SEATTLE PUBLIC UTILITIES
SEPA ENVIRONMENTAL CHECKLIST

This SEPA environmental review of Seattle Public Utilities' Delridge Natural Drainage System (NDS) Project (a.k.a. Delridge Roadside Raingardens 2015) 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:

Delridge Natural Drainage System (NDS), also known as Delridge Roadside Raingardens 2015.

2. Name of applicant:

Seattle Public Utilities

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

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4. Date checklist prepared:

October 15, 2014

5. Agency requesting checklist:

Seattle Public Utilities (SPU)

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

Construction is planned to begin before October 31, 2015, with substantial completion in 2016. The project is anticipated to require approximately 150 working days, and there would not be any contractually required phasing. The Contractor may propose phasing for SPU to review and approve.

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

The City of Seattle Department of Transportation (SDOT) plans to build Neighborhood Greenways (NG) in the Delridge neighborhood in West Seattle. In coordinating capital improvements, SPU and SDOT identified SPU's proposed Delridge NDS Project as a partnering opportunity to co-locate NG and Green Stormwater Infrastructure (GSI) along approximately 17 blocks in the Delridge area. NG are residential streets with low volumes of auto traffic and

low speeds, where bicyclists and pedestrians are given priority. NG often include traffic calming techniques and support increased planting and tree canopy to create a more welcoming and pleasant environment for NG users. Both of these characteristics can be enhanced by locating GSI infrastructure along NG routes. SPU's Delridge NDS project focuses GSI improvements along NG routes to capitalize on these synergies. SDOT plans to begin NG construction along these streets after construction of SPU's Delridge NDS project is complete.

Regular operation and maintenance of the proposed facilities would include on-going monitoring of surface water discharges and maintenance of vegetation. SPU does not have any plans for other future capital project additions related to this project.

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

Associated Earth Sciences, Inc. 2014 (August 29). Geotechnical Report For 30% Street Improvement Permit (SIP) Submittal, Delridge Natural Drainage Systems, Seattle, Washington.

CM Design Group. 2013 (September). Draft Delridge Natural Drainage Solutions Parking Study.

HRA, Inc. 2014 (April). Archaeological Survey for SPU's Delridge Natural Drainage Systems Project, City of Seattle, King County, Washington. [Final Report.]

SPU. 2013 (June, revised August). Geotechnical Report for Delridge Natural Drainage Solutions 2015, Seattle, Washington.

SvR Design Company. 2013 (November 11). Draft Delridge Natural Drainage Solutions 2015 Options Analysis—Basis of Design. [Preliminary working draft report.]

Troost, K.G., D.B. Booth, A.P. Wisher, and S.A. Shimel. 2005. Geologic map of Seattle. U.S. Geological Survey Open File Report 2005-1252. http://pubs.usgs.gov/of/2005/1252/of2005-1252.pdf

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.

There are no known applications pending for governmental approvals of other proposals directly affecting the property covered by this proposal.

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

Permits and approvals that may be required for this proposed project include:

City of Seattle:
- Street Use Permit (for construction in public right-of-way)
- Street Improvement Permit
- Side Sewer Permit

King County:
- Industrial Waste Discharge Permit
- Puget Sound Air Pollution Control Agency Notice of Construction

Washington State Department of Ecology (Ecology):
- National Pollutant Discharge Elimination System (NPDES) Stormwater General Permit
- Underground Injection Control Well Registration(s)

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.

The City of Seattle's wastewater collection system includes separate, partially separated, and combined sewer areas. In separate sewer areas, stormwater runoff flows to a storm drainage system, while sanitary sewage and industrial wastewaters are conveyed through sewers to regional wastewater treatment facilities owned and operated by King County. In the partially separated areas of the City, storm drain separation projects were built during the 1960s and 1970s to divert street runoff to the storm drainage system while allowing rooftop and other private property drainage to continue flowing into sewers.

In the combined sewer areas of the City, sewage, industrial wastewater, and stormwater are conveyed in combined sewers to King County's combined sewer system and wastewater treatment facilities. During storm events, the quantity of stormwater runoff flowing into the wastewater collection system sometimes exceeds capacities of the partially separated and combined sewer systems. When this happens, the wastewater collection system overflows at outfall structures designed for this purpose. There are currently 87 outfalls in the City of Seattle where combined sewer overflows (CSOs) can occur.

To comply with State and Federal requirements for combined sewer systems, SPU must limit CSOs to not more than one discharge event per year per outfall [WAC 173-245-020(22)]. This requirement is reiterated in (a) SPU's National Pollutant Discharge Elimination System (NPDES) permit (Permit No. WA0031682, issued on October 27, 2010 and modified on September 13, 2012) and (b) the City's wastewater consent decree (Civil Action No. 2:13-cv-678, entered in U.S. District Court on July 3, 2013).

The Delridge area is a combined sewer area with two outfalls that discharge into Longfellow Creek, a tributary of the Duwamish Waterway. To limit CSOs from these outfalls to not more than one per year per outfall, SPU has designed a project (the Delridge CSO Retrofit Project, for which a SEPA environmental review was completed in November 2013) that would retrofit the existing combined sewer system to make fuller use of existing system storage capacity. SPU's NPDES permit includes a requirement to complete the Delridge CSO Retrofit Project by November 1, 2015. Once completed, the Delridge Retrofit Project would increase flows to King County's combined sewer system by approximately 2.73 million gallons per year (MG/yr).

SPU's Delridge NDS Project was developed condition to reduce the downstream impacts of the Delridge Retrofit Project on the King County combined sewer system and to provide additional assurance that the Delridge CSO outfalls would meet the state and federal performance standard. SPU estimates the proposed project would reduce the amount of stormwater reaching the City's combined sewer system by 4.37 MG/yr.

The primary goal of the Delridge NDS Project is to reduce stormwater runoff and CSO events in the Delridge area by receiving and infiltrating, evaporating, and retaining stormwater runoff from roadways, sidewalks, driveways and some roofs by constructing and maintaining roadside raingardens—a GSI technique. This project presents additional opportunities to leverage these multiple benefits that natural drainage solutions can provide—in addition to CSO reduction—by overlapping with SDOT's proposed NG routes and community goals for improving their neighborhood.

Specifically, the Delridge NDS Project would design and construct infiltrating raingardens (bioretention cells) along up to 17 blocks (one block equals approximately 330 feet) (Attachment B). Those raingardens would be located primarily within existing planting strip areas located within City street rights-of-way. The existing planting strips would be converted from landscaped, lawn, or impervious areas to vegetated bioretention cells and upland planting areas.

