SEATTLE PUBLIC UTILITIES

SEPA ENVIRONMENTAL CHECKLIST

This SEPA environmental review of Seattle Public Utilities' Pump Station 38 Conversion Project has been conducted in accord with the Washington State Environmental Policy Act (SEPA) (RCW 43.21C), State SEPA regulations [Washington Administrative Code (WAC) Chapter 197-11], and the City of Seattle SEPA ordinance [Seattle Municipal Code (SMC) Chapter 25.05].

A. BACKGROUND

1. Name of proposed project:

Pump Station 38 Conversion Project

2. Name of applicant:

Seattle Public Utilities (SPU)

3. Address and phone number of applicant and contact person:

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Project Delivery and Engineering Branch
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4. Date checklist prepared:

July 9, 2021

5. Agency requesting checklist:

Seattle Public Utilities (SPU)

6. Proposed timing or schedule (including phasing, if applicable):

Construction is scheduled to begin during the second quarter of 2022 and conclude by the end of the first quarter of 2023. Construction is anticipated to require approximately 225 working days, assuming typical Northwest weather conditions prevail during that time.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

SPU currently has no plans for future additions or expansions related to the proposed project.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

- Herrera. 2020 (October 16). Results from Odor Monitoring at PS-62, PS-63, and PS-38.
- SPU. 2020 (July). Pump Station 38 Conversion Project Geotechnical Report.
- SPU. 2021 (July, pending). Final Drainage Report for the Pump Station 38 Replacement.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

SPU is not aware of pending government approvals of other proposals directly affecting property involved in this proposal.

10. List any government approvals or permits that will be needed for your proposal, if known.

Implementation of this project may require some or all of these permits and approvals:

- Utility Major Permit (type 51, major projects), City of Seattle Department of Transportation (SDOT) (includes traffic control plans)
- Street Use Permit(s) (SDOT)
- Electrical Service Application, Seattle City Light (SCL)
- Shoreline Substantial Development Permit Exemption, City of Seattle Department of Construction and Inspections (SDCI)
- Temporary Revocable Use Permit from Seattle Department of Parks and Recreation (SPR) for construction on a small area of SPR property

11. Give a brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page.

SPU operates 13 airlift-type wastewater pump stations. These stations use airlift pumps that inject compressed air at the bottom of a discharge pipe immersed in the liquid to be pumped. The compressed air mixes with the liquid causing the air-water mixture to be less dense than the surrounding liquid. The liquid is therefore displaced upwards through the discharge pipe by the surrounding liquid of higher density. Airlift pumps were installed primarily due to solids (in the pumped liquid) that tend to plug and wear-out other types of wastewater pumps. However, these airlift pumps are obsolete and deteriorated—demanding frequent maintenance and subject to unavailability of replacement parts and equipment.

The *SPU Airlift Replacement Project – Options Analysis Technical Report* (September 2015) evaluated each of SPU's 13 airlift-type wastewater pump stations. Each evaluation included background information including contributing area, parcels served, flow projections, and an options analysis comparing a 'Do Nothing' option, a new pump station option, and a retrofit option. The recommended option for Pump Station 38 was a retrofit of the existing facility. Pump Station 38 was identified as the highest priority for retrofit along with Pump Station 56, which is addressed in SPU's separate Pump Station 56 Conversion Project.

Constructed in 1959, Pump Station 38 is buried in the street right-of-way for Alki Ave SW. The only above-ground or at-grade structures include access hatches and one electrical cabinet. Proposed improvements would completely remove the existing airlift system; install centrifugal pumps and mechanical piping; divide the existing structure into a separated wet well and dry well configuration; replace the existing 8-inch diameter force main with a 6-inch diameter force main; upgrade electrical and structural components to prolong the useful life of the station; and install underground ventilation ducting, and drainage and irrigation pipe.

The station would update instrumentation, improve code compliance, and enhance maintenance access by installing new access hatches. Site improvements would include a concrete pad with public art, a protective guardrail atop the adjacent seawall, and landscape plantings featuring plants native to the Seattle area.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The project is in the street right-of-way for Alki Ave SW (Attachments A and B) and has a street address of 1411 Alki Ave SW. A portion of the project area is also on SPR property at 1141 Alki Ave SW (tax parcel 7666706950), which contains a seawall along Puget Sound. The project is in the northwest quarter of Section 11, Township 24N, Range 03E, and within the Duwamish-Green Water Resource Inventory Area (WRIA) 9.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site:

☒ Flat ☐ Rolling ☐ Hilly ☐ Steep Slopes ☐ Mountainous ☐ Other:

b. What is the steepest slope on the site (approximate percent slope)?

The project is flat. The pump station is buried in the street right-of-way for Alki Ave SW.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing these soils.

Soils consist of placements of fill material in the former shoreline of Puget Sound. Urban development in this part of the City over the last 100 years has resulted in a predominance of disturbed native soils/sediments, cut slopes, and placements of fill material throughout the project site and immediately surrounding area.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe:

The pump station is in a Liquefaction Environmentally Critical Area (ECA) and adjacent to Potential Slide and Known Slide ECAs, as mapped by SDCI. However, there are currently no surface indications of unstable soils.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate the source of fill.

Construction is anticipated to disturb a total of approximately 3,700 square feet of ground. All excavation would be in ground that has been previously disturbed. Construction would excavate approximately 100 cubic yards of soil and backfill with approximately 100 cubic yards of excavated and/or imported soil, imported aggregate, and other fill material. Imported material would be obtained from purveyors of such

materials licensed to conduct business in Washington. All exported excavated material would be legally disposed at an approved upland location or used as fill material (if suitable) at sites approved for filling and grading.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe:

No significant erosion is anticipated during the proposed work. A Construction Stormwater and Erosion Control Plan would be prepared and implemented. Disturbed areas would be restored to their near-original conditions (primarily concrete and asphalt). The project would comply with applicable provisions of the City of Seattle's Stormwater Code SMC Title 22, Subtitle VIII, City of Seattle Director's Rule SDCI 17-2017/SPU DWW-200, and Volume 2 Construction Stormwater Control Manual.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

The project site is essentially 100 percent impervious hard surfaces consisting of concrete and asphalt pavement (street, curb, bike lane, sidewalk, and seawall) and hard-packed earthen materials vegetated by turfgrasses and weeds. After construction, 53 percent (1,953 square feet) of the total site area (3,678 square feet) would be impervious hard surface and 47 percent (1,725 square feet) would be new native planting beds and restored turf with new topsoil and amended subgrade.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

A Construction Stormwater and Erosion Control Plan would be prepared and implemented. Best Management Practices (BMP) as identified in the City of Seattle's Stormwater Code SMC Title 22, Subtitle VIII, City of Seattle Director's Rule SDCI 17-2017/SPU DWW-200, and Volume 2 Construction Stormwater Control Manual would be used to manage stormwater runoff, disturbance, and erosion during construction.

