface (bgs). Fill soils were underlain by a clay to sandy clay unit, representative of historical tideflat deposits. Groundwater was encountered in all four monitoring wells at a depth of 4.5 to 5.7 feet bgs, with a westerly flow direction (Figure 5).

Six soil samples were submitted for analysis based on field observations and relative to identified RECs, including gasoline-, diesel-, and oil-range TPH (using methods NWTPH-Gx, and NWTPH-Dx), and metals (arsenic, cadmium, chromium, copper, lead, manganese, mercury, nickel, and zinc) using EPA Method 6020B. In addition, two samples were submitted for analysis of volatile organic compounds (VOCs) using EPA Method 8260D and carcinogenic polycyclic aromatic hydrocarbons (cPAHs) using EPA Method 8270D/SIM. Contaminants of concern (COCs) either were not detected or were detected at concentrations less than cleanup levels in soil and/or groundwater, except for the following:

- Two analytes were detected in one soil sample above the MTCA Method A cleanup levels. These exceedances were at 12.5 feet bgs at location AMW-1 at concentrations of 27.8 and 4,720 mg/kg for arsenic and lead, respectively. The arsenic value slightly exceeds the CUL of 20 mg/kg, while lead was greater than the CUL of 250 mg/kg (Figure 3).
- Vinyl chloride was detected in groundwater at a concentration of 2.9 µg/L in off-property well AMW-1, exceeding the MTCA Method A CUL. Dissolved arsenic concentrations above the MTCA Method A CUL (5 µg/L) were detected in off-property wells AMW-1 and AMW-3 at concentrations ranging between 11 and 20.3 µg/L, respectively (Figure 4).

Four temporary subslab soil gas samples (SV-1 through SV-4; Figure 6) were collected and submitted for analysis of VOCs. Based on the chemical analytical soil gas results, and vapor intrusion modeling using the Johnson-Ettinger Model for vapor intrusion (JEM), vinyl chloride was predicated to possibly exceed the MTCA Method B CUL in indoor air of the north warehouse. Draft Ecology guidance related to trichloroethene (TCE) vapor intrusion screening was also referenced in the Phase II ESA report (Aspect, 2019b), and TCE was also considered a potential chemical that could intrude into the north warehouse building at levels exceeding screening levels. The model did not predict exceedances of contaminants in the south warehouse. Aspect recommended that the sump in the north warehouse (the suspected source of solvents) be cleaned, following which soil gas be resampled in the north wing of the building. The Phase II ESA recommendations also indicated that if "concentrations remain elevated in soil gas, mitigation measures may be necessary (such as active and/or passive venting systems) for that portion of the building to be occupied."

In 2020, the basement sump in the north warehouse, and on-site stormwater system (five catch basins around the Subject Property), were cleaned (Aspect, 2021). After the sump and stormwater systems were cleaned, two subslab soil gas samples were collected and analyzed for VOCs and air-phase petroleum hydrocarbons. Based on the chemical analytical soil gas results, the following contaminants were detected at concentrations greater than the MTCA Method B screening levels (adjusted to commercial exposure): benzene, TPH, TCE, and vinyl chloride.

1.5 Project Goal

ETS has operated at 1700 Airport Way South since 1997 when the organization was relocated to make way for the construction of Safeco Field (now known as T-Mobile Park). While ETS has persevered at this location for over 25 years, the building remains plagued by structural limitations and deficiencies that create challenges to delivering high quality healthcare and retaining the requisite workforce to deliver on the organization's mission to transform the lives of individuals and their communities through innovative and effective addiction and social services. Originally built as a manufacturing plant to make furnace blowers in 1914, the heavy timber building has never been suitable to address the health care needs of a mostly elderly ETS patient population, of which approximately 25 percent have an identified physical or cognitive disability and 40 percent are unstably housed. The layout of the building is fragmented with tight labyrinth-like hallways and steep stairs, which are not conducive for a disabled and aging patient base. There is not a safe patient drop-off and pickup area, leading to drivers frequently parking on the sidewalk. The property lacks adequate parking for staff as well, which creates safety concerns given the site opens for services at 5 a.m., 6 days per week.

In January 2024, the site suffered catastrophic flood damage leaving large sections of the building unsafe for staff and patients. Work has shifted to one of the warehouses on site, but all patient-related services have shifted to other ETS locations.

The Site redevelopment plan involves demolishing the current structures and building new structures into an integrated behavioral health and wellness center for the treatment of opioid use disorder specializing in low-barrier, whole-person care.

Once complete, ETS will serve more individuals in an intentionally designed, environmentally sustainable, healing-centered clinic space that incorporates and reflects the voices of subject matter experts—including individuals with lived experience. The expansion of site services will also further support the legacy role of ETS as a founding member of the Pacific Northwest node of the clinical trials network of the National Institute of Drug Abuse.

2 Applicable Regulations and Cleanup Standards

2.1 Cleanup Oversight Responsibility

Cleanup of the Subject Property will be overseen by Ecology under its Expedited Voluntary Cleanup Program (EVCP). The EVCP process is designed to encourage cleanup and redevelopment, and EVCP projects must meet the same cleanup standards as any cleanup project in Washington.

The Subject Property is in the process of entering into the EVCP.

2.2 Cleanup Standards for Major Contaminants

Cleanup actions conducted in accordance with MTCA must comply with cleanup standards for identified COCs and affected media, as well as applicable regulatory requirements based on federal and state laws (Washington Administrative Code [WAC] 173-340-710). Cleanup standards for the Site included establishing CULs and the points of compliance at which those CULs will be attained in soil, groundwater, and air.

Recommended CULs for affected media at the Site are:

- **Soil:** MTCA Method A CULs for unrestricted use
- **Groundwater:** MTCA Method A CULs for protection of drinking water as a beneficial use
- **Soil Gas:** Soil Gas screening levels based on MTCA Method B indoor air CULs

2.3 Laws & Regulations Applicable to the Cleanup

The most applicable or relevant and appropriate requirement (ARAR) for the Site is Ecology's MTCA cleanup levels and regulations that address the implementation of a cleanup under MTCA (Chapter 173.105D Revised Code of Washington [RCW]; Chapter 173-340 WAC). Other potential ARARs include:

- Federal Clean Water Act (33 USC 1251)
- Federal Water Quality Standards (40 Code of Federal Regulations [CFR] Part 131)
- Federal Small Business Liability Relief and Brownfields Revitalization Act (115 Stat. 2356)
- Federal Davis-Bacon Act (ch. 411, 46 Stat. 1494)
- Occupational Safety and Health Act (OSHA; 29 CFR Subpart 1910.120)
- Water Pollution Control (Chapter 90.48 RCW)

- Water Resources Act of 1971 (Chapter 90.54 RCW)
- Water Quality Standards for Surface Waters of the State of Washington (Chapter 178-201A WAC)
- Hazardous Waste Management (Chapter 70.105 RCW)
- Dangerous Waste Regulations (Chapter 173-303 WAC)
- Solid Waste Management Reduction and Recycling (Chapter 70.95 RCW)
- Washington Industrial Safety and Health Act (Chapter 49.17 RCW)
- Archaeological Sites and Resources (Chapter 27.53 RCW)
- Washington Clean Air Act (Chapter 70.94 RCW)
- State Environmental Policy Act (SEPA; Chapter 43.21C RCW, Chapter 173-802 WAC, and Chapter 197-11 WAC)
- Minimum Standards for Construction and Maintenance of Wells (Chapter 173-160 WAC)
- Puget Sound Clean Air Agency (PSCAA) Regulations (http://www.pscleanair.org)

In addition, all appropriate permits (e.g., notify before you dig, soil transport/disposal manifests) will be obtained prior to the work commencing.

3 Cleanup Alternatives

3.1 Cleanup Alternatives Considered

To address contamination at the Subject Property, four different alternatives were considered:

- Alternative #1: No Action, Monitoring Only
- Alternative #2: Minimal Action, Sump Removal and Monitoring, At Grade Development
- Alternative #3: Shallow Excavation and Capping, Partial Subgrade Development
- Alternative #4: Deep Excavation and Capping, Full Subgrade Development

3.1.1 Alternative #1: No Action, Monitoring Only

Alternative #1 would include no actions to remediate or mitigate impacts on environmental media on the Subject Property. Groundwater and vapor intrusion conditions would be monitored during twice-annual monitoring events. If redevelopment occurs, vapor intrusion issues would be managed with new HVAC systems.

3.1.2 Alternative #2: Minimal Action, Sump Removal and Monitoring, At Grade Development

Alternative #2 would include the demolition of the sump, removal and off-site disposal of shallow contaminated soil in the immediate vicinity of the sump, monitoring of the natural attenuation of contaminant concentrations in groundwater. A chemical vapor barrier would be constructed at-grade beneath new structures, with the buildings and hardscapes acting as a cap above contaminated media. Groundwater monitoring would occur during twice-annual monitoring events for 10 years.

3.1.3 Alternative #3: Shallow Excavation and Capping, Partial Subgrade Development

Alternative #3 would include demolition of the sump, removal and off-site disposal of contaminated shallow soil in accessible areas in the vicinity of the sump, and regrading the Site to support redevelopment with one or more partially below-grade structures. A chemical vapor barrier would be constructed beneath new structures, with the buildings and hardscapes acting as a cap above contaminated media (if any remains after remedial excavation). Contaminated groundwater would be treated via application of chemical oxidizers and/or in situ bioremediation techniques, and contaminant concentrations in groundwater would be monitored for 1 to 5 years.

3.1.4 Alternative #4: Deep Excavation and Capping, Full Subgrade Development

Alternative #4 would include demolition of the sump, removal and off-site disposal of contaminated soil in the vicinity of the sump and throughout the Subject Property (as needed) down to a depth of 12 feet below street grade, and installation of sheet piles along the boundary of the Site to support construction of one level of underground parking beneath one or more structures on the Site during redevelopment. This alternative would allow management of the shallow aquifer on the Site because of the impermeable basement structure featuring chemical and hydraulic barriers. As a result, no chemical vapor barrier would be necessary. It is assumed that all contaminated soil would be removed in this scenario. But even if not, the new structures and hardscapes would serve as a cap separating remnant contaminated media from site occupants.