Flow reduction and water quality treatment would be provided through a combination of bioretention (raingarden) facilities and deep infiltration. All raingardens would receive stormwater runoff from pollution generating impervious surfaces and would be designed with 18 inches of bioretention soil to provide water quality treatment. Cross sections of proposed bioretention facilities would be based on the widths of existing plantings strips and in some locations additional width provided at curb bulbs.

Bioretention facilities are designed with either side slopes or vertical walls. Side slopes are preferred as they create a softer edge along sidewalks and on-street parking; however, vertical walls are used as necessary to achieve performance goals for flow reduction and water quality treatment. On the proposed project, raingardens would have a vertical wall on the sidewalk side, a flat bottom, and a side slope (2.5 horizontal: 1 vertical) on the road side.

The proposed project includes two general types of raingarden designs: 1) Planting Strip Raingardens (see figure in Attachment C); and 2) Curb Bulb-out Planting Strip Raingardens (see figure in Attachment D). The Curb Bulb-out design typically would be used for traffic calming and improved pedestrian and bicyclist sightlines at select locations. The curb bulb-out raingardens typically would be used near intersections and would be sized to minimize or avoid loss of legal parking. All raingardens would be located to avoid existing driveways, historic/significant trees (if any), hydrants, and utilities where possible. Only the Planting Strip Raingardens would incorporate a passenger loading (parking egress) area.

Inlet curb cuts would be installed to route stormwater flow from the roadway gutter to the raingardens. Outlet curb cuts would be installed on the downstream end of the raingardens to provide conveyance of excess flows (during high flow events) via roadway gutter to the nearest down-gradient existing combined sewer inlet.

Based on results of continuing geotechnical analyses, some or all of the raingardens may be constructed using underdrains and geotechnical liners that would direct collected water to pit drains (up to 12 feet deep for shallow infiltration); vertically drilled drains (25 to 35 feet deep for medium deep infiltration); or gravity-driven underground injection control wells (UICs) (35 to 80 feet deep for deep infiltration). Pit drains are shallow, vertical drains constructed by digging a hole through naturally layered or interbedded sediments and then backfilling the excavation with free-draining materials such as pea gravel. UIC wells would not be used unless pit drains and drilled drains are found to be infeasible (as determined by on-going geotechnical analysis and groundwater monitoring).

In addition, the project would construct pedestrian and safety improvements such as curb ramps where required. Certain utilities such as side sewers and natural gas mains may need to be relocated or replaced during construction.

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.

This project is located within the Delridge neighborhood of the City of Seattle, King County, Washington, and is located entirely within improved street rights-of-way (generally 60 feet wide) in existing 10 to 12 foot wide planting strips and adjacent parking lanes. The project is located within Section 31, Township 24N and Range 4E, and Section 36, Township 24N and Range 3E. The project would construct infiltrating roadside raingardens along up to 17 blocks (one block is equal to approximately 330 feet). The following blocks may be affected:

- 17th Avenue Southwest: 7900, 8100, 8400, 8600, 8800 blocks
- Southwest Henderson Street: 1600 and 1700 blocks
- Southwest Trenton Street: 1600 block
- Southwest Cloverdale: 1600 block
- Southwest Thistle Street: 1600 block
- Southwest Elmgrove Street: 1600 block
- Southwest Kenyon Street: 1500 and 1600 blocks

The project may also construct pedestrian and safety improvements (such as curb ramps) at the intersection of 16th Avenue Southwest and Southwest Kenyon Street.

Attachments A and B provide maps of the proposed block locations and street intersections. Neither the specific intersection improvements nor the number, location, and design of the raingardens has been finalized.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site: *[Check the applicable boxes]*

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

The Delridge NDS project location is situated on a glaciated upland. The upland is bordered on the east by the Duwamish River Valley and to the west by the shallow valley occupied by Longfellow Creek and surrounding residential and commercial development. The upland continues to the north and south of the project location. Upland topography generally consists of low hills and shallow valleys elongated in the north-south direction. The ground surface in the project area reaches a maximum elevation of about 380 feet at the south end of the project area; the lowest elevation in the project location is about elevation 330 feet at the north end of the project location.

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

Elevations and slopes within the project area vary significantly and small areas of steep slopes are located to the east and west near (but not within) the project location. Slopes in the project location range from less than 1 percent to not more than 10 percent.

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 any of these soils.

The general geologic setting of Seattle is a result of glacial and non-glacial activity occurring over the course of many millennia. The most recent and extensive glacial activity in the Puget Sound area was the Vashon stade of the Fraser continental glaciation that occurred between around 15,000 and 10,000 years ago. Deposits preceding the Fraser glaciation include both glacial and non-glacial materials that have been overridden by subsequent glacial advance and retreat. As a result, these deposits tend to be very dense and highly consolidated (compacted).

During the most recent glacial advance, meltwater channels flowing from the toe of the glacier transported and deposited well-sorted sands and gravels ahead of the advancing glacier. These advance outwash deposits were subsequently overridden and consolidated (compacted) under the advancing ice-sheet. In a typical glacial deposition sequence, advance outwash coarsens upwards to glacial till. Glacial till (a mix of poorly sorted silt, sand, and sub-rounded to well-rounded gravels and cobbles) is transported by the glacier and deposited under the ice (as lodgment till). The glacial till deposits are very dense to over-consolidated (compacted). During glacial retreat, recessional outwash deposits characterized by moderately to well-sorted sands and gravels were transported by glacial meltwater and deposited in outwash channels. Finer silts and clays often accumulated adjacent to recessional lakes. These deposits were not overridden by glacial ice and are not over-consolidated.

Review of the surficial geologic map of Seattle (Troost, et al. 2005) indicates the project location is generally underlain by Vashon glacial till deposits. Recessional outwash and lacustrine deposits are mapped to a lesser extent to the south. Advance outwash deposits are mapped to the west.

SPU (2013) provides a more detailed review and analysis of the geologic and hydrogeologic conditions of the project location. Existing information and subsurface exploration conducted by SPU (2013) and others indicate a thick sequence of unsaturated regionally extensive permeable Vashon advance outwash sand is present beneath the low-permeability Vashon glacial till (lodgment till) and underlies the entire project area. Depths to advance outwash may range between 15 and 20 feet, which eliminates the feasibility of shallow infiltration (for purposes of GSI). However, the thick unsaturated Vashon advance outwash has capacity to infiltrate treated stormwater runoff via drilled drains and/or UIC wells, allowing collected stormwater to slowly infiltrate downward to the regional Vashon advance aquifer located at the base of the Vashon advance outwash stratum.

