

SEATTLE PUBLIC UTILITIES
SEPA ENVIRONMENTAL CHECKLIST

This SEPA environmental review of Seattle Public Utilities' Routine Maintenance & Repair of Publicly Owned Drainage System Facilities has been conducted in accordance 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:

Routine Maintenance & Repair of Publicly Owned Drainage System Facilities

2. Name of applicant:

Seattle Public Utilities (SPU)

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

Applicant:

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4. Date checklist prepared:

September 26, 2023

5. Agency requesting checklist:

Seattle Public Utilities (SPU)

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

Routine maintenance and repair activities described in this SEPA Environmental Checklist would occur as the need is identified and would continue for the life of the facilities. This Checklist analyzes environmental effects for the years 2024 through approximately 2029. In approximately five years, if the ongoing work, methods, and impacts on the natural and built

environments are largely unchanged, SPU would likely document any minor revisions in a SEPA addendum to the Determination of Non-significance (DNS) issued based on this Checklist. If substantive changes warrant a new threshold determination, SPU would prepare a new Checklist.

In-water work would generally be conducted during authorized in-water construction work windows (also known as fish windows) identified by the Washington Department of Fish and Wildlife (WDFW). U. S. Fish & Wildlife Service (USFWS) and/or National Marine Fisheries Services (NMFS) may prescribe different fish windows for waters where federally protected species occur. Most activities would be short-term, usually lasting one day or less. Exact timing of the activities would be subject to various permit requirements and work prioritization. This Checklist analyzes routine maintenance, not emergency maintenance; emergency conditions may make drainage maintenance necessary during any time of the year and would be conducted in consultation with the relevant regulatory agencies.

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

During the next approximately five years, it is possible existing drainage facilities listed in Appendix A may be expanded and that new drainage facilities may be added, either because of new residential or commercial development or constructed in response to emergencies and drainage investigations. Construction of new or expanded facilities would be analyzed in separate SEPA environmental reviews. Maintenance of new facilities would generally be of the same type and class analyzed in this Checklist and would be conducted within the listed conditions. Minor revisions would likely be documented in a SEPA DNS addendum. If changes warrant a new SEPA threshold determination, SPU would prepare a new Checklist for that purpose.

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

No other environmental information has been prepared for maintenance of the drainage facilities at this time. Environmental information such as stream studies, wetland delineation reports, and biological assessments would be prepared if needed to obtain required city, county, state, or federal permits.

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 other known project applications pending governmental approval which directly affect the drainage facilities covered by this proposal.

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

Some or all these permits and approvals may be needed to perform this work:

- WDFW: Hydraulic Project Approvals (HPA) for sites under WDFW jurisdiction (RCW 77.55)
- Seattle Department of Construction and Inspections (SDCI): Floodplain Management approvals or permits

- SDCI: Shoreline Substantial Development Permit (SSDP) or SSDP Exemption for facilities subject to the Washington State Shorelines Management Act (RCW 90.58)
- SPU: City of Seattle Environmentally Critical Area code compliance (SMC 25.09)
- Seattle Department of Transportation (SDOT): Street Use Permits and traffic Control Plans Washington State Department of Ecology (Ecology): Approval to Allow Temporary Exceedance of Water Quality Standards (RCW 90.48 RCW)
- U. S. Army Corps of Engineers, Department of the Army: permit or authorization under Section 10 of the Rivers and Harbors Act and/or Sections 401 and/or 404 of the Clean Water Act. Corps' issuances of a permit or authorization are subject to compliance and consultation requirements of other federal regulations, including Endangered Species Act (ESA), National Historic Preservation Act (NHPA) Section 106, and Coastal Zone Management Act.

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 conducts routine operation, maintenance, and repair of publicly owned drainage system facilities (routine drainage maintenance) throughout the City of Seattle. Some of this work is conducted wholly or in part on lands covered by water and must be reviewed for environmental impacts. For efficiency, SPU has chosen to conduct a system-wide environmental review for three categories of drainage system facilities: open channel drainage system facilities, enclosed drainage system facilities, and drainage system pond facilities. SPU's drainage system includes approximately 58 open channel drainage facilities, 52 enclosed drainage facilities, and 19 drainage system pond facilities located throughout the municipal limits of the City of Seattle.

Open channel drainage facilities include ditches, culverts, and bioswales, as well as riparian enhancement projects resulting from infrastructure improvements and riparian enhancement projects designed to create habitat not directly connected to a pond facility.

Enclosed drainage facilities include piped infrastructure, treatment vaults, diversion structures, trash racks, and similar structures which are not directly connected to a pond facility.

Pond drainage facilities include stormwater detention pond cells, channels or lakes, treatment pond cells or channels, and all hydraulically connected drainage appurtenances such as pipes, engineered wetlands, ditches and culverts, bioswales, riparian enhancements, and structures such as vaults, maintenance holes and diversion structures. Thus, a pond facility is comprised of the detention pond itself and any directly connected open channel or enclosed drainage component which collectively act as a pond system. Three of the pond facilities comprise pipe outfalls and upstream drainage structures: Haller Lake, Bitter Lake, and Green Lake.

Drainage system facilities are designed and constructed to minimize the impacts of development on downstream infrastructure, residential areas, and Environmentally Critical Areas (ECA), including wetlands and watercourses. Routine maintenance and repair of these facilities is required to prevent performance degradation of the facility. SPU's maintenance

and repair programs are designed to maintain the original design intent and capacity; improve facility functions by reducing or eliminating adverse impacts caused by clogged, eroded, unrepaired, or outdated structures and mechanical appurtenances (such as valves, slide or sluice gates, and debris racks); and incorporate safety improvements as needed.

SPU determines the specific maintenance and repair activities to be performed at each drainage facility. Some of the more routine and predictable facility maintenance needs are based on an established preventive maintenance schedule administered via SPU's enterprise database and automated work management system. SPU staff determine the exact timing of activities, subject to various permit requirements and work prioritization.

Work would be performed at each site using one or more of **eight routine types of maintenance and repair activities**, as described in Exhibit C and summarized below:

1. Sediment and Debris Removal

Sediment and debris removal removes excess sediment and vegetative matter that compromise capacity and performance of the drainage system. This work is often on-demand (e.g., due to storm events, requirements in the City's municipal separate storm sewer system NPDES permit, or beaver activity) and not conducted on a regular schedule. It is conducted using hand tools or with either vactor trucks or heavy equipment such as excavators and backhoes. Pumps and in-water/pond water-tight structures or silt fences may be employed for isolation and dewatering of the work area if needed. Environmental buckets or other erosion and sediment control Best Management Practices (BMP) may be used to prevent discharge of fill or deleterious materials downstream. Fish exclusion measures and other protection measures may also be employed.

2. Vactoring and Jetting

Vactor trucks are used to vactor and jet excess sediment and vegetative matter compromising the drainage system in pipes, culverts, structures, ponds, and ditches. This is often scheduled preventive maintenance work and is required on an ongoing basis.

3. Vegetation Control

Vegetation control removes excess or obstructing vegetation from a facility and its appurtenances such as ponds, trash racks, ditches, and inside of and around structures, pipes, and culverts. The goal is to maintain accessibility and capacity of the facility and all appurtenances. This involves cutting back live vegetation or removing and replacing trees. This work is often scheduled work and is required on a consistent basis. It is accomplished using a variety of hand tools including rakes, weed eaters, and machetes.

4. Anchoring Large Woody Material (LWM)/Habitat Restoration

Anchoring LWM/habitat restoration anchors existing woody material from previously constructed habitat improvement projects to prevent the migration and blockage of key infrastructure. It also applies to naturally occurring LWM that may need to be repositioned and anchored to restore stormwater conveyance capacity of the drainage system pond. This work is not conducted on a regular schedule and is accomplished using hand tools such as cant hooks, wenchers, shovels, and pry bars. Cranes may be used

(staged from an upland location) to relocate LWM unable to be moved by hand. Heavy chain, cable, and rebar are used to anchor and secure LWM.

5. Beaver Dam Management

a. Beaver Dam Maintenance

Beaver dam maintenance completes or partially removes or manipulates dams in areas where flooding and property damage might otherwise result. SPU coordinates with WDFW on beaver dam maintenance. Beaver dam maintenance may occur during these scenarios:

- New dams (less than 1 year old) constructed in areas where there is limited habitat value and flooding will occur.
- Old dams that need to be manipulated for fish passage.
- Old dams that need to be manipulated for flood control.

b. Beaver Exclusion Devices

SPU will occasionally design, install, and maintain guards, grates, grills, fences, and other beaver exclusion devices to provide unimpeded fish passage and to prevent beavers from plugging a culvert or other water crossing structures such as low bridge crossings. This work is not conducted on a regular schedule and is accomplished using hand tools such as pry bars, shovels, and rakes.

6. Mechanical Improvements and Repairs/Replacements

Mechanical Improvements include new gates, valves, trash racks, and access hatches and their components when necessary to maintain functionality of the structure and facility. Mechanical repairs/replacements refer to maintaining or replacing structural components such as slide or sluice gates, orifice plates, hinges, trash racks, valves, etc. The goal of this activity is to maintain operability and function of the structural components of drainage system facilities. This work is often conducted on-demand and not on a regular schedule.

7. Safety Improvements

Safety Improvements address safe accessibility for crew and emergency response at drainage system facilities. For example, facilities in areas of steep slopes may be furnished with a stairwell, platform, and/or handrails for safer personnel access to a structure. Other potential safety improvements could include, but are not limited to, fencing and security features, improvements to access roads, and improvements to boat ramps.

8. Monitoring Equipment Installation, Repair/Replacement

This work installs monitors and associated equipment in watercourses, ponds, pipes and structures and maintains and replaces existing monitoring equipment at various locations. These activities track water levels and flow, sediment levels, and water quality data to understand and evaluate SPU's drainage sites and facilities.

The eight types of maintenance activities summarized above would include **the seven methods and BMPs** described in Exhibit E and summarized below:

1. Delineation of Work Areas

For each maintenance activity, the first step is to delineate the work area. ECAs are identified and protected to exclude people and equipment and to limit the impact of routine drainage maintenance activities on the site. Staging areas are identified where materials and equipment can be secured. Other work areas that may need to be identified include temporary access roads or stream access points. The work area is identified and marked to limit ground disturbance and to avoid unintended effects on upland vegetation, wetlands, riparian, and other sensitive areas outside of identified work area. Delineation of work areas may include flagging, fencing, mulch, coir rolls, or other appropriate materials. All delineation methods are maintained for the duration of the maintenance activity.

2. Temporary Bypass of Streamflow

For maintenance activities involving in-water work, the second step is to provide temporary dewatering, fish removal, and flow bypass to reduce turbidity and minimize impacts on aquatic species. Fish removal work is led by a qualified fisheries biologist. Fish removal uses methods approved by WDFW. Isolation nets are installed and several attempts to capture fish are completed before flow bypass operations begin.

In most cases, a gravity or pump system is used to bypass flow from an upstream containment berm or dam around the work area to a location immediately downstream of the work area. The length of the bypassed stream channel varies depending on the work to be performed. All work areas use a method to dissipate water velocity at the downstream end of the bypass. Upon project completion, water flow back into the work area is regulated to minimize turbidity.

3. Vactoring and Jetting

Vactoring removes sediment and turbid water from structures and pipes using vactor trucks with suction hoses. Jet cleaning (jetting water into a pipe or culvert) is occasionally required to loosen sediment in a pipe or culvert. Typically, jetted material is flushed down to a catch basin or sump where it can be captured and vactored out. Vehicles are staged adjacent to the work area, typically in an upland area. Vactored material is stored in trucks and disposed of at one of the City's existing vactor waste facilities.

To prevent migration of sediment and turbid waters downstream, the culvert system being cleaned is isolated or plugged at the downstream end. The vactor truck stages at this location and captures all sediment and debris entering the structure. Temporary bypass of streamflow may be required to manage the water before it enters the work area.

4. Excavating

Excavation removes accumulated sediments and other debris from around culverts or outfalls; within watercourse channels, pond drainage facilities, and fish ladders; and from habitat restoration areas. Excavation removes accumulated sediment that occurs below the wetted perimeter or ordinary high-water mark (OHWM) of a watercourse or waterbody. The accumulated sediment impedes conveyance and capacity and increases flooding risk.

Excavation work is typically done when water flow in the system is low to minimize the amount of work required within the wetted perimeter. For work that occurs in the dry, heavy equipment such as an excavator or backhoe (which may be fitted with an environmental bucket as needed) is operated directly from upland staging areas. Sediments are excavated and hauled to an existing upland disposal site. Temporary bypass of streamflow or silt screens may be required to control turbidity.

5. Bank/Retaining Wall Stabilization

Bank/retaining wall stabilization replaces or repairs existing banks, installs new bank stabilization, and places toe/logs in various waterbodies. Stabilization measures are structural remedies to arrest erosion or slumping of banks. Bank stabilization may also be needed in areas where there is a high rate of slope erosion or to address storm damage. Bank stabilization improves existing structures, enhances habitat for juvenile salmonids, prevents erosion and scour, and minimizes risk of failure of adjacent roadways, utilities, or other public facilities. Bank stabilization includes the following:

- Rehabilitation of existing headwalls and retaining walls
- Construction of log or rock toes
- Rehabilitation of existing sloped embankments

Erosion control methods based on ecological principles and techniques to stabilize banks while enhancing habitat (e.g., the creation of coves), improving aesthetics, and reducing costs are considered first before any other bank protection method. Where appropriate, vegetation, wood, and other natural materials are used to protect creek banks and maintain shallow water and shallow gradients to re-establish the integrity of the bank.

6. Addition or Maintenance of Habitat Elements

Habitat elements are organic or inorganic objects that—when placed in or near aquatic areas—increase fish and wildlife habitat and protect infrastructure. Habitat elements include large wood, root wads, baffles, boulders, rocks, and weirs. When placed in waterbodies, these objects can slow or alter flow direction and provide complex habitat including riffles, pools, and appropriate substrate that enhance food production and escape cover for fish and wildlife. Habitat addition and maintenance also protect infrastructure (e.g., roads, sewer lines, etc.). Habitat addition or maintenance work may require using heavy or light equipment, hand labor, or a combination of these methods. Many projects require establishing a temporary access into the channel.

7. Site Restoration/Landscaping

Site restoration stabilizes a site after maintenance activities are complete and the staging and access areas are vacated. This prepares the site for replanting, returns it to pre-existing conditions, and protects disturbed soil from erosion and invasive weeds. Graded areas are inspected to ensure that water flowing across final slopes will not generate erosive energy and affect sensitive areas. When necessary, compacted access roads, staging areas, and stockpile areas are loosened. Stockpiled woody material is scattered and placed. Coir logs or jute matting with mulch can be used to stabilize surfaces while native vegetation establishes. Upon project completion, stockpiled materials are spread

or removed. All imported soil or rock is removed. The covered surface is re-graded and replanted to original conditions.

Exhibit A provides lists of the specific drainage facilities, maintenance activities, and the scope and timing of each. Exhibit A-1 includes the open channel drainage facilities, Exhibit A-2 includes the enclosed drainage facilities, and Exhibit A-3 includes the pond drainage facilities.

Maintenance activities and methods use BMPs designed to avoid, minimize, and mitigate impacts on waterbodies and aquatic life. In addition, the Seattle Biological Evaluation (<https://www.seattle.gov/utilities/construction-resources/standards-and-guidelines/seattle-biological-evaluation>) and City of Seattle's 2021 Stormwater Manual (<https://www.seattle.gov/documents/Departments/SDCI/Codes/StormwaterCode/2021SWCodeFinalClean.pdf>) would be used to select and implement appropriate BMPs to minimize disruption to the natural environment. Work would also comply with other regulations protecting water quality, endangered species, shorelines, and ECAs.

- 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.**

Subject facilities are located throughout the City of Seattle. Location information for each facility is grouped by category and provided in Exhibits A (Drainage System Facility Information Summary Tables), B (Drainage System Facility Addresses), and D (Overview Location Maps & Representative Facility Data Sheets).

The currently identified drainage system sites (approximately 58 existing open channel sites, 52 existing enclosed sites, and 19 existing drainage system ponds) are listed in Exhibit A by site reference name, drainage facility description, maintenance activities, and methods. Exhibit D includes an overview map showing the facility locations, and a representative photo and data sheet for each individual facility.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site:

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

Conditions vary by site. Most project sites are on flat to gently sloping terrain.

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

Topography varies by location. Some facilities may include steeper slopes of between 30 percent and 45 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.**

Drainage system maintenance sites are generally underlain by alluvial and glacial till outwash deposits. However, most of the sites are surrounded by densely urbanized areas where native soils have been extensively altered by excavation, filling, and other disturbances. None of the sites are in use for agricultural purposes or considered prime farmland.

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

Eroding open channel banks are usually unstable. There is no indication of unstable soils in the immediate vicinity of the other drainage facilities. Some of the routine drainage maintenance activities analyzed in this Checklist include repairs or proactive channel bank stabilization to prevent bank failures. Erosion control measures would be implemented as appropriate to maintain site stability and prevent soil loss during routine drainage maintenance.

- 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.**

Projects would primarily remove sediment (aka dredged material) and debris. However, minor filling and grading may occur to restore drainage facilities to design conditions and for slope stability following maintenance. Sediment deposits would be removed to prevent blockage and maintain the capacity of drainage facilities. Material removed from drainage facilities would be deposited in an approved manner at an approved upland site. The amount of dredged material would vary from site to site. Exhibit A includes anticipated quantities of dredged material and debris removal for each site, based on SPU's experience. The volume of fill (if needed) would vary by facility but fill quantities typically would be less than 50 cubic yards. Sources of fill would be from business licensed to purvey such materials or other SPU-approved sources.

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

Many of the facilities are designed specifically to control erosion. Erosion would be unlikely to occur because of these activities. BMPs would be used to control erosion during clearing and maintenance.

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

No new impervious area would be added because of these activities. Any repairs to existing impervious surfaces would be in-kind.

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

Stormwater control BMPs would be used to protect the existing stormwater drainage systems and to minimize erosion and sedimentation. BMPs as identified in the City of Seattle's Stormwater Code found at SMC Title 22, Subtitle VIII, City of Seattle Directors'

Rules SDCI 17-2017/SPU DWW-200, and Volume 2 Construction Stormwater Control Manual, would be used to manage stormwater runoff, construction disturbance, and erosion as needed during construction.

All work would be performed consistent with an approved construction stormwater and erosion control plan (CSECP). Maintenance work would comply with permit requirements and applicable guidelines and regulations, including Washington State Water Quality Standards and WDFW HPA conditions. BMPs implemented during these activities include:

- Isolating the work area from the flowing water by pumping, piping, damming, or bypassing water around work areas on applicable projects.
- Limiting activities to low or no flow conditions when and where appropriate or specified by permits.
- Keeping clearing and grading to a minimum.
- Placing erosion control structures such as silt fences, sediment screens, wattles, and straw bales.
- Decanting sediment-laden water to prevent entry into waterbodies.
- Hydroseeding, replanting, or mulching disturbed areas immediately following completion of work.

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.**

During construction, mobile and stationary equipment would be used to implement these activities, thus generating emissions due to the combustion of gasoline and diesel fuels (such as oxides of nitrogen, carbon monoxide, particulate matter and smoke, un-combusted hydrocarbons, hydrogen sulfide, carbon dioxide, and water vapor). Emissions during project implementation would also include normal amounts of dust from soil-disturbing activities and exhaust (that is, carbon monoxide, sulfur, and particulates) from construction equipment. These impacts are expected to be minimal, localized, and temporary.

Work activities would also generate greenhouse gas (GHG) emissions during construction. This project would generate greenhouse gas (GHG) emissions through maintenance activity only. GHG emission calculations are shown in Attachment C and summarized in Table 1. One metric ton metric ton of carbon dioxide emission (MTCO_{2e}) is equal to 2,205 pounds. No ongoing GHG emissions would result following construction of work activities.

Table 1. Combined Per Annum Summary of Greenhouse Gas (GHG) Emissions

Activity/Emission Type	GHG Emissions (pounds of CO₂e)¹	GHG Emissions (metric tons of CO₂e)¹
Buildings	0	0
Paving	0	0
Construction Activities (Diesel)	0	0
Construction Activities (Gasoline)	0	0
Long-term Maintenance (Diesel)	628,253	285.0
Long-term Maintenance (Gasoline)	372,155	169
Approximate Total GHG Emissions	1,011,325.0	454

¹ Note: 1,000 pounds = 0.45359237 metric tons

² Note: See Exhibit F: GHG Worksheets, for detailed calculations

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

No off-site emissions would affect this work.

- 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, 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.**

Drainage system facilities are often in or adjacent to lakes, ponds, watercourses, or wetlands. Exhibit A identifies the drainage basin and adjacent or downstream waterbody associated with each work area. Exhibit D includes a diagram and map for each work 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.**

Maintenance and repair activities may occur over, in, or adjacent to the surface waterbodies listed in Exhibit A. See Exhibit D for a diagram and map of each site.

- (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.**

Placement of fill materials would be limited to the amount needed to restore a facility to design specifications and placed in accord with permit requirements. In

general, quantities would be less than 50 cubic yards. Fill material would be sourced businesses licensed to purvey such materials or other SPU-approved sources.

A primary objective of routine drainage facility maintenance is to remove (dredge) accumulated sediment and other debris to maintain functionality and capacity of the drainage facilities. The amount of dredged material would vary from site to site. Exhibit A describes anticipated sediment and debris removal quantities, based on SPU's experience. Dredged material would be hauled off-site and disposed of at an SPU-approved location. In some cases, dredged material may be staged on-site briefly to allow the material to dewater before hauling.

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

For most sites, water withdrawal would not occur during these activities. In some cases, water may be temporarily bypassed around work areas for erosion and water quality control or pumped out of ponded areas to facilitate the removal of sediment. Most maintenance activities would occur during low or no flow periods to minimize the need for temporary bypass or diversion around work areas. Many project sites would have no flow during work activity.

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

Activities would occur within 100-year floodplains in the Thornton, Lake Union, Duwamish, Lake Washington, and Puget Sound drainage basins. See Exhibit D for the location and diagram of each site.

(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.

No waste materials would be discharged to surface waters because of these activities. Some sites may experience a temporary release of sediment when flow bypassing ends and water is reintroduced into the drainage facility.

b. Ground Water:

(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.

No groundwater would be withdrawn. Turbid surface water may be disposed of on the ground surface and allowed to infiltrate.

(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 the ground because of these projects.

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 runoff associated with these facilities include surface runoff from development, watercourse base flows, groundwater, and stormwater. Drainage facilities are designed to convey runoff. Existing runoff typically flows into the drainage facilities and from the drainage facilities into other conveyance features, watercourses, or lakes. Maintenance activities attempt to minimize and control stormwater runoff impacts. No additional runoff would result from these activities.

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

There is an unlikely possibility fuel spills could occur from machinery. Spill control and response plans would be in place during all work.

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

Drainage patterns near the sites would not be affected.

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

Most maintenance activities analyzed in this Checklist are intended to ensure continued operation of facilities designed to reduce or control surface and runoff water impacts. BMPs would be implemented on all sites (see Exhibit E), and permit/approval conditions would be met during maintenance activities, which would minimize short-term impacts. Runoff from work areas would be treated and controlled to meet Washington State Water Quality Standards (WAC Chapter 173-201A). The Seattle Biological Evaluation (SBE) (City of Seattle 2015; <https://www.seattle.gov/utilities/construction-resources/standards-and-guidelines/seattle-biological-evaluation>) and the City of Seattle Stormwater Manual (City of Seattle 2021) would be used to select and implement appropriate BMPs to minimize disruption to the natural environment. No long-term measures are proposed because the completed maintenance activities would not generate any additional or long-term runoff.

4. Plants

a. Types of vegetation found on the site:

Vegetation varies according to location. Most facilities covered by this Checklist are in densely urbanized areas and vegetated with invasive, non-native weeds. Some facilities are in or adjacent to sensitive areas with native vegetation (e.g., watercourses, wetlands, and their buffers).

- | | | | | |
|--|--|---|---|--|
| <input checked="" type="checkbox"/> Deciduous trees: | <input checked="" type="checkbox"/> Alder | <input checked="" type="checkbox"/> Maple | <input type="checkbox"/> Aspen | <input checked="" type="checkbox"/> Other: birch, oak, black cottonwood |
| <input checked="" type="checkbox"/> Evergreen trees: | <input checked="" type="checkbox"/> Fir | <input checked="" type="checkbox"/> Cedar | <input type="checkbox"/> Pine | <input checked="" type="checkbox"/> Other: western hemlock, Sitka spruce |
| <input checked="" type="checkbox"/> Shrubs | | | | |
| <input checked="" type="checkbox"/> Grass | | | | |
| <input type="checkbox"/> Pasture | | | | |
| <input type="checkbox"/> Crop or grain | | | | |
| <input type="checkbox"/> Orchards, vineyards, or other permanent crops | | | | |
| <input checked="" type="checkbox"/> Wet soil plants: | <input checked="" type="checkbox"/> Cattail | <input checked="" type="checkbox"/> Buttercup | <input checked="" type="checkbox"/> Bulrush | <input type="checkbox"/> Skunk cabbage |
| <input type="checkbox"/> Other: | | | | |
| <input checked="" type="checkbox"/> Water plants: | <input checked="" type="checkbox"/> water lily | <input type="checkbox"/> eelgrass | <input checked="" type="checkbox"/> milfoil | <input type="checkbox"/> Other: |
| <input type="checkbox"/> Other types of vegetation: | | | | |

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

Some facilities are located where vegetation has been removed or replaced by weedy, non-native species such as blackberry (*Rubus* spp.), Scot broom (*Cytisus scoparius*), and reed canary grass (*Phalaris arundinacea*). King County Class A, B, and C noxious weeds would be removed as required by Washington state law and regulations adopted by the King County Noxious Weed Board. For sites with native vegetation in ECAs, effort would be made to conduct activities with the least impact. Disturbed areas would be revegetated using the original or native species, as appropriate.

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

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. Based on a review of the Washington Department of Natural Resources (WDNR) Natural Heritage Program data, there are no documented occurrences of sensitive, threatened, or endangered plant species on or near the open channel drainage system facilities, enclosed drainage system facilities, or drainage system pond facilities.

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

Removal of or damage to native plants would be avoided whenever possible. In some cases, native plants may need to be pruned or removed to allow maintenance activities to proceed; in these cases, work areas would be minimized to the greatest extent

feasible. Native plants, consistent with function, would be replaced with similar plants if they are removed or destroyed during the work.

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

giant hogweed (*Heracleum mantegazzianum*)
 Japanese knotweed (*Polygonum cuspidatum*)
 Himalayan blackberry (*Rubus bifrons*)
 garlic mustard (*Alliaria petiolata*)
 policemen's helmet (*Impatiens glandulifera*)
 tansy ragwort (*Senecio jacobaea*)
 English Ivy (*Hedera helix*)
 English holly (*Ilex aquifolium*)
 purple loosestrife (*Lythrum salicaria*)
 garden loosestrife (*Lysimachia vulgaris*)
 bittersweet nightshade (*Solanum dulcamara*)
 hedge bindweed (*Convolvulus sepium*)
 Scot broom (*Cytisus scoparius*)
 reed canarygrass (*Phalaris arundinacea*)
 shiny geranium (*Geranium lucidum*)
 Poison Hemlock (*Conium maculatum*)

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]

Numerous songbirds, waterfowl, and other bird species have been observed in and near the sites. As described in the SBE, fish species near the sites include cutthroat (*Oncorhynchus clarkii*), rainbow (*O. mykiss*), and steelhead trout (*O. mykiss*); Chinook (*O. tshawytscha*), coho (*O. kisutch*), chum (*O. keta*), and sockeye salmon (*O. nerka*); peamouth (*Mylocheilus caurinus*); largescale sucker (*Catostomus macrocheilus*); three-spine stickleback (*Gasterosteus aculeatus*); prickly and coast-range sculpin (*Cottus aleuticus*); Pacific (*Entosphenus tridentatus*) and river (*Lampetra fluviatilis*) lamprey; and longnose dace (*Rhinichthys cataractae*).

Birds: <input checked="" type="checkbox"/> Hawk <input checked="" type="checkbox"/> Heron <input checked="" type="checkbox"/> Eagle <input checked="" type="checkbox"/> Songbirds <input checked="" type="checkbox"/> Other: waterfowl
Mammals: <input type="checkbox"/> Deer <input type="checkbox"/> Bear <input type="checkbox"/> Elk <input type="checkbox"/> Beaver <input checked="" type="checkbox"/> Other: racoon, opossum, otter
Fish: <input type="checkbox"/> Bass <input checked="" type="checkbox"/> Salmon <input checked="" type="checkbox"/> Trout <input type="checkbox"/> Herring <input type="checkbox"/> Shellfish <input type="checkbox"/> Other: stickleback

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

The City of Seattle's SBE documents presence of threatened and endangered species and includes other baseline information. The SBE identified seven action areas: Elliott Bay, Lake Washington Ship Canal, Lower Green/Duwamish, North Seattle/Puget Sound, North Seattle/Lake Washington, South Seattle/Puget Sound, and South Seattle/Lake Washington. ESA-listed animal species for these areas include:

Birds listed as Threatened:

marbled murrelet (*Brachyramphus marmoratus*)
yellow-billed cuckoo (*Coccyzus americanus*)
Streak Horned lark (*Eremophila alpestris strigata*)

Fish listed as Threatened:

Puget Sound Chinook salmon
Puget Sound steelhead
bull trout (*Salvelinus confluentus*)

In addition to the species occurring in these areas, the SBE addresses ESA-listed marine mammals, eulachon, and rockfish that occur in Puget Sound. The western pond turtle (*Actinemys marmorata*) is statutorily (WAC 220-610-010) listed as Endangered in the State of Washington and historically occurred in the City of Seattle, although no known populations are known there currently. Maintenance activities would comply with the ESA to avoid 'take' of listed species or their habitat.

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

Some project sites are in watercourses or waterbodies that serve as habitat or migration routes for resident and anadromous fish, including cutthroat trout and coho salmon. Juvenile and adult anadromous and resident fish migrate through some of these systems during certain times of the year that include fall spawning and summer/spring outmigration. All instream facility structures or facilities with connections to watercourses/waterbodies are assumed to have salmonids present unless there are well-established migratory barriers as documented in the SBE or confirmed by WDFW.

Seattle is included in migratory routes of many birds 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. SPU's facilities may provide stopover habitat for migrating waterfowl.

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

Most maintenance activities would have minimal impacts on wildlife or habitat. Most activities would be short-term and occur in small areas where habitat is previously disturbed. To reduce potential impacts, work activities would:

1. Restore disturbed habitat with native vegetation, where appropriate.
2. Implement methods and BMPs described in Exhibit E, including isolation of work areas. Some activities may require that watercourses be temporarily diverted, pumped, or dammed and that erosion control be established and maintained. These measures are intended to prevent or reduce the amount of erosion and the amount of sediment delivered to surface waters.
3. Carefully time work. Activities in watercourses, open channels, enclosed drainage, and drainage ponds with salmonids would not be conducted during adult salmonid spawning windows, during overwintering stages of eggs, or during juvenile emergence. Timing requirements for in-water work prescribed by

WDFW, USFWS, and/or NMFS would be followed. Most in-water work would be conducted during periods of low flow when fish populations are at their lowest levels. Fish removal from in-water work areas or isolation from in-water impacts would be facilitated where and when necessary.

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

King County lists European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*) Eastern gray squirrel (*Sciurus carolinensis*), and fox squirrel (*S. niger*) as terrestrial invasive species occurring in the City of Seattle and surrounding area. King County also lists these aquatic invasive species as known to occur within the City of Seattle and surrounding area: nutria (*Myocastor coypus*), New Zealand mud snail (*Potamopyrgus antipodarum*), and American bullfrog (*Lithobates catesbeianus*). See <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.

Petroleum fuel (gasoline and diesel) would be used to operate maintenance equipment. No additional energy would be required to meet constructed projects' energy needs, beyond the energy already used for the existing drainage system.

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

Activities would not build structures or plant vegetation that would block access to the sun for 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:

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 at each site 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 maintenance activities because of either equipment failure or worker error.

Though unlikely, contaminated soils, sediments, or groundwater could be encountered during excavation. If disturbed, contaminated substances could expose construction

workers and potentially other individuals in the vicinity through direct contact, blowing dust, stormwater runoff, or vapors.

Some work may take place in confined spaces such as deep trenches or drainage structures such as catch basins, overflow maintenance holes, and flow control structure vaults/maintenance holes.

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

None of the project sites are known to have environmental contamination. However, it is possible that contamination of soil or groundwater associated with past uses or activities may be present on or near a site.

(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 the planning for and completion of routine maintenance activities.

(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.

Maintenance activities may generate pollutants that could potentially enter local drainage conveyance systems. Non-sediment pollutants that may be present during performance of the work include:

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

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

No special emergency services would be required during implementation of these activities. The sites would be accessible to emergency vehicles at all times. Radio and cell phone communication would be available while work is being conducted.

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

During maintenance activities, SPU workers would use standard operating procedures and BMPs identified in the City of Seattle's Stormwater Code found at SMC Title 22, Subtitle VIII, City of Seattle Directors' Rules SDCI 10-2021/SPU DWW 200, and Volume 2 Construction Stormwater Control Manual to reduce or control possible environmental health hazards. SPU work crews and/or contractors would be required to develop and implement a Spill Plan to control and manage spills during construction. 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.

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

To ensure workers are not exposed to harmful substances that can be present in drainage water or unsafe concentrations of gases or vapors, flows may be bypassed around work areas as needed to facilitate work. Additionally, workers would be required to follow the Washington State safety standards for entry and work in confined spaces (WAC Chapter 296-809), which include requirements for atmospheric testing in a confined space structure prior to entry and for the duration of work in the structure.

b. Noise

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

Normal urban noises are expected. These would have no impact on the activities covered by this Checklist.

(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.

Short-term noise would be generated from vehicles and heavy equipment performing maintenance activities (for example, truck traffic, vector truck, backhoe, grader, pumps for bypassing flows, and so forth). Work crews would work during hours determined by SMC Section 25.08.425 to control noise impacts on adjacent homeowners/residents. Noise from construction and maintenance activities is typically allowed between 7 a.m. and 7 p.m. on weekdays and 9 a.m. and 7 p.m. on weekends for most residential and some commercial zones. In other zones, the hours are 7 a.m. to 10 p.m. for weekdays and 9 a.m. to 10 p.m. for weekends. Short-term noise impacts would end upon completion of work at each site. Activities would not generate long-term 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 during implementation of these activities, except for during emergencies.

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.

Current use of all sites where these activities would occur is public utility (surface water drainage). Uses on adjacent properties include street rights-of-way, residential,

commercial, and park/open space uses. The work would not change or affect adjacent, nearby, or current land use.

- 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?**

No sites are currently used for agricultural/farmland or working forest purposes, and no lands would be converted from farm or forest use. Uses prior to conversion to drainage facilities are unknown.

- (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?**

There are no working farms or forest lands in the vicinity of the work areas.

- c. Describe any structures on the site.**

This Checklist addresses routine maintenance and repair activities at existing drainage system facilities. Many, but not all, have associated physical structures, including:

- catch basins, maintenance holes, and pipes
- culverts, weirs, and bypass structures
- retaining walls, headwalls, endwalls
- flow control structures
- weirs, dams, and spillways
- foot bridges and docks
- fences
- signs, outdoor furniture, or landscaping
- access roads

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

Typically, existing drainage facility structures would not be demolished as part of the work described in this Checklist. Structures listed in Section B.8.c may be repaired, modified, or replaced to ensure proper function of a facility. Repairs or replacements would be similar to the size and location of existing structures. Changes to a drainage facility that engage major new construction would be addressed in a separate, project-specific SEPA environmental review.

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

Work areas are located throughout the City; zoning varies (e.g., single-family, multi-family, manufacturing/industrial, neighborhood/commercial and government use). Generalized zoning for each site is listed in Exhibit A.

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

Work areas are located throughout the City and comprehensive plan designations vary.

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

Densmore Outfall to Green Lake is in the Conservancy Management Environment of Green Lake, a Shoreline of the State. No other sites have Shoreline Master Program designations. Maintenance and repair of existing structures or developments typically are exempt under the City of Seattle's Shoreline Master Program regulations (SMC 23.60.A.020 C1).

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

Most sites are in Riparian Management Areas, wetlands and wetland buffers, liquefaction-prone Areas and/or flood-prone areas. All of these are ECAs, as mapped by SDCI. Specific locations, activities, and ECAs are described in Exhibit A.

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

No people would reside in the work areas.

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

No people would be displaced by the work activities.

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

Work activities would not result in displacement impacts.

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

Work activities would not establish new land uses or change existing land uses. The work is intended to ensure existing surface drainage facilities continue to operate and provide surface water drainage levels of service as originally designed to accommodate current and planned future land uses.

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

There would be no impacts to adjacent agricultural or 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.

Work activities would not create any housing units.

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

Work activities would not eliminate any housing units.

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

Work activities would not result in any housing impacts; therefore, no measures are proposed.

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?

Existing structures associated with these facilities are drainage-related or are associated with a drainage-related facility and typically lie at or below ground level. No existing structures extend more than about 10 feet above ground level.

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

None.

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

No measures to reduce or control aesthetic impacts 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?

Work would usually be done during the day. The completed work would not be lighted.

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?

Existing off-site sources of light or glare would not affect this proposal.

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

No measures would be necessary because there would be no light and glare impacts to reduce or control.

12. Recreation

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

Some sites where work activities would occur are in or adjacent to parks, greenbelts, or natural areas. Uses may be passive and/or active. Sites Identified within recreational areas include:

Bluedog – Off Leash Dog Area
Densmore Outfall to Green Lake
Jackson Park Ponds – Public Golf Course
Littles Creek Pond – Public Golf Course
Genesee Street Dam Facility – Public Golf Course

TH1: NE 51st St @ Matthews Beach
TH2: 49th Ave NE @ 51st Ave NE
TH3: Thornton Creek @ NE 93rd St
TH10: Thornton Creek @ Burke Gilman Trail
TH11: NE 95th St @ Sand Point Way NE
TH25: Lake City Fish Ladder
TH32: Knickerbocker Reach Habitat Improvements
TH34: Ne 105th St @ 17th Ave NE
TH35: NE 108th @ 8th Ave NE
TH48: 10th Ave NE @ Thornton Creek
TH56: NE Northgate Way @ Victory Creek
LU2: Licton Springs @ Woodlawn Ave
PS2: NE Culbertson Dr @ Sherwood Rd NW
PS4: 8th Ave NE @ Holman Rd NW
SC1: SW Tieg Pl @ Schmitz Creek
PC1: SW Puget Way @ Puget Creek
LO2: SW Nevada St @ Longfellow Creek
LO3: SW Genesee St @ Longfellow Creek
LO4: SW Brandon St @ Longfellow Creek
LO5: 26th Ave SW @ Longfellow Creek
LO6: Beaver Ponds above SW Juneau St
LO7: SW Juneau St @ Longfellow Creek
L10: SW Willow St @ Longfellow Creek
TA3: SE Holyoke Way @ Taylor Creek
MC1: S Cloverdale St @ Grattan Pl S
FA1: Fauntleroy Way @ Fauntleroy Creek
FA2: 45th Ave SW @ Fauntleroy Creek
FA3: California Ave SW @ Fauntleroy Creek

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

Although work areas would be limited to a few parked vehicles, activities may require temporary detours for pedestrians, joggers, dog walkers, and others. For the open channels and enclosed drainage facilities, maintenance would typically last 4 to 8 hours. However, maintenance at pond facilities could detour passive recreation for up to three months due to mobilization and staging of construction equipment and BMPs, and de-mobilization of construction equipment.

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

To avoid or reduce projects impacts on recreational facilities and activities, work activities would:

- Coordinate all project work affecting public parks and trails in advance with the City of Seattle Department of Parks and Recreation.
- Coordinate all project work affecting streets and sidewalks in advance with SDOT.
- Comply with any SDOT Street Use Permits requirements.

- Plan and manage work at each project site to make any necessary closures and detours as brief as possible.
- Ensure safe pedestrian and bicycle routes are maintained at all times consistent with approved SDOT Street Use Permits and traffic control plans.
- Place temporary project signs along affected streets and sidewalks prior to performing the work, to provide residents with advance notice regarding temporary street and sidewalk 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.**

Site LO1 is located approximately 130 feet south of the Seattle Steel Company/Nucor Steel Mill at 2424 SW Andover St (WISAARD ID No. 38466). This facility was determined eligible for the National Register of Historic Places in 2003. There are no other known sites, structures, or buildings listed on, or proposed for, national, state, or local preservation registers on or near work areas.

- 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.**

No cultural resource surveys were conducted for the work activities analyzed in this Checklist. No landmarks, features, or other evidence of Indian or historic use or occupation are known to be on or adjacent to the work areas. However, according to the Washington Information System for Architectural and Archaeological Records Data (WISAARD) predictive model based on environmental factors, some project locations are in areas with High and Very High risk ratings for detecting archaeological resources. However, the work locations are on previously disturbed and filled ground, which importantly reduces risk of encountering contextually significant archaeological materials. Given the High and Very High risk ratings for potentially encountering archaeological materials, work activities would operate under an inadvertent discovery plan that would be available on-site to crews and in effect during all construction and ground-disturbing activities.

- 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 National Register or Washington Heritage properties are in or adjacent to the project site, project locations were checked against the following registers on August 17, 2023:

- Washington Information System for Architectural & 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 May 6, 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.

Work activities would minimally disturb previously disturbed and filled upland, wetland areas, and watercourses. Work activities would not affect buildings or known cultural resources; none of these portions of SPU's existing drainage system are considered historically or culturally important. Work activities are on previously disturbed and filled ground, which importantly reduces risk of encountering contextually significant archaeological materials. However, given the High and Very High risk ratings for potentially encountering archaeological materials, work activities would have an approved inadvertent discovery plan onsite and in effect during all construction and ground-disturbing activities. Work crews would be trained on inadvertent discovery protocols should archaeological material be discovered. If 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 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.

Work activities would occur at publicly owned drainage system facilities located throughout the City of Seattle. Typically, access is from adjacent public and private streets. For location maps and street addresses, see Exhibits D and B, respectively.

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?

Work activities would occur at the publicly owned drainage system facilities located throughout the City of Seattle. Two public transportation agencies serve Seattle: King County Metro, which operates local and commuter buses within King County, and Sound Transit, which operates commuter rail, light rail, and regional express buses within the greater Puget Sound region. Public transit may serve areas adjacent to the specific project sites. Service levels vary by site.

- c. 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).**

No new roads or streets or road improvements would be required. Existing on-site access roads would be maintained; these access roads are similar in function to a driveway; they are meant to provide SPU vehicle access only, much like a private driveway serves only the homeowner.

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

Work activities would not use water, rail, or air transportation. Work areas in the immediate vicinity of known water, rail, or air transportation facilities include the Norfolk Pond – Boeing Field and Northern Pacific Railway site which is near air and rail transportation facilities.

- e. 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?**

Up to several vehicular trips per day may be needed to complete routine maintenance at a site. A brief increase in local traffic can be expected from transporting the equipment and personnel used to conduct the work, although the equipment is not likely to be parked or staged as to obstruct traffic flow. No long-term additional traffic would result from this work. This estimate is made based on professional judgement and experience; no modeling was used. Work activities would not generate any additional vehicle trips beyond that which is normally occurring for the on-going and routine operation, maintenance, and monitoring of these drainage assets.

- f. 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.**

City of Seattle arterial streets may be used freely by the public, inclusive of commercial trucks. Therefore, it is possible that trucks transporting any type of product, including agricultural or forest product, may travel on a road near a maintenance project. The maintenance activities covered by this Checklist are not expected to interfere with the movement of these vehicles.

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

The following measures would be used to reduce or control transportation impacts, as needed:

- SPU would conduct public outreach before and during project construction to notify residents, local agencies, 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.
- Alternative routes for pedestrians, bicyclists, and those with disabilities would be identified and clearly signed, as needed.
- Standard construction signs and flagging would be used to ensure worksite safety and reduce any temporary transportation impacts.

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.

There would be no increased need for public services resulting from the work activities. Work activities would protect existing infrastructure. Failure to conduct these activities can result in the temporary or permanent loss of infrastructure necessary for public services.

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

Work activities would accommodate emergency access at all times. No mitigation is being proposed because the project would not increase impacts on public services.

16. Utilities

Work activities would affect exiting drainage utility facilities. Other utilities vary from site to site; most work locations have no other utilities. Some of the facilities may have other utilities crossing the site. Minor temporary relocations of utilities may be required in some cases. In such cases, the appropriate utility service provider would be notified in advance to ensure coordination.

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


- | | | | |
|---|---|--|---|
| <input type="checkbox"/> None | | | |
| <input type="checkbox"/> Electricity | <input type="checkbox"/> Natural gas | <input type="checkbox"/> Water | <input type="checkbox"/> Refuse service |
| <input type="checkbox"/> Telephone | <input type="checkbox"/> Sanitary sewer | <input type="checkbox"/> Septic system | |
| <input type="checkbox"/> Other: stormwater and combined sewer utilities | | | |

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.

No interruptions of utility services are anticipated during implementation of work activities construction. No new utilities are proposed. The effect of this proposal would extend the life of existing drainage facilities, ensure their proper working order, and minimize risk of failure.

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:  _____
Chapin Pier, Urban Watershed Science Manager

Date: 9/26/2023

Exhibits:

Exhibit A – Drainage System Facility Information Summary Tables
Exhibit B – Drainage System Facility Addresses
Exhibit C – Routine Maintenance & Repair Activities
Exhibit D – Overview Location Maps & Representative Facility Data Sheets
Exhibit E – Routine Maintenance & Repair Methods
Exhibit F – Greenhouse Gas Emissions Worksheet



**Seattle
Public
Utilities**

Citywide Drainage Maintenance Program

SEPA Application Exhibits

Revised September 18, 2023

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Exhibit F – Greenhouse Gas Emissions Worksheet

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Exhibit A-1: Open Channel Drainage System Facilities

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature Associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Activity Duration and Quantity Removed	Estimated Frequency of Maintenance	Environmentally Critical Areas
TH1	NE 51st St. @ Matthews Beach	Single Family	47.69382N	122.27217W	Matthews Creek	Thornton Basin - Lake Washington	30" reinforced concrete pipe (RCP) outfall to engineered wetland	Sediment and Debris Removal	Vactor/ Excavate/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 10 CY	Every 3 years	Wildlife, riparian, floodplain, steep slope
TH3	Thornton Creek @ NE 93rd St.	Single Family	47.69587N	122.27543W	Thornton Creek	Thornton Basin - Lake Washington	76" x 84" Concrete Box Culvert	Sediment and Debris Removal	Vactor/ Excavate/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope, shoreline
TH4	Thornton Creek @ Sand Point Way	Single Family	47.69638N	122.27697W	Thornton Creek	Thornton Basin - Lake Washington	Twin 48" x 72" Concrete Box Culverts	Sediment and Debris Removal	Vactor/ Excavate/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope
TH5	NE 93rd St. @ Sand Point Way	Single Family	47.69580N	122.27640W	Maple Creek	Thornton Basin - Lake Washington	18" corrugated metal pipe (CMP) Culvert	Sediment and Debris Removal, Jetting Culverts	Vactor/ Excavate/ Hand Work	Remove accumulated sediment from culvert system and at the outfall/inflow	10 hours for sediment/debris removal 25 CY	Every year	Wildlife, riparian, floodplain
TH10	Thornton Creek @ Burke Gilman Trail	Single Family	47.69660N	122.27722W	Thornton Creek	Thornton Basin - Lake Washington	Large Irregular Opening	Sediment and Debris Removal	Vactor/ Excavate/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope
TH11	NE 95th St. @ Sand Point Way NE	Single Family	47.69737N	122.27813W	Thornton Creek	Thornton Basin - Lake Washington	Twin 48" x 48" Concrete Box Culverts	Sediment and Debris Removal, Control Vegetation	Vactor/ Excavate/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope
TH17	N & S Branch Thornton Creek Confluence	Single Family	47.70692N	122.29000W	Thornton Creek	Thornton Basin - Lake Washington	Confluence of the N & S branches of Thornton Creek	Anchoring LWM/Habitat Restoration, Sediment and Debris Removal, Control Vegetation	Vactor/ Excavate/ Hand Work	Restore habitat features by anchoring existing woody material and rock. Sediment and debris removal limited to what is required for site restoration.	1 day for LWM anchoring, habitat restore/ sediment removal 10 CY	Demand Work as needed	Wildlife, riparian, floodplain
TH19	30th Ave. NE @ NE 107th St. Thornton Culvert	Single Family	47.70688N	122.29617W	Thornton Creek	Thornton Basin - Lake Washington	98" x 42" Concrete Box Culvert	Sediment and Debris Removal, Jetting Culverts	Vactor/ Excavate/ Hand Work	Remove accumulated sediment in culvert system and at the outfall/inflow	2 days for sediment/ debris removal 50 CY	Every year	Wildlife, floodplain
TH21	30th Ave. NE @ NE 110th St.	Single Family	47.70832N	122.29630W	Kramer Creek	Thornton Basin - Lake Washington	18" RCP Culvert	Sediment and Debris Removal, Control Vegetation, Jetting Culverts	Vactor/ Excavate/ Hand Work	Remove accumulated sediment in culvert system and at the outfall/inflow	1 day for sediment/debris removal 20 CY	Every year	Wildlife, floodplain
TH23	NE 107th St. @ 30th Ave. NE Culvert	Single Family	47.70668N	122.29655W	Thornton Creek	Thornton Basin - Lake Washington	98" x 42" Concrete Box Culvert	Sediment and Debris Removal	Vactor/ Excavate/ Hand Work	Remove accumulated sediment at the outfall/inflow	0.5 day for sediment/debris removal 10 CY	Demand Work as needed	Wildlife, floodplain

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature Associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Activity Duration and Quantity Removed	Estimated Frequency of Maintenance	Environmentally Critical Areas
TH24	27th Ave. NE @ NE 105th St.	Single Family	47.70478N	122.29865W	Thornton Creek	Thornton Basin - Lake Washington	81" x 59" CMP Culvert	Anchoring LWM/ Habitat Restoration, Sediment and Debris Removal	Vactor/ Excavate/ Hand Work	Restore habitat features by anchoring existing woody material and rock. Sediment and debris removal limited to what is required for site restoration.	1 day for LWM anchoring, habitat rehab/sediment removal 5 CY	Demand Work as needed	Wildlife, floodplain
TH25	Lake City Fish Ladder	Neighborhood/ Commercial	47.70112N	122.30262W	Thornton Creek	Thornton Basin - Lake Washington	72" x 60" Concrete Box Culvert	Anchoring LWM/Habitat Restoration, Sediment and Debris Removal	Vactor/ Hand Work	Restore habitat features by anchoring existing woody material and rock. Sediment and debris removal limited to what is required for site restoration.	1 day for LWM anchoring, habitat restore/sediment removal 10 CY	Demand Work as needed	Wildlife, riparian, floodplain
TH29	NE 95th St. @ Lake City Way	Neighborhood/ Commercial	47.69832N	122.30477W	Willow Creek	Thornton Basin - Lake Washington	24" RCP Culvert	Vactoring and Jetting culverts and ditches, Control Vegetation	Vactor/ Hand Work	Remove accumulated sediment from the culvert/ditch system	0.5 day for sediment/debris removal 10 CY	Every 7 years	Wildlife, riparian, floodplain, wetland, steep slope
TH30	NE 98th St. @ Lake City Way NE	Neighborhood/ Commercial	47.70007N	122.30287W	Willow Creek	Thornton Basin - Lake Washington	12" RCP Culvert	Vactoring and Jetting culverts and ditches	Vactor/ Hand Work	Remove accumulated sediment from the culvert/ditch system	2 hours for sediment/debris removal 5 CY	Quarterly and before storms	Wildlife, riparian, floodplain, wetland, steep slope
TH31	NE 98th St. @ Ravenna Ave. NE	Single Family	47.70003N	122.30152W	Thornton - S Branch Trib E	Thornton Basin - Lake Washington	Trash Rack on 36" Outfall	Sediment and Debris Removal	Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for small woody debris removal 5 CY	Quarterly and before storms	Wildlife, riparian, floodplain, wetland,
TH32	Knickerbocker Reach Habitat Improvements	Single Family	47.70058N	122.30593W	Thornton Creek	Thornton Basin - Lake Washington	Creek Restoration with Habitat Features	Anchoring LWM/Habitat Restoration, Sediment and Debris Removal, Control Vegetation	Vactor/ Excavate/ Hand Work	Restore habitat features by anchoring new and existing woody material and rock. Sediment and debris removal are limited to what is necessary to restore the site.	1 day for LWD anchoring, habitat restore/sediment removal 10 CY	Demand Work as needed	Wildlife, riparian, floodplain, wetland, steep slope
TH33	NE 103rd St. Sewer Main Crossing	Single Family	47.70327N	122.30967W	Thornton Creek	Thornton Basin - Lake Washington	Sewer encased in concrete with adjacent habitat features.	Anchoring LWM/Habitat Restoration, Sediment and Debris Removal, Control Vegetation	Vactor/ Excavate/ Hand Work	Restore habitat features by anchoring new and existing woody debris and rock. Sediment and debris removal are limited to what is necessary to rehabilitate the site	1 day for LWD anchoring, habitat rehab/sediment removal 10 CY	Demand Work as needed	Wildlife, riparian, floodplain
TH34	NE 105th St. @ 17th Ave. NE	Single Family	47.70485N	122.31132W	Thornton Creek	Thornton Basin - Lake Washington	19' x 6'6" Concrete Box Culvert	Anchoring LWM/Habitat rehabilitation, Sediment and debris removal	Vactor/ Excavate/ /Hand Work	Restore habitat features by anchoring new and existing woody debris and rock. Sediment and debris removal are limited to what is necessary to rehabilitate the site	1 day for LWD anchoring, habitat rehab/sediment removal 10 CY	Demand Work as needed	Wildlife, riparian, floodplain
TH35	NE 108th @ 8th Ave. NE (Beaver Lodge Park)	Single Family	47.70558N	122.31977W	Thornton Creek	Thornton Basin - Lake Washington	--	Sediment and Debris Removal	Vactor/ Hand Work	Remove or manipulate dams for flood control and fish passage	4 hours for sediment and small woody debris removal 5 CY	Monthly	Wildlife, riparian, floodplain, wetland
TH37	1st Ave. NE @ NE 100th St.	Neighborhood/ Commercial	47.70132N	122.32865W	Thornton Creek	Thornton Basin - Lake Washington	60" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	0.5 day for sediment/debris removal 5 CY	Demand Work as needed	Peat settlement prone

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature Associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Activity Duration and Quantity Removed	Estimated Frequency of Maintenance	Environmentally Critical Areas
TH38	1st Ave. NE @ NE 100th St. Ditch	Neighborhood/ Commercial	47.70048N	122.32858W	Thornton Creek	Thornton Basin - Lake Washington	Drainage conveyance ditch.	Sediment and Debris Removal, Control Vegetation	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	1 day for sediment/debris removal 20 CY	Every 3 years	Riparian
TH43	North Fork Culvert @ Lake City Way	Neighborhood/ Commercial	47.71490N	122.29810W	Thornton Creek	Thornton Basin - Lake Washington	72" x 60" Concrete Box Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 10 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope
TH44	25th Ave. NE @ Thornton Creek	Single Family	47.71792N	122.30185W	Thornton Creek	Thornton Basin - Lake Washington	50" x 48" Concrete Box Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 10 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope
TH45	NE 125th @ Thornton Creek	Single Family	47.71932N	122.30335W	Thornton Creek	Thornton Basin - Lake Washington	52" x 48" Concrete Box Culvert	Sediment and Debris Removal, control Vegetation	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 10 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope
TH46	19th Ave. NE @ NE 130th St.	Single Family	47.72295N	122.30857W	Thornton Creek	Thornton Basin - Lake Washington	80" x 56" CMP Culvert	Anchoring LWD/Habitat rehabilitation, sediment and debris removal	Vactor/ Hand Work	Restore habitat features by anchoring new and existing woody debris and rock. Sediment and debris removal are limited to what is necessary to restore the site	1 day for LWD anchoring, habitat restore/sediment removal 10 CY	Demand Work as needed	Wildlife, riparian, floodplain, steep slope
TH50	NE 115th St. @ Littlebrook 918272	Single Family	47.71195N	122.28988W	Littlebrook Creek	Thornton Basin - Lake Washington	36" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope
TH51	NE 120th St. @ Littlebrook Creek	Single Family	47.71550N	122.29050W	Littlebrook Creek	Thornton Basin - Lake Washington	30" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope
TH52	NE 123rd St. @ Littlebrook Creek	Single Family	47.71732N	122.29057W	Littlebrook Creek	Thornton Basin - Lake Washington	30" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope
TH53	35th Ave. NE @ Littlebrook Creek	Single Family	47.71815N	122.29117W	Littlebrook Creek	Thornton Basin - Lake Washington	30" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope
TH70	20th Ave. NE between NE 143rd St. and NE 145th St.	Neighborhood Residential (@ NE 143rd St.)/Lowrise Multi-Family (@ NE 145th St.)	47.7337N	122.3074W	Hamlin Creek	Thornton Basin - Lake Washington	Vegetation-Ditch; 30" RCP Culvert	Sediment and Debris Removal, Vegetation Control	Vactor/ Hand Work	Divert Hamlin Creek around the work area using pump and bypass, remove accumulated material and overgrown vegetation from the ditch channel, reshape ditch profile to facilitate flow	3 days for sediment/debris, vegetation removal and shaping of ditch profile 40 CY	Every 2 years	Riparian, Wetland

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature Associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Activity Duration and Quantity Removed	Estimated Frequency of Maintenance	Environmentally Critical Areas
TH73	17th Ave NE between NE 136th St and NE 143rd St	Single Family	47.72839N	122.31005W	Unnamed tributary (North Fork Thornton Creek)	Thornton Basin - Lake Washington	Vegetation-Ditch; 12" RCP Culvert	Sediment and Debris Removal	Vactor/ Excavate/ Hand Work	Remove accumulated sediment from the culvert/ditch system	3 days for sediment/debris removal, removal and shaping of ditch profile 30 CY	Every 3 years	--
LU1	N 97th St @ Woodlawn Ave NE	Single Family	47.6994N	122.3382W	Licton Springs	Lake Union	18" RCP culvert, 12" RCP culvert, sandbox	Sediment and Debris Removal	Vactor/ Excavate/ Hand Work	Remove accumulated sediment from the culvert/ditch system	1 day for sediment/ debris removal 15CY	Demand Work as needed	Riparian, Wetland
MK1	56th Ave SW at SW Oregon St	Single Family	47.5631N	122.4050W	Mee-Kwa-Mooks Creek	Puget Sound	Vegetation-Ditch; 12" RCP Culvert	Sediment and Debris Removal	Vactor/ Excavate/ Hand Work	Remove accumulated sediment from the culvert/ditch system	1 day for sediment/ debris removal 15CY	Every 3 years	Riparian, Wetland
PS5	NW 92nd St. @ 28th Ave. NW	Single Family	47.69590N	122.39233W	Unnamed PS07 - Mainstem	Puget Sound	18" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope
PS6	28th Ave. NW @ NW Esplanade	Single Family	47.70017N	122.39357W	Unnamed PS07 - Mainstem	Puget Sound	48" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope
PS7	Marmount Dr. NW @ NW North Beach Dr.	Single Family	47.70080N	122.38995W	Unnamed PS06 - E. Fork	Puget Sound	18" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Demand Work as needed	Potential slide, riparian corridor, wetland, wildlife
PS8	Marmount Dr. NW @ NW North Beach Dr.	Single Family	47.70077N	122.39020W	Unnamed PS06 - W. Fork	Puget Sound	18" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Potential slide, riparian corridor, wetland, wildlife
PS9	NW 96th St. @ 26th Ave. NW	Single Family	47.69862N	122.38962W	Unnamed PS06 - E. Fork	Puget Sound	18" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope
PS10	26th Ave. NW @ NW 96th St.	Single Family	47.69818N	122.38945W	Unnamed PS06 - E. Fork	Puget Sound	18" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope
PS11	NW 95th St. @ 26th Ave. NW	Single Family	47.69775N	122.38950W	Unnamed PS06 - E. Fork	Puget Sound	18" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature Associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Activity Duration and Quantity Removed	Estimated Frequency of Maintenance	Environmentally Critical Areas
PS12	NW 92nd St. @ 25th Ave. NW	Single Family	47.69650N	122.38850W	Unnamed PS06 - E. Fork	Puget Sound	12" CIP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope
PS13	NW Golden Dr. @ 31st Ave. NW	Single Family	47.69833N	122.39608W	Unnamed PS08 - Mainstem	Puget Sound	18" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope
PS14	NW 95th St. @ 26th Pl. NW	Single Family	47.69750N	122.39152W	Unnamed PS06 - W. Fork	Puget Sound	24" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope
PS15	NW 95th St. @ 28th Ave. NW	Single Family	47.69777N	122.39278W	Unnamed PS07 - Mainstem	Puget Sound	12" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope
PS16	View Dr. NW @ 32nd Ave. NW	Single Family	47.69698N	122.39877W	Unnamed PS09 - Mainstem	Puget Sound	12' RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope
PS17	Becker's Culvert	Utility/Public (Carkeek Park)	47.7109N	122.3654W	Pipers Creek (Tributary H)	Pipers	Historically but no longer a private impoundment; 43.08' Culvert on Tributary H	Debris Removal, Control Vegetation	Hand Work	Remove debris and thin noxious vegetation	1 day for sediment/debris removal 1 CY	Vegetation every year; Demand Work as needed	Wetland, wildlife habitat, riparian corridor, steep slope, slide area
LO1	SW Andover St. @ Longfellow Creek	Manufacturing/ Industrial	47.56807N	122.36630W	Longfellow Creek	Duwamish Drainage Basin	60" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Floodplain, wildlife
LO2	SW Nevada St. @ Longfellow Creek	Multi-Family	47.56502N	122.36752W	Longfellow Creek	Duwamish Drainage Basin	Creek Restoration with Habitat Features	Anchoring LWM/Habitat Restoration, Sediment and debris removal, Control Vegetation	Vactor/ Hand Work	Restore habitat features by anchoring new and existing woody debris and rock. Sediment and debris removal are limited to what is necessary to restore the site	1 day for LWD anchoring, habitat rehab/sediment removal 10 CY	Demand Work as needed	Riparian, wildlife, floodplain, steep slope
LO4	SW Brandon St. @ Longfellow Creek	Single Family	47.55375N	122.36675W	Longfellow Creek	Duwamish Drainage Basin	16' x 72" Arch Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain, steep slope, wetland
LO7	SW Juneau St. @ Longfellow Creek	Single Family	47.54998N	122.36493W	Longfellow Creek	Duwamish Drainage Basin	78" Concrete Emergency Bypass Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/ inflow	4 hours for sediment and small woody debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain, wetland
LO8	24th Ave. SW Mid-Block	Single Family	47.54502N	122.36420W	Longfellow Creek	Duwamish Drainage Basin	60" x 192" Arch Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment and small woody debris removal 5 CY	Quarterly and before storms	Floodplain, wildlife

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature Associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Activity Duration and Quantity Removed	Estimated Frequency of Maintenance	Environmentally Critical Areas
LO9	24th Ave. SW @ 25th Ave. SW	Single Family	47.54447N	122.36438W	Longfellow Creek	Duwamish Drainage Basin	60" x 192" Arch Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment and small woody debris removal 5 CY	Quarterly and before storms	Floodplain, wildlife
LO10	SW Willow St. @ Longfellow Creek	Single Family	47.54187N	122.36353W	Longfellow Creek	Duwamish Drainage Basin	50" x 177" Arch Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment and small woody debris removal 5 CY	Quarterly and before storms	Floodplain, wildlife
LO12	SW Holden @ Longfellow Creek	Multi-Family	47.53352N	122.36182W	Longfellow Creek	Duwamish Drainage Basin	75" x 112" Arch Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment and small woody debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain, steep slope, wetland
SP1	31st Ave. SW @ SW 104th St.	Single Family	47.51005N	122.37130W	Seola Pond	Puget Sound Drainage Basin	18" HDPE Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/ inflow	1 day for sediment/debris removal 10 CY	Every 3 years	None
DU1	2nd Ave. SW @ W. Marginal Way	Manufacturing/ Industrial	47.53637N	122.33730W	Tidal Ditch	Duwamish Drainage Basin	48" CMP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/ inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Wetland, pond
DU2	S. Norfolk St. Treatment Swale	Manufacturing/ Industrial	47.50998N	122.28253W	Engineered Swale	Duwamish Drainage Basin	60" RCP Mainline	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/ inflow	1 day for sediment/debris removal 10 CY	Demand Work as needed	Wetland
MC1	S. Cloverdale @ Grattan Pl. S.	Single Family	47.52332N	122.26437W	Mapes Creek	Lake Washington Drainage Basin	24" RCP Culvert Outfall	Sediment and Debris Removal	Vactor/Hand Work	Remove or manipulate dams for flood control and fish passage	4 hours for sediment and small woody debris removal 5 CY	Demand Work as needed	Riparian, steep slope

Notes
1) WDFW Site # is a unique identification for each facility used by SPU for permitting documents, the first two initials are an abbreviation for waterbody or drainage basin the facility is in (e.g., TH49 is in Thornton Basin, LO11 is on Longfellow Creek).
2) The presence of the New Zealand Mud Snail (NZMS) is confirmed in the Thornton, Mapes, Longfellow, and Piper drainage basins. SPU will follow WDFW and internal guidelines for equipment decontamination and management of dredged/excavated materials that may contain NZMS.
CY = cubic yards, LWM = large woody material

Exhibit A-2: Enclosed Drainage System Facilities

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Activity Duration and Quantity Removed	Estimated Frequency of Maintenance	Environmentally Critical Areas
TH2	49th Ave. NE @ NE 51st St.	Single Family	47.69448N	122.27312W	Thornton Mainstem Tributary A	Thornton Basin - Lake Washington	12" and 24" RCP culverts	Vactoring and Jetting culverts and ditches, Control Vegetation	Vactor/ Hand Work	Remove accumulated sediment from the culvert/ditch system	4 hours for sediment/debris removal 5 CY	Every 5 years	Wildlife, riparian, floodplain, shoreline
TH6	NE 92nd St. @ Sand Point Way	Single Family	47.69545N	122.27623W	Maple Creek	Thornton Basin - Lake Washington	12" RCP Culvert	Vactoring and Jetting culverts and ditches, Control Vegetation	Vactor/ Hand Work	Remove accumulated sediment from the culvert/ditch system	1 day for sediment/debris removal 15 CY	Every 5 years	Wildlife, floodplain
TH7	Matthews Ave. NE @ Sand Point Way	Single Family	47.69563N	122.27743W	Maple Creek	Thornton Basin - Lake Washington	12" RCP Culvert	Vactoring and Jetting culverts and ditches	Vactor/ Hand Work	Remove accumulated sediment from the culvert/ditch system	4 hours for sediment/debris removal 5 CY	Every 5 years	Wildlife, floodplain
TH8	Matthews Ave. NE Mid-Block	Single Family	47.69518N	122.27742W	Thornton Mainstem Tributary B (Maple Creek)	Thornton Basin - Lake Washington	12" RCP Culvert	Vactoring and Jetting culverts and ditches	Vactor/ Hand Work	Remove accumulated sediment from the culvert/ditch system	4 hours for sediment/debris removal 2 CY	Every 5 years	Wildlife, floodplain
TH9	Matthew Ave. NE South Block	Single Family	47.69447N	122.27695W	Thornton Mainstem Tributary A	Thornton Basin - Lake Washington	12" RCP Culvert	Vactoring and Jetting culverts and ditches	Vactor/ Hand Work	Remove accumulated sediment from the culvert/ditch system	4 hours for sediment/debris removal 5 CY	Every 5 years	Wildlife, riparian, floodplain
TH12	NE 96th St. @ 39th Ave. NE 905457	Single Family	47.69828N	122.28692W	Mock Creek	Thornton Basin - Lake Washington	18" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/ Excavate/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Quarterly and before storms	Wildlife, riparian, floodplain
TH20	30th Ave. NE @ NE 107th St. Kramer Culvert	Single Family	47.70693N	122.29618W	Kramer Creek	Thornton Basin - Lake Washington	36" CMP Culvert	Sediment and Debris Removal, Jetting Culverts	Vactor/ Excavate/ Hand Work	Remove accumulated sediment from culvert system and at the outfall/inflow	1 day for sediment/debris removal 25 CY	Every year	Wildlife, floodplain
TH22	31st Ave. NE @ NE 110th St.	Single Family	47.70838N	122.29398W	Unnamed Tributary	Thornton Basin - Lake Washington	24" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Every 3 years	Wildlife, floodplain
TH26	NE 100th St. @ Ravenna Ave. NE	Single Family	47.70110N	122.30098W	Willow Creek	Thornton Basin - Lake Washington	18" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	1/2 day for sediment/debris removal 5 CY	Demand Work as needed	Wildlife, riparian, floodplain
TH27	NE 86th St @ Ravenna Ave. NE	Single Family	47.69118N	122.30237W	Willow Creek	Thornton Basin - Lake Washington	18" RCP Culvert	Vactoring and Jetting culverts and ditches	Vactor/ Hand Work	Remove accumulated sediment from the culvert/ditch system	1/2 day for sediment/debris removal 10 CY	Every 3 years	Wildlife, riparian, floodplain, wetland
TH28	NE 89th St. @ Ravenna Ave.	Multi-Family	47.69302N	122.30353W	Willow Creek	Thornton Basin - Lake Washington	18" RCP Culvert.	Vactoring and Jetting culverts and ditches	Vactor/ Hand Work	Remove accumulated sediment from the culvert/ditch system	1/2 day for sediment/debris removal 10 CY	Every 3 years	Wildlife, riparian, floodplain, wetland