2. Air

a. What types of emissions to the air would result from the proposal [*e.g.*, dust, automobile, odors, industrial wood smoke, greenhouse gases (GHG)] during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

Air Quality and Odors

Construction

During construction, emissions would occur from vehicles and mobile and stationary equipment that combust gasoline and diesel fuels, such as crew vehicles, trucks, and construction equipment. Emissions would include oxides of nitrogen, carbon monoxide, particulate matter and smoke, uncombusted hydrocarbons, hydrogen sulfide, carbon dioxide, and water vapor. Emissions during construction would also include dust from ground-disturbing activities.

Operation

Ventilation system requirements in pump stations are governed by National Fire Protection Association (NFPA) Standard 820 (Standard for Fire Protection in Wastewater Treatment and Collection Facilities). The ventilation system would be sized only for code compliance and would not guarantee a safe atmosphere for continuous human occupation. As a result, crews operating within the completed project would continue to follow requirements of SPU's Confined Space Safety Program, which implements requirements of WAC Chapter 296-809.

Odor is a common and prevalent problem for wastewater facilities. Certain operating and maintenance conditions may cause wastewater odors to intermittently emanate or be discharged from these facilities. Although not detrimental to human health at low-level exposures, these odors can be perceived as a nuisance at concentrations as low as 0.02 ppm. SPU does not currently have an odor control policy for wastewater pump stations and, in this case, the proposed project does not include odor control. However, to limit discharge of wet well odors the wet well ventilation system has been designed to provide only 4 air changes per hour, per SPU Pump Station policy. During normal pump station operation, wastewater in the dry well of the pump station is fully contained in piping, valves, and pumps and is not exposed to air inside the dry well, thereby minimizing or eliminating potential for generating airborne odors. Therefore, no increased perception of odors is expected from dry well ventilation improvements.

However, wastewater in the wet well is exposed to the atmosphere inside the wet well. Wet well ventilation improvements would increase the rate and volume of air exhausted from the wet well, which could potentially result in increased emission of odors from the pump station compared to the existing condition. Generation and transmission of odor-producing molecules in outdoor air is determined by many factors, including environmental and atmospheric conditions, physical landscape, and (in the case of wastewater pump stations) chemical composition of the wastewater and the piping configuration and velocity of the wastewater through the pump station. Additionally, the higher rate of air flow resulting from the ventilation improvements has potential to dilute concentrations of odor exhausted from the wet well. To the extent this dilution occurs, the proposed project could also result in no increase of emitted odors.

Greenhouse Gas Emissions

Greenhouse gas emissions are characterized as 'direct' (emissions from sources owned or controlled by the reporting entity) and 'indirect' (emissions from sources that are a consequence of the reporting entity, but which occur at sources owned or controlled by another entity [e.g., electricity purchased to operate facilities and equipment and embodied emissions associated with the manufacture of purchased materials]. This Checklist provides information regarding potential for new or increased direct greenhouse gas emissions resulting from construction and operation of the project, including indirect construction-related (embodied) emissions associated with replacement of demolished and damaged concrete/asphalt surfaces and structures. Embodied greenhouse gas emissions in other materials such as aggregate and pre-cast

structures to be used in this project have not been estimated as part of this environmental review due to the difficulty of accurately calculating those emissions.

Construction

Construction would generate greenhouse gas emissions during the estimated 225 working-days via the operation of diesel- and gasoline-powered equipment and the transport of materials, equipment, and workers to and from the site. Because project construction methods were not completely known at the time this Checklist was prepared, the estimates provided here are based on daily vehicle operation times for the estimated 225 working-day duration; actual times may be less. The project's direct greenhouse gas emissions related to construction are presented as total metric tons of carbon dioxide (MTCO2e), calculated in Attachment C, and summarized in Table 1. Total greenhouse gas emissions for the project are estimated to be about 521.9 metric tons of carbon dioxide emission (MTCO2e), where one metric ton is equal to 2,205 pounds.

Operation and Maintenance

Operation of the completed project would result in greater volumes of air being vented to the atmosphere from the pump station's dry well and wet well. The amount of greenhouse gases in the air exhausted from the pump station's dry well is expected to be negligible. Depending on the concentration of greenhouse gases such as carbon dioxide or methane in the exhausted air, there is potential for an incremental increase of greenhouse gas released to the atmosphere due to the increased wet well ventilation. However, the amount of any greenhouse gas currently being released directly to the atmosphere during operation of the pump station is not known and at present there is no widely-accepted general model or methodology for estimating effects of ventilation, or changes in ventilation, on greenhouse gas emissions associated with direct releases to the atmosphere from wastewater collection and conveyance facilities. Therefore, the magnitude of potential changes in direct greenhouse gas emissions associated with operation of the project has not been estimated.

Long-term maintenance of the completed project would not result in increases in greenhouse gas emissions above current levels. The project would be constructed at an existing operational pump station and would not result in increases to the frequency or duration of pump station maintenance visits/activities.

Table 1. Summary of Greenhouse Gas (GHG) Emissions

Activity/Emission Type	GHG Emissions (pounds of CO_2e)[1]	GHS Emissions (metric tons of CO_2e)[1]
Buildings	0	0
Paving	275,625	125
Construction Activities (Diesel)	842,431.5	382
Construction Activities (Gasoline)	32,805	14.9
Long-term Operation/ Maintenance (Diesel)	0	0
Long-term Operation/Maintenance (Gasoline)	0	0
Total GHG Emissions	1,150,861.5	521.9

[1] Note: 1 metric ton = 2,204.6 pounds of CO_2e. 1,000 pounds = 0.45 metric tons of CO_2e

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

There are no known off-site sources of emissions that may affect this proposal.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

During construction, impacts to air quality would be reduced and controlled through implementation of standard federal, state, and local emission control criteria and City of Seattle construction practices. These would include requiring contractors to use best available control technologies, ensure proper vehicle maintenance, and minimize vehicle and equipment idling. The project includes sealing electrical conduits, access openings, and other penetrations to create a gas-tight seal between the pump station wet well and the dry well, which would prevent wet well air and any associated odors from directly entering the dry well and then being exhausted from the dry well to the outside air during pump station operation.

3. Water

a. Surface:

(1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If so, describe type and provide names. If appropriate, state what stream or river it flows into.

The pump station is on the shoreline of Puget Sound and is protected by an existing seawall owned and managed by SPR.

(**2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If so, please describe, and attach available plans.**

There would be no work over or in any waterbodies. All work is proposed on or landward of the existing shoreline seawall. The entire project is within 200 feet of Puget Sound.

(3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

No material would be placed in or removed from surface water or wetlands.

(4) Will the proposal require surface water withdrawals or diversions? If so, give general description, purpose, and approximate quantities if known.

Neither project construction nor operation of the completed project would require surface water withdrawals or diversions. Stormwater runoff from the project area is collected via existing stormwater catchbasins and directed either into the combined sewer system served by Pump Station 38 or discharged directly to Puget Sound. The completed project would not change the volume or timing of stormwater runoff directed to the combined sewer system or to Puget Sound.

(5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

No portion of the project lies within a 100-year floodplain.