All of these naturally deposited geologic strata are typically overlain by shallow to deep layers of fill materials placed or created during previous development of the project location into a residential neighborhood. Most of the project area has been developed into a moderate- to high-density residential neighborhood. As a result, virtually all of the project location has been disturbed by previous grading and filling associated with the construction of streets and buildings. There are no agricultural soils.

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

There are no surface indications or history of unstable soils in the vicinity.

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.

This project would disturb approximately 0.81 acres of land as a result of excavation, grading, and filling during clearing, grading, and construction of underground utilities, roadway improvements, and the new raingardens. Approximately 3,500 cubic yards of material would be excavated for roadway features, drainage structures and pipe, and raingardens. Approximately 2,800 cubic yards of mineral aggregates, landscape soils, borrow materials, bioretention soils, and backfills for pipe and utilities would be imported as fill material. Fill materials would be obtained from a commercial purveyor of such materials, licensed and permitted by the State of Washington. Excavated materials would be exported off the project and either reused on other projects or disposed of in an approved upland disposal location per the construction contract requirements.

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

Erosion and sedimentation could occur as a result of this project, although the risk is very low because the project area is relatively flat. In addition, no filling would take place in or near watercourses or wetlands and best management practices (BMPs) would be used to protect the existing stormwater drainage system and minimize off-site drainage. Also, all work would be required to be performed with an approved construction erosion and sedimentation control plan (CESC), while also meeting NPDES stormwater permit requirements.

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

The project would construct approximately 0.5 acres of new and replaced impervious surface. Of that amount, 0.04 acres would be pollution-generating impervious surface (subject to vehicular traffic). A breakdown of pre-project and post-project surfaces within the project limits is included in this table:

	Pre-Project (acres)	Post-Project (acres)	Project Contribution (new/replaced surfaces) (acres)
Impervious Surface within Project Limits	3.51	3.47	0,5
Pollution-Generating Portion of Impervious Surface within Project Limits	3.29	3.21	0.04
Pervious Surface within Project Limits	1.83	1.87	0.31

Overall, the project would decrease total impervious surface by 0.04 ac (approximately 1742 square feet) primarily because the project would opportunistically remove impervious surfaces and replace those with pervious surfaces such as turf or landscaping. The project would reduce pollution-generating impervious surfaces by about 3,485 square feet. The project would meet the City of Seattle's water quality and retention requirements for any increase or replacement of impervious area.

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

The project would develop and implement a CESC plan with BMPs appropriate to the site, conditions, and activities. Work would be monitored, maintained, and adjusted as necessary to meet changing conditions and to meet requirements of the NPDES permit.

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.

Construction equipment could include hand-held power tools, gasoline and diesel-powered compressors and generators, and gasoline and diesel-powered vehicles to remove existing roadway infrastructure and build the new roadway improvements. Due to the combustion of gasoline and diesel fuels, these tools would generate greenhouse gas emissions (GHG) such as oxides of nitrogen, carbon monoxide, particulate matter and smoke, uncombusted hydrocarbons, hydrogen sulfide, carbon dioxide, and water vapor. Other emissions during construction could include dust and exhaust from construction vehicles. These effects are expected to be localized, temporary and minimized.

The project would produce GHGs in three ways: embodied in materials to be installed on the project; through construction activity (especially as described above); and within regular operation, maintenance, and monitoring activities throughout the life of the facility. The new raingardens are expected to capture and accumulate biomass (organic matter); however, the mass of carbon sequestered by the raingardens during their anticipated 50 year lifespan is not estimated here or otherwise considered in this environmental analysis.

Total GHG emissions for the project are estimated to be 2,860 metric tons of carbon dioxide emission (MTCO2e). The GHG emissions calculations are shown in Attachment E and summarized in the table below. One metric ton is equivalent to 2,205 pounds.

The project would demolish and remove existing concrete surfaces as well as install new concrete structures and surfaces. The estimated volume of new concrete is approximately 883 cubic yards, which embodies approximately 2,384 MTCO2e.

The project would generate GHG emissions during construction through the operation of diesel- and gasoline-powered equipment, and in the transportation of materials, equipment, and workers to and from the site. Estimates provided here are based on assumptions for typical numbers of vehicle operations to execute the work, see Attachment E for more information. Construction activities would generate an estimated 457 MTCO2e.

The project would also generate 19 MTCO2e of GHG emissions through the operation, maintenance, and monitoring of the constructed project, based on an assumed 50 year life expectancy for the raingardens.

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	5,256,720	2,384
Construction Activities (Diesel)	912,258	414
Construction Activities (Gasoline)	94,770	43
Long-term Maintenance (Diesel)	22,302	10
Long-term Maintenance (Gasoline)	19,440	9
Total GHG Emissions	6,305,490	2,860

[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 off-site sources of emissions or odors that would affect the proposed project. The neighborhood is fully developed as single family residential.

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 federal, state, and local emission control criteria and City of Seattle construction practices. These would include requiring contractors to use best management practices for construction methods, proper vehicle maintenance, and minimizing vehicle and equipment idling.

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.

There are no surface water bodies on or near this project location. The Duwamish Waterway is more than 7,000 feet to the east of the project location. Longfellow Creek is located in a valley approximately 1,500 feet west of the project area.

(**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 are no surface water bodies adjacent to or within 200 feet of this project location.

(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 fill or dredge material would be placed in or removed from surface waters or wetlands.

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

One project goal is to mimic natural pre-urbanization (that is, forested) hydrologic conditions as much as possible by infiltrating clean, treated surface water (stormwater) into the ground. Therefore, this project would not require surface water withdrawals or diversions in the traditional sense. The project would treat stormwater by removing sediment and pollutants. That treated stormwater would then be directed to the ground through the raingardens and associated pit drains, drilled drains, and/or UIC wells, providing recharge to the aquifer(s) within the Vashon advance outwash. Such recharge is expected to provide a clean source of additional groundwater that supports baseflows and groundwater discharges in water bodies (such as Longfellow Creek) downstream of the project area. Stormwater flows that exceed the capacity of the raingardens would bypass the raingardens and be conveyed to the combined sewer system.

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

The project does not lie 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 project 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.

The project location is generally characterized as having two groundwater systems: a surficial and shallow interflow and perched water zone located within the glacial till near the ground surface; and a relatively deep regional aquifer contained within the Vashon advance outwash stratum. The shallow groundwater is contained within recessional deposits and is generally perched on underlying low-permeability lodgment till deposits. Recharge there is primarily from rainfall; water levels can rise rapidly in response to rainfall events. During wet weather months, groundwater accumulates, or perches, on top of relatively impermeable layers (such as glacial till, in this case) located near the ground surface. Perched groundwater conditions can result in reduced infiltration capacities and in some cases can fill infiltration facilities (such as raingardens) with groundwater.