3.2 Evaluation of Cleanup Alternatives

3.2.1 Effectiveness

Alternative #1: No Action, Monitoring Only is not effective in controlling or preventing the exposure of receptors to contamination at the Site.

Alternative #2: Minimal Action, Sump Removal and Monitoring, At Grade Development, would be somewhat effective in reducing exposure of receptors to contamination at the Site, and inclusion of a chemical vapor barrier is an effective method to prevent intrusion of contaminated soil gas into indoor air. However, natural attenuation of contamination in groundwater may not be effective at reducing contaminant concentrations in groundwater on a reasonable timescale as required by MTCA.

Alternative #3: Shallow Excavation and Capping, Partial Subgrade Development, would remove most, if not all, of the contaminated soil on the Site, effectively eliminating the soil direct contact pathway for Site receptors. Capping is an effective way to prevent Site receptors from coming into direct contact with potential remnant contaminated soils or contaminated groundwater, and inclusion of a chemical vapor barrier is an effective method to prevent intrusion of contaminated soil gas into indoor air. Application of groundwater treatment technologies would effectively restore groundwater quality on a reasonable timescale.

Alternative #4: Deep Excavation and Capping, Full Subgrade Development would remove most, if not all, of the contaminated soil on the Site, effectively eliminating the soil direct contact pathway for Site receptors. Deep excavation would also include removal of contaminated groundwater to dewater the Site, significantly accelerating restoration of groundwater quality on the Site via physical removal of the contaminated aquifer. Finally, capping is an effective way to prevent Site receptors from coming into direct contact with remnant contaminated soil or groundwater, and the sheet pile and waterproofed slab would act as a chemical vapor barrier managing the potential of soil gas into indoor air. This alternative would be the most effective alternative under consideration.

General Climate Consideration Notes

Increased annual variation in precipitation patterns may result in increased annual variability in Site groundwater elevations; however, this is not expected to significantly impact the efficacy of the cleanup alternatives under consideration.

3.2.2 Implementability

Alternative #1: No Action, Monitoring Only is highly implementable as no cleanup actions would be conducted and new groundwater and/or subslab soil gas monitoring points would be installed following redevelopment.

Alternative #2: Minimal Action, Sump Removal and Monitoring, At Grade Development is highly implementable assuming demolition of the north warehouse occurs in preparation for redevelopment.

Alternative #3: Shallow Excavation and Capping, Partial Subgrade Development is highly implementable assuming property redevelopment occurs, as excavation and regrading would be necessary for redevelopment.

Alternative #4: Deep Excavation and Capping, Full Subgrade Development is difficult to implement unless the underground parking scenario is planned for redevelopment. Installation of sheet piles and excavation of deep soils would require assessment of potential upwelling of groundwater from below sheet pile walls, and installation of shoring/sheet piles would require geotechnical assessment for feasibility.

3.2.3 Cost

Rough Order of Magnitude costs are outlined in Table 1 and summarized below:

- Alternative #1: No Action, Monitoring Only is estimated to cost approximately $400,000 over the course of 10 years.
- Alternative #2: Minimal Action, Sump Removal and Monitoring, At Grade Development is estimated to cost approximately $800,000, assuming the sump removal and a subslab chemical vapor barrier are completed during redevelopment of the Site, and monitoring of soil and soil vapor conditions occurs twice-annually for 10 years.
- Alternative #3: Shallow Excavation and Capping, Partial Subgrade Development is estimated to cost approximately $1,300,000, assuming the alternative is completed during

redevelopment of the Site, and designs for new structures on the Site include chemical vapor barriers.

- Alternative #4: Deep Excavation and Capping, Full Subgrade Development is estimated to cost approximately $2,400,000, assuming the alternative is completed during redevelopment of the Site, and designs for new structures on the Site include chemical vapor barriers.

3.3 Recommended Cleanup Alternative

The recommended cleanup alternative is Alternative #4: Deep Excavation and Capping, Full Subgrade Development, as it is the most effective alternative under consideration, and contributes the most to the Project Goal as defined in Section 1.5.

Alternative #1, No Action, Monitoring Only, cannot be recommended because it does not address site risks (long-term groundwater contamination and vapor intrusion potential).

Alternative #2, Minimal Action, Sump Removal and Monitoring, At Grade Development, cannot be recommended because it does not address site risks on a reasonable restoration timeline as required by MTCA.

Alternative #3, Shallow Excavation and Capping, Partial Subgrade Development, is less expensive than Alternative #4 as it requires less excavation and fewer risks associated with the installation of sheet pile shoring walls, but it would not be as effective as Alternative #4 in removing contaminated media from the Site.

3.3.1 Green and Sustainable Remediation Measures for Selected Alternative

Several techniques are planned to make the selected alternative more sustainable. The most recent Best Management Practices (BMPs) issued under ASTM International (ASTM) Standard E-2893: Standard Guide for Greener Cleanups will be used as a reference in this effort. ETS will require the cleanup contractor to follow an idle-reduction policy and use heavy equipment with advanced emissions controls operated on ultra-low sulfur diesel. The number of mobilizations to the Site would be minimized, and erosion control measures would be used to minimize runoff into environmentally sensitive areas. In addition, ETS plans to ask bidding cleanup contractors to propose additional green remediation techniques in their response to the Request for Proposals for the cleanup contract.

Limitations

Work for this project was performed for the Evergreen Treatment Services (Client), and this letter was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This letter does not represent a legal opinion. No other warranty, expressed or implied, is made.

All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect Consulting. Aspect Consulting's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

Sincerely,

Aspect consulting

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Attachments: Table 1– Cleanup Alternatives - Rough Order of Magnitude (ROM) Cost Summary

Figure 1 – Subject Property Location Map
Figure 2 – Subject Property Plan
Figure 3 – Summary of Soil Chemical Analytical Results
Figure 4 – Summary of Groundwater Chemical Analytical Results
Figure 5 – Summary of Groundwater Elevations, December 2018
Figure 6 – Summary of Soil Gas Chemical Analytical Results

Attachment A – NOAA NCEI 2022 Washington State Climate Summary
Attachment B – FEMA FIRMette

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TABLE

Table 1. Cleanup Alternatives - Rough Order of Magnitude (ROM) Cost Summary

Project No. AS180043, 1700 Airport Way S, Seattle, Washington

Cleanup Element	Alternative #1: No Action, Monitoring Only		Alternative #2: Minimal Action, Sump Removal and Monitoring, At Grade Development		Alternative #3: Shallow Excavation and Capping, Partial Subgrade Development		Alternative #4: Deep Excavation and Capping, Full Subgrade Development	
	Cost	Notes	Cost	Notes	Cost	Notes	Cost	Notes
Site Preparation	$ -	None.	$ 60,000	Sump removal and slab demolition.	$ -	None; demolition included in assumed site redevelopment.	$ 1,578,120	Installation of sheet pile wall around north half of Site with contaminated soils and setup/operation of dewatering treatment equipment. Demolition included in assumed site redevelopment.
Impacted and Contaminated Soil Excavation	$ -	None.	$ 75,360	Contaminated soil around sump only.	$ 585,060	Impacted soil from shallow excavation, contaminated soil from vicinity of sump to approximately 6 feet below street grade.	$ 697,770	Impacted soil from deep excavation, contaminated soil from vicinity of sump to bottom of excavation approximately 12 feet below street grade.
Groundwater Treatment	$ -	None.	$ -	None.	$ 88,800	Application of groundwater treatment product either at base of excavation or via direct injection.	$ -	None.
Vapor Intrusion Mitigation	$ -	None.	$ 259,800	Chemical vapor barrier installed beneath building slab.	$ 303,000	Chemical vapor barrier installed along base and shallow sidewalls of redevelopment.	$ -	None.
Environmental Monitoring	$ 384,000	10 years of semi-annual groundwater and soil vapor monitoring.	$ 336,000	10 years of semi-annual groundwater monitoring.	$ 259,200	2 years of quarterly groundwater monitoring followed by 3 years of semi-annual monitoring.	$ 72,000	1 year of quarterly groundwater monitoring.
TOTAL	$ 384,000		$ 731,160		$ 1,236,060		$ 2,347,890	
ROM ESTIMATE (Rounded up to nearest $100,000)	**$ 400,000**		**$ 800,000**		**$ 1,300,000**		**$ 2,400,000**	