(6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

The proposal would not produce or discharge waste materials to surface waters.

b. Ground:

(1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

Historical boring logs indicate groundwater is located between 5 and 10 feet below the ground surface (bgs) on the east side of Alki Ave SW. Groundwater levels are expected to be controlled by water levels in Puget Sound and thus tidally influenced. Puget Sound generally fluctuates between elevations -5 and 11 feet, which corresponds to depths below Alki Ave SW between approximately 5 and 21 feet bgs. SPU assumes groundwater would be encountered at 5 feet bgs, which may require collection and removal during construction. If so, SPU would require its contractor to prepare a Temporary Construction Dewatering Plan and collected water would be managed according to that Plan. Quantities of water potentially collected during construction dewatering and the discharge location(s) of that water are unknown. The project would not otherwise withdraw, discharge, or surcharge groundwater.

(2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: domestic sewage; industrial, containing the following chemicals…; agricultural, *etc.*). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

No waste material would be discharged to groundwater for this project.

c. Water Runoff (including storm water):

(1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Project area stormwater runoff from paved surfaces within the street right of way, and from roof and yard drains from adjacent private properties, is collected via existing stormwater catchbasins and directed into SPU's combined sewer system or discharged directly to Puget Sound.

During project construction, stormwater runoff may need to be managed to prevent sediment from entering and leaving the construction site. Precipitation that lands on the construction site would be directed to the existing stormwater collection and distribution system or contained on-site and allowed to infiltrate. Barriers such as sandbags and catchbasin inserts would be used to prevent sediments from entering

and leaving the construction area. Once construction is complete, temporary erosion control measures would be removed.

The project site is essentially 100 percent impervious hard surfaces consisting of concrete and asphalt pavement (street, curb, bike lane, sidewalk, and seawall) and hard-packed earthen materials vegetated by turfgrasses and weeds. After construction, 53 percent (1,953 square feet) of the total site area (3,678 square feet) would be impervious hard surface and 47 percent (1,725 square feet) would be new native planting beds and restored turf with new topsoil and amended subgrade. Generally, the completed project would be re-covered with concrete and/or asphalt but would not create a need to manage additional stormwater runoff beyond currently existing conditions. Stormwater runoff on and adjacent to the project site would follow pre-construction drainage pathways.

(2) Could waste materials enter ground or surface waters? If so, generally describe.

No part of the proposed work involves any discharges of waste materials to surface or ground waters. However, several construction activities such as sawcutting, concrete pouring and handling, etc., would generate pollutants that could potentially enter local drainage conveyance systems. Non-sediment pollutants that may be present during construction include:

- Petroleum products including fuel, lubricants, hydraulic fluids, and form oils
- Paints, glues, solvents, and adhesives
- Concrete and concrete washwater, and
- Chemicals associated with portable toilets.

Procedures to prevent and control pollutants, including hazardous materials such as hydrocarbons and pH-modifying substances, would be described in a spill prevention, control, and countermeasures plan that would be prepared for the project and approved by the City of Seattle prior to the start of construction.

(3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

The completed project would restore disturbed areas to near-original condition (primarily concrete and asphalt) and would not create a need to manage additional stormwater runoff beyond currently existing conditions. Stormwater would follow pre-construction drainage pathways.

d. Proposed measures to reduce or control surface, ground, runoff water, and drainage impacts, if any:

No adverse impacts to surface, ground, or runoff water are anticipated. BMPs, as identified in the City of Seattle's Stormwater Code SMC Title 22, Subtitle VIII, City of Seattle Director's Rule SDCI 17-2017/SPU DWW-200, and Volume 2 Construction Stormwater Control Manual, would be used as needed to control erosion and sediment transport from and to the project site during construction.

4. Plants

a. Types of vegetation found on the site:

☐ Deciduous trees:	☐ Alder	☐ Maple	☐ Aspen	☐ Other: dogwood
☐ Evergreen trees:	☐ Fir	☐ Cedar	☐ Pine	☐ Other: juniper
☐ Shrubs				
☒ Grass				
☐ Pasture				
☐ Crop or grain				
☐ Orchards, vineyards, or other permanent crops				
☐ Wet soil plants:	☐ Cattail	☐ Buttercup	☐ Bulrush	☐ Skunk cabbage
☐ Other:				
☐ Water plants:	☐ water lily	☐ eelgrass	☐ milfoil	☐ Other:
☒ Other types of vegetation: herbaceous weeds				

b. What kind and amount of vegetation will be removed or altered?

Proposed work in the street right-of-way would affect impervious surfaces, including concrete travel lanes and hard-packed earthen surfaces vegetated with turfgrasses and weeds. There are no trees in or near the project location. Project construction would remove approximately 700 square feet of turf and replace that with 1,725 square feet of new landscape planting beds and restored turf with new topsoil and amended subgrade.

c. List threatened or endangered species known to be on or near the site.

According to a review of the Washington Department of Natural Resources Natural Heritage Program's document called "Sections that Contain Natural Heritage Features, Current as of January 12, 2021" (accessed at www.dnr.wa.gov), there are no documented occurrences of sensitive, threatened, or endangered plant species at or near the project site. No federally-listed endangered or threatened plant species or State-listed sensitive plant species are known to occur within Seattle's municipal limits. The project site has been intensively disturbed by development and redevelopment over the last 100 years and has been extensively excavated, filled, paved, or occupied by street, utility, and other constructed features. There is no habitat for threatened or endangered plants.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Project construction would remove approximately 700 square feet of hard-packed earthen surfaces vegetated with turfgrasses and replace that with 1,725 square feet of restored turf and new landscape planting beds featuring native plants. All disturbed areas to be landscaped would be amended with suitable soil-improving materials (e.g., compost) and revegetated as directed by SDOT and SPR.

e. List all noxious weeds and invasive species known to be on or near the site.

A review of information maintained by the King County Noxious Weed Program (available at King County iMap interactive online mapping program,

http://gismaps.kingcounty.gov/iMap/) did not identify documented occurrence of any noxious weeds within 1,000 feet of the project site.

5. Animals

a. List any birds and other animals that have been observed on or near the site or are known to be on or near the site:

Birds:	☒ Hawk	☒ Heron	☒ Eagle	☒ Songbirds
☒ Other: crow, pigeon, gull				
Mammals:	☐ Deer	☐ Bear	☐ Elk	☐ Beaver
☒ Other: possum, raccoon, squirrel, marine mammals				
Fish:	☐ Bass	☒ Salmon	☒ Trout	☒ Herring
☒ Shellfish	☐ Other:			

b. List any threatened or endangered species known to be on or near the site:

The project is adjacent to the shoreline of Puget Sound. Endangered Species Act-listed species for this area of Puget Sound and the Puget Sound (PS) region are Chinook salmon (*Oncorhynchus tshawytscha*, Threatened PS), steelhead (*O. mykiss*, Threatened PS), bull trout (*Salvelinus confluentus*, Threatened PS), bocaccio (*Sebastes paucispinis*, Endangered PS), yelloweye rockfish (*Sebastes ruberrimus*, Threatened, PS), Southern Resident orca whale (*Orcinus orca*, Endangered PS), marbled murrelet (*Brachyramphus marmoratus*, Threatened), streaked horned lark (*Eremophila alpestris strigata*, Threatened), yellow-billed cuckoo (*Coccyzus americanus*, Threatened), and gray wolf (*Canis lupus*, Proposed Endangered). Because the project is not proposing any in-water work and the project site does provide habitat for any threatened and endangered species, the project is expected to have no adverse effect on those species.