Geotechnical and groundwater investigations identified such seasonally perched and localized groundwater at depths of 3 and 10 feet below the ground surface (bgs) in portions of the project location. This is why some or all of the proposed raingardens may be constructed using underdrains and geotechnical liners that would direct collected water to pit drains, vertically drilled drains, and/or UIC wells. Based on the project's groundwater studies, the unsaturated portions of the regional aquifer (located within the sandy advance outwash under glacial till and discussed below)

are considered capable of providing sufficient infiltration capacity to accept treated stormwater.

A relatively deep regional, unconfined aquifer system is formed in the basal portion of the Vashon advance outwash sediments. The base of the aquifer is confined by older low-permeability, pre-Fraser-age deposits. The regional groundwater table is commonly found at a depth of 50 to more than 100 feet below ground surface (bgs). A thick sequence of unsaturated regionally extensive permeable Vashon advance outwash sand (approximately 50 to 85 feet thick) lies above the upper elevation of this regional aquifer. Groundwater flow direction beneath the project location is interpreted to be generally to the west, with a component of groundwater beneath the northern portion of the project draining west-northwest toward Longfellow Creek valley and the Southwest Orchard Street ravine. A component of groundwater beneath the southern portion of the project location is presumed to drain to the west-southwest. Flows are interpreted to primarily discharge in the subsurface below the Longfellow Creek valley and as springs in the Orchard Street ravine.

Groundwater would not be withdrawn as part of this project or its construction. However, the project would direct stormwater runoff to the raingardens for treatment, after which it would be discharged to groundwater via infiltration and pit drains; vertically drilled drains; or UIC wells. A project goal is to replicate as closely as possible the natural hydrology of the area prior to urbanization, thus providing clean and steady baseflows to downstream creeks and other water bodies for purposes of sustaining aquatic environments. Volumes or precise directions of flow of the infiltrated water are not known.

(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 into ground water from 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.

Sources of stormwater runoff include upstream neighborhood streets, sidewalks, driveways and impervious areas, including privately owned rooftops and paved areas. Stormwater runoff in the roadway rights-of-way on these blocks generally flows southerly via gutters on both sides of the street to combined sewer system inlets located at the downstream end of each block. The project includes new facilities to intercept and direct stormwater to the raingarden systems for treatment, retention, and discharge to groundwater via infiltration and pit drains, vertically drilled drains, or UIC wells. Inlet curb cuts would be installed in all raingardens to route stormwater flow from the roadway gutter to the raingardens. Outlet curb cuts

would be installed on the downstream end of the raingardens to allow excess stormwater to flow by gravity and via roadway gutter to the nearest existing combined sewer inlet. Existing drainage patterns are therefore maintained during peak storm conditions. During non-peak storm conditions, stormwater would infiltrate into soils and/or pit drains under the raingardens. No flows would discharge directly to any surface waters or other bodies of water.

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

This project would not generate waste materials that could enter groundwater or surface waters. Turbidity resulting from construction would be managed by developing and implementing a CESC plan with BMPs appropriate to the site, conditions, and activities. Work would be monitored, maintained, and adjusted as necessary to meet changing conditions and to meet requirements of the stormwater NPDES permit.

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

The proposed project would not alter surface drainage patterns in the project location. During non-peak storm conditions, the project would capture volumes of stormwater currently flowing along this drainage system and infiltrate that stormwater into soils and/or pit drains, drilled drains, or UIC wells associated with the raingardens.

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

A key goal of this project is to provide water quality treatment in a highly developed, urbanized basin where no stormwater drainage or treatment facilities currently exist. Typical construction methods are anticipated and no adverse impacts to surface or ground waters are expected. BMPs, as identified in the City of Seattle's Stormwater Code SMC 22.800 through 22.808, Director's Rule: 2009-004 SPU/16-2009 Department of Planning and Development (DPD), and Volume 2 Construction Stormwater Technical Requirements Manual would be used to control erosion and sedimentation during construction. The project would develop and implement a CESC.

SPU is aware of a higher occurrence of drainage related issues (such as seeps or wet basements) along 18th Avenue Southwest and along Southwest Trenton Street. Some of SPU's subsurface geotechnical exploration (along Southwest Trenton Street and Southwest Kenyon Street) encountered shallow ground water. However, because the project would collect stormwater and direct it to the deeper regional aquifer, the project is not expected to exacerbate soil saturation in surficial soils or geologic layers that may led to drainage issues such as localized seeps or wet basements. Based on the project's groundwater studies, the regional unsaturated portions of the regional aquifer (located within the advance outwash under glacial till) are considered capable of providing sufficient infiltration capacity to accept the treated stormwater.

4. Plants

a. Types of vegetation found on the site: *[check the applicable boxes]*

☒ Deciduous trees: ☐ Alder ☒ Maple ☐ Aspen ☒ Other: various species of native and non-native ornamental trees such as crabapples (*Malus* hybrids); cherries (*Prunus* species and hybrids, maples (*Acer* species and hybrids), serviceberry (*Amelanchier* species and hybrids), and redbuds (*Cercis canadensis*).
☒ Evergreen trees: ☒ Fir ☒ Cedar ☒ Pine ☒ Other: various species of native and non-native ornamental trees
☒ Shrubs
☒ Grass (turf and weeds)
☐ 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: (identify)
☐ Other types of vegetation:

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

The right-of-way consists mostly of impervious surfaces, including concrete road with curb and gutter, sidewalk, and driveway aprons. The remaining area, which includes the planting strips and the thin section of land between the back of sidewalk and right-of-way boundary, is pervious (i.e., lawn, landscape, and/or trees). Adjacent private parcels consist mostly of impervious surfaces (i.e., roofs, driveways, patios), with pervious areas covered by lawn, landscaping, and trees. Publicly and privately planted street trees are located sporadically within the right-of-way landscape, with few areas of same-species continuity.

Some of the raingarden locations may conflict with existing street trees, none of which meet the definition of an exceptional tree as defined by SMC Chapter 25.11 and DPD Director's Rule 16-2008. In those cases where there would be a conflict, smaller trees may be transplanted to other areas of the street right-of-way or to a private parcel. If a street tree is not transplanted or dies after being transplanted, then replacement trees would be installed on a two-for-one basis.