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Activity Duration and Quantity Removed	Estimated Frequency of Maintenance	Environmentally Critical Areas
TH41	35th Ave. NE @ NE 115th St.	Single Family	47.71197N	122.29068W	Thornton Creek	Thornton Basin - Lake Washington	81" x 59" CMP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 10 CY	Quarterly and before storms	Wildlife, riparian, floodplain
TH42	33rd Ave. NE @ NE 117th St.	Single Family	47.71278N	122.29188W	Thornton Creek	Thornton Basin - Lake Washington	72" x 54" Concrete Box Culvert, 48" Concrete Box Culvert, 24" CIP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 10 CY	Quarterly and before storms	Wildlife, riparian, floodplain
TH47	15th Ave. NE @ NE 130th Pl.	Multi-Family	47.72510N	122.31297W	Thornton Creek	Thornton Basin - Lake Washington	72" Concrete Box Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 10 CY	Demand Work as needed	Wildlife, riparian, floodplain, steep slope
TH48	10th Ave. NE @ Thornton Creek	Single Family	47.72337N	122.31812W	Thornton Creek	Thornton Basin - Lake Washington	2 - 36" RCP Culverts	Vactoring and Jetting culverts and ditches, Control Vegetation	Vactor/ Hand Work	Remove accumulated sediment from the culvert/ditch system	4 hours for sediment/debris removal 10 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope
TH55	33rd Ave. NE @ NE 127th St. 969068	Neighborhood/Commercial	47.72118N	122.29257W	Littlebrook Creek	Thornton Basin - Lake Washington	48" RCP Culvert with Sediment Vault	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 10 CY	Every 2 years	Riparian, flood prone, steep slope
TH56	NE Northgate Way @ Victory Creek	Single Family	47.70873N	122.31520W	Victory Creek	Thornton Basin - Lake Washington	36" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope
TH57	Ravenna Av. NE @ Lake City Way NE 972327	Multi-Family	47.69567N	122.30548W	Willow Creek	Thornton Basin - Lake Washington	36" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope
TH58	NE 97th St. @ 20th Ave. NE	Single Family	47.69940N	122.30702W	Beckler Creek	Thornton Basin - Lake Washington	12" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian
TH59	2407 NE 98th St.	Single Family	47.70023N	122.30478W	Beckler Creek	Thornton Basin - Lake Washington	12" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian
TH60	NE 117th St @ 12th Ave NE 905081	Single Family	47.71401N	122.31616W	Victory Creek	Thornton Basin - Lake Washington	24" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian
TH61	NE 120th St @ 12th Ave NE	Single Family	47.71582N	122.3166W	Victory Creek	Thornton Basin - Lake Washington	24" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Activity Duration and Quantity Removed	Estimated Frequency of Maintenance	Environmentally Critical Areas
TH62	NE 115th @ 12th Ave NE 905087	Single Family	47.71213N	122.31549W	Victory Creek	Thornton Basin - Lake Washington	2 - 12" RCP Culverts	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian
TH63	Pinehurst Way NE @ Victory Creek	Single Family	47.71199N	122.31543W	Victory Creek	Thornton Basin - Lake Washington	24" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian
TH64	NE 114th St @ 12th Ave NE 905116	Single Family	47.71097N	122.3155W	Victory Creek	Thornton Basin - Lake Washington	24" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian
TH65	NE 113th St @ 12th Ave NE 905119	Single Family	47.71066N	122.3156W	Victory Creek	Thornton Basin - Lake Washington	30" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 4 CY	Demand Work as needed	Riparian
TH66	NE 95th St @ 27th Ave NE	Single Family	47.69745N	122.29958W	Willow Creek Tributary E	Thornton Basin - Lake Washington	18" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian, steep slope
TH67	NE 94th St @ 27th Ave NE 771901	Single Family	47.69655N	122.29869W	Willow Creek Tributary D	Thornton Basin - Lake Washington	12" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian
TH68	NE 96th @ 35th Ave NE 904413	Single Family	47.69818N	122.29048W	Mock Creek	Thornton Basin - Lake Washington	24" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian, wildlife, steep slope
TH69	NE 93rd St @ 45th Ave NE 975177	Single Family	47.69576N	122.27996W	Maple Creek	Thornton Basin - Lake Washington	2 - 24" RCP Culverts	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian, steep slope
TH71	NE 100th St Drainage Mainline (Thornton Creek) (starting @ 1st Ave. NE and ending immediately east of 5th Ave. NE)	Seattle Mixed (@ 1st Ave. NE to 3ve. NE)/Neighborho od Commercial (@ 3rd Ave. NE to 5th Ave. NE)	47.7014N	122.3258W	Thornton Creek South Branch	Thornton Basin - Lake Washington	72" RCP Mainline	Sediment and Debris Removal	Vactor/Hand Work	Use pipe-in-pipe bypass to remove accumulated sediment from the pipe system, repair any minor damage to concrete	30 days for sediment/debris removal 360 CY	Every 10 years	Peat settlement- prone (category 2), steep slope
TH72	NE 110th Street Drainage Mainline (Kramer Creek) (starting @ Lake City Way NE and ending @ 30th Ave. NE)	Neighborhood Commercial (@ Lake City Way NE)/Neighborho od Residential (to 30th Ave. NE)	47.7085N	122.2995W	Kramer Creek	Thornton Basin - Lake Washington	12" RCP Culvert	Sediment and Debris Removal, Vegetation Control	Vactor/Hand Work	Construct temporary streamflow bypass, remove and relocate fish, remove accumulated material and overgrown vegetation from the system	1 day for sediment/debris, vegetation removal 15 CY	Every 2 years	Riparian corridor, wetland, flood- prone,

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Activity Duration and Quantity Removed	Estimated Frequency of Maintenance	Environmentally Critical Areas
LU2	Licton Springs @ Woodlawn Ave. N.	Single Family	47.69743N	122.33872W	Licton Springs	Lake Union	18" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, floodplain
PS2	NW Culbertson Dr @ Sherwood Rd. NW	Single Family	47.73188N	122.37050W	Unnamed PS01 - S. Fork	Puget Sound	18" CMP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Demand work as needed	Riparian, steep slope
PS3	7th Ave. NW @ Holman Rd NW	Multi-Family	47.70063N	122.36517W	Pipers Creek	Puget Sound	30" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope
PS4	8th Ave. NW @ Holman Rd. NW	Multi-Family	47.69987N	122.36563W	Pipers Creek	Puget Sound	60" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope
LO5	26th Av. SW @ Longfellow Creek	Single Family	47.55130N	122.36557W	Longfellow Creek	Duwamish Drainage Basin	Twin 36" RCP Culverts	Vactoring and Jetting culverts and ditches	Vactor/ Hand Work	Remove accumulated sediment from the culvert/ditch system	1 day for sediment/debris removal 10 CY	Every 5 years	Riparian, wildlife, floodplain, steep slope, wetland
TA1	Rainier Ave. S. @ Taylor Creek	Neighborhood/Commercial	47.51123N	122.24782W	Taylor Creek	Lake Washington Drainage Basin	48" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain
TA2	68th Ave. S. @ Taylor Creek	Single Family	47.50938N	122.24810W	Taylor Creek	Lake Washington Drainage Basin	168" x 72" Box Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain
TA3	SE Holyoke Way @ Taylor Creek	Single Family	47.50860N	122.24797W	Taylor Creek	Lake Washington Drainage Basin	168" x 72" Box Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain
FA1	Fauntleroy Way SW @ Fauntleroy Creek 943242	Single Family	47.52273N	122.39277W	Fauntleroy Creek	Puget Sound Drainage Basin	36" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain, steep slope
FA2	45th Av. SW @ Fauntleroy Creek 918243	Neighborhood Commercial/ Lowrise Multi-Family	47.52140N	122.39022W	Fauntleroy Creek	Puget Sound Drainage Basin	24" circular Clay 119' in length	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the inflow	4 hours for sediment/debris removal 10 CY	Quarterly and before storms	Riparian, wildlife, floodplain, steep slope
FA3	California Way SW @ Fauntleroy Creek 918244	Single Family	47.52348N	122.38757W	Fauntleroy Creek	Puget Sound Drainage Basin	36" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain, steep slope

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Activity Duration and Quantity Removed	Estimated Frequency of Maintenance	Environmentally Critical Areas
SC1	SW Tieg Pl. @ Schmitz Creek	Single Family	47.57780N	122.40528W	Schmitz Creek	Puget Sound Drainage Basin	Stormwater Treatment Vault	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment from the treatment structure.	4 hours for sediment/debris removal 10 CY	Quarterly and before storms	Riparian, wildlife, floodplain, steep slope
PC1	SW Puget Way @ Puget Creek	Single Family	47.55790N	122.35357W	Puget Creek	Duwamish Drainage Basin	46" CMP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain, steep slope
PC2	SW Dawson @ 19th Ave SW 968515	Single Family	47.55572N	122.35822W	Puget Creek	Duwamish Drainage Basin	24" CMP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 3 CY	Demand Work as needed	Riparian, wildlife,
PC3	SW Brandon @ 19th Ave SW 968514	Single Family	47.55367N	122.35816W	Puget Creek	Duwamish Drainage Basin	18" CMP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 3 CY	Demand Work as needed	Riparian, wildlife, wetland
MC2	Sturtevant Ave S @ S. Roxbury St.	Single Family	47.51682N	122.26782W	Mapes Creek	Lake Washington Drainage Basin	18" RCP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope
MC3	Sturtevent Ave S. @ Renton Ave S.	Single Family	47.51568N	122.26789W	Mapes Creek	Lake Washington Drainage Basin	24" RCP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope
YC1	NE 65th St @ 39th Ave NE 904418	Single Family	47.67577N	122.28643W	Yesler Creek	Lake Washington Drainage Basin	27" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian
YC2	NE 62nd St @ 40th Ave NE	Single Family	47.67396N	122.28453W	Yesler Creek	Lake Washington Drainage Basin	24" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian
YC3	NE 60th St. @ 40th Ave NE	Single Family	47.67211N	122.28455W	Yesler Creek	Lake Washington Drainage Basin	15" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian

Notes
1) WDFW Site # is a unique identification for each facility used by SPU for permitting documents. The first two initials are an abbreviation for the waterbody or drainage basin where the facility is located (e.g., TH49 is in Thornton Basin, LO11 is on Longfellow Creek.)
2) Types of Pipe: CMP - Corrugated Metal Pipe, RCP - Reinforced Concrete Pipe, HDPE - High Density Polyethylene.
3) The presence of the New Zealand Mud Snail (NZMS) is confirmed in the Thornton, Mapes, Longfellow, and Piper drainage basins. SPU will follow WDFW and internal guidelines for equipment decontamination and management of dredged/excavated materials that may contain NZMS.
CY = cubic yards

Exhibit A-3: Pond Drainage System Facilities

Site Name	Zoning	Latitude	Longitude	Water Feature Associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods*	Limits of Work	Estimated Maintenance Activity Duration and Quantities	Estimated Frequency of Maintenance	Environmentally Critical Areas
Highland Park Basin	Major Institutions	47.540450 N	122.344280 W	Unknown Tributary	Duwamish	Stormwater detention: Infall - concrete headwall to 30” culvert and 18” bypass pipe w/ slide gate; concrete basin; overflow maintenance hole w/ trash rack to 24” CMP outlet pipe	Sediment and Debris Removal. Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc.	Heavy equipment, vactor, jetting, and hand work. If needed, bypass and dewater structure using pumps.	Remove sediment/debris and thin noxious vegetation. Repair erosion damage to road, parking area, and berm separating settling basin from the road.	Sediment – 1 Weeks, 60 CY; Vegetation - 1 Day; Debris - 1 Day; Road/Parking Area/Berm - 3 Days, 20 CY crushed rock	Sediment – As frequently as annually; Vegetation – As frequently as monthly; Debris – As needed; Demand work - As needed; Road/Parking Area/Berm – As frequently as annually	Wetlands, known slide, potential slide, wildlife habitat
Norfolk Pond	Industrial/ commercial	47.510584 N	122.284773 W	None	Duwamish	Stormwater detention & treatment: Twin WSDOT culvert outfalls; two Pond Cells with high flow bypass pipe, culvert connection pipe and access ramp; one wetland cell with low flow outlet pipe.	Sediment and debris removal. Control vegetation. Access road maintenance. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. Dewater pond cells with pumps. Access road maintenance work may require addition of quarry spall/gravels and compaction of surface.	Thin obstructing and noxious vegetation around perimeter of pond and around twin WSDOT culvert outfalls. Vegetation maintenance in Wetland Cell. Sediment removal from pond cells 1 and 2 and pipes.	Sediment - 4 Weeks, 700 CY.; Vegetation - 1 Day; Access Road - 1 Day; Debris - 1 Day	Sediment – As frequently as annually; Vegetation – As frequently as monthly; Access Road – As frequently as annually; Debris – As needed; Demand work - As needed	Wetlands, wildlife habitat, liquefaction area
Jackson Park Ponds	Single Family (on Golf course)	47.728583 N	122.322082 W	Thornton Creek	Thornton Basin - Lake Washington	Stormwater detention & seasonal irrigation storage for golf course: Pond 1 with infall, fish passage, fish weir, and outfall with fish screen; Pond 2 with infall and outfall; Pond 3 with infall with trash rack and outfall.	Sediment and Debris Removal. Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, valves, debris racks, weirs, fish screen, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. Use of pumps and temporary watertight structure to isolate and dewater the ponds. Fish protection measures include fish screens, catch and release downstream and/or return to Pond 1.	Sediment and debris removal from ponds and pipes. Thin obstructing and noxious vegetation around ponds and fish return channel. Maintenance/repair of fish screen and aerators.	Sediment - 6 weeks, 3000 CY.; Vegetation - 1 Week; Fish Screen/aerators - 1 Week; Debris - 3 Days	Sediment – As frequently as annually; Vegetation – As frequently as monthly; Fish screen/aerators – as frequently as annually; Debris – As needed; Demand work – As needed	Wetland, riparian corridor, flood prone

Site Name	Zoning	Latitude	Longitude	Water Feature Associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods*	Limits of Work	Estimated Maintenance Activity Duration and Quantities	Estimated Frequency of Maintenance	Environmentally Critical Areas
Jackson Park Ponds-Diversion Structure & Forebay (WDFW Site #TH49)	Single Family (on Golf course)	47.72942N	122.32303W	Thornton Creek	Thornton Basin - Lake Washington	Forebay; and concrete Diversion Structure with trash rack, 36-inch outlet, diversion weir, and creek weir.	Sediment and Debris Removal. Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. Use of pumps and temporary watertight structures to isolate the forebay and diversion structure from the creek. Fish protection measures include fish screens, catch and release downstream.	Remove sediment and debris from forebay and structures. Thin obstructing and noxious vegetation around forebay, diversion structure, and 36-inch outlet pipe.	Sediment - 1 Week, 30 CY.; Vegetation - 1 Week; Debris - 3 Days	Sediment – As frequently as bi-annually; Vegetation – As frequently as monthly; Debris – As needed; Demand work – As needed	Wetland, riparian corridor, flood prone
Jackson Park Ponds-Maintenance Holes & Flow Control Structures	Single Family (on Golf course)	47.72748N	122.32070W	Thornton Creek	Thornton Basin - Lake Washington	Three concrete maintenance holes; three flow control structures each with two gates and one weir; and associated piping.	Sediment and Debris Removal. Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. Jetting pipes. Saw cutting concrete for access improvements.	Sediment and debris removal inside of structures and pipes. Thin obstructing and noxious vegetation around structures and pipes. Mechanical repair/replacement for access improvements at flow control structures.	Sediment - 4 Weeks, 30 CY.; Vegetation - 3 Days; Debris - 3 Days	Sediment– As frequently as annually; Vegetation – As frequently as monthly; Debris – As needed; Demand work – As needed	Wetland, riparian corridor, flood prone
Thornton Creek Water Quality Channel	Neighborhood/commercial	47.70182N	122.32424W	Thornton Creek	Thornton Basin - Lake Washington	Stormwater detention & treatment: Biofiltration system consisting of upper waterfall; splash pool; lower waterfall; Cell 1; Cell 2 with notch weir; Cell 3 with log spreader; and outlet cell.	Sediment and Debris Removal. Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. Bypass flows using the diversion structure. Dewater cells using pumps. Fish protection measures will be implemented as needed and may include fish screens, catch and release downstream.	Thin obstructing and noxious vegetation around cells. Sediment and debris removal around upper waterfall, in splash pool, around lower waterfall, in Cells 1,2,3, and outlet cell.	Sediment - 6 Weeks, 800 CY.; Vegetation - 2 Weeks; Debris - 1 Week	Sediment - As frequently as annually; Vegetation – As frequently as daily; Debris – As needed; Demand work – As needed	Peat settlement prone area category 2

Site Name	Zoning	Latitude	Longitude	Water Feature Associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods*	Limits of Work	Estimated Maintenance Activity Duration and Quantities	Estimated Frequency of Maintenance	Environmentally Critical Areas
Thornton Creek Water Quality Channel-Diversion Structure (WDFW Site #TH36)	Neighborhood/commercial	47.70177N	122.32403W	Thornton Creek	Thornton Basin - Lake Washington	Concrete Diversion Structure with weir, gate, 60-inch by 36-inch (5’ x 3”) box culvert outlet, and trash rack. Can be used to bypass the pond cells for routine maintenance.	Sediment and Debris Removal. Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. If needed, bypass and dewater structure using pumps.	Remove sediment in diversion structure and box culvert. Remove debris from trash rack. Thin obstructing and noxious vegetation around structures and outlet.	Sediment - 3 Weeks, 50 CY.; Vegetation - 3 Days; Debris - 3 Days	Sediment – As frequently as annually; Vegetation – As frequently as daily; Debris – As needed; Demand work – As needed	Peat settlement prone area category 2
Thornton Creek Water Quality Channel-Outlet Structure	Neighborhood/commercial	47.70296N	122.32337W	Thornton Creek	Thornton Basin - Lake Washington	Concrete Structure with 72-inch by 36-inch (6’ x 3”) box culvert outlet, and trash rack.	Sediment and Debris Removal. Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. If needed, bypass and dewater structure using pumps.	Remove sediment in diversion structure and box culvert. Remove debris from trash rack. Thin obstructing and noxious vegetation around structures and outlet.	Sediment - 2 Weeks, 30 CY.; Vegetation - 1 Week; Debris - 3 Days	Sediment - As frequently as annually; Vegetation – As frequently as daily; Debris – As needed; Demand work – As needed	Peat settlement prone area category 2
Thornton Creek Water Quality Channel-Inlet Structure	Neighborhood/commercial	47.70296N	122.32337W	Thornton Creek	Thornton Basin - Lake Washington	Concrete Structure with 24-inch inlet pipe, and 72-inch by 18-inch (6’ x 18”) box culvert outlet, and trash rack.	Sediment and Debris Removal. Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work.	Remove sediment in diversion structure and inlet and outlet. Thin obstructing and noxious vegetation around structures and outlet.	Sediment - 1 Week, 30 CY.; Vegetation - 1 Week; Debris - 3 Days	Sediment - As frequently as annually; Vegetation – As frequently as daily; Debris – As needed; Demand work – As needed	Peat settlement prone area category 2

Site Name	Zoning	Latitude	Longitude	Water Feature Associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods*	Limits of Work	Estimated Maintenance Activity Duration and Quantities	Estimated Frequency of Maintenance	Environmentally Critical Areas
Littles Creek Pond	Single Family (on Golf course)	47.73286N	122.31870W	Littles Creek	Thornton Basin - Lake Washington	Stormwater detention: Overflow channel with weir and berm; Pond with 12-inch outfall and concrete headwall.	Sediment and Debris Removal. Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. Dewater pond using pumps. Fish protection measures will be implemented as needed and may include fish screens, catch and release downstream.	Remove sediment and debris in pond, channel and around outflow structures. Thin obstructing and noxious vegetation around berm, channel, pond and 12-inch outfall pipe.	Sediment - 4 weeks, 500 CY.; Vegetation - 1 Week; Debris - 3 Days	Sediment – As frequently as annually; Vegetation – As frequently as monthly; Debris – As needed; Demand work as needed	Wetland, riparian corridor, liquefaction
NSC Stormwater Structures & Outfalls	Major Institutions	47.70162N	122.33377W	Thornton Creek	Thornton Basin - Lake Washington	Concrete diversion structure with weir wall, weir plate and gate; 24-inch outfall with sluice gate and headwall; 36-inch outfall; 12-inch outfall and associated maintenance holes; and oil water separator	Sediment and Debris Removal. Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacement as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work.	Sediment and debris removal in diversion structure, oil water separator, and at outfalls. Thin obstructing and noxious vegetation around outfalls.	Sediment - 2 Weeks, 50 CY.; Vegetation - 1 Week; Debris - 3 Days	Sediment - As frequently as annually; Vegetation – As frequently as monthly; Debris – As needed; Demand work – As needed	Peat settlement prone area category 2, wetland
Webster Pond (WDFW Site #LO11)	Multi Family	47.53510N	122.36190W	Longfellow Creek	Duwamish	Stormwater detention: Diversion structure with gate and 12-inch bypass pipe; concrete lined settling basin; outlet structure with trash rack, gate, and 24-inch outlet pipe; overflow maintenance hole with debris cage; overflow structure with weir, trash rack and 60-inch outfall pipe; grass lined overflow spillway; detention area; and gravel access road.	Sediment and Debris Removal. Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacement as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. Access road maintenance work may require addition of quarry spall/gravels and compaction of surface. Bypass stream flows and isolate pond area using existing diversion structure and/or watertight structure. Fish protection measures will be implemented as needed and may include fish screens, catch and release downstream	Sediment and debris removal in settling basin, detention area, around and inside of pond structures and pipes. Maintain access road. Thin obstructing and noxious vegetation around structures, along maintenance road and on perimeter slopes.	Sediment - 3 Weeks, 2 CY.; Vegetation - 2 Weeks; Debris - 1 Week	Sediment - As frequently as annually; Vegetation – As frequently as monthly; Debris – As needed; Demand work – As needed	Flood prone, wetlands, riparian corridor

Site Name	Zoning	Latitude	Longitude	Water Feature Associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods*	Limits of Work	Estimated Maintenance Activity Duration and Quantities	Estimated Frequency of Maintenance	Environmentally Critical Areas
Genesee Pond: Inlet Culvert (WDFW Site #LO3)	Single Family	47.56449N	122.36722W	Longfellow Creek	Duwamish	Inlet structure with concrete headwall, debris rack, riprap and 48-inch discharge pipe.	Sediment and Debris Removal, Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. Temporary watertight structure and pumps to isolate inlet and bypass creek for sediment removal. Fish protection measures as needed may include fish screens, catch and release downstream.	Remove accumulated sediment and debris at culvert inflow and trash rack. Jet clean culvert. Vegetation thinning at culvert inflow	Sediment - 1 Week, 25 CY.; Vegetation - 3 Days; Debris - 1 Day	Sediment - As frequently as annually; Vegetation – As frequently as monthly; Debris – As needed; Demand work – As needed	Steep slope, riparian corridors, wetlands, flood prone, wildlife, liquefaction
Genesee Pond: Outlet Structure	Single Family	47.56500N	122.36746W	Longfellow Creek	Duwamish	Concrete open-top outlet structure with metal safety railing, 6-inch weir outlet, two outlet ports and one 12-inch low flow outlet port.	Sediment and Debris Removal, Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. Temporary watertight structure and pumps to isolate and bypass flow for sediment removal. Fish protection measures as needed may include fish screens, catch and release downstream. Construct temporary access road if needed.	Remove accumulated sediment and debris around outlet structure and inside of structure. Vegetation thinning around outlet structure and for construction of temporary access road if needed.	Sediment - 2 Weeks, 70 CY.; Vegetation - 1 Week; Debris - 3 Days	Sediment - As frequently as annually; Vegetation – As frequently as monthly; Debris – As needed; Demand work – As needed	Steep slope, riparian corridors, wetlands, flood prone, wildlife, liquefaction
Olson Pond	Single Family	47.52252N	122.33502W	Unnamed creek	Duwamish	Stormwater Detention: Pond- Pond outlet maintenance hole with 18-inch grated outlet, 24-inch grated outlet, and 30-inch outlet culvert; one 18-inch outfall to pond; and Ecology Block/rock overflow spillway.	Sediment and Debris Removal, Control Vegetation. Safety improvements as needed for accessibility and public safety. Mechanical repairs/replacements as needed for appurtenant piping, gates, debris racks, weirs, etc. Monitoring equipment installation and repairs/replacement.	Heavy equipment, vactor, jetting, and hand work. Construct temporary access road if needed.	Sediment removal to be done during dry season. Remove accumulated sediment and debris at outlet pipes and pond area. Thin vegetation around maintenance hole and on access road. Thin obstructing vegetation around retaining wall and spillway. May require removal of up to 5 mature trees to be replaced with similar native species at min. 1:1.	Sediment - 2 Weeks, 100 CY.; Vegetation - 1 Day; Debris - 1 Day	Sediment - As frequently as annually; Vegetation – As frequently as monthly; Debris – As needed; Demand work – As needed	Wetland. Wildlife Habitat.

Exhibit B – Drainage System Facility Addresses

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Exhibit B-3: Pond Drainage System Facility Addresses	25

Exhibit B-1: Open Channel Drainage System Facility Addresses

WDFW Site #	Site Name	Street Address
TH1	NE 51st St. @ Matthews Beach	5101 NE 90th Pl.
TH3	Thornton Creek @ NE 93rd St.	4819 NE 93rd St.
TH4	Thornton Creek @ Sand Point Way	East of Matthews Ave. NE @ Sand Point Way NE
TH5	NE 93rd St. @ Sand Point Way	NE 93rd St. @ Sand Point Way NE
TH10	Thornton Creek @ Burke Gilman Trail	9251 Matthews Ave. NE
TH11	NE 95th St. @ Sand Point Way NE	NE 95th St. @ Sand Point Way
TH17	N & S Branch Thornton Creek Confluence	10706 35th Ave. NE
TH19	30th Ave. NE @ NE 107th St. Thornton Culvert	10703 30th Ave. NE
TH21	30th Ave. NE @ NE 110th St.	30th Ave. NE @ NE 110th St.
TH23	NE 107th St. @ 30th Ave. NE Culvert	2839 NE 107th St.
TH24	27th Ave. NE @ NE 105th St.	2710 NE 105th St.
TH25	Lake City Fish Ladder	9800 Lake City Way NE
TH29	NE 95th St. @ Lake City Way	9500 Lake City Way NE
TH30	NE 98th St. @ Lake City Way NE	2351 NE 98th St.
TH31	NE 98th St. @ Ravenna Ave. NE	9750 Ravenna Ave. NE
TH32	Knickerbocker Reach Habitats	1919 NE 100 th St.
TH33	NE 103rd St. Sewer Main Crossing	10312 17th Ave. NE
TH34	NE 105th St. @ 17th Ave. NE	10423 17th Ave. NE
TH35	NE 108th @ 8th Ave. NE (Beaver Lodge Park)	800 NE 106th St.
TH37	1st Ave. NE @ NE 100th St.	10001 1st Ave. NE
TH38	1st Ave. NE @ NE 100th St. Ditch	9580 1st Ave. NE

WDFW Site #	Site Name	Street Address
TH43	North Fork Culvert @ Lake City Way	11701 Lake City Way NE
TH44	25th Ave. NE @ Thornton Creek	12321 25th Ave. NE
TH45	NE 125th @ Thornton Creek	12507 24th Ave. NE
TH46	19th Ave. NE @ NE 130th St.	1903 NE 130th Pl.
TH50	NE 115th St. @ Littlebrook	3516 NE 115th St.
TH51	NE 120th St. @ Littlebrook Creek	3516 NE 120th St.
TH52	NE 123rd St. @ Littlebrook Creek	3518 NE 123rd St.
TH53	35th Ave. NE @ Littlebrook Creek	12329 35th Ave. NE
TH70	20th Ave. NE between NE 143rd St. and NE 145th St.	20th Ave. NE between NE 143rd St. and NE 145th St.
TH73	17th Ave NE between NE 136th St and NE 143rd St	17th Ave NE between NE 136th St and NE 143rd St
LU1	N 97th St @ Woodlawn Ave NE	N 97th St @ Woodlawn Ave NE
MK1	56th Ave SW @ SW Oregon St	56th Ave SW @ SW Oregon St
PS5	NW 92nd St. @ 28th Ave. NW	9115 27th Ave. NW
PS6	28th Ave. NW @ NW Esplanade	2803 NW Esplanade
PS7	Marmount Dr. NW @ NW North Beach Dr.	9810 Marmount Dr. NW
PS8	Marmount Dr. NW @ NW North Beach Dr.	2605 North Beach Drive
PS9	NW 96th St. @ 26th Ave. NW	9519 26th Ave. NW
PS10	26th Ave. NW @ NW 96th St.	2518 NW 95th St.
PS11	NW 95th St. @ 26th Ave. NW	2515 NW 95th St.
PS12	NW 92nd St. @ 25th Ave. NW	9220 25th Ave. NW
PS13	NW Golden Dr. @ 31st Ave. NW	2855 NW Golden Dr.

WDFW Site #	Site Name	Street Address
PS14	NW 95th St. @ 26th Pl. NW	2639 NW 95th St.
PS15	NW 95th St. @ 28th Ave. NW	9404 28th Ave. NW
PS16	View Dr. NW @ 32nd Ave. NW	9300 View Ave. NW
PS17	Becker's Culvert	777 NW Carkeek Park Road
LO1	SW Andover St. @ Longfellow Creek	2629 SW Andover St.
LO2	SW Nevada St. @ Longfellow Creek	2641 SW Nevada St.
LO4	SW Brandon St. @ Longfellow Creek	2607 SW Brandon St.
LO7	SW Juneau St. @ Longfellow Creek	2519 SW Juneau St.
LO8	24th Ave. SW Mid- Block	6331 24th Ave. SW
LO9	24th Ave. SW @ 25th Ave. SW	6504 24th Ave. SW
LO10	SW Willow St. @ Longfellow Creek	6747 24th Ave. SW
LO12	SW Holden @ Longfellow Creek	SW Holden @ Longfellow Creek
SP1	31st Ave. SW @ SW 104th St.	10262 31st Ave. SW
DU1	2nd Ave. SW @ W. Marginal Way	7245 W. Marginal Way SW
DU2	S. Norfolk St. Treatment Swale	9892 40th Ave. S.
MC1	S. Cloverdale @ Grattan Pl. S.	5401 S. Henderson St.

Exhibit B-2: Enclosed Drainage System Facilities Addresses

WDFW Site #	Site Name	Street Address
TH2	49th Ave. NE @ NE 51st St.	9029 49th Ave. NE
TH6	NE 92nd St. @ Sand Point Way	9253 Sand Point Way NE
TH7	Matthews Ave. NE @ Sand Point Way	9223 Matthews Ave. NE
TH8	Matthews Ave. NE Mid-Block	9209 Matthews Ave. NE
TH9	Matthew Ave. NE South Block	9101 Matthews Ave. NE
TH12	NE 96th St. @ 39th Ave. NE	3823 NE 96th St.
TH20	30th Ave. NE @ NE 107th St. Kramer Culvert	10703 30th Ave. NE
TH22	31st Ave. NE @ NE 110th St.	3024 NE 110th St.
TH26	NE 100th St. @ Ravenna Ave. NE	2511 NE 100th St.
TH27	NE 86th St @ Ravenna Ave. NE	NE 86th St @ Ravenna Ave. NE
TH28	NE 89th St. @ Ravenna Ave. NE	NE 89th St. @ Ravenna Ave. NE
TH41	35th Ave. NE @ NE 115th St.	3422 NE 115th St.
TH42	33rd Ave. NE @ NE 117th St.	11537 34th Av. NE
TH47	15th Ave. NE @ NE 130th Pl.	1511 NE 130th Pl.
TH48	10th Ave. NE @ Thornton Creek	13000 10th Av. NE
TH55	33rd Ave. NE @ NE 127th St.	12562 33rd Av. NE
TH56	NE Northgate Way @ Victory Creek	1060 NE Northgate Way
TH57	Ravenna Ave. NE @ Lake City Way NE	2201 NE 92nd St.
TH58	NE 97th St. @ 20th Ave. NE	9701 20th Ave. NE
TH59	2407 NE 98th St.	2407 NE 98th St.
TH60	NE 117th St @ 12th Ave NE	1040 NE 117th St.
TH61	NE 120th St @ 12th Ave NE	1034 NE 120th St.

WDFW Site #	Site Name	Street Address
TH62	NE 115th @ 12th Ave NE	11519 B 12th Ave NE
TH 63	Pinehurst Way NE @ Victory Creek	11420 Pinehurst Way NE
TH 64	NE 114th St @ 12th Ave NE	1050 NE 114th St.
TH 65	NE 113th St @ 12th Ave NE	11305 12th Ave NE
TH66	NE 95th St @ 27th Ave NE	2545 NE 95th St.
TH 67	NE 94th St @ 27th Ave NE	9223 27th Ave NE
TH 68	NE 96th @ 35th Ave NE	3259 NE 97th St.
TH 69	NE 93rd St @ 45th Ave NE	9223 45th Ave NE
TH71	NE 100th Street Drainage Mainline (Thornton Creek)	NE 100th St. starting @ 1st Ave. NE and ending immediately east of 5th Ave. NE
TH72	NE 110th Street Drainage Mainline (Kramer Creek)	NE 110th St. starting @ Lake City Way NE and ending @ 30th Ave. NE
LU2	Licton Springs @ Woodlawn Ave. N.	9241 Woodlawn Ave. N.
PS2	NW Culbertson Dr @ Sherwood Rd. NW	1204 NW Culbertson Drive
PS3	7th Ave. NW @ Holman Rd NW	9722 8th Av. NW
PS4	8th Ave. NW @ Holman Rd. NW	9704 Holman Rd NW
LO5	26th Av. SW @ Longfellow Creek	5624 26th Av. SW
TA1	Rainier Ave. S. @ Taylor Creek	10005 Rainier Av. S
TA2	68th Ave. S. @ Taylor Creek	10050 68th Av. S.
TA3	SE Holyoke Way @ Taylor Creek	10250 Holyoke Way S.
FA1	Fauntleroy Way SW @ Fauntleroy Creek	9108 Fauntleroy Way SW
FA2	45th Ave. SW @ Fauntleroy Creek	9144 45th Av. SW
FA3	California Way SW @ Fauntleroy Creek	9140 California Av. SW
SC1	SW Tieg Pl. @ Schmitz Creek	5639 SW Tieg Pl.
PC1	SW Puget Way @ Puget Creek	4860 14th Av. SW

WDFW Site #	Site Name	Street Address
PC2	SW Dawson @ 19th Ave SW	1823 SW Dawson St.
PC3	SW Brandon @ 19th Ave SW	1821 SW Brandon St.
MC2	Sturtevant Ave S @ S. Roxbury St.	5140 S Roxbury St.
MC3	Sturtevant Ave S. @ Renton Ave S.	9650 Renton Ave S.
YC1	NE 65th St @ 39th Ave NE	6053 39th Ave NE
YC2	NE 62nd St @ 40th Ave NE	6203 40th Ave NE
YC3	NE 60th St. @ 40th Ave NE	5756 39th Ave NE

Exhibit B-3: Pond Drainage System Facilities Addresses

Site Name	Nearest Street Address
Highland Park Basin	Highland Park Way SW / West Marginal Way SW
Norfolk Pond	Interstate 5 SB exit 158
Jackson Park Ponds (on Golf Course)	1000 NE 135th St. (Jackson Park Golf Course)
Jackson Park Ponds- Diversion Structure & Forebay (WDFW Site #TH49)	1000 NE 135th St. (Jackson Park Golf Course)
NSC Stormwater Structures & Outfalls	9600 College Way N
Thornton Creek Water Quality Channel	10005 5th Ave NE
Littles Creek Pond (on Golf Course)	1000 NE 135th St. (Jackson Park Golf Course)
Webster Pond	7501 Delridge Way SW
Genesee Pond: Inlet Culvert	4405 26th Ave SW
Genesee Pond: Outlet Structure	2629 SW Nevada St.
Olson Pond	9220 Olson Place SW
Outfall to Bitter Lake	317 N 137th St
Green Lake – Densmore Outfall	7801 West Green Lake Drive N
Outfall to Haller Lake	12555 Meridian Ave N
Ashworth Pond	Ashworth Ave N / N 128th St.
Blue Dog Pond	26th Ave S / S Massachusetts St.
Midvale Pond	Midvale Ave N / N 107th St.
Stone Pond	Stone Ave N / N 122nd St.

Exhibit C – Routine Maintenance & Repair Activities

To simplify the maintenance process, seven primary routine maintenance and repair activities are identified and described below. These seven activities include:

1. Sediment and Debris Removal
2. Vactoring and Jetting
3. Vegetation Control
4. Anchoring Large Woody Debris (LWD)/Habitat Restoration
5. Mechanical Improvements and Repairs/Replacements
6. Safety Improvements
7. Monitoring Equipment Installation, Repair/Replacement

For these maintenance activities, specific BMP's are identified to accomplish the task with minimal impacts on the surrounding environment. The methods and associated BMP's are listed and explained in Exhibit E: Maintenance & Repair Methods.

1. Sediment and Debris Removal

Sediment and Debris Removal consists of the removal of excess sediment and vegetative matter which compromises the performance of the facility. This work is often demand work (e.g., as a result of storm events or requirements in the City's municipal separate storm sewer system NPDES permit) and not on a regular schedule. The goal of sediment and debris removal is to maintain the capacity or function of the facility by removing excess sediments and returning the facility to its original design capacity or to provide continuous flow through to reduce flood risk. The work may be accomplished by hand or by utilizing either vactor trucks or heavy equipment such as excavators and backhoes. Pumps and in-creek/pond water-tight structures or silt fence may be employed for isolation and dewatering of the work area if needed. Environmental buckets or other erosion and sediment control BMPs may be employed to prevent discharge of fill or deleterious materials downstream. Fish exclusion measures and other protection measures may also be employed.

Sediment and debris removal are required most commonly in:

- Catch basin and stormwater structures to maintain their capacity and function.
- Conveyance facilities to maintain their capacity:
 - Piped stormwater infrastructure.
 - Culvert and ditch systems.
 - Instream infrastructure may require sediment/debris removal near or in water at culvert inflows/outfalls and trash racks.
- Stormwater Facilities to maintain their capacity and treatment:
 - Treatment Ponds
 - Detention Ponds
 - Engineered Wetlands

BMPs for sediment and debris removal include:

- Delineation of Work Areas
- Temporary Bypass of Stream Flow

- Vactoring and Jetting
- Excavating and use of environmental buckets
- Habitat Addition or Maintenance
- Site Restoration/Landscaping
- Temporary Erosion Control
- Temporary Dewatering

2. Vactoring and Jetting

Vactoring and jetting is the removal of excess sediment and vegetative matter which compromises the ditch and culvert or pipe facility. This work is often scheduled and is required on a regular basis. The goal of vactoring and jetting is to remove excess material to reduce flooding impacts and maintain capacity. Vactoring and jetting is accomplished utilizing a combination vactor truck and is most commonly required in pipes and culvert systems and ditches.

BMPs for vactoring and jetting include:

- Delineation of Work Areas
- Temporary Bypass of Stream Flow
- Vactoring and Jetting
- Excavating and use of environmental buckets
- Habitat Addition or Maintenance
- Site Restoration/Landscaping

3. Vegetation Control

Vegetation control is the removal of excess or obstructing vegetation from a facility and its appurtenances such as ponds, trash racks, ditches, inside of and around structures, pipes and culverts. The goal is to maintain accessibility and capacity of the facility and all appurtenances. This involves cutting back live vegetation or removing and replacing trees. This work is often scheduled work and is required on a consistent basis and is accomplished utilizing a variety of hand tools including rakes, weed eaters and machetes.

Vegetation control is required most commonly in:

- Ditches
- Culvert inflows and outflows
- Ponds
- Maintenance Hole Lids/Access Hatches

BMPs for vegetation control include:

- Delineation of Work Areas
- Temporary Bypass of Stream Flow
- Habitat Addition or Maintenance
- Site Restoration/Landscaping

4. *Anchoring LWM/Habitat Restoration*

Anchoring Large Woody Material (LWM)/Habitat Restoration is the anchoring of existing woody material from previously constructed habitat improvement projects to prevent the migration and blockage of infrastructure. It also applies to naturally occurring LWM that may need to be redistributed and anchored to restore the conveyance capacity of the stormwater facility or may be deemed necessary and beneficial for habitat within the stormwater facility. This work is often demand work (storm event driven) and not on a regular schedule. The goal of anchoring LWM and habitat restoration is to maintain stormwater facility capacity and function, replace and improved damaged habitat to benefit fish and wildlife.

This work required most commonly in:

- Ditches
- Habitat projects where woody debris has destabilized and needs to be anchored such as engineered wetland areas or creeks
- Trash racks
- Ponds

BMPs for Anchoring LWM/Habitat Restoration include:

- Delineation of Work Areas
- Temporary Bypass of Stream Flow
- Habitat Addition or Maintenance
- Site Restoration/Landscaping

5. *Mechanical Improvements and Repairs/Replacements*

Mechanical improvements refer to adding new gates, valves, trash racks, access hatches and their components when necessary to maintain functionality of the structure and facility. Mechanical repairs/replacements refer to maintaining structural components such as slide or sluice gates, orifice plates, hinges, trash racks, valves, etc. The goal of this activity is to maintain the operability and function of the structural components of drainage system facilities. This work is often conducted on-demand and not on a regular schedule.

Mechanical improvements are required most commonly in:

- Flow control structures
- Culverts or pipes fitted with trash racks or gates
- Diversion structures
- Overflow maintenance holes fitted with debris cages

BMPs for mechanical repairs include:

- Delineation of work areas
- Temporary Bypass of Stream Flow (if needed)
- Site Restoration/Landscaping (if needed)

6. *Safety Improvements*

Safety Improvements refer to improving safe accessibility for crew and emergency response at stormwater facilities. For example, steep slopes may be furnished with a stairwell and platform for safer access to a structure. Fencing and security improvements fall under this activity.

Improvements to access roads and boat ramps also fall under this activity. The goal of this activity is to maintain the safety and accessibility of stormwater facilities. This work is often demand work and not on a regular schedule.

BMPs for Safety Improvements:

- Delineation of work areas
- Temporary Bypass of Stream Flow
- Habitat Addition or Maintenance
- Site Restoration/Landscaping

7. Monitoring Equipment Installation, Repair/Replacement

Monitoring equipment installation refers to installing monitors and associated equipment in creeks, ponds, pipes and structures. Monitoring equipment repair/replacement refers to the maintenance of existing monitoring equipment at various locations. The goal of this activity is to track level, flow, sediment, and water quality data to better understand and evaluate our drainage sites and facilities.

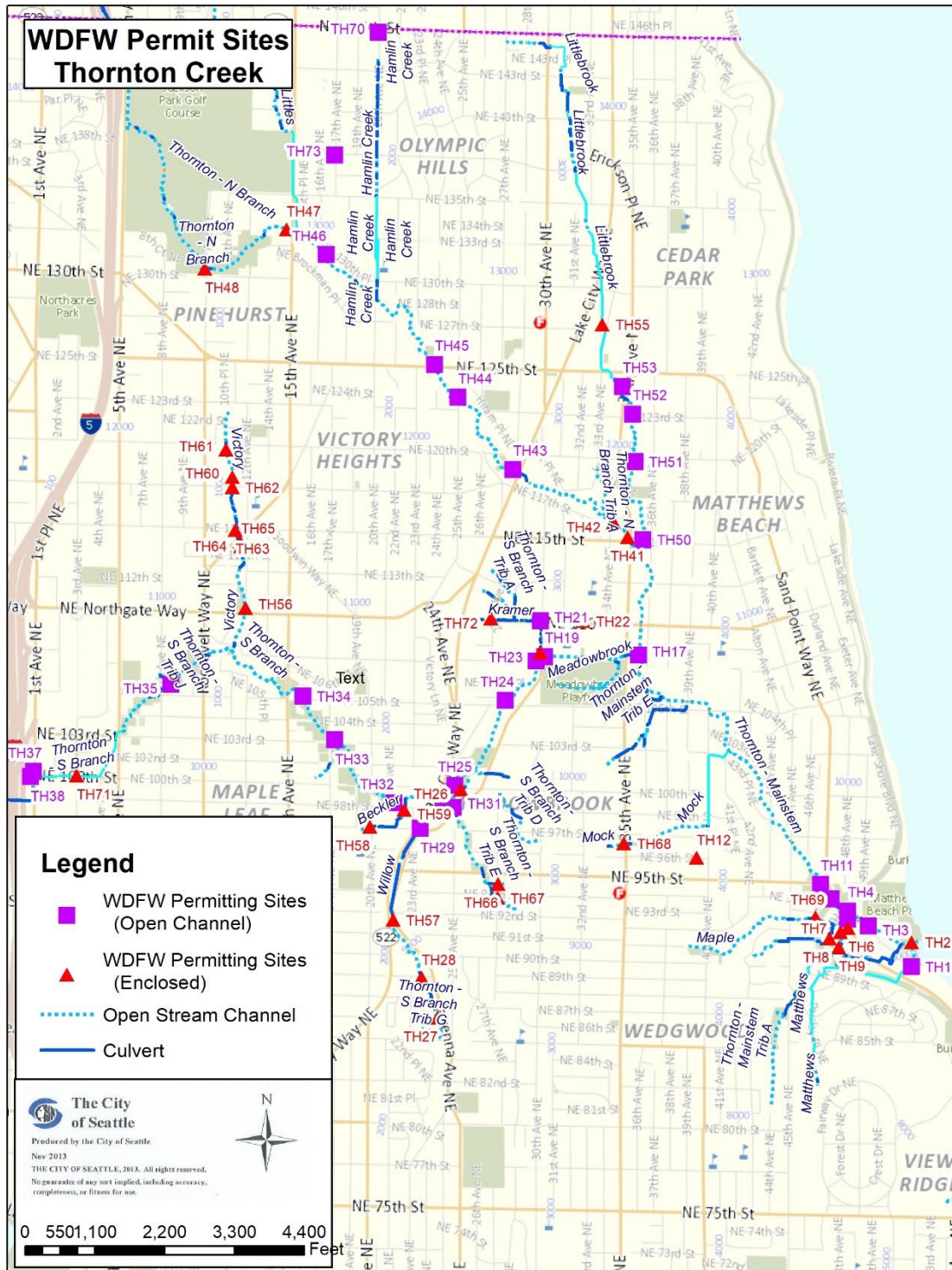
BMPs for safety improvements include:

- Delineation of work areas
- Temporary Bypass of Stream Flow (if needed)
- Site Restoration/Landscaping

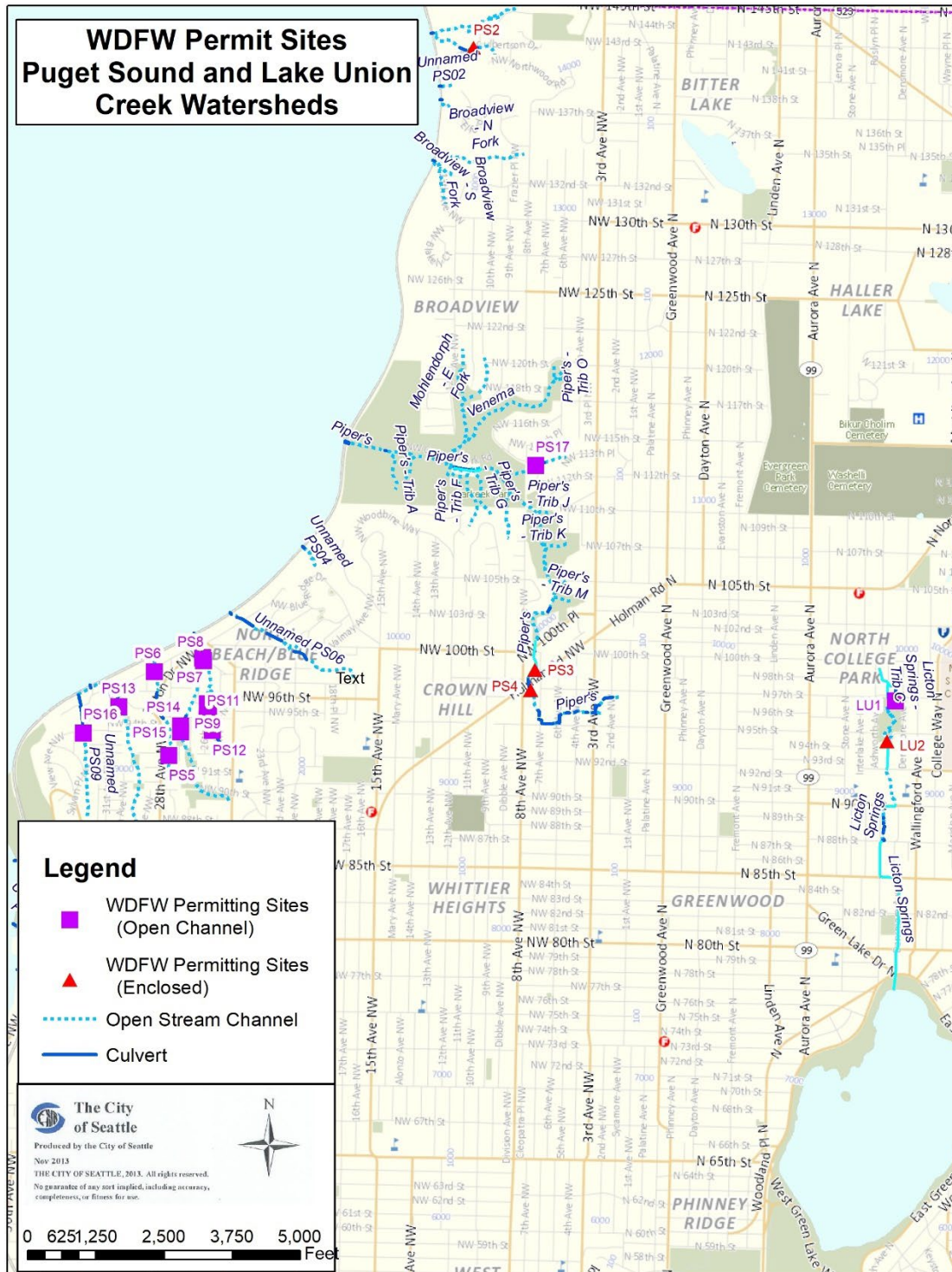
Exhibit D – Overview Location Maps & Representative Facility Data Sheets

Exhibit D-1: Open Channel and Enclosed Drainage System Facility Overview Location Maps	31
Exhibit D-2: Open Channel Drainage System Facility Data Sheets.....	38
Exhibit D-3: Enclosed Drainage System Representative Facility Data Sheet.....	96
Exhibit D-4: Pond Drainage System Overview Location Maps & Representative Facility Data Sheets	148

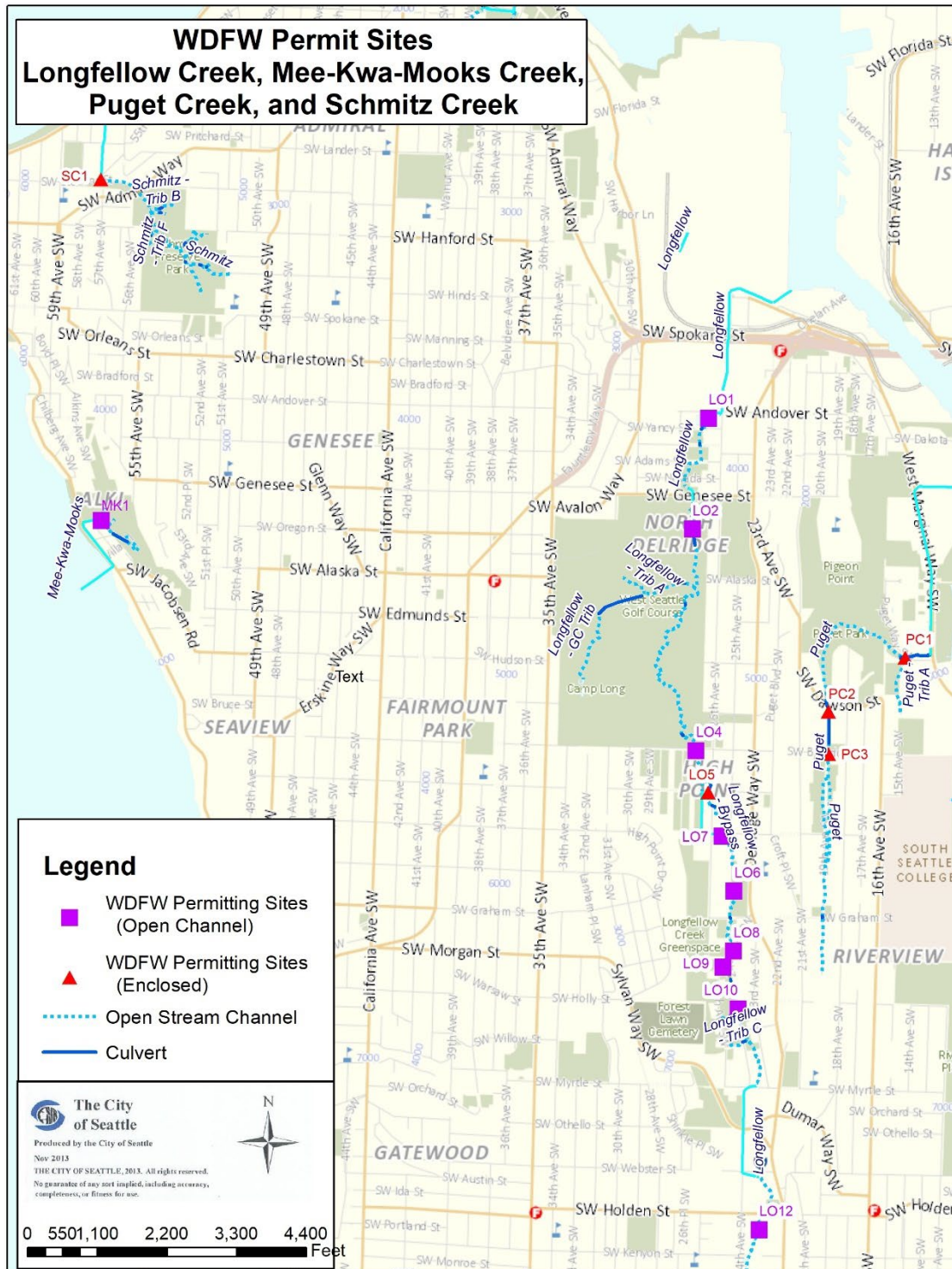
Exhibit D-1: Open Channel and Enclosed Drainage System Facility Overview Location Maps
Thornton Creek WDFW Sites



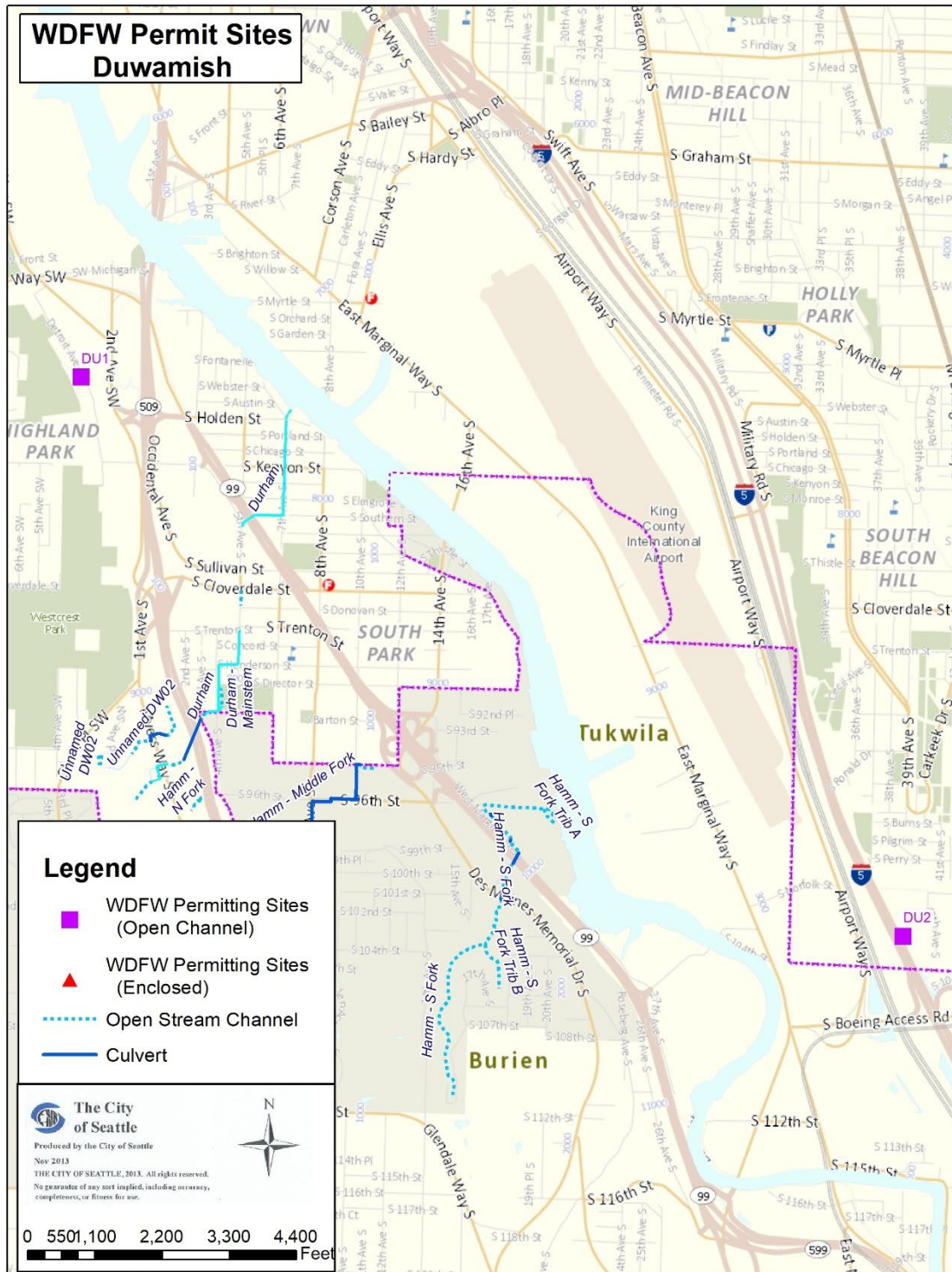
Puget Sound and Lake Union Creek Watersheds WDFW Sites



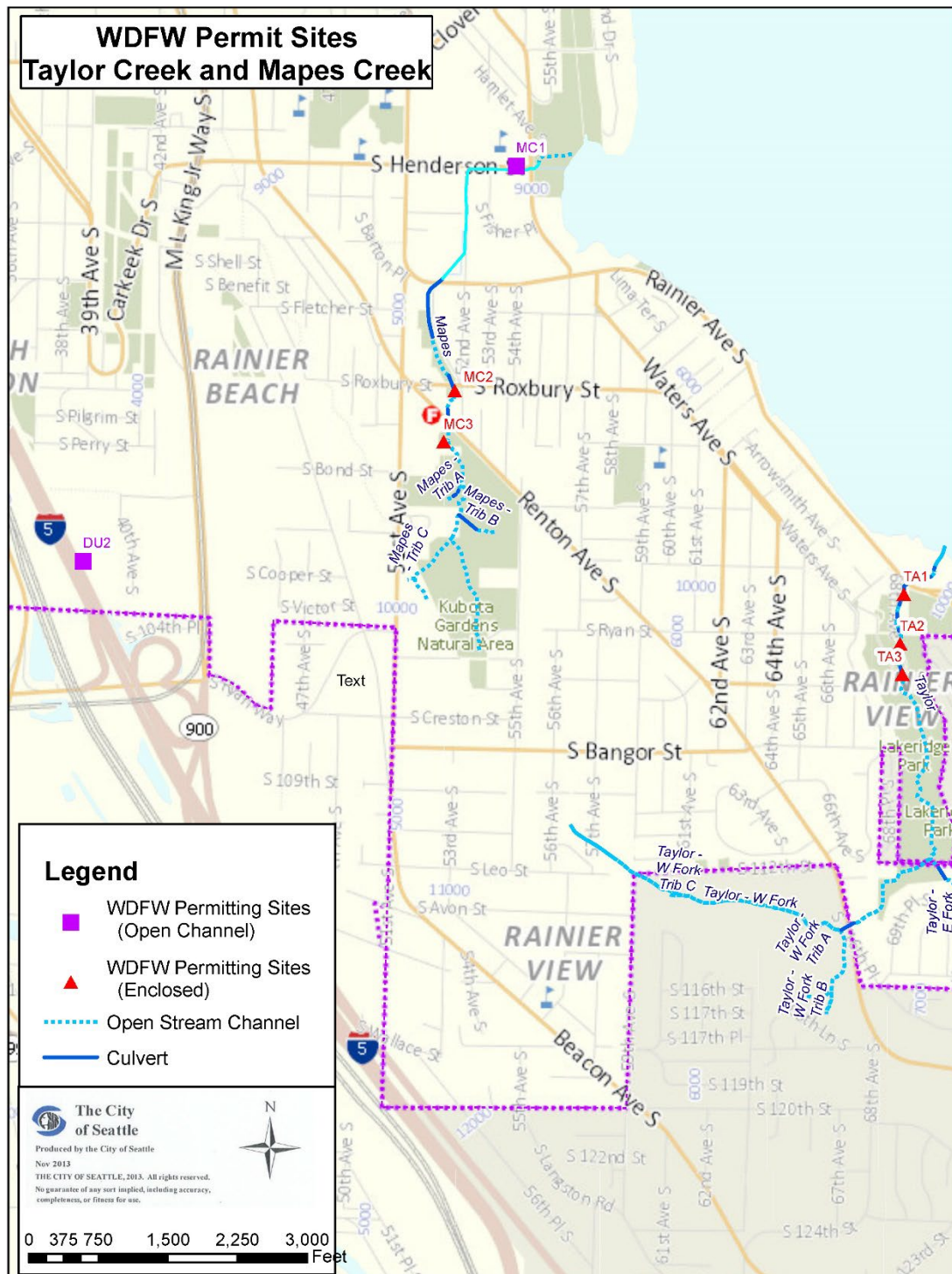
Longfellow Creek, Mee-Kwa-Mooks Creek, Puget Creek, and Schmitz Creek WDFW Sites



Duwamish WDFW Sites



Taylor Creek and Mapes Creek WDFW Sites



**WDFW Permit Sites
Fauntleroy Creek
and Seola Beach Creek**

Legend

- WDFW Permitting Sites (Open Channel)
- WDFW Permitting Sites (Enclosed)
- Open Stream Channel
- Culvert

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Nov 2013
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0 312.5625 1,250 1,875 2,500 Feet

Yesler Creek WDFW Sites

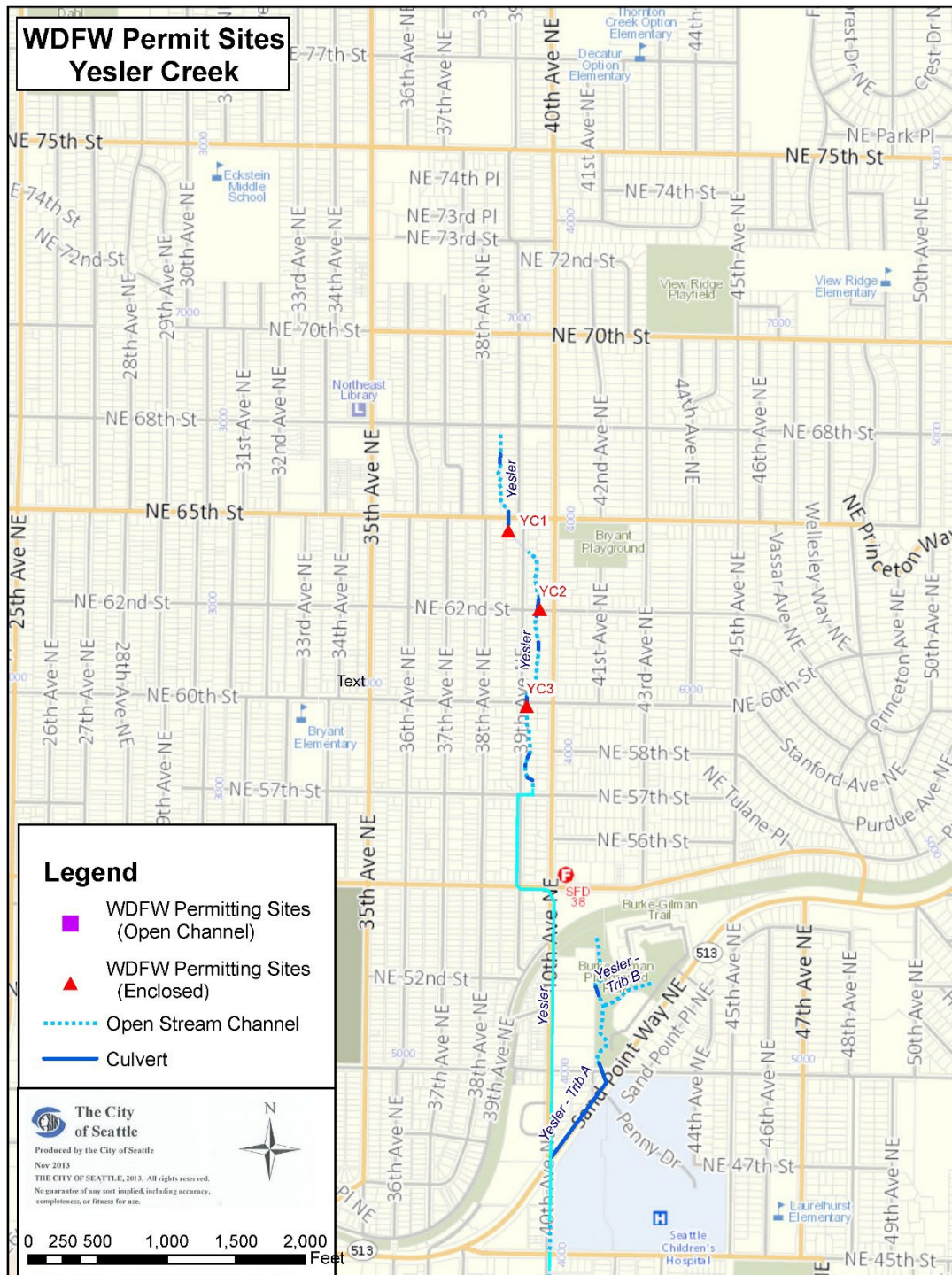
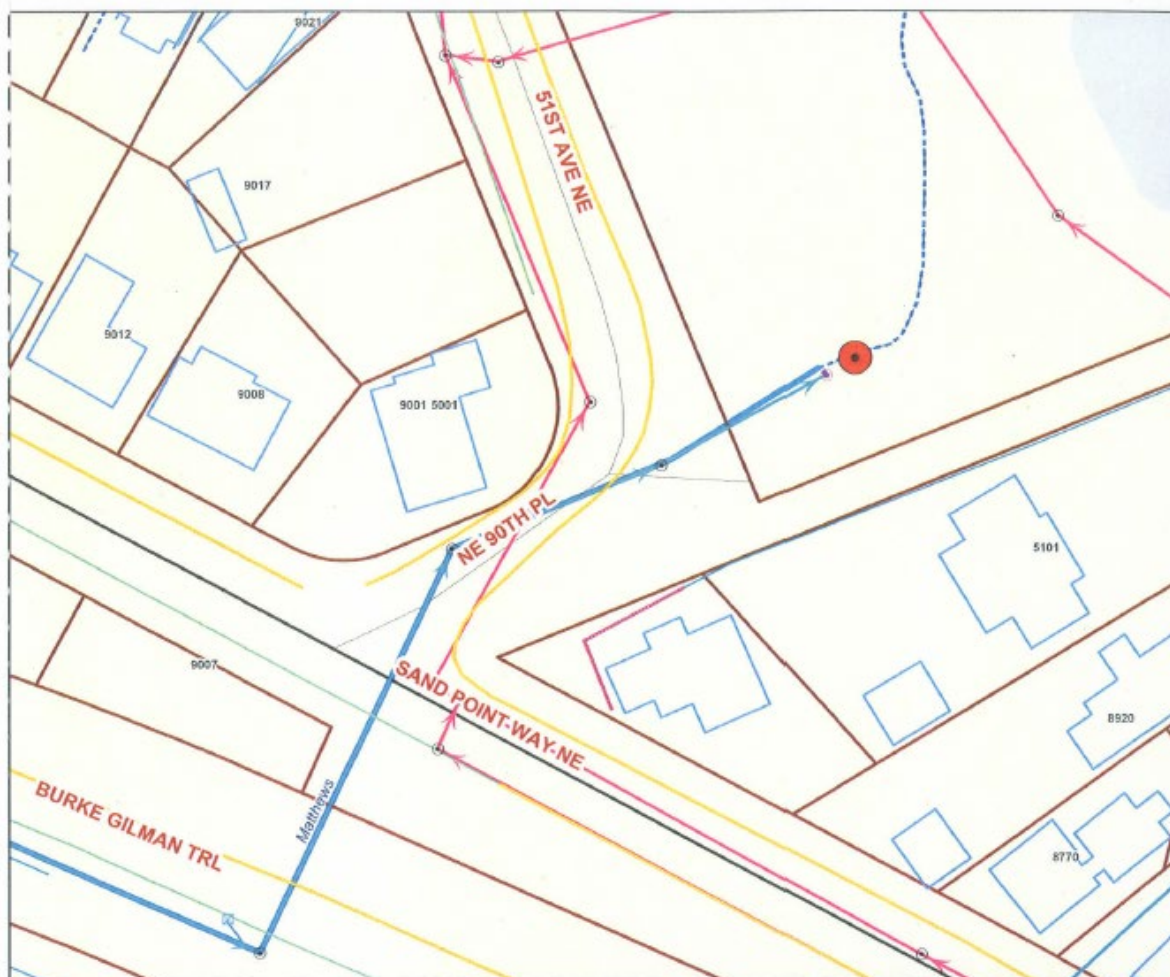


Exhibit D-2: Open Channel Drainage System Facility Representative Facility Data Sheets

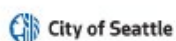
TH1: NE 51st St @ Matthews Beach



**TH1: NE 51st St @
Matthews Beach**

Routine Maintenance Activity:
- Sediment and Debris Removal

Section/Township/Range (SE 34 26 4)
Latitude (47.69382N)
Longitude (122.27217W)
Waterbody - Matthews Creek



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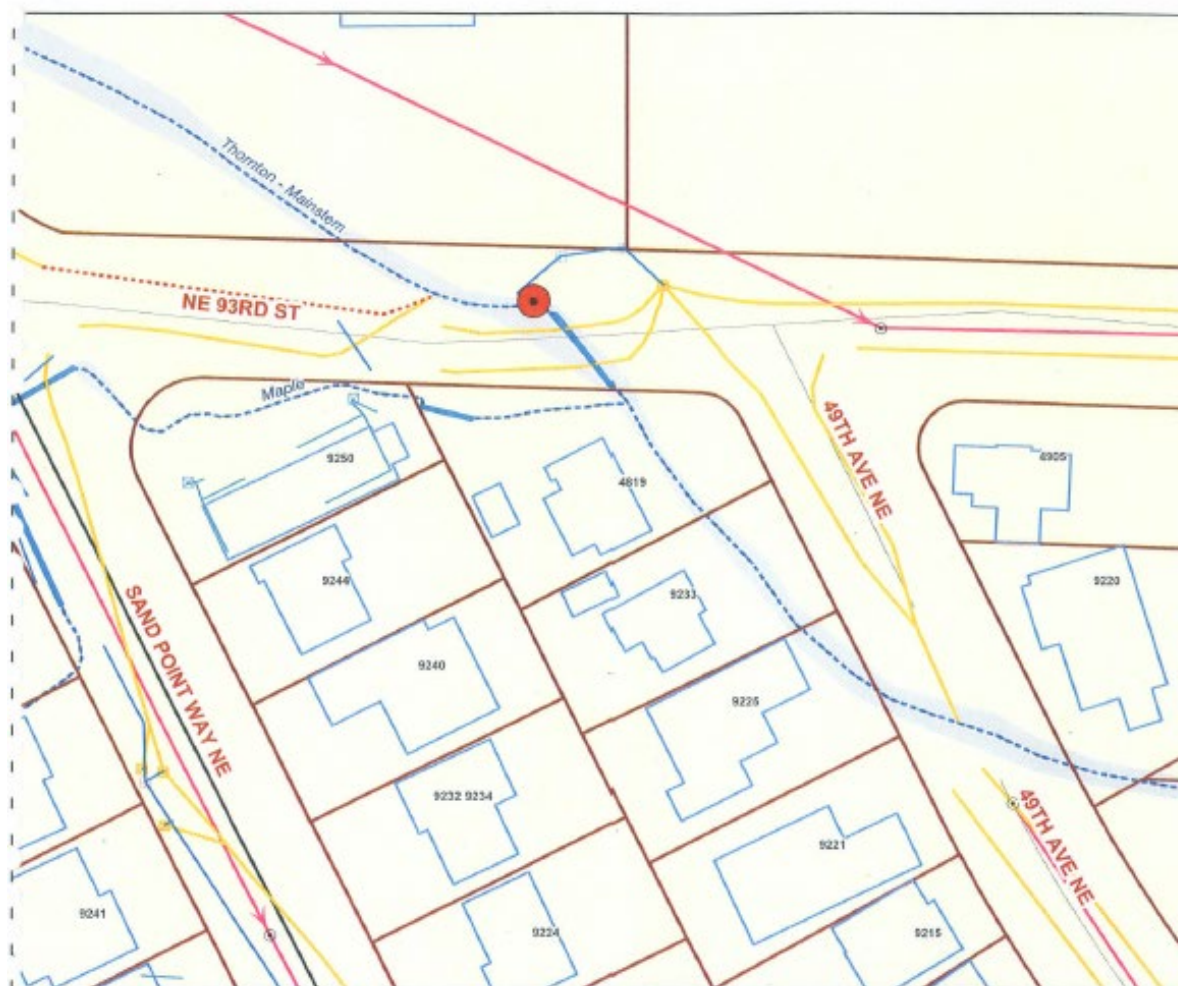
June 2018

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completeness, or fitness for use.

