



2022 Stormwater Management Program (SWMP) Plan

March 31, 2022

*In Compliance with NPDES Western
Washington Phase II Municipal
Stormwater Permit #WAR045547*



*Prepared by the City of Clyde Hill's
Public Works Department
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HISTORY

The Federal Water Pollution Control Act of 1948 was the first major U.S. law of its kind to address water pollution. Overtime and growing public awareness and concern for controlling water pollution led to amendments in 1972. As amended in 1972, the law became commonly known as the Clean Water Act (CWA), with the intention to stop point source polluters and improve water quality for fishing, drinking, and recreational use.

The [National Pollution Discharge Elimination System](#) (NPDES) Permit Program was created by the 1972 CWA to protect and restore surface water quality by requiring a permit to continue discharging into waters of the United States. The NPDES Permit requires annual progress reports with various requirements that are phased into effect throughout the five-year coverage period that expires July 31, 2024. The City's Stormwater Management Program (SWMP) has been organized to reflect the structure of the 2019-2024 permit requirements. The required elements of this SWMP are:

- Stormwater Planning
- Public Education and Outreach
- Public Involvement and Participation
- MS4 Mapping and Documentation
- Illicit Discharge Detection and Elimination
- Controlling Runoff from New Development, Redevelopment, and Construction Sites
- Operations and Maintenance
- Source Control Program for Existing Development

The purpose of the SWMP is to develop and present the City's approach for addressing regulations, adopted plans and programs, and policies that affect urban stormwater, flooding, and associated water-dependent resources. The Public Works Department is responsible for the SWMP and NPDES Permit implementation with input and feedback from the City's Planning / Building Departments, City Administration, Consultants, Regulatory bodies, and it's citizens.

To provide comments regarding the City of Clyde Hill's SWMP please utilize the following methods:

Email: shaun@clydehill.org;
Phone: contact Public Works at 425.453.7800 ext. 104
Mail: City of Clyde Hill - Public Works Department
9605 NE 24th Street
Clyde Hill WA, 98004

View past reports - <https://www.clydehill.org/departments/public-works/stormwater-management/>

COVID-19 Restrictions: *The SWMP Plan is updated annually based on the information and resources available at the time. As circumstances cause the City to realign priorities, NPDES Permit efforts will adapt to address the greatest program needs*

INTRODUCTION

The NPDES Permit Program was created by the 1972 CWA to protect and restore surface water quality by requiring a permit to continue discharging into waters of the United States. This requires those permitted to establish a stormwater program with a set of activities and actions aimed at protecting and restoring local creeks, streams, rivers and lakes. The Washington State Department of Ecology (Ecology) administers the NPDES Permit for the Environment Protection Agency (EPA).

Specific permit requirements are identified using the Permit's citation methodology (e.g. S5.C.3.b). All Western Washington Phase II Municipal NPDES Permits and accompanying manuals, including the entire current NPDES Permit, can be viewed by visiting the Washington Department of Ecology Website: <https://ecology.wa.gov/>.

The City follows permit requirements and plans continued compliance with future requirements as they come into effect.

S5 STORMWATER MANAGEMENT PROGRAM

S5.C.1 STORMWATER PLANNING

Stormwater planning was a permit requirement introduced in the 2019 NPDES Permit. The City has engaged in various stormwater planning efforts for many years however, the new permit requirement asks the City to take a fresh look at a broad range of water quality tools available to protect and restore its receiving waters.

S5.C.1.(a) Interdisciplinary Team

Clyde Hill utilizes an “all hands” approach to inform and assist in the development of stormwater policies and strategies as well as water quality management tools to protect receiving waters. As a small agency, strategic discussions involve the Public Works Director & maintenance staff, Building Official, Administrator, City Clerk, and appropriate consultants with relevant experience either in Stormwater Design or Stormwater Planning disciplines.

S5.C.1.(b) Coordination with Long-Range Plan Updates

The core team described above will continue to ensure that stormwater considerations are used to inform updates to the City's Comprehensive Plan & its elements, along with Surface and Stormwater Management Plans. In 2022 Clyde Hill will begin the process of rewriting its Comprehensive Plan, with anticipated plan adoption in 2023. Stormwater will be an important part of this conversation and the team will ensure watershed protections, water quality standards, and stormwater management are included in long-term planning efforts as it relates to land use, growth and transportation.

Clyde Hill’s Municipal Code [15.10.090](#) generally encourages the use of LID techniques. Additional guidance for developers related specifically to drainage and Minimum Requirement #5 is available in the city’s “[Stormwater Drainage Guidelines](#)” document. Public Works will continue to review municipal code and development guidance to affirm that Low Impact Development (LID) principles and best management practices (BMPs) are the preferred approach to site development.

i. S5.C.1.(d).i Receiving Water Assessment

The City utilized a consultant to perform basin delineation and watershed & receiving water identification. The results of the assessment is included as an Appendix at the end of this SWMP.

In accordance with this requirement the City will utilize information from the “Receiving Water Assessment” to evaluate which receiving waters will most benefit from targeted facility improvements or management-policy actions. The prioritized and ranked list will be available no later than *June 30th 2022*.

Clyde Hill will utilize the information developed in Part i & ii of this section and take necessary action to meet the *March 31st 2023* deadline for development of its SMAP.