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 (WDNR) Natural Heritage Program's document called "Sections that Contain Natural Heritage Features, Current as of March 1, 2013" (accessed at www.dnr.wa.gov), there are no documented occurrences of sensitive, threatened, or endangered plant species in this Section. No federally-listed endangered or threatened plant species or State-listed sensitive plant species are known to occur within the municipal limits of the City of Seattle. The project location has been intensively disturbed by development and redevelopment over the last 80 years. The project area has been extensively excavated, filled, paved, or occupied by street and other built structures. 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:

The project would limit plant removal, pruning, and other disturbance to that required for project construction. Construction limits would be clearly and physically delineated by protective construction fencing to prevent unauthorized trespass and collateral damage to nearby vegetation. The project would also replant the right-of-way both within the raingardens and the planting strip between the sidewalk and curb.

An undetermined number of street trees may need to be removed or may not survive transplantation. However, twice that number of replacement trees would be planted as required by City of Seattle Tree Protection provisions, including Executive Order 03-05 (2005; Clerk File #307611) directing City departments to replace every tree removed from City property with two new trees.

The raingardens would also contain a variety of small trees and low-growing species of grasses, shrubs, bulbs, and perennials to perform the bioretention and water quality treatment functions. Landscape plant selections for both raingardens and planting strips are made using templates from SPU's and SDOT's GSI program and SDOT lists of permissible trees and plantings allowed in the right-of-way. Typically, plant selections are subsequently adjusted using input from private landowners adjacent to the project.

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

No noxious weeds or invasive species are known to be on or near the 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: *[check the applicable boxes]*

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

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

No such species are known to be present on or near the project location—based on a check of the Washington Department of Fish and Wildlife's "Priority Habitat Species on the Web" database on August 28, 2014. The project location 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.

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

Seattle is located 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. The Duwamish Waterway is more

than 7,000 feet to the east of the project location. Longfellow Creek is located in a valley approximately 1,500 feet west of the project area. Both areas are important water migration routes for many animal species.

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

The project would increase the number, diversity, and character of plantings within the public right-of-way, both within the raingardens and planting strips. These additional plantings of low-growing plants, shrubs, small trees, and public street trees would increase habitat available for wildlife, providing refuge and new food sources.

The project would also minimize disturbance areas and use BMPs identified in the City of Seattle's Stormwater Code (SMC 22.800 through 22.808 and Director's Rule 2009-004 SPU/16-2009 DPD) and Construction Stormwater Control Technical Requirements Manual (Volume 2) to generally protect fish and wildlife and manage stormwater. For example, equipment used for construction activity would be cleaned and inspected before it arrives at the project location to avoid and minimize potential for fuel or lubricant leaks.

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

No such species are known to be present on or near the project site.

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 completed project would not require any grid-based electrical energy to operate.

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

The proposed project does not involve building structures or planting vegetation that would block access to the sun for adjacent properties. SPU has coordinated the project's landscape design with individual, adjacent property owners to avoid and minimize impacts to solar energy reaching possibly affected residences.

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:

There are no conservation features or proposed measures to reduce or control energy impacts because there would be no such impacts.

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 as a result of either equipment failure or worker error. Though highly unlikely and not expected at this location, contaminated soils, sediments, or groundwater could also be exposed during excavation. If disturbed, contaminated substances could expose construction workers and potentially other individuals in the vicinity through blowing dust, stormwater runoff, or vapors.

The project's raingardens would provide water quality treatment and bioretention for urban stormwater runoff. Roadway contaminants found in runoff could be expected to accumulate within raingarden soils, although recent scientific studies have asserted that many contaminants actually bind with organic matter within the amended biofiltration soil and plant material and then undergo transformation. Stormwater discharged to the deep regional aquifer would be treated prior to discharge by passing through the biofiltration media and plantings within the raingardens—which meets Ecology's requirements for such discharge methods. No waste material would be discharged to ground water for this project. While any contaminants or their concentrations are not expected to be significant health hazards, the raingardens are designed to discourage recreational use. Additionally, soils in the raingardens are expected to be removed and replaced at the end of their life span (estimated at 50 years, depending on actual flow and pollutant accumulations).

Completed raingardens could also attract mosquitoes and water-loving insects. However, the proposed raingardens are designed to minimize this in two ways: 1) raingardens are designed to have flowing water, which does not support mosquito breeding; and 2) after storm events, the raingardens are designed to drain in less than 72 hours, which is prior to the minimum of 72 hours of standing water required for mosquito larval development.

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

There are no known contamination issues at the project location. The project location does not have a history of industrial or commercial uses that might suggest there could be potential contamination.

(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.

The construction contractor would be required to develop and implement a spill control plan to control and manage spills during construction. During construction, the contractor would use standard operating procedures and BMPs, as identified in the City of Seattle's Stormwater Code SMC 22.800-22.808, Director's Rule: 2009-004 SPU/16-2009 DPD, and Volume 2 Construction Stormwater Control Technical Requirements Manual to reduce or control any possible environmental health hazards. Any soils contaminated by spills 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.

As required by the Washington Department of Labor and Industries (WAC 296-843), a Health and Safety Plan would be prepared by SPU or SPU's contractor prior to work commencing. The plan would address proper employee training, use of protective equipment, contingency planning, and secondary containment of hazardous materials.

SPU would monitor the raingardens' functioning and efficacy as well as the accumulation of contaminants from urban stormwater runoff, and would renovate the raingardens as needed. During renovation, vegetation and soils would be excavated and disposed of in a landfill licensed to receive such wastes. New soils and vegetation would then be reinstalled. Anticipated replacement intervals are dependent on multiple factors but are estimated to occur at 50 year intervals or as otherwise needed.

(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.

No toxic or hazardous chemicals would be stored, used, or produced during the project's construction, or at any time during the operating life of the project.

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

Possible fire or medic services could be required during project construction, as well as possibly during maintenance of the completed project. However, the completed project would not demand higher levels of special emergency services than already exist at the project location. Typical emergency services required for medical emergencies are provided by the Seattle Fire Department. Typical security services are provided by the Seattle Police Department (and SPU's contractor during project construction).

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

No such measures are proposed because there would be no environmental health hazards.

b. Noise

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

Noises that exist 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 in the vicinity of construction would temporarily increase during construction activities. Short-term noise from construction equipment would be limited to the allowable maximum levels of City of Seattle's Noise Control Ordinance (SMC Chapter 25.08). Within the allowable maximum levels, SMC 25.08 permits

noise from construction equipment between the hours of 7 am and 7 pm weekdays, and 9 am and 7 pm weekends and legal holidays; however, it is expected that the majority of construction would take place from 7 am to 6 pm on weekdays. After completion of the project, occasional noise from equipment used for operation, maintenance, and monitoring would occur periodically, but would be limited to the hours allowed by the City of Seattle's Noise Control Ordinance.