0 1,000 2,000 4,000 Feet



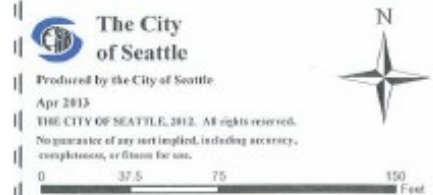
TH3: Thornton Creek @NE 93rd St



TH3: Thornton Creek @
NE 93rd St

Routine Maintenance Activity:
- Sediment and Debris Removal

Section/Township/Range (E 34 26 4)
Latitude (47.69587N)
Longitude (122.27543W)
Waterbody - Thornton Creek



TH4: Thornton Creek @Sand Point Way NE



TH5: NE 93rd St @ Sand Point Way NE



**TH5: NE 93rd St @
Sand Point Way NE**

Routine Maintenance Activity:

- Sediment and Debris Removal

Section/Township/Range (SE 34 26 4)

Latitude (47.69580N)

Longitude (122.27640W)

Waterbody - Maple Creek



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0 1,000 2,000 4,000 Feet



TH10: Thornton Creek@ Burke Gilman Trail



**TH10: Thornton Creek @
Burke Gilman Trail**

Routine Maintenance Activity:
-Sediment and Debris Removal

*Section/Township/Range (E 34 26 4)
Latitude (47.69660N)
Longitude (122.27722W)
Waterbody - Thornton Creek*



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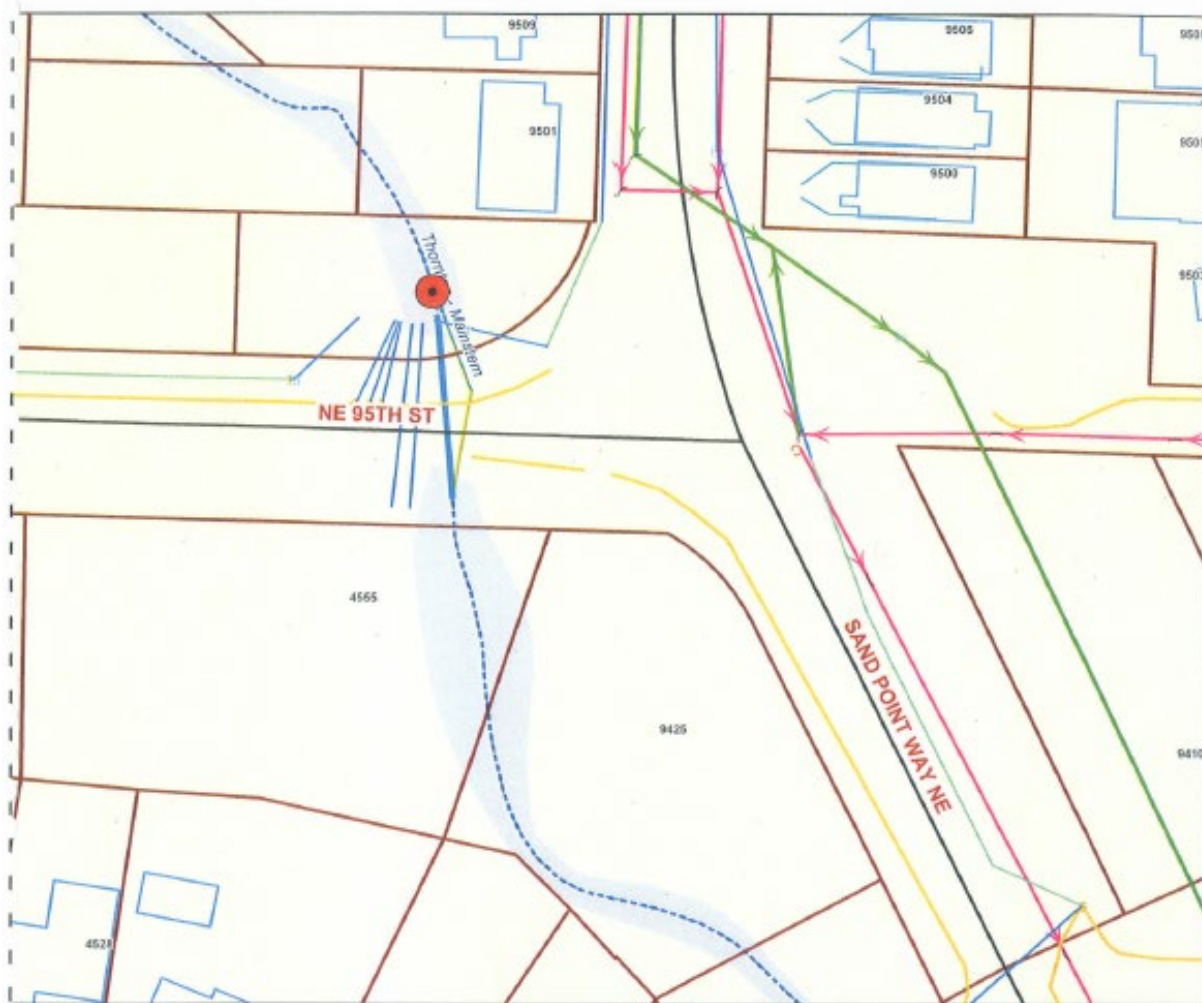
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completeness, or fitness for use.



0 37.5 75 150 Feet



TH11: NE 95th St@ Sand Point Way NE



**TH11: NE 95th St @
Sand Point Way NE**

Routine Maintenance Activity:
-Sediment and Debris Removal,
Control Vegetation

Section/Township/Range (E 34 26 4)

Latitude (47.69737N)

Longitude (122.27813W)

Waterbody - Thornton Creek



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0 37.5 75 150 Feet



TH17: N & S Branch Thornton Creek Confluence



TH19: 30th Ave NE @ NE 107th Thornton Culvert



**TH19: 30th Ave NE @
NE 107th Thornton
Culvert**

Routine Maintenance Activity:
- Sediment and Debris Removal

*Section/Township/Range (SE 28 26 4)
Latitude (47.70688N)
Longitude (122.29617W)
Waterbody - Thornton Creek*



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0 37.5 75 150 Feet



TH21: 30th Ave NE @ NE 110th St



**TH21: 30th Ave NE @
NE 110th St**

Routine Maintenance Activity:

-Sediment and Debris Removal,
Control Vegetation

Section/Township/Range (SE 28 26 4)

Latitude (47.70832N)

Longitude (122.29630W)

Waterbody - Kramer Creek



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0 1,000 2,000 4,000 Feet



TH23: NE 107th St @ 30th Ave NE Culvert



**TH23: NE 107th St @
30th Ave NE Culvert**

Routine Maintenance Activity:
-Sediment and Debris Removal,

*Section/Township/Range (SE 28 26 4)
Latitude (47.70668N)
Longitude (122.29655W)
Waterbody - Thornton Creek*



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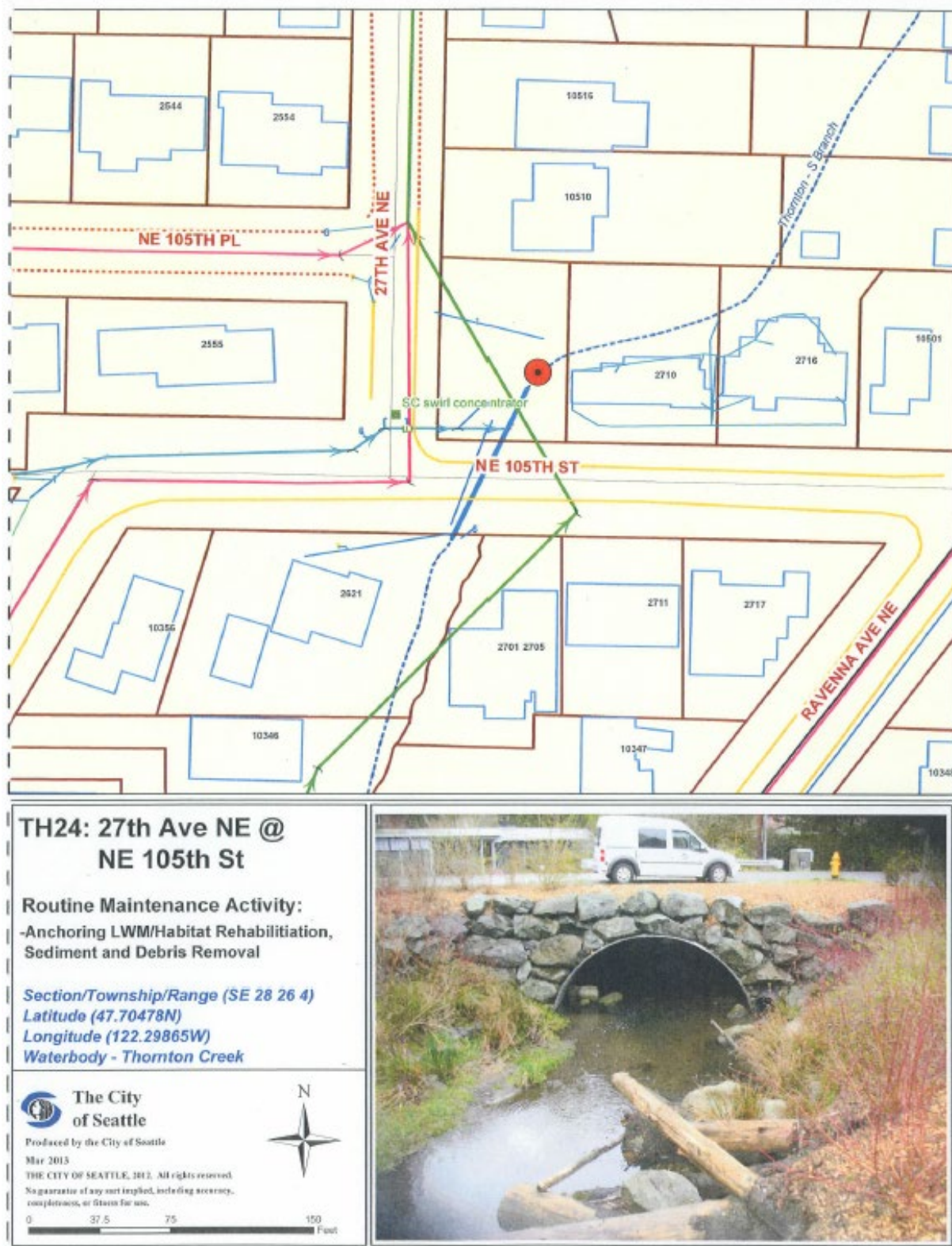
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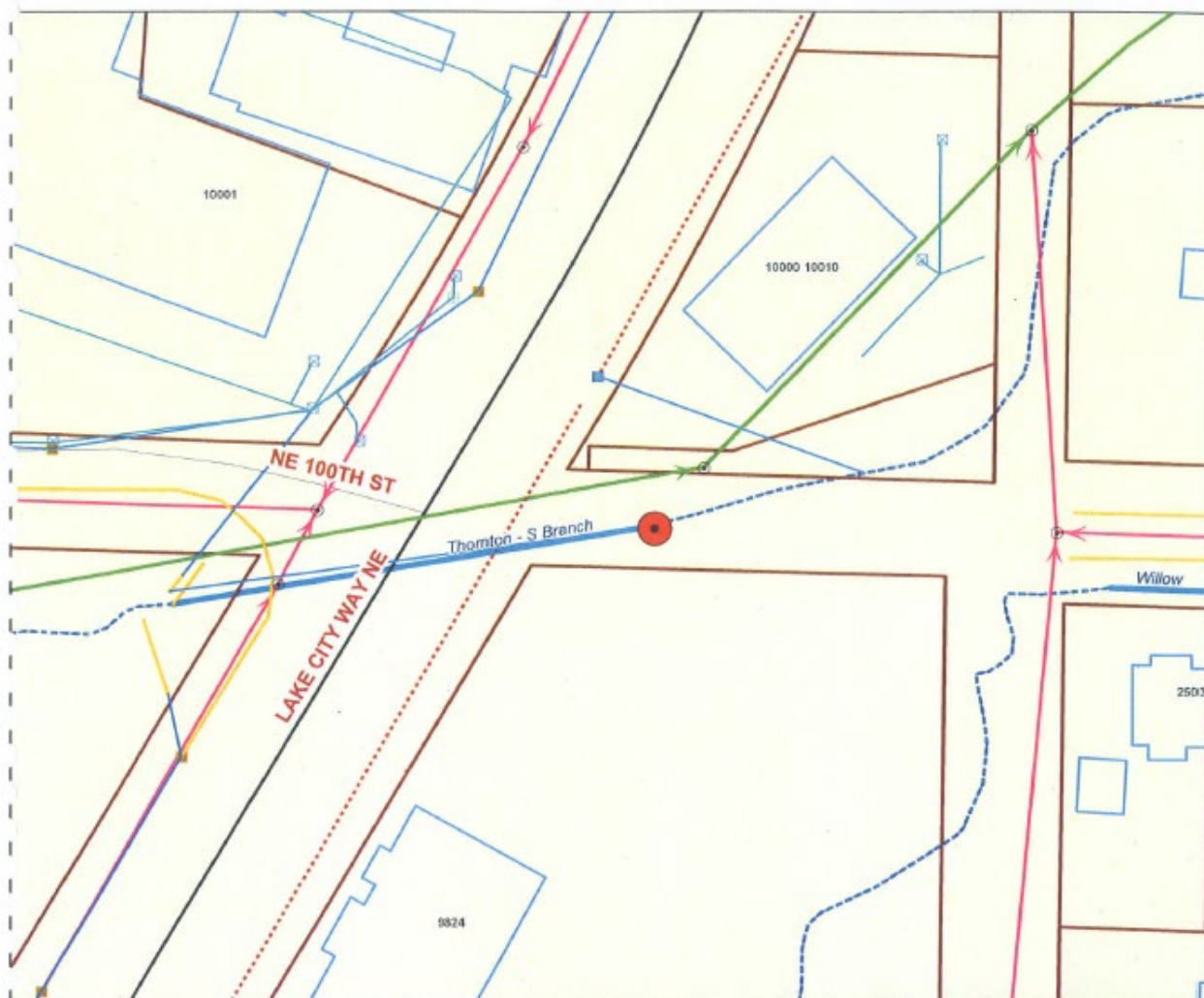
0 37.5 75 150
Foot



TH24: 27th Ave NE @ NE 105th St



TH25: Lake City Fish Ladder



**TH25: Lake City
Fish Ladder**

Routine Maintenance Activity:
- Anchoring LWM/Habitat Rehabilitation,
Sediment and Debris Removal

*Section/Township/Range (NW 33 26 4)
Latitude (47.70112N)
Longitude (122.30262W)
Waterbody - Thornton Creek*



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0 1,000 2,000 4,000 Feet



TH29: NE 95th St @ Lake city Way NE



**TH29: NE 95th St @
Lake City Way NE**

Routine Maintenance Activity:

- Vactoring and jetting culverts and ditches,
Control Vegetation

Section/Township/Range (NW 33 26 4)

Latitude (47.69832N)

Longitude (122.30477W)

Waterbody - Thornton Creek



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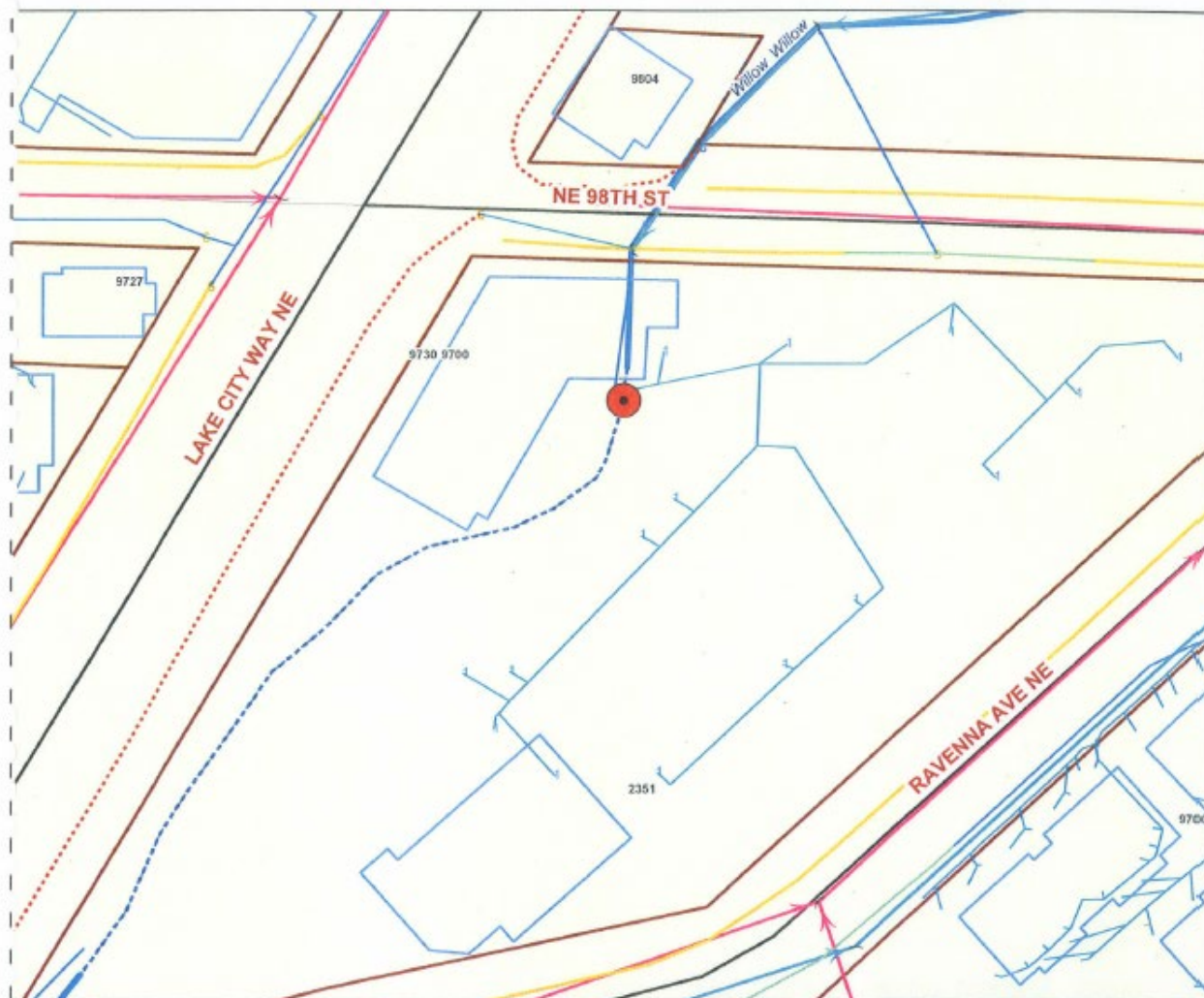
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completeness, or fitness for use.



0 1,000 2,000 4,000
Feet



TH30: NE 98th St @ Lake City Way NE



**TH30: NE 98th St @
Lake City Way NE**

Routine Maintenance Activity:
- Vactoring and Jetting culverts and ditches

*Section/Township/Range (NW 33 26 4)
Latitude (47.70007N)
Longitude (122.30287W)
Waterbody - Willow Creek*



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0 1,000 2,000 4,000 Feet



TH31: NE 98th St @ Ravenna Ave NE



**TH31: NE 98th St @
Ravenna Ave NE**

Routine Maintenance Activity:
- Sediment and Debris Removal

*Section/Township/Range (NW 33 26 4)
Latitude (47.70003N)
Longitude (122.30152W)
Waterbody - Thornton Creek South Branch
Trib E*



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0 37.5 75 150 Feet



TH32: Knickerbocker Reach Habitats



**TH32: Knickerbocker
Reach Habitats**

Routine Maintenance Activity:
- Anchoring LWM/Habitat rehabilitation,
Sediment and debris removal,
Control Vegetation

Section/Township/Range (NW 33 26 4)
Latitude (47.70058N)
Longitude (122.30593W)
Waterbody - Thornton Creek



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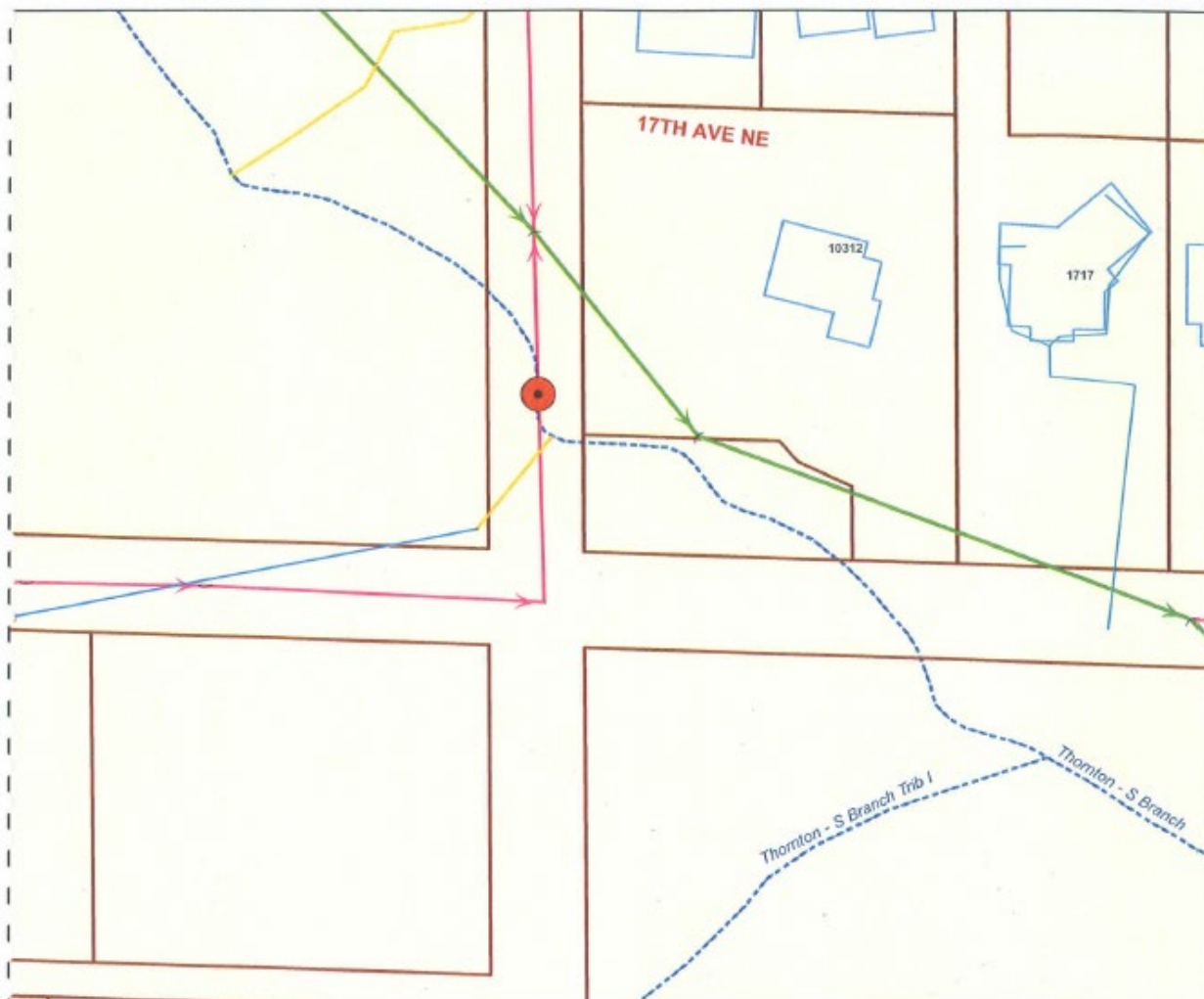
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0 1,000 2,000 4,000
Feet



TH33: NE 103rd St Sewer Crossing



**TH33: NE 103rd St
Sewer Crossing**

Routine Maintenance Activity:
- Anchoring LWM/Habitat rehabilitation,
Sediment and debris removal,
Control Vegetation

Section/Township/Range (NW 33 26 4)

Latitude (47.70327N)

Longitude (122.30967W)

Waterbody - Thornton Creek



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0 1,000 2,000 4,000 Feet



The map displays a residential area with property boundaries and lot numbers. A green line runs diagonally from the top left towards the bottom right. A blue dashed line, labeled "Thomson - S Branch", follows a similar path. A red line runs horizontally across the middle of the map, labeled "NE 105TH ST". A red dot is located on this street. A pink line runs diagonally from the top right towards the bottom left, labeled "NE ELSHIN PL". Lot numbers are scattered throughout the map, including 1529, 1537, 1541, 1545, 1515, 1543, 1511, 1514, 1522, 1602, and 1605. The map also shows a blue dashed line labeled "Thomson - S Branch" and a pink line labeled "NE ELSHIN PL".



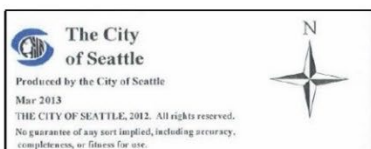
TH35: NE 108th St @ 8th Ave NE (Beaver Lodge)



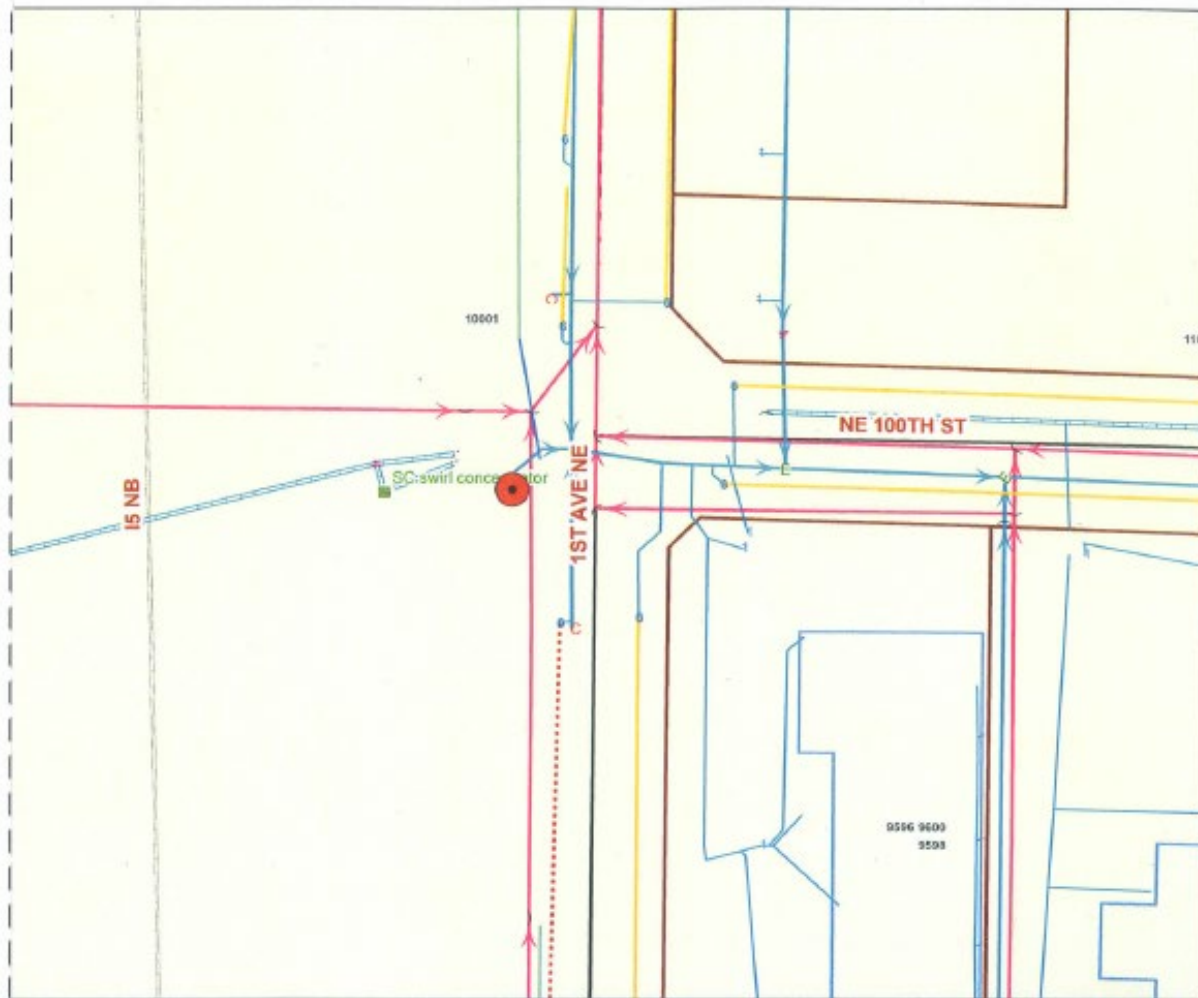
**TH35: NE 105th St @ 8th
Ave NE (Beaver Lodge)**

Routine Maintenance Activity:
Sediment and Debris Removal

Section/Township/Range (SE 29 26 4)
Latitude (47.705587N)
Longitude (122.31977W)
Waterbody – Thornton Creek



TH37: 1st Ave NE @ NE 100th St



**TH37: 1st Ave NE @
NE 100th St**

Routine Maintenance Activity:
- Sediment and Debris Removal

*Section/Township/Range (NW 32 26 4)
Latitude (47.70132N)
Longitude (122.32865W)
Waterbody - Thornton Creek*



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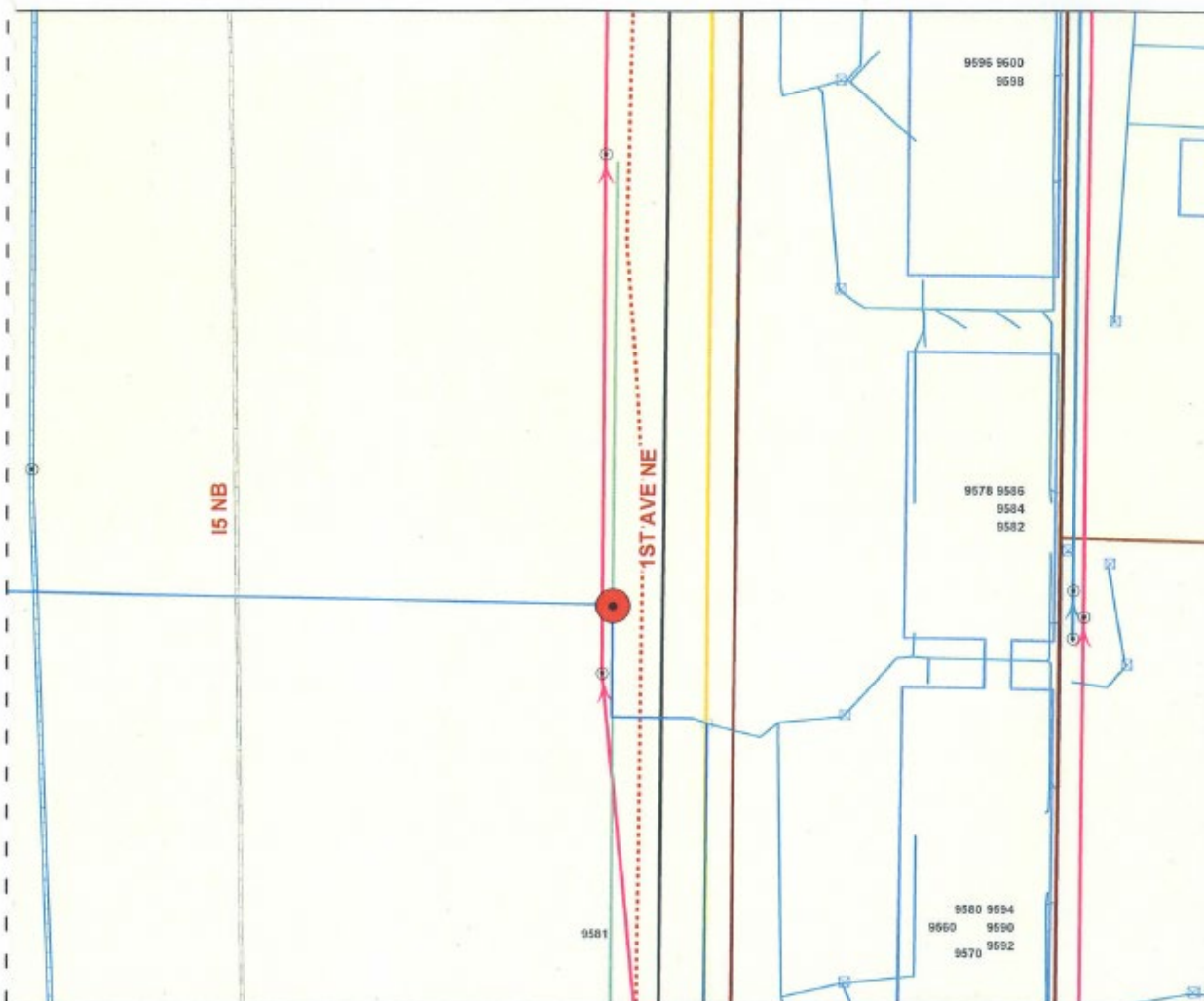
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0 37.5 75 150 Feet



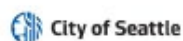
TH38: 1st Ave NE @ NE 100th St Ditch



**TH38: 1st Ave NE @
NE 100th St Ditch**

Routine Maintenance Activity:
- Sediment and Debris Removal,
Control Vegetation

*Section/Township/Range (NW 32 26 4)
Latitude (47.70048N)
Longitude (122.32858W)
Waterbody - Thornton Creek*



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0 1,000 2,000 4,000 Feet



TH43: North Fork Culvert @ Lake City Way NE



**TH43: North Fork Culvert @
Lake City Way NE**

Routine Maintenance Activity:

- Sediment and Debris Removal

Section/Township/Range (NE 28 26 4)

Latitude (47.71490N)

Longitude (122.29810W)

Waterbody - Thornton Creek



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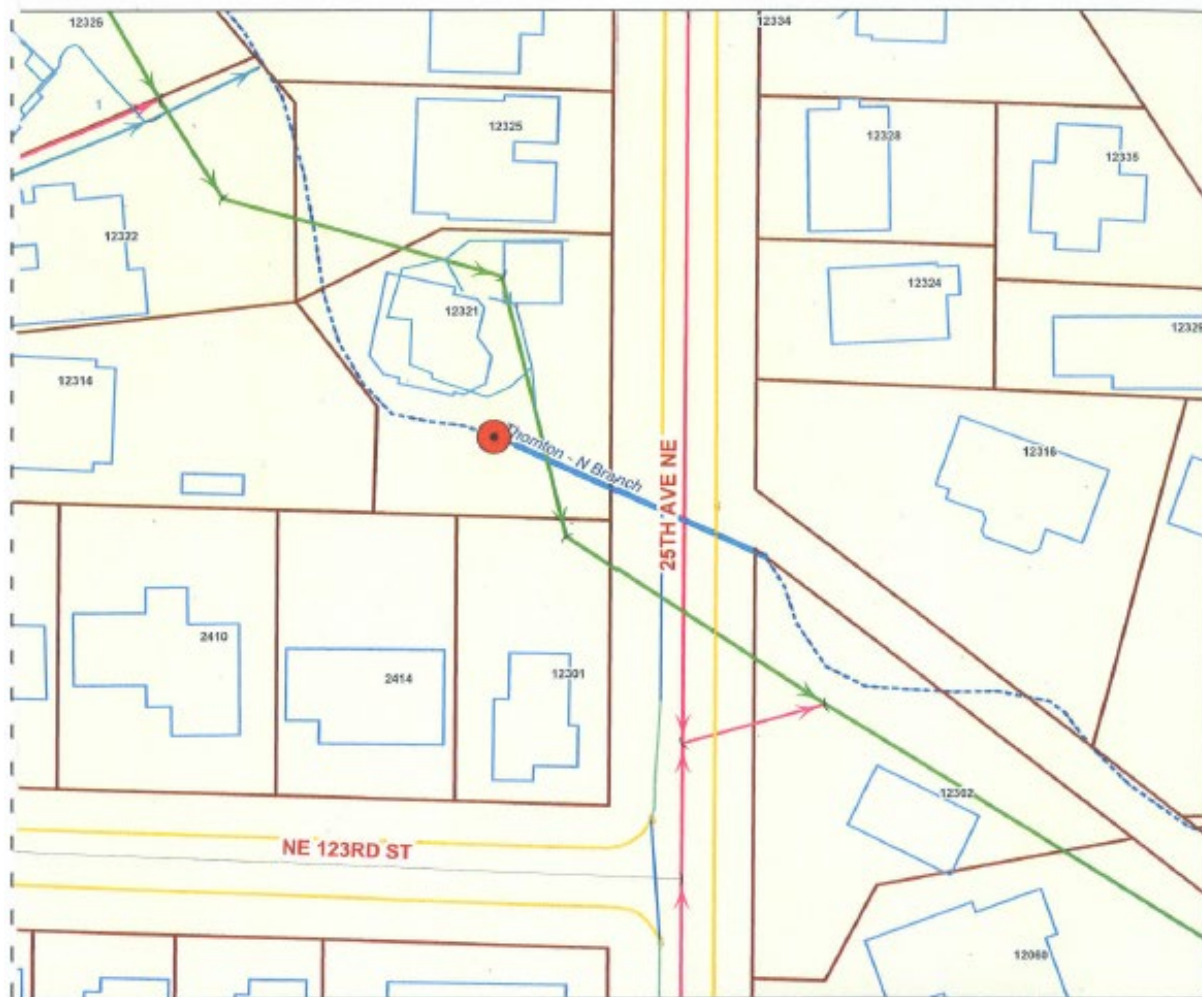
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0 37.5 75 150 Feet



TH44: 25th Ave NE @ Thornton Creek



**TH44: 25th Ave NE @
Thornton Creek**

Routine Maintenance Activity:
- Sediment and Debris Removal

*Section/Township/Range (NE 28 26 4)
Latitude (47.71792N)
Longitude (122.30185W)
Waterbody - Thornton Creek*



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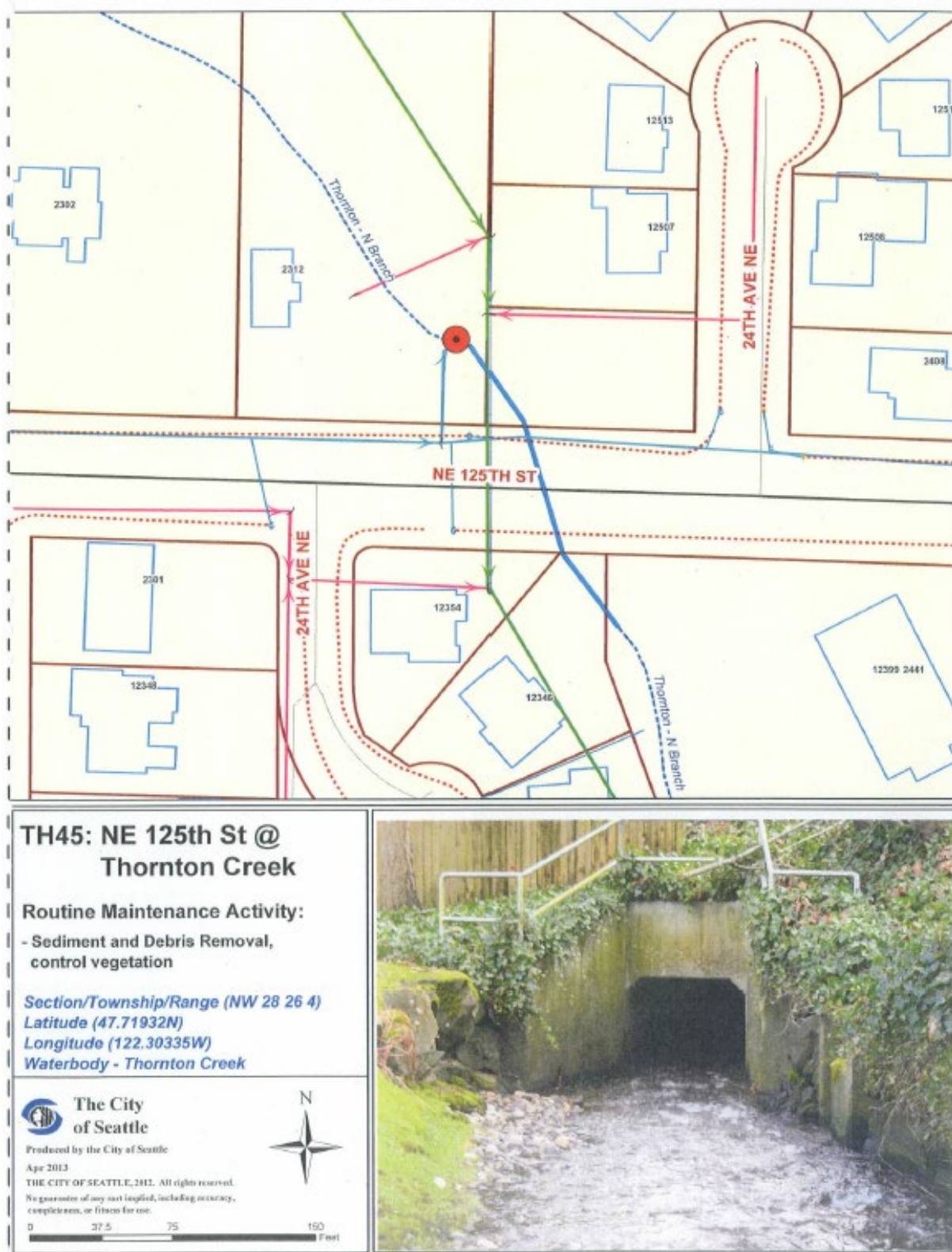
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0 25 50 75 150 Feet



TH45: NE 125th St @ Thornton Creek



TH46: 19th Ave NE @ NE 130th St



**TH46: 19th Ave NE @
NE 130th St**

Routine Maintenance Activity:

- Anchoring LWD/Habitat rehabilitation,
Sediment and debris removal

Section/Township/Range (SW 21 26 4)

Latitude (47.72295N)

Longitude (122.30857W)

Waterbody - Thornton Creek



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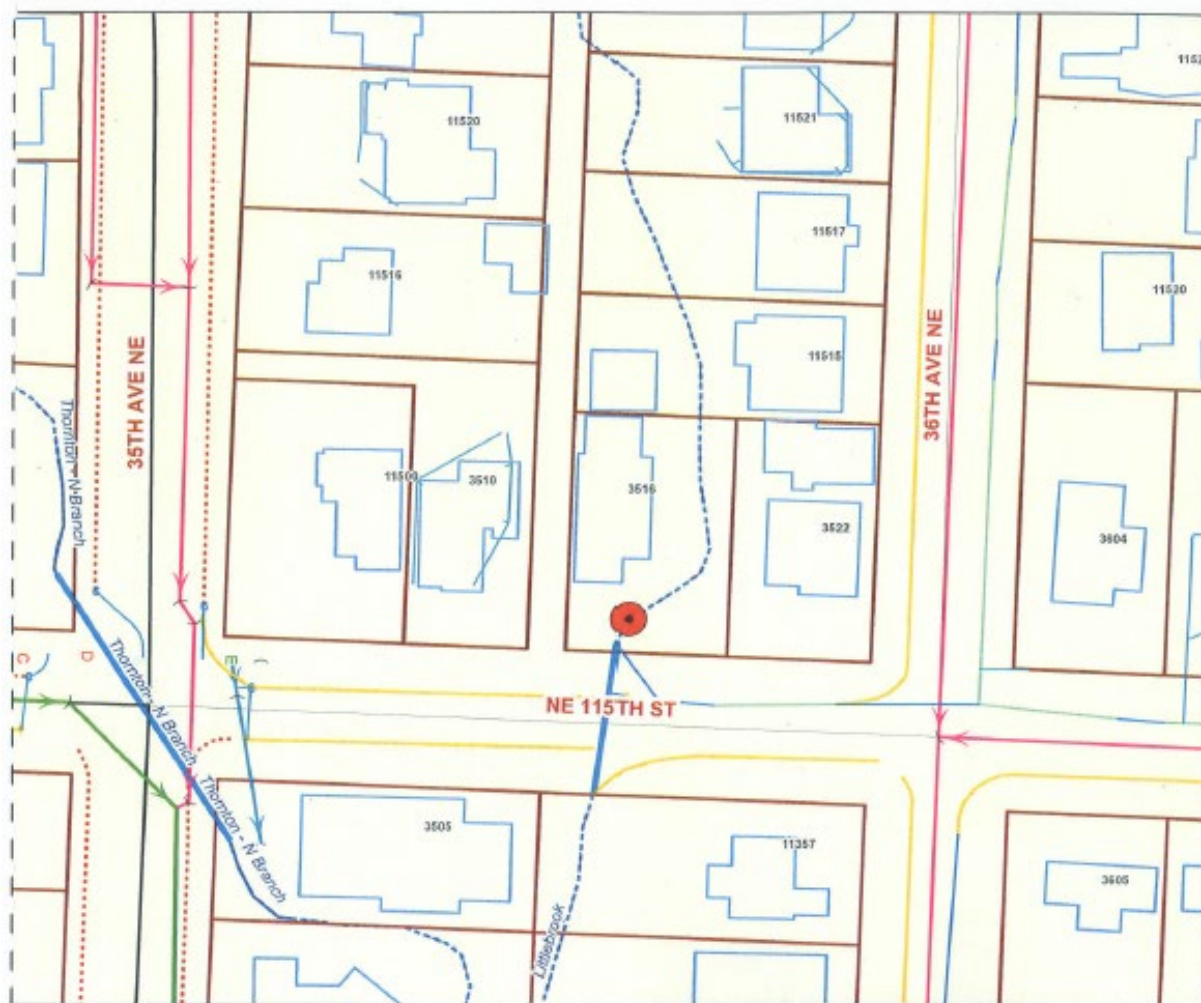
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0 25 50 75 100 Feet



TH50: NE 115th St @ Littlebrook Creek



**TH50: NE 115th St @
Littlebrook Creek**

Routine Maintenance Activity:
- Sediment and Debris Removal

*Section/Township/Range (W 27 26 4)
Latitude (47.71195N)
Longitude (122.28988W)
Waterbody - Littlebrook Creek*



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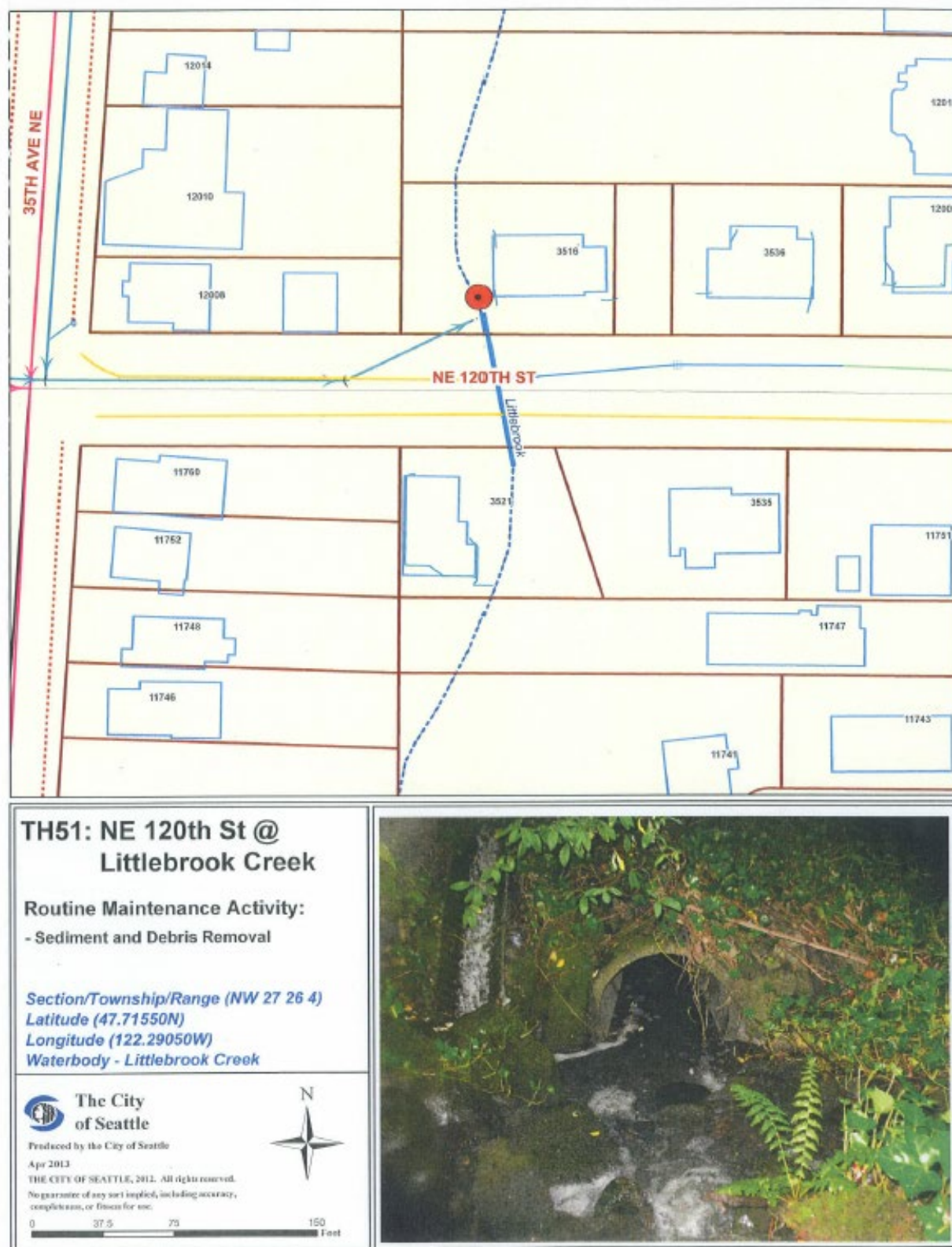
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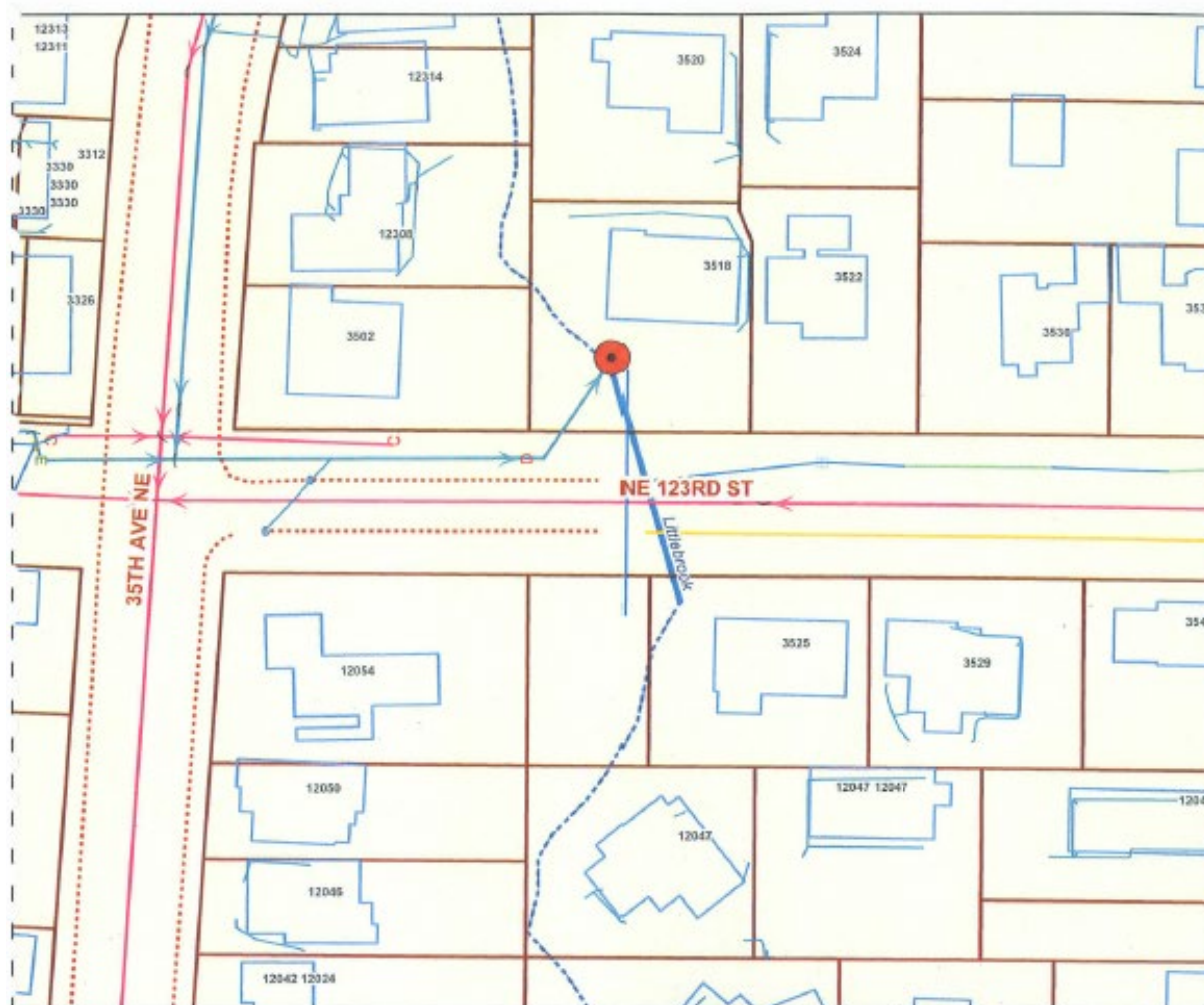
0 37.5 75 150 Feet



TH51: NE 120th St @ Littlebrook Creek



TH52: NE 123rd St @ Littlebrook Creek



**TH52: NE 123rd St @
Littlebrook Creek**

Routine Maintenance Activity:
- Sediment and Debris Removal

*Section/Township/Range (NW 27 26 4)
Latitude (47.71732N)
Longitude (122.29057W)
Waterbody - Littlebrook Creek*



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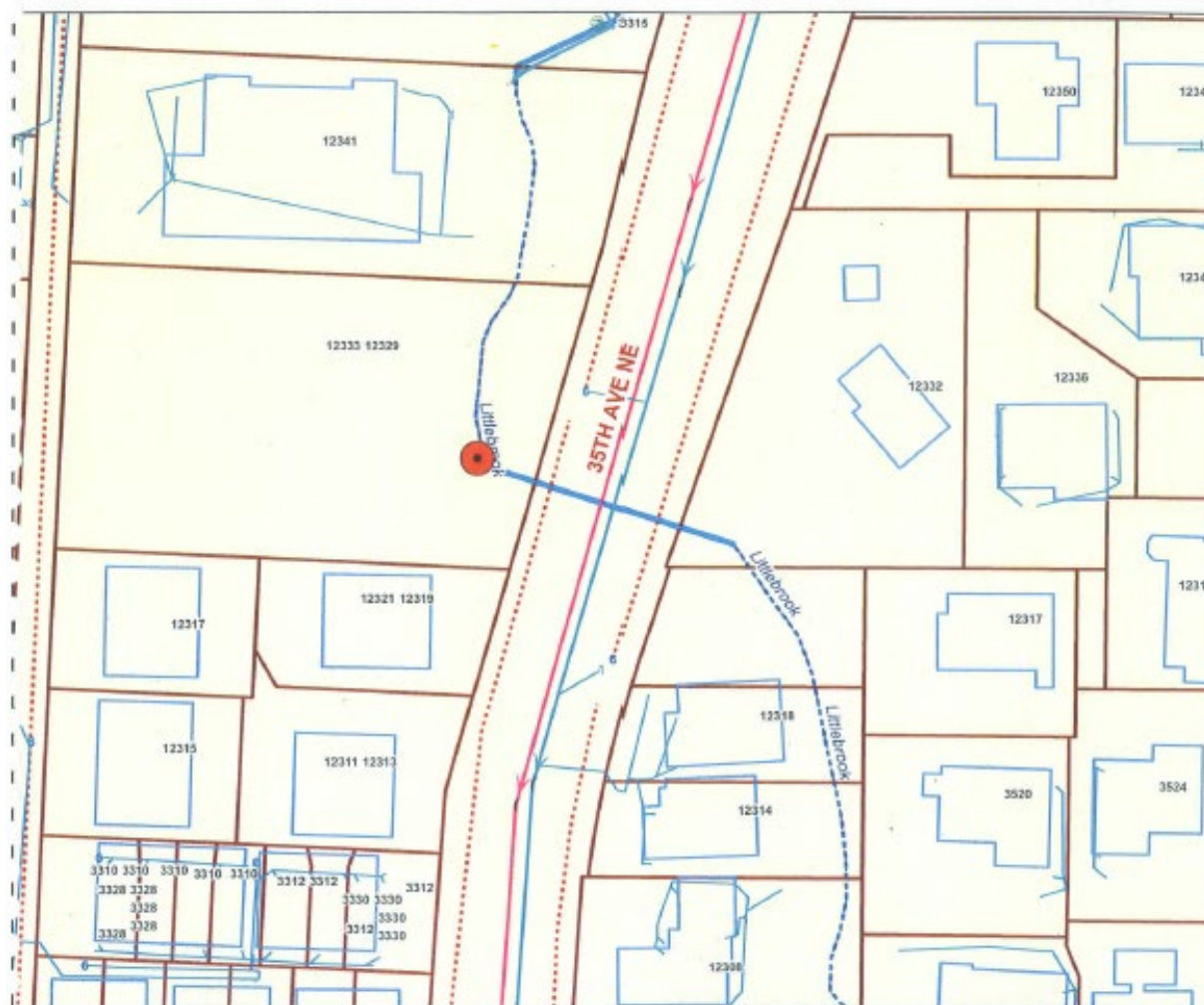
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completeness, or fitness for use.