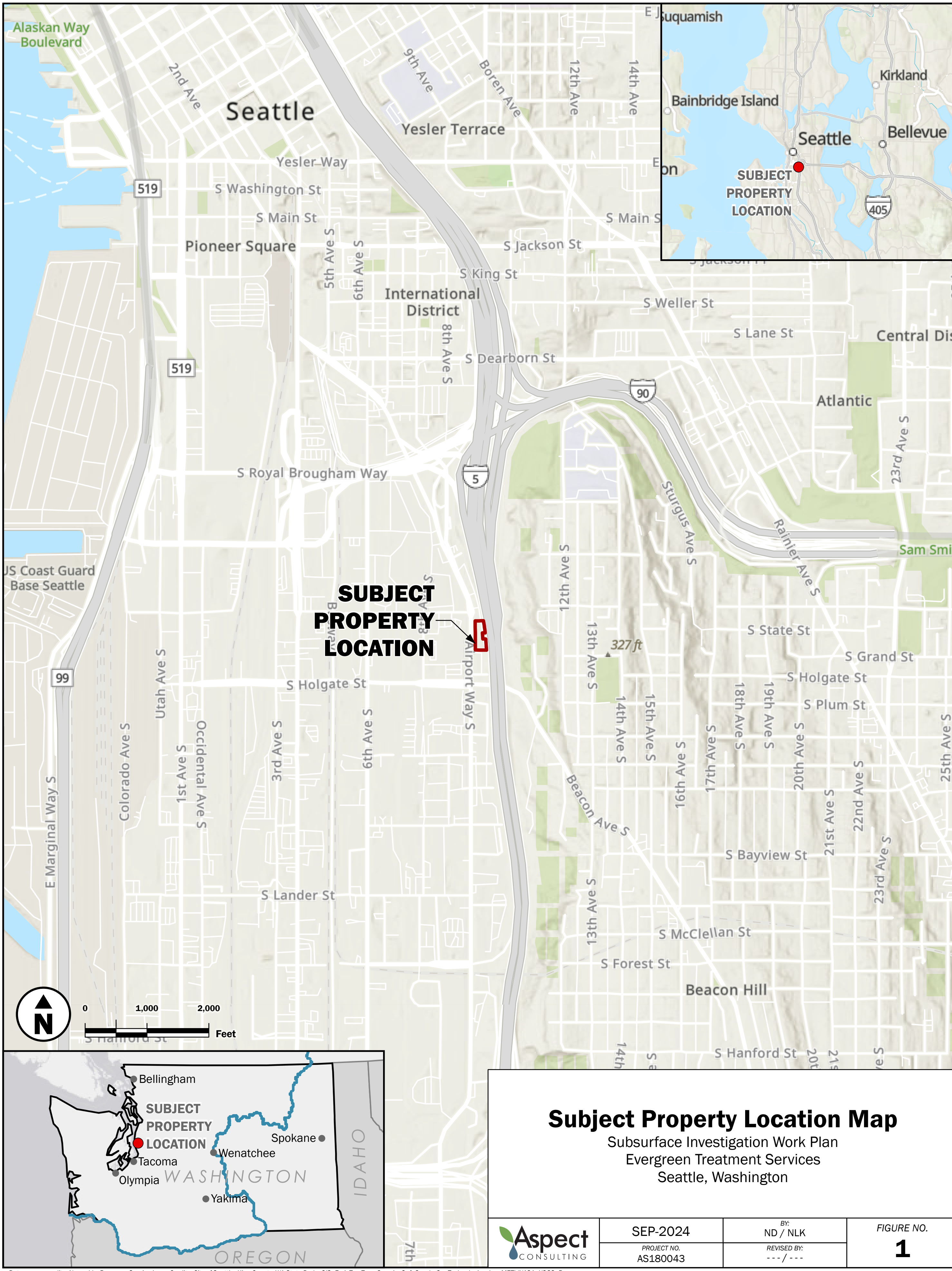
Notes and Definitions

ROM = Rough Order of Magnitude

Costs in this Table represent a Rough Order of Magnitude (ROM) remedial cost estimate presenting environmental costs for high-level project planning purposes only. All unit costs are based on Aspect's recent project experience in this area. Unit costs are not based on contract or vendor bids and need to be vetted by the general contractor.

LIMITATIONS--Work for this project was performed for Evergreen Treatment Services (Client) and this cost estimate was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This cost estimate does not represent a legal opinion. No other warranty, expressed or implied, is made. All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect Consulting. Aspect Consulting's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

FIGURES

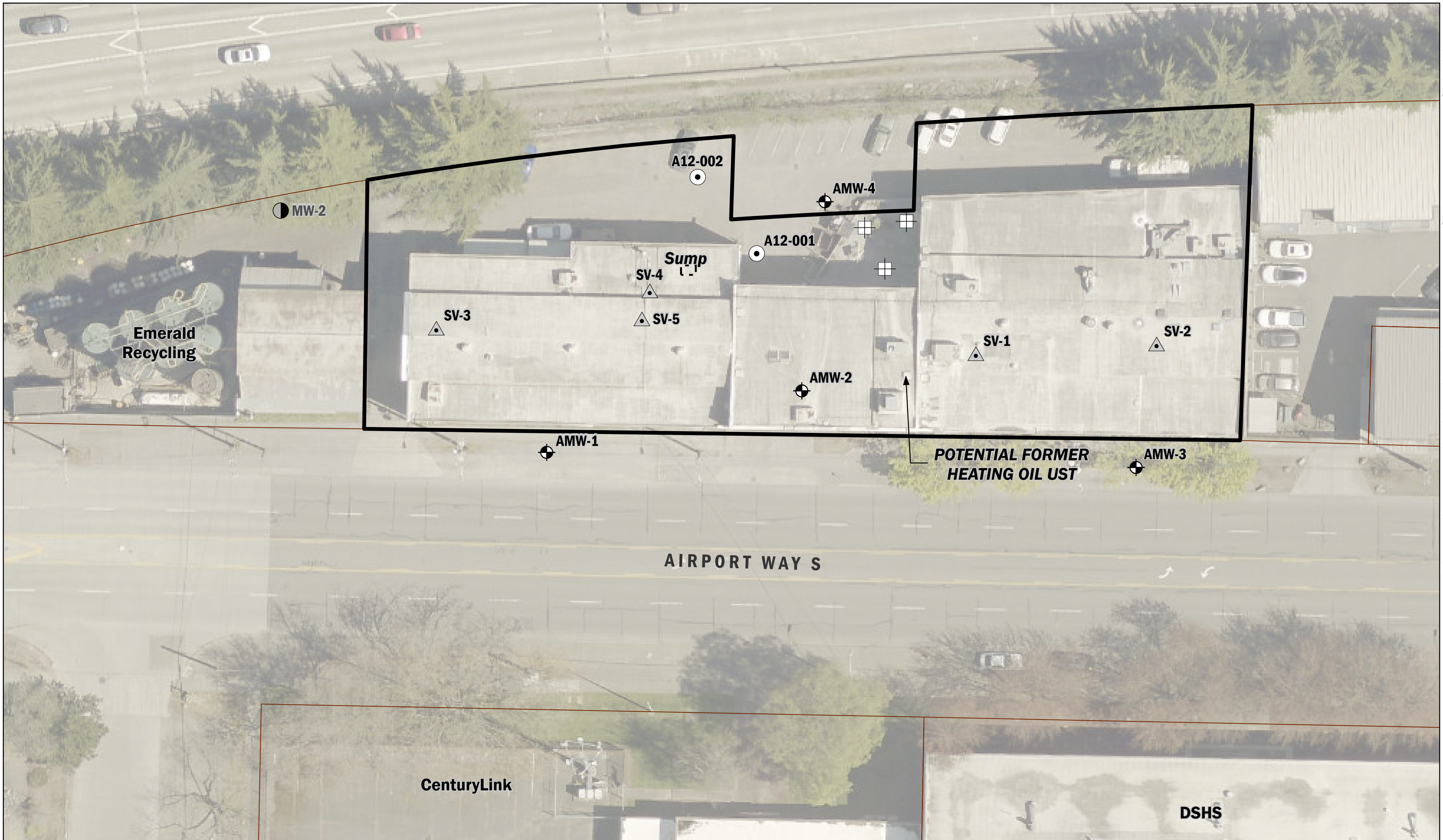


Subject Property Location Map

Subsurface Investigation Work Plan
Evergreen Treatment Services
Seattle, Washington

Aspect CONSULTING	SEP-2024	BY: ND / NLK	FIGURE NO.
	PROJECT NO. AS180043	REVISED BY: - - - / - - -	1

Data source credits: None || Basemap Service Layer Credits: City of Seattle, King County, WA State Parks GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA, USFWS, Esri, NASA, NGA, USGS, Esri, NASA, NGA, USGS, FEMA, City of Seattle, King County, WA State Parks GIS, Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USFWS, Esri, HERE, Garmin, USGS, EPA, NPS



Soil Gas Sample Location (Aspect, 2018-2020)

Concrete Sample Location (NWES, 1995)

Shallow Soil Sample Location (NWES, 1995)

Groundwater Monitoring Well Location (Aspect, 2018)

Damaged Monitoring Well

Sump

Subject Property

King County Tax Parcel

N

0 25 50 Feet

Notes: MW-2 was reported to be damaged in 2010 groundwater monitoring report (AECOM, 2010).

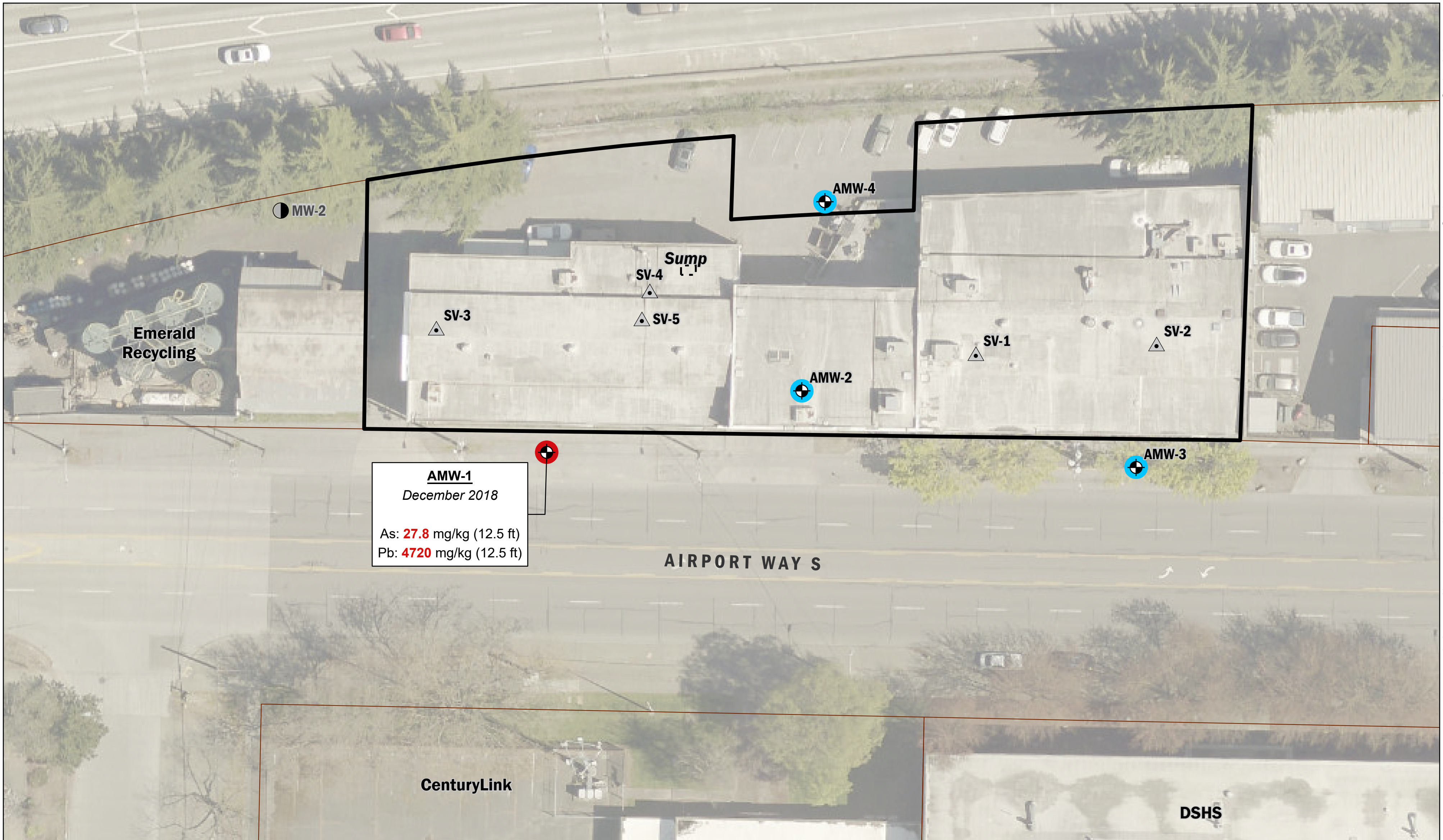
Subject Property Plan

Subsurface Investigation Work Plan
Evergreen Treatment Services
Seattle, Washington