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

No such measures are proposed because there would be no noise impacts.

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 proposed project is located in improved public rights-of-way used for vehicle and pedestrian travel and parking. Adjacent property uses are entirely single-family residential, some of which may contain home-based occupations.

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 non-farm or non-forest use?

The project site has not 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?

The proposed project would neither be affected by nor affect surrounding working farm or forest land normal business operations because there are no such operations.

c. Describe any structures on the site.

No houses or buildings are located on the project site, which is fully within street rights-of-way. Some privately owned fences, wall, gates, or other developments may encroach on the public right-of-way; project staff members would coordinate with individual property owners for the removal and/or relocation of these items, as needed.

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

Fences, gates, or other privately owned developments that encroach into the right-of-way and not cleared by their private owners prior to construction would be removed by the project.

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

The project would be located in improved street rights-of-way. The immediately surrounding area is zoned for single family residential (SF 5000).

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

The current comprehensive plan designation for the project area is single family residential.

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

The project area has no Shorelines of the State that are regulated under the City of Seattle's Shoreline Master Program.

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

None of the project site has been classified as an environmentally critical area.

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 ensure the proposal is compatible with nearby 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?

No such structures are proposed or included in the project.

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

No views in the immediate vicinity would be altered or obstructed. Street trees planted within the right-of-way could partially obscure neighborhood and territorial views when they attain full height and maturity. To the maximum extent practicable, precise siting of proposed street trees would be coordinated with adjacent property owners.

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

The project's proactive involvement plan with the community and adjacent property owners has included open houses and one-on-one meetings to encourage public input in landscape plant and tree selection, as well as the overall planting plan. No additional measures are proposed.

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 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?

Highland Park Playground is located more than 1,300 feet east of the project location. The entire project location is used for informal recreational activities such as dog-walking, walking, jogging, and bicycling—all within the public right-of-way.

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

The proposed project would not permanently displace any existing recreational uses. Temporary closures or detours affecting vehicle and pedestrian routes/access may be required, and there would be temporary reductions in available street parking during construction. The project contractor would be required to maintain safe pedestrian and vehicle access at all times. Upon completion, new sidewalk facilities would provide a safe, designated location for pedestrians.

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

Project notifications through web-site updates, emails, and mailings would provide local residents with limited advance notice regarding temporary street and sidewalk closures and detours. 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.

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.

To determine if National Register or Washington Heritage properties are located in or adjacent to the project area, the project location was checked against the following registers on August 28, 2014.

- City of Seattle Landmarks
http://www.cityofseattle.net/neighborhoods/preservation/landmarks_listing.htm

- Washington Heritage Register and National Register of Historic Places
http://www.dahp.wa.gov/historic-register (general site on historic registers),
http://www.dahp.wa.gov/washington-heritage-register (a site specific to the Washington Heritage Register) and the WISAARD database
http://www.dahp.wa.gov/learn-and-research/find-a-historic-place

There are no buildings, structures, or sites on or near the project site that are listed on, or proposed for listing on, national, state, or local preservation registers. While the WISAARD database includes numerous historic property inventory reports for various structures near the project location, these reports do not indicate the eligibility of any particular property for listing on the national or other preservation registers.

A cultural resources review did not identify any register-eligible sites within or adjacent to the project location (HRA 2014).

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.

Cultural resource reviews found no recorded historic or pre-contact properties in or adjacent to the project location (HRA 2014). That research indicates the project is not in an archaeologically sensitive area and there is low potential for encountering pre-contact or historic period archaeological remains. The project location largely consists entirely of previously filled and disturbed land associated with residential development, improved street rights-of-way, and other recently disturbed upland ground.

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.*

An archaeological survey that included field sampling was completed for this project area in 2014 (HRA 2014).

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.

No historic buildings or known cultural resources would be affected by this project. Should evidence of cultural remains, either historic or prehistoric, be encountered during the construction process, work in the 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. However, because the project would not be excavating or removing previously undisturbed native soils or soil sediments, there is low likelihood of encountering such resources.

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 entirely within existing improved street rights-of-way. Streets within the project area are generally 25 feet wide with 5 foot wide sidewalks and planting strips ranging from 7 to 14 feet wide on both sides of the street. Parking, curb, and gutter exist on both sides of the streets. Residential driveways are accessed either from the streets or the alleys depending on the particular street. Parking for residents is primarily on-street, with private parcel garages accessed from the street or alley augmenting on-street parking. Main arterials serving the project location include Delridge Way Southwest (to the west) and 9th Avenue Southwest (to the east).

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 Delridge area is served by King County Metro public transit route 120 that runs along Delridge Way Southwest (more than 900 feet west of and parallel the project location) and routes 125 and 128 that run along 16th Avenue Southwest. The closest transit stops

to the project location are on 16th Avenue Southwest, within 1 to 4 city blocks of anywhere in the project location. Construction would not impact the roadways, traffic, or bus routes on 16th Avenue Southwest or Delridge Way Southwest.

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

Based on general observations at most times of the day and night, parking supply in the project location appears to currently exceed demand. A parking assessment identified 436 legal, on-street parking spaces within the project location. An undetermined number of on-street parking spaces would be temporarily unavailable for approximately two weeks during construction at any one specific construction site within the project location, at times requiring residents and visitors to park up to one to two blocks from their destination. The completed project would permanently displace approximately 24 legal, on-street parking spaces with raingardens. Following project construction, parking spaces would be available on the affected streets and any motorists seeking additional parking would continue to be able to seek parking in immediately adjacent unaffected streets.

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 proposed project would restore/replace approximately 1,341 square feet of concrete roadway on the public right-of-way, but would not require construction of any new roads or streets. In addition, the project would install safety improvements such as curb ramps at seven intersections adjacent to planned raingardens.

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

The project would not use or occur near 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 about 1,800 vehicle round-trips (estimated using Attachment E) due to workers and materials being transported to and from the site during the estimated total 150 workday construction period. Most trips would occur during business hours (between 7 am and 6 pm) on weekdays (Mondays through Fridays).

The completed project would generate an estimated 410 vehicle round-trips per year (estimated using Attachment E) related to the on-going routine operation, maintenance, and monitoring of the project over its 50 year lifespan.

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:

During construction, the contractor would be required to deploy a traffic control plan approved by SPU and SDOT. Construction of the proposed project would comply with SDOT policies regarding temporary lane and sidewalk closures. The construction contractor would be encouraged to carpooling for its employees.

The completed project would feature new delineation of street edges, new curb and gutter, landscaped planting strips, and planted raingardens. All of these features are expected to assist in traffic calming, especially for non-local access traffic attempting to use residential streets as cut-through routes to arterials.