0 37.5 75 150 Feet



TH53: 35th Ave NE @ Littlebrook Creek



**TH53: 35th Ave NE @
Littlebrook Creek**

Routine Maintenance Activity:
- Sediment and Debris Removal

*Section/Township/Range (NE 28 26 4)
Latitude (47.71815N)
Longitude (122.29117W)
Waterbody - Littlebrook Creek*



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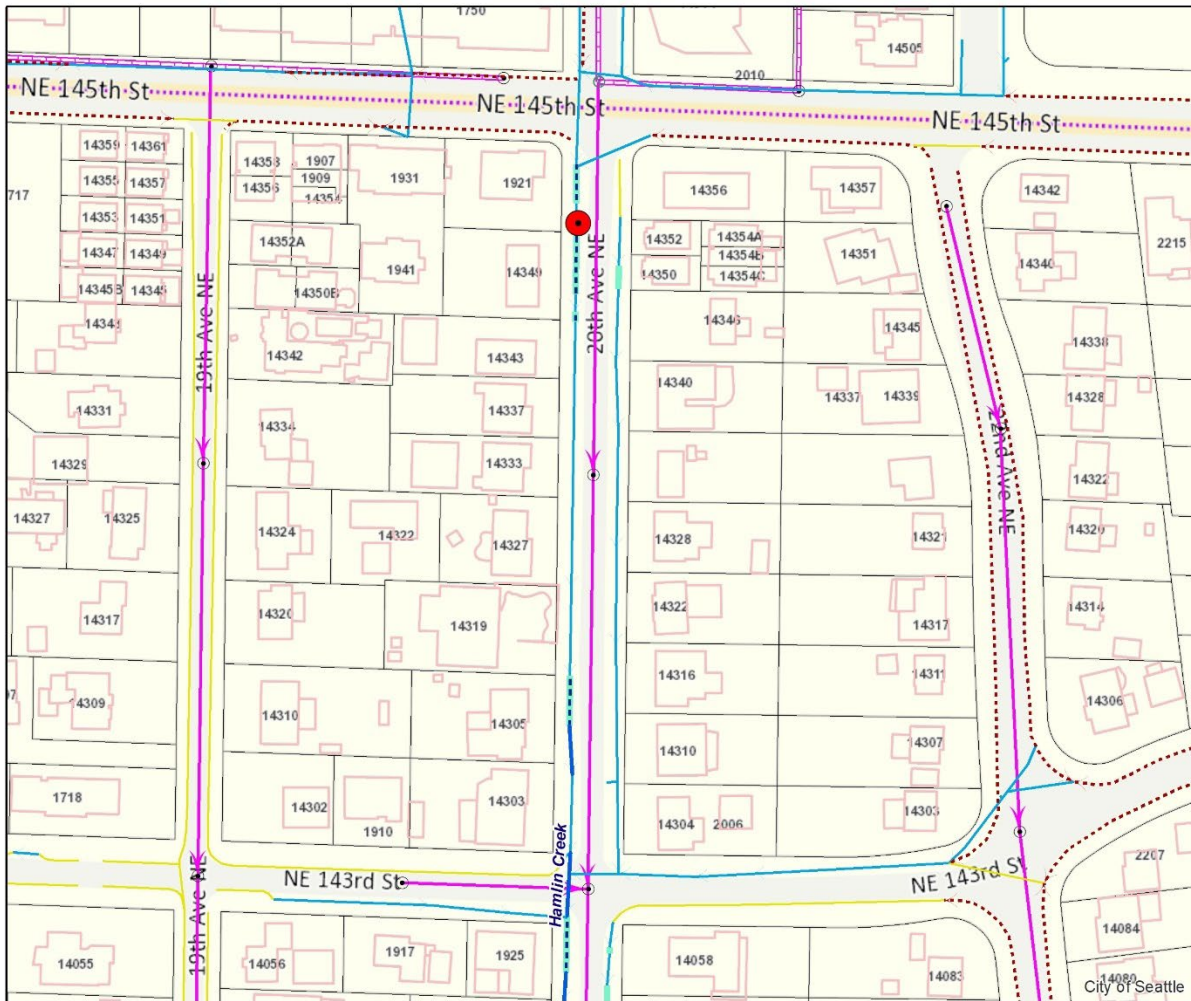
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0 37.5 75 150 Feet



TH70: 20th Ave. NE between NE 143rd St. and NE 145th St.



**TH70: 20th Ave NE
between NE 143rd
St and NE 145th St**

**Routine Maintenance Activity:
Sediment and Debris Removal,
Vegetation Control**

Section/Township/Range (NW 21 26 04)

Latitude (47.7337N)

Longitude (122.3074W)

Waterbody - Hamlin Creek



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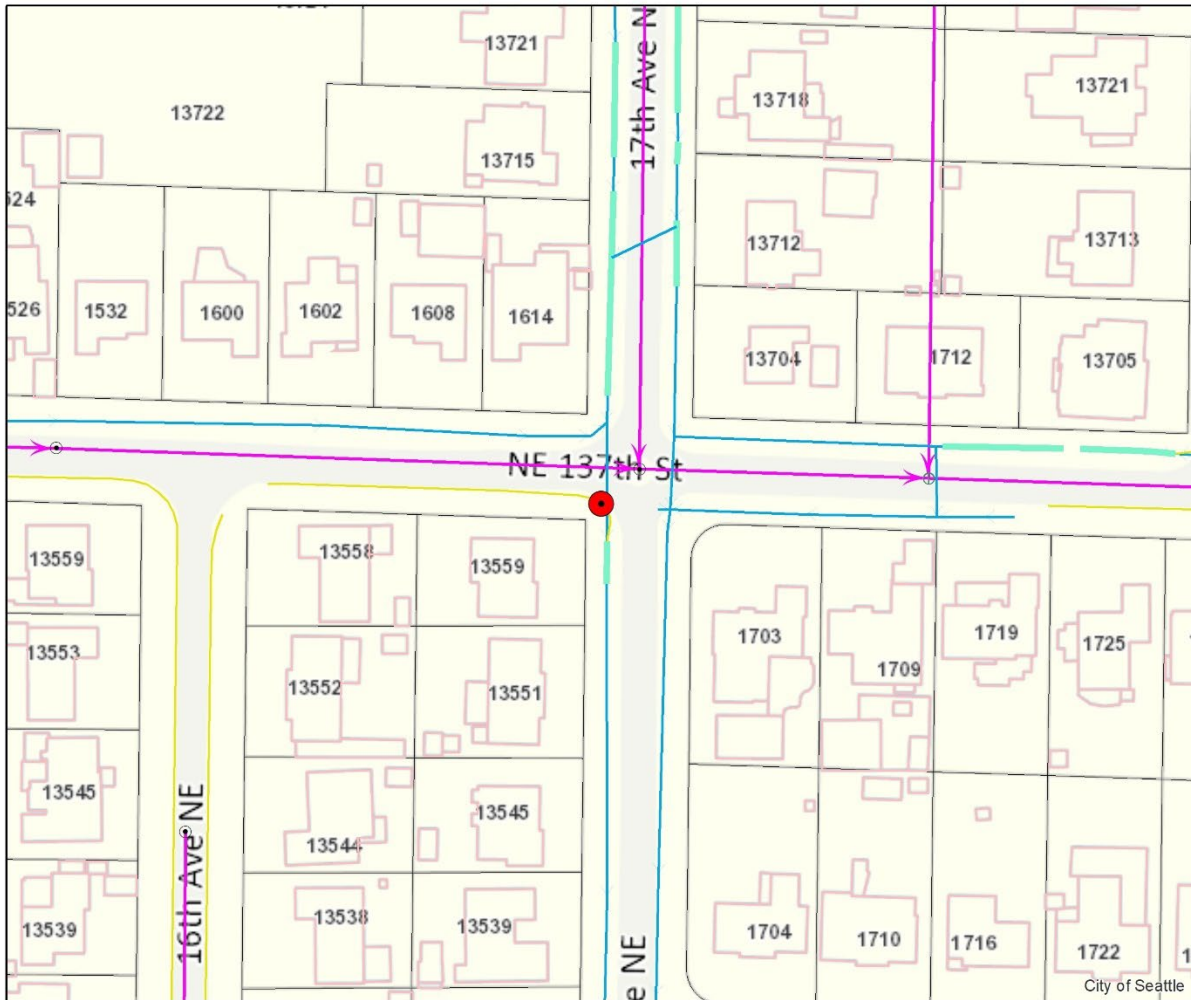
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0 80 160 320 Feet



TH73: 17th Ave NE between NE 136th St and NE 143rd St



**TH73: 17th Ave NE
between NE 136th
St and NE 143rd St**

**Routine Maintenance Activity:
Sediment and Debris Removal**

Section/Township/Range (NW 21 26 04)

Latitude (47.72839N)

Longitude (122.31005W)

Waterbody - Unnamed tributary - TNMA



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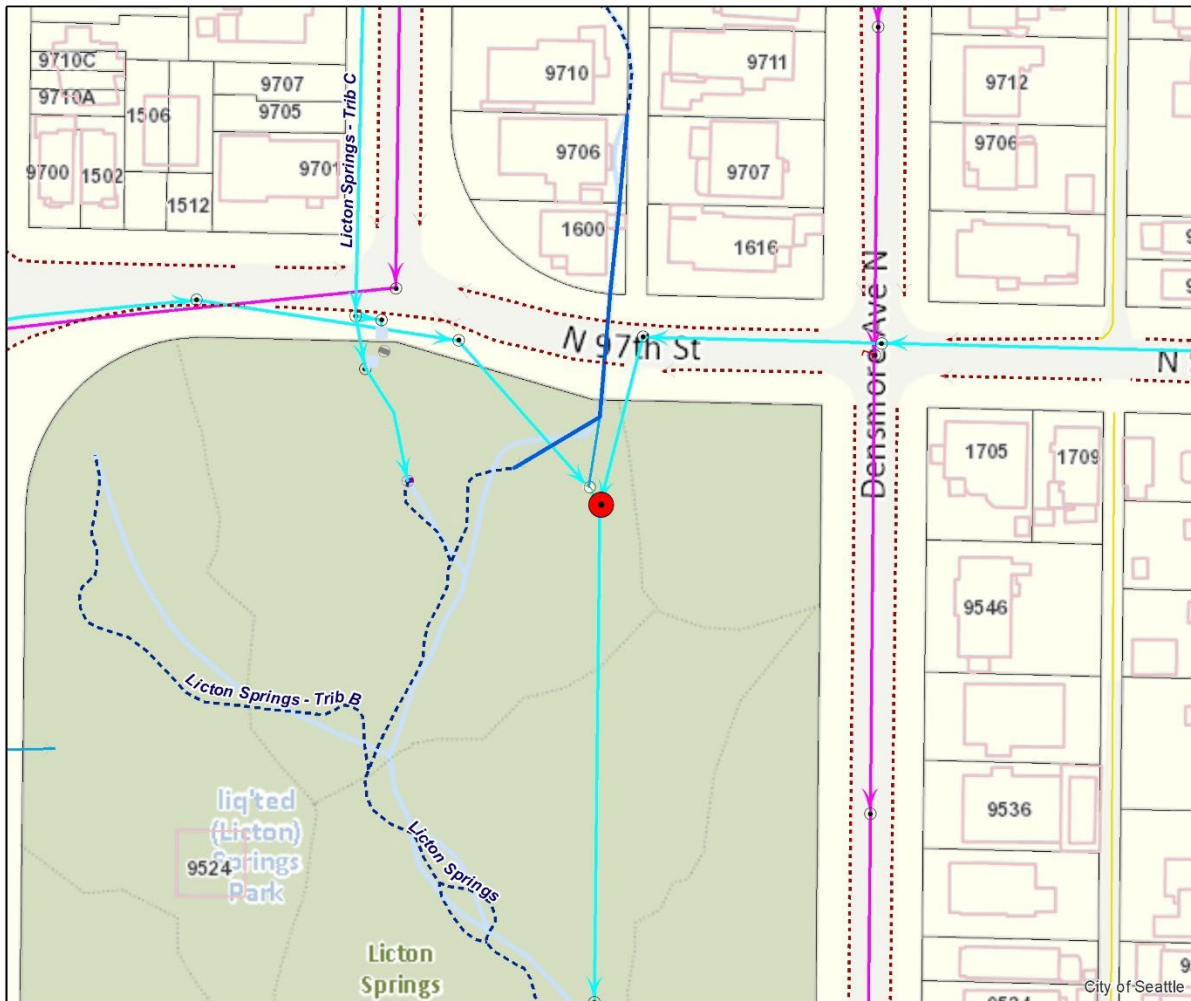
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0 50 100 200 Feet



LU1: N 97th St @ Woodlawn Ave NE



**LU1: N 97th St @
Woodlawn Ave NE**

**Routine Maintenance Activity:
Sediment and Debris Removal**

*Section/Township/Range (NE 31 26 04)
Latitude (47.6994N)
Longitude (122.3382W)
Waterbody - Lake Union*



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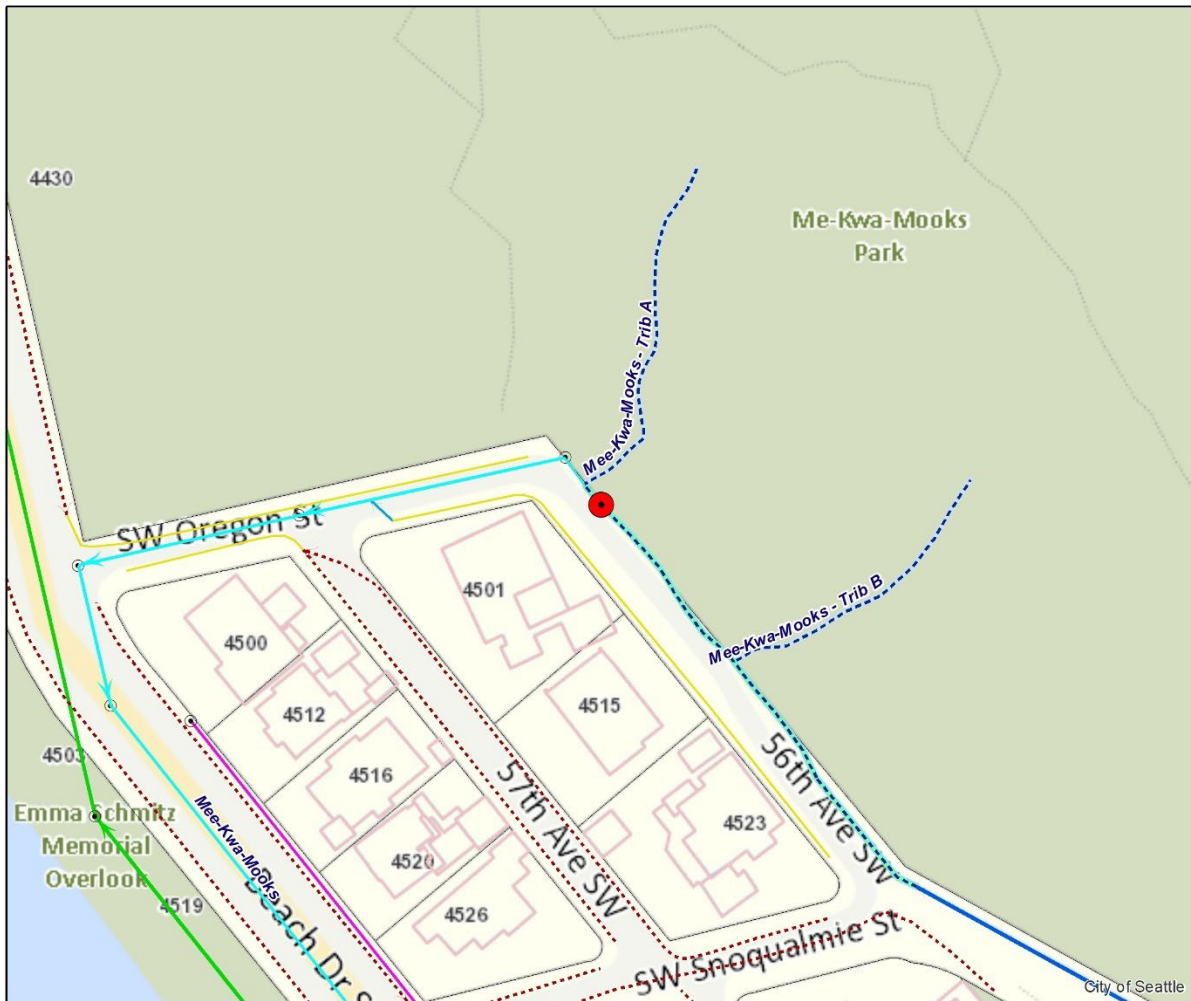
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0 50 100 200 Feet



MK1: 56th Ave SW at SW Oregon St



MK1: 56th Ave SW at SW Oregon St

Routine Maintenance Activity:
Sediment and Debris Removal

Section/Township/Range (SE 15 24 03)
Latitude (47.5631N)
Longitude (122.4050W)
Waterbody - Mee-Kwa-Mooks Creek



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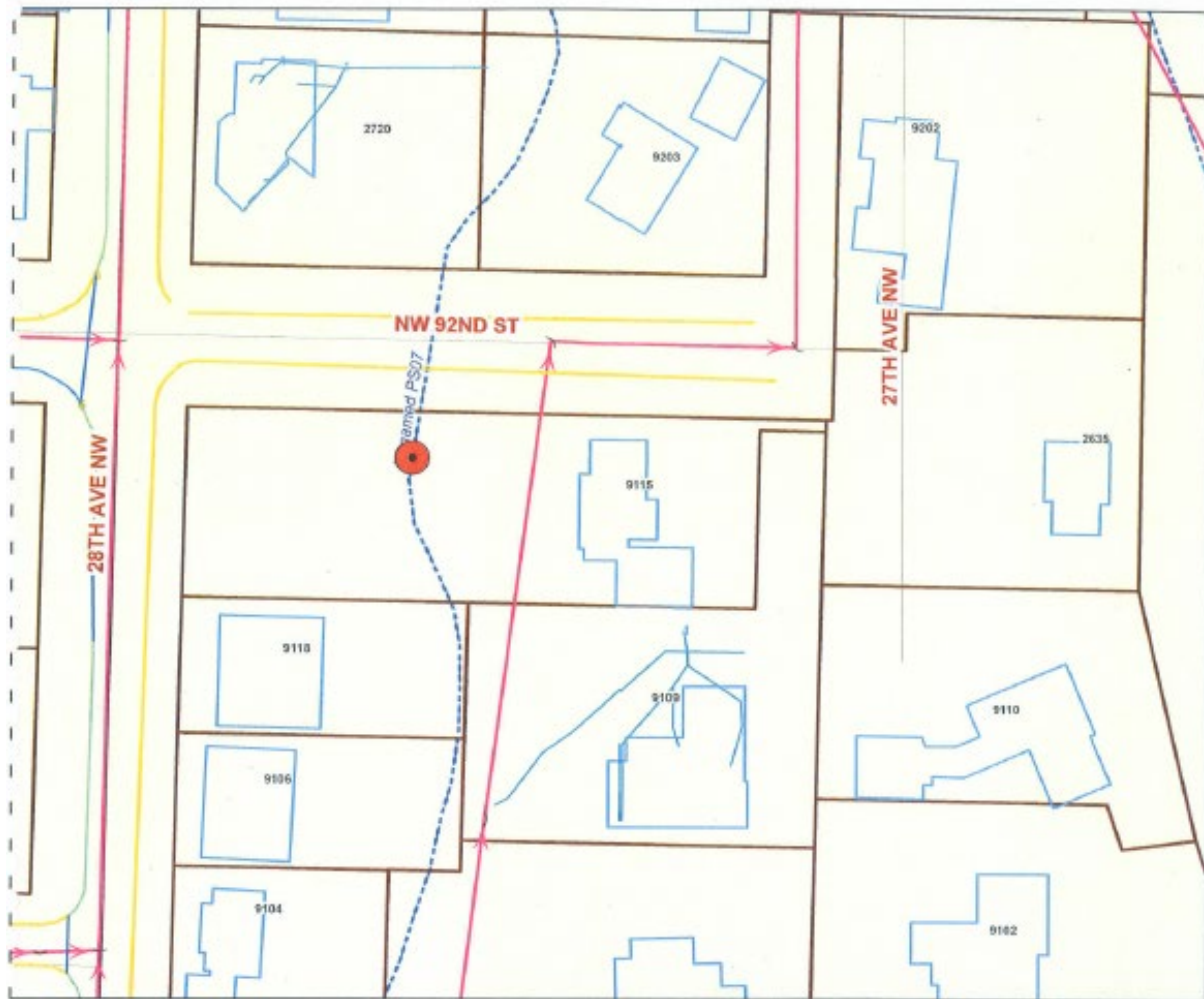
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0 50 100 200 Feet



PS5: NW 92nd St @ 28th Ave NW



**PS5: NW 92nd St @
28th Ave NW**

Routine Maintenance Activity:
- Sediment and Debris Removal,

Section/Township/Range (NW 35 26 3)

Latitude (47.69590N)

Longitude (122.39233W)

Waterbody - Unnamed PS07 - Mainstem



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0 37.5 75 150 Feet



PS6: 28th Ave NW @ NW Esplanade



PS6: 28th Ave NW @ NW Esplanade

Routine Maintenance Activity:
Sediment and Debris Removal

Section/Township/Range (NW 35 26 03)
Latitude (47.70017N)
Longitude (122.39357W)
Waterbody - Unnamed PS07 - Mainstem



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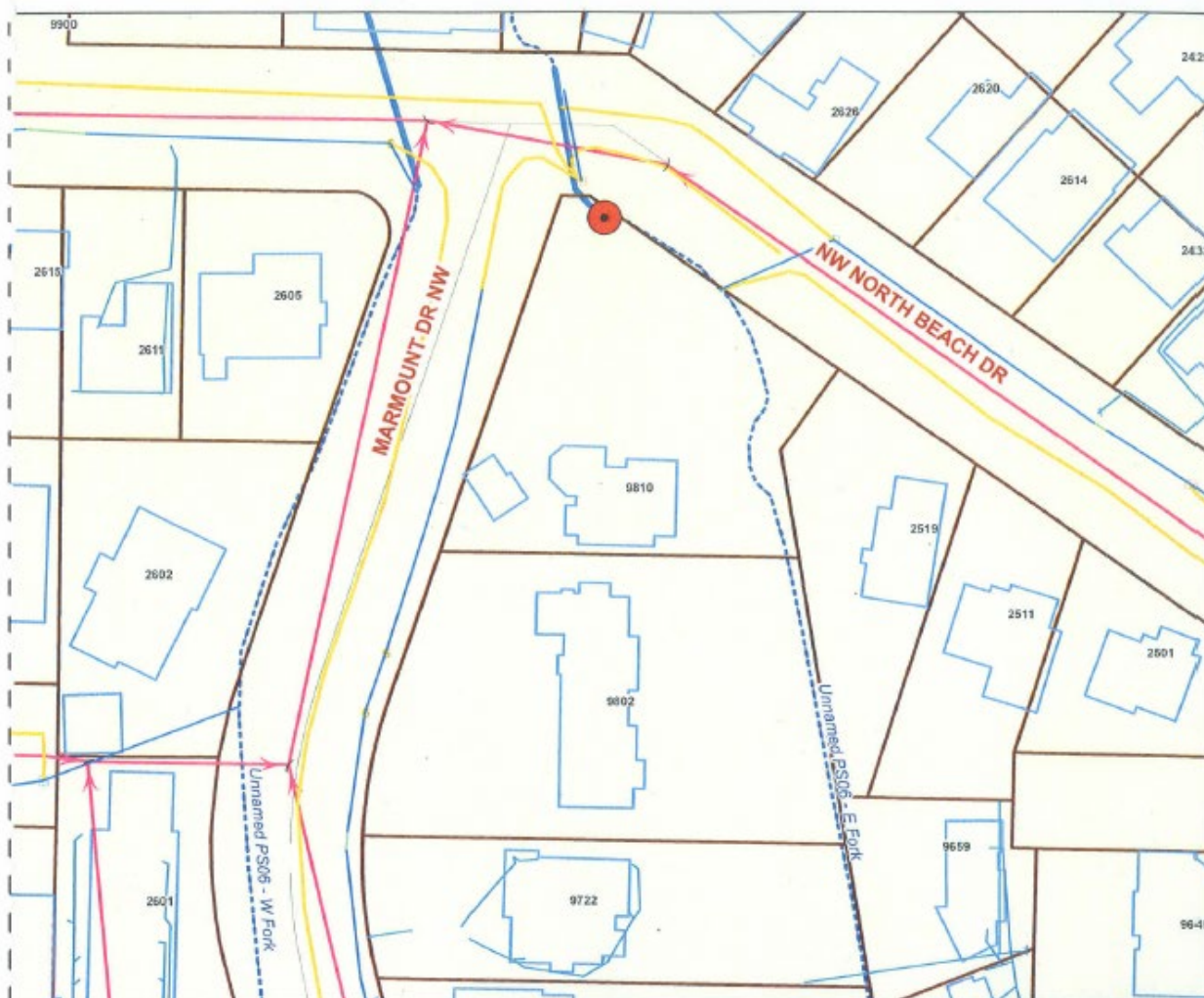
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0 50 100 200 Feet



PS7: Marmount Dr. NW @  NW North Beach Dr.



**PS7: Marmount Dr. NW @
NW North Beach Dr.**

Routine Maintenance Activity:
- Sediment and Debris Removal

*Section/Township/Range (E 34 26 4)
Latitude (47.70080N)
Longitude (122.38995W)
Waterbody - Unnamed PS06 - E Fork*



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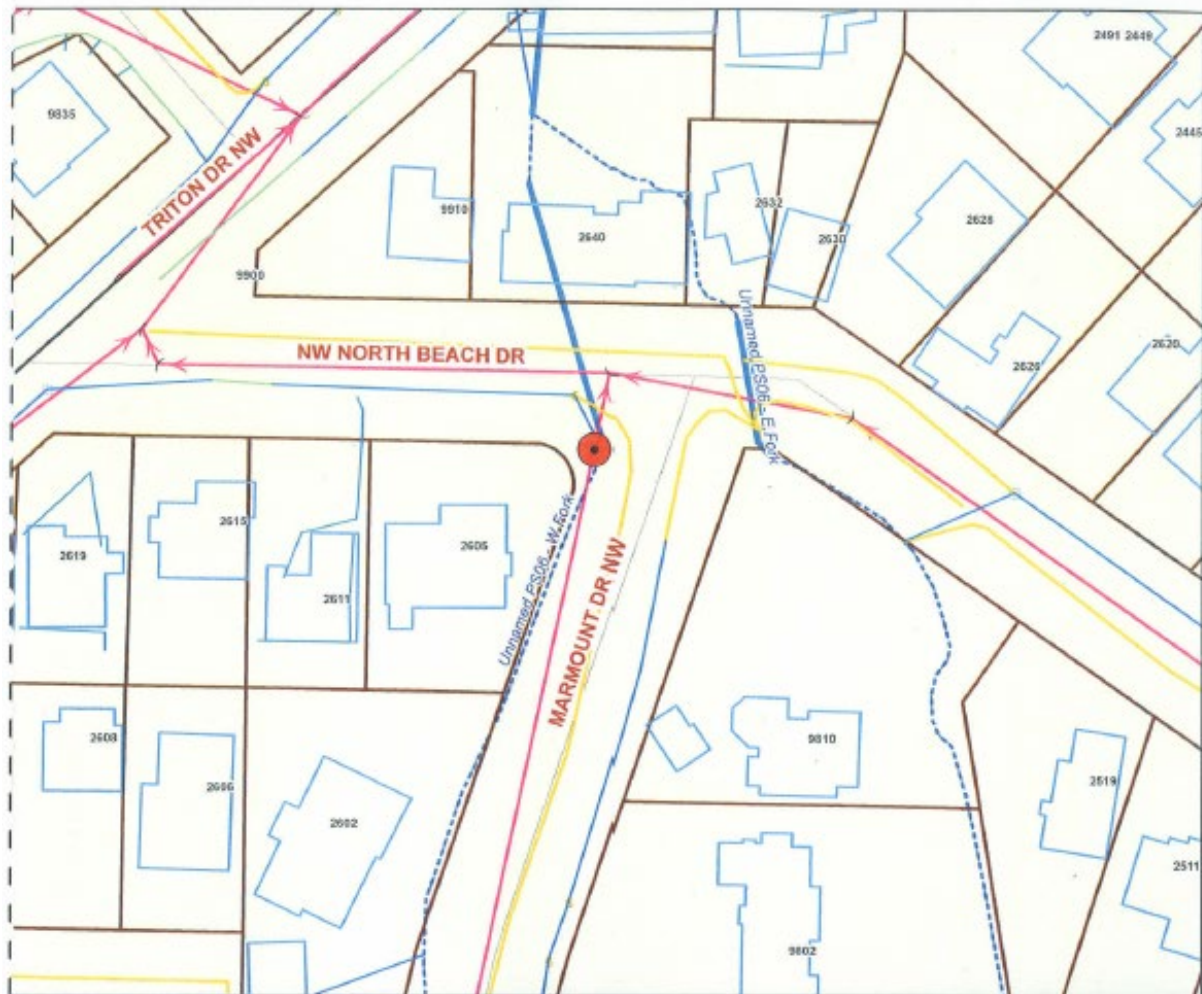
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0 1,000 2,000 4,000 Feet



PS8: Marmount Dr. NW @ NW North Beach Dr.



**PS8: Marmount Dr. NW @
NW North Beach Dr.**

Routine Maintenance Activity:
- Sediment and Debris Removal

*Section/Township/Range (NW 35 26 3)
Latitude (47.70077N)
Longitude (122.39020W)
Waterbody - Unnamed PS06 - W. Fork*



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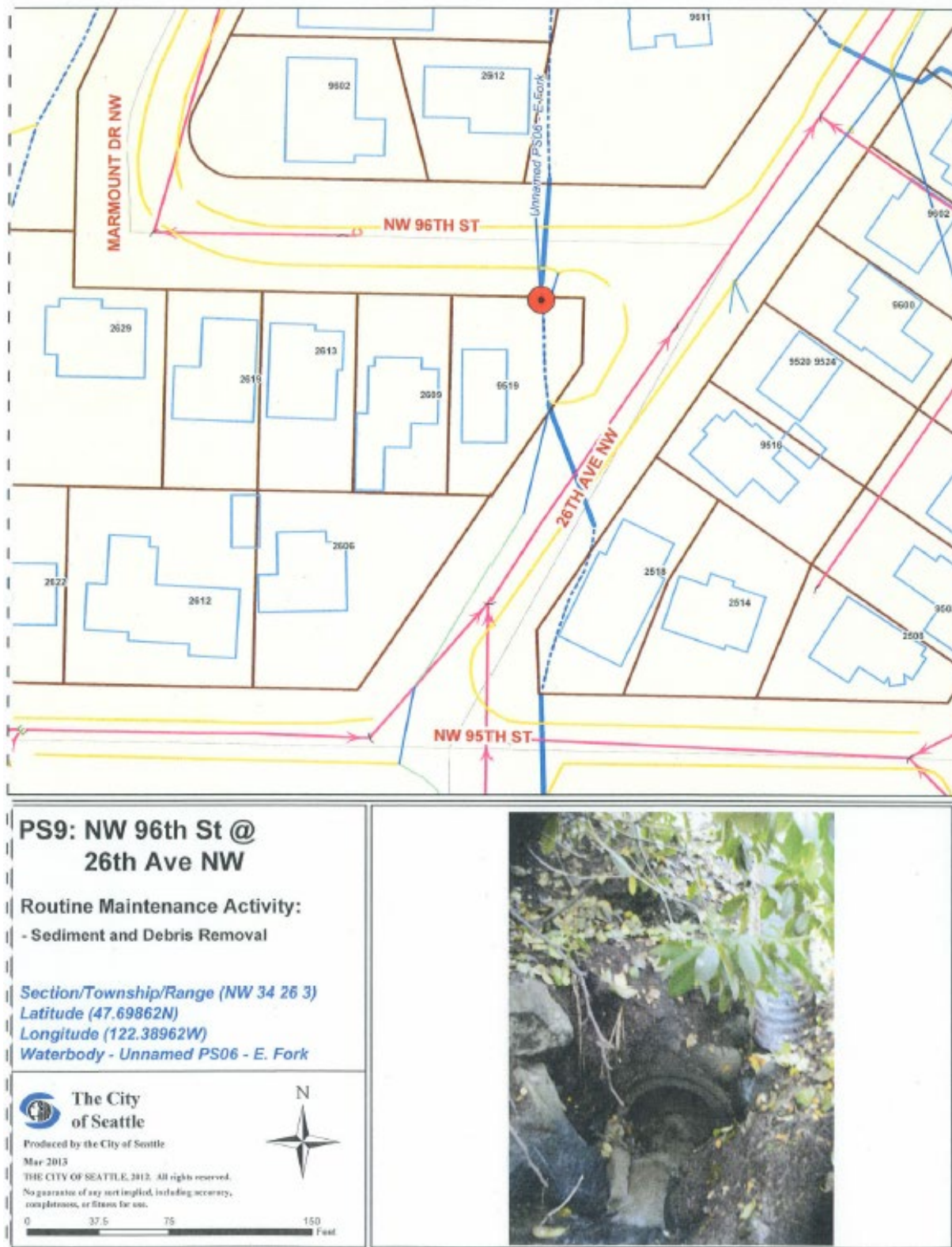
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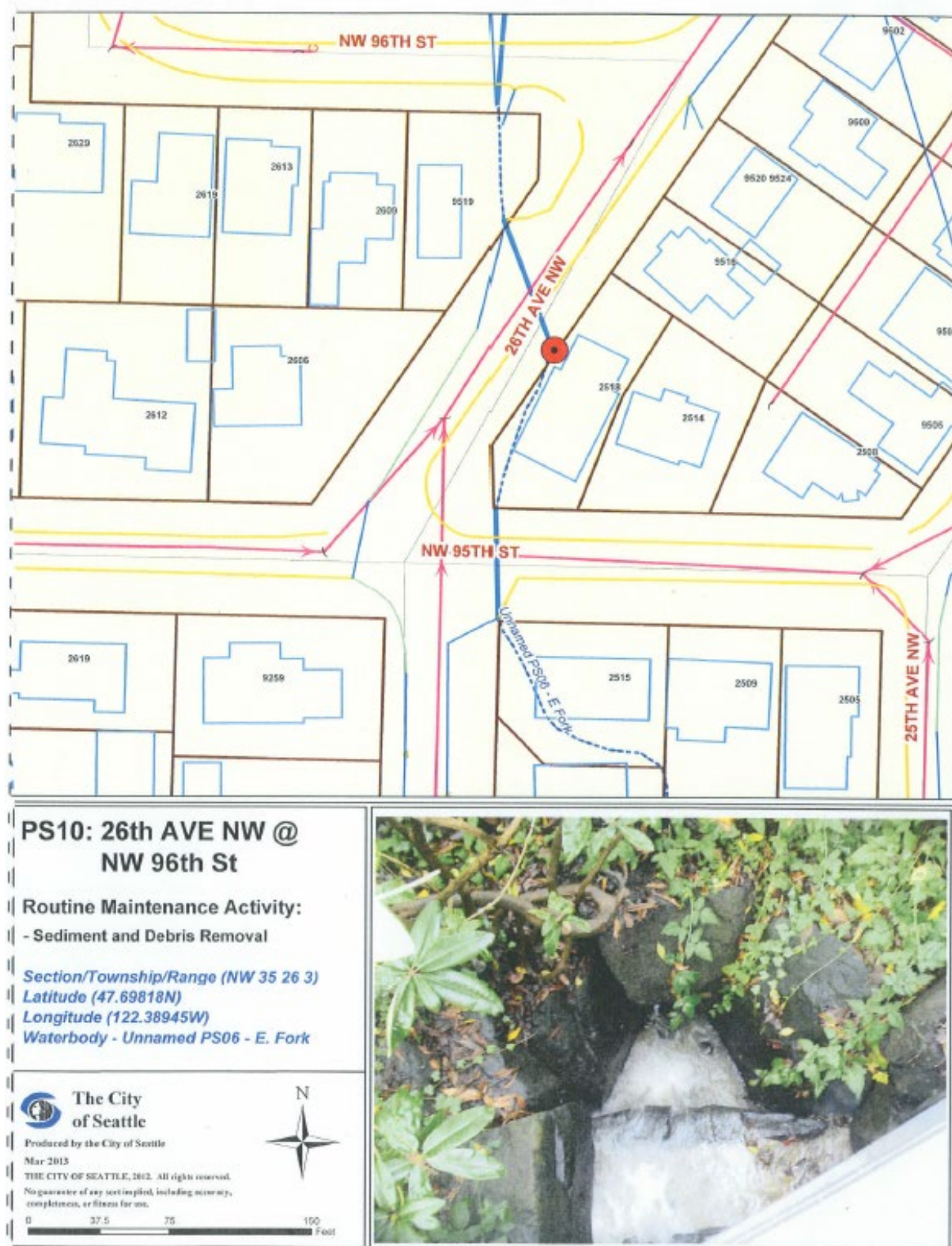
0 20.5 75 150 Feet



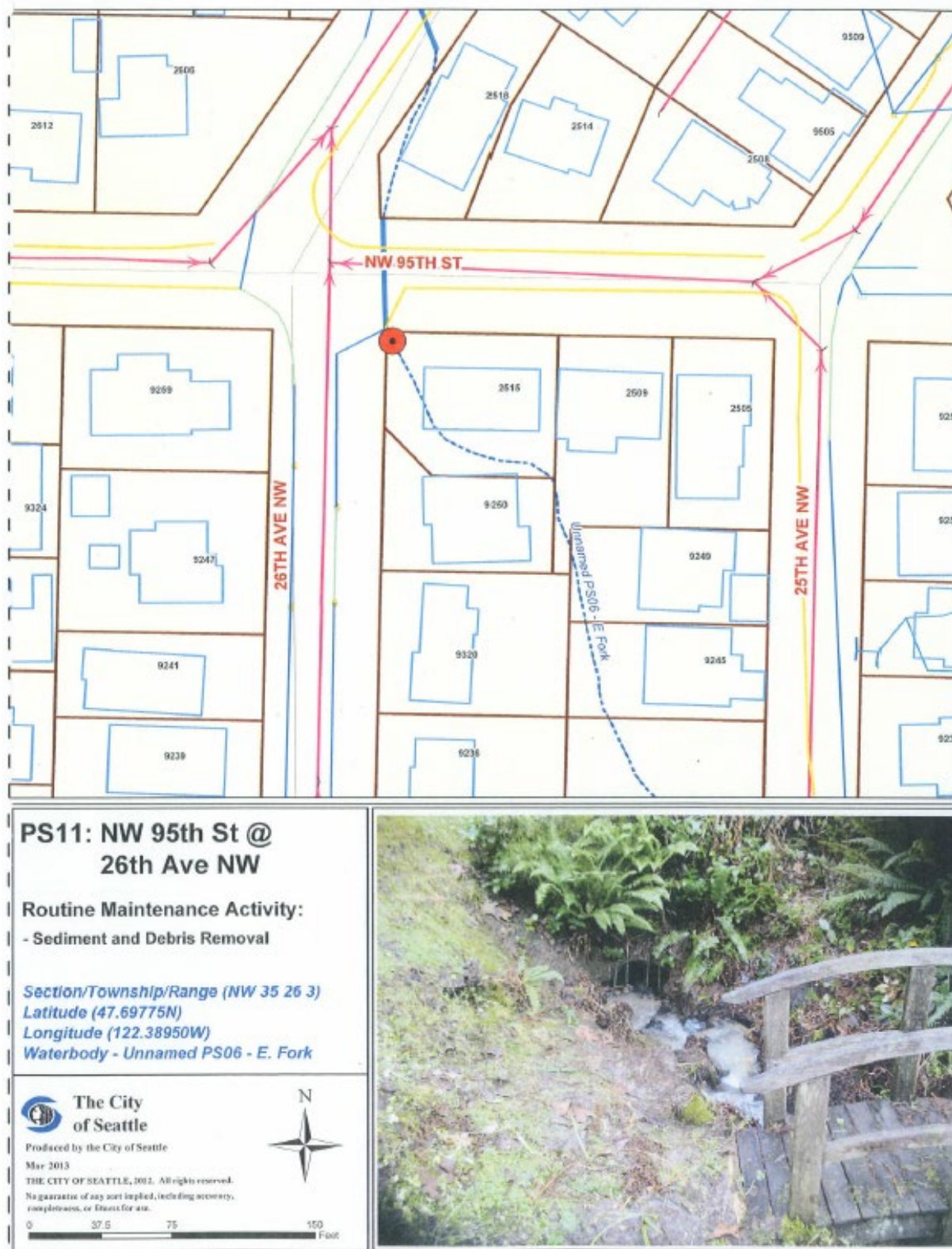
PS9: NW 96th St @ 26th Ave NW



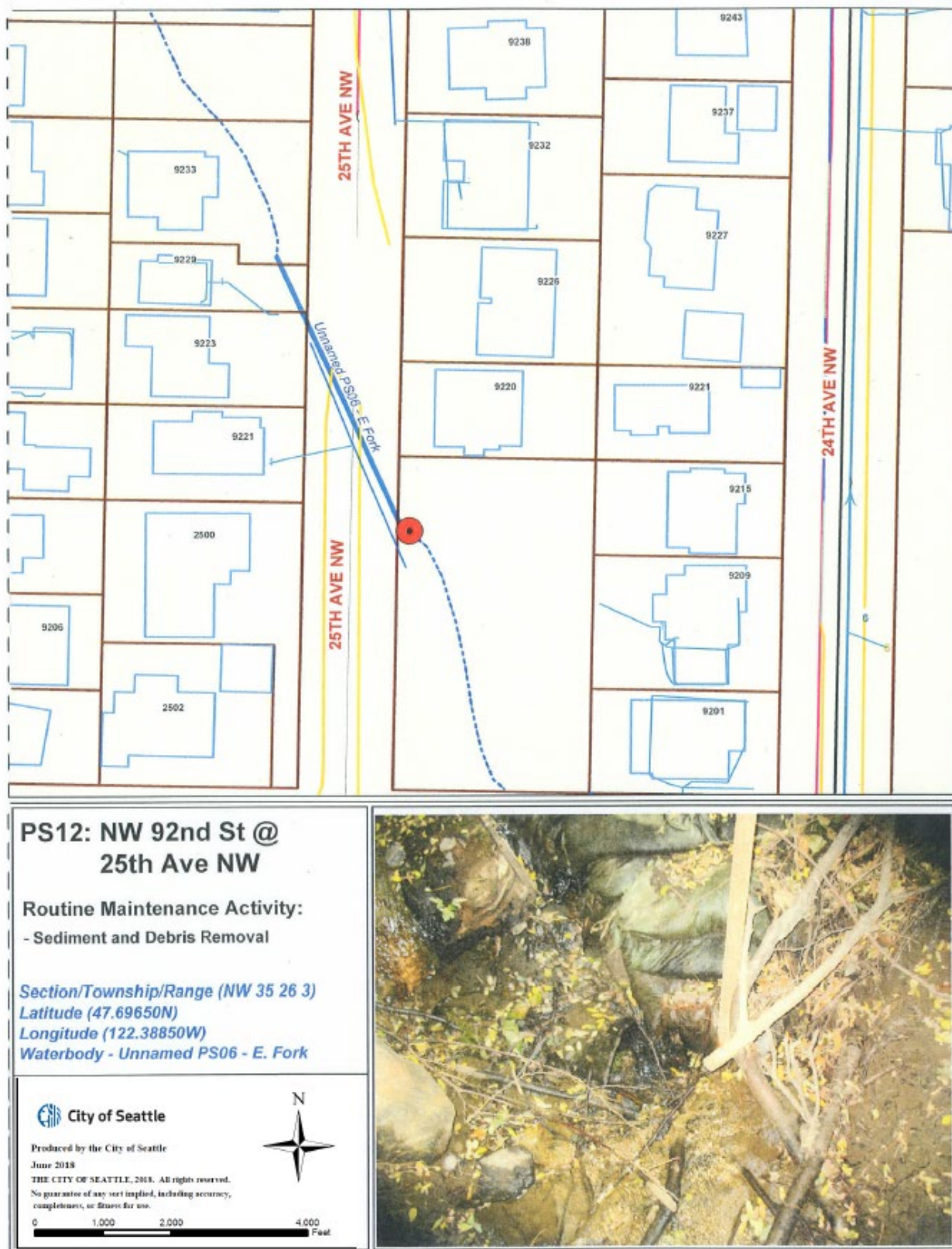
PS10: 26th Ave NW @ NW 96th St



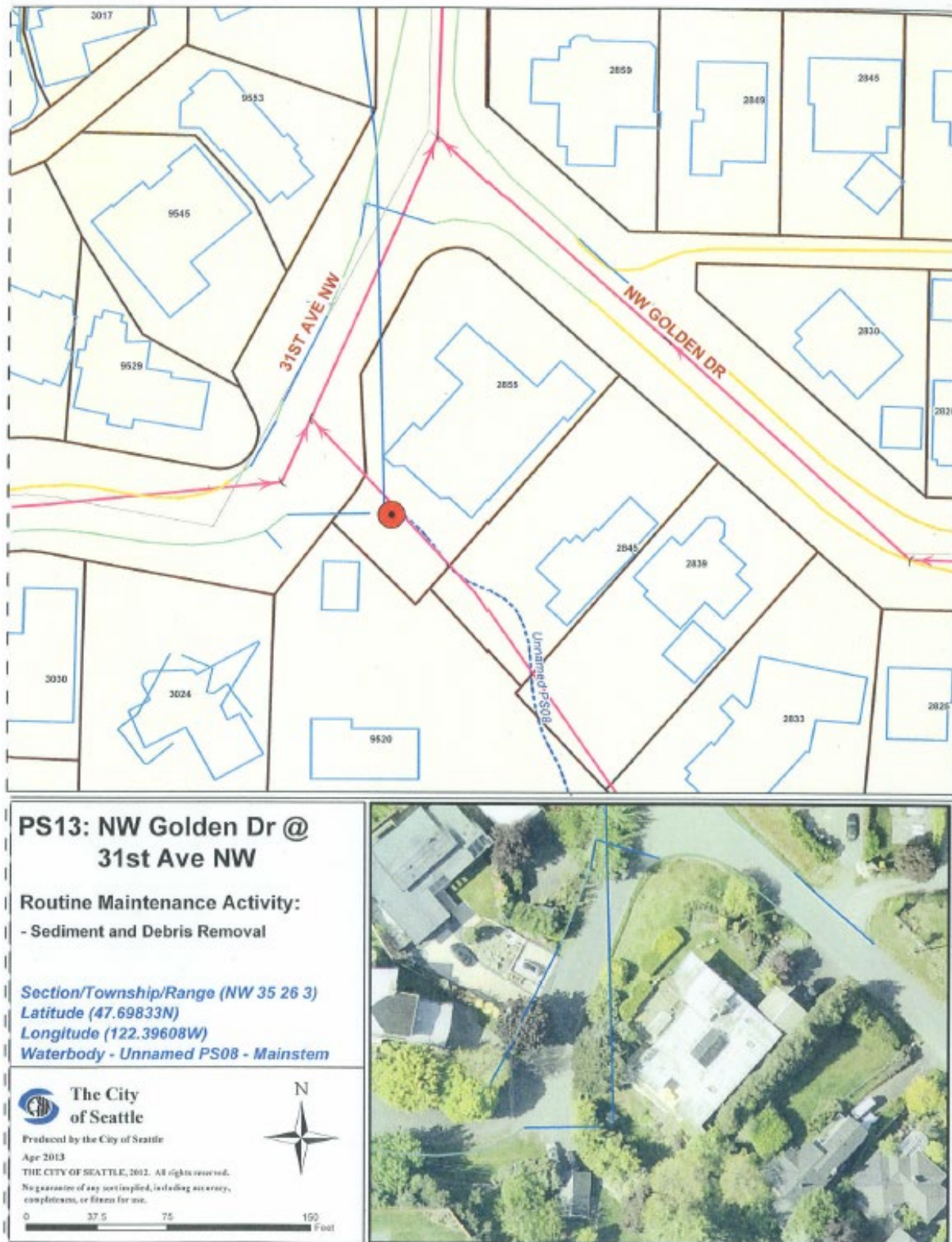
PS11: NW 95th St @ 26th Ave NW



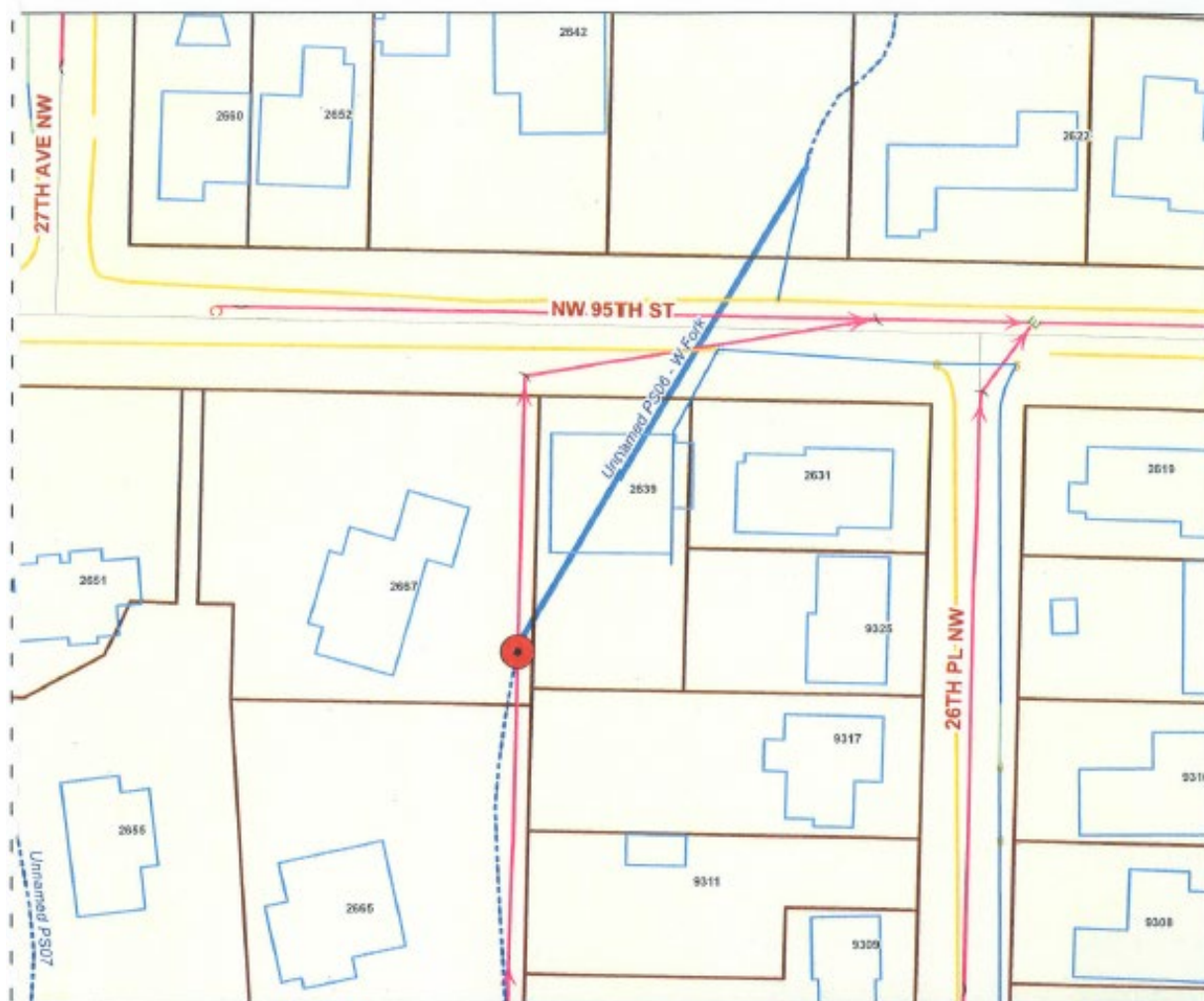
PS12: NW 92nd St @ 25th Ave NW



PS13: NW Golden Dr @ 31st Ave NW



PS14: NW 95th St @ 26th PI NW



**PS14: NW 95th St @
26th PI NW**

Routine Maintenance Activity:

- Sediment and Debris Removal

Section/Township/Range (NW 35 26 3)

Latitude (47.69750N)

Longitude (122.39152W)

Waterbody - Unnamed PS06 - W. Fork



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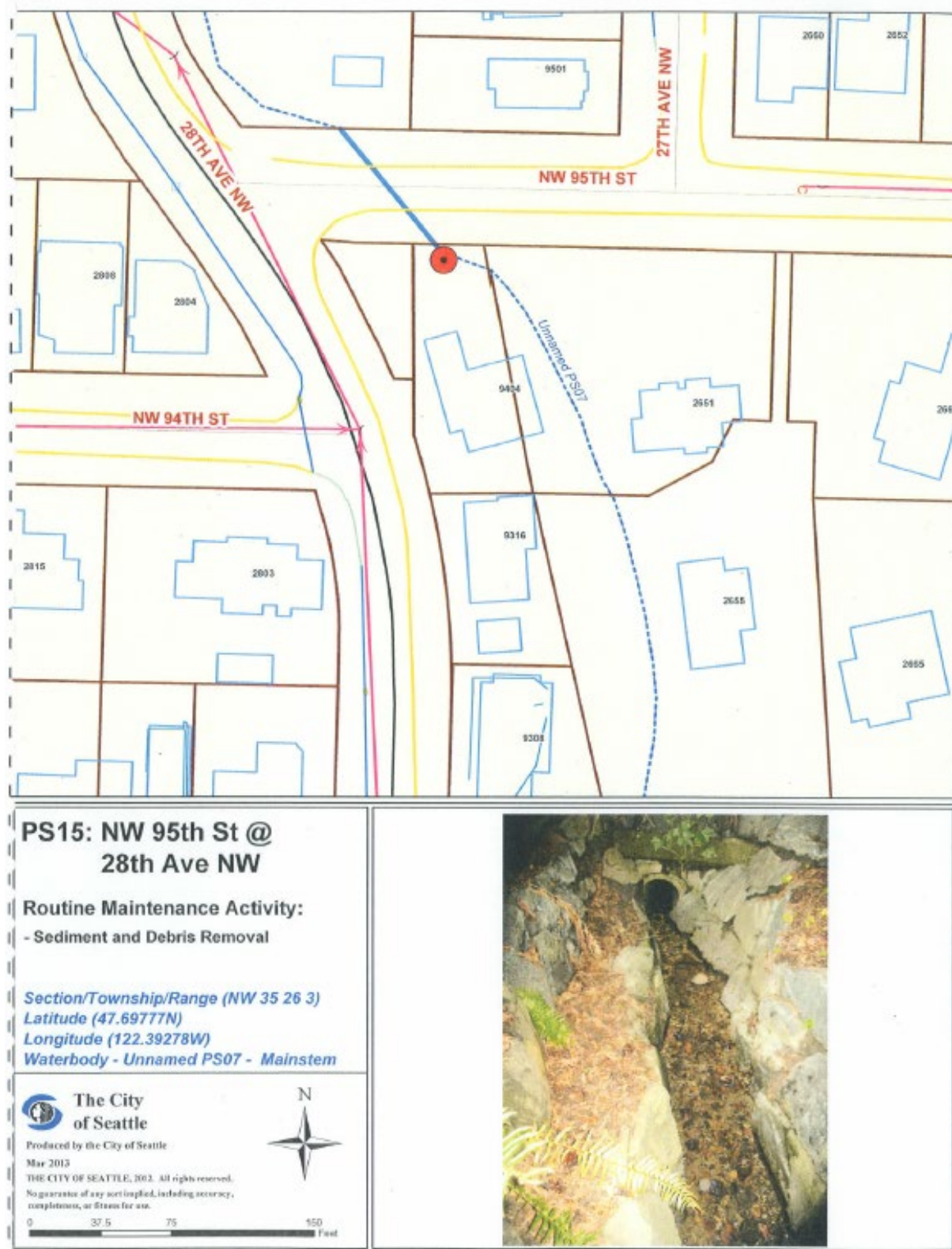
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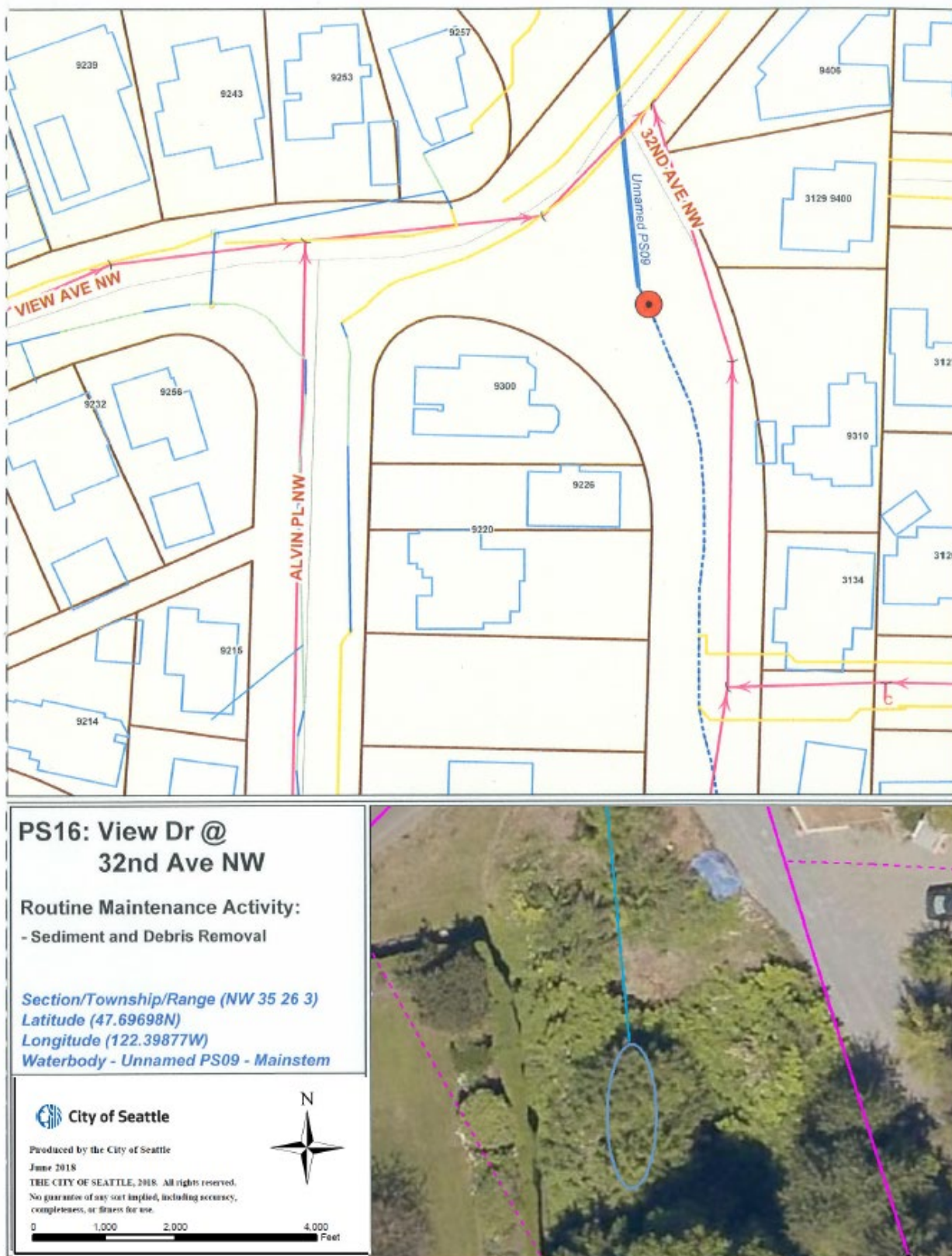
0 37.5 75 150 Feet



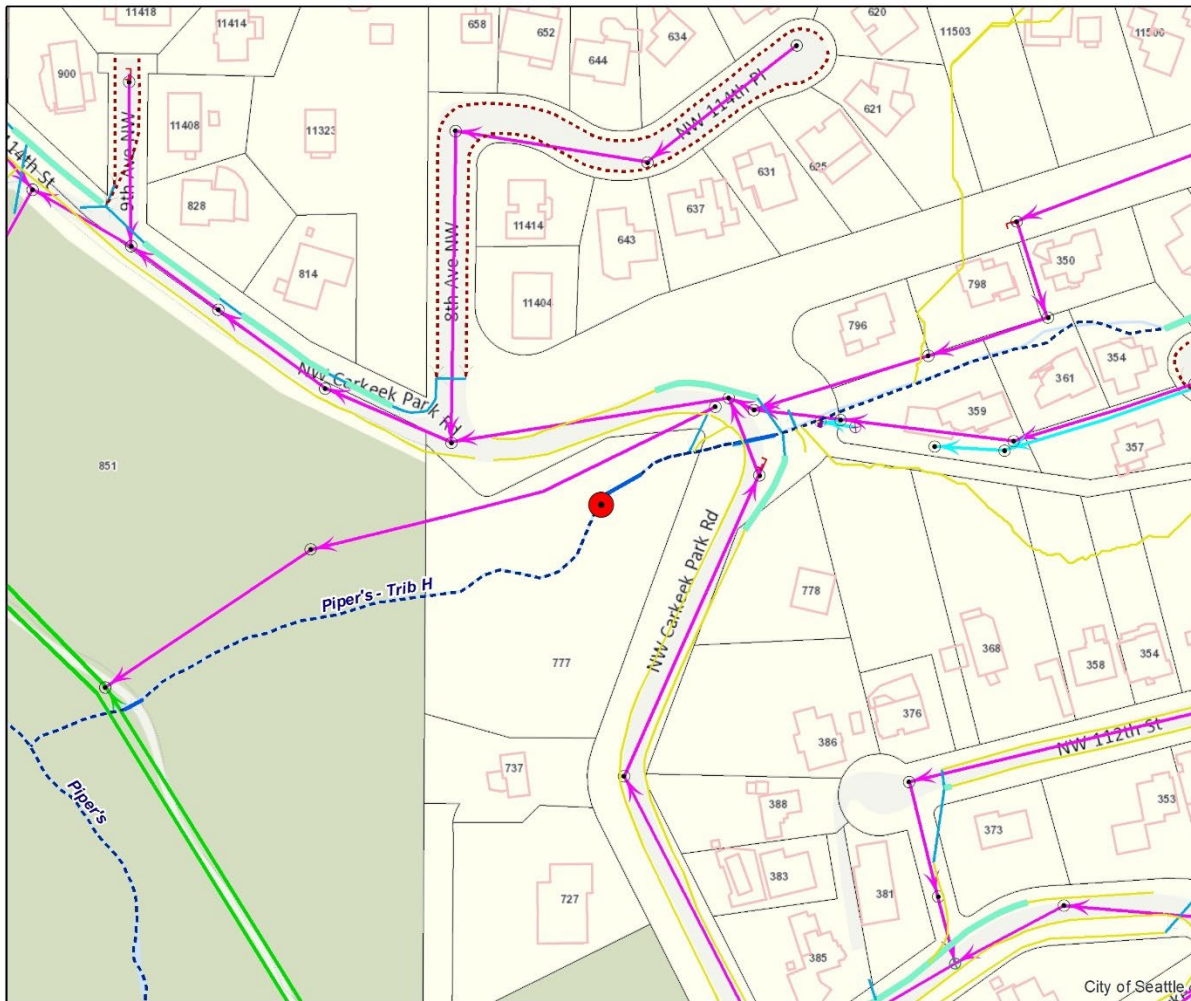
PS15: NW 95th St @ 28th Ave NW



PS16: View Dr @ 32nd Ave NW



PS17: 777 NW Carkeek Park Road



PS17: Becker's Culvert

Routine Maintenance Activity:
Debris Removal, Vegetation Control

Section/Township/Range (SW 25 26 03)
Latitude (47.7109N)
Longitude (122.3654W)
Waterbody - Pipers Creek



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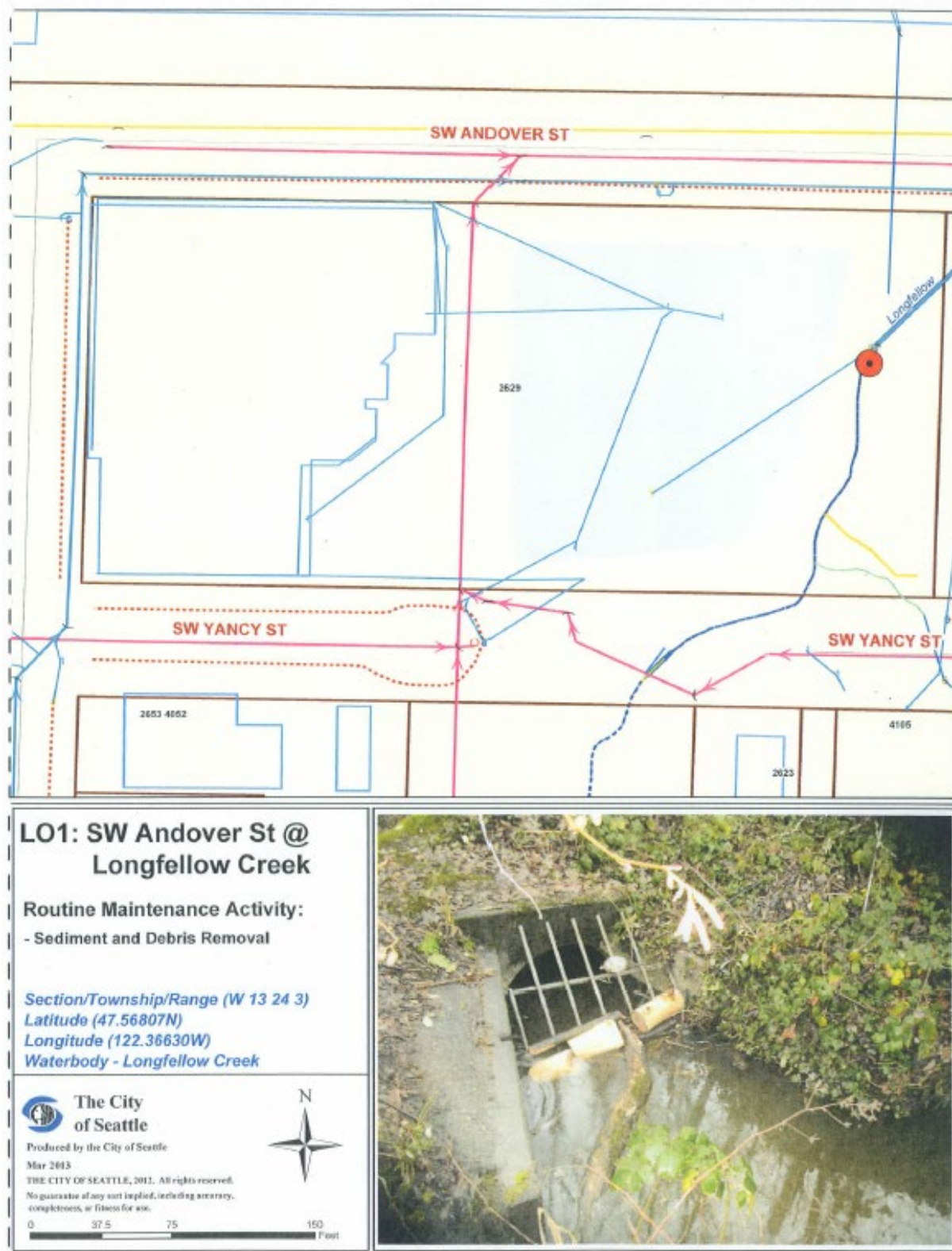
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0 95 190 380 Feet



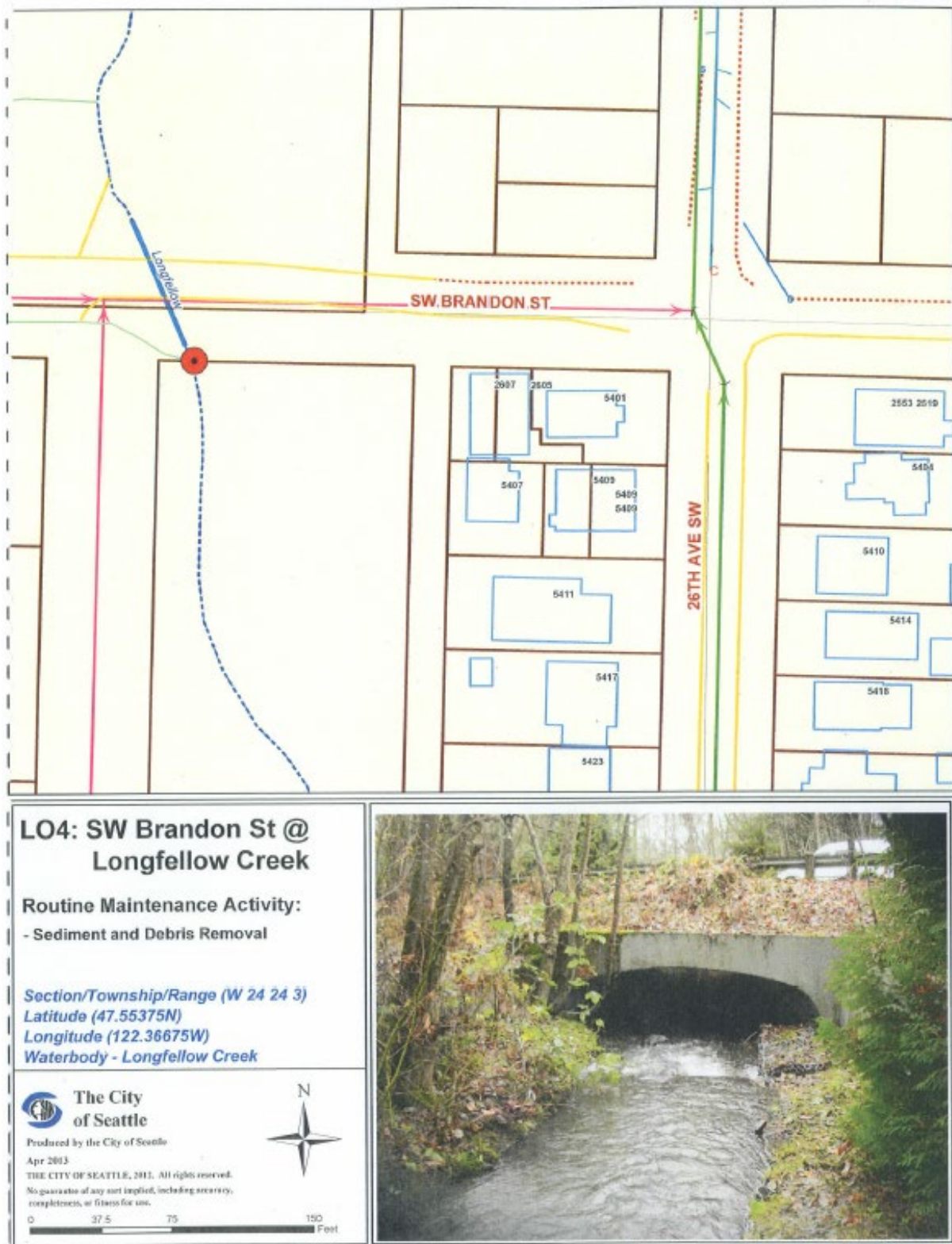
LO1: SW Andover St @ Longfellow Creek



LO2: SW Nevada St @ Longfellow Creek



LO4: SW Brandon St @ Longfellow Creek



LO7: SW Juneau St @ Longfellow Creek



**LO7: SW Juneau St @
Longfellow Creek**

Routine Maintenance Activity:
- Sediment and Debris Removal

*Section/Township/Range (SW 24 24 3)
Latitude (47.54998N)
Longitude (122.36493N)
Waterbody - Longfellow Creek*



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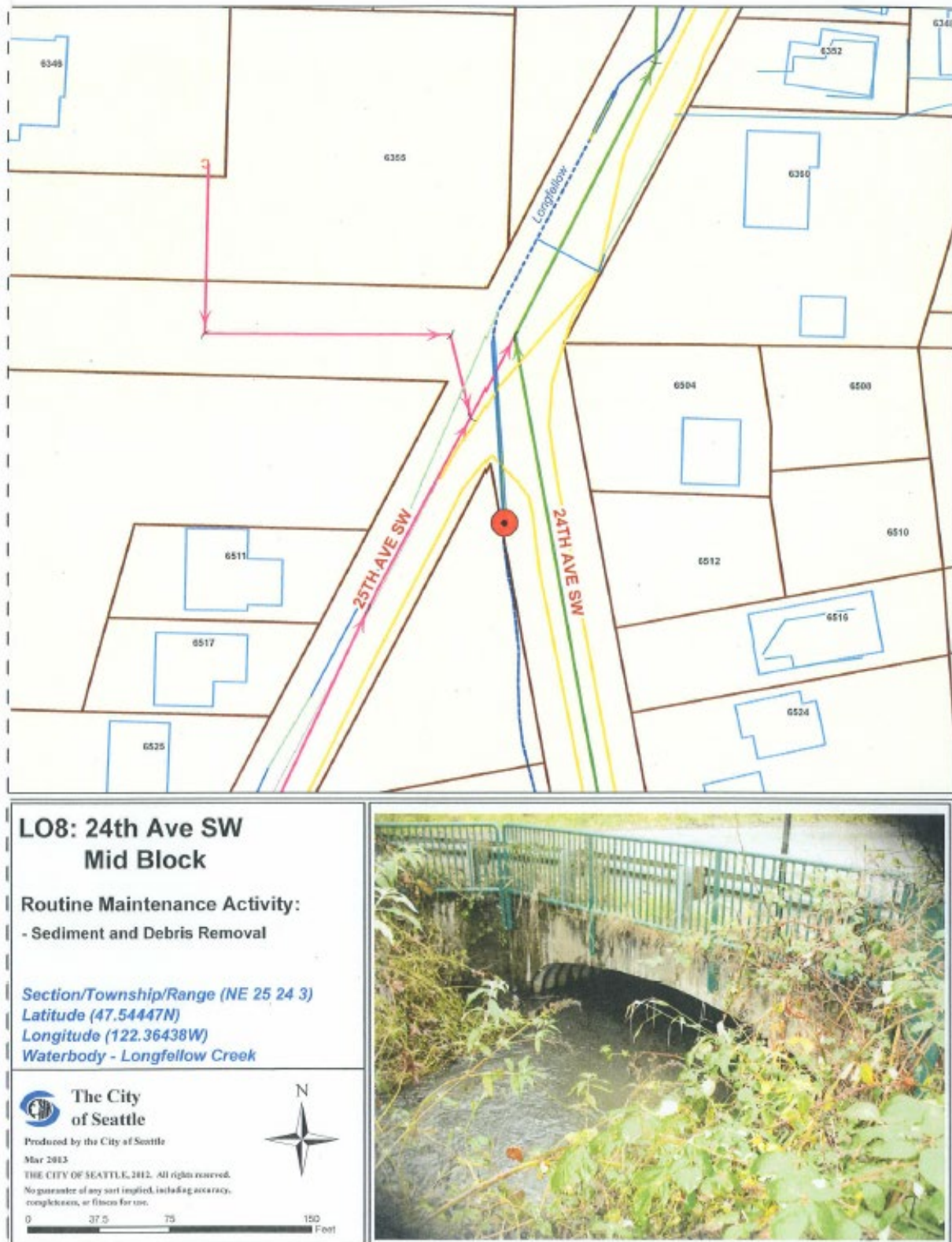
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completeness, or fitness for use.