Aspect CONSULTING

SEP-2024	BY: ND / NLK	FIGURE NO. 2
PROJECT NO. AS180043	REVISED BY: - - - / - - -	

Data source credits: DLC / EAC / SCC || Basemap Service Layer Credits: EagleView Technologies, Inc.



Soil Gas Sample Location (Aspect, 2018-2020)
Groundwater Monitoring Well Location (Aspect, 2018)
Damaged Monitoring Well
One or More Analytes Exceed Screening Level
One or More Analytes Detected, No Screening Level Exceedance
No Analytes Detected

Sump
Subject Property
King County Tax Parcel

N

0 25 50 Feet

Notes: MW-2 was reported to be damaged in 2010 groundwater monitoring report (AECOM, 2010). Only analytical results which exceed the screening level are displayed.

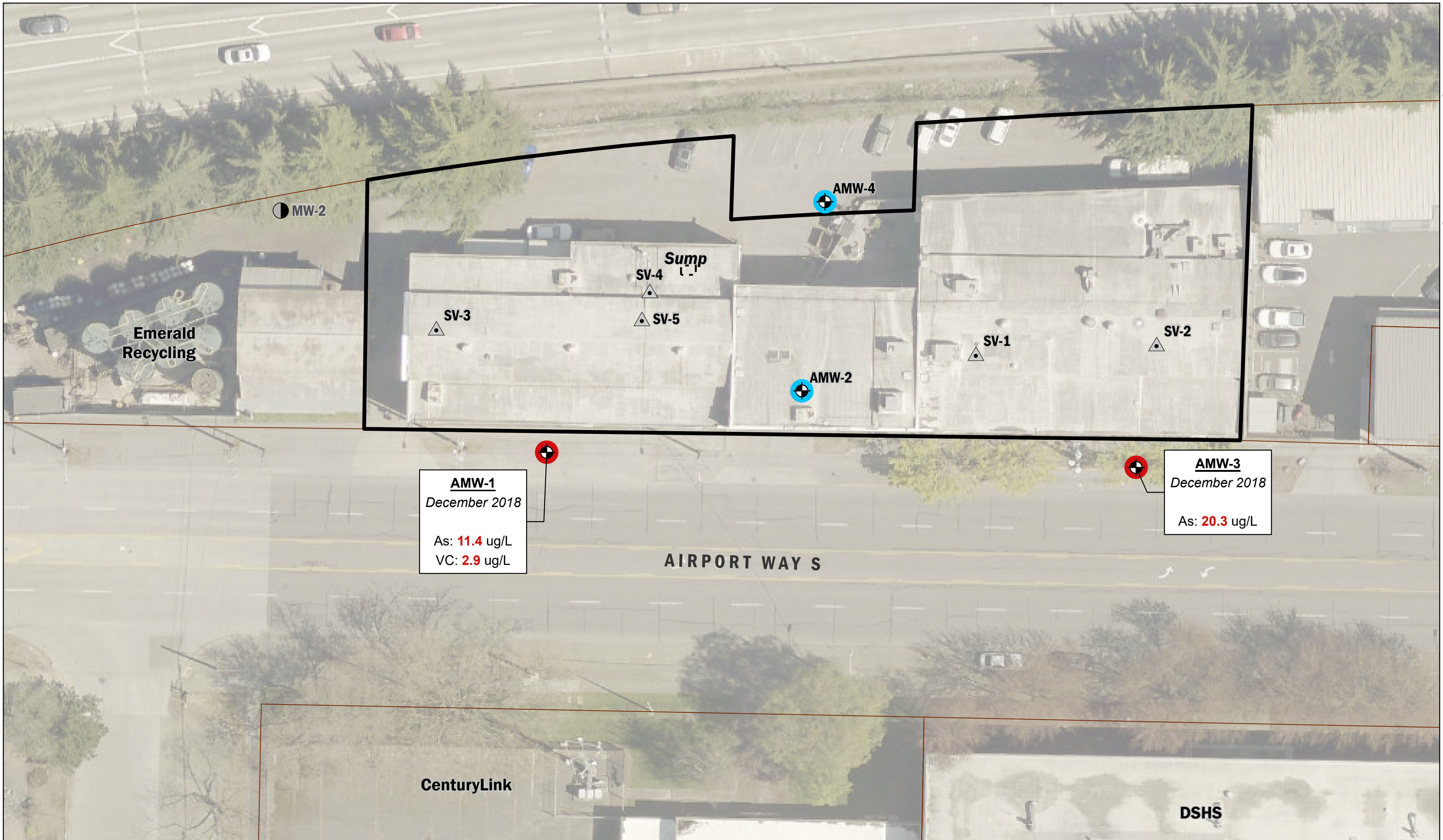
Summary of Soil Chemical Analytical Results

Subsurface Investigation Work Plan
Evergreen Treatment Services
Seattle, Washington

Aspect CONSULTING	SEP-2024	BY: ND / NLK	FIGURE NO. 3
	PROJECT NO. AS180043	REVISED BY: --- / ---	

GIS Path: G:\projects\EvergreenTreatmentServices_180043\EvergreenTreatmentServices_AS180043.aprx: 03 Summary of Soil Chemical Analytical Results || User: Nora.Kochie || Print Date: 9/26/2024

Data source credits: DLC / EAC / SCC || Basemap Service Layer Credits: EagleView Technologies, Inc.



GIS Path: G:\projects\EvergreenTreatmentServices_180043\EvergreenTreatmentServices_AS180043.aprx: 04 Summary of Groundwater Chemical Analytical Results || User: Nora.Kochie || Print Date: 9/26/2024

- Soil Gas Sample Location (Aspect, 2018-2020)
- Groundwater Monitoring Well Location (Aspect, 2018)
- Damaged Monitoring Well
- One or More Analytes Exceed Screening Level
- One or More Analytes Detected, No Screening Level Exceedance
- No Analytes Detected
- Sump
- Subject Property
- King County Tax Parcel

N

0 25 50 Feet

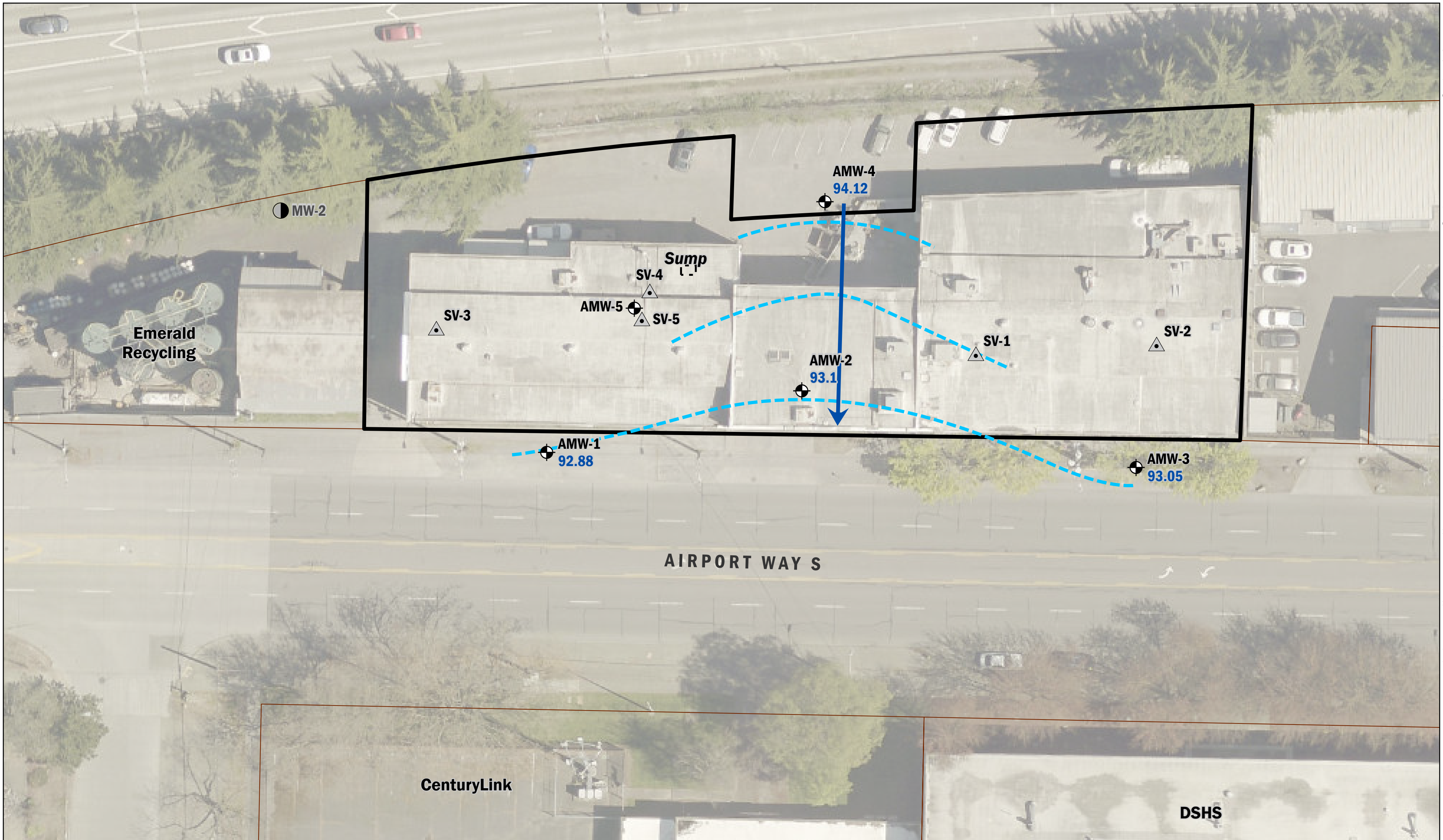
Notes: MW-2 was reported to be damaged in 2010 groundwater monitoring report (AECOM, 2010). Only analytical results which exceed the screening level are displayed.