A check of the Washington Department of Fish and Wildlife's "Priority Habitat Species on the Web" database on July 1, 2021, indicates Puget Sound in the project vicinity includes Pacific herring (*Clupea pallasi*), a State-listed Priority Species. The site is known to be (but not mapped as being) within the habitat of bald eagle (*Haliaeetus leucocephalus*) and great blue heron (*Ardea herodias*)—priority species in Washington. There are no known nests in the vicinity of the project.

c. Is the site part of a migration route? If so, explain.

Seattle is within the migratory route of many birds and other animal species and is part of the Pacific Flyway, a major north-south route of travel for migratory birds in the Americas extending from Alaska to Patagonia, South America. Also, Puget Sound, Lake Washington, the Lake Washington Ship Canal, and the Duwamish Waterway are important water migration routes for many animal species.

d. Proposed measures to preserve or enhance wildlife, if any:

The proposed work involves no in-water or over-water work in Puget Sound or other waterbodies. All disturbed ground intended to be landscaped would be amended with suitable soil-improving materials (e.g., compost) and revegetated as directed by SDOT and SPR.

e. List any invasive animal species known to be on or near the site.

King County lists European starling, house sparrow, Eastern gray squirrel, and fox squirrel as terrestrial invasive species for this area (http://www.kingcounty.gov/services/environment/animals-and-plants/biodiversity/threats/Invasives.aspx).

6. Energy and Natural Resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, *etc.*

The project would improve an existing wastewater pump station that currently uses electrical energy during normal operation. The new equipment installed by the project would also be electrically powered.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

The completed project would not affect the potential use of solar energy by adjacent properties. No elements of the project would cast shade on adjacent properties.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

The project will meet the applicable requirements of the State of Washington and City of Seattle energy codes. No additional energy conservation measures are proposed.

7. Environmental Health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe:

Small amounts of materials likely to be present during construction include gasoline and diesel fuels, hydraulic fluids, oils, lubricants, solvents, paints, and other chemical products. A spill of one of these chemicals could potentially occur during construction due to equipment failure or worker error. Though unlikely, contaminated soils, sediments, or groundwater could also be exposed during ground disturbance. If disturbed, contaminated substances could expose construction workers and potentially other individuals in the vicinity through blowing dust, stormwater runoff, or vapors.

Substances present in sewage could pose a potential environmental health hazard during construction and operation of project improvements. Sewage typically consists of a mixture of human waste, food scraps, oils, soaps, and chemicals. Decomposition of organic household or industrial wastes present in wastewater can produce gases including hydrogen sulfide, ammonia, methane, carbon monoxide, sulfur dioxide, and nitrogen oxides. Many of these gases are heavier than air and tend to settle in low areas. Chemicals potentially present in wastewater and the gases they produce are toxic to

humans and could pose a health risk to workers if exposed during project construction or during routine pump station operation and maintenance activities after construction has been completed. In high enough concentrations, gases produced by the substances in wastewater can also be flammable, creating a risk of fire or explosion if ignited.

(1) Describe any known or possible contamination at the site from present or past uses.

The project site is not known to have had industrial or commercial land uses that may have resulted in contamination of soil materials. However, it is possible contamination of soil or groundwater associated with past uses or activities on or near the site may be present.

(2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

There are no known hazardous chemicals or conditions that might affect project development and design.

(3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

Construction activities such as sawcutting, concrete pouring and handling, etc., would generate pollutants that could potentially enter local drainage conveyance systems. Non-sediment pollutants that may be present during construction include:

- Petroleum products, including fuel, lubricants, hydraulic fluids, and form oils
- Paints, glues, solvents, and adhesives
- Concrete and concrete washwater
- Chemicals associated with portable toilets.

During normal operation of the completed project no toxic or hazardous chemicals would be stored at any time at the project site. However, SPU workers may use small quantities of the above items as part of routine operation and maintenance activities. During project construction, wastewater flows would be temporarily bypassed around the pump station as required to accomplish project work. The completed project would not affect the composition of sewage passing through the pump station. Potential for hazardous chemicals to be produced by or associated with substances present in, or chemical processes occurring in, the sewage being conveyed through the pump station would be the same as prior to construction.

(4) Describe special emergency services that might be required.

No special emergency services would be required during construction or operation of the project. Possible fire or medic services could be required during project construction, as well as possibly during operation of the completed project. However, the completed project would not demand higher levels of special emergency services than already exist at the project location.

(5) Proposed measures to reduce or control environmental health hazards, if any:

The construction contractor would be required to develop and implement a Spill Plan to control and manage spills during construction. During construction, the contractor would use standard operating procedures and BMPs identified in the City of Seattle's Stormwater Code SMC Title 22, Subtitle VIII, City of Seattle Director's Rule SDCI 17-2017/SPU DWW-200, and Volume 2 Construction Stormwater Control Manual to reduce or control any possible environmental health hazards. In addition, a spill response kit will be maintained at each site during construction work at that site, and all project site workers would be trained in spill prevention and containment consistent with the City of Seattle's Standard Specifications for Road, Bridge, and Municipal Construction.

Any soil discovered to be contaminated by previous land uses or by spills during construction would be excavated and disposed of in a manner consistent with the level and type of contamination, in accordance with federal, state, and local regulations, by qualified contractor(s) and/or City staff.

To address potential fire and explosion hazards associated with wastewater facility environments, NFPA has published NFPA Standard 820, a standard for Fire Protection in Wastewater Treatment and Collection Facilities. The proposed project would improve pump station ventilation systems to ensure a safe working environment for SPU personnel and to achieve ventilation system performance consistent with NFPA 820 by:

- Installing dry well ventilation to achieve 6 air changes per hour
- Installing wet well ventilation to achieve 4 air changes per hour
- Installing combustible and toxic gas detectors; and
- Sealing electrical conduits and other penetrations between the pump station wet well and the dry well to create a gas-tight seal.

To ensure workers are not exposed to harmful substances that can be present in wastewater or unsafe concentrations of wastewater gases or vapors during project construction, wastewater flows would be bypassed around the pump station as needed to facilitate construction. Additionally, workers would be required to follow State of Washington safety standards for entry and work in confined spaces (WAC Chapter 296-809), which includes requirements for atmospheric testing in a confined space structure prior to entry and work in the structure. SPU workers operating and maintaining the completed project would be required to follow requirements of SPU's Confined Space Safety Program, which implements requirements of WAC Chapter 296-809.

b. Noise

(1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

Noise that exists in the area would not affect the project.