0 37.5 75 150 Feet



LO8: 24th Ave SW Mid Block



LO9: 24th Ave SW @ 25th Ave SW



**LO9: 24th Ave SW @
25th Ave SW**

Routine Maintenance Activity:

- Sediment and Debris Removal

Section/Township/Range (NW 35 26 3)

Latitude (47.54447N)

Longitude (122.36438W)

Waterbody - Unnamed PS08 - Mainstem



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0 40 80 160 Feet



LO10: SW Willow St @ Longfellow Creek



**LO10: SW Willow St @
Longfellow Creek**

Routine Maintenance Activity:
- Sediment and Debris Removal

*Section/Township/Range (NE 25 24 3)
Latitude (47.54187N)
Longitude (122.36353W)
Waterbody - Longfellow Creek*



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0 37.5 75 150 Feet



LO12: SW Holden St @ Longfellow Creek

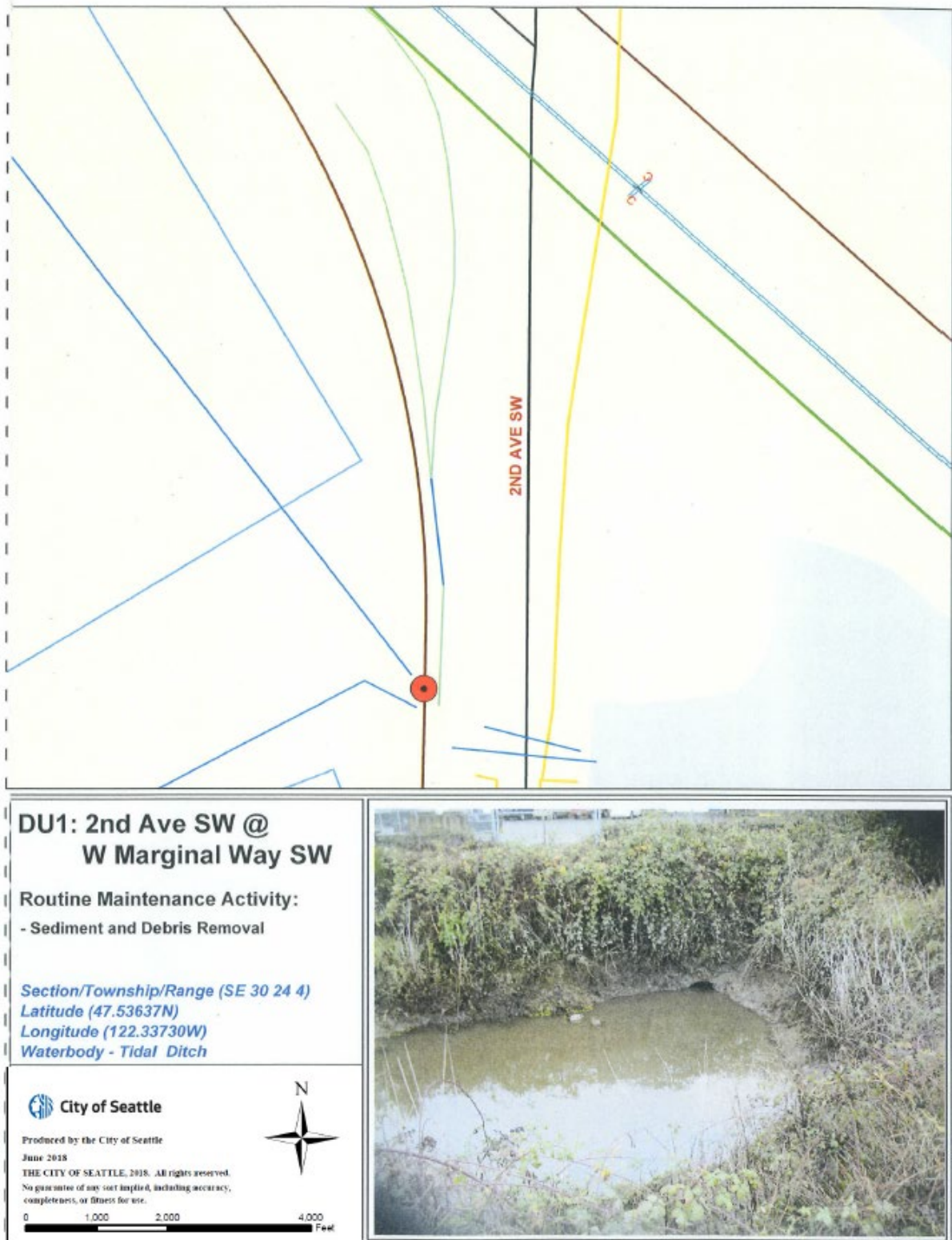


This map shows the intersection of SW 104th St and 30th Ave SW. The area is divided into several lots, each labeled with an address. The lots are outlined in blue. The street names are written in red. A red dot marks the intersection of SW 104th St and 30th Ave SW. The map includes a scale bar and a north arrow.

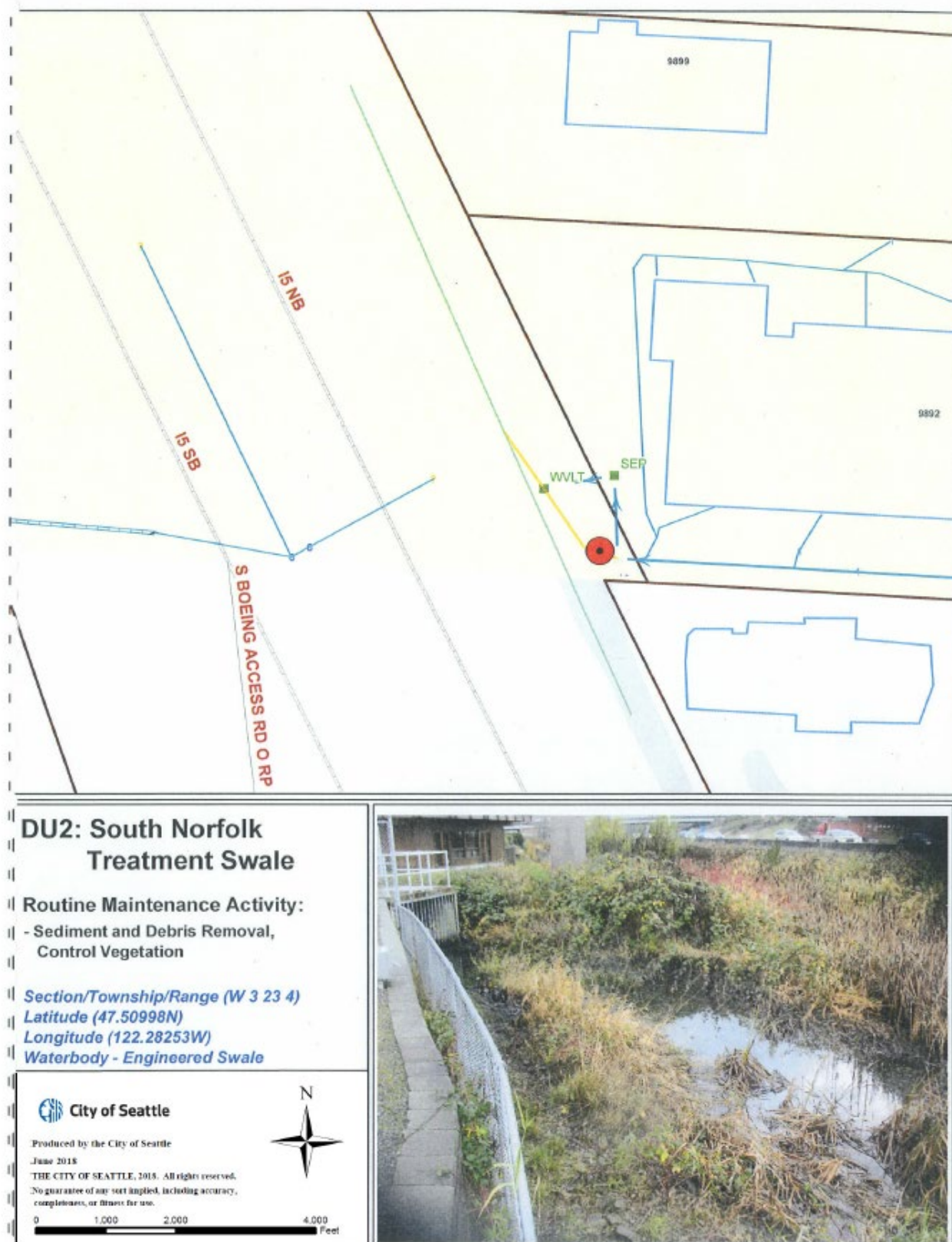
Address	Location
10247	Top left lot
10253	Lot below 10247
10255	Lot to the right of 10253
10259	Top right lot
10262	Lot below 10259
3103	Bottom left lot
3101	Lot to the right of 3103
3011	Lot to the right of 3101



DU1: 2nd Ave SW @ W Marginal Way SW



DU2: South Norfolk Treatment Swale



MC1: S Cloverdale St @ Grattan Pl S

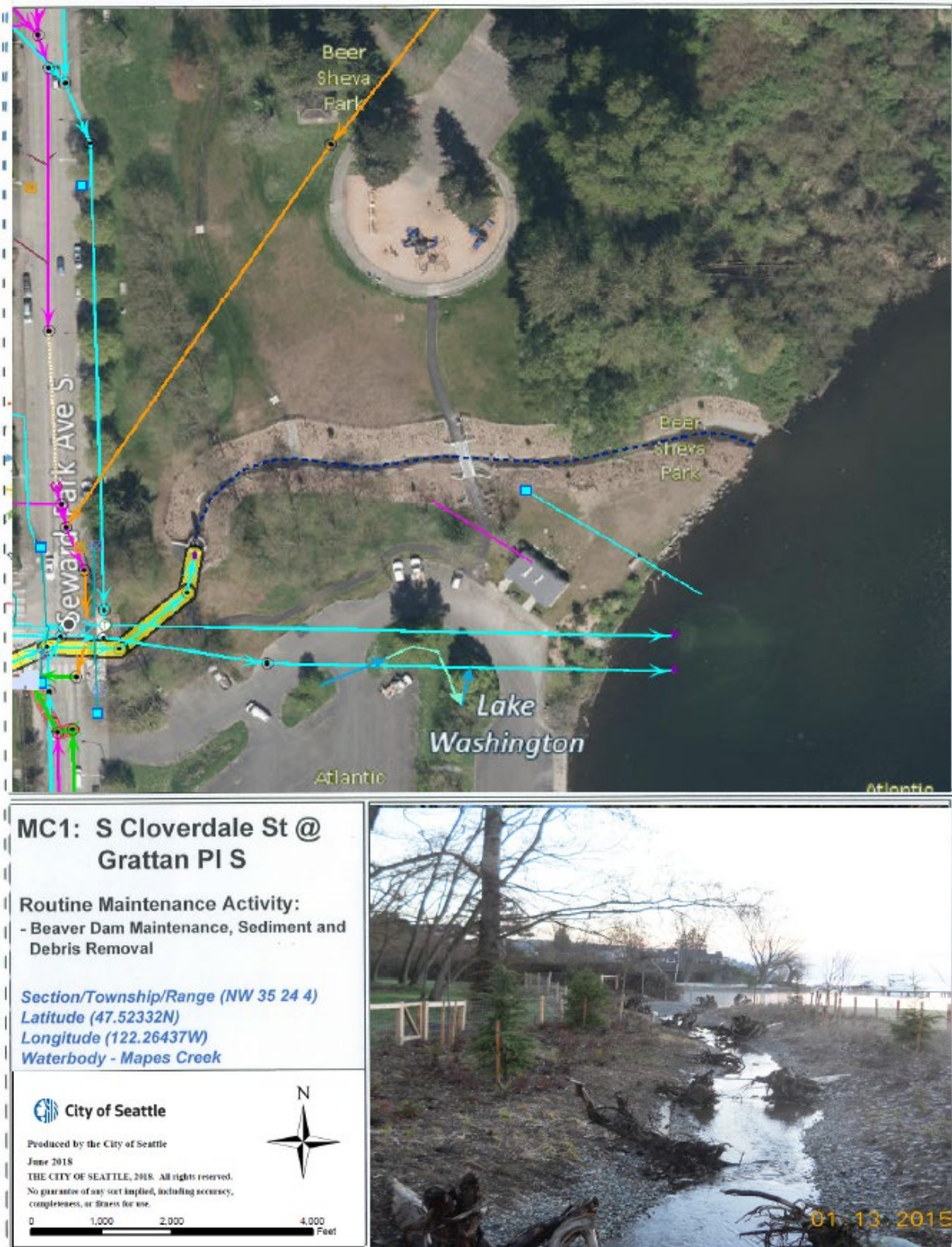


Exhibit D-3: Enclosed Drainage System Representative Facility Data Sheet

TH2: 49th Ave. NE @ NE 51st St.



**TH2: 49th Ave NE @
51st Ave NE**

Routine Maintenance Activity:

- Vactoring and jetting culverts and ditches,
control vegetation

Section/Township/Range (E 34 26 4)

Latitude (47.69448N)

Longitude (122.27312W)

**Waterbody - Thornton Creek Mainstem
Trib A**



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0 37.5 75 150 Feet



TH6: NE 92nd St @ Sand Point Way NE



**TH6: NE 92nd St @
Sand Point Way NE**

Routine Maintenance Activity:

- Vactoring and jetting culverts and ditches,
Control vegetation

Section/Township/Range (SE 34 26 4)

Latitude (47.69545N)

Longitude (122.27623W)

Waterbody - Maple Creek



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0 37.5 75 150 Feet



TH7: NE 92nd St @ Sand Point Way NE



**TH7: Matthews Ave NE @
Sand Point Way NE**

Routine Maintenance Activity:
- Vactoring and jetting culverts and ditches

Section/Township/Range (E 34 26 4)
Latitude (47.69563N)
Longitude (122.27743W)
Waterbody - Maple Creek



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0 37.5 75 150 Feet



TH8: Matthews Ave NE Mid - Block



**TH8: Matthews Ave NE
Mid - Block**

Routine Maintenance Activity:

-Vactoring and jetting culverts and ditches

Section/Township/Range (E 34 26 4)

Latitude (47.69518N)

Longitude (122.27742W)

Waterbody - Maple Creek



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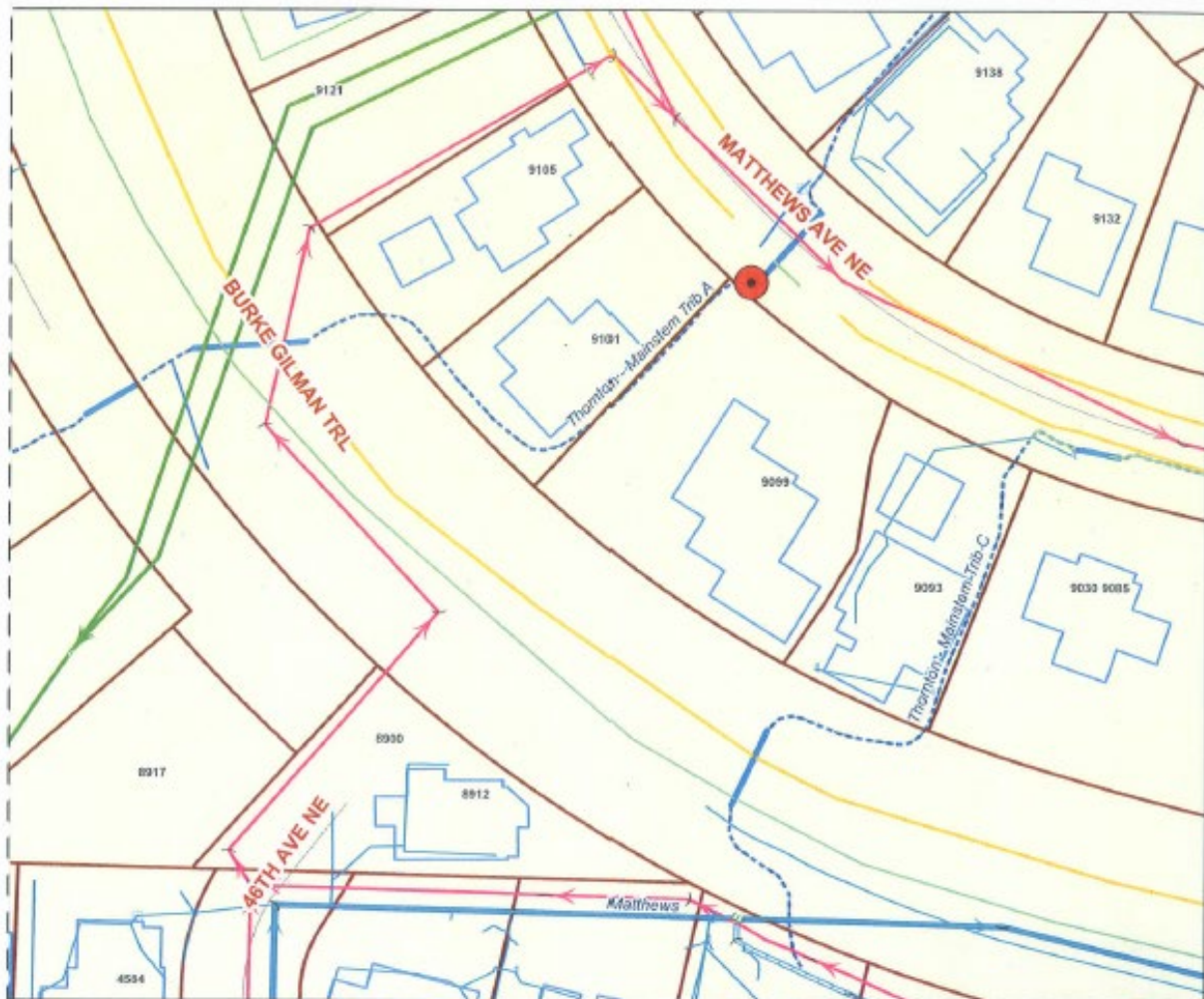
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0 37.5 75 150 Feet



TH9: Matthews Ave NE South - Block



**TH9: Matthews Ave NE
South - Block**

Routine Maintenance Activity:

-Vacuoring and jetting culverts and ditches

Section/Township/Range (E 34 26 4)

Latitude (47.69447N)

Longitude (122.27695W)

*Waterbody - Thornton Creek Mainstem
Trib A*



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0 37.5 75 150 Feet



TH12: NE 96th St. @ 39th Ave NE



**TH12: NE 96th St @
39th Ave NE**

Routine Maintenance Activity:
-Sediment and Debris Removal,
Control Vegetation

*Section/Township/Range (NW 34 26 4)
Latitude (47.69828N)
Longitude (122.28692W)
Waterbody - Thornton Creek*



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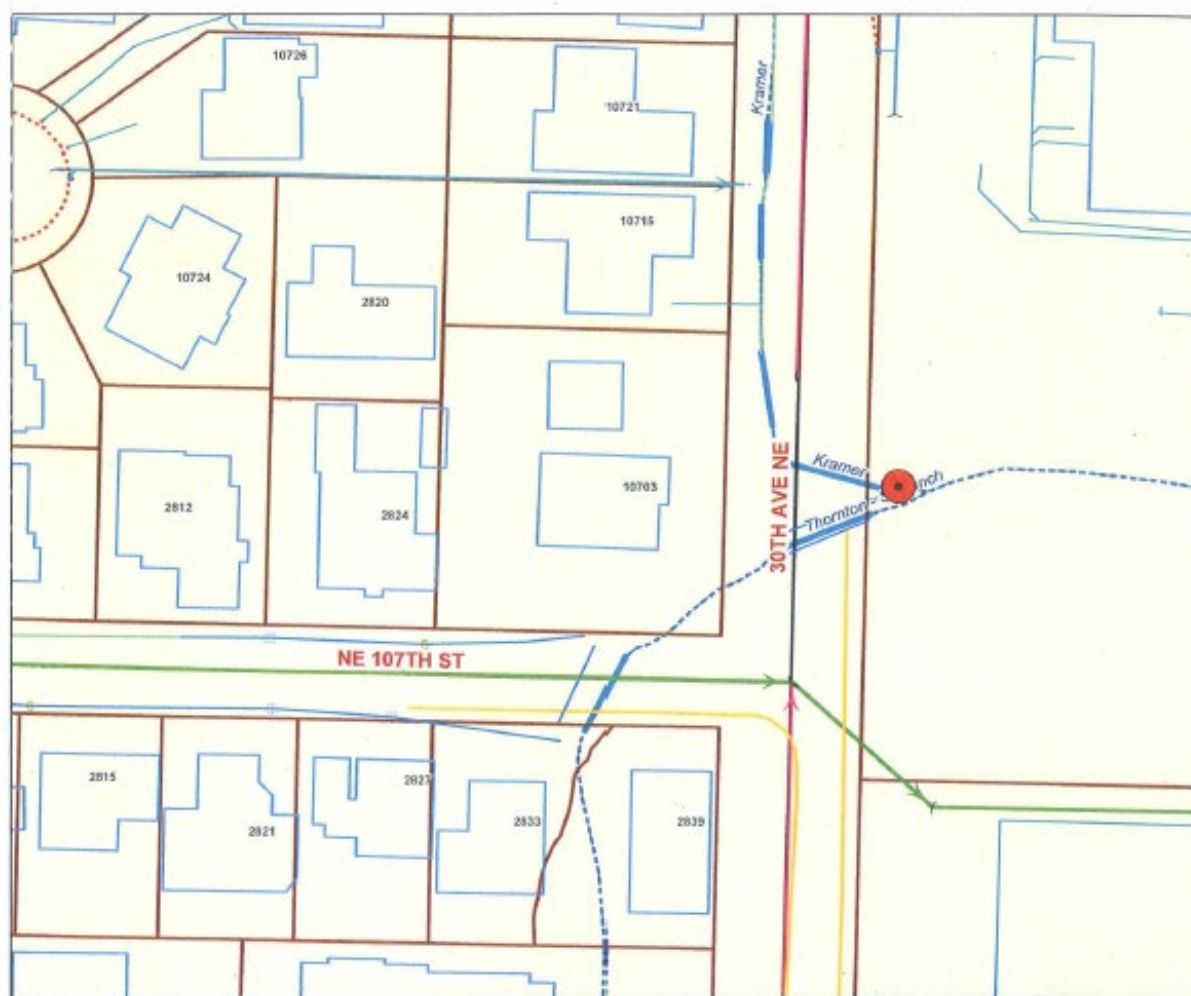
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0 37.5 75 150
Feet



TH20: 30th Ave NE @ NE 107th St Kramer



**TH20: 30th Ave NE @
NE 107th St Kramer
Culvert**

Routine Maintenance Activity:
- Sediment and Debris Removal

*Section/Township/Range (E 34 26 4)
Latitude (47.70693N)
Longitude (122.29618W)
Waterbody - Kramer Creek*



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0 37.5 75 150 Feet



TH22: 31st Ave NE @ NE 110th St



**TH22: 31st Ave NE @
NE 110th St**

Routine Maintenance Activity:
-Sediment and Debris Removal,
Control Vegetation

*Section/Township/Range (SE 28 26 4)
Latitude (47.70838N)
Longitude (122.29398W)
Waterbody - Unnamed Tributary*



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0 37.5 75 150
Feet



TH26: NE 100th St @ Ravenna Ave NE



**TH26: NE 100th St @
Ravenna Ave NE**

Routine Maintenance Activity:
- Sediment and Debris Removal

*Section/Township/Range (SE 28 26 4)
Latitude (47.70110N)
Longitude (122.30098W)
Waterbody - Willow Creek*



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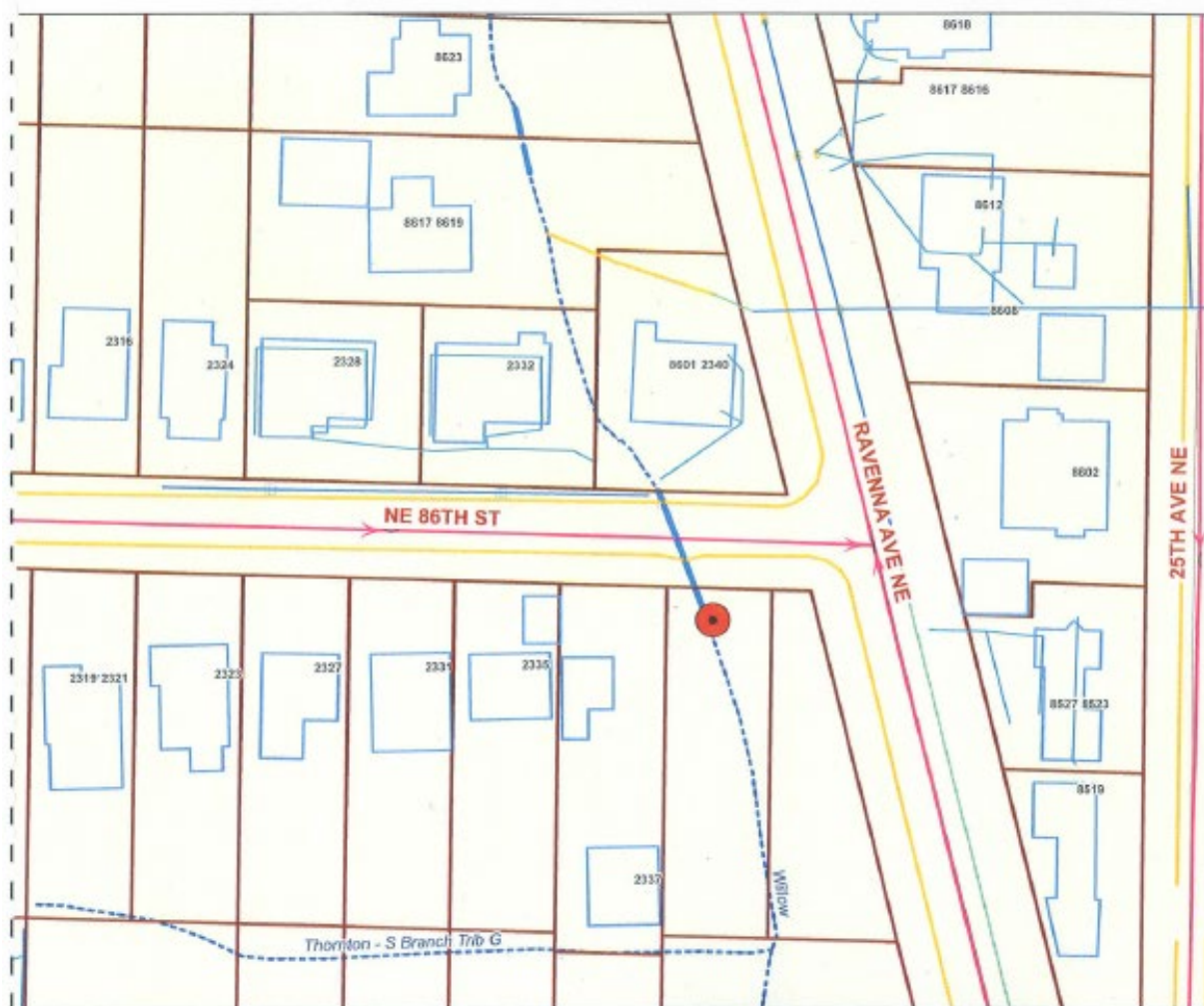
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0 37.5 75 150 Feet



TH27: NE 86th St @ Ravenna Ave NE



**TH27: NE 86th St @
Ravenna Ave NE**

Routine Maintenance Activity:

- Vactoring and Jetting culverts and ditches

Section/Township/Range (SW 33 26 4)

Latitude (47.69118N)

Longitude (122.30237W)

Waterbody - Willow Creek



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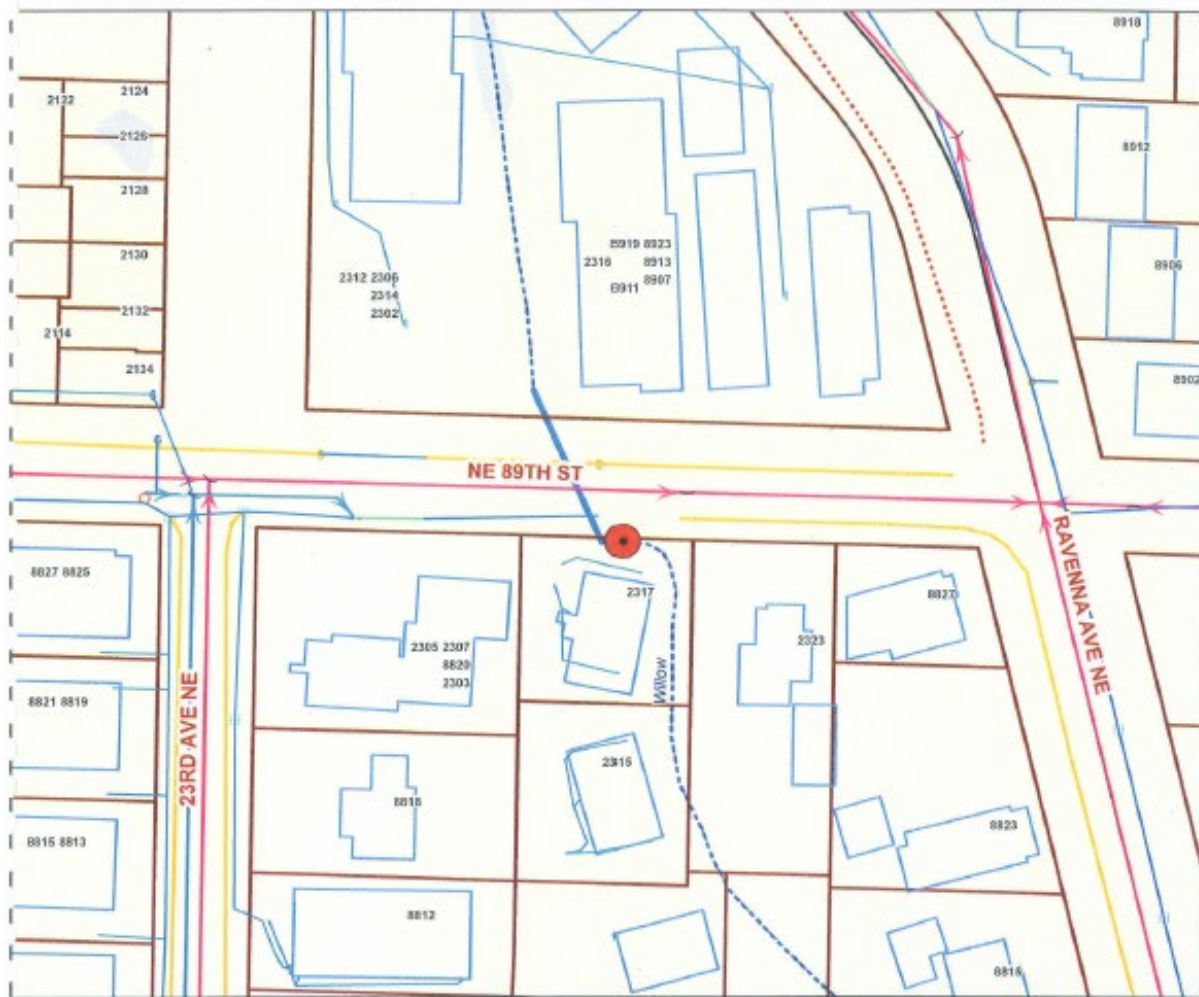
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0 37.5 75 150
Foot



TH28: NE 89th St @ Ravenna Ave NE



TH41: 35th Ave NE @ NE 115th St



**TH41: 35th Ave NE @
NE 115th St**

Routine Maintenance Activity:
- Sediment and debris removal

*Section/Township/Range (E 28 26 4)
Latitude (47.71197N)
Longitude (122.29068W)
Waterbody - Thornton Creek*



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0 25 75 150 Feet



TH42: 33rd Ave NE @ NE 117th St



**TH42: 33rd Ave NE @
NE 117th St**

Routine Maintenance Activity:
- Sediment and Debris Removal

*Section/Township/Range (E 28 26 4)
Latitude (47.71278N)
Longitude (122.29188W)
Waterbody - Thornton Creek*



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0 37.5 75 150 Feet



TH47: 15th Ave NE @ NE 130th Pl.



TH48: 10th Ave NE @ Thornton Creek



**TH48: 10th Ave NE @
Thornton Creek**

Routine Maintenance Activity:
- Vactoring and Jetting culverts and ditches,
control Vegetation

Section/Township/Range (SE 20 26 4)

Latitude (47.72337N)

Longitude (122.31812W)

Waterbody - Thornton Creek



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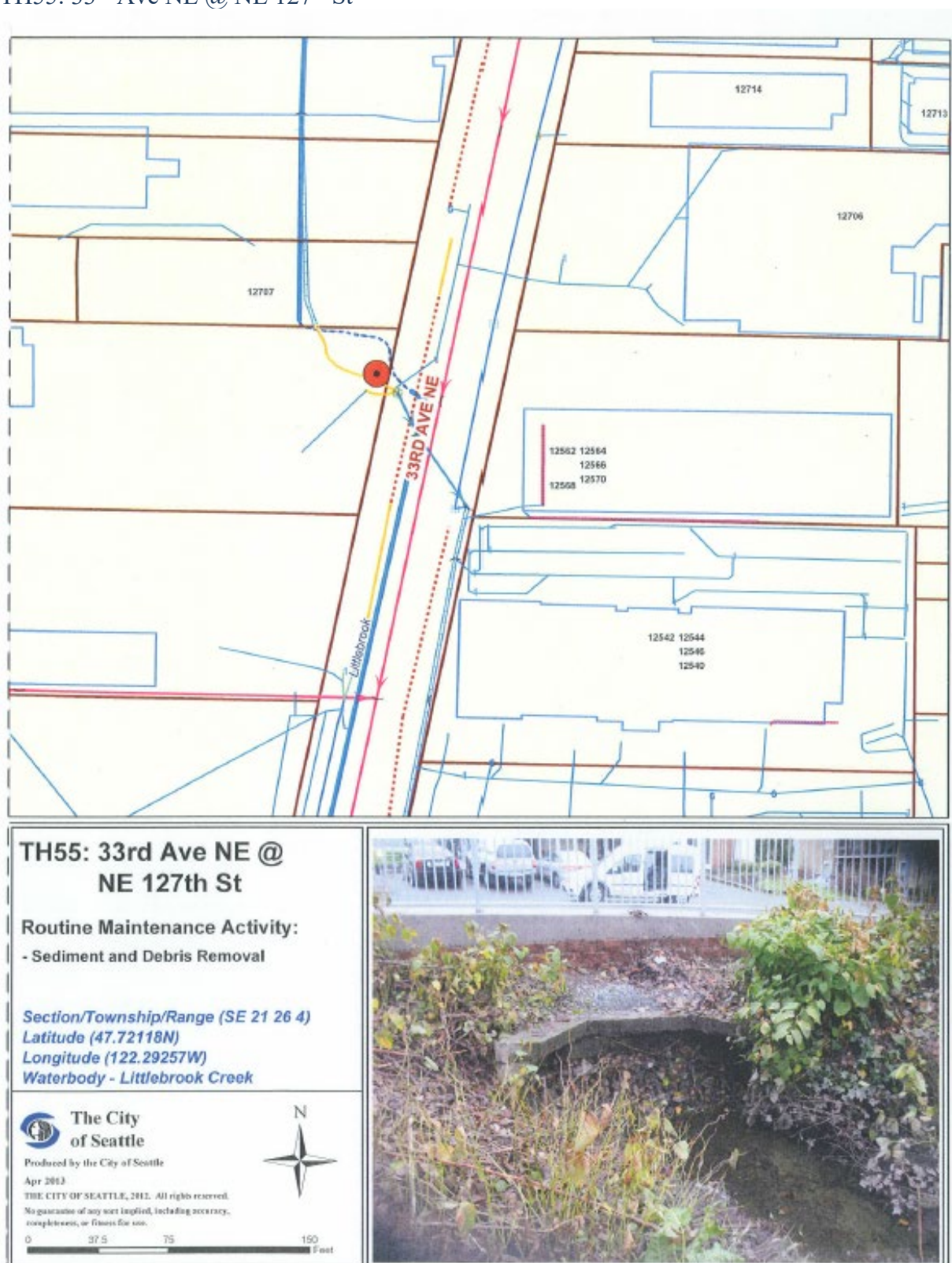
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0 37.5 75 150 Feet



TH55: 33rd Ave NE @ NE 127th St



TH56: NE Northgate Way @ Victory Creek



**TH56: NE Northgate Way @
Victory Creek**

Routine Maintenance Activity:

- Sediment and Debris Removal

Section/Township/Range (SE 29 26 4)

Latitude (47.70873N)

Longitude (122.31520W)

Waterbody - Victory Creek



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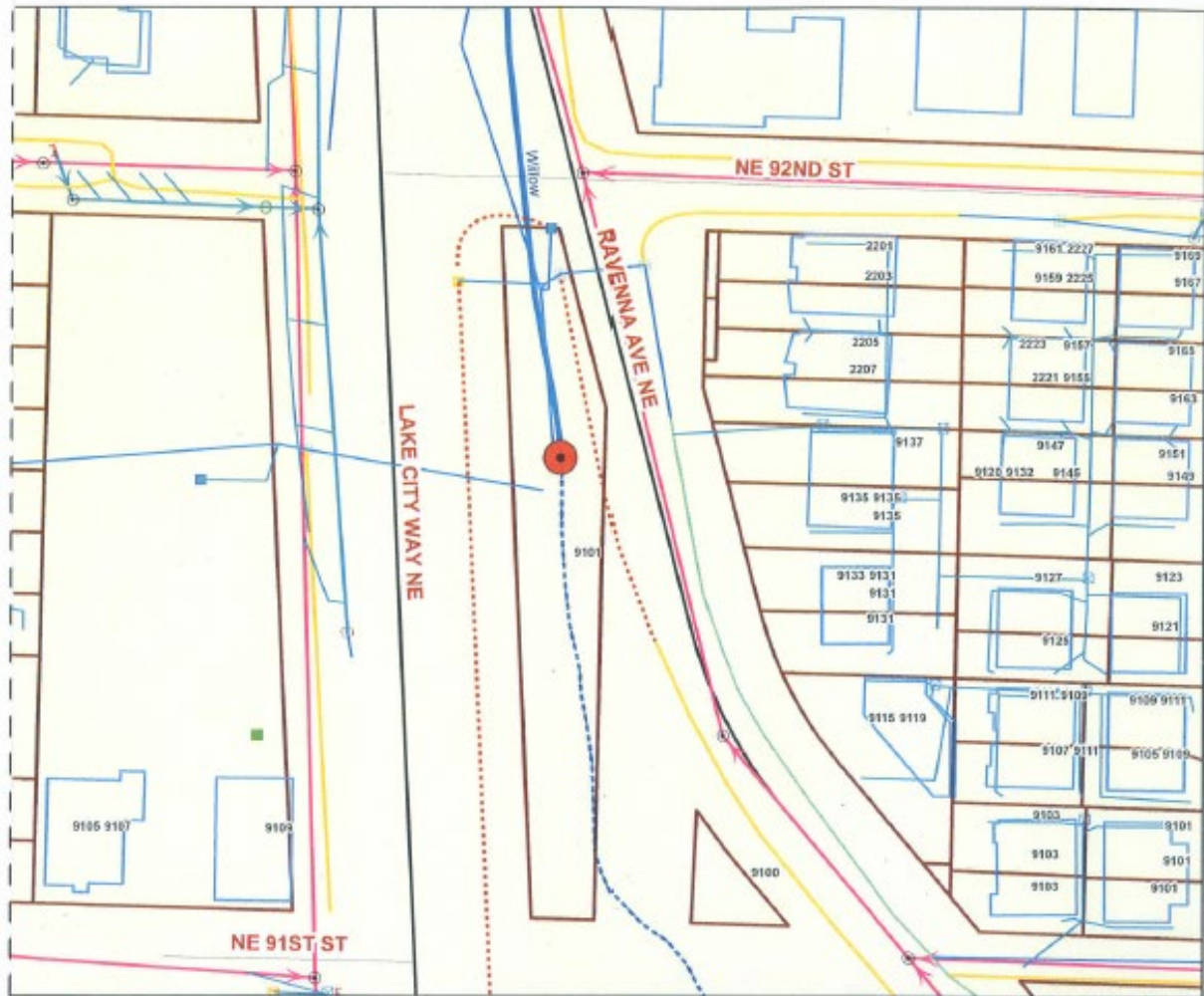
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0 37.5 75 150 Feet



TH57: Ravenna Ave NE @ Lake City Way NE (Willow)



**TH57: Ravenna Ave NE @
Lake City Way NE
(Willow)**

Routine Maintenance Activity:

- Sediment and Debris Removal

Section/Township/Range (W 33 26 4)

Latitude (47.69567N)

Longitude (122.30548W)

Waterbody - Willow Creek



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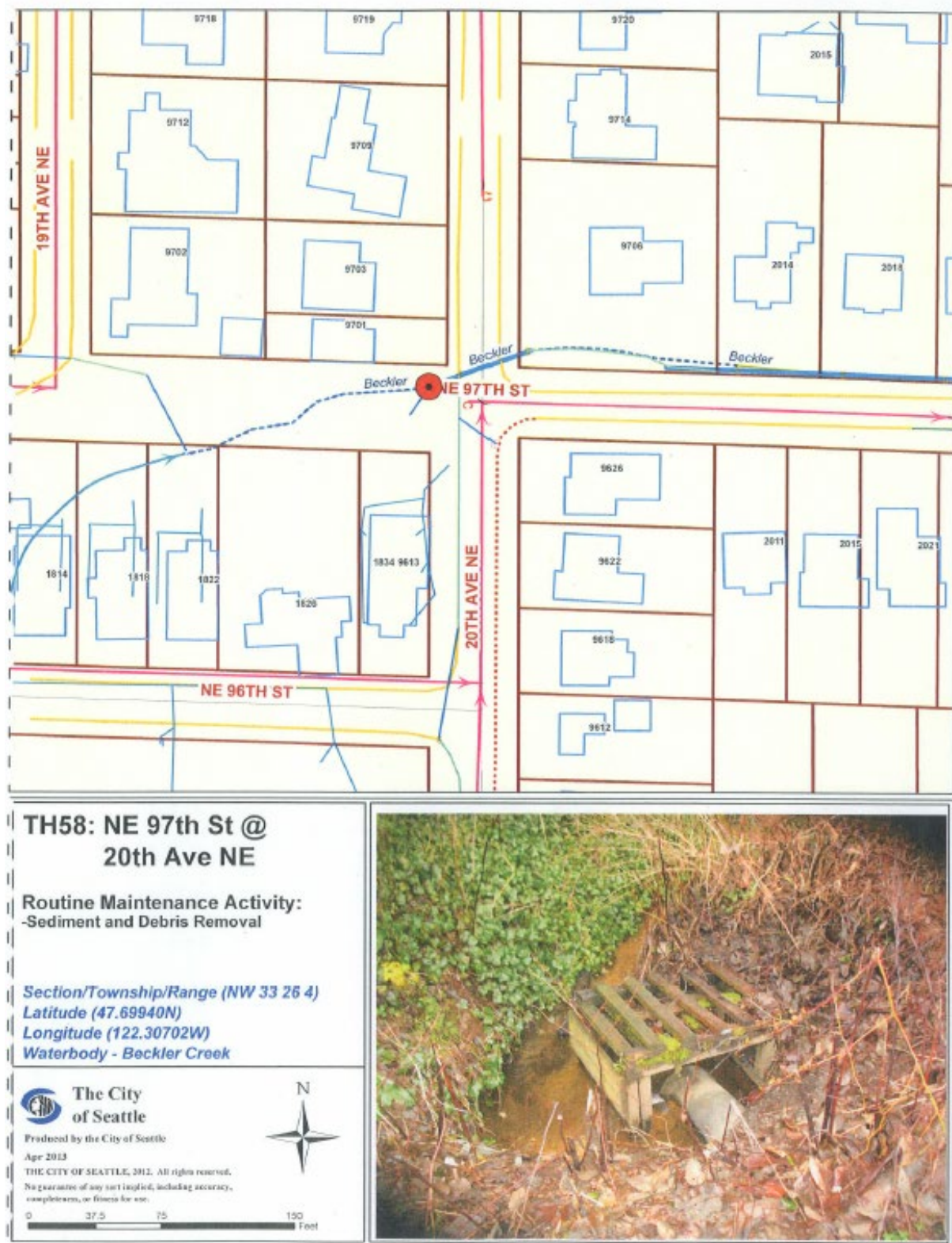
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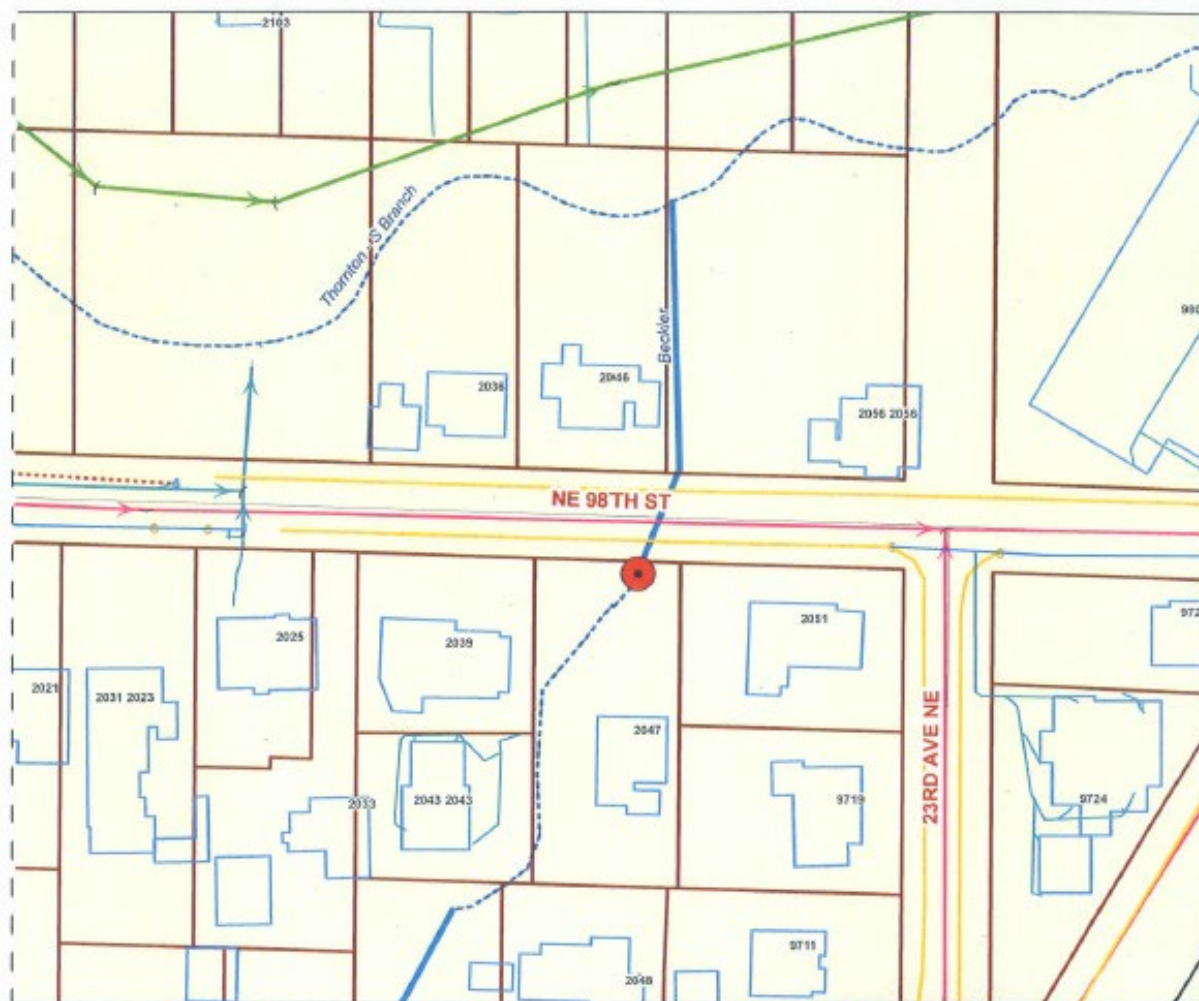
0 37.5 75 150 Feet



TH58: NE 97th St @ 20th Ave NE



TH59: NE 98th St @ 24th Ave NE



**TH59: NE 98th St @
24th Ave NE**

Routine Maintenance Activity:
-Sediment and Debris Removal,

*Section/Township/Range (NW 33 26 4)
Latitude (47.70023N)
Longitude (122.30478W)
Waterbody - Beckler Creek*



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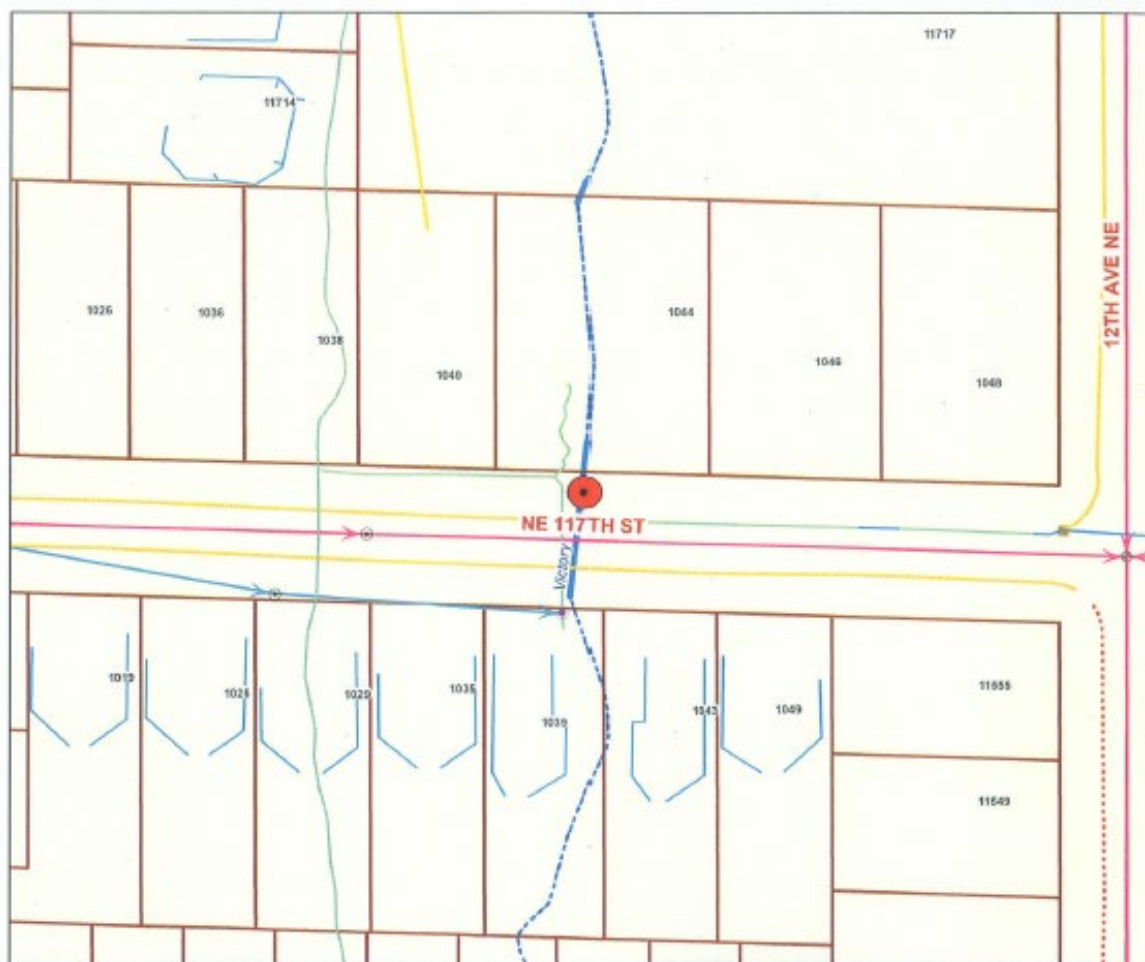
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completeness, or fitness for use.