Summary of Groundwater Chemical Analytical Results

Subsurface Investigation Work Plan
Evergreen Treatment Services
Seattle, Washington

Aspect CONSULTING	SEP-2024	BY: ND / NLK	FIGURE NO. 4
	PROJECT NO. AS180043	REVISED BY: - - - / - - -	

Data source credits: DLC / EAC / SCC || Basemap Service Layer Credits: EagleView Technologies, Inc.



Soil Gas Sample Location (Aspect, 2018-2020)

Groundwater Monitoring Well Location (Aspect, 2018)

Damaged Monitoring Well

Groundwater Contour Line

Groundwater Flow Direction

Sump

Subject Property

King County Tax Parcel

AMW-2 ← Exploration Number
93.1 ← Groundwater Elevation (ft)

N

0 25 50 Feet

Note: MW-2 was reported to be damaged in 2010 groundwater monitoring report (AECOM, 2010).

Summary of Groundwater Elevations, December 2018

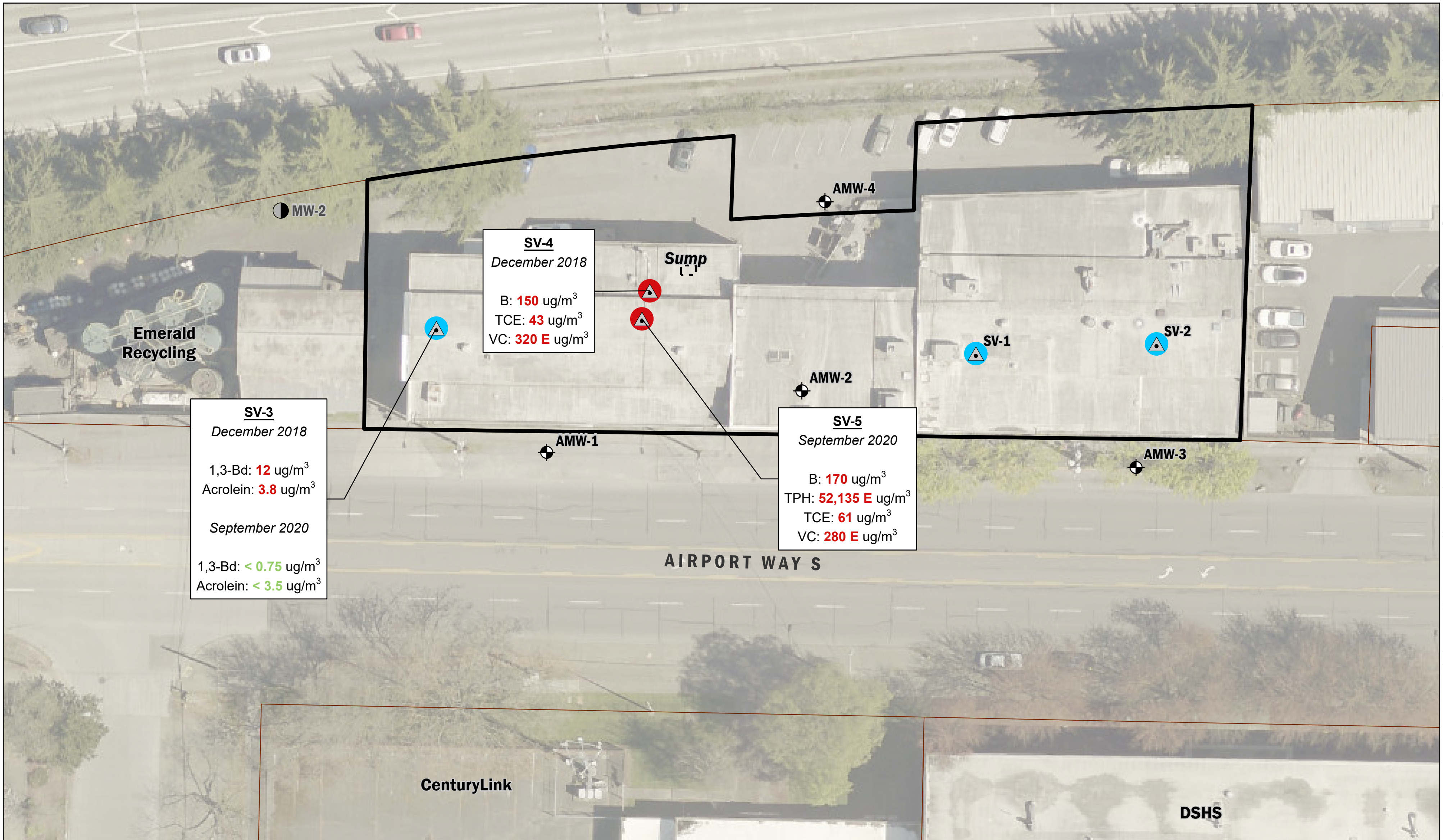
Subsurface Investigation Work Plan
Evergreen Treatment Services
Seattle, Washington

Aspect CONSULTING

SEP-2024	BY: ND / NLK	FIGURE NO. 5
PROJECT NO. AS180043	REVISED BY: - - - / - - -	

Data source credits: DLC / EAC / SCC || Basemap Service Layer Credits: EagleView Technologies, Inc.

GIS Path: G:\projects\EvergreenTreatmentServices_180043\EvergreenTreatmentServices_AS180043.aprx: 05 Summary of Groundwater Elevations - Dec 2018 || User: Nora.Kochie || Print Date: 9/26/2024



- Soil Gas Sample Location (Aspect, 2018-2020)
- Groundwater Monitoring Well Location (Aspect, 2018)
- Damaged Monitoring Well
- One or More Analytes Exceed Screening Level
- One or More Analytes Detected, No Screening Level Exceedance
- No Analytes Detected
- Sump
- Subject Property
- King County Tax Parcel

Notes:
- B: Benzene
- TPH: Total Petroleum Hydrocarbons
- TCE: Trichloroethene
- VC: Vinyl Chloride
- 1,3-Bd: 1,3-Butadiene

N

0 25 50 Feet

Summary of Soil Gas Chemical Analytical Results

Subsurface Investigation Work Plan
Evergreen Treatment Services
Seattle, Washington

Aspect CONSULTING

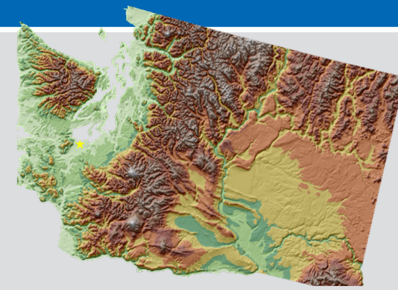
SEP-2024	BY: ND / NLK	FIGURE NO.	
PROJECT NO. AS180043	REVISED BY: - - - / - - -	6	

Data source credits: DLC / EAC / SCC || Basemap Service Layer Credits: EagleView Technologies, Inc.

GIS Path: G:\projects\EvergreenTreatmentServices_180043\EvergreenTreatmentServices_AS180043.aprx: 06 Summary of Soil Gas Chemical Analytical Results || User: Nora.Kochie || Print Date: 9/26/2024

ATTACHMENT A

NOAA NCEI 2022 Washington State Climate Summary



WASHINGTON

Key Messages

Temperatures in Washington have risen almost 2°F since the beginning of the 20th century. Winter warming has been evident in the below average number of freezing days and very cold nights since 1990. Under a higher emissions pathway, historically unprecedented warming is projected to continue through this century.

Rising temperatures will lead to earlier melting of the snowpack, which plays a critical role in spring and summer water supplies. The combination of this earlier melting and more precipitation falling as rain instead of snow may lead to an increase in springtime flooding.

Wildfires during the dry summer months are a particular concern for Washington, and the frequency and severity of wildfires are projected to increase.

Washington's location in the heart of the middle latitudes exposes it to frequent storm systems associated with the mid-latitude jet stream. Due to the physical barrier of the Cascade Mountains, the climate differs greatly in the western and eastern parts of the state. The Pacific Ocean provides abundant moisture, causing frequent precipitation west of the Cascade Mountains, with some locations experiencing orographic enhancement (the increase of rainfall with elevation on the upwind side of mountain ranges). The region east of the Cascades receives less precipitation due to the reduced availability of ocean moisture. Temperatures in the central and eastern portions of the state are not as strongly moderated by the ocean and exhibit a greater annual range than those in the western portion.

Since the beginning of the 20th century, temperatures in Washington have risen almost 2°F (Figure 1)**, and since 1986, all but 5 years have been above the long-term (1895–2020) average.** The hottest year on record was 2015, with a statewide average temperature of 50.0°F, which was 3.7°F above the long-term average. The overall warming trend is evident in an increased number of warm nights. Since 1990, the numbers of very cold nights in Eastern Washington and freezing days in Western Washington have both been below average (Figure 2a). However, the numbers of very warm nights in Eastern Washington and warm nights in Western Washington have both been above average since 1990 (Figure 3). The numbers of very hot days in Eastern Washington and hot days in Western Washington have been quite variable but were both generally above average during the 2015–2020 period, after below average numbers during the 2010–2014 period (Figure 2b).