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 would not create increased need for public services.

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

No mitigation is being proposed because there would be no impacts on public services.

16. Utilities

a. Check utilities available at the site, if any: *[check the applicable boxes]*

☐ 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.

☒ **None**
This completed project would not require utility services for normal operation and would not install any new utilities.

Construction of the raingardens may require replacement of up to 30 privately owned side sewers and relocation or reconstruction of an undetermined number of other existing utilities when conflicts with the project design are present. The project anticipates minimal interruptions in service during those utility relocations. However, if more than a short service disruption would occur during relocation, then temporary connections to businesses and residences would be provided. Inadvertent damage to underground utilities could also 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. In addition, some residents may need to place their curbside garbage and recycling containers in front of an adjacent neighbor's house on garbage pick-up days. No other interruptions to regular utility services are expected during construction.

C. SIGNATURE

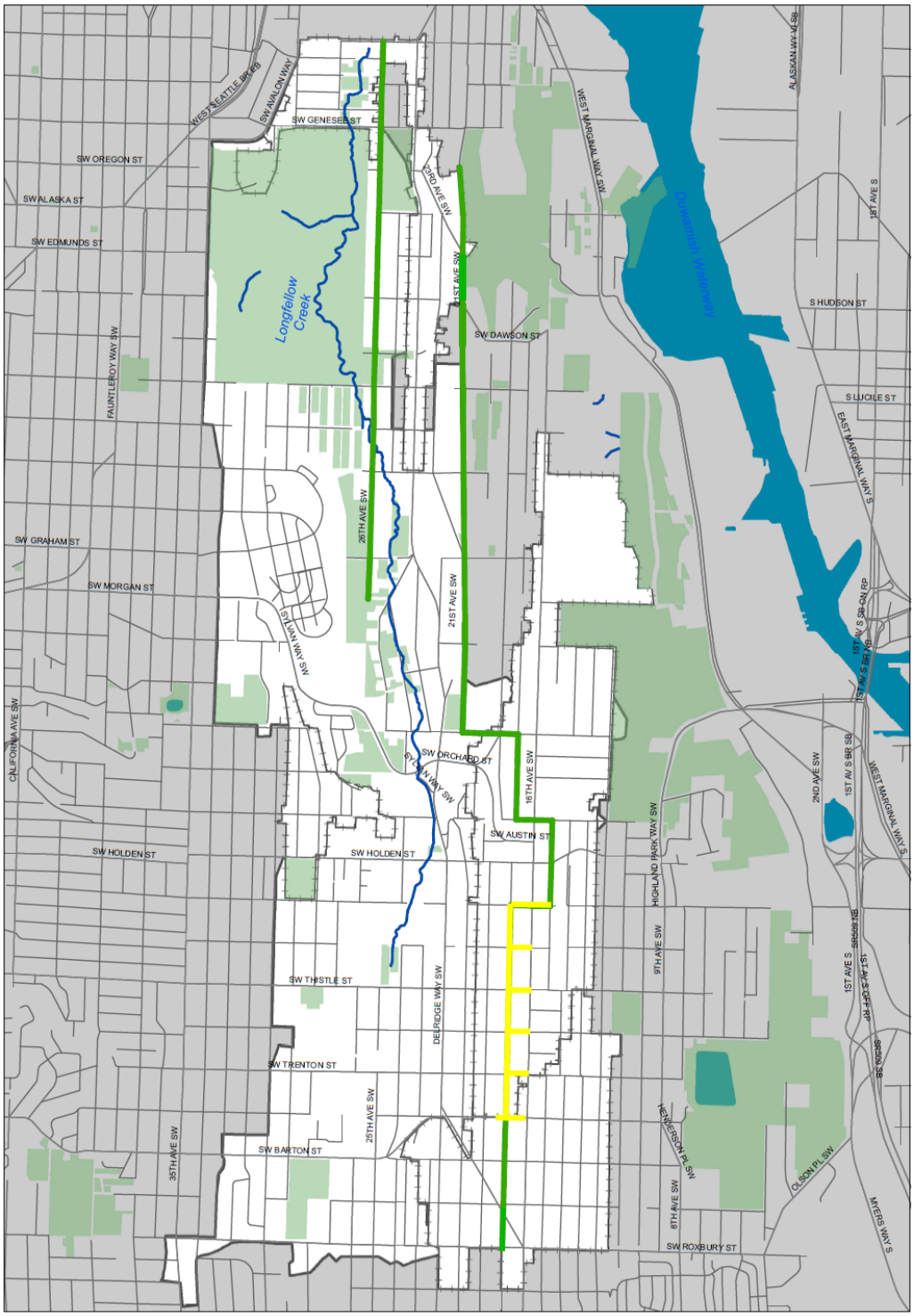
The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: Don Anderson Date: 10-15-2014

Don Anderson, P.E.
Project Manager

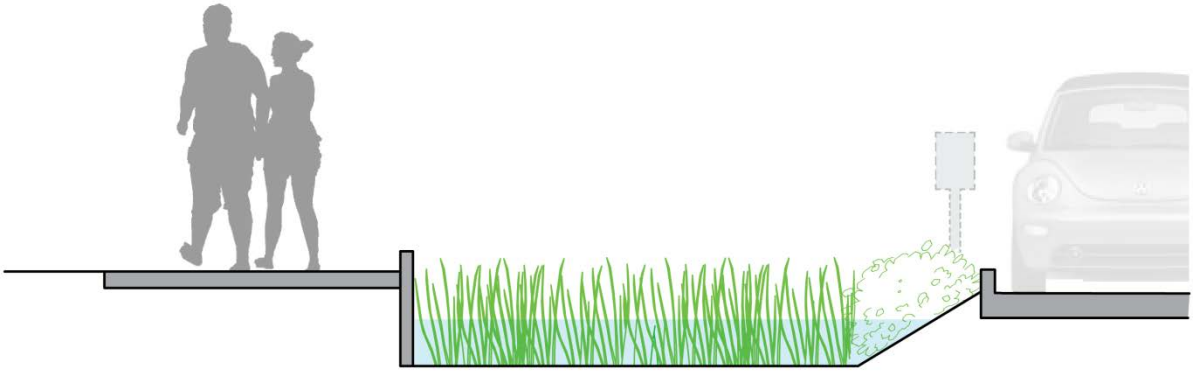
Attachment A: Location Map, including NPDES Basins 168/169
Attachment B: Proposed Project Blocks and Intersections
Attachment C: Proposed Curb Bulb-out Planting Strip Raingarden Configuration
Attachment D: Proposed Planting Strip Raingarden Configuration
Attachment E: Greenhouse Gas Emissions Worksheet

Attachment A: Location Map, including NPDES Basins 168/169.