0 37.5 75 150 Feet



TH60: NE 117th St @ 12th Ave NE



**TH60: NE 117th St @
12th Ave NE**

Routine Maintenance Activity:
- Sediment and Debris Removal,
Control Vegetation

*Section/Township/Range (NE 29 26 4)
Latitude (47.7140N)
Longitude (122.3162W)
Waterbody - Victory Creek*



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0 37.5 75 150 Feet



TH61: NE 120th St @ 12th Ave NE



**TH61: NE 120th St @
12th Ave NE**

Routine Maintenance Activity:
- Sediment and Debris Removal,
Vegetation Control

*Section/Township/Range (NE 29 26 4)
Latitude (47.7158N)
Longitude (122.3166W)
Waterbody - Victory Creek*



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0 37.5 75 150 Feet



TH62: NE 115th St @ 12th Ave NE



**TH62: NE 115th St @
12th Ave NE**

Routine Maintenance Activity:
- Sediment and Debris Removal,
Vegetation Control

*Section/Township/Range (NE 29 26 4)
Latitude (47.7121N)
Longitude (122.3159W)
Waterbody - Victory Creek*



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0 37.5 75 150 Feet



TH63: Pinehurst Way NE @ Victory Creek



**TH63: Pinehurst Way NE @
Victory Creek**

Routine Maintenance Activity:
- Sediment and Debris Removal,
Control Vegetation

*Section/Township/Range (NE 29 26 4)
Latitude (47.7117N)
Longitude (122.3157W)
Waterbody - Victory Creek*



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0 25 50 75 150 Feet



TH64: NE 114th St @ 12th Ave NE



**TH64: NE 114th St @
12th Ave NE**

Routine Maintenance Activity:
- Sediment and Debris Removal,
Vegetation Control

*Section/Township/Range (E 29 26 4)
Latitude (47.7110N)
Longitude (122.3155W)
Waterbody - Victory Creek*



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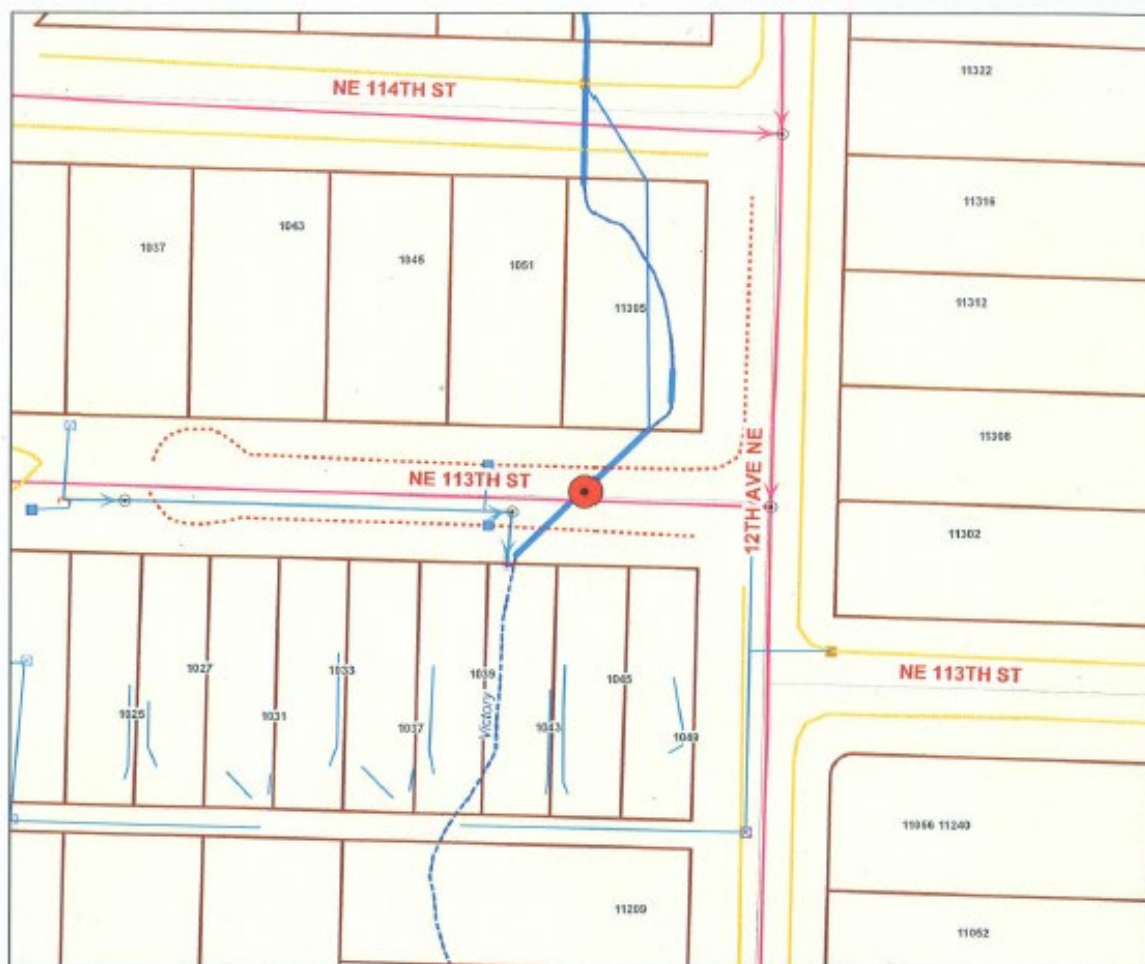
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0 37.5 75 150 Feet



TH65: NE 113th St @ 12th Ave NE



**TH65: NE 113th St @
12th Ave NE**

Routine Maintenance Activity:
- Sediment and Debris Removal,
Vegetation Control

*Section/Township/Range (NE 29 26 4)
Latitude (47.7105N)
Longitude (122.3155W)
Waterbody - Victory Creek*



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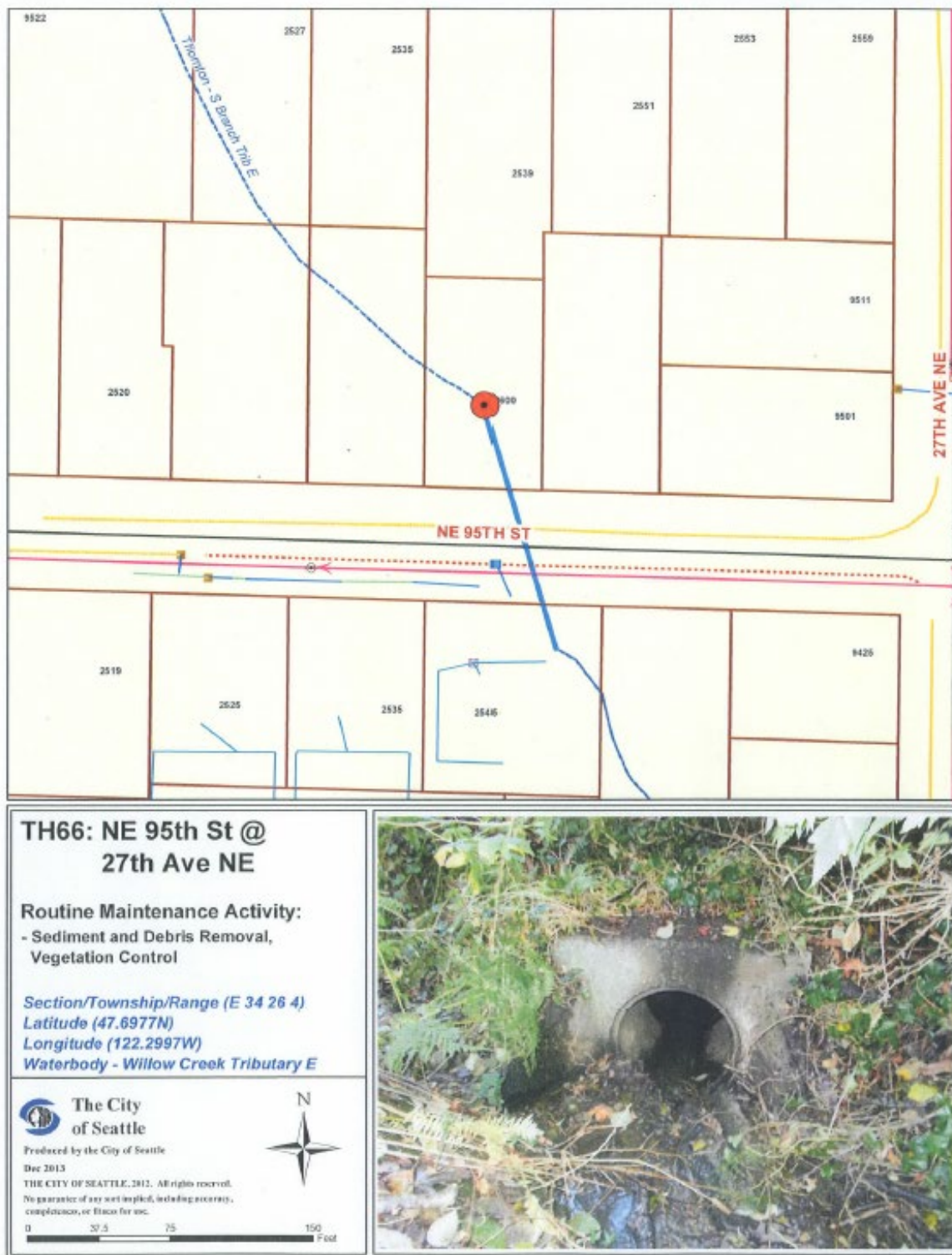
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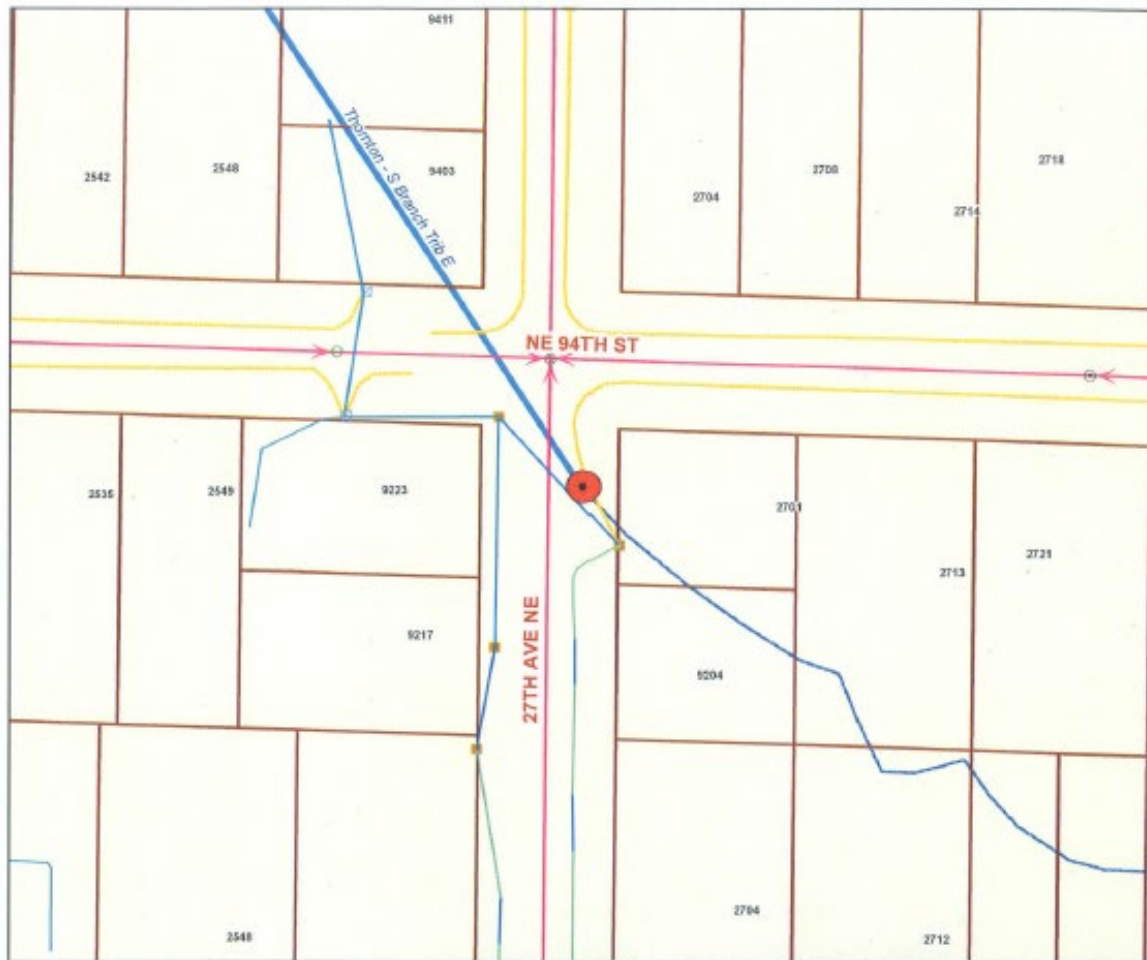
0 37.5 75 150 Feet



TH66: NE 95th St @ 7th Ave NE



TH67: NE 94th St @ 27th Ave NE



**TH67: NE 94th St @
27th Ave NE**

Routine Maintenance Activity:
- Sediment and Debris Removal,
Vegetation Control

*Section/Township/Range (E 34 26 4)
Latitude (47.6964N)
Longitude (122.2987W)
Waterbody - Willow Creek Tributary D*



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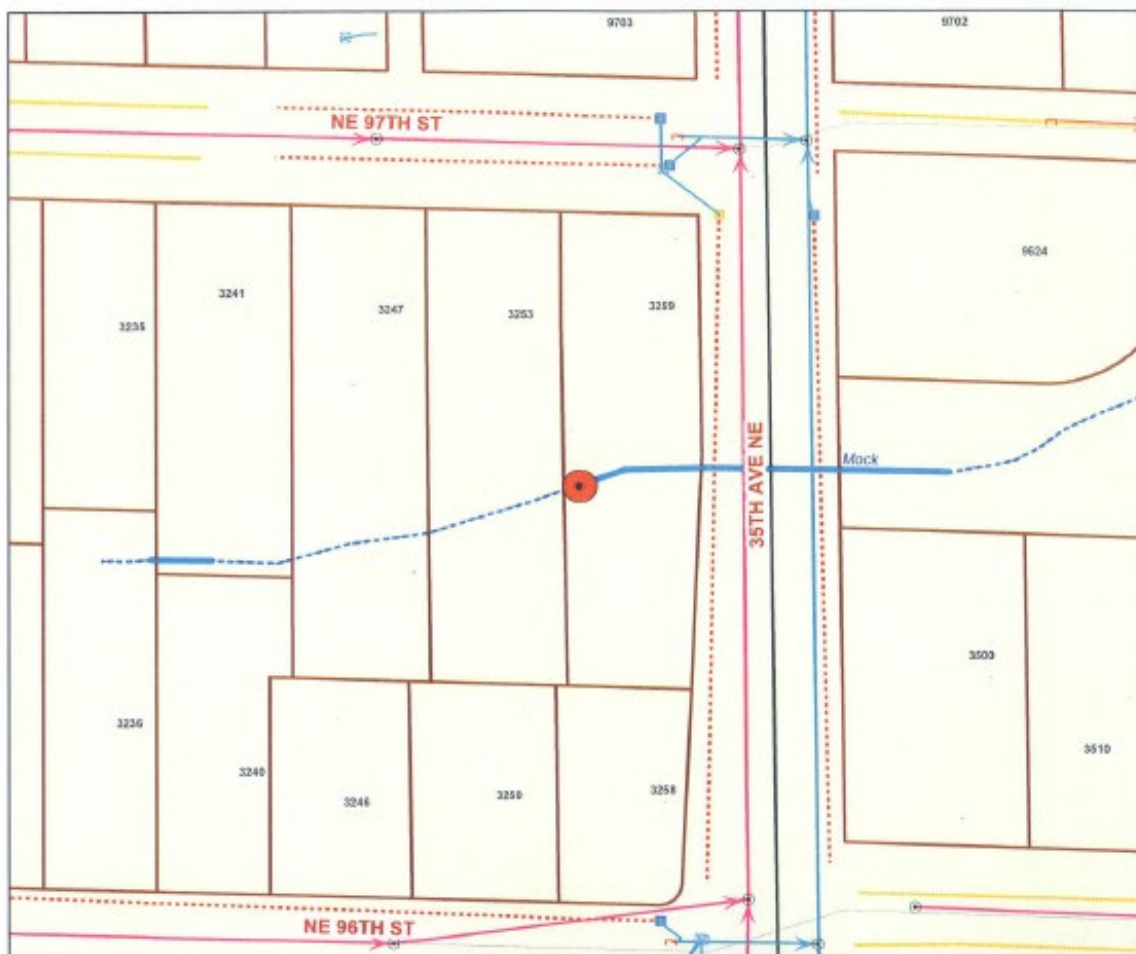
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0 37.5 75 150 Feet



TH68: NE 96th St @ 35th Ave NE



**TH68: NE 96th St @
35th Ave NE**

Routine Maintenance Activity:
- Sediment and Debris Removal,
Vegetation Control

*Section/Township/Range (NE 33 26 4)
Latitude (47.6989N)
Longitude (122.2909W)
Waterbody - Mock Creek*



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0 37.5 75 150 Feet



TH69: NE 93rd St @ 45th Ave NE



**TH69: NE 93th St @
45th Ave NE**

Routine Maintenance Activity:
- Sediment and Debris Removal,
Vegetation Control

*Section/Township/Range (E 34 26 4)
Latitude (47.6958N)
Longitude (122.2801W)
Waterbody - Maple Creek*



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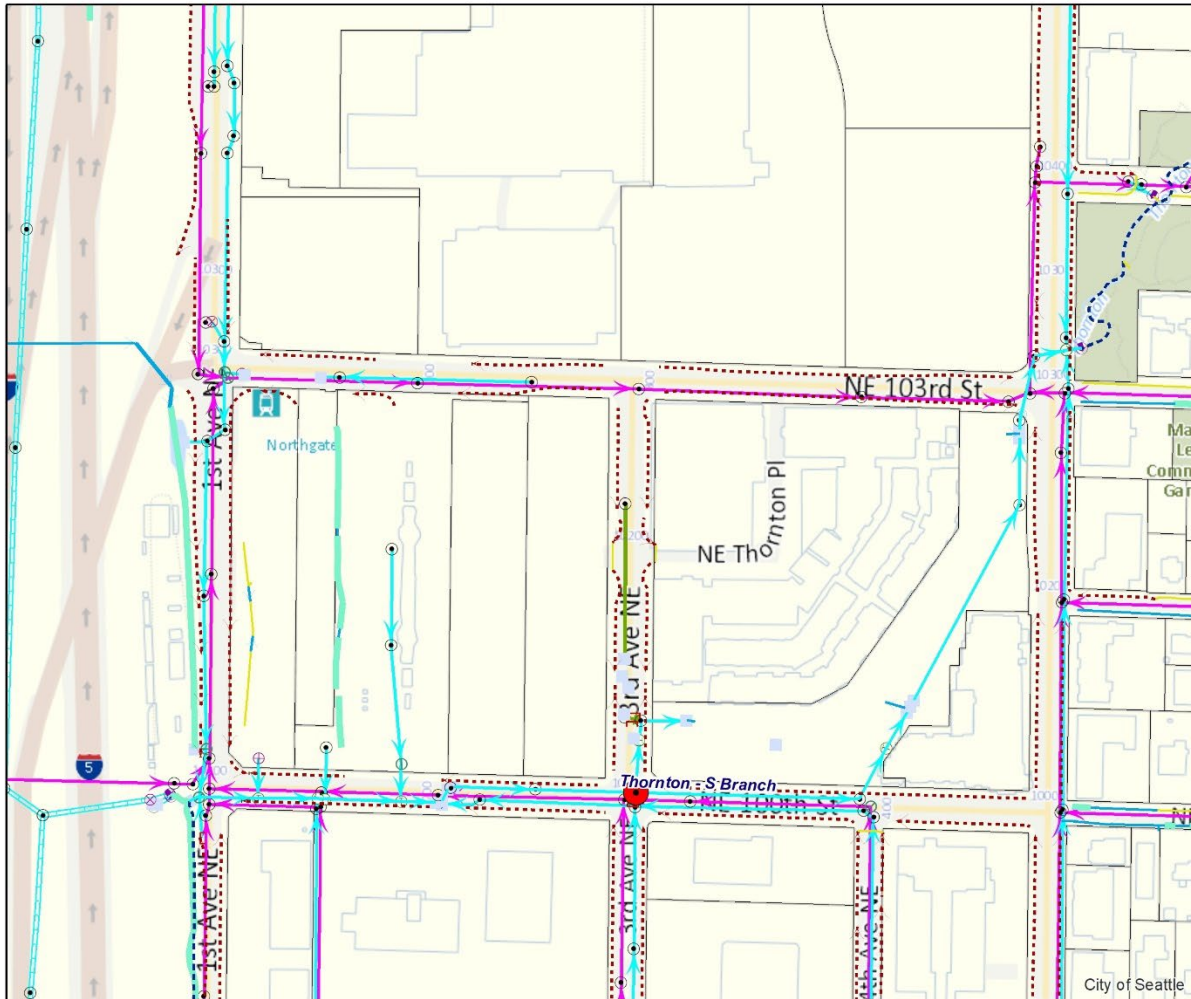
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0 37.5 75 150 Feet



TH71: NE 100th St. starting @ 1st Ave. NE and ending immediately east of 5th Ave. NE



TH71: NE 100th St Drainage Mainline (Thornton Creek)

Routine Maintenance Activity:
Sediment and Debris Removal

Section/Township/Range (NW 32 26 04)

Latitude (47.7014N)

Longitude (122.3258W)

Waterbody - Thornton Creek



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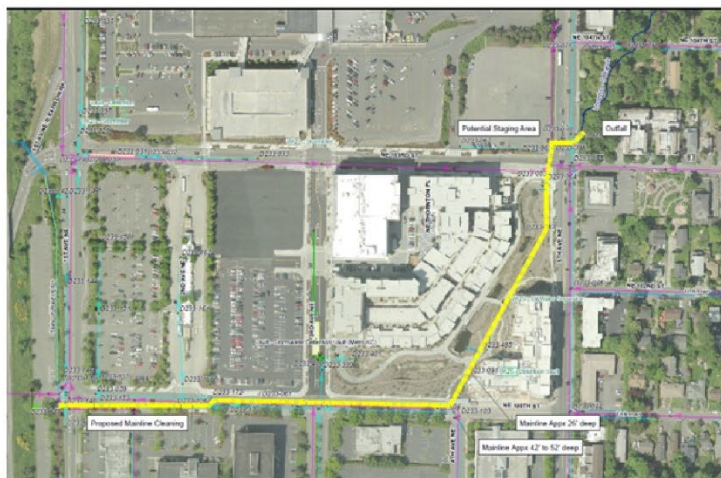
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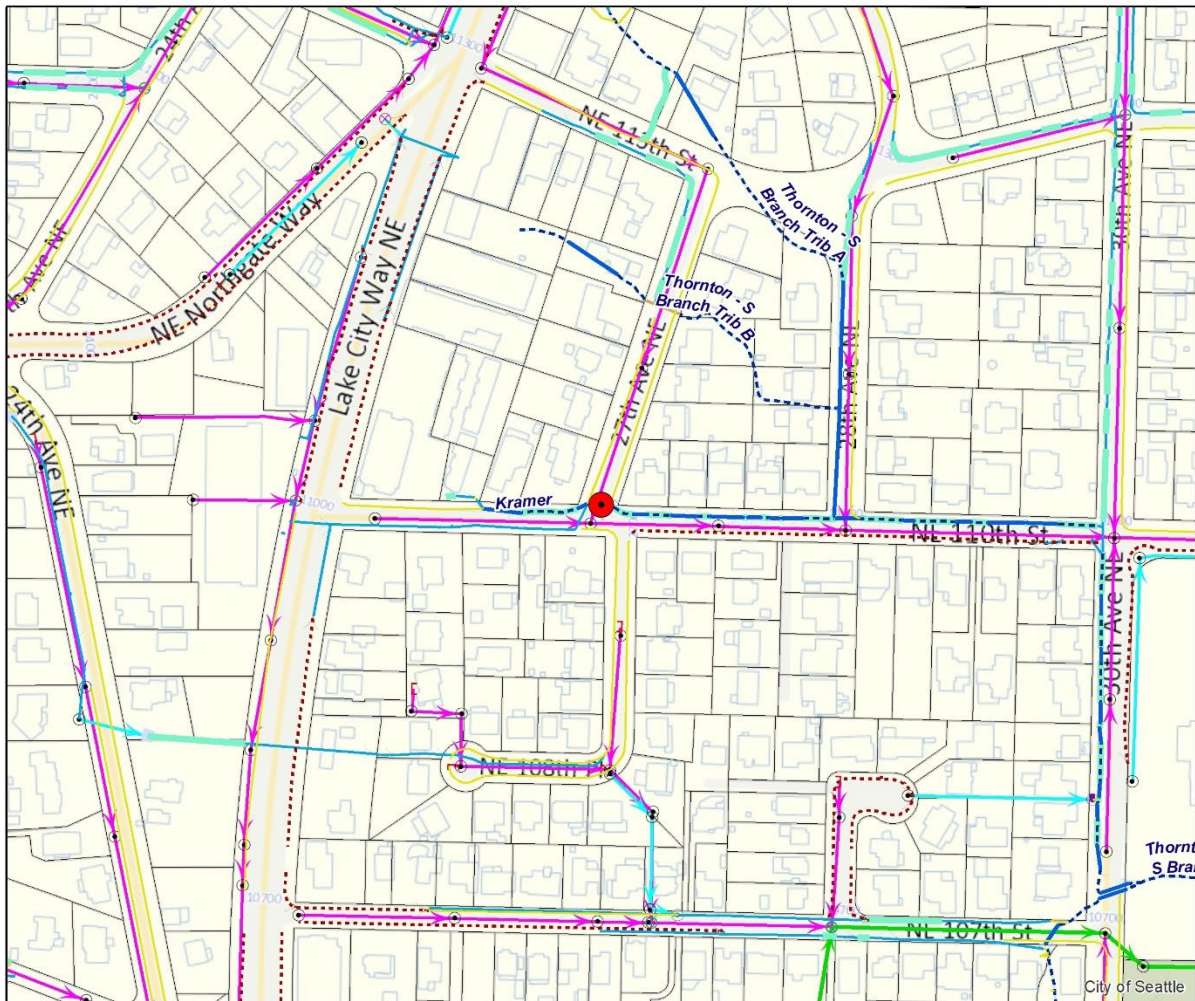
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0 150 300 600 Feet



TH72: NE 110th St. starting @ Lake City Way NE and ending @ 30th Ave. NE



TH72: NE 110th St Drainage Mainline (Kramer Creek)

**Routine Maintenance Activity:
Sediment and Debris Removal,
Vegetation Control**

*Section/Township/Range (SE 28 26 04)
Latitude (47.7085N)
Longitude (122.2995W)
Waterbody - Kramer Creek*



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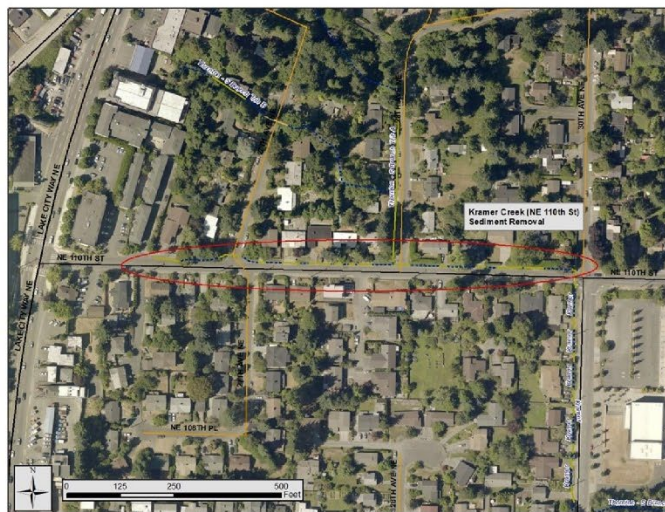
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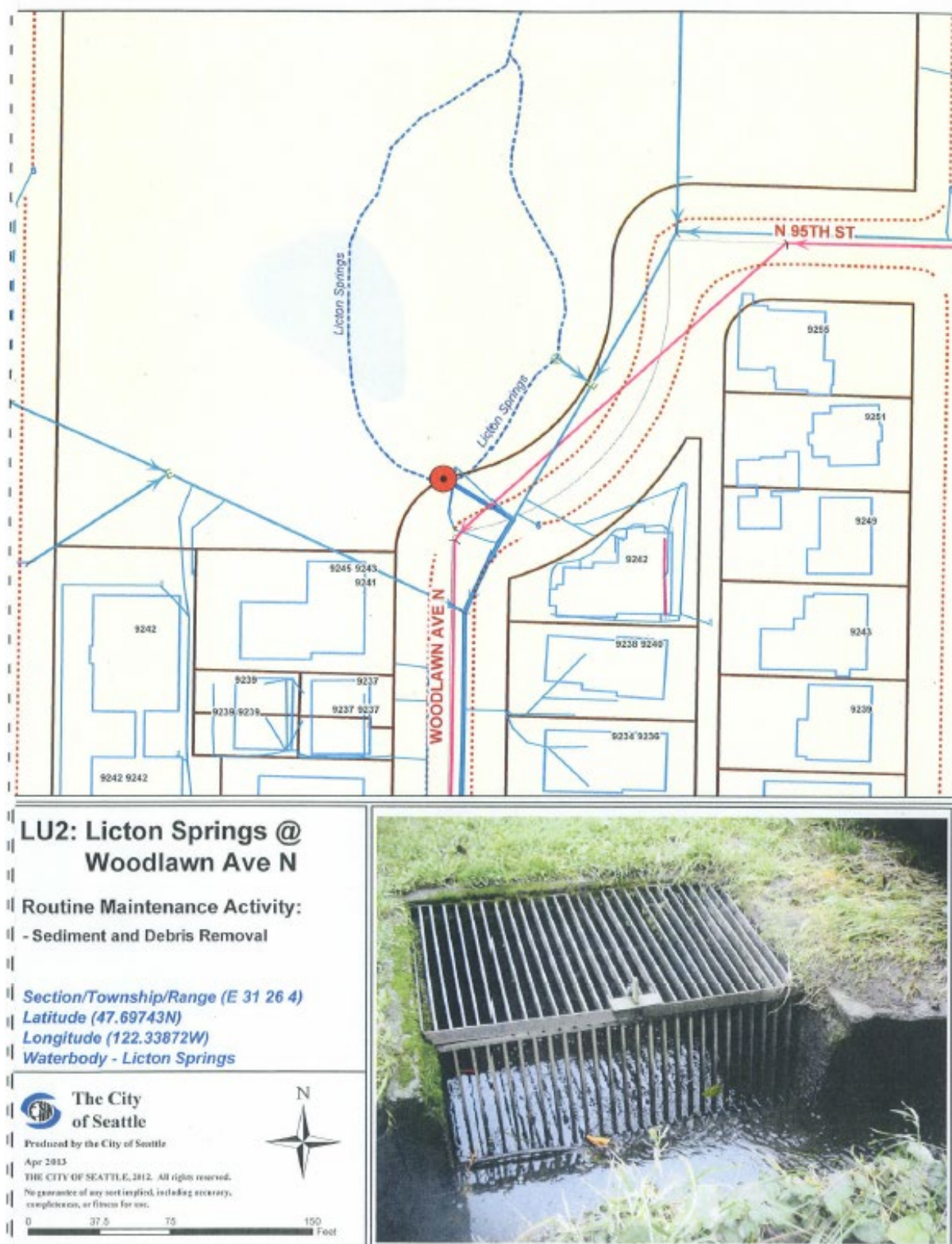
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0 150 300 600 Feet



LU2: Licton Springs @ Woodlawn Ave N



PS2: NW Culbertson Dr @ Sherwood Rd NW



**PS2: NW Culbertson Dr @
Sherwood Rd NW**

Routine Maintenance Activity:
- Sediment and Debris Removal

*Section/Township/Range (NW 24 26 4)
Latitude (47.73188N)
Longitude (122.37050W)
Waterbody - Unnamed PS01 - S. Fork*



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0 37.5 75 150 Feet



PS3: 7th Ave NE @ Holman Rd NW



**PS3: 7th Ave NW @
Holman Rd NW**

Routine Maintenance Activity:
- Sediment and Debris Removal

Section/Township/Range (SE 25 26 4)
Latitude (47.70063N)
Longitude (122.36517W)
Waterbody - Piper's Creek



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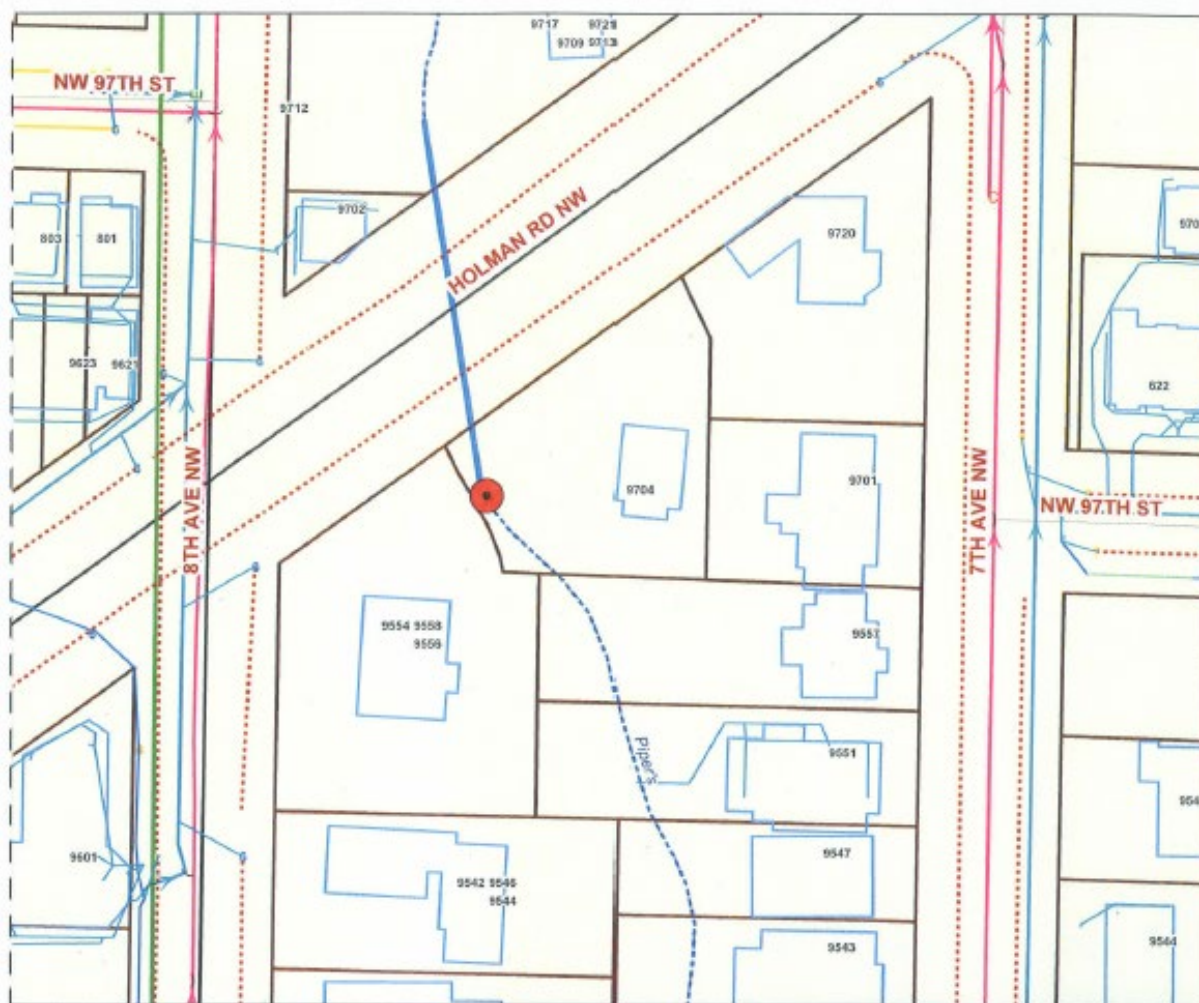
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0 37.5 75 150 Feet



PS4: 8th Ave NW @ Holman Rd NW



**PS4: 8th Ave NW @
Holman Rd NW**

Routine Maintenance Activity:

- Sediment and Debris Removal,
- Control Vegetation

Section/Township/Range (SE 25 26 4)

Latitude (47.69987N)

Longitude (122.36563W)

Waterbody - Piper's Creek



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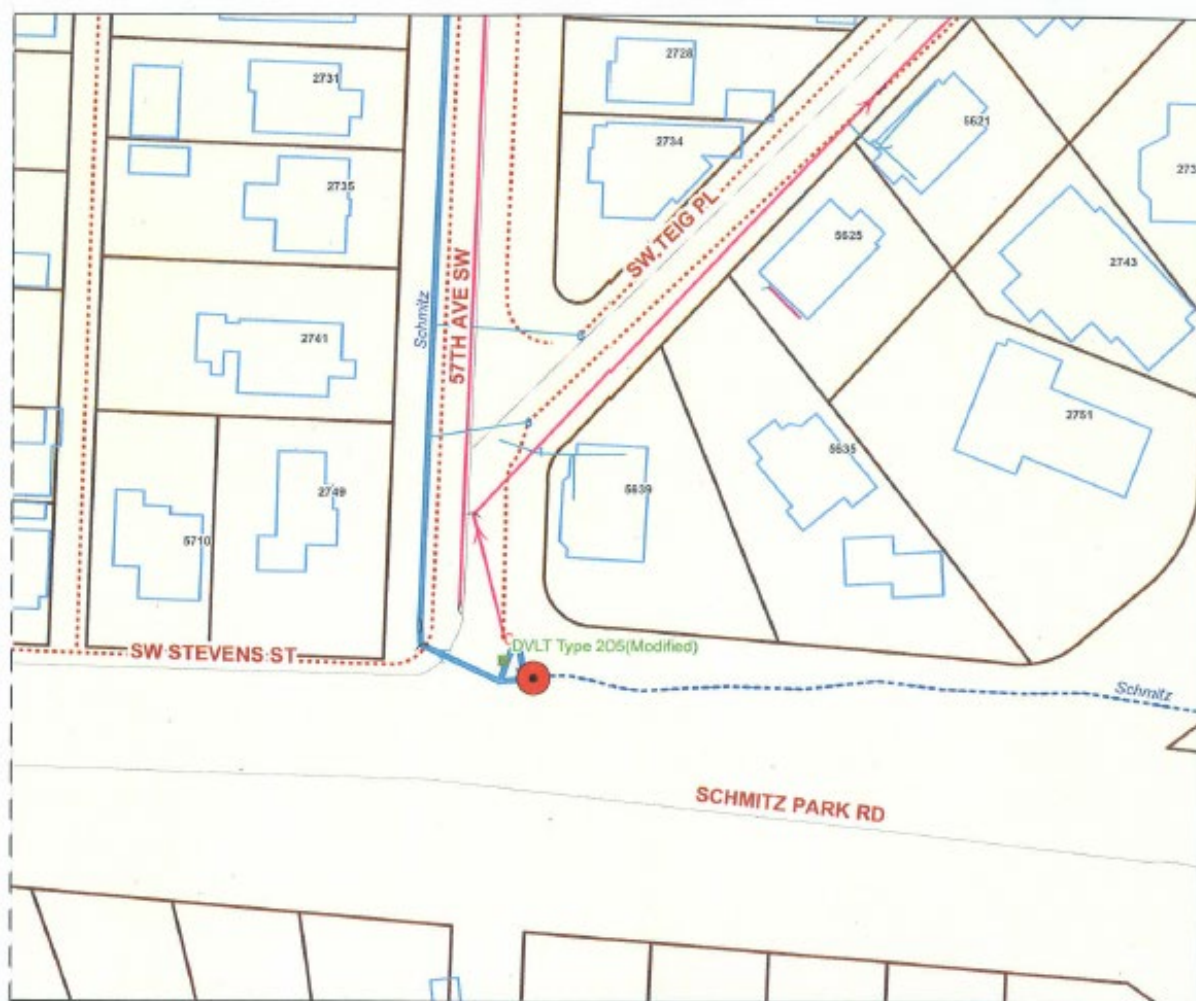
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0 25 50 75 150 Feet



SC1: SW Tieg Pl @ Schmitz Creek



**SC1: SW Tieg Pl @
Schmitz Creek**

Routine Maintenance Activity:
- Sediment and Debris Removal

*Section/Township/Range (SE 10 24 3)
Latitude (47.57780N)
Longitude (122.40528W)
Waterbody - Schmitz Creek*



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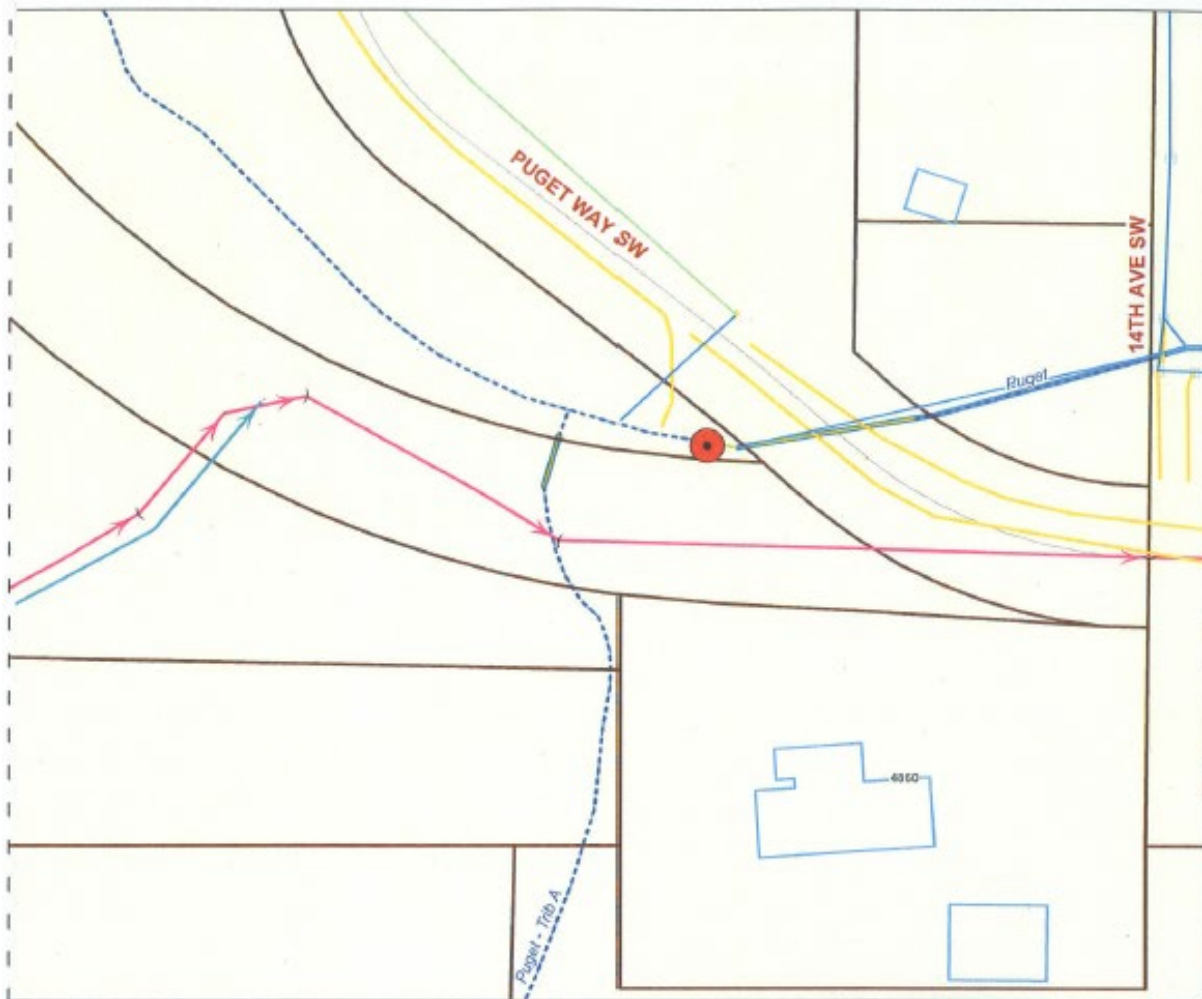
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0 37.5 75 150 Feet



PC1: SW Puget Way @ Puget Creek



**PC1: SW Puget Way @
Puget Creek**

Routine Maintenance Activity:
- Sediment and Debris Removal

Section/Township/Range (NW 19 24 4)
Latitude (47.55790N)
Longitude (122.35357W)
Waterbody - Puget Creek



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0 37.5 75 150 Feet



PC2: SW Dawson @ 19th Ave SW



PC3: SW Brandon @ 19th Ave SW



**PC3: SW Brandon @
19th Ave SW**

Routine Maintenance Activity:
- Sediment and Debris Removal

*Section/Township/Range (NW 24 24 3)
Latitude (47.5536N)
Longitude (122.3582W)
Waterbody - Puget Creek*



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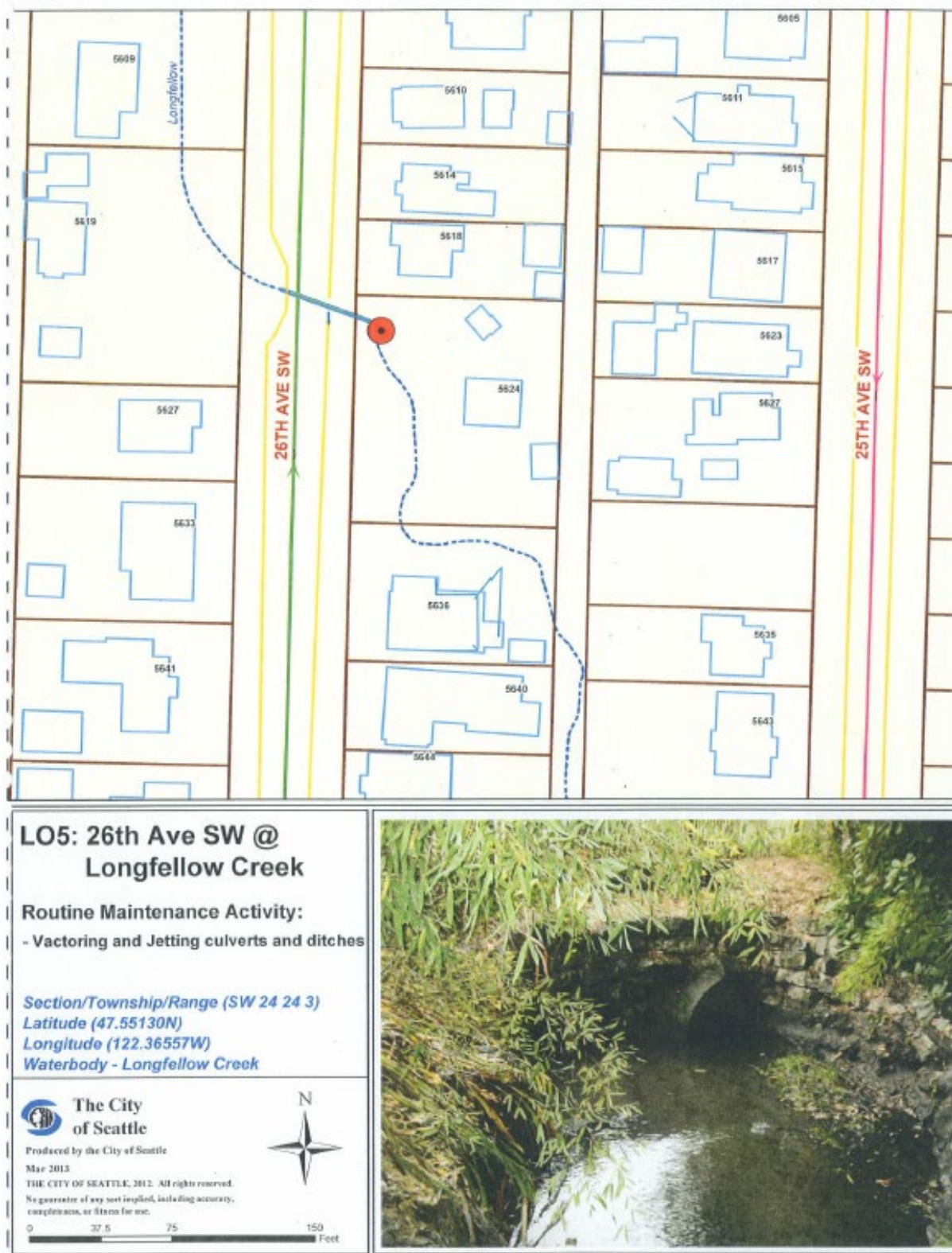
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0 37.5 75 150 Feet



LO5: 26th Ave SW @ Longfellow Creek



TA1: Rainier Ave S @ Taylor Creek



**TA1: Rainier Ave S @
Taylor Creek**

Routine Maintenance Activity:
- Sediment and Debris Removal

*Section/Township/Range (NW 1 23 4)
Latitude (47.51123N)
Longitude (122.24782W)
Waterbody - Taylor Creek*



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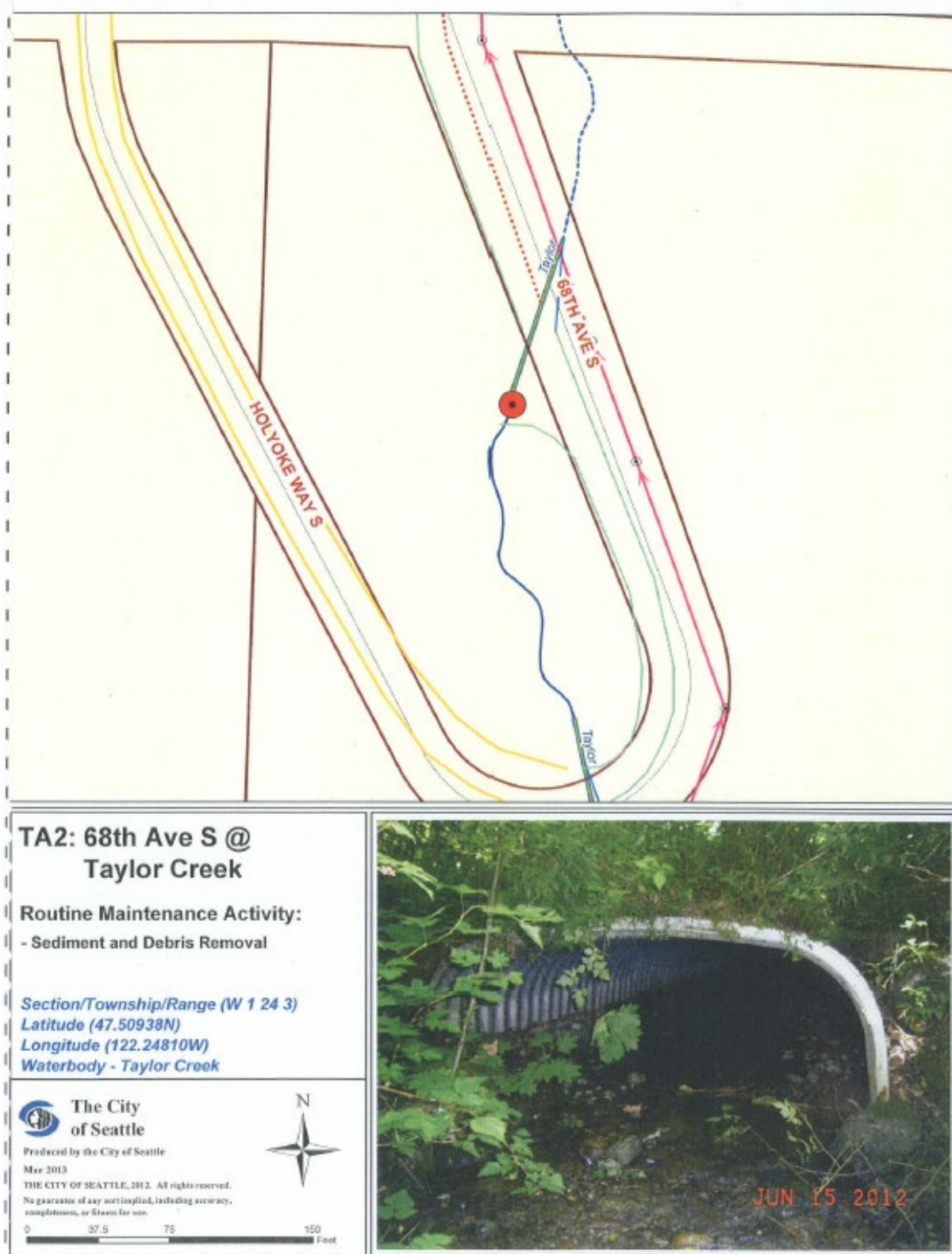
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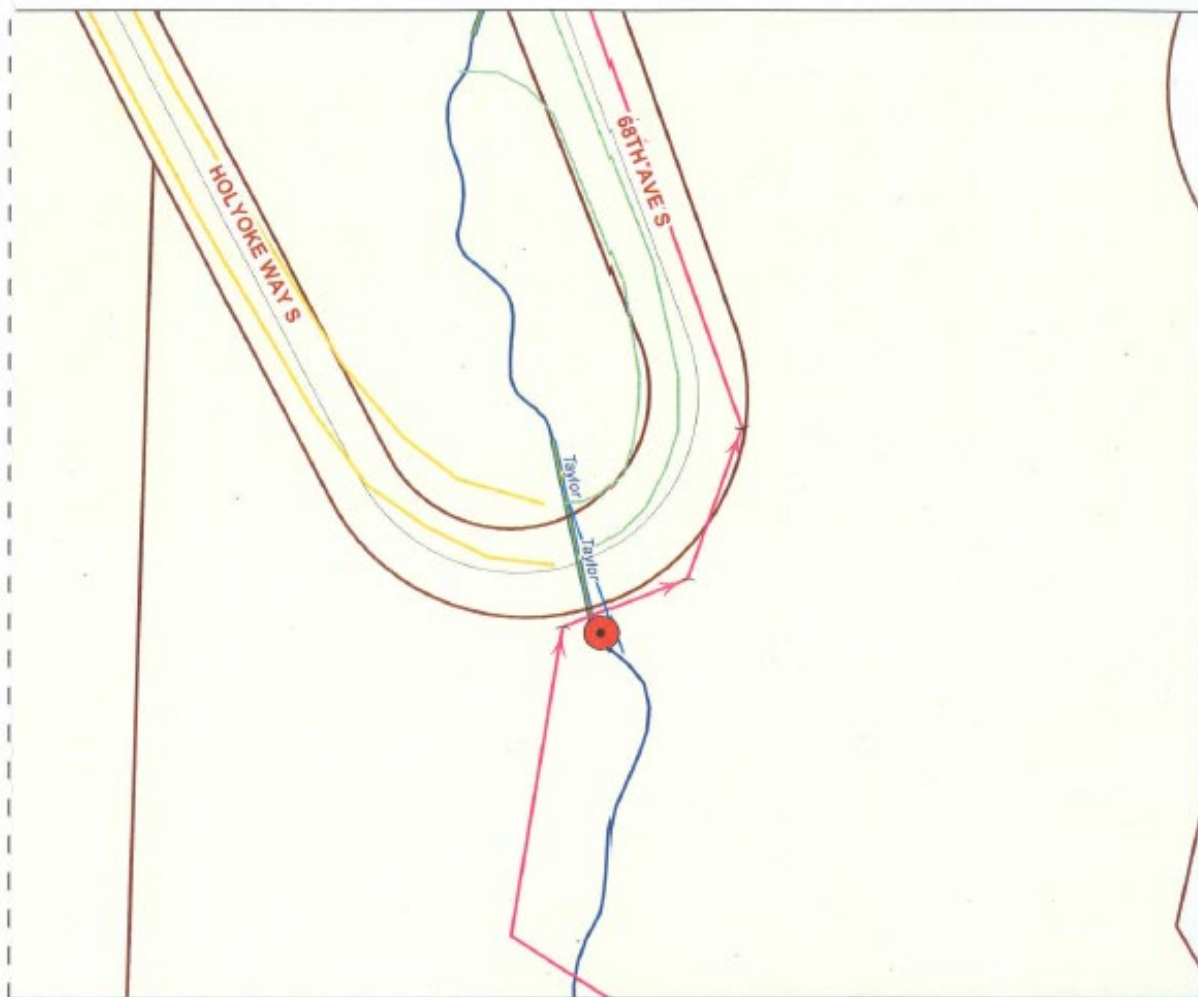
0 37.5 75 150 Feet



TA2: 68th Ave S @ Taylor Creek



TA3: SE Holyoke Way @ Taylor Creek



**TA3: SE Holyoke Way @
Taylor Creek**

Routine Maintenance Activity:
- Sediment and Debris Removal

*Section/Township/Range (SW 1 23 4)
Latitude (47.50860N)
Longitude (122.24797W)
Waterbody - Taylor Creek*



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0 37.5 75 150 Feet



MC2: Sturtevant Ave S @ S Roxbury St



**MC2: Sturtevant Ave S @
S Roxbury St**

Routine Maintenance Activity:
- Sediment and Debris Removal

*Section/Township/Range (NW 2 23 4)
Latitude (47.5166N)
Longitude (122.2676W)
Waterbody - Mapes Creek*



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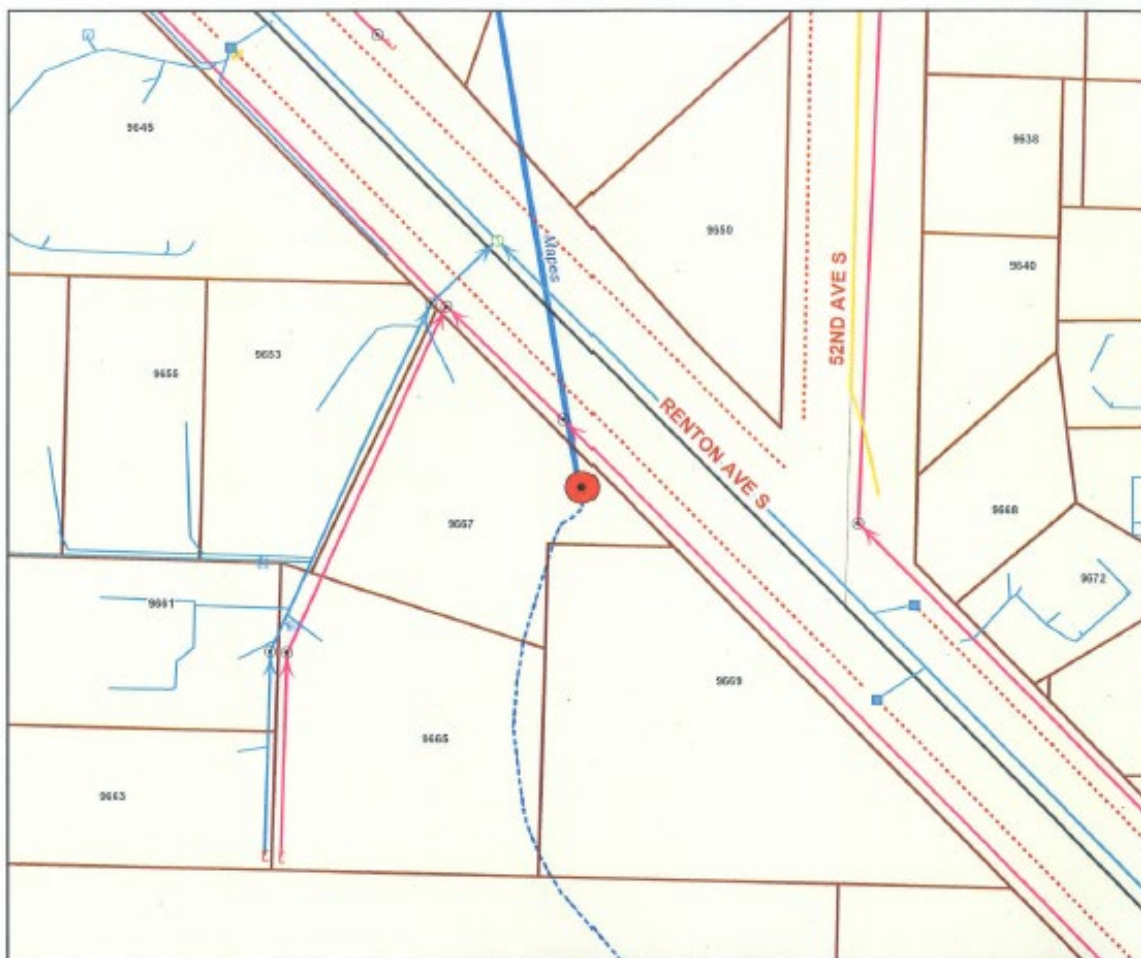
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0 37.5 75 150 Feet



MC3: Sturtevant Ave S @ Renton Ave S



**MC3: Sturtevant Ave S @
Renton Ave S**

Routine Maintenance Activity:
- Sediment and Debris Removal

*Section/Township/Range (NW 2 23 4)
Latitude (47.5155N)
Longitude (122.2678W)
Waterbody - Mapes Creek*



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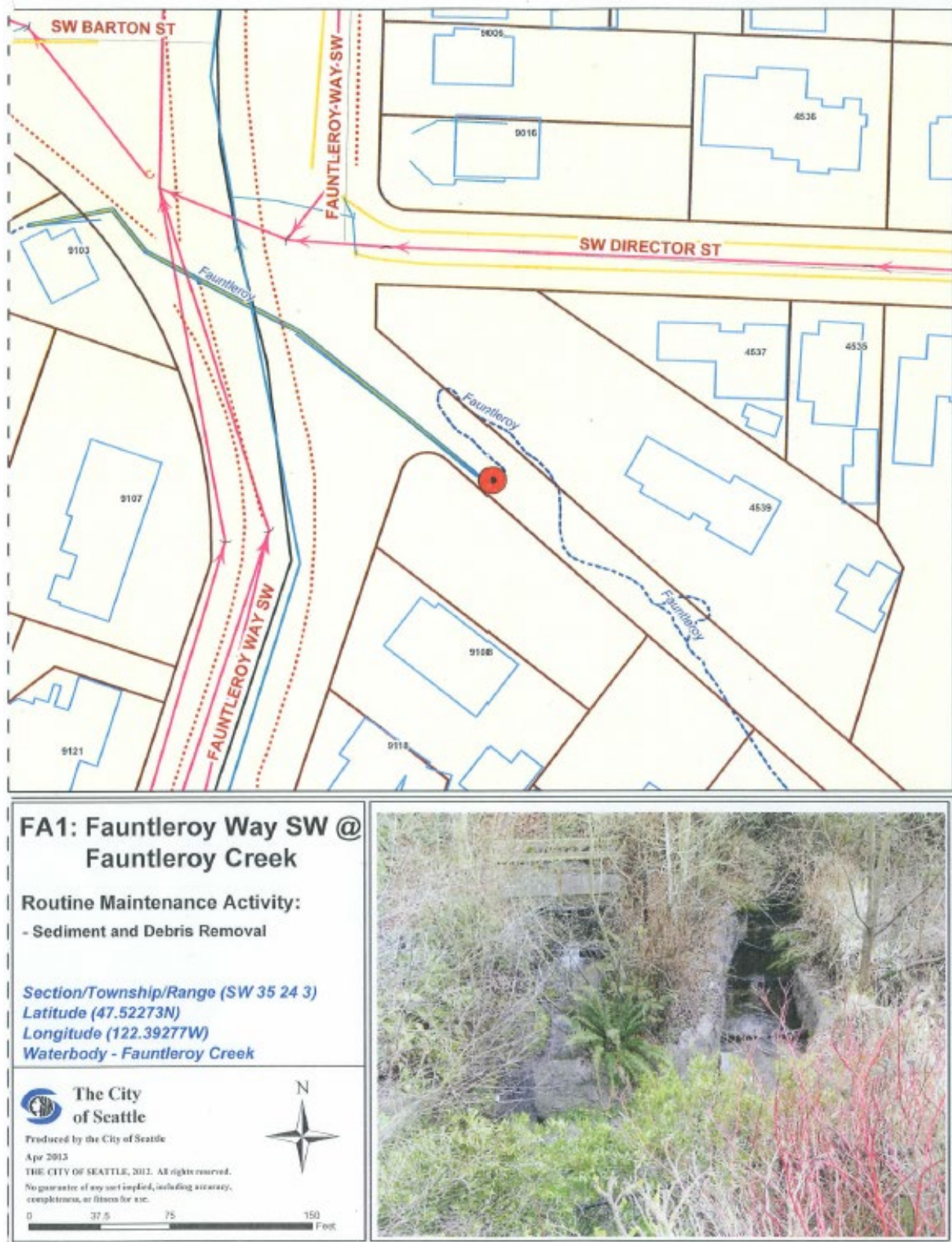
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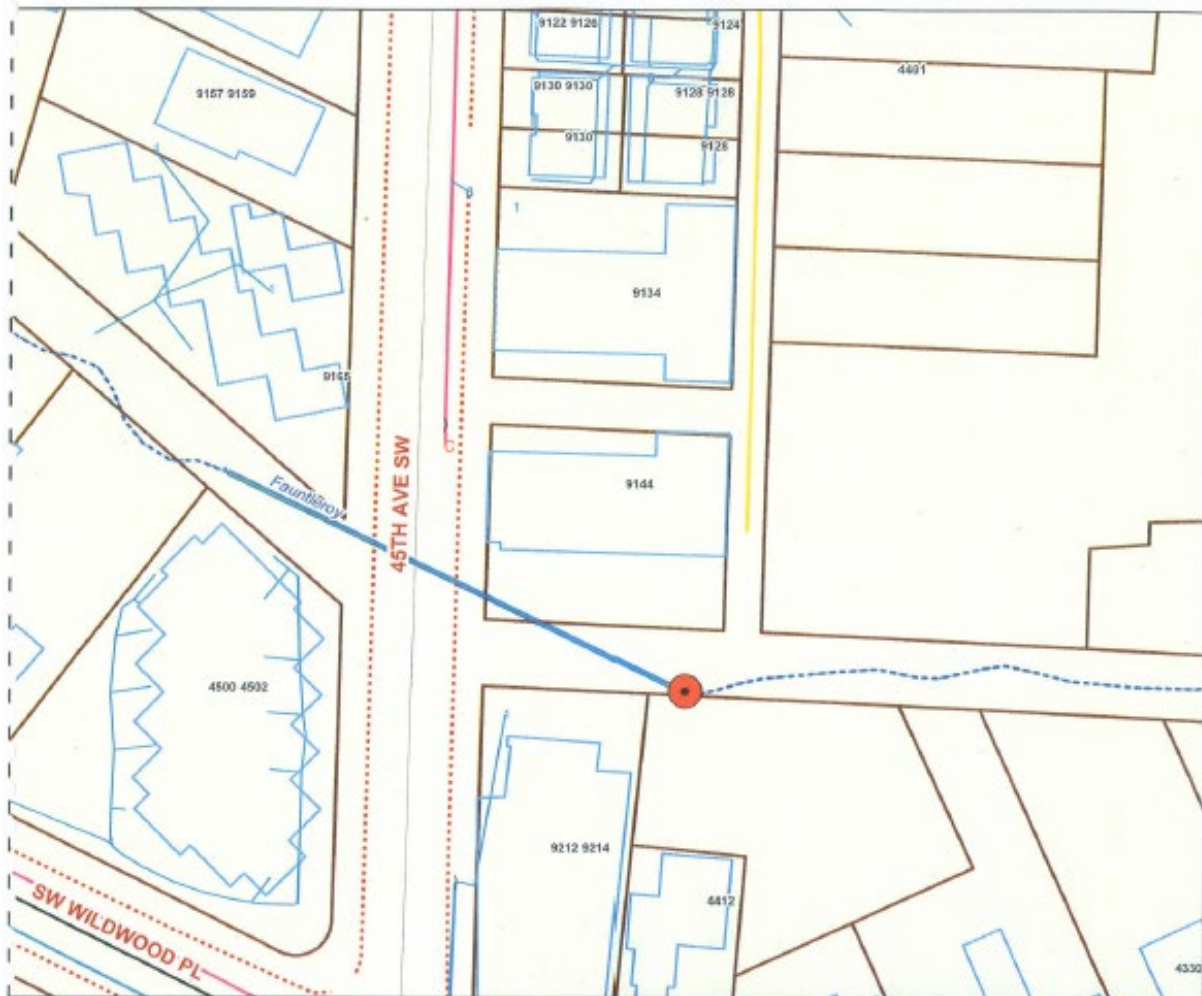
0 37.5 75 150 Feet



FA1: Fauntleroy Way SW @ Fauntleroy Creek



FA2: 45th Ave SE @ Fauntleroy Creek



**FA2: 45th Ave SW @
Fauntleroy Creek**

Routine Maintenance Activity:
- Sediment and Debris Removal

*Section/Township/Range (SW 35 24 3)
Latitude (47.52140N)
Longitude (122.39022W)
Waterbody - Fauntleroy Creek*



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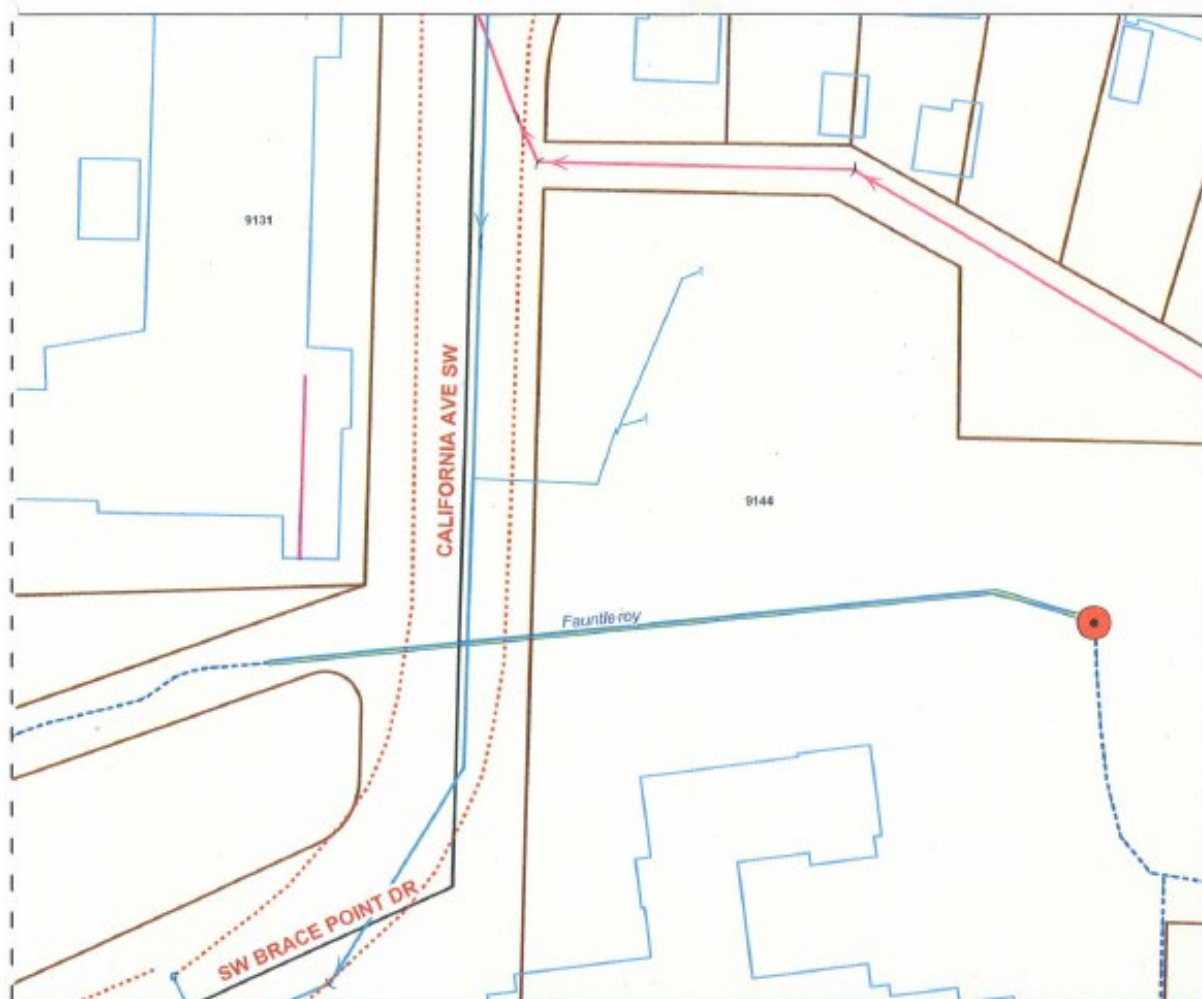
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0 37.5 75 150 Feet



FA3: California Way SW @ Fauntleroy Creek



**FA3: California Way SW @
Fauntleroy Creek**

Routine Maintenance Activity:
- Sediment and Debris Removal

*Section/Township/Range (SE 35 24 3)
Latitude (47.521N)
Longitude (122.386W)
Waterbody - Fauntleroy Creek*



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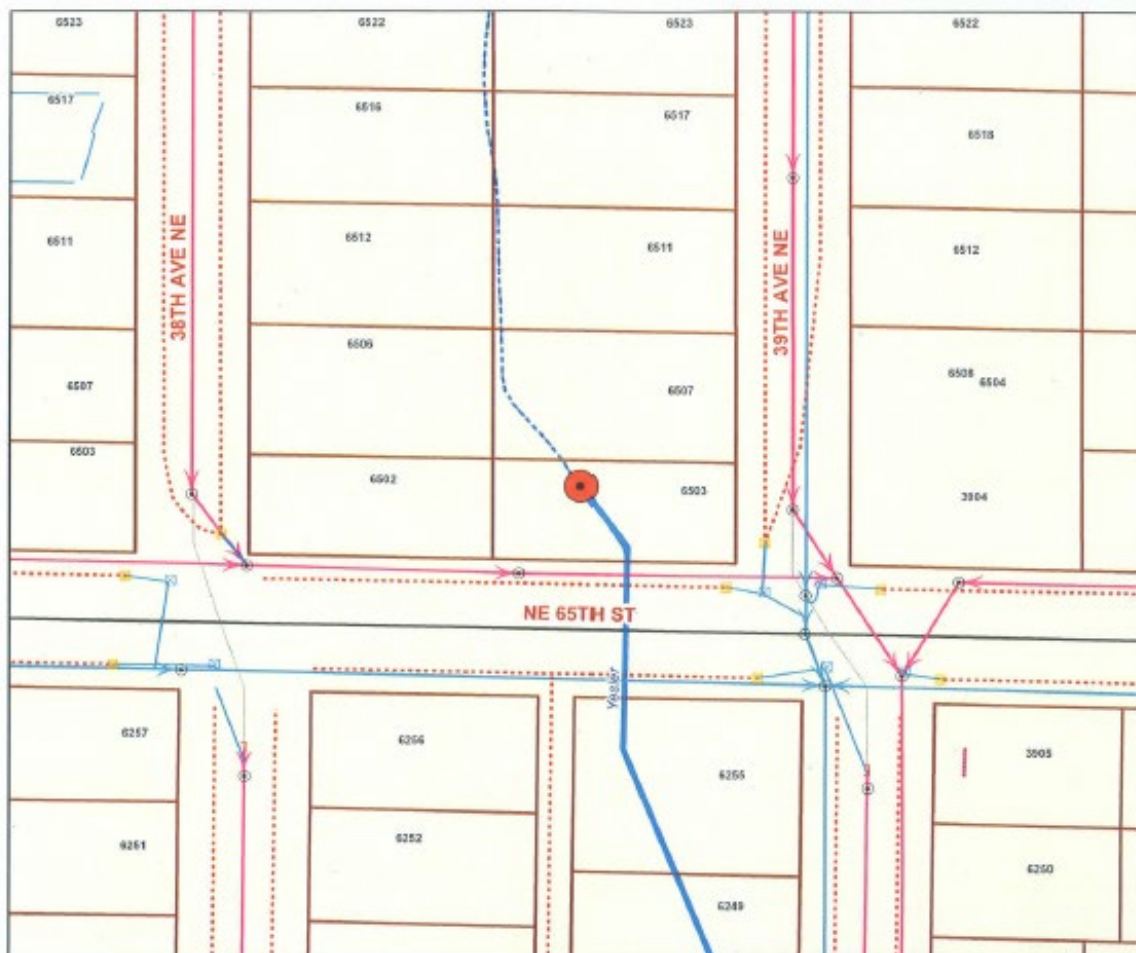
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0 37.5 75 150 Feet



YC1: NE 65th St @ 39th Ave NE



**YC1: NE 65th St @
39th Ave NE**

Routine Maintenance Activity:
- Sediment and Debris Removal

Section/Township/Range (NW 10 25 4)

Latitude (47.6739N)

Longitude (122.2854W)