Observed and Projected Temperature Change

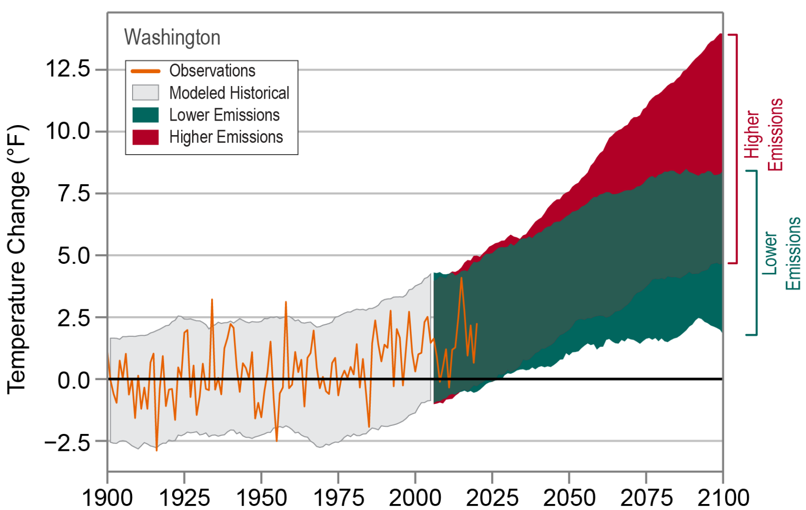
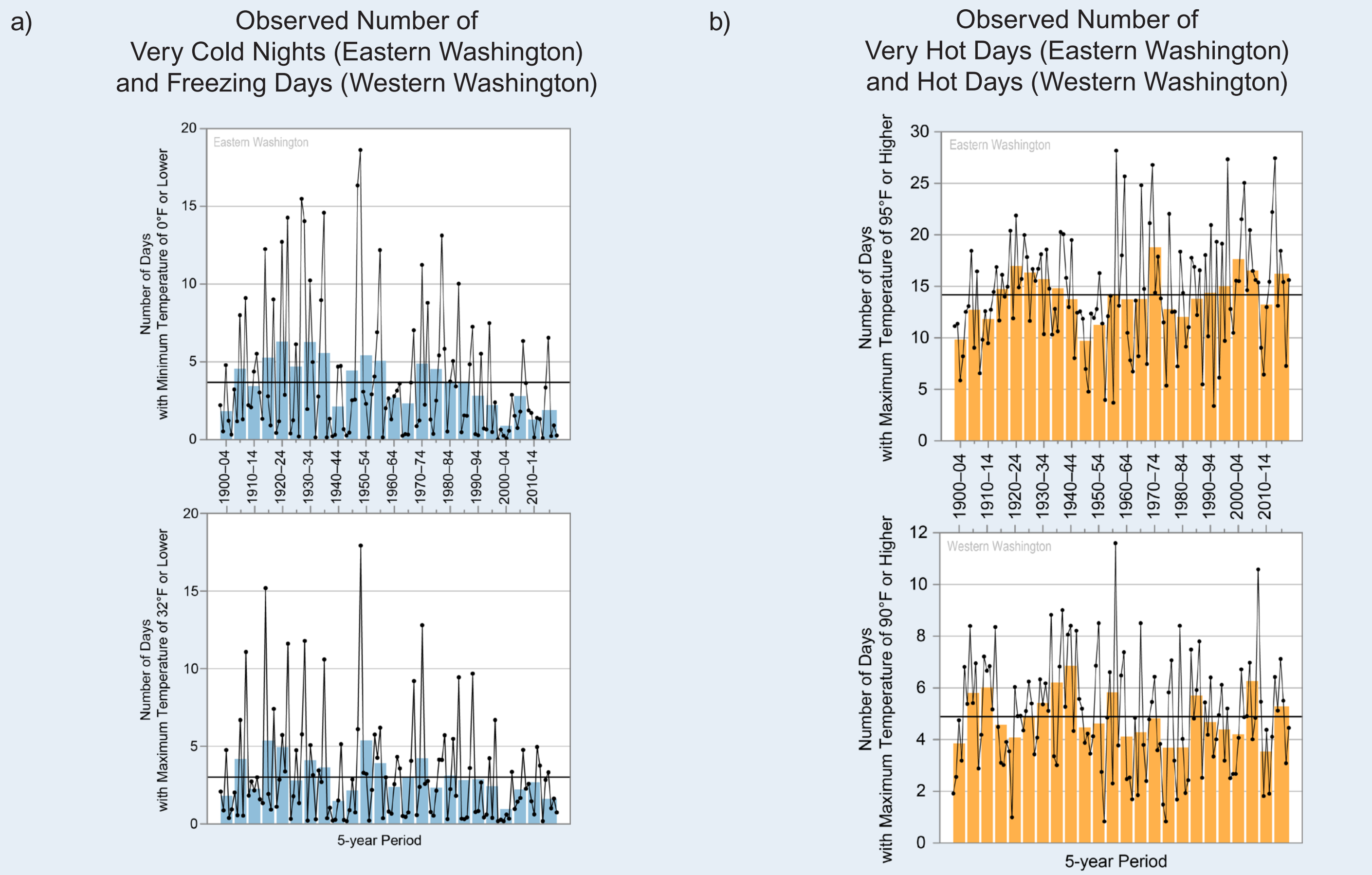
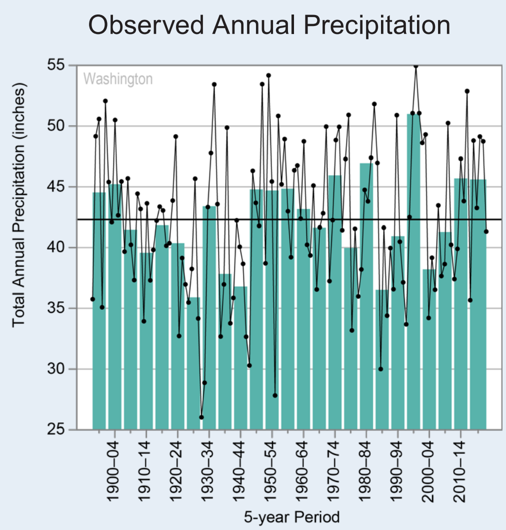


Figure 1: Observed and projected changes (compared to the 1901–1960 average) in near-surface air temperature for Washington. Observed data are for 1900–2020. Projected changes for 2006–2100 are from global climate models for two possible futures: one in which greenhouse gas emissions continue to increase (higher emissions) and another in which greenhouse gas emissions increase at a slower rate (lower emissions). Temperatures in Washington (orange line) have risen almost 2°F since the beginning of the 20th century. Shading indicates the range of annual temperatures from the set of models. Observed temperatures are generally within the envelope of model simulations of the historical period (gray shading). Historically unprecedented warming is projected to continue through this century. Less warming is expected under a lower emissions future (the coldest end-of-century projections being about 1°F warmer than the historical average; green shading) and more warming under a higher emissions future (the hottest end-of-century projections being about 10°F warmer than the hottest year in the historical record; red shading). Sources: CISESS and NOAA NCEI.





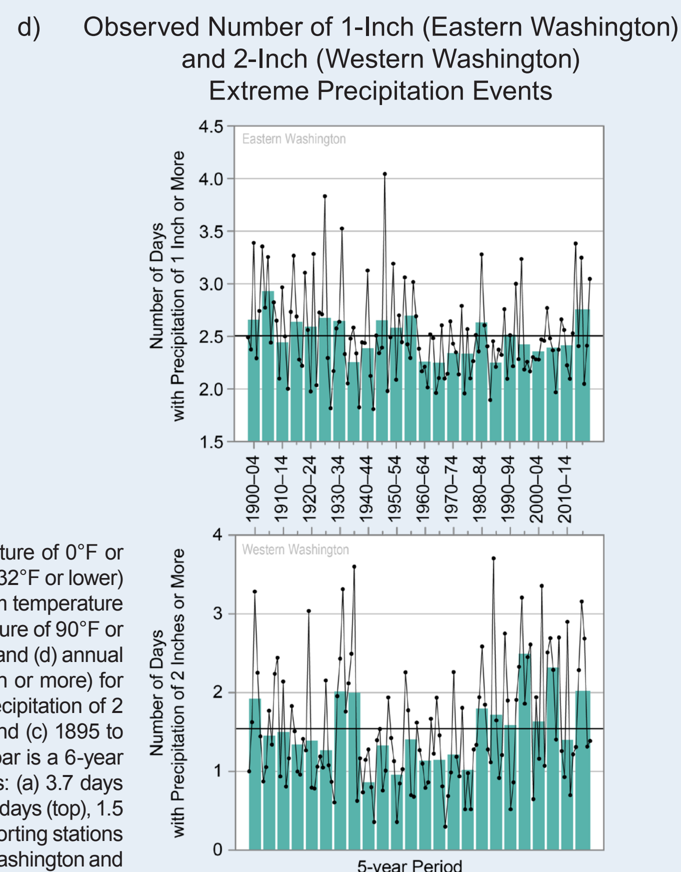


Figure 2: Observed (a) annual numbers of very cold nights (minimum temperature of 0°F or lower) for Eastern Washington (top) and freezing days (maximum temperature of 32°F or lower) for Western Washington (bottom), (b) annual numbers of very hot days (maximum temperature of 95°F or higher) for Eastern Washington (top) and hot days (maximum temperature of 90°F or higher) for Western Washington (bottom), (c) total statewide annual precipitation, and (d) annual numbers of 1-inch extreme precipitation events (days with precipitation of 1 inch or more) for Eastern Washington (top) and 2-inch extreme precipitation events (days with precipitation of 2 inches or more) for Western Washington (bottom) from (a, b, d) 1900 to 2020 and (c) 1895 to 2020. Dots show annual values. Bars show averages over 5-year periods (last bar is a 6-year average). The horizontal black lines show the long-term (entire period) averages: (a) 3.7 days (top), 3.0 days (bottom); (b) 14 days (top), 5.0 days (bottom); (c) 42.3 inches; (d) 2.5 days (top), 1.5 days (bottom). (Note that for Figures 2a, 2b, and 2d, the average for individual reporting stations varies greatly because of the state's large elevation range.) Since 1990, Eastern Washington and Western Washington have experienced below average numbers of very cold nights and freezing days, respectively, which is indicative of warming in the region. The numbers of very hot days in Eastern Washington and hot days in Western Washington have both been variable since 1990. Both annual precipitation and the number of extreme precipitation events have varied widely since the beginning of the 20th century. A typical station in Eastern Washington experiences between two and three 1-inch extreme precipitation events per year. A typical station in Western Washington experiences between one and two 2-inch events per year. Sources: CISESS and NOAA NCEI. Data: (a, b) GHCN-Daily from 17 long-term stations; (c) nClimDiv; (d) GHCN-Daily from 23 long-term stations.