(2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Noise levels near project construction would temporarily increase during construction. Short-term noise from construction equipment would be limited to the allowable maximum levels of applicable laws, including the City of Seattle's Noise Control Ordinance [SMC Chapter 25.08.425—Construction and Equipment Operations]. Within the allowable maximum levels, SMC 25.08 permits noise from construction equipment between the hours of 7 a.m. and 7 p.m. weekdays, and 9 a.m. and 7 p.m. weekends and legal holidays. SPU expects construction would require 225 working days.

The project would upgrade the pump station's ventilation system to satisfy NFPA code by installing continuously operating exhaust fans in the dry well and wet well. As a result, operation and maintenance of the completed project would generate low levels of noise.

(3) Proposed measures to reduce or control noise impacts, if any:

Construction equipment would be muffled in accordance with the applicable laws. SMC Chapter 25.08 (which prescribes limits to noise and construction activities) would be enforced while the project is being constructed and during operations, except for emergencies. The upgraded ventilation system would use fans enclosed in ducting within the pump station structure (dry well fans) or within a noise attenuating enclosure (wet well fan). Intake and exhaust vents for ventilation fans would be in below-grade structures to mitigate aesthetic and noise impacts. All new fans and associated noise attention measures would be designed to achieve a maximum noise level of 50 dB at 5 feet. Operation of the completed project would comply with applicable City of Seattle Noise Ordinance (SMC 25.08) and State of Washington Maximum Environmental Noise Levels (WAC Chapter 173-60).

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

The project site is primarily in improved public street right-of-way for Alki Ave SW, which is a Minor Arterial heavily used for vehicle and pedestrian travel and parking. Project construction would also affect a small area of an SPR-owned parcel and a portion of the seawall located thereupon. Adjacent property uses are residential and park/open space. Project construction would temporarily close or reroute the Alki Trail, an urban paved bike/pedestrian trail in street rights-of-way that runs along the shoreline of Puget Sound from the Alki beaches on the west side of the West Seattle peninsula around Duwamish Head and down through the West Seattle industrial area.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or non-forest use?

There is no documentation indicating the site has been used for agricultural purposes.

(1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how?

No working farm or forest land business operations are at or near the project site.

c. Describe any structures on the site.

The proposed work is associated with an existing wastewater facility buried in improved public right-of-way used for vehicle and pedestrian travel and parking. Adjacent property uses are residential (some of which may include space for home-based occupations) and park/open space. Utilities are buried in street rights-of-way.

d. Will any structures be demolished? If so, what?

The project would not demolish any structures.

e. What is the current zoning classification of the site?

The project site is in the MR zone (Multifamily Residential) where residential development such as townhouses, rowhouses, and apartments are allowed.

f. What is the current comprehensive plan designation of the site?

The comprehensive plan designation is Multifamily Residential.

g. If applicable, what is the current shoreline master program designation of the site?

The project site is in the Urban Residential and Conservation Recreation environments of the City of Seattle's Shoreline Management District.

h. Has any part of the site been classified as an "environmentally critical" area? If so, specify.

The pump station is in a Liquefaction Environmentally Critical Area (ECA) and adjacent to Potential Slide and Known Slide ECAs, as mapped by SDCI.

i. Approximately how many people would reside or work in the completed project?

No people would reside or work in the completed project.

j. Approximately how many people would the completed project displace?

The project would not displace any people.

k. Proposed measures to avoid or reduce displacement impacts, if any:

There would be no displacement impacts.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

The project would be compatible with existing and projected land uses and plans.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:

There are no nearby agricultural and forest lands of long-term commercial significance.

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

The proposed project would not construct any housing units.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

The proposed project would not eliminate any housing units.

c. Proposed measures to reduce or control housing impacts, if any:

No measures are proposed because there would be no housing impacts.

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas? What is the principal exterior building material(s) proposed?

Primarily, the project proposes to install or modify buried elements. Surface features would include new and replaced access hatches, new intake and exhaust ports for ventilation, new landscaping and pavement treatments, and a new guardrail atop the existing seawall One existing above-ground electrical cabinet (less than 6 feet high) would remain and be the tallest structure on the site.

b. What views in the immediate vicinity would be altered or obstructed?

Primarily, the project proposes to install or mod1ify buried elements. Due to safety requirements in the City of Seattle's Building and Construction Code (SMC 22.206.130), a guardrail is required due to the site's proximity to a drop-off of more than 30 inches at the existing seawall. To minimize visual impact of this guardrail on views of Puget Sound and beyond, the project would construct a guardrail having the minimum required dimension (36-inch height) and transparent paneling materials between guardrail posts. Over time, trees installed as part of the landscape improvements would grow sufficiently large to block or partially block views from Alki Ave SW and adjacent residential properties.

c. Proposed measures to reduce or control aesthetic impacts, if any:

Primarily, the project proposes to install or modify buried elements. Due to safety requirements in the City of Seattle's Building and Construction Code (SMC 22.206.130), a guardrail is required due to the site's proximity to a drop-off of more than 30 inches at the existing seawall. To minimize visual impact of this guardrail on views of Puget Sound and beyond, the project would construct a guardrail having the minimum dimension required (36-inch height) and transparent paneling materials between guardrail posts.

11. Light and Glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

The constructed project would not produce light or glare. No new street lights are proposed or required. During construction, if an emergency situation calls for after-dark work, the construction contractor may deploy portable lights that temporarily produce light and glare.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

The completed project would not create light or glare.

c. What existing off-site sources of light or glare may affect your proposal?

There are no existing off-site sources of light and glare that would affect the proposal.

d. Proposed measures to reduce or control light and glare impacts, if any:

No measures are needed to reduce or control light and glare impacts because no impacts would occur. If an emergency requires after-dark work during construction, portable lighting would be adjusted as feasible to minimize glare.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

The proposed project is in improved street right-of-way heavily used for recreational activities such as dog-walking, walking, jogging, and bicycling. The project is also adjacent to Alki Beach Park (below the seawall), a City park owned and managed by SPR. Project construction would temporarily close or reroute the Alki Trail, an urban paved bike/pedestrian trail in street rights-of-way that runs along the shoreline of Puget Sound from the Alki beaches on the west side of the West Seattle peninsula around Duwamish Head and down through the West Seattle industrial area. The Duwamish Head Greenbelt is east of the project site behind private residential properties. The Alki Trail and Greenbelt are managed by SDOT and SPR, respectively.

b. Would the proposed project displace any existing recreational uses? If so, describe.

The proposed work would not permanently displace any existing recreational uses. Project construction activities would result in short-term temporary lane closures and detour impacts that would affect motor vehicles, walkers, runners, and bicyclists using Alki Ave SW and the adjacent sidewalks and trail.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

Temporary closures or detours affecting vehicle and pedestrian routes/access may be required. The project would attempt to make those closures and detours as brief as possible. Project notifications through website updates, emails, and mailings would provide affected residents with advance notice regarding temporary closures and detours. The completed project would maintain a more open, welcoming, and safe environment for pedestrians on and around the pump station site.