Waterbody - Yesler Creek



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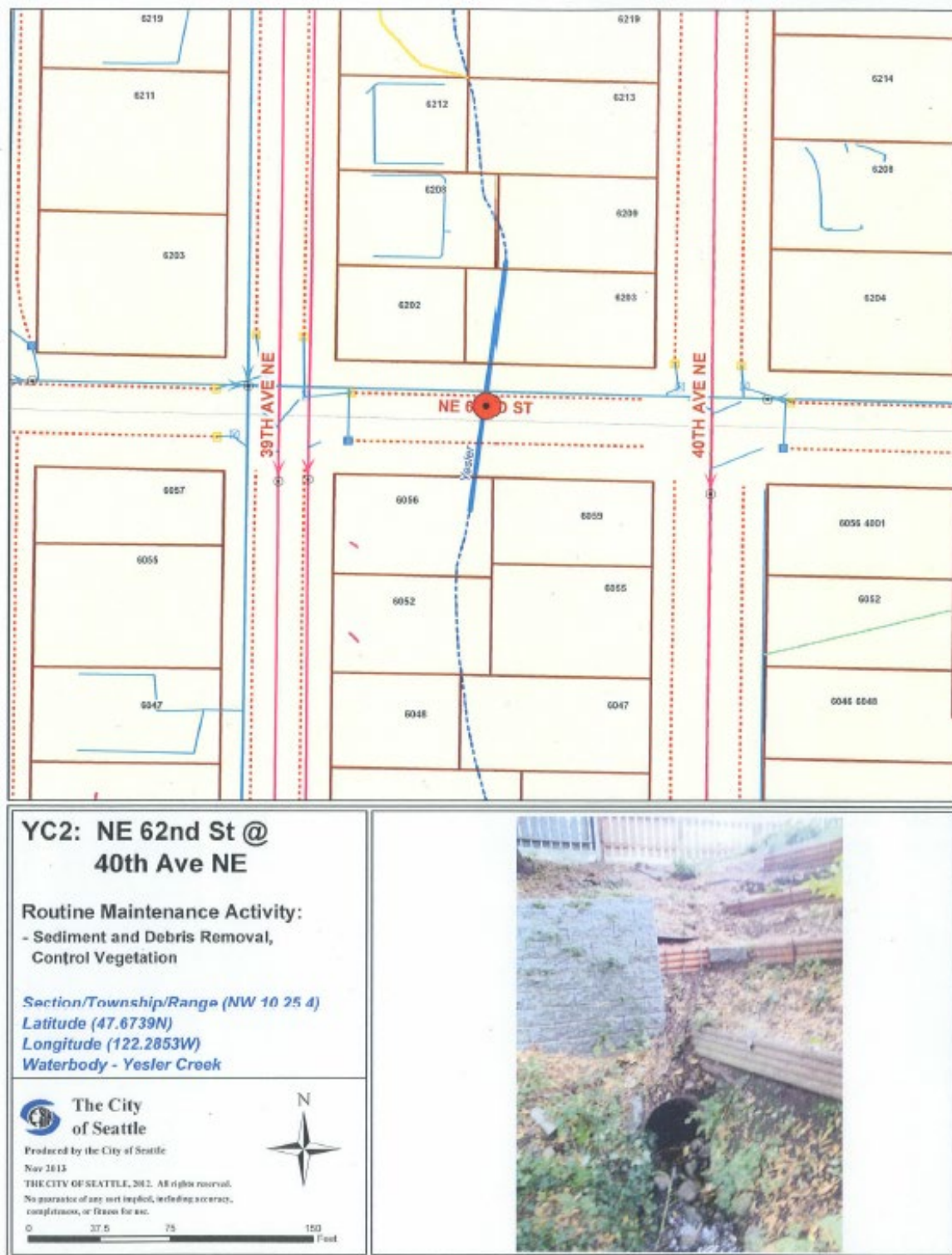
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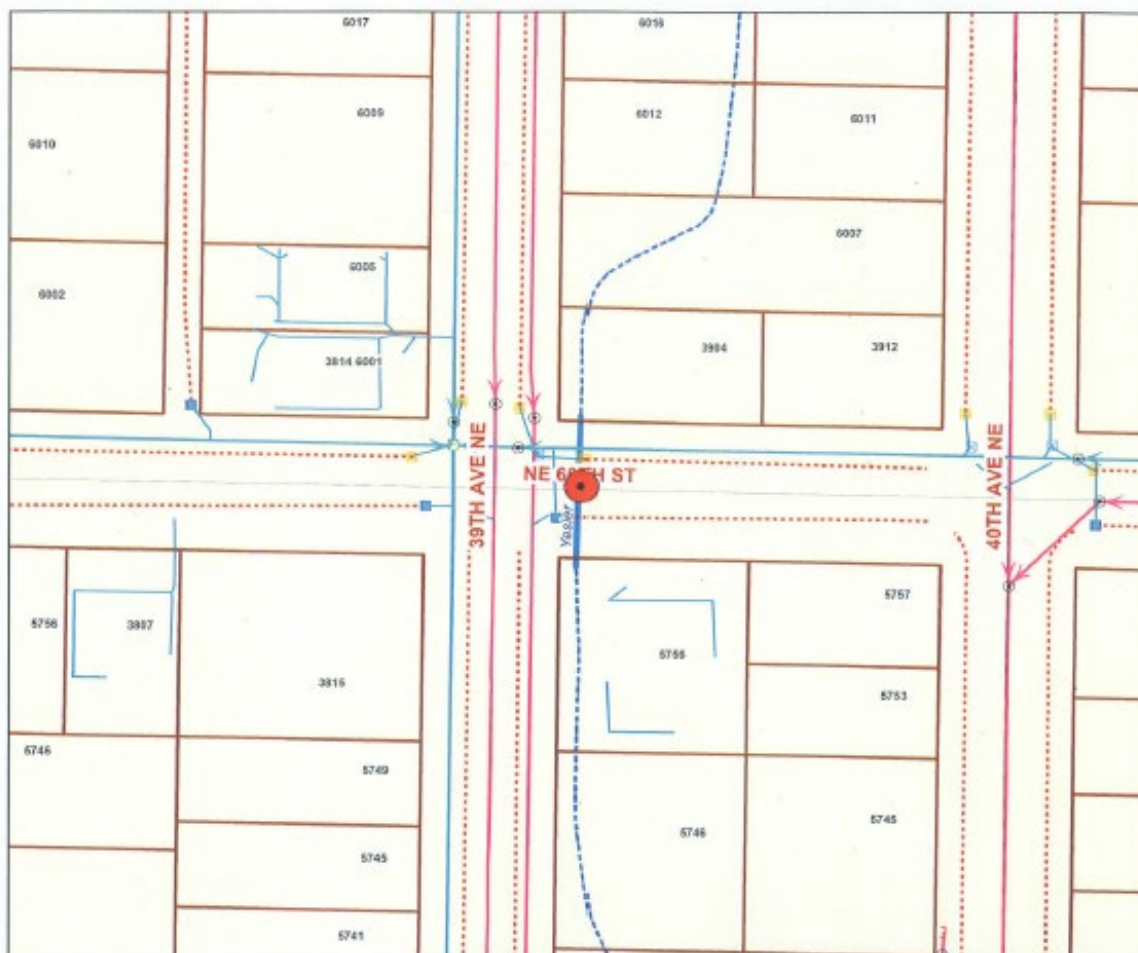
0 37.5 75 150 Feet



YC2: NE 62nd St @ 40th Ave NE



YC3: NE 60th St @ 40th Ave NE



**YC3: NE 60th St @
40th Ave NE**

Routine Maintenance Activity:
- Sediment and Debris Removal,
Control Vegetation

Section/Township/Range (NW 10 25 4)

Latitude (47.6721N)

Longitude (122.2856W)

Waterbody - Yesler Creek



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0 37.5 75 150 Feet



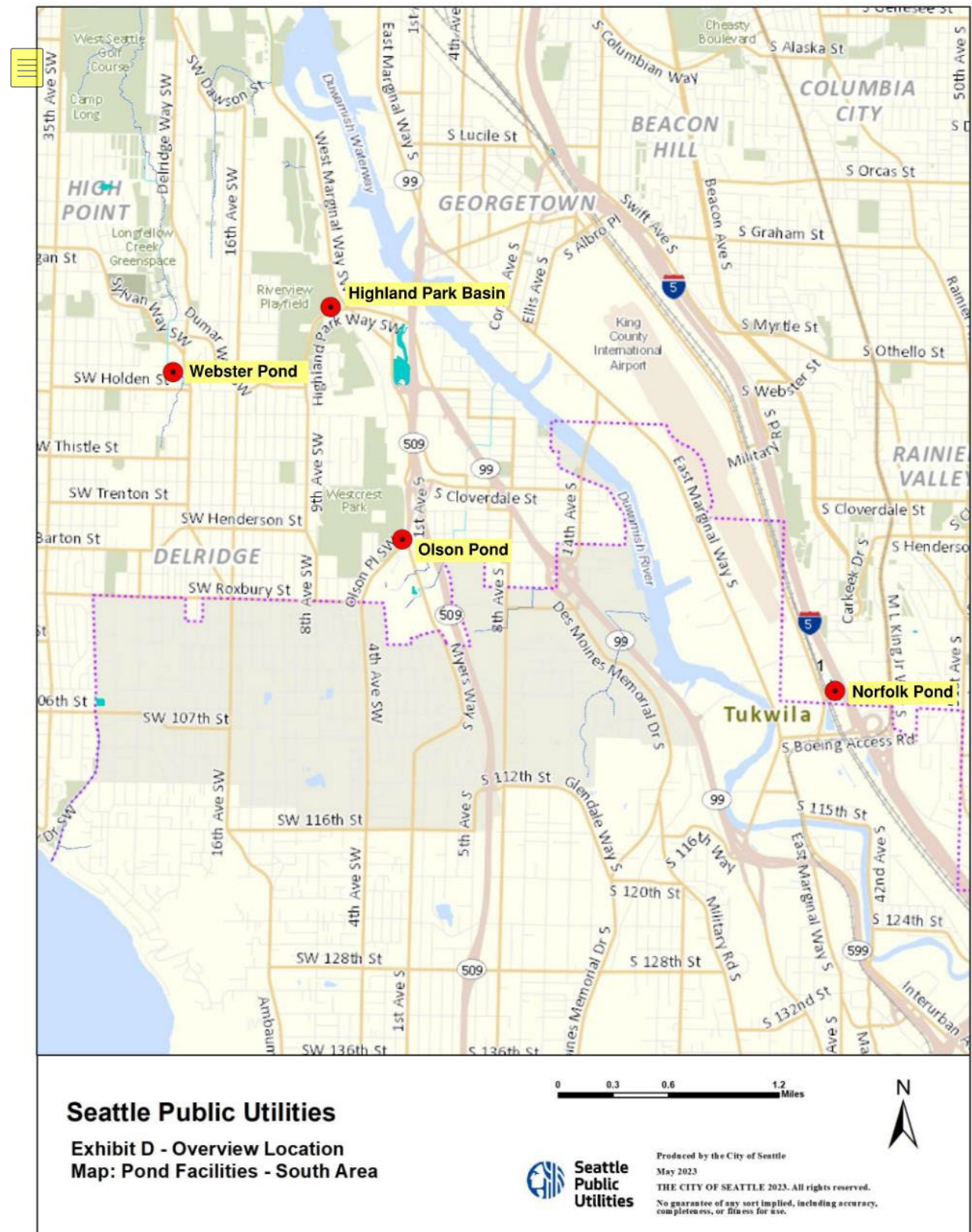
North Area Pond Facilities Overview Location Map



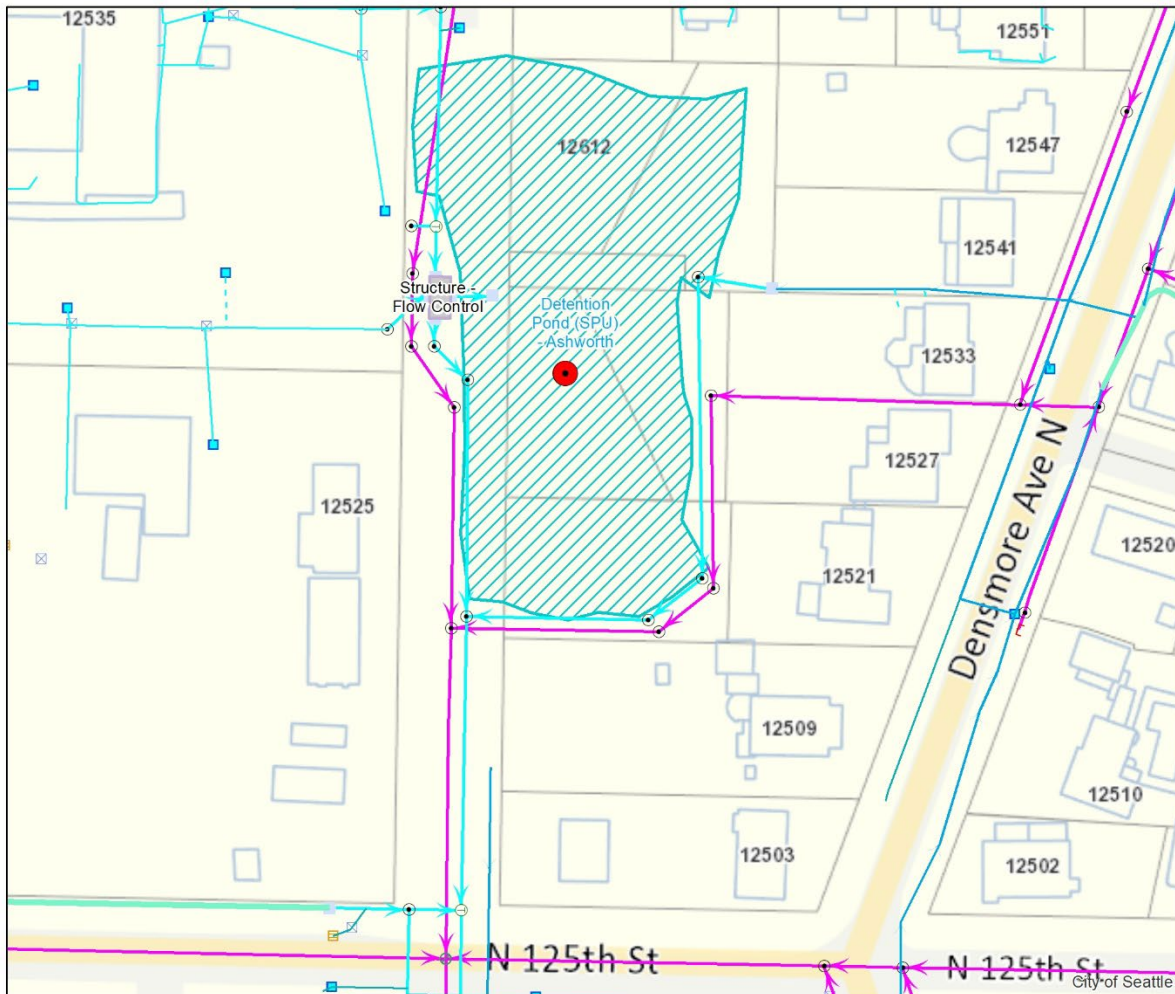
Central Area Pond Facilities Overview Location Map



South Area Pond Facilities Overview Location Map



Ashworth Pond: 12593-12501 Ashworth Ave N



Ashworth Pond

Routine Maintenance Activity:

-Sediment and Debris Removal,
Vegetation Control, Safety
Improvements, Mechanical Repairs

Section/Township/Range (SE 19 26 4)

Latitude (47.72083N)

Longitude (122.33931W)

Waterbody - Green Lake



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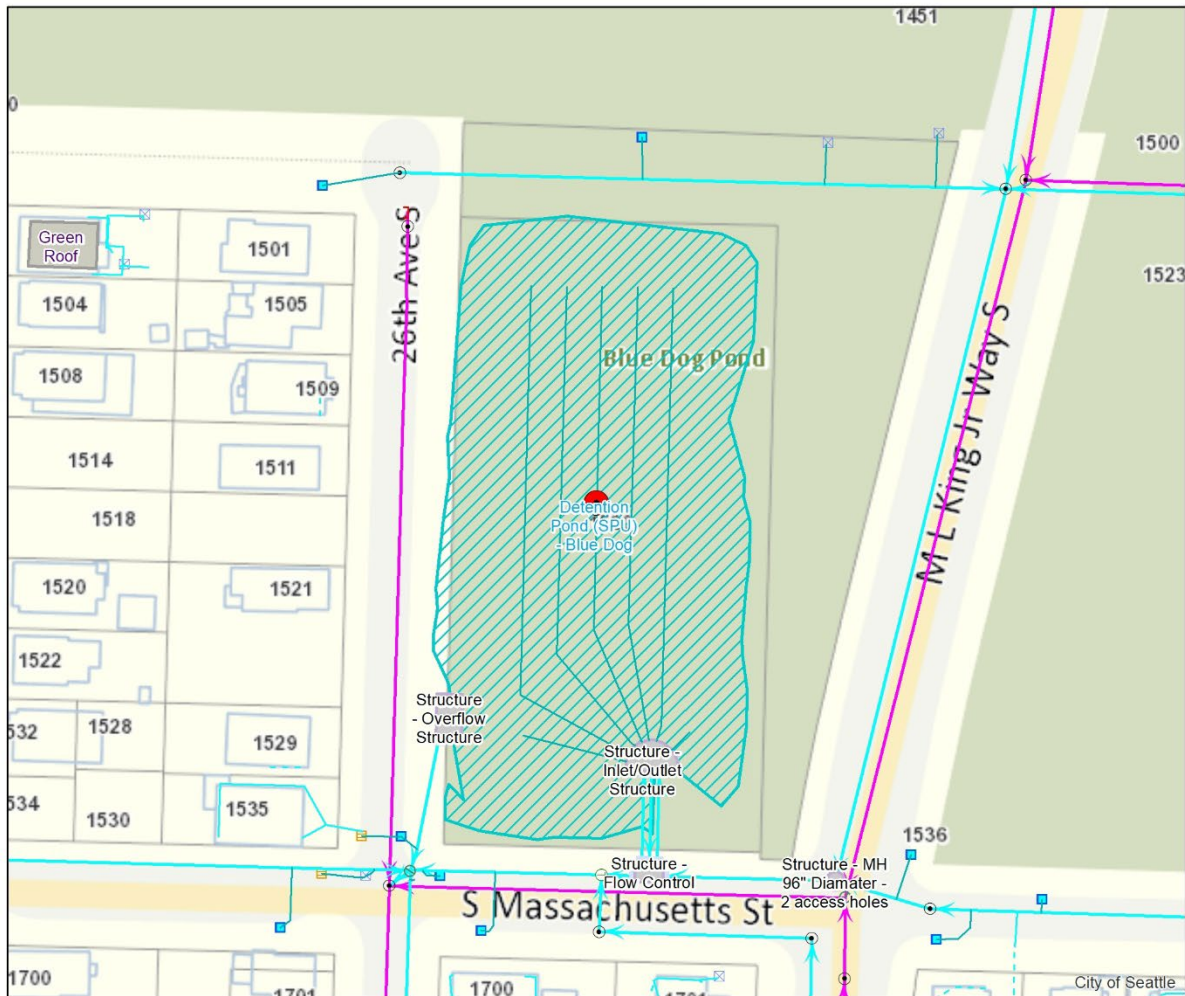
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0 50 100 200 Feet



Blue Dog Pond: S Massachusetts St / M L King Jr Way S



Blue Dog Pond

Routine Maintenance Activity:

- Sediment and Debris Removal,
Vegetation Control, Safety
Improvements, Mechanical Repairs

Section/Township/Range (N 9 24 4)

Latitude (47.58892N)

Longitude (122.29855W)

Waterbody - Duwamish



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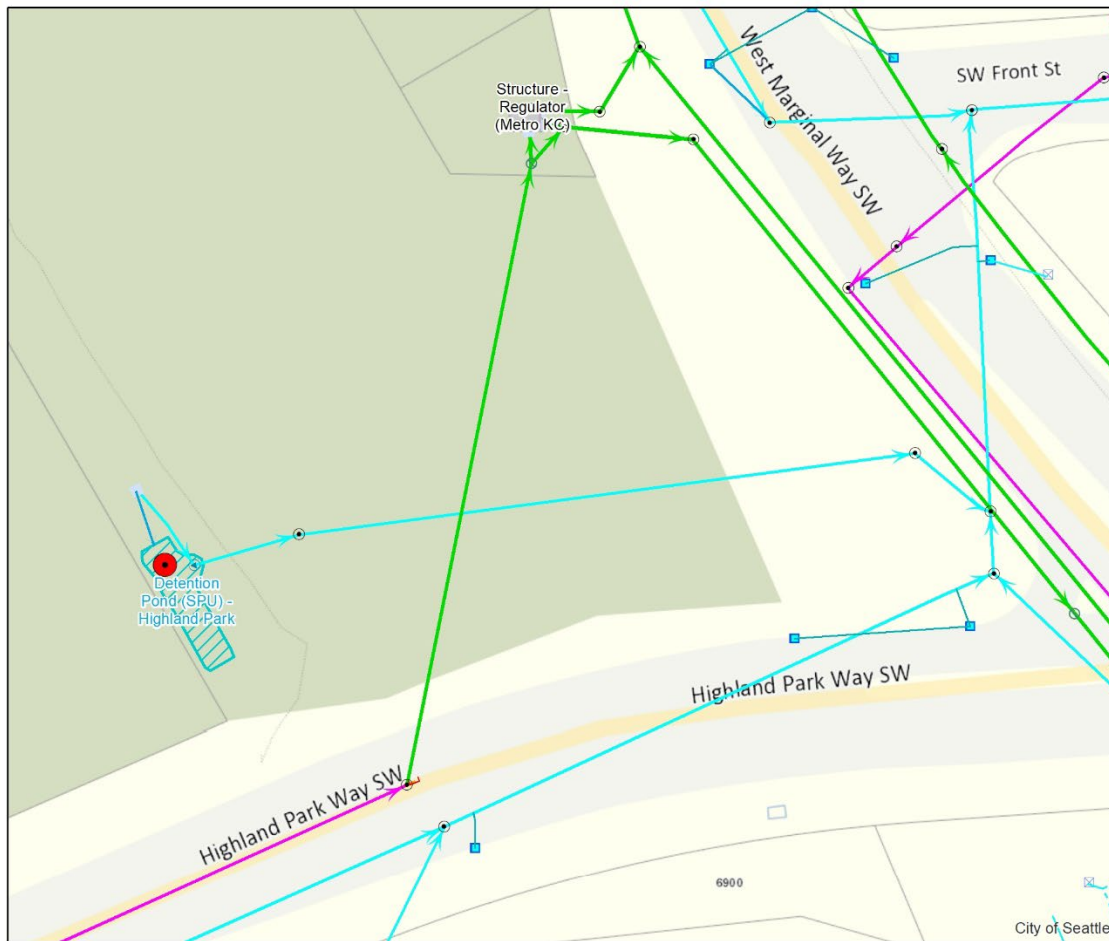
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0 50 100 200 Feet



Highland Park Basin: Highland Park Way SW / West Marginal Way SW



Highland Park Basin

Routine Maintenance Activity:

-Sediment and Debris Removal,
Vegetation Control, Safety
Improvements, Mechanical Repairs

Section/Township/Range (NE 30 24 4)

Latitude (47.54045N)

Longitude (122.34428W)

Waterbody - Duwamish



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0 40 80 160 Feet



Norfolk Pond: Interstate 5 SB @ Exit 158



Norfolk Pond

Routine Maintenance Activity:

- Sediment and Debris Removal,
Vegetation Control, Safety
Improvements, Mechanical Repairs

Section/Township/Range (NE 3 24 3)

Latitude (47.51058N)

Longitude (122.28477W)

Waterbody - Duwamish



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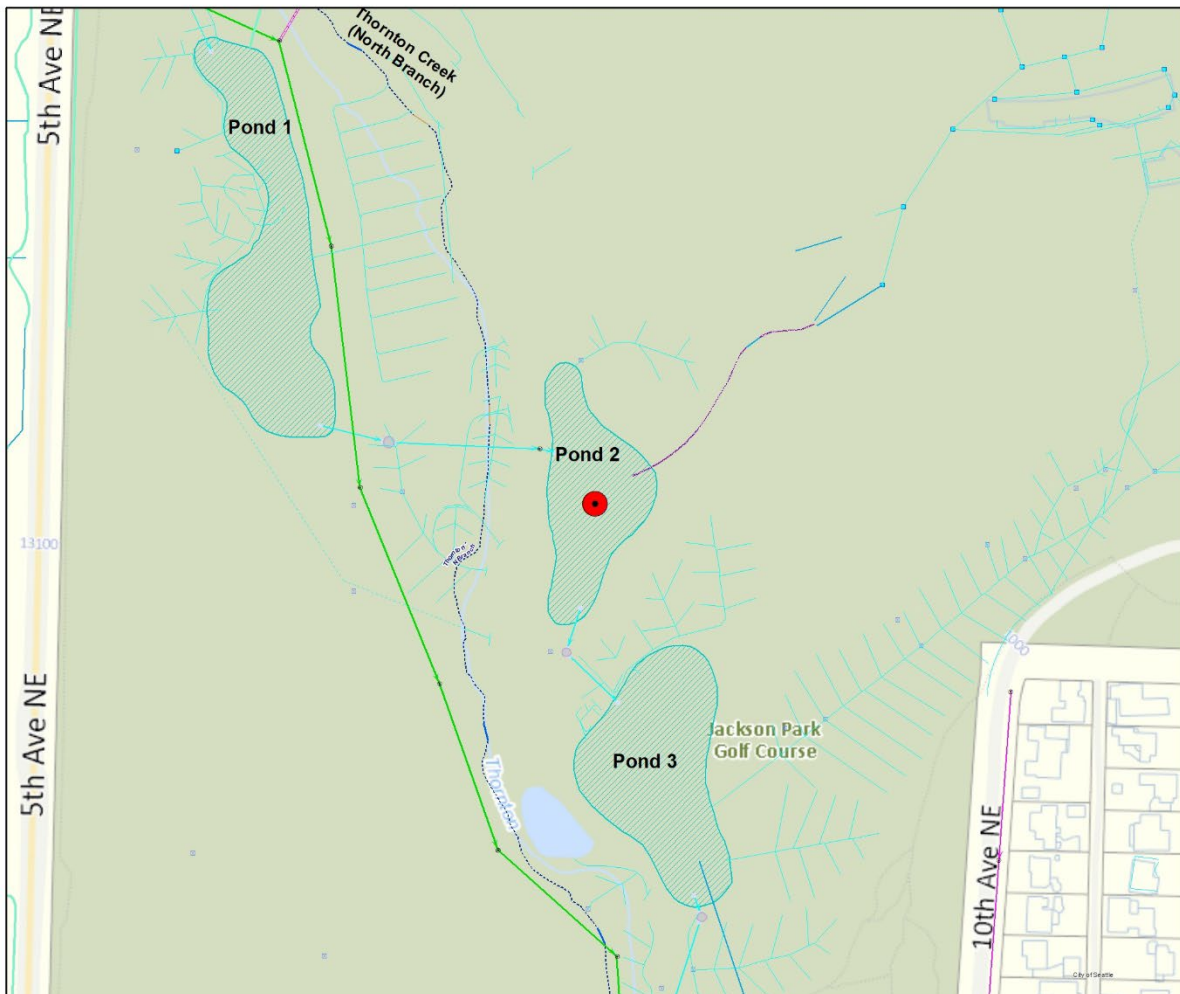
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0 80 160 320 Feet



Jackson Park Detention Ponds 1000 NE 135th St. (Jackson Park Golf Course)



Jackson Park Ponds

Routine Maintenance Activity:

- Sediment and Debris Removal,
- Vegetation Control, Safety
- Improvements, Mechanical Repairs

Section/Township/Range (NE 20 26 4)

Latitude (47.72858N)

Longitude (122.32208W)

Waterbody - Thornton Creek



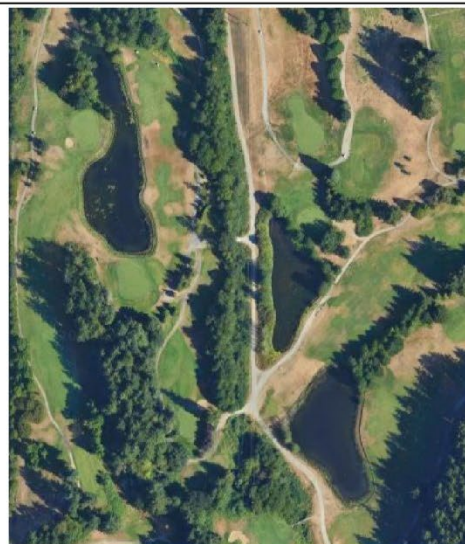
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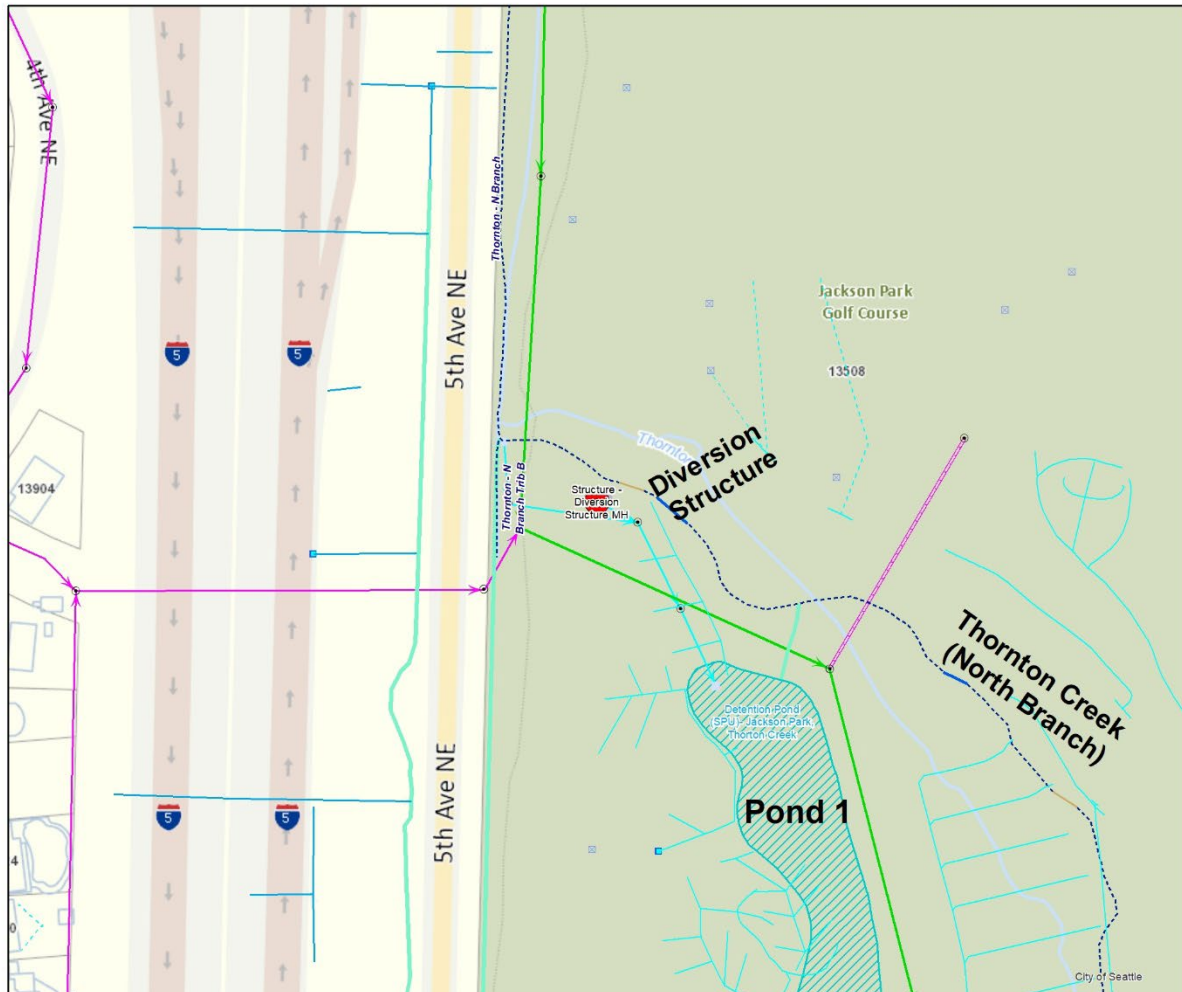
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0 130 260 520 Feet



Jackson Park Ponds- Diversion Structure & Forebay 1000 NE 135th St. (Jackson Park Golf Course)



**Jackson Park Ponds-
Diversion Structure**
Routine Maintenance Activity:

- Sediment and Debris Removal,
Vegetation Control, Safety
Improvements, Mechanical Repairs

Section/Township/Range (NE 20 26 4)
Latitude (47.72942N)
Longitude (122.32303W)
Waterbody - Thornton Creek



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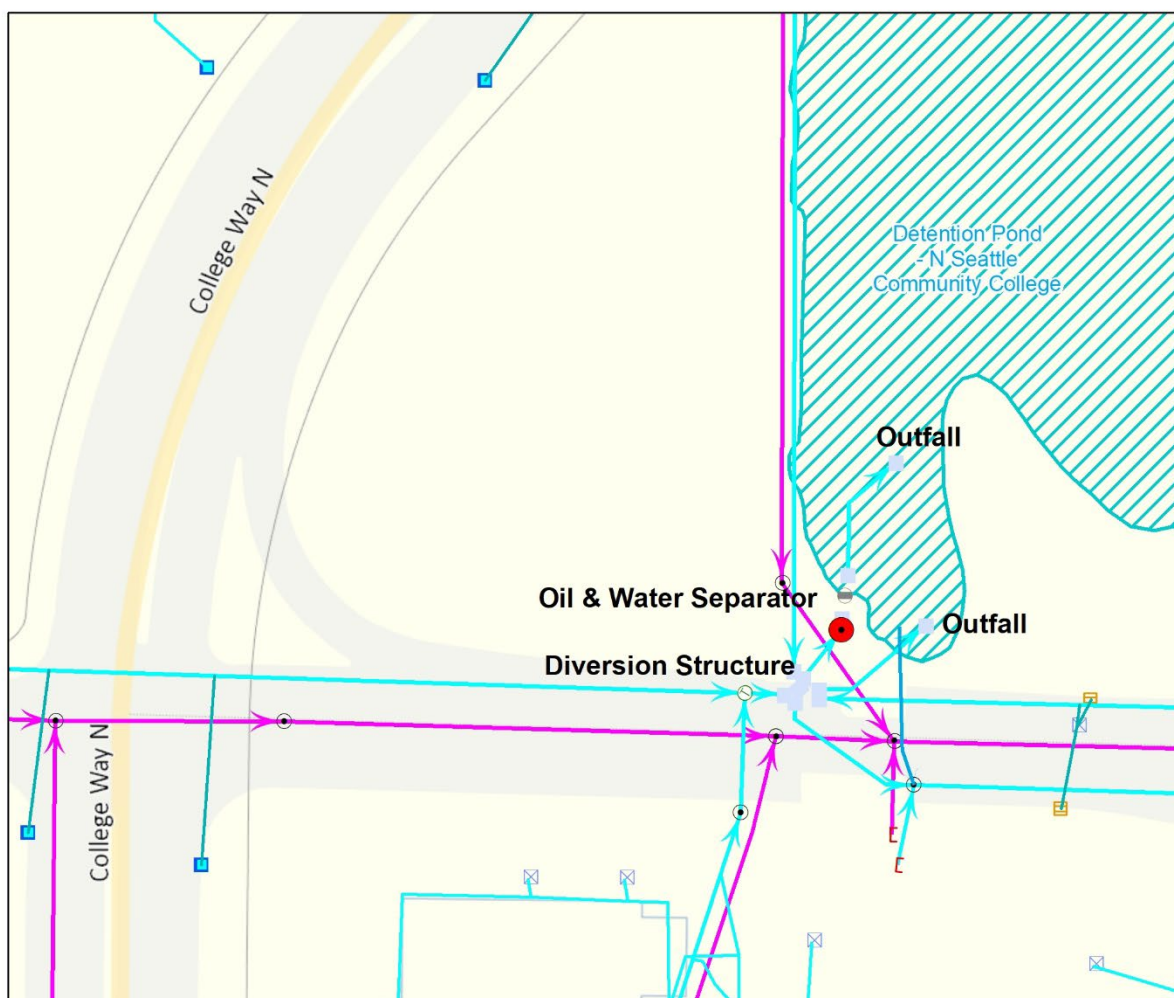
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0 80 160 320 Feet



NSC Stormwater Structures & Outfalls: 9600 College Way N



**NSC Stormwater
Structures & Outfalls**
Routine Maintenance Activity:

- Sediment and Debris Removal,
Vegetation Control, Safety
Improvements, Mechanical Repairs

Section/Township/Range (NE 32 26 4)

Latitude (47.70162N)

Longitude (122.33377W)

Waterbody - Thornton Creek



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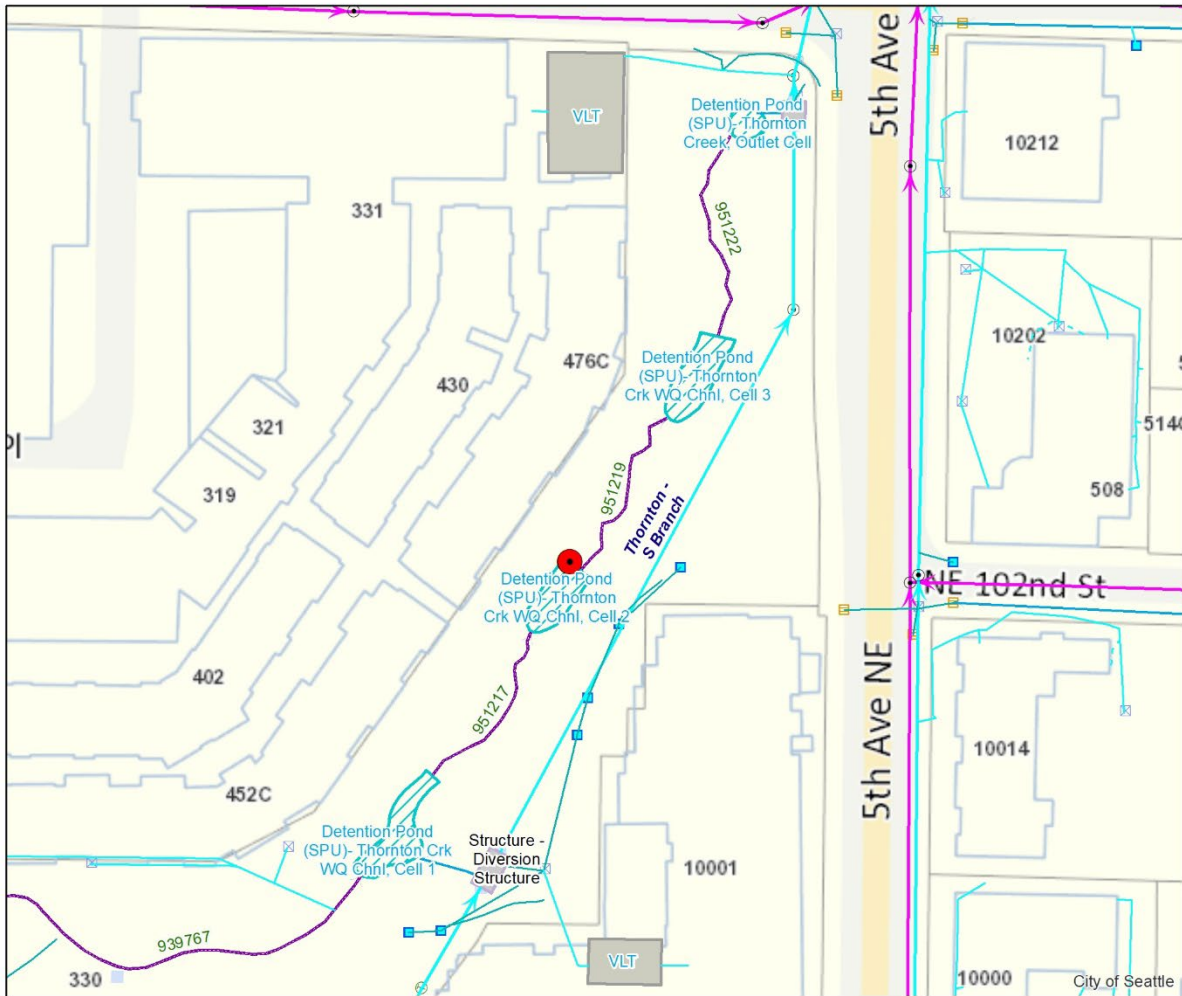
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0 40 80 160
Feet



Thornton Creek Water Quality Channel: 10005 5th Avenue NE



Thornton Creek Water Quality Channel
Routine Maintenance Activity:

-Sediment and Debris Removal,
Vegetation Control, Safety
Improvements, Mechanical Repairs

Section/Township/Range (NE 32 26 4)

Latitude (47.70182N)

Longitude (122.32424W)

Waterbody - Thornton Creek



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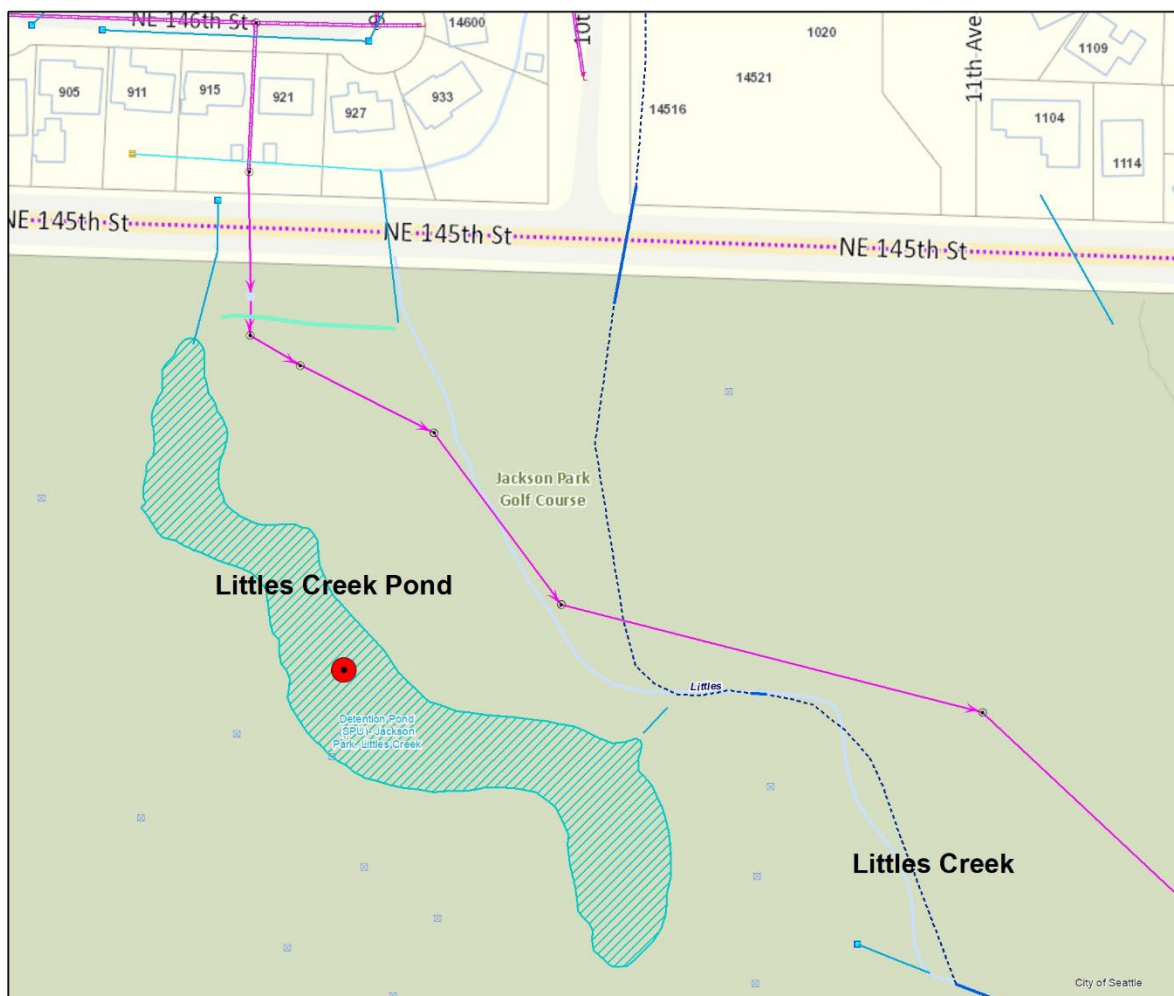
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0 50 100 200 Feet



Littles Creek Pond 1000 NE 135th St. (Jackson Park Golf Course)



Littles Creek Pond

Routine Maintenance Activity:

- Sediment and Debris Removal,
- Vegetation Control, Safety
- Improvements, Mechanical Repairs

Section/Township/Range (NE 20 26 4)

Latitude (47.73286N)

Longitude (122.31870W)

Waterbody - Littles Creek



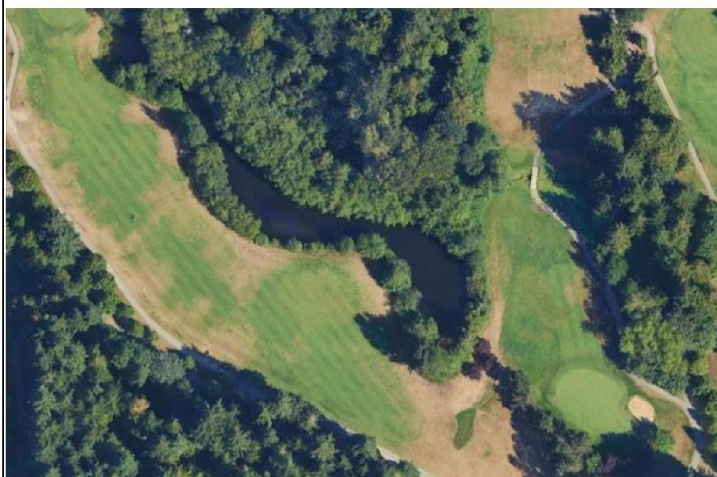
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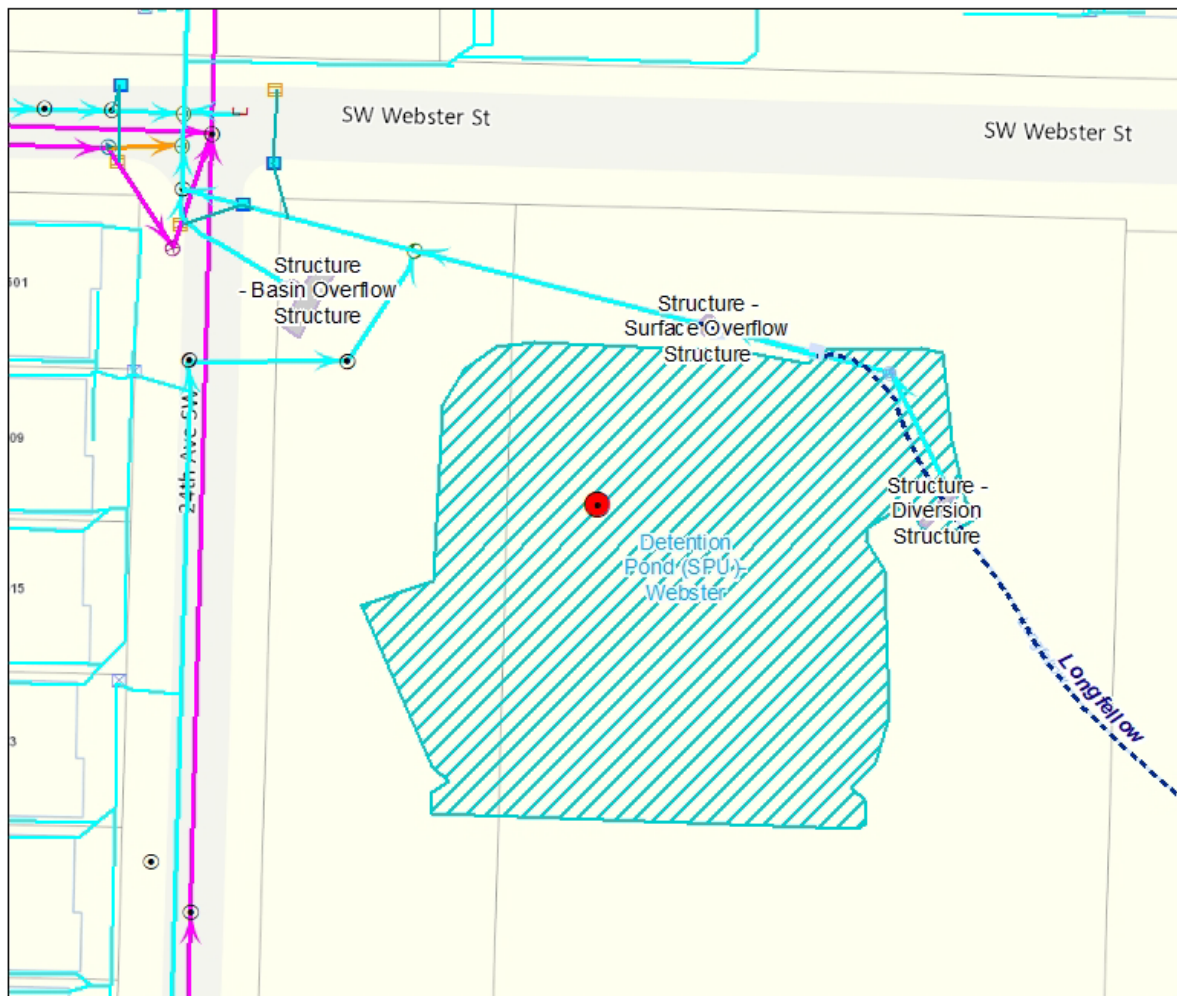
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0 80 160 320 Feet



Webster Pond: 7501 Delridge Way SW



Webster Pond

Routine Maintenance Activity:

- Sediment and Debris Removal,
Vegetation Control, Safety
Improvements, Mechanical Repairs

Section/Township/Range (NE 25 24 3)

Latitude (47.53510N)

Longitude (122.36190W)

Waterbody - Longfellow Creek



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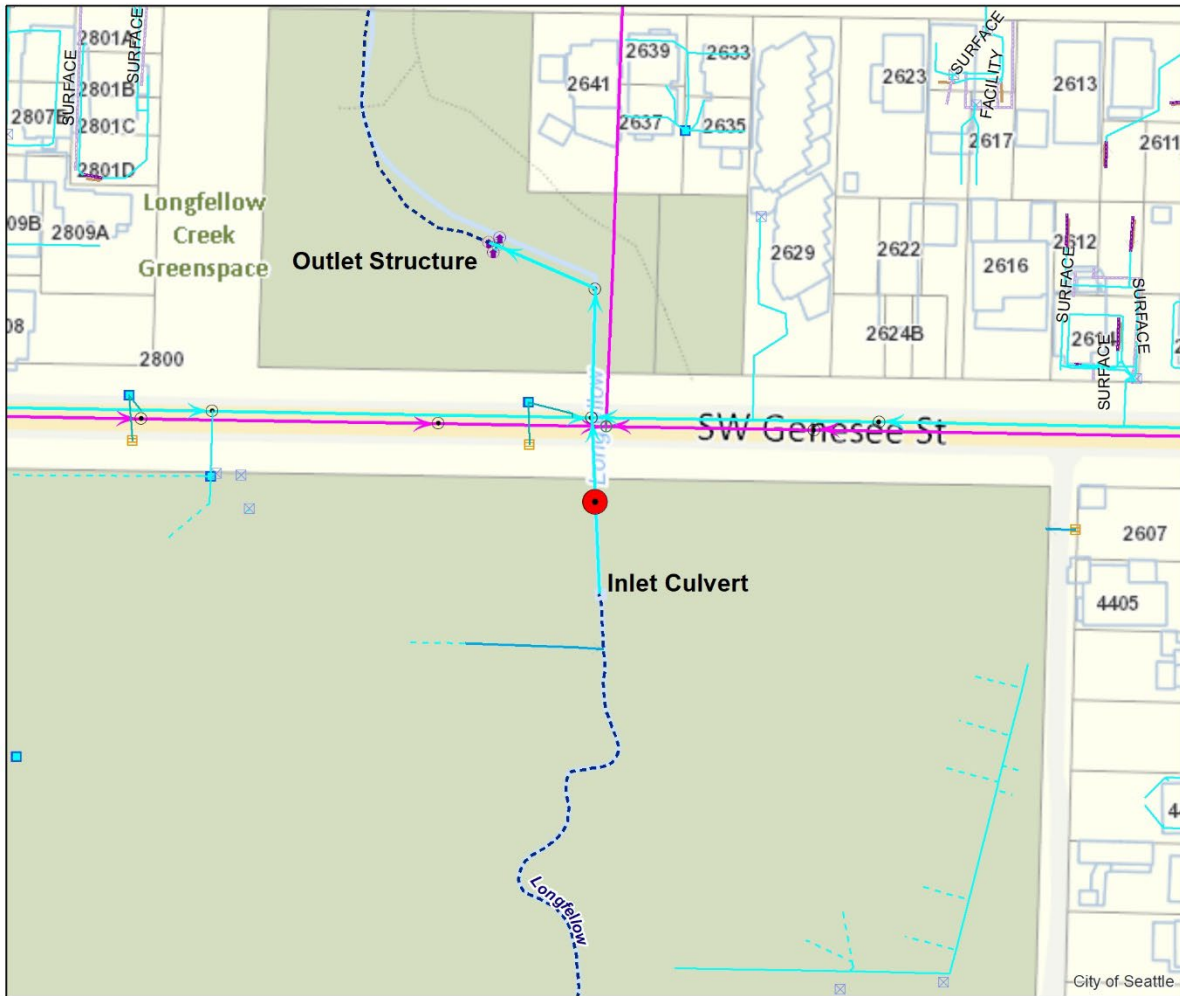
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0 40 80 160
Feet



Genesee Pond: Inlet Culvert and Outlet Structure



Genesee Inlet Culvert & Outlet Structure

Routine Maintenance Activity:

- Sediment and Debris Removal,
Vegetation Control, Safety
Improvements, Mechanical Repairs

Section/Township/Range (NE 13 24 3)

Latitude (47.56449N)

Longitude (122.36722W)

Waterbody - Longfellow Creek



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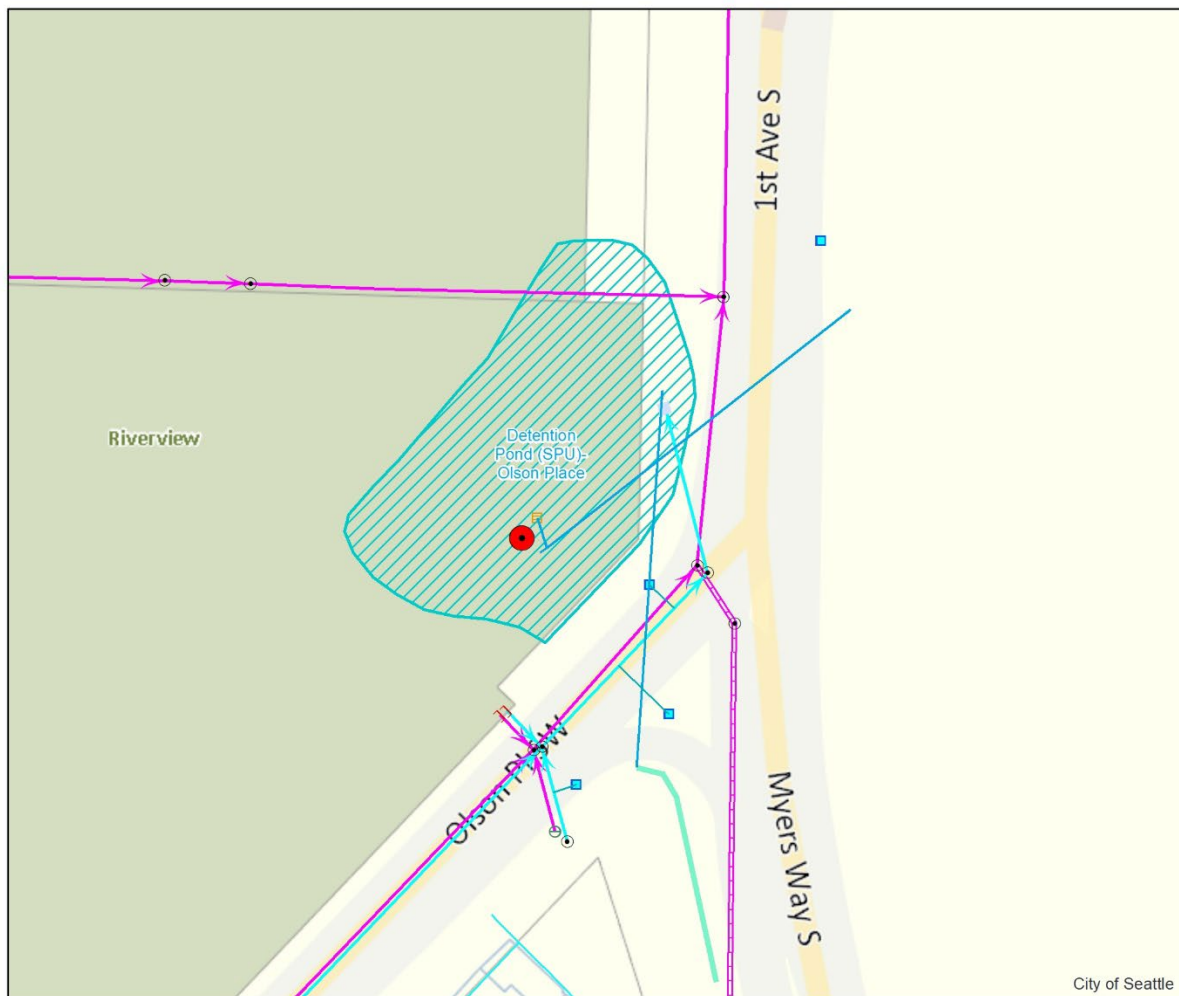
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0 50 100 200 Feet



Olson Pond: 9220 Olson Place SW



Olson Pond

Routine Maintenance Activity:

- Sediment and Debris Removal,
Vegetation Control, Safety
Improvements, Mechanical Repairs

Section/Township/Range (NE 31 24 4)

Latitude (47.52252N)

Longitude (122.33502W)

Waterbody - Duwamish



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0 62.5 125 250 Feet

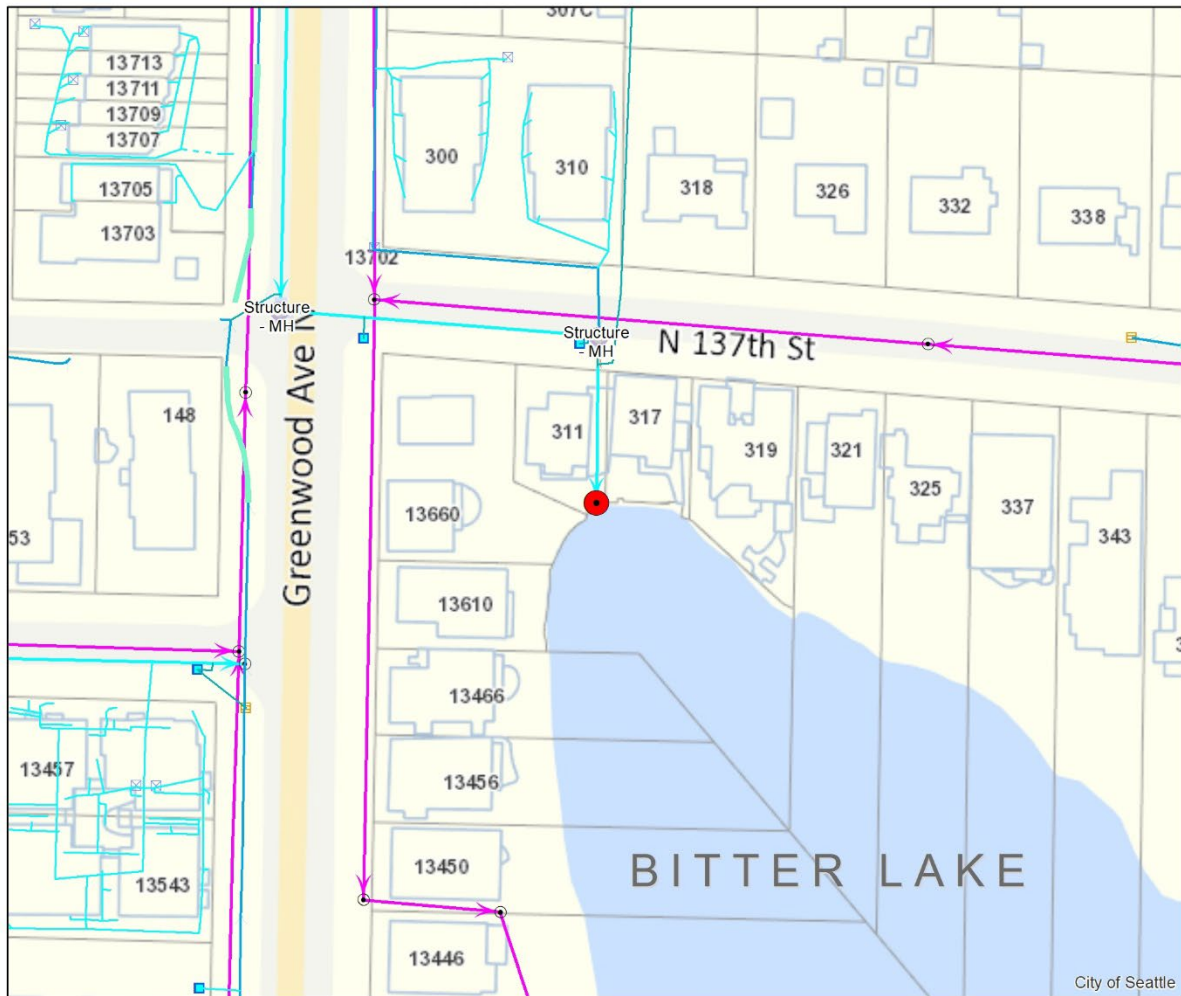


Low Level Grated Inlet to MH (Pond Outlet)



Overflow Level Grated Inlet to MH (Pond Outlet)

Outfall to Bitter Lake: 317 N 137th St



Outfall to Bitter Lake

Routine Maintenance Activity:

-Sediment and Debris Removal,
Vegetation Control, Safety
Improvements, Mechanical Repairs

Section/Township/Range (W 19 26 4)

Latitude (47.72845N)

Longitude (122.35477W)

Waterbody - Bitter Lake



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0 50 100 200 Feet



Green Lake – Densmore Outfall: 7801 West Green Lake Drive N



Green Lake – Densmore

Routine Maintenance Activity:

-Sediment and Debris Removal,
Vegetation Control, Safety
Improvements, Mechanical Repairs

Section/Township/Range (NE 6 25 4)

Latitude (47.68485N)

Longitude (122.33793W)

Waterbody - Green Lake



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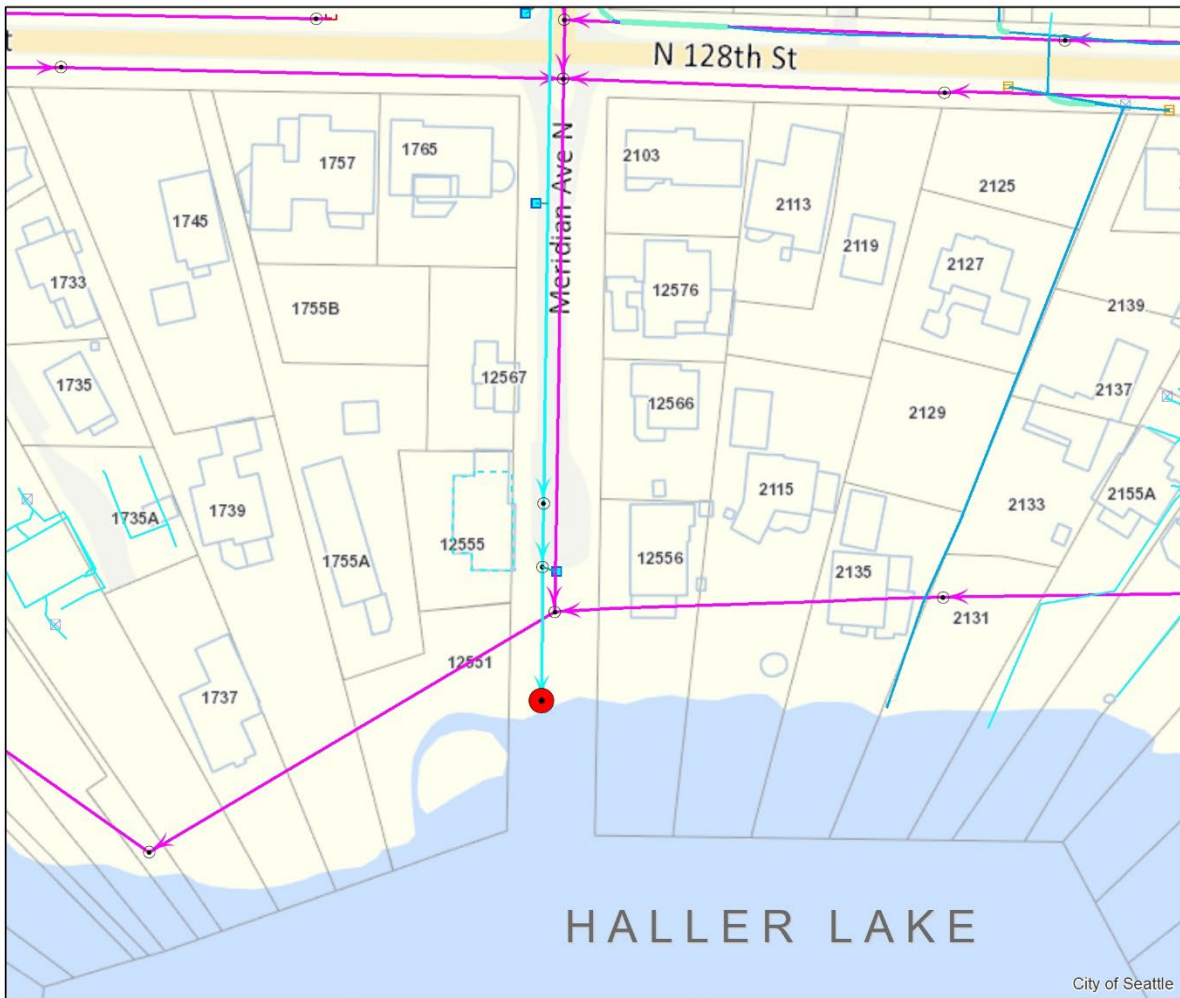
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0 50 100 200 Feet



Outfall to Haller Lake: 12555 Meridian Ave N



Outfall to Haller Lake

Routine Maintenance Activity:

-Sediment and Debris Removal,
Vegetation Control, Safety
Improvements, Mechanical Repairs

Section/Township/Range (SE 19 26 4)

Latitude (47.72080N)

Longitude (122.33423W)

Waterbody - Haller Lake



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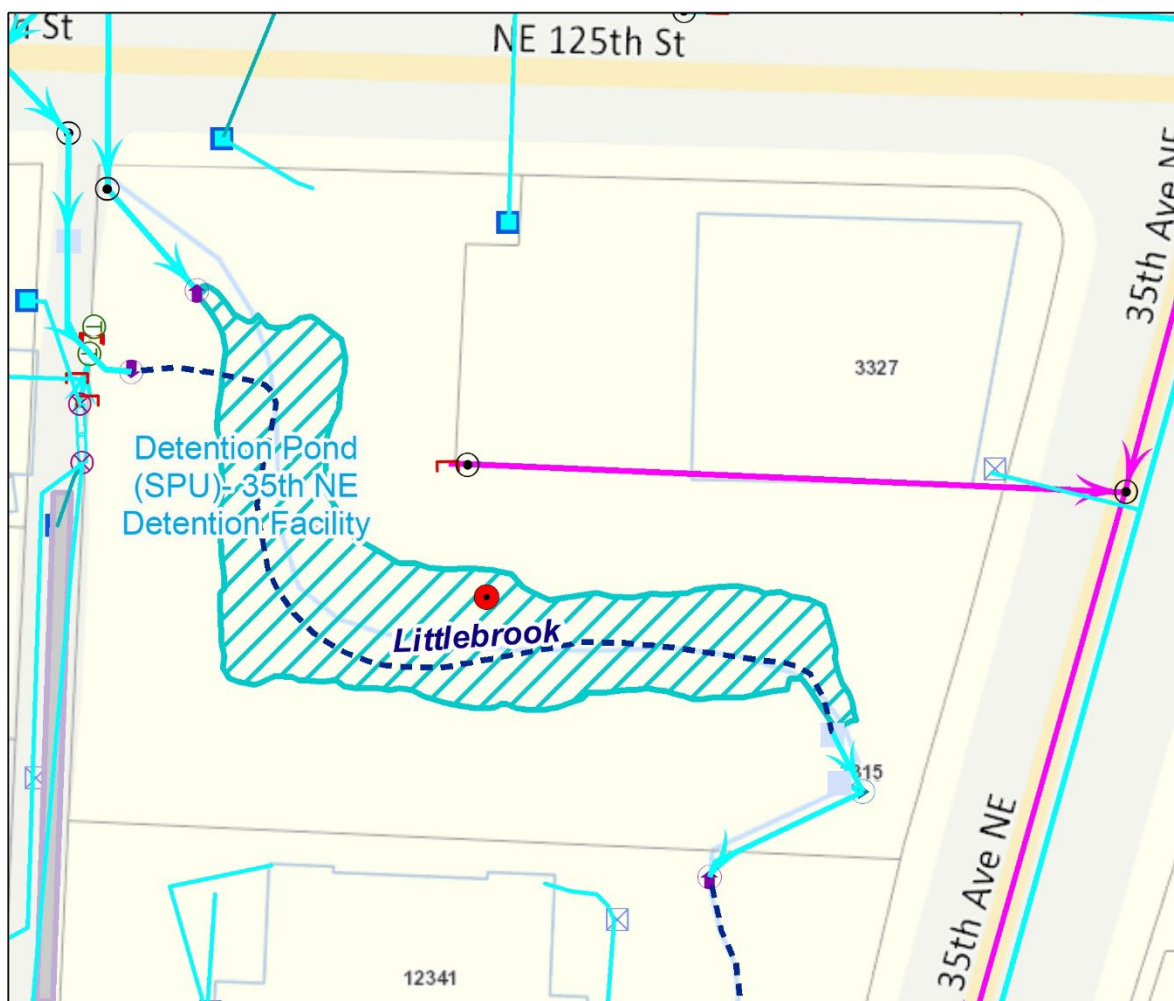
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0 62.5 125 250 Feet



Lake City Pond: NE 125th Steet / 35th Ave NE



Lake City Pond

Routine Maintenance Activity:

-Sediment and Debris Removal,
Vegetation Control, Safety
Improvements, Mechanical Repairs

Section/Township/Range (NE 28 26 4)

Latitude (47.71877N)

Longitude (122.29123W)

Waterbody - Little Creek



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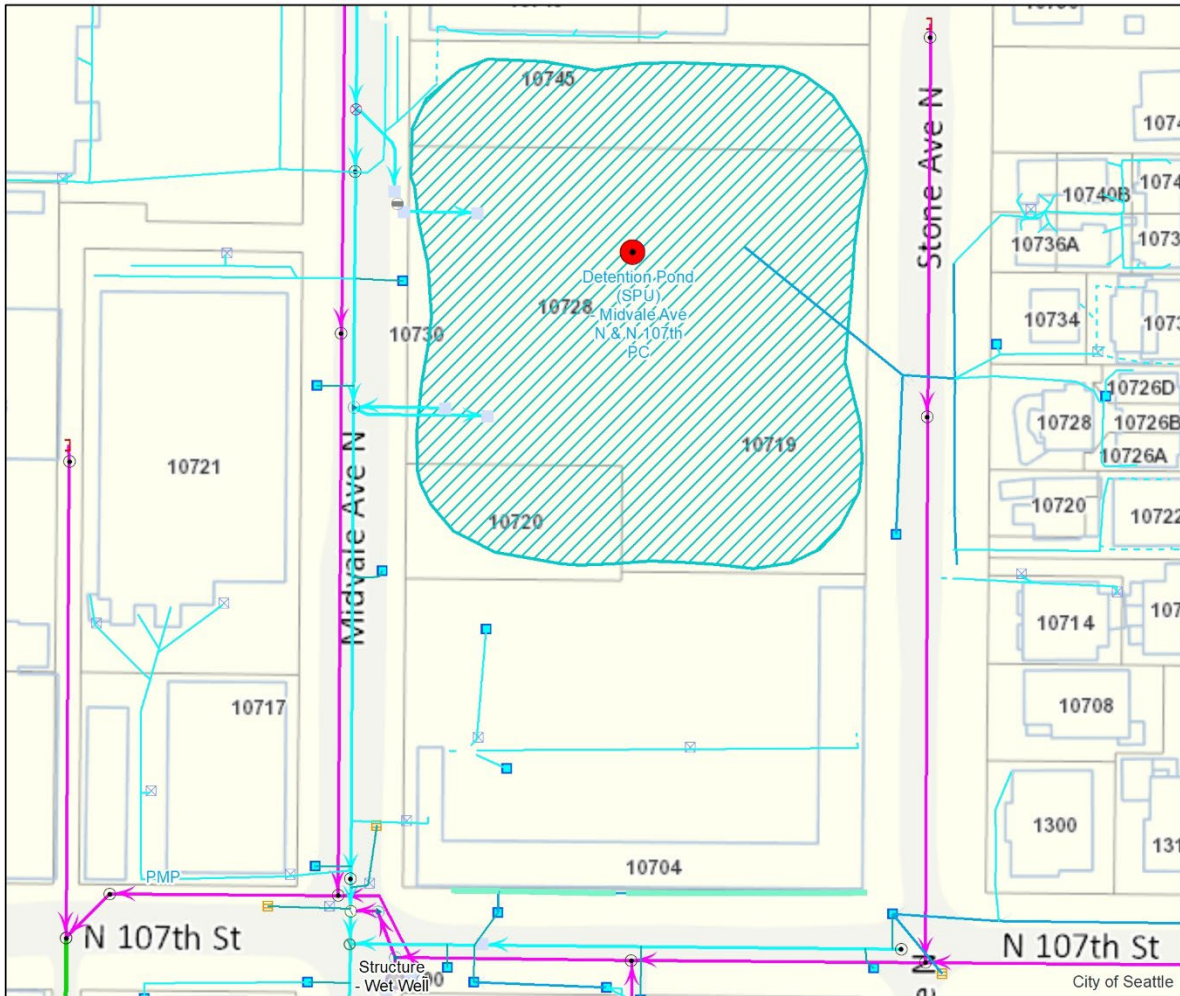
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0 25 50 100 Feet



Midvale: 10730 Midvale Avenue N



Midvale Pond

Routine Maintenance Activity:

-Sediment and Debris Removal,
Vegetation Control, Safety
Improvements, Mechanical Repairs

Section/Township/Range (SE 30 26 4)

Latitude (47.70788N)

Longitude (122.34271W)

Waterbody - Green Lake



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0 50 100 200
Feet



0 80 160 320 Feet



Exhibit E – Routine Maintenance & Repair Methods

This document lists all the Maintenance Methods utilized in the field to complete projects. These maintenance methods include stormwater Best Management Practices (BMP's) which may be utilized to minimize the adverse effects of routine maintenance activities. These Maintenance Methods and associated BMP's are listed under seven distinct categories. Some or all maintenance methods may be utilized in order to accomplish the maintenance activities listed in Exhibit C – Routine Maintenance Activities. The seven maintenance methods are:

1. Delineation of Work Areas
2. Temporary Bypass of Stream Flow & Fish Removal
3. Vactoring and Jetting
4. Excavating
5. Maintenance of Habitat Elements
6. Site Restoration/Landscaping

1. Delineation of Work Areas

Environmentally sensitive areas are identified and protected to keep people and equipment out of them (unless the project area lies within a sensitive area) and to limit the impact of construction activities on the site. Staging areas are used to secure materials and equipment. Identifying staging areas is necessary to initiate project site work. Other work areas may include temporary access roads or stream access points. The extent of the project needs to be established and actions taken to limit any soil disturbing activities outside of the established project area. Delineation of these areas may include use of flagging, fencing, mulch, coir rolls, or other appropriate materials that must be maintained throughout construction.