Annual precipitation exhibits wide regional variations across the state. Portions of the Olympic Peninsula receive upwards of 150 inches of precipitation annually, while areas along the Columbia River in eastern interior Washington average less than 10 inches. Statewide total annual precipitation has ranged from a low of 26.0 inches in 1929 to a high of 55.0 inches in 1996. The driest multiyear periods were in the late 1920s, early 1940s, and late 1980s, and the wettest were in the early 1970s, early 1980s, and late 1990s (Figure 2c). The driest consecutive 5-year interval was 1926–1930, with an annual average of 34.6 inches, and the wettest was 1995–1999, with an annual average of 51.0 inches. Washington has not experienced any long-term trend in the number of extreme precipitation events (Figure 2d).

Most of Washington's precipitation falls during the winter months, and the Cascades can receive upwards of 400 inches of snowfall annually. **Snowpack in the mountains provides an important source of water during the drier summer months** (Figure 4)**.** Precipitation falling as rain rather than snow can have negative impacts on critical industries, such as timber and agriculture, which are also vulnerable to extreme temperatures. Wildfires during the drier summer months are a particular concern. The 2015 wildfire season was the most destructive in Washington's history, with more than 1 million acres burned (more than 6 times the average).

Under a higher emissions pathway, historically unprecedented warming is projected to continue through the end of this century (Figure 1)**.** Even under a lower emissions pathway, temperatures are projected to most likely exceed historical record levels by the middle of this century. However, a large range of temperature increases is projected under both pathways, and under the lower pathway, a few projections are only slightly warmer than historical records (Figure 1). Overall, warming will lead to increases in heat wave intensities but decreases in cold wave intensities. Unlike other locations in the United States, Seattle and other urban areas are rarely exposed to very high temperatures. Future heat waves, particularly an increase in the frequency of warm nights, could stress these communities, which are not well adapted to such events.

Temperature increases will affect basins with significant snowmelt contributions to their streamflow. Projected rising temperatures will raise the elevation of the snow line—the average lowest elevation at which snow falls. This will increase the likelihood that precipitation will fall as rain instead of snow, reducing water storage in the snowpack, particularly at those lower mountain elevations that are now on the margins of reliable snowpack accumulation. Rainfall is expected to be the dominant form of precipitation across the majority of the state by the end of this century. Higher spring temperatures will also result in earlier melting of the snowpack, with average snowpack projected to decline by up to 70% by the end of this century. This will further decrease water availability during the already dry summer months, and due to earlier spring peak flows, it will increase the risk of spring

Observed Number of
Very Warm Nights (Eastern Washington)
and Warm Nights (Western Washington)

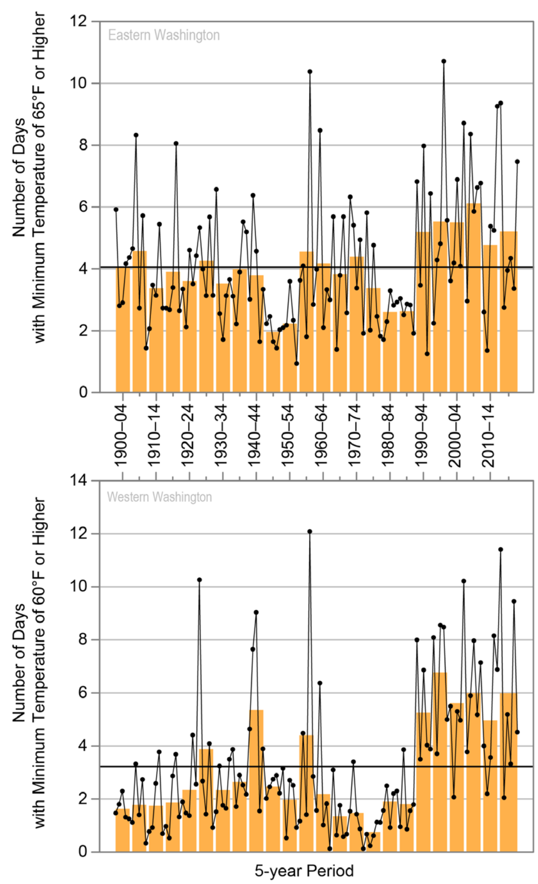


Figure 3: Observed annual numbers of very warm nights (minimum temperature of 65°F or higher) for Eastern Washington and warm nights (minimum temperature of 60°F or higher) for Western Washington from 1900 to 2020. Dots show annual values. Bars show averages over 5-year periods (last bar is a 6-year average). The horizontal black lines show the long-term (entire period) averages of 4.0 nights (top) and 2.5 nights (bottom; note that the average for individual reporting stations varies greatly because of the state's large elevation range). The numbers of very warm nights in Eastern Washington and warm nights in Western Washington have both been above average since 1900. Sources: CISESS and NOAA NCEI. Data: GHCN-Daily from 17 long-term stations.

flooding. Projected increases in heavy rainfall events by midcentury could further increase flood risk. Reductions in summer flow (projected to occur in 80% of the state's watersheds) will have important ecological implications and are a particular concern for hydropower and irrigation water supplies.

Increasing temperatures raise concerns for sea level rise in coastal areas. Since 1900, global average sea level has risen by about 7–8 inches. It is projected to rise another 1–8 feet, with a likely range of 1–4 feet, by 2100 as a result of both past and future emissions from human activities (Figure 6). Sea level rise has caused an increase in tidal floods associated with nuisance-level impacts. Nuisance floods are events in which water levels exceed the local threshold (set by NOAA's National Weather Service) for minor impacts. These events can damage infrastructure, cause road closures, and overwhelm storm drains. As sea level has risen along the Washington coastline, the number of tidal flood days has also increased at Seattle, with the greatest number (11) occurring in 1997 during a strong El Niño event (Figure 7). Some areas of the coast are rising, which has mitigated the impacts of recent sea level rise and will reduce somewhat the local projected sea level rise.

Although projections of overall annual precipitation are uncertain, summer precipitation is projected to decrease (Figure 5)**.** Drier conditions during the summer could increase reliance on diminishing snowmelt for irrigation. Additionally, the combination of drier summers, higher temperatures, and earlier melting of the snowpack would tend to increase the frequency and extent of wildfires.

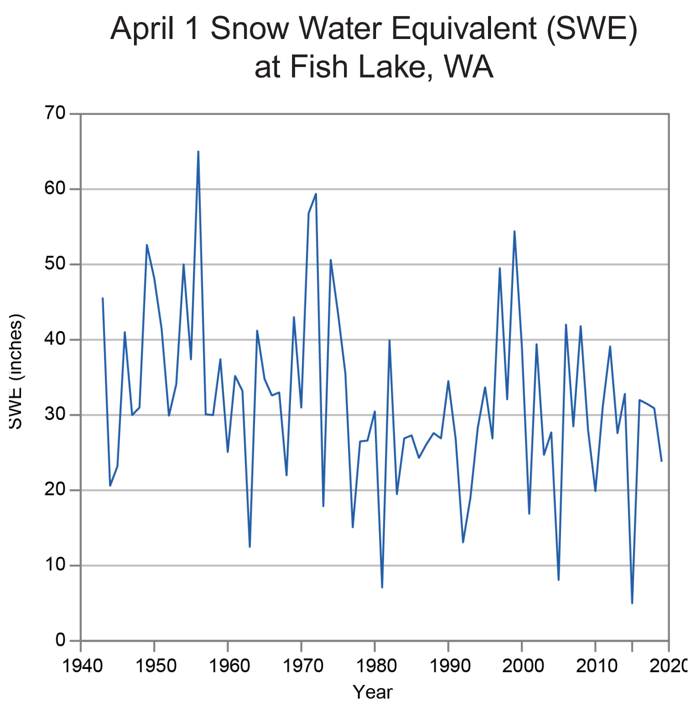


Figure 4: Variations in April 1 snow water equivalent (SWE) at the Fish Lake, Washington, snow course site from 1943 to 2019. SWE, the amount of water contained within the snowpack, varies widely from year to year, but there is a general downward trend. The extremely low snowpack levels in 2005 (third lowest) were due to below average winter precipitation and above average winter temperatures. In 2015 (record lowest), warmer than normal winter temperatures were the main driver of the drought, causing more precipitation to fall as rain rather than snow. Source: NRCS NWCC.

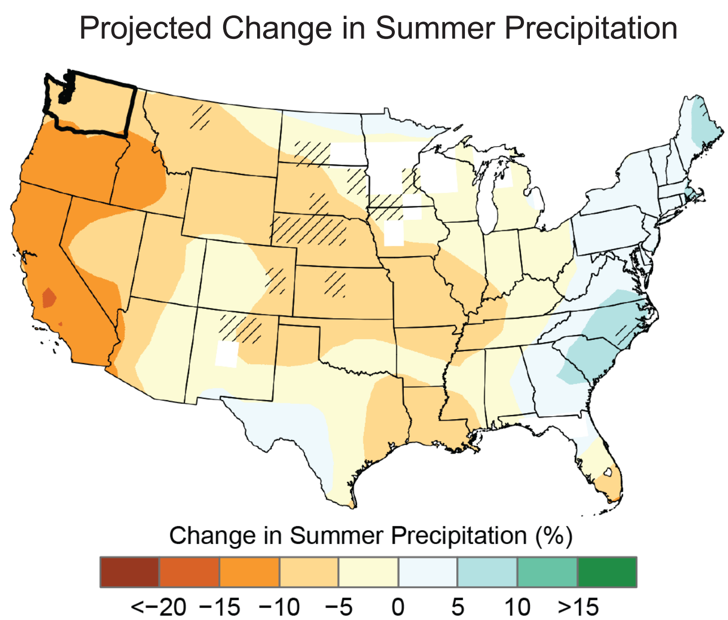


Figure 5: Projected changes in total summer (June–August) precipitation (%) for the middle of the 21st century compared to the late 20th century under a higher emissions pathway. Whited-out areas indicate that the climate models are uncertain about the direction of change. Hatching represents areas where the majority of climate models indicate a statistically significant change. Washington is projected to see a decrease in summer precipitation. Source: CISESS and NEMAC. Data: CMIP5.