In addition, SPU will take the following measures to avoid or reduce projects impacts on recreation facilities and activities:

- Coordinate all project work affecting public streets, sidewalks, parks, and trails in advance with the SDOT and SPR
- Comply with required SDOT Street Use Permits issued for the project
- Ensure that safe pedestrian and bicycle routes are maintained at all times consistent with approved street use permits, and traffic control plans; and
- Place temporary project signs along affected streets and sidewalks prior to project construction to provide residents with advance notice regarding temporary street, sidewalk, and trail closures and detours.

13. Historic and Cultural Preservation

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers? If so, specifically describe.

There are numerous residential and commercial buildings over 45 years old located in the vicinity of the project site, most of which have not been evaluated for cultural/historic significance. However, aside from the proposed improvement to the pump station, no buildings or structures would be disturbed by the project. The project was checked against the registers listed in Item B.13.c below. None of these registers recorded any places or objects listed on, or proposed for, national, state, or local preservation registers located on or adjacent to the project site. The project site is approximately 2,200 feet southwest of the well-known historic location of Luna Park, an amusement park that operated from 1907 until 1913.

The project proposes to construct modifications and improvements at Pump Station 38, which was constructed in 1959, has not been substantially modified since that time, and has not been evaluated for its eligibility for listing in national, state, or local preservation registers. Likewise, the adjacent seawall has not been so evaluated. Based on SPU's review of historical construction drawings, a tongue-and-groove timber sheet pile seawall was installed in 1915 at approximately the current wall location. The timber sheet piles were embedded 4 to 6 feet below the native ground surface and 30-foot long inclined-timber pile anchors extending towards Alki Ave SW were installed every 10 feet along the length of the wall. Drawings from 1929 indicate the timber wall was replaced with a steel sheet pile wall; however, most of the original timber wall was to be left in place. The steel sheet piles were 18 feet long; 12-foot long inclined steel tie rods with anchor blocks were installed every 50 feet along the length of the wall. The tie rods were attached 6 inches below the top of the wall. Drawings from 1961 indicate a 12-foot tall concrete facing was added to the steel sheet pile wall.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

According to the information sources listed in Item B.13.c below, there are no such cultural resources at or near the project site. According to the Washington State Department of Archaeology and Historic Preservation's Landscape Predictive Model, the project site is in an area of Very High Risk for discovery of cultural resources. However, all ground disturbance and excavation would occur in existing street right-of-way and developed areas that have been disturbed previously in recent times by installation of underground utility infrastructure, roads, seawalls, and residential structures. The project site is also located in within a designated National Maritime Heritage Area. National heritage Areas are special places recognized by the U.S. Congress as having nationally important heritage resources and operated locally to benefit local communities and support local heritage organizations.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the Department of Archaeology and Historic Preservation, archaeological surveys, historic maps, GIS data, *etc.*

To determine if the project site is on or near properties listed, or documented to be eligible for listing, on federal, state, or local cultural/historical registers, the following registers were checked on July 1, 2021:

- Washington Information System for Architectural and Archaeological Research Data (WISAARD) maintained by the Washington State Department of Archaeology and Historic Preservation (https://wisaard.dahp.wa.gov/)
- King County and City Landmarks List maintained by the King County Historic Preservation Program, (https://www.kingcounty.gov/~/media/services/home-property/historic-preservation/documents/resources/T06_KCLandmarkList.ashx?la=en)
- Landmark List, and Map of Designated Landmarks, maintained by the City of Seattle, Department of Neighborhoods, accessed April 28, 2021 (http://www.seattle.gov/neighborhoods/programs-and-services/historic-preservation/landmarks/landmarks-map

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

The proposed work would not affect buildings or known cultural resources. Only portions of SPU's municipal wastewater system would be affected. None of those objects are considered historically or culturally important. Also, the proposed work is located on previously filled and disturbed upland areas. The work's location on previously disturbed and filled ground significantly reduces the chance of encountering contextually significant archaeological materials. An inadvertent discovery plan would be in effect and onsite during all ground disturbing activities. Work crews would be trained on the inadvertent discovery protocols should any archaeological material be discovered. Should evidence of cultural artifacts or human remains, either historic or prehistoric, be encountered during excavation, work in that immediate area would be suspended and the find would be examined and documented by a professional archaeologist. Decisions regarding appropriate mitigation and further action would be made at that time.

14. Transportation

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

The project would occur in existing, improved street rights-of-way for Alki Ave SW, which is classified by SDOT as a Minor Arterial. Construction would use Alki Ave SW to access the work site.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

The proposed project is not expected to impact public transit service. King County Metro Route 775 runs on Alki Ave SW. The nearest bus stop is located approximately 200 feet north of the project and would not need to be closed or relocated.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

Because the proposed work involves work in the street right-of-way, construction would require temporary closures of parking as well as travel lanes. Parking associated with street right-of-way is currently on-street, free parking (on the east side of Alki Ave SW only) managed by the City of Seattle. During construction, there may be no or restricted parking on the east side of Alki Ave SW. Project construction would temporarily eliminate up to approximately 15 on-street public parking spaces adjacent to the construction zone to accommodate contractor vehicles, mobilization, construction, and local and through access. Generally, however, there is ample on-street parking available elsewhere at the project site and most adjacent and nearby residences have their own off-street parking. The specific timing and duration of parking and lane closures are not known at this time, but such closures would comply with relevant policies administered by SDOT as part of its street use permitting process. SDOT would require the contractor to submit an approvable traffic control plan. The completed project would neither create nor eliminate parking spaces.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

The project would restore all demolished and damaged street panels, curbs, sidewalks, bike lanes, and traffic aprons to pre-construction conditions or better, as required by SDOT. No new permanent roads or streets would be constructed as part of the project.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

The proposed project would not use water, rail, or air transportation.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and non-passenger vehicles). What data or transportation models were used to make these estimates?

Project construction would generate an estimated 1,750 daily vehicle trips due to workers and materials being transported to and from the site during the estimated 225-working-day construction period. Most trips would occur during business hours (between 7 a.m. and 6 p.m.) on weekdays (Mondays through Fridays) but trips may occur at other times including weekend days. The completed project would not generate additional vehicle trips beyond those normally occurring for on-going and routine operation and maintenance of the municipal wastewater system in this area.

g. Will the proposal interfere with, affect, or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

The proposal would not interfere with, affect, or be affected by the movement of agricultural and forest products on roads or streets in the area.

h. Proposed measures to reduce or control transportation impacts, if any:

These measures would be used to reduce or control transportation impacts:

- SPU would require the construction contractor to submit a traffic control plan for approval and enforcement by SPU and SDOT.
- SPU would conduct public outreach before and during project construction to notify residents, local agencies, Seattle School District, Metro, and other stakeholders of work progress and expected disruptions or changes in traffic flow.
- Access for emergency-response vehicles would be maintained at all times.
- Through access and vehicle access to private properties may not be available at all times during construction, but temporary closures would be minimized, and detour routes would be properly and clearly signed.
- Alternative routes for pedestrians, bicyclists, and those with disabilities would be identified and clearly signed, as needed.