2. Temporary Bypass of Stream Flow & Fish Removal

Dewatering work areas and fish removal are standard practices to minimize impacts to aquatic species. To reduce turbidity, construction areas that occur within natural drainage systems and shorelines or pipe infrastructure are isolated before and during project work to prevent scour and eliminate the transport of sediment downstream. This method includes removing all fish from the isolated area using methods approved by WDFW and initiated by a qualified fisheries biologist. Isolation nets are installed and several attempts to relocate fish are completed before bypass operations begin.

The following bypass scenarios may be utilized during routine maintenance activities:

- **Temporary bypass for stream flow in a partial channel:** Occurs when a full bypass is not required because work occurs in a limited area of a stream. This method requires fish removal before installation of the bypass.
- **Temporary bypass for stream flow in a full channel.** Occurs when a full bypass is required because work occurs within a full channel. This method requires that fish be removed before installation of the bypass.
- **Isolating the work area in large waterbodies.** Typically, this method involves using a silt curtain to isolate the work area and contain any turbidity created during

maintenance. This method usually requires curtains to remain in place until turbidity has subsided which may take several days.

- **Isolation/dewatering of piped infrastructure.** This method involves bypassing stormwater that discharge to a creek or other waterbody from piped stormwater infrastructure. It can also require removal and treatment of wastewater resulting from maintenance activities.

In most cases, a gravity or pump system will bypass stream flow from an upstream containment berm or dam around the project site to a location immediately downstream of the construction zone. The length of the isolated stream channel can vary, depending on project size. All projects will have a method to dissipate flow at the downstream end of the diversion. Upon project completion water flow back into the work area is regulated to minimize turbidity.

3. Vactoring and Jetting

Vactoring is removal of sediment and turbid water using vactor trucks with suction hoses. Jet cleaning (jetting water into a culvert) is occasionally required to loosen sediment in a pipe or culvert. Typically, material is flushed down to a catch basin or sump where it can be captured and vactored out. Vehicles are staged adjacent to the work area, typically in an upland area. Vactored material is stored in trucks and disposed of at one of the City's vactor waste facilities.

To prevent the migration of sediment and turbid waters downstream, the system being cleaned is isolated or plugged at the downstream end. The vactor truck stages at this location and captures all sediment and debris entering the structure. A temporary bypass of stream flow may be required to manage the water before it enters the work area.

4. Excavating

This method is used to remove accumulated sediments and other debris from around culverts or outfalls, within creek channels, in-line/off-line sedimentation ponds, fish ladders and habitat restoration areas. Excavation removes accumulated sediment below the OHW line - or wetted perimeter where no OHW exists - that impedes conveyance and increases flooding risk.

As sediments accumulate in and adjacent to ponds, culverts, outfalls, ditches and drainage structures, these sediments are periodically removed. Work is typically done when the water level is low to minimize the amount of work required within the wetted perimeter. For work that occurs in the dry, a tractor or backhoe is operated directly from upland staging areas. Sediments are excavated and hauled to an upland disposal site. If work in the wetted perimeter is necessary, sediments are removed with hand tools or, if mechanized equipment is used, only an extension arm and bucket operate in the water. A temporary bypass of stream flow may be required to manage the water before it enters the work area. If deemed necessary, an environmental bucket may be employed to reduce incidental sediment fall back into the wetted area. Large quantities of excavated sediment (larger quantities are typical for ponds) must often be staged on site to dewater before removal to a disposal site. The location must be selected to avoid incidental draining back into the pond.

5. *Maintenance of Habitat Elements*

Habitat elements are organic or inorganic objects that—when placed in or near aquatic areas— increase fish and wildlife habitat and protect infrastructure. Habitat elements include large wood, root wad, baffles, boulders, rock, and weirs. When placed into waterbodies, these objects can slow or alter flow directions and provide complex habitat including riffles, pools and appropriate substrate that create food and hiding places for fish and wildlife. Habitat restoration and maintenance also protect infrastructure and drainage lines.

Habitat restoration or maintenance work may require using heavy or light equipment, hand labor or a combination of these methods. Many projects including those in parks require establishing a temporary construction access. The following is the construction technique for habitat restoration or maintenance:

- Select design and installation of habitat elements in accordance with the WDFW *Integrated Streambank Protection Guidelines* (WDFW et al. 2003).
- Instream or floodplain restoration materials (e.g. large wood and boulders) shall mimic as much as possible those found in a natural environment. Such materials may be salvaged or reused from the project site or hauled in from offsite but cannot be taken from streams, wetlands, or other sensitive areas.
- Various anchoring techniques are sometimes required to prevent the movement of structures when their movement could damage downstream infrastructure or channel integrity. If anchoring is required, bury the habitat element—such as woody debris or boulders—into the banks. Use chain or concrete blocks only sparingly in project design and only when conditions do not exist to anchor woody debris naturally between riparian trees or into the banks. Use concrete sparingly when necessary to anchor boulders to concrete weirs to create a more natural effect.

6. *Site Restoration/Landscaping*

Site restoration stabilizes the site after maintenance is complete and the staging and access areas are vacated. This prepares the site for replanting and protects disturbed soil from erosion and invasive weeds.

Inspect rough grading to ensure final slopes will not generate erosive energy affecting sensitive areas. When necessary, loosen compacted access roads, staging, and stockpile areas. Scatter and place stockpiled woody debris. Coir logs or jute matting with mulch can be utilized to stabilize surfaces while native vegetation is established.

Upon project completion, spread or remove stockpiled materials. All imported soil or rock must be removed, and the covered surface regraded and replanted to original conditions upon project completion.

Exhibit F – Greenhouse Gas Emissions Worksheet *

Section I: Buildings						
			Emissions Per Unit or Per Thousand Square Feet (MTCO ₂ e)			
Type (Residential) or Principal Activity (Commercial)	# Units	Square Feet (in thousands of square feet)	Embodied	Energy	Transportation	Lifespan Emissions (MTCO ₂ e)
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 ₂ e)
Pavement (sidewalk, asphalt patch)	0	0	0	0	0	0
Concrete Pad (50 MTCO ₂ e/1,000 sq. ft. of pavement at a depth of 6 inches)	0	0	0	0	0	0
TOTAL Section II Pavement						0

Section III: Construction						
(See detailed calculations below)						Emissions (MTCO ₂ e)
TOTAL Section III Construction						0

Section IV: Operations and Maintenance						
(See detailed calculations below)						Emissions (MTCO ₂ e)
TOTAL Section IV Operations and Maintenance						454

TOTAL GREENHOUSE GAS (GHG) EMISSIONS FOR PROJECT (MTCO₂e)						454
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Exhibit F – Greenhouse Gas Emissions Worksheet*

Section III Construction Details		
Construction: Diesel		
Equipment	Diesel (gallons)	Assumptions
Excavator	0	
Dump Truck	0	
Subtotal Diesel Gallons	0	
GHG Emissions in lbs CO₂e	0	26.55 lbs CO ₂ e per gallon of diesel
GHG Emissions in metric tons CO₂e	0	1,000 lbs = 0.45359237 metric tons

Construction: Gasoline		
Equipment	Gasoline (gallons)	Assumptions
Pick-up Trucks or Crew Vans	0	
Subtotal Gasoline Gallons	0	
GHG Emissions in lbs CO₂e	0	24.3 lbs CO ₂ e per gallon of gasoline
GHG Emissions in metric tons CO₂e	0	1,000 lbs = 0.45359237 metric tons

Construction Summary		
Activity	CO ₂ e in pounds	CO ₂ e in metric tons
Diesel	0	0
Gasoline	0	0
Total for Construction	0	0

Section IV Long-Term Operations and Maintenance Details		
Operations and Maintenance: Diesel		
Equipment	Diesel (gallons)	Assumptions
Emergency Operation	0	Emergency operations are uncertain and were not estimated
Maintenance Operation	23,663	Maintenance operations include combinations of diesel powered equipment consumption and vehicle consumption
Fueling truck/repair truck	0	Already included above
Subtotal Diesel Gallons	23,663	
GHG Emissions in lbs CO₂e	628,253	26.55 lbs CO ₂ e per gallon of diesel
GHG Emissions in metric tons CO₂e	285.0	1,000 lbs = 0.45359237 metric tons

Operations and Maintenance: Gasoline		
Equipment	Gasoline (gallons)	Assumptions
Maintenance Operation	15,315	Gasoline maintenance operations include only equipment consumption. Vehicles are assumed to consume diesel not gasoline fuel
Subtotal Gasoline Gallons	15,315	
GHG Emissions in lbs CO₂e	372,155	24.3 lbs CO ₂ e per gallon of gasoline
GHG Emissions in metric tons CO₂e	169	1,000 lbs = 0.45359237 metric tons

Operations and Maintenance Summary		
Activity	CO ₂ e in pounds	CO ₂ e in metric tons
Diesel	628,253	285.0
Gasoline	372,155	169
Total Operations and Maintenance	1,011,325.0	454

*This worksheet was created by King County in conjunction with City of Seattle. A copy of the full GHG Emissions worksheet can be found on King County's website.

Table F-1: Open Channel Facilities

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Activity Duration and Quantity Removed	Estimated Frequency of Maintenance	Environmentally Critical Areas	Crew (person/day/event)	Duration (day/event)	Frequency (event/yr)	Round Trips (qty)	Diesel Consumption (gal/yr)	Gasoline Consumption (gal/yr)
TH1	NE 51st St. @ Matthews Beach	Single Family	47.69382N	122.27217W	Matthews Creek	Thornton Basin - Lake Washington	30" RCP outfall to engineered wetland	Sediment and Debris Removal	Vactor/ Excavate/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 10 CY	Every 3 years	Wildlife, riparian, floodplain, steep slope	1	0.5	0.3	1	9.6	2.0
TH3	Thornton Creek @ NE 93rd St.	Single Family	47.69587N	122.27543W	Thornton Creek	Thornton Basin - Lake Washington	76" x 84" Concrete Box Culvert	Sediment and Debris Removal	Vactor/ Excavate/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope, shoreline	1	0.5	4	1	128.0	26.7
TH4	Thornton Creek @ Sand Point Way	Single Family	47.69638N	122.27697W	Thornton Creek	Thornton Basin - Lake Washington	Twin 48" x 72" Concrete Box Culverts	Sediment and Debris Removal	Vactor/ Excavate/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope	1	0.5	4	1	128.0	26.7
TH5	NE 93rd St. @ Sand Point Way	Single Family	47.69580N	122.27640W	Maple Creek	Thornton Basin - Lake Washington	18" CMP Culvert	Sediment and Debris Removal, Jetting Culverts	Vactor/ Excavate/ Hand Work	Remove accumulated sediment from culvert system and at the outfall/inflow	10 hours for sediment/debris removal 25 CY	Every year	Wildlife, riparian, floodplain	1	0.25	1	1	16.0	4.7
TH10	Thornton Creek @ Burke Gilman Trail	Single Family	47.69660N	122.27722W	Thornton Creek	Thornton Basin - Lake Washington	Large Irregular Opening	Sediment and Debris Removal	Vactor/Excavate/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope	1	0.5	4	1	128.0	26.7
TH11	NE 95th St. @ Sand Point Way NE	Single Family	47.69737N	122.27813W	Thornton Creek	Thornton Basin - Lake Washington	Twin 48" x 48" Concrete Box Culverts	Sediment and Debris Removal, Control Vegetation	Vactor/ Excavate/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope	1	0.5	4	1	128.0	26.7
TH17	N & S Branch Thornton Creek Confluence	Single Family	47.70692N	122.29000W	Thornton Creek	Thornton Basin - Lake Washington	Confluence of the N & S branches of Thornton Creek	Anchoring LWM/Habitat Restoration, Sediment and Debris Removal, Control Vegetation	Vactor/ Excavate/ Hand Work	Restore habitat features by anchoring existing woody material and rock. Sediment and debris removal limited to what is required for site restoration.	1 day for LWM anchoring, habitat restore/sediment removal 10 CY	Demand Work as needed	Wildlife, riparian, floodplain	1	1	4	1	256.0	42.7
TH19	30th Ave. NE @ NE 107th St. Thornton Culvert	Single Family	47.70688N	122.29617W	Thornton Creek	Thornton Basin - Lake Washington	98" x 42" Concrete Box Culvert	Sediment and Debris Removal, Jetting Culverts	Vactor/ Excavate/ Hand Work	Remove accumulated sediment in culvert system and at the outfall/inflow	2 days for sediment/ debris removal 50 CY	Every year	Wildlife, floodplain	1	1	1	1	64.0	10.7
TH21	30th Ave. NE @ NE 110th St.	Single Family	47.70832N	122.29630W	Kramer Creek	Thornton Basin - Lake Washington	18" RCP Culvert	Sediment and Debris Removal, Control Vegetation,	Vactor/ Excavate/ Hand Work	Remove accumulated sediment in culvert system and at the outfall/inflow	1 day for sediment/debris removal 20 CY	Every year	Wildlife, floodplain	1	1	1	1	64.0	10.7
TH23	NE 107th St. @ 30th Ave. NE Culvert	Single Family	47.70668N	122.29655W	Thornton Creek	Thornton Basin - Lake Washington	98" x 42" Concrete Box Culvert	Sediment and Debris Removal	Vactor/ Excavate/Hand Work	Remove accumulated sediment at the outfall/inflow	0.5 day for sediment/debris removal 10 CY	Demand Work as needed	Wildlife, floodplain	1	0.5	4	1	128.0	26.7
TH24	27th Ave. NE @ NE 105th St.	Single Family	47.70478N	122.29865W	Thornton Creek	Thornton Basin - Lake Washington	81" x 59" CMP Culvert	Anchoring LWM/ Habitat Restoration, Sediment and Debris Removal	Vactor/ Excavate/ Hand Work	Restore habitat features by anchoring existing woody material and rock. Sediment and debris removal limited to what is required for site restoration.	1 day for LWM anchoring, habitat rehab/sediment removal 5 CY	Demand Work as needed	Wildlife, floodplain	1	1	4	1	256.0	42.7

Table F-1: Open Channel Facilities


WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Activity Duration and Quantity Removed	Estimated Frequency of Maintenance	Environmentally Critical Areas	Crew (person/day/event)	Duration (day/event)	Frequency (event/yr)	Round Trips (qty)	Diesel Consumption (gal/yr)	Gasoline Consumption (gal/yr)
TH25	Lake City Fish Ladder	Neighborhood/Commercial	47.70112N	122.30262W	Thornton Creek	Thornton Basin - Lake Washington	72" x 60" Concrete Box Culvert	Anchoring LWM/Habitat Restoration, Sediment and Debris Removal	Vactor/ Hand Work	Restore habitat features by anchoring existing woody material and rock. Sediment and debris removal limited to what is required for site restoration.	1 day for LWM anchoring, habitat restore/sediment removal 10 CY	Demand Work as needed	Wildlife, riparian, floodplain	1	1	4	1	256.0	42.7
TH29	NE 95th St. @ Lake City Way	Neighborhood/Commercial	47.69832N	122.30477W	Willow Creek	Thornton Basin - Lake Washington	24" RCP Culvert	Vactoring and Jetting culverts and ditches, Control Vegetation	Vactor/ Hand Work	Remove accumulated sediment from the culvert/ditch system	0.5 day for sediment/debris removal 10 CY	Every 7 years	Wildlife, riparian, floodplain, wetland, steep slope	1	0.5	0.15	1	4.8	1.0
TH30	NE 98th St. @ Lake City Way NE	Neighborhood/Commercial	47.70007N	122.30287W	Willow Creek	Thornton Basin - Lake Washington	12" RCP Culvert	Vactoring and Jetting culverts and ditches	Vactor/ Hand Work	Remove accumulated sediment from the culvert/ditch system	2 hours for sediment/debris removal 5 CY	Quarterly and before storms	Wildlife, riparian, floodplain, wetland, steep slope	1	0.25	4	1	64.0	18.7
TH31	NE 98th St. @ Ravenna Ave. NE	Single Family	47.70003N	122.30152W	Thornton - S Branch Trib E	Thornton Basin - Lake Washington	Trash Rack on 36" Outfall	Sediment and Debris Removal	Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for small woody debris removal 5 CY	Quarterly and before storms	Wildlife, riparian, floodplain, wetland,	1	0.5	4	1	128.0	26.7
TH32	Knickerbocker Reach Habitat Improvements	Single Family	47.70058N	122.30593W	Thornton Creek	Thornton Basin - Lake Washington	Creek Restoration with Habitat Features	Anchoring LWM/Habitat Restoration, Sediment and Debris Removal, Control Vegetation	Vactor/ Excavate/ Hand Work	Restore habitat features by anchoring new and existing woody material and rock. Sediment and debris removal are limited to what is necessary to restore the site.	1 day for LWD anchoring, habitat restore/sediment removal 10 CY	Demand Work as needed	Wildlife, riparian, floodplain, wetland, steep slope	1	1	4	1	256.0	42.7
TH33	NE 103rd St. Sewer Main Crossing	Single Family	47.70327N	122.30967W	Thornton Creek	Thornton Basin - Lake Washington	Sewer encased in concrete with adjacent habitat features.	Anchoring LWM/Habitat Restoration, Sediment and Debris Removal, Control Vegetation	Vactor/ Excavate/ Hand Work	Restore habitat features by anchoring new and existing woody debris and rock. Sediment and debris removal are limited to what is necessary to rehabilitate the site	1 day for LWD anchoring, habitat rehab/sediment removal 10 CY	Demand Work as needed	Wildlife, riparian, floodplain	1	1	4	1	256.0	42.7
TH34	NE 105th St. @ 17th Ave. NE	Single Family	47.70485N	122.31132W	Thornton Creek	Thornton Basin - Lake Washington	19' x 6'6" Concrete Box Culvert	Anchoring LWM/Habitat rehabilitation, Sediment and debris removal	Vactor/ Excavate /Hand Work	Restore habitat features by anchoring new and existing woody debris and rock. Sediment and debris removal are limited to what is necessary to rehabilitate the site	1 day for LWD anchoring, habitat rehab/sediment removal 10 CY	Demand Work as needed	Wildlife, riparian, floodplain	1	1	4	1	256.0	42.7
TH35	NE 108th @ 8th Ave. NE (Beaver Lodge Park)	Single Family	47.70558N	122.31977W	Thornton Creek	Thornton Basin - Lake Washington	--	Sediment and Debris Removal	Vactor/ Hand Work	Remove or manipulate dams for flood control and fish passage	4 hours for sediment and small woody debris removal 5 CY	Monthly	Wildlife, riparian, floodplain, wetland	1	0.5	12	1	384.0	80.0
TH37	1st Ave. NE @ NE 100th St.	Neighborhood/Commercial	47.70132N	122.32865W	Thornton Creek	Thornton Basin - Lake Washington	60" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	0.5 day for sediment/debris removal 5 CY	Demand Work as needed	Peat settlement prone	1	0.5	4	1	128.0	26.7
TH38	1st Ave. NE @ NE 100th St. Ditch	Neighborhood/Commercial	47.70048N	122.32858W	Thornton Creek	Thornton Basin - Lake Washington	Drainage conveyance ditch.	Sediment and Debris Removal, Control Vegetation	Vactor/ Hand Work 	Remove accumulated sediment at the outfall/inflow	1 day for sediment/debris removal 20 CY	Every 3 years	Riparian	1	1	0.3	1	19.2	3.2

Table F-1: Open Channel Facilities

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Activity Duration and Quantity Removed	Estimated Frequency of Maintenance	Environmentally Critical Areas	Crew (person/day/event)	Duration (day/event)	Frequency (event/yr)	Round Trips (qty)	Diesel Consumption (gal/yr)	Gasoline Consumption (gal/yr)
TH43	North Fork Culvert @ Lake City Way	Neighborhood/ Commercial	47.71490N	122.29810W	Thornton Creek	Thornton Basin - Lake Washington	72" x 60" Concrete Box Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 10 CY	Quarterly and before storms		1	0.5	4	1	128.0	26.7
TH44	25th Ave. NE @ Thornton Creek	Single Family	47.71792N	122.30185W	Thornton Creek	Thornton Basin - Lake Washington	50" x 48" Concrete Box Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 10 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope	1	0.5	4	1	128.0	26.7
TH45	NE 125th @ Thornton Creek	Single Family	47.71932N	122.30335W	Thornton Creek	Thornton Basin - Lake Washington	52" x 48" Concrete Box Culvert	Sediment and Debris Removal, control Vegetation	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 10 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope	1	0.5	4	1	128.0	26.7
TH46	19th Ave. NE @ NE 130th St.	Single Family	47.72295N	122.30857W	Thornton Creek	Thornton Basin - Lake Washington	80" x 56" CMP Culvert	Anchoring LWD/Habitat rehabilitation, Sediment and debris removal	Vactor/ Hand Work	Restore habitat features by anchoring new and existing woody debris and rock. Sediment and debris removal are limited to what is necessary to restore the site	1 day for LWD anchoring, habitat restore/sediment removal 10 CY	Demand Work as needed	Wildlife, riparian, floodplain, steep slope	1	1	4	1	256.0	42.7
TH50	NE 115th St. @ Littlebrook 918272	Single Family	47.71195N	122.28988W	Littlebrook Creek	Thornton Basin - Lake Washington	36" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope	1	0.5	4	1	128.0	26.7
TH51	NE 120th St. @ Littlebrook Creek	Single Family	47.71550N	122.29050W	Littlebrook Creek	Thornton Basin - Lake Washington	30" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope	1	0.5	4	1	128.0	26.7
TH52	NE 123rd St. @ Littlebrook Creek	Single Family	47.71732N	122.29057W	Littlebrook Creek	Thornton Basin - Lake Washington	30" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope	1	0.5	4	1	128.0	26.7
TH53	35th Ave. NE @ Littlebrook Creek	Single Family	47.71815N	122.29117W	Littlebrook Creek	Thornton Basin - Lake Washington	30" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope	1	0.5	4	1	128.0	26.7
TH70	20th Ave. NE between NE 143rd St. and NE 145th St.	Neighborhood Residential (@ NE 143rd St.)/Lowrise Multi-Family (@ NE 145th St.)	47.7337N	122.3074W	Hamlin Creek	Thornton Basin - Lake Washington	Vegetation-Ditch; 30" RCP Culvert	Sediment and Debris Removal, Vegetation Control	Vactor/ Hand Work	Divert Hamlin Creek around the work area using pump and bypass, remove accumulated material and overgrown vegetation from the ditch channel, reshape ditch profile to facilitate flow	3 days for sediment/debris, vegetation removal and shaping of ditch profile 40 CY	Every 2 years	Riparian, Wetland	2	3	0.5	1	160.0	0.0
TH73	17th Ave NE between NE 136th St and NE 143rd St	Single Family	47.72839N	122.31005W	Unnamed tributary (North Fork Thornton Creek)	Thornton Basin - Lake Washington	Vegetation-Ditch; 12" RCP Culvert	Sediment and Debris Removal	Vactor/ Excavate/ Hand Work	Remove accumulated sediment from the culvert/ditch system	3 days for sediment/debris removal, removal and shaping of ditch profile 30 CY	Every 3 years	--	2	3	0.3	1	160.0	0.0
LU1	N 97th St @ Woodlawn Ave NE	Single Family	47.6994N	122.3382W	Licton Springs	Lake Union	18" RCP culvert, 12" RCP culvert, sandbox	Sediment and Debris Removal	Vactor/ Excavate/ Hand Work	Remove accumulated sediment from the culvert/ditch system	1 day for sediment/ debris removal 15 CY	Demand Work as needed	Riparian, Wetland	1	0.5	4	1	128.0	26.7

Table F-1: Open Channel Facilities

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Activity Duration and Quantity Removed	Estimated Frequency of Maintenance	Environmentally Critical Areas	Crew (person/day/event)	Duration (day/event)	Frequency (event/yr)	Round Trips (qty)	Diesel Consumption (gal/yr)	Gasoline Consumption (gal/yr)
MK1	56th Ave SW at SW Oregon St	Single Family	47.5631N	122.4050W	Mee-Kwa-Mooks Creek	Puget Sound	Vegetation-Ditch; 12" RCP Culvert	Sediment and Debris Removal	Vactor/ Excavate/ Hand Work	Remove accumulated sediment from the culvert/ditch system	1 day for sediment/ debris removal 15 CY	Every 3 years	Riparian, Wetland	1	0.5	4	1	128.0	26.7
PS5	NW 92nd St. @ 28th Ave. NW	Single Family	47.69590N	122.39233W	Unnamed PS07 - Mainstem	Puget Sound	18" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope	1	0.5	4	1	128.0	26.7
PS6	28th Ave. NW @ NW Esplanade	Single Family	47.70017N	122.39357W	Unnamed PS07 - Mainstem	Puget Sound	48" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope	1	0.5	4	1	128.0	26.7
PS7	Marmount Dr. NW @ NW North Beach Dr.	Single Family	47.70080N	122.38995W	Unnamed PS06 - E. Fork	Puget Sound	18" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Demand Work as needed	Potential slide, riparian corridor, wetland, wildlife	1	0.25	4	1	64.0	18.7
PS8	Marmount Dr. NW @ NW North Beach Dr.	Single Family	47.70077N	122.39020W	Unnamed PS06 - W. Fork	Puget Sound	18" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Potential slide, riparian corridor, wetland, wildlife	1	0.5	4	1	128.0	26.7
PS9	NW 96th St. @ 26th Ave. NW	Single Family	47.69862N	122.38962W	Unnamed PS06 - E. Fork	Puget Sound	18" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope	1	0.25	4	1	64.0	18.7
PS10	26th Ave. NW @ NW 96th St.	Single Family	47.69818N	122.38945W	Unnamed PS06 - E. Fork	Puget Sound	18" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope	1	0.25	4	1	64.0	18.7
PS11	NW 95th St. @ 26th Ave. NW	Single Family	47.69775N	122.38950W	Unnamed PS06 - E. Fork	Puget Sound	18" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope	1	0.25	4	1	64.0	18.7
PS12	NW 92nd St. @ 25th Ave. NW	Single Family	47.69650N	122.38850W	Unnamed PS06 - E. Fork	Puget Sound	12" CIP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope	1	0.25	4	1	64.0	18.7
PS13	NW Golden Dr. @ 31st Ave. NW	Single Family	47.69833N	122.39608W	Unnamed PS08 - Mainstem	Puget Sound	18" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope	1	0.25	4	1	64.0	18.7
PS14	NW 95th St. @ 26th Pl. NW	Single Family	47.69750N	122.39152W	Unnamed PS06 - W. Fork	Puget Sound	24" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope	1	0.5	4	1	128.0	26.7
PS15	NW 95th St. @ 28th Ave. NW	Single Family	47.69777N	122.39278W	Unnamed PS07 - Mainstem	Puget Sound	12" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope	1	0.25	4	1	64.0	18.7
PS16	View Dr. NW @ 32nd Ave. NW	Single Family	47.69698N	122.39877W	Unnamed PS09 - Mainstem	Puget Sound	12' RCP CULVERT	Sediment and Debris Removal, Control Vegetation	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope	1	0.25	4	1	64.0	18.7

Table F-1: Open Channel Facilities

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Activity Duration and Quantity Removed	Estimated Frequency of Maintenance	Environmentally Critical Areas	Crew (person/day/event)	Duration (day/event)	Frequency (event/yr)	Round Trips (qty)	Diesel Consumption (gal/yr)	Gasoline Consumption (gal/yr)
PS17	Becker's Culvert	Utility/Public (Carkeek Park)	47.7109N	122.3654W	Pipers Creek (Tributary H)	Pipers	Historically a private impoundment: Tributary H to Pipers Creek, no longer an impoundment	Debris Removal, Control Vegetation	Hand Work	Remove debris and thin noxious vegetation	1 day for sediment/debris removal 1 CY	Vegetation every year; Demand Work as needed	Wetland, wildlife habitat, riparian corridor, steep slope, slide area	1	1	0.25	1	9.0	8.0
LO1	SW Andover St. @ Longfellow Creek	Manufacturing/Industrial	47.56807N	122.36630W	Longfellow Creek	Duwamish Drainage Basin	60" RCP Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Floodplain, wildlife	1	0.5	4	1	128.0	26.7
LO2	SW Nevada St. @ Longfellow Creek	Multi-Family	47.56502N	122.36752W	Longfellow Creek	Duwamish Drainage Basin	Creek Restoration with Habitat Features	Anchoring LWM/Habitat Restoration, Sediment and debris removal, Control Vegetation	Vactor/ Hand Work	Restore habitat features by anchoring new and existing woody debris and rock, limiting sediment and debris removal to what is necessary to restore the site	1 day for LWD anchoring, habitat rehab/sediment removal 10 CY	Demand Work as needed	Riparian, wildlife, floodplain, steep slope	1	1	4	1	256.0	42.7
LO4	SW Brandon St. @ Longfellow Creek	Single Family	47.55375N	122.36675W	Longfellow Creek	Duwamish Drainage Basin	16' x 72" Arch Culvert	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain, steep slope, wetland	1	0.5	4	1	128.0	26.7
LO7	SW Juneau St. @ Longfellow Creek	Single Family	47.54998N	122.36493W	Longfellow Creek	Duwamish Drainage Basin	78" Concrete Emergency Bypass Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment and small woody debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain, wetland	1	0.5	4	1	128.0	26.7
LO8	24th Ave. SW Mid-Block	Single Family	47.54502N	122.36420W	Longfellow Creek	Duwamish Drainage Basin	60" x 192" Arch Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment and small woody debris removal 5 CY	Quarterly and before storms	Floodplain, wildlife	1	0.5	4	1	128.0	26.7
LO9	24th Ave. SW @ 25th Ave. SW	Single Family	47.54447N	122.36438W	Longfellow Creek	Duwamish Drainage Basin	60" x 192" Arch Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment and small woody debris removal 5 CY	Quarterly and before storms	Floodplain, wildlife	1	0.5	4	1	128.0	26.7
LO10	SW Willow St. @ Longfellow Creek	Single Family	47.54187N	122.36353W	Longfellow Creek	Duwamish Drainage Basin	50" x 177" Arch Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment and small woody debris removal 5 CY	Quarterly and before storms	Floodplain, wildlife	1	0.5	4	1	128.0	26.7
LO12	SW Holden @ Longfellow Creek	Multi-Family	47.53352N	122.36182W	Longfellow Creek	Duwamish Drainage Basin	75" x 112" Arch Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment and small woody debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain, steep slope, wetland	1	0.5	4	1	128.0	26.7
SP1	31st Ave. SW @ SW 104th St.	Single Family	47.51005N	122.37130W	Seola Pond	Puget Sound Drainage Basin	18" HDPE Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	1 day for sediment/debris removal 10 CY	Every 3 years	None	1	1	0.3	1	19.2	3.2
DU1	2nd Ave. SW @ W. Marginal Way	Manufacturing/Industrial	47.53637N	122.33730W	Tidal Ditch	Duwamish Drainage Basin	48" CMP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Wetland, pond	1	0.5	4	1	128.0	26.7

Table F-1: Open Channel Facilities

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Activity Duration and Quantity Removed	Estimated Frequency of Maintenance	Environmentally Critical Areas	Crew (person/day/event)	Duration (day/event)	Frequency (event/yr)	Round Trips (qty)	Diesel Consumption (gal/yr)	Gasoline Consumption (gal/yr)
DU2	S. Norfolk St. Treatment Swale	Manufact uring/ Industrial	47.50998N	122.28253W	Engineered Swale	Duwamish Drainage Basin	60" RCP Mainline	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/ inflow	1 day for sediment/debris removal 10 CY	Demand Work as needed	Wetland	1	1	4	1	256.0	42.7
MC1	S. Cloverdale @ Grattan Pl. S.	Single Family	47.52332N	122.26437W	Mapes Creek	Lake Washington Drainage Basin	24" RCP Culvert Outfall	Sediment and Debris Removal	Vactor/Hand Work	Remove or manipulate dams for flood control and fish passage	4 hours for sediment and small woody debris removal 5 CY	Demand Work as needed	Riparian, steep slope	1	0.5	4	1	128.0	26.7
															Fuel Consumption (gal)/yr:			7501.8	1450.4
															GHG Emissions (lbs CO ₂ e):			199172.8	35244.7
															GHG Emissions (metric tons CO ₂ e):			90.3	16.0

Notes
CMP = corrugated metal pipe; CO₂e = carbon dioxide equivalent; CY = cubic yards; GHG = greenhouse gas; LWM = large woody material; RCP = reinforced concrete pipe; WDFW = Washington Department of Fish and Wildlife

Emissions Factors and Assumptions

Equipment	Diesel	Gasoline	Assumption
Excavator/Vactor Truck (gal/crew/day)	32	--	4 gal/hr
Hand-held Mower (gal/crew/day)	--	8	1 gal/hr
Generator (gal/crew/day)	32	--	4 gal/hr
Dump Truck (gal/crew/trip)	--	2.7	15 mi/gal; 40 mi/round trip; 20 CY material/round trip (at least 1 round trip even if CY material is less than 20)
Emission Factors	Diesel	Gasoline	
lbs CO ₂ e/gal	26.55	24.3	
1,000 lbs = 0.45359237 metric tons			

Table F-2: Enclosed Facilities

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Activity Duration and Quantity Removed	Estimated Frequency of Maintenance	Environmentally Critical Areas	Crew (person/day/event)	Duration (day/event)	Frequency (event/yr)	Round Trips (qty)	Diesel Consumption (gal/yr)	Gasoline Consumption (gal/yr)
TH2	49th Ave. NE @ NE 51st St.	Single Family	47.69448N	122.27312W	Thornton Mainstem Trib A	Thornton Basin - Lake Washington	12" and 24" RCP culverts	Vactoring and Jetting culverts and ditches, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment from the culvert/ditch system	4 hours for sediment/debris removal 5 CY	Every 5 years	Wildlife, riparian, floodplain, shoreline	1	0.5	0.2	1	6.4	1.3
TH6	NE 92nd St. @ Sand Point Way	Single Family	47.69545N	122.27623W	Maple Creek	Thornton Basin - Lake Washington	12" RCP Culvert	Vactoring and Jetting culverts and ditches, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment from the culvert/ditch system	1 day for sediment/debris removal 15 CY	Every 5 years	Wildlife, floodplain	1	0.5	0.2	1	6.4	1.3
TH7	Matthews Ave. NE @ Sand Point Way	Single Family	47.69563N	122.27743W	Maple Creek	Thornton Basin - Lake Washington	12" RCP Culvert	Vactoring and Jetting culverts and ditches	Vactor/Hand Work	Remove accumulated sediment from the culvert/ditch system	4 hours for sediment/debris removal 5 CY	Every 5 years	Wildlife, floodplain	1	0.5	0.2	1	6.4	1.3
TH8	Matthews Ave. NE Mid-Block	Single Family	47.69518N	122.27742W	Thornton Mainstem Trib B (Maple Creek)	Thornton Basin - Lake Washington	12" RCP Culvert	Vactoring and Jetting culverts and ditches	Vactor/Hand Work	Remove accumulated sediment from the culvert/ditch system	4 hours for sediment/debris removal 2 CY	Every 5 years	Wildlife, floodplain	1	0.5	0.2	1	6.4	1.3
TH9	Matthew Ave. NE South Block	Single Family	47.69447N	122.27695W	Thornton Mainstem Trib A	Thornton Basin - Lake Washington	12" RCP Culvert	Vactoring and Jetting culverts and ditches	Vactor/Hand Work	Remove accumulated sediment from the culvert/ditch system	4 hours for sediment/debris removal 5 CY	Every 5 years	Wildlife, riparian, floodplain	1	0.5	0.2	1	6.4	1.3
TH12	NE 96th St. @ 39th Ave. NE 905457	Single Family	47.69828N	122.28692W	Mock Creek	Thornton Basin - Lake Washington	18" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Excavate/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Quarterly and before storms	Wildlife, riparian, floodplain	1	0.25	4	1	64.0	18.7
TH20	30th Ave. NE @ NE 107th St. Kramer Culvert	Single Family	47.70693N	122.29618W	Kramer Creek	Thornton Basin - Lake Washington	36" CMP Culvert	Sediment and Debris Removal, Jetting Culverts	Vactor/Excavate/Hand Work	Remove accumulated sediment from culvert system and at the outfall/inflow	1 day for sediment/debris removal 25 CY	Every year	Wildlife, floodplain	1	0.5	1	1	32.0	6.7
TH22	31st Ave. NE @ NE 110th St.	Single Family	47.70838N	122.29398W	Unnamed Tributary	Thornton Basin - Lake Washington	24" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Every 3 years	Wildlife, floodplain	1	0.25	0.3	1	4.8	1.4
TH26	NE 100th St. @ Ravenna Ave. NE	Single Family	47.70110N	122.30098W	Willow Creek	Thornton Basin - Lake Washington	18" RCP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Wildlife, riparian, floodplain	1	0.5	4	1	128.0	26.7
TH27	NE 86th St @ Ravenna Ave. NE	Single Family	47.69118N	122.30237W	Willow Creek	Thornton Basin - Lake Washington	18" RCP Culvert	Vactoring and Jetting culverts and ditches	Vactor/Hand Work	Remove accumulated sediment from the culvert/ditch system	4 hours for sediment/debris removal 10 CY	Every 3 years	Wildlife, riparian, floodplain, wetland	1	0.5	0.3	1	9.6	2.0
TH28	NE 89th St. @ Ravenna Ave.	Multi-Family	47.69302N	122.30353W	Willow Creek	Thornton Basin - Lake Washington	18" RCP Culvert.	Vactoring and Jetting culverts and ditches	Vactor/ Hand Work	Remove accumulated sediment from the culvert/ditch system	4 hours for sediment/debris removal 10 CY	Every 3 years	Wildlife, riparian, floodplain, wetland	1	0.5	0.3	1	9.6	2.0
TH41	35th Ave. NE @ NE 115th St.	Single Family	47.71197N	122.29068W	Thornton Creek	Thornton Basin - Lake Washington	81" x 59" CMP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 10 CY	Quarterly and before storms	Wildlife, riparian, floodplain	1	0.5	4	1	128.0	26.7
TH42	33rd Ave. NE @ NE 117th St.	Single Family	47.71278N	122.29188W	Thornton Creek	Thornton Basin - Lake Washington	72" x 54" Concrete Box Culvert, 48" Concrete Box Culvert, 24" CIP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 10 CY	Quarterly and before storms	Wildlife, riparian, floodplain	1	0.5	4	1	128.0	26.7
TH47	15th Ave. NE @ NE 130th Pl.	Multi-Family	47.72510N	122.31297W	Thornton Creek	Thornton Basin - Lake Washington	72" Concrete Box Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 10 CY	Demand Work as needed	Wildlife, riparian, floodplain, steep slope	1	0.5	4	1	128.0	26.7

Table F-2: Enclosed Facilities

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Activity Duration and Quantity Removed	Estimated Frequency of Maintenance	Environmentally Critical Areas	Crew (person/day/event)	Duration (day/event)	Frequency (event/yr)	Round Trips (qty)	Diesel Consumption (gal/yr)	Gasoline Consumption (gal/yr)
TH48	10th Ave. NE @ Thornton Creek	Single Family	47.72337N	122.31812W	Thornton Creek	Thornton Basin - Lake Washington	2 - 36" RCP Culverts	Vactoring and Jetting culverts and ditches, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment from the culvert/ditch system	4 hours for sediment/debris removal 10 CY	Quarterly and before storms	Wildlife, riparian, floodplain, steep slope	1	0.5	4	1	128.0	26.7
TH55	33rd Ave. NE @ NE 127th St. 969068	Neighborhood/Commercial	47.72118N	122.29257W	Littlebrook Creek	Thornton Basin - Lake Washington	48" RCP Culvert with Sediment Vault	Sediment and Debris Removal	Vactor/ Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 10 CY	Every 2 years	Riparian, flood prone, steep slope	1	0.5	0.5	1	16.0	3.3
TH56	NE Northgate Way @ Victory Creek	Single Family	47.70873N	122.31520W	Victory Creek	Thornton Basin - Lake Washington	36" RCP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope	1	0.5	4	1	128.0	26.7
TH57	Ravenna Av. NE @ Lake City Way NE 972327	Multi-Family	47.69567N	122.30548W	Willow Creek	Thornton Basin - Lake Washington	36" RCP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope	1	0.5	4	1	128.0	26.7
TH58	NE 97th St. @ 20th Ave. NE	Single Family	47.69940N	122.30702W	Beckler Creek	Thornton Basin - Lake Washington	12" RCP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian	1	0.25	4	1	64.0	18.7
TH59	2407 NE 98th St.	Single Family	47.70023N	122.30478W	Beckler Creek	Thornton Basin - Lake Washington	12" RCP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian	1	0.25	4	1	64.0	18.7
TH60	NE 117th St @ 12th Ave NE 905081	Single Family	47.71401N	122.31616W	Victory Creek	Thornton Basin - Lake Washington	24" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian	1	0.25	4	1	64.0	18.7
TH61	NE 120th St @ 12th Ave NE	Single Family	47.71582N	122.3166W	Victory Creek	Thornton Basin - Lake Washington	24" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian	1	0.25	4	1	64.0	18.7
TH62	NE 115th @ 12th Ave NE 905087	Single Family	47.71213N	122.31549W	Victory Creek	Thornton Basin - Lake Washington	2 - 12" RCP Culverts	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian	1	0.25	4	1	64.0	18.7
TH63	Pinehurst Way NE @ Victory Creek	Single Family	47.71199N	122.31543W	Victory Creek	Thornton Basin - Lake Washington	24" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian	1	0.25	4	1	64.0	18.7
TH64	NE 114th St @ 12th Ave NE 905116	Single Family	47.71097N	122.3155W	Victory Creek	Thornton Basin - Lake Washington	24" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian	1	0.25	4	1	64.0	18.7
TH65	NE 113th St @ 12th Ave NE 905119	Single Family	47.71066N	122.3156W	Victory Creek	Thornton Basin - Lake Washington	30" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 4 CY	Demand Work as needed	Riparian	1	0.25	4	1	64.0	18.7
TH66	NE 95th St @ 27th Ave NE	Single Family	47.69745N	122.29958W	Willow Creek Tributary E	Thornton Basin - Lake Washington	18" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian, steep slope	1	0.25	4	1	64.0	18.7
TH67	NE 94th St @ 27th Ave NE 771901	Single Family	47.69655N	122.29869W	Willow Creek Tributary D	Thornton Basin - Lake Washington	12" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian	1	0.25	4	1	64.0	18.7

Table F-2: Enclosed Facilities

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Activity Duration and Quantity Removed	Estimated Frequency of Maintenance	Environmentally Critical Areas	Crew (person/day/event)	Duration (day/event)	Frequency (event/yr)	Round Trips (qty)	Diesel Consumption (gal/yr)	Gasoline Consumption (gal/yr)
TH68	NE 96th @ 35th Ave NE 904413	Single Family	47.69818N	122.29048W	Mock Creek	Thornton Basin - Lake Washington	24" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian, wildlife, steep slope	1	0.25	4	1	64.0	18.7
TH69	NE 93rd St @ 45th Ave NE 975177	Single Family	47.69576N	122.27996W	Maple Creek	Thornton Basin - Lake Washington	2 - 24" RCP Culverts	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 2 CY	Demand Work as needed	Riparian, steep slope	1	0.25	4	1	64.0	18.7
TH71	NE 100th St Drainage Mainline (Thornton Creek) (starting @ 1st Ave. NE and ending immediately east of 5th Ave. NE)	Seattle Mixed @ 1st Ave. NE to 3 rd Ave NE/ Neighbor -hood Commer-cial @ 3rd Ave. NE to 5th Ave. NE	47.7014N	122.3258W	Thornton Creek South Branch	Thornton Basin - Lake Washington	72" RCP Mainline	Sediment and Debris Removal	Vactor/Hand Work	Use pipe-in-pipe bypass to remove accumulated sediment from the pipe system, repair any minor damage to concrete	30 days for sediment/debris removal 360 CY	Every 10 years	Peat settlement-prone (category 2), steep slope	4	30	0.1	1	480.0	0.0
TH72	NE 110th Street Drainage Mainline (Kramer Creek) (starting @ Lake City Way NE and ending @ 30th Ave. NE)	Neighbor -hood Commer-cial @ Lake City WayNE/ Neighbor -hood Residen-tial to 30th Ave. NE	47.7085N	122.2995W	Kramer Creek	Thornton Basin - Lake Washington	12" RCP Culvert	Sediment and Debris Removal, Vegetation Control	Vactor/Hand Work	Construct temporary streamflow bypass, remove and relocate fish, remove accumulated material and overgrown vegetation from the system	1 day for sediment/debris, vegetation removal 15 CY	Every 2 years	Riparian corridor, wetland, flood-prone,	4	2	0.5	1	304.0	0.0
LU2	Licton Springs @ Woodlawn Ave. N.	Single Family	47.69743N	122.33872W	Licton Springs	Lake Union	18" RCP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, floodplain	1	0.5	4	1	128.0	26.7
PS2	NW Culbertson Dr @ Sherwood Rd. NW	Single Family	47.73188N	122.37050W	Unnamed PS01 - S. Fork	Puget Sound	18" CMP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	2 hours for sediment/debris removal 5 CY	Demand work as needed	Riparian, steep slope	1	0.5	4	1	64.0	18.7
PS3	7th Ave. NW @ Holman Rd NW	Multi-Family	47.70063N	122.36517W	Pipers Creek	Puget Sound	30" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope	1	0.5	4	1	128.0	26.7
PS4	8th Ave. NW @ Holman Rd. NW	Multi-Family	47.69987N	122.36563W	Pipers Creek	Puget Sound	60" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, steep slope	1	0.5	4	1	128.0	26.7
LO5	26th Av. SW @ Longfellow Creek	Single Family	47.55130N	122.36557W	Longfellow Creek	Duwamish Drainage Basin	Twin 36" RCP Culverts	Vactoring and Jetting culverts and ditches	Vactor/Hand Work	Remove accumulated sediment from the culvert/ditch system	1 day for sediment/debris removal 10 CY	Every 5 years	Riparian, wildlife, floodplain, steep slope, wetland	1	1	0.2	1	12.8	2.1
TA1	Rainier Ave. S. @ Taylor Creek	Neighbor hood/Co mmercial	47.51123N	122.24782W	Taylor Creek	Lake Washington Drainage Basin	48" RCP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain	1	0.5	4	1	128.0	26.7
TA2	68th Ave. S. @ Taylor Creek	Single Family	47.50938N	122.24810W	Taylor Creek	Lake Washington Drainage Basin	168" x 72" Box Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain	1	0.5	4	1	128.0	26.7

Table F-2: Enclosed Facilities

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Activity Duration and Quantity Removed	Estimated Frequency of Maintenance	Environmentally Critical Areas	Crew (person/day/event)	Duration (day/event)	Frequency (event/yr)	Round Trips (qty)	Diesel Consumption (gal/yr)	Gasoline Consumption (gal/yr)
TA3	SE Holyoke Way @ Taylor Creek	Single Family	47.50860N	122.24797W	Taylor Creek	Lake Washington Drainage Basin	168" x 72" Box Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain	1	0.5	4	1	128.0	26.7
FA1	Fauntleroy Way SW @ Fauntleroy Creek 943242	Single Family	47.52273N	122.39277W	Fauntleroy Creek	Puget Sound Drainage Basin	36" RCP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain, steep slope	1	0.5	4	1	128.0	26.7
FA2	45th Av. SW @ Fauntleroy Creek 918243	Neighborhood Commercial/Lowrise Multi-Family	47.52140N	122.39022W	Fauntleroy Creek	Puget Sound Drainage Basin	24" circular Clay 119' in length	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the inflow	4 hours for sediment/debris removal 10 CY	Quarterly and before storms	Riparian, wildlife, floodplain, steep slope	1	0.5	4	1	128.0	26.7
FA3	California Way SW @ Fauntleroy Creek 918244	Single Family	47.52348N	122.38757W	Fauntleroy Creek	Puget Sound Drainage Basin	36" RCP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain, steep slope	1	0.5	4	1	128.0	26.7
SC1	SW Tieg Pl. @ Schmitz Creek	Single Family	47.57780N	122.40528W	Schmitz Creek	Puget Sound Drainage Basin	Stormwater Treatment Vault	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment from the treatment structure.	4 hours for sediment/debris removal 10 CY	Quarterly and before storms	Riparian, wildlife, floodplain, steep slope	1	0.5	4	1	128.0	26.7
PC1	SW Puget Way @ Puget Creek	Single Family	47.55790N	122.35357W	Puget Creek	Duwamish Drainage Basin	46" CMP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Quarterly and before storms	Riparian, wildlife, floodplain, steep slope	1	0.5	4	1	128.0	26.7
PC2	SW Dawson @ 19th Ave SW 968515	Single Family	47.55572N	122.35822W	Puget Creek	Duwamish Drainage Basin	24" CMP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 3 CY	Demand Work as needed	Riparian, wildlife,	1	0.5	4	1	128.0	26.7
PC3	SW Brandon @ 19th Ave SW 968514	Single Family	47.55367N	122.35816W	Puget Creek	Duwamish Drainage Basin	18" CMP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 3 CY	Demand Work as needed	Riparian, wildlife, wetland	1	0.5	4	1	128.0	26.7
MC2	Sturtevant Ave S @ S. Roxbury St.	Single Family	47.51682N	122.26782W	Mapes Creek	Lake Washington Drainage Basin	18" RCP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope	1	0.5	4	1	128.0	26.7
MC3	Sturtevent Ave S. @ Renton Ave S.	Single Family	47.51568N	122.26789W	Mapes Creek	Lake Washington Drainage Basin	24" RCP Culvert	Sediment and Debris Removal	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian, steep slope	1	0.5	4	1	128.0	26.7
YC1	NE 65th St @ 39th Ave NE 904418	Single Family	47.67577N	122.28643W	Yessler Creek	Lake Washington Drainage Basin	27" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian	1	0.5	4	1	128.0	26.7
YC2	NE 62nd St @ 40th Ave NE	Single Family	47.67396N	122.28453W	Yessler Creek	Lake Washington Drainage Basin	24" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian	1	0.5	4	1	128.0	26.7
YC3	NE 60th St. @ 40th Ave NE	Single Family	47.67211N	122.28455W	Yessler Creek	Lake Washington Drainage Basin	15" RCP Culvert	Sediment and Debris Removal, Control Vegetation	Vactor/Hand Work	Remove accumulated sediment at the outfall/inflow	4 hours for sediment/debris removal 5 CY	Demand Work as needed	Riparian	1	0.5	4	1	128.0	26.7
															Fuel Consumption (gal/yr):			4996.8	953.3

Table F-2: Enclosed Facilities

WDFW Site #	Site Name	Zoning	Latitude	Longitude	Water Feature associated with Facility	Drainage Basin	Drainage Facility	Maintenance	Methods	Limits of Work	Estimated Maintenance Activity Duration and Quantity Removed	Estimated Frequency of Maintenance	Environmentally Critical Areas	Crew (person/day/event)	Duration (day/event)	Frequency (event/yr)	Round Trips (qty)	Diesel Consumption (gal/yr)	Gasoline Consumption (gal/yr)
															GHG Emissions (lbs CO ₂ e):			132665.0	23165.2
															GHG Emissions (metric tons CO ₂ e):			60.2	10.5

Notes
CMP = corrugated metal pipe; CO₂e = carbon dioxide equivalent; CY = cubic yards; GHG = greenhouse gas; LWM = large woody material; RCP = reinforced concrete pipe; WDFW = Washington Department of Fish and Wildlife

Emissions Factors and Assumptions

Equipment	Diesel	Gasoline	Assumption
Excavator/Vactor Truck (gal/crew/day)	32	--	4 gal/hr
Hand-held Mower (gal/crew/day)	--	8	1 gal/hr
Generator (gal/crew/day)	32	--	4 gal/hr
Dump Truck (gal/crew/trip)	--	2.7	15 mi/gal; 40 mi/round trip; 20 CY material/round trip (at least 1 round trip even if CY material is less than 20)

Emission Factors	Diesel	Gasoline
lbs CO ₂ e/gal	26.55	24.3
1,000 lbs = 0.45359237 metric tons		

Table F-3: Pond Facilities

				Round-trip Vehicle Mileage Estimates ¹						Vehicle Usage Estimates ²			Diesel Consumption (gal)		Equipment Usage Estimates ³				
Site Reference Name	Methods	Estimated Maintenance Activity Duration and Quantity Removed	Anticipated Maintenance Frequency (event/yr)	SPU Shop (mi)	Round Trips (qty)	Decant Facility (mi)	Round Trips (qty)	Solid Waste Facility (mi)	Round Trips (qty)	Work Trucks & Flatbeds (qty)	Vactor Trucks (qty)	Dump Trucks -10CY (qty)	Diesel Consumption (gal)	Total Diesel Consumption (gal/yr)	Gasoline Equipment Use Duration (hr)	Gasoline Equipment Used (qty)	Diesel Equipment Use Duration (hr)	Diesel Equipment Used (qty)	Total Gasoline Consumption (gal/yr)
Highland Park Basin	Excavator/Vactor/Hand Work/Pumping	1 week. 60 CY.	1	15	3	20	1	40	1	2	1	1	170	170	20	4	40	1	320
Norfolk Pond	Excavator/Hand Work/Pumping	4 weeks. 700 CY.	0.2	16	20	0	0	40	70	3	0	1	891	178	80	4	160	1	256
Jackson Park Pond - Cells	Excavator/Hand Work/Pumping	8 weeks. 3000 CY.	0.2	4	30	0	0	40	300	3	0	1	2104	421	160	4	320	1	512
Jackson Park Ponds-Structures	Vactor & Hand Work	4 weeks. 30 CY.	1	4	5	20	5	0	0	1	1	0	648	648	80	2	160	1	640
Thornton Creek Water Quality Channel - Cells	Excavator/Vactor/Hand Work/Pumping	8 weeks. 800 CY.	1	5	30	20	30	40	50	3	1	1	2763	2763	160	5	320	2	3,200
Thornton Creek Water Quality Channel- Structures	Vactor & Hand Work	4 weeks. 100 CY.	1	5	10	20	5	0	3	1	1	0	650	650	80	2	160	1	640
Littles Creek Pond	Excavator/Hand Work/Pumping	4 weeks. 500 CY.	1	4	20	0	0	40	50	3	0	1	789	789	80	4	160	1	1,280
NSC Stormwater Structures & Outfalls	Vactor & Hand Work	2 weeks. 50 CY.	0.2	5	5	20	1	0	2	1	1	0	323	65	40	2	80	1	64
Webster Pond-Settling Basin	Excavator/Hand Work	3 weeks. 300 CY.	1	16	3	0	0	40	8	3	0	1	511	511	60	4	120	1	960
Webster Pond-Overflow Maintenance Hole	Vactor/Hand Work	2 weeks. 100 CY.	4	16	10	20	1	0	10	1	1	0	332	1328	40	2	80	1	1,280
Lake City Detention Pond	Excavator/Vactor/Hand Work/Pumping	4 weeks. 1500 CY.	1	5	10	20	10	40	150	3	1	1	1703	1703	80	5	160	2	1,600
Lake City Detention Pond-Structures	Vactor/Hand Work	1 week. 10 CY.	1	5	1	20	1	0	5	1	1	0	162	162	20	2	40	1	160
Genesee Pond: Inlet Culvert	Excavator/Vactor/Hand Work	1 week. 50 CY.	1	12	3	20	1	40	2.5	2	1	1	333	333	20	4	40	2	320
Genesee Pond: Outlet Structure	Excavator/Vactor/Hand Work	2 weeks. 100 CY.	1	12	5	20	1	40	5	2	1	1	663	663	40	4	80	2	640

Table F-3: Pond Facilities

				Round-trip Vehicle Mileage Estimates ¹						Vehicle Usage Estimates ²			Diesel Consumption (gal)		Equipment Usage Estimates ³				
Site Reference Name	Methods	Estimated Maintenance Activity Duration and Quantity Removed	Anticipated Maintenance Frequency (event/yr)	SPU Shop (mi)	Round Trips (qty)	Decant Facility (mi)	Round Trips (qty)	Solid Waste Facility (mi)	Round Trips (qty)	Work Trucks & Flatbeds (qty)	Vactor Trucks (qty)	Dump Trucks -10CY (qty)	Diesel Consumption (gal)	Total Diesel Consumption (gal/yr)	Gasoline Equipment Use Duration (hr)	Gasoline Equipment Used (qty)	Diesel Equipment Use Duration (hr)	Diesel Equipment Used (qty)	Total Gasoline Consumption (gal/yr)
Olson Pond	Excavator/Vactor/Hand Work/Pumping	1 week. 100 CY	1	14	5	20	5	40	10	3	1	1	367	367	20	5	40	2	400
Bitter Lake Outfall	Excavator/Vactor/Hand Work/Pumping	1 week. 100 CY.	0.33	2	5	20	3.5	40	5	1	1	1	179	59	20	3	40	1	79
Green Lake Outfall	Excavator/Vactor/Hand Work/Pumping	2 days. 10 CY.	0.5	9	2	20	1	40	0	1	1	0	67	33	8	2	16	1	32
Haller Lake Outfall	Excavator/Vactor/Hand Work/Pumping	2 weeks. 50 CY.	0.2	1	2	20	3.5	40	1	1	1	0	325	65	40	2	80	1	64
Ashworth Pond	Excavator/Vactor/Hand Work/Pumping	1 week. 25 CY.	0.2	1	5	20	2.5	40	1	1	1	0	164	33	20	2	40	1	32
Blue Dog Pond	Excavator/Vactor/Hand Work	1 week. 50 CY.	0.2	2	2	20	2.5	40	1	1	1	1	166	33	20	3	40	1	48
Midvale Pond	Excavator/Vactor/Hand Work/Pumping	1 month. 1000 CY.	0.2	1	20	20	100	40	1	2	1	2	781	156	80	5	160	1	320
Stone Pond	Excavator/Vactor/Hand Work/Pumping	1 week. 50 CY.	0.2	1	5	20	5	40	1	2	1	1	170	34	20	4	40	1	64
										Total Estimated Diesel Fuels Consumption (gal/yr):				11,164	Total Estimated Gasoline Consumption (gal/yr):				12,911
										Diesel Emissions (lbs CO ₂ e):				296,414	Gasoline Emissions (lbs CO ₂ e):				313,742
										Diesel Emissions (metric tons CO ₂ e):				134	Gasoline Emissions (metric tons CO ₂ e):				142

Notes & Assumptions
1) Mileage estimates include approximate round-trip distance from the Charles Street or Haller Lake shop to the job site, distance from the job site to the nearest decant facility (up to 20 miles), or distance to the nearest solid waste disposal facility (up to 40 miles). If job does not require travel to decant or disposal, value is zero.
2) Vehicle types: Vactor truck, dump truck (10 CY), flatbed truck, standard work truck
3) Equipment types: Handheld mowers, generators, weedeater, trailer pumps, other pumps, excavators & vactor trucks
CY = cubic yards

Emissions Factors & Assumptions	
Diesel emissions (lbs CO ₂ e per gallon)	26.55
Gasoline emissions (lbs CO ₂ e per gallon)	24.3
1000 lbs to metric tons	0.45359237
Diesel vehicle efficiency (mpg)	15
Equipment consumption (gph)	4