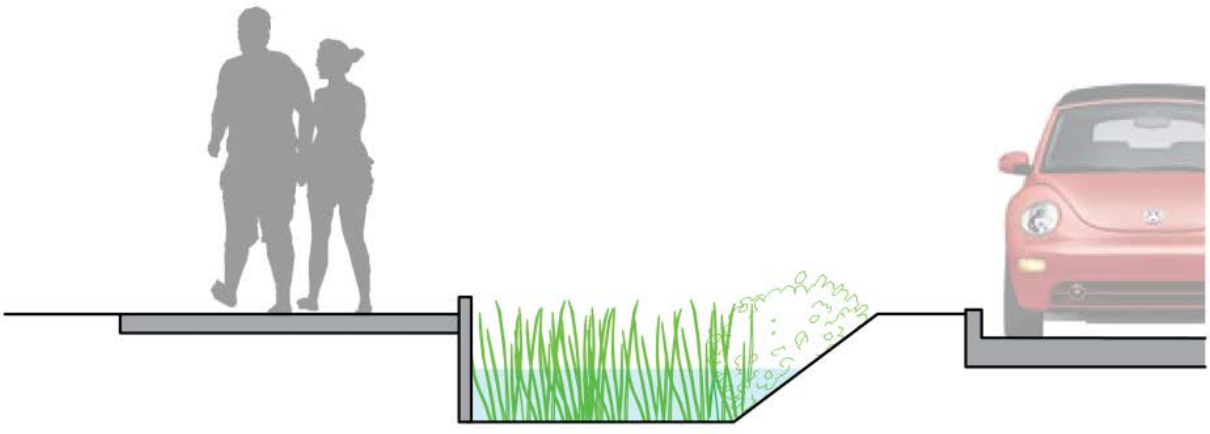


Attachment B: Proposed Project Blocks and Intersections.

Attachment C: Proposed Curb Bulb-out Planting Strip Raingarden Configuration



Attachment D: Proposed Planting Strip Raingarden Configuration



Attachment E: Greenhouse Gas Emissions Worksheet

Section 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 ($MTCO_2e$)
Concrete (50 $MTCO_2e$/1,000 sq. ft. of pavement, 6 inches thick)		883 cu yds				**2,384**
					TOTAL Section II Pavement	**2,384**

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Section III: Construction	
(See detailed calculations below)	**Emissions ($MTCO_2e$)**
TOTAL Section III Construction	**457**

Section IV: Operations and Maintenance	
(See detailed calculations below)	**Emissions ($MTCO_2e$)**
TOTAL Section IV Operations and Maintenance	**19**

TOTAL GREENHOUSE GAS (GHG) EMISSIONS FOR PROJECT ($MTCO_2e$)	**2,860**

Attachment E: Greenhouse Gas Emissions Worksheet, continued

Section III Construction Details		
Construction: Diesel		
Equipment	**Diesel (gallons)**	**Assumptions**
Backhoe/Excavator	18,000	1,200 hours x 15 gallons/hour (345 hp engine)
Front-end Loader	8,400	1,200 hours x 7 gallons/hour (345 hp engine)
Vibratory Roller	2,400	600 hours x 4 gallons/hour (185 hp engine)
Asphalt Paver	300	100 hours x 3 gallons/hour (80 hp engine)
Asphalt Truck	700	100 hours x 7 gallons/hour (345 hp engine); (10 round trips)
Drill Rig	1,400	200 hours x 7 gallons/hour (345 hp engine)
Flat-bed Truck	300	20 round trips x 75 miles/round trip ÷ 5 mpg
Dump Truck and Pup (17 cubic yard/load) (assumes backhaul of import materials)	2,520	210 round trips x 60 miles/round trip ÷ 5 mpg
Concrete truck (10 cubic yard capacity)	180	90 round trips x 10 miles/round trip ÷ 5 mpg
Street Sweeper	160	200 hours x 0.8 gallons/hour (185 hp engine)
Subtotal Diesel Gallons	34,360	
GHG Emissions in lbs CO_2e	912,258	26.55 lbs CO_2e per gallon of diesel
GHG Emissions in metric tons CO_2e	414	1,000 lbs = 0.45359237 metric tons

Construction: Gasoline		
Equipment	**Gasoline (gallons)**	**Assumptions**
Pick-up Trucks or Crew Vans	3,000	150 workdays x 10 trucks x 1 round-trip/day x 40 miles/round-trip ÷ 20 mpg
Misc Hand equipment	900	150 workdays x 10 hours x 2 pieces of equipment x 0.3 gal/hour
Subtotal Gasoline Gallons	3,900	
GHG Emissions in lbs CO_2e	94,770	24.3 lbs CO_2e per gallon of gasoline
GHG Emissions in metric tons CO_2e	43	1,000 lbs = 0.45359237 metric tons

Construction Summary		
Activity	**CO_2e in pounds**	**CO_2e in metric tons**
Diesel	912,258	414
Gasoline	94,770	43
Total for Construction	1,007,028	**457**

Attachment E: Greenhouse Gas Emissions Worksheet, continued

Section IV Long-Term Operations and Maintenance Details		
Operations and Maintenance: Diesel		
Equipment	**Diesel (gallons)**	**Assumptions**
Emergency Operation	40	10 events (every 5 years for 50 years) x 1 round-trip/event x 20 miles/round-trip ÷ 5 mpg
Maintenance Operation	800	200 events (four times annually for 50 years) x 1 round-trip/event x 20 miles/round-trip ÷ 5 mpg
Subtotal Diesel Gallons	840	
GHG Emissions in lbs CO_2e	22,302	26.55 lbs CO_2e per gallon of diesel
GHG Emissions in metric tons CO_2e	10	1,000 lbs = 0.45359237 metric tons

Operations and Maintenance: Gasoline		
Equipment	**Gasoline (gallons)**	**Assumptions**
Pick-up Trucks or Crew Vans	800	200 events (four times annually for 50 years) x 1 round-trip/event x 20 miles/round-trip ÷ 5 mpg
Subtotal Gasoline Gallons	800	
GHG Emissions in lbs CO_2e	19,440	24.3 lbs CO_2e per gallon of gasoline
GHG Emissions in metric tons CO_2e	9	1,000 lbs = 0.45359237 metric tons

Operations and Maintenance Summary		
Activity	**CO_2e in pounds**	**CO_2e in metric tons**
Diesel	22,302	10
Gasoline	19,440	9
Total Operations and Maintenance	41,742	**19**