15. Public Services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

The proposed project is not expected to create an increased need for public services. The project would be required at all times to accommodate emergency access for buildings accessed via the affected streets. Emergency access would comply with relevant policies administered by SDOT as part of the Street Use permitting process.

b. Proposed measures to reduce or control direct impacts on public services, if any.

During construction, the project would be required at all times to accommodate emergency access for structures accessed via Alki Ave SW. The project would avoid impacting known buried utilities, which include electrical, communication, gas, water, and sewer infrastructure. No mitigation is being proposed because the project would have no adverse impacts on public services.

16. Utilities

a. Check utilities available at the site, if any:

☐ None
☒ Electricity ☒ Natural gas ☒ Water ☒ Refuse service
☒ Telephone ☒ Sanitary sewer ☐ Septic system
☒ Other: cable, fiber optics

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

During construction, this proposed work is not expected to interrupt, relocate, or reconstruct other utilities. However, inadvertent damage to underground utilities could occur during construction. While such incidents do not occur frequently, they could temporarily affect services to customers served by the affected utility while emergency repairs are made. No other interruptions to regular utility services are expected during construction. The completed project would enhance the life and serviceability of a critical wastewater facility and would continue to be owned, operated, and maintained by SPU and powered with electricity provided by SCL.

C. SIGNATURE

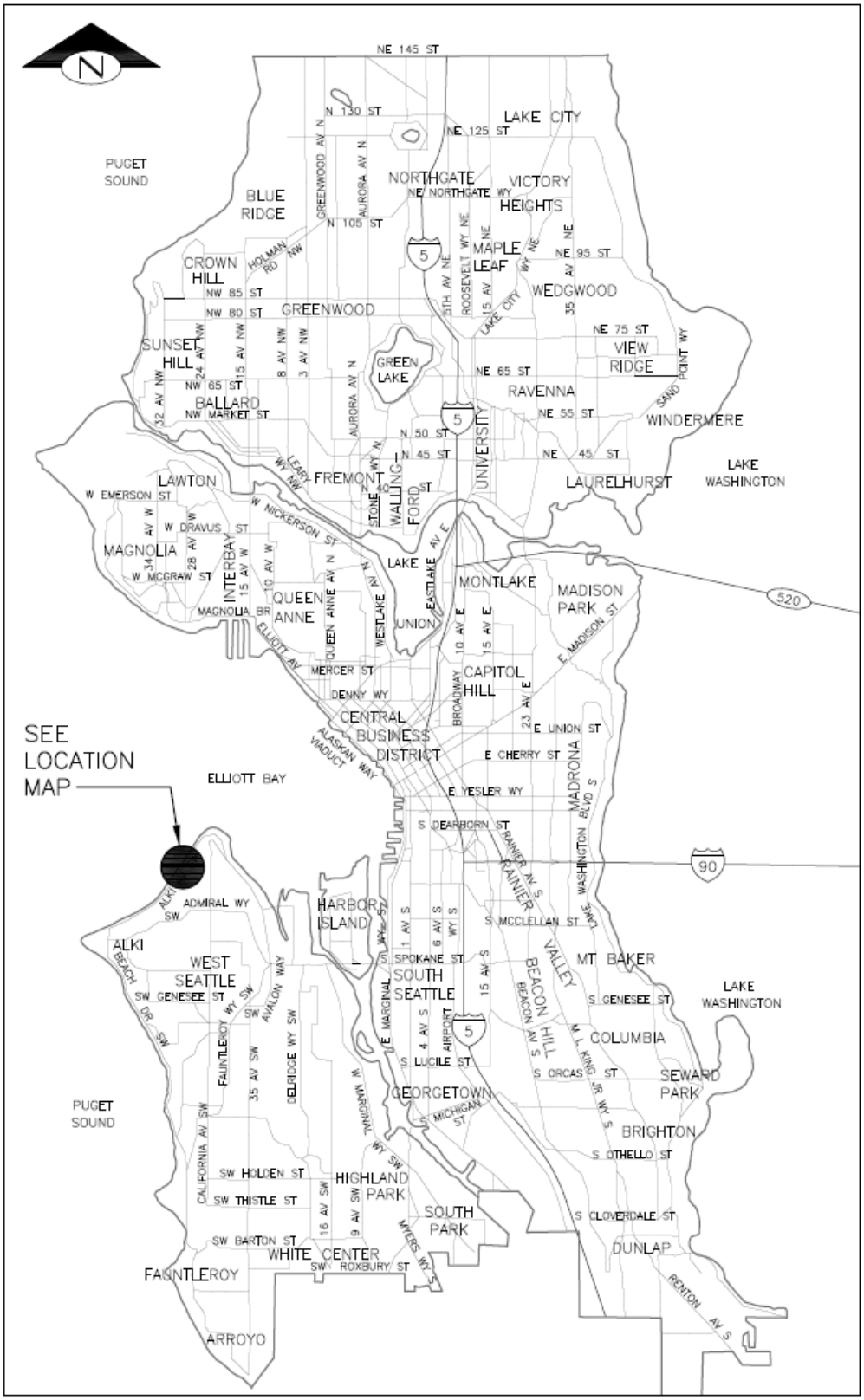
The above answers are true and complete to the best of my knowledge. I understand that the SEPA Lead Agency is relying on them to make its decision.

Signature: Jonathan Brown Digitally signed by Jonathan Brown Date: 2021.07.09 08:17:28 -07'00'