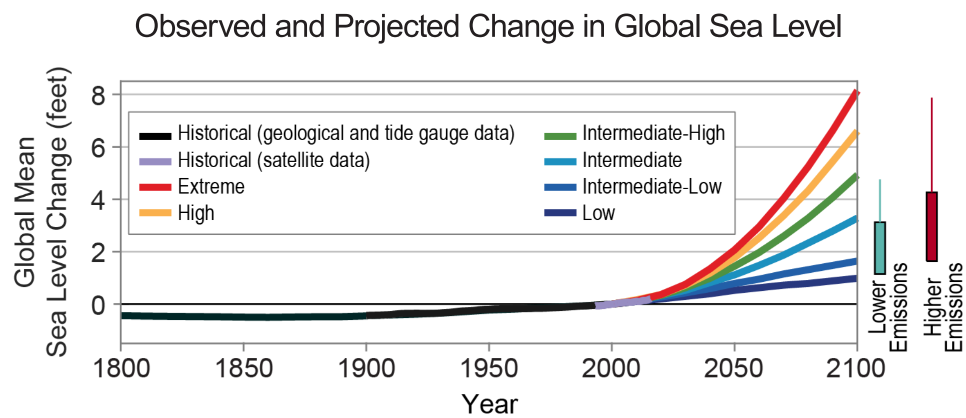


Figure 6: Global mean sea level (GMSL) change from 1800 to 2100. Projections include the six U.S. Interagency Sea Level Rise Task Force GMSL scenarios (Low, navy blue; Intermediate-Low, royal blue; Intermediate, cyan; Intermediate-High, green; High, orange; and Extreme, red curves) relative to historical geological, tide gauge, and satellite altimeter GMSL reconstructions from 1800–2015 (black and magenta lines) and the very likely ranges in 2100 under both lower and higher emissions futures (teal and dark red boxes). Global sea level rise projections range from 1 to 8 feet by 2100, with a likely range of 1 to 4 feet. Source: adapted from Sweet et al. 2017.

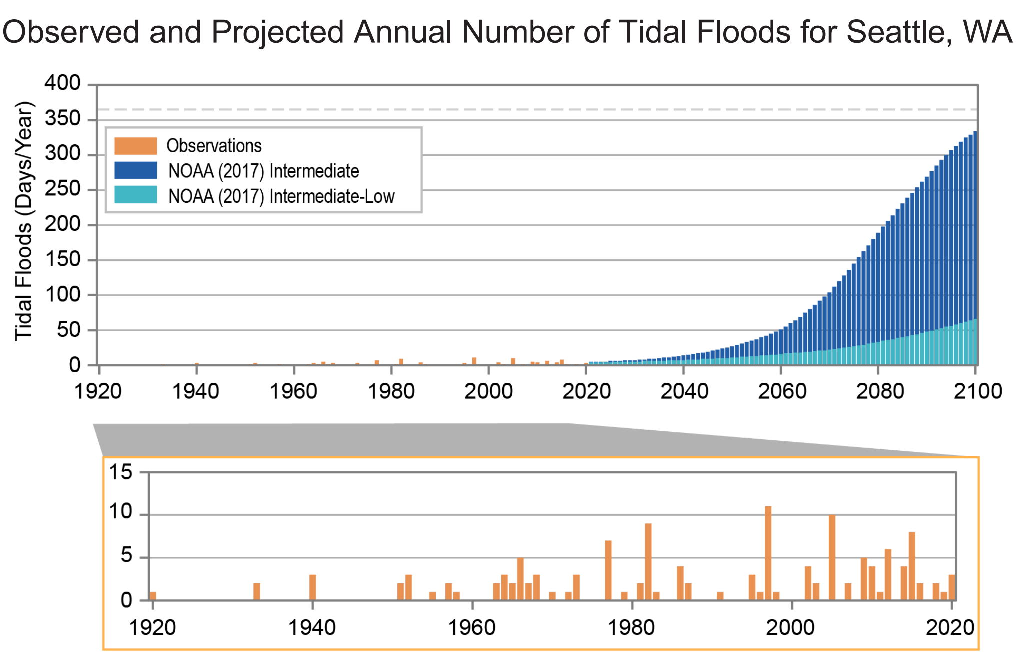


Figure 7: Number of tidal flood days per year at Seattle, Washington, for the observed record (1920–2020 orange bars) and projections for two NOAA (2017) sea level rise scenarios (2021–2100): Intermediate (dark blue bars) and Intermediate-Low (light blue bars). The NOAA (2017) scenarios are based on local projections of the GMSL scenarios shown in Figure 5. Sea level rise has caused a gradual increase in tidal floods associated with nuisance-level impacts. The greatest number of tidal flood days (all days exceeding the nuisance-level threshold) occurred in 1997 at Seattle. Projected increases are large even under the Intermediate-Low scenario. Under the Intermediate scenario, tidal flooding is projected to occur nearly every day of the year by the end of the century. Additional information on tidal flooding observations and scenarios is available online at https://statesummaries.ncics.org/technicaldetails. Sources: CISESS and NOAA NOS.

Technical details on observations and projections are available online at https://statesummaries.ncics.org/technicaldetails.

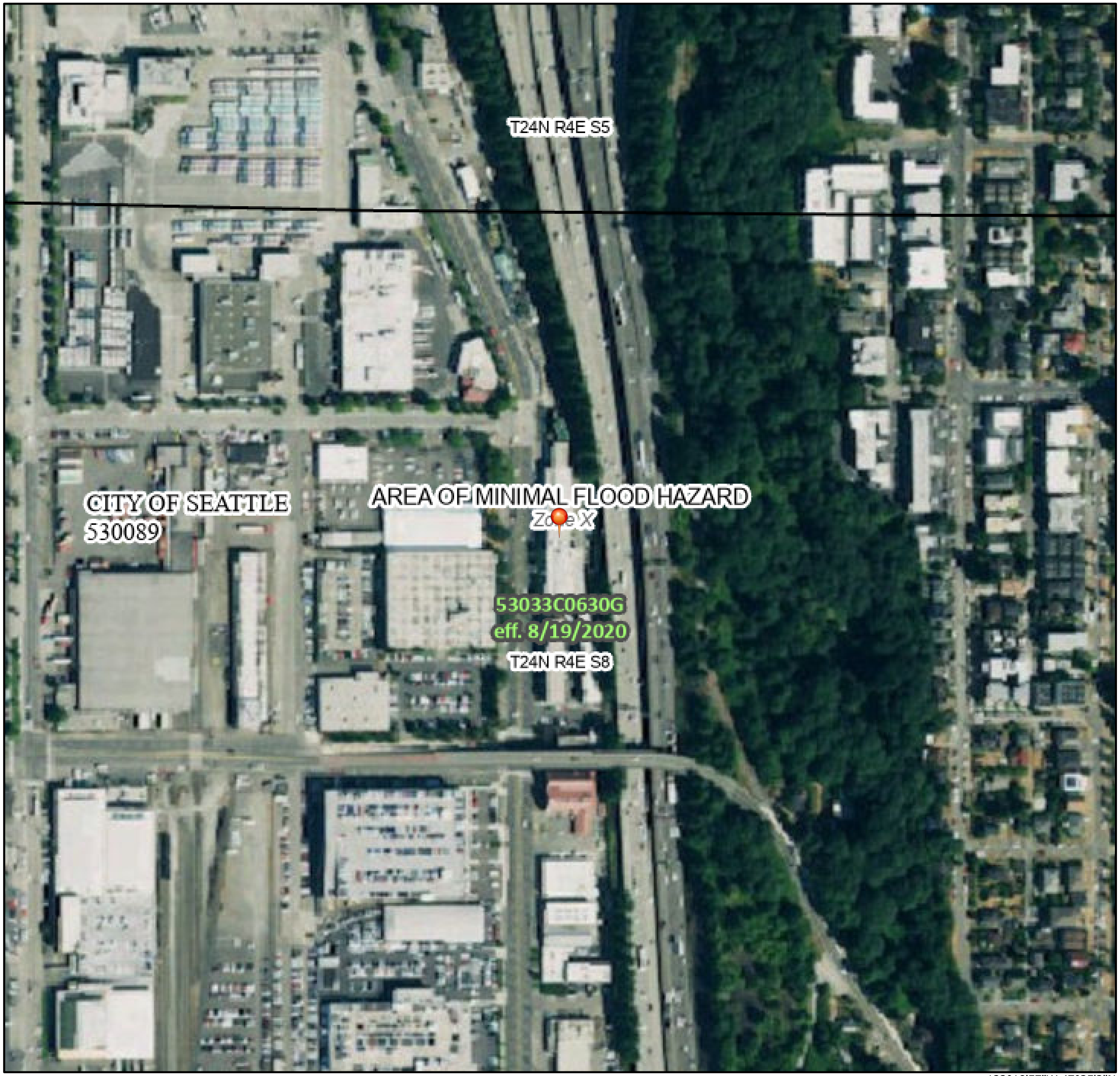
ATTACHMENT B

FEMA FIRMette

National Flood Hazard Layer FIRMette

FEMA

122°19'34"W 47°35'27"N



122°18'57"W 47°35'3"N

Feet
0 250 500 1,000 1,500 2,000

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- B 20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/6/2024 at 8:37 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.