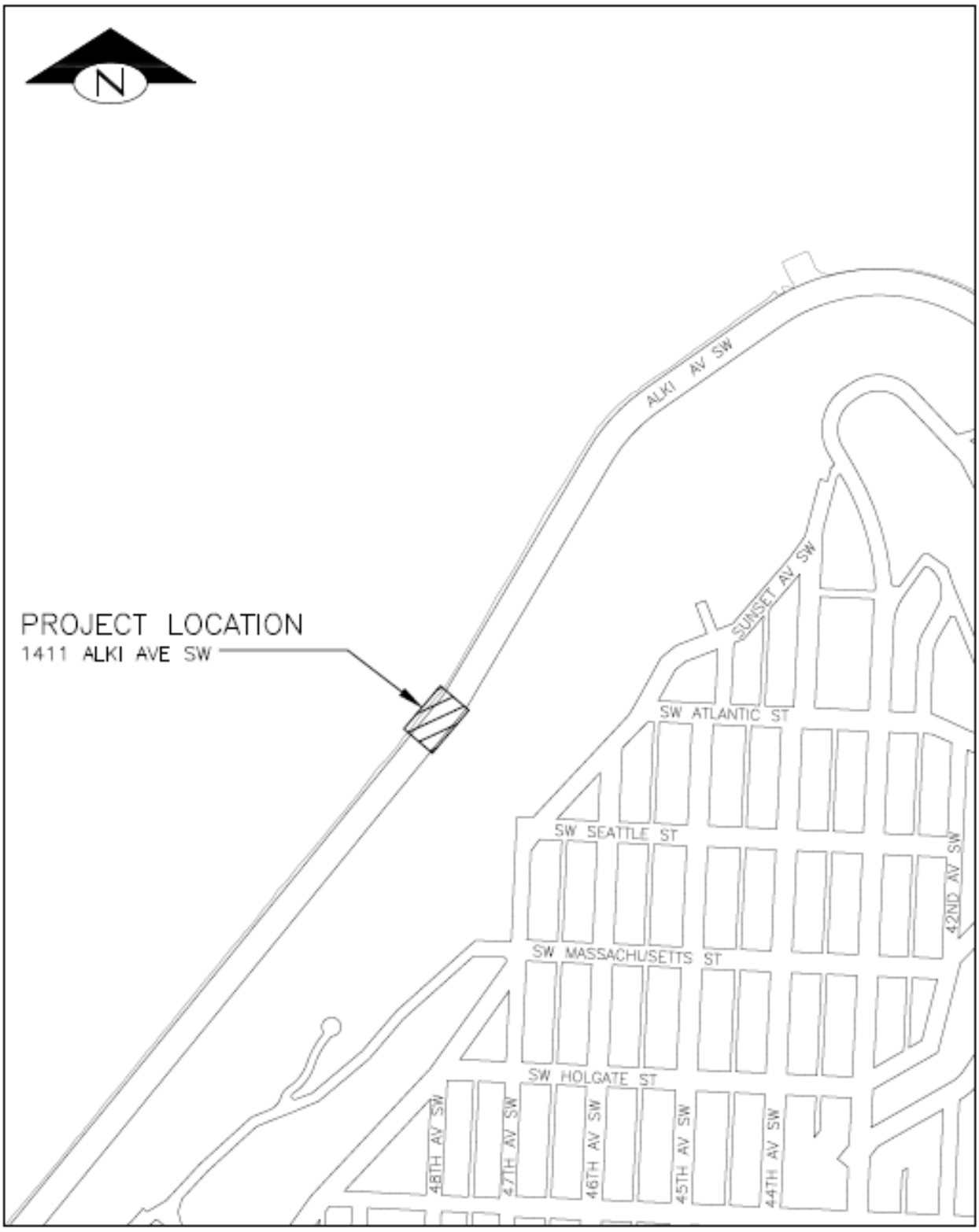
Jonathan Brown
Project Manager

Attachment A: Vicinity Map
Attachment B: Location Map
Attachment C: Greenhouse Gas Emissions Worksheet

Attachment A: Vicinity Map



Attachment B: Location Map



Attachment C: Greenhouse Gas Emissions Worksheet

54.8Section I: Buildings

			Emissions Per Unit or Per Thousand Square Feet ($MTCO_2e$)			
Type (Residential) or Principal Activity (Commercial)	# Units	Square Feet (in thousands of square feet)	Embodied	Energy	Transportation	Lifespan Emissions ($MTCO_2e$)
Single-Family Home	0		98	672	792	0
Multi-Family Unit in Large Building	0		33	357	766	0
Multi-Family Unit in Small Building	0		54	681	766	0
Mobile Home	0		41	475	709	0
Education		0.0	39	646	361	0
Food Sales		0.0	39	1,541	282	0
Food Service		0.0	39	1,994	561	0
Health Care Inpatient		0.0	39	1,938	582	0
Health Care Outpatient		0.0	39	737	571	0
Lodging		0.0	39	777	117	0
Retail (Other than Mall)		0.0	39	577	247	0
Office		0.0	39	723	588	0
Public Assembly		0.0	39	733	150	0
Public Order and Safety		0.0	39	899	374	0
Religious Worship		0.0	39	339	129	0
Service		0.0	39	599	266	0
Warehouse and Storage		0.0	39	352	181	0
Other		0.0	39	1,278	257	0
Vacant		0.0	39	162	47	0
					TOTAL Section I Buildings	0

Section II: Pavement

						Emissions ($MTCO_2e$)
Pavement (sidewalk, asphalt patch)						
Asphalt or Concrete Pad (50 $MTCO_2e$/1,000 sq ft of pavement at a depth of 6 inches)		(2,500 sq ft)				125
					TOTAL Section II Pavement	

Section III: Construction

	Emissions ($MTCO_2e$)
(See detailed calculations below)	
TOTAL Section III Construction	396.9

Section IV: Operations and Maintenance

	Emissions ($MTCO_2e$)
(See detailed calculations below)	
TOTAL Section IV Operations and Maintenance	0

TOTAL GREENHOUSE GAS (GHG) EMISSIONS FOR PROJECT ($MTCO_2e$)	521.9

Attachment C: Greenhouse Gas Emissions Worksheet, continued

Section III Construction Details		
Construction: Diesel		
Equipment	**Diesel (gallons)**	**Assumptions**
Front-end Loaders/Excavators (2)	31,500	2,250 hours x 7 gallons/hour x 2 (345 hp engine)
Dump Truck (17 CY capacity)	20	10 round trips x 10 miles/round trip ÷ 5 mpg
Flat-bed Truck	120	30 round trips x 20 miles/round trip ÷ 5 mpg
Drum Compactor	50	100 hours x 0.5 gallons per hour
Concrete Truck (10 CY capacity)	40	10 round trips x 20 miles/round trip ÷ 5 mpg
Subtotal Diesel Gallons	31,730	
GHG Emissions in lbs CO_2e	842,431.5	26.55 lbs CO_2e per gallon of diesel
GHG Emissions in metric tons CO_2e	382	1,000 lbs = 0.45359237 metric tons

Construction: Gasoline		
Equipment	**Gasoline (gallons)**	**Assumptions**
Pick-up Trucks or Crew Vans	1,350	225 working days x 3 trucks x 2 round-trip/day x 20 miles/ round trip ÷ 20 mpg
Subtotal Gasoline Gallons	1,350	
GHG Emissions in lbs CO_2e	32,805	24.3 lbs CO_2e per gallon of gasoline
GHG Emissions in metric tons CO_2e	14.9	1,000 lbs = 0.45359237 metric tons

Construction Summary		
Activity	**CO_2e in pounds**	**CO_2e in metric tons**
Diesel	842,431.5	382
Gasoline	32,805	14.9
Total for Construction	875,236.5	**396.9**

Section IV Long-Term Operations and Maintenance Details		
Operations and Maintenance: Diesel		
Equipment	**Diesel (gallons)**	**Assumptions**
Subtotal Diesel Gallons	0	
GHG Emissions in lbs CO_2e	0	26.55 lbs CO_2e per gallon of diesel
GHG Emissions in metric tons CO_2e	0	1,000 lbs = 0.45359237 metric tons

Operations and Maintenance: Gasoline		
Equipment	**Gasoline (gallons)**	**Assumptions**
Subtotal Gasoline Gallons	0	
GHG Emissions in lbs CO_2e	0	24.3 lbs CO_2e per gallon of gasoline
GHG Emissions in metric tons CO_2e	0	1,000 lbs = 0.45359237 metric tons

Operations and Maintenance Summary		
Activity	**CO_2e in pounds**	**CO_2e in metric tons**
Diesel	0	0
Gasoline	0	0
Total Operations and Maintenance	0	**0**