[illegible]

Figure 1 - Basin Delineation and Watershed Identification

S5.C.2 PUBLIC EDUCATION AND OUTREACH

The City will be increasing its participation in a variety of stormwater education and outreach efforts focused on environmental stewardship, including stormwater management. This includes participation in regional stormwater working groups, and whenever appropriate, the City will partner with neighboring jurisdictions to ensure stormwater outreach messages are clear, consistent, and widely distributed for the local population.

S5.C.2.(a).i General Awareness

In 2022 the City will implement or continue the following activities to provide targeted stormwater-related outreach programs to the public:

- Coordinate with other permitted jurisdictions in the region through organizations such as the Stormwater Outreach for Regional Municipalities (STORM) and Puget Sound Starts Here (PSSH).
- Provide school-based* environmental educational programs through a partnership with the Cascade Water Alliance and the environmental education non-profit organization Nature Vision.
- Maintain pet waste stations at various locations throughout the City. Implement findings of the 2021 Behavior Change campaign (summary memo included in appendix).
- Monitor, update, and replace signage as needed around City-owned properties or stormwater facilities to educate residents, businesses, and visitors about the vital role proper stormwater management plays in local environmental health.
- Provide information to local developers, engineers, and contractors regarding permanent and temporary management of stormwater on a site

**Due to COVID-19 programming restrictions, classroom programs may continue to be limited or take place on-line.*

S5.C.2.(a).ii Behavior Change

Through 2022 the City will work with the regional STORM group and plans to participate in the “Adopt a Drain” program to affect behavior change of residents in the prevention of illicit discharges into the MS4 by utilizing social marketing practices and methods.

Clyde Hill’s 2021 Behavior Change campaign involved proper disposal of pet waste with the intent of preventing waste from entering into the MS4. Generally the city used online surveys to gauge

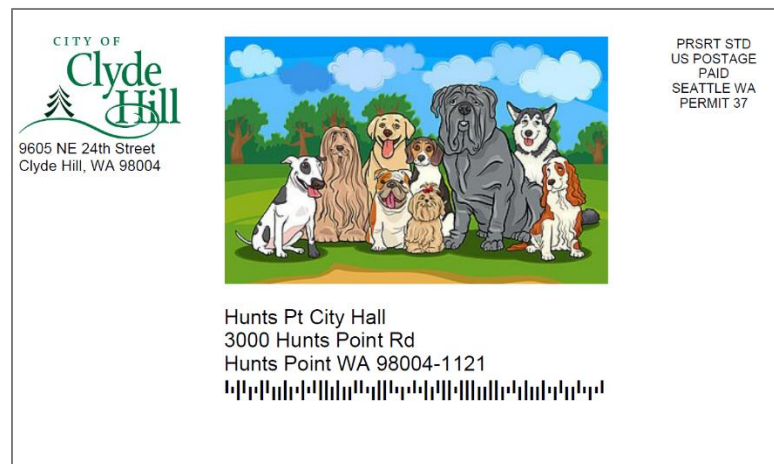


Figure 2 - Survey Postcard

public perceptions at the beginning and end of the campaign, while also measuring (by weight) the use of dog-waste disposal bags at various locations in the city during the campaign period. The study found that many pet owners were already properly disposing of their pets waste and identified higher traffic areas that could benefit from additional receptacles. The campaign provided good information and lessons-learned which will benefit future efforts, a summary memo is included in the appendix to this SWMP.

S5.C.2.(c) Creating Stewardship Opportunity

SWMP stewardship opportunities have been created to encourage participation in surface water protection and active incorporation of SWMP principles and goals. General residential stewardship activities such as volunteer plantings are emphasized during public venues such as Earth and Arbor Day, and other public educational opportunities at City sponsored events. Stewardship is also encouraged through interaction and volunteer planting/maintenance parties and storm drain marking primarily with the Boy Scouts of America, or groups and individuals requesting or required to complete volunteer service hours. Additional local & regional stewardship opportunities include:

City of Bellevue Environmental Stewardship Volunteer Opportunities:

<https://parks.bellevuewa.gov/nature-and-environment/visitor-centers-environmental-programs/environmental-stewardship-volunteer-opportunities>

(Provides information on volunteer stewardship opportunities in City of Bellevue parks)

Earthcorps:

<https://www.earthcorps.org/volunteer/>

(Provides information on volunteer stewardship opportunities in other Eastside parks)

COVID-19 restrictions: *in-person activities are still generally limited, and no specific stewardship events are currently planned. The City will look for opportunities to support additional stewardship events in the coming year as restrictions ease and partner agencies resume typical activities.*

S5.C.3 PUBLIC INVOLVEMENT AND PARTICIPATION

Comments from the public are welcomed throughout the year and the city provides a phone number and email address for residents to contact with questions. The Draft SWMP Plan will be presented to the City Council during a Public hearing at a regularly scheduled meeting on March 8th 2022. During the meeting, any member of the public who wishes to comment on the SWMP will be given the opportunity to do so. Comments will be evaluated by staff and adjustments to the SWMP made if appropriate.

The City will notify the public of stormwater related discussions outside of the annual SWMP via the City website and social media posts. City webpages can be translated into other languages using the Google Translate Tool but the City will take advantage of opportunities to translate key written outreach materials into common languages spoken in our community when presented.

Common ways to participate or get involved:

- Website: <https://www.clydehill.org/departments/public-works/stormwater-management/>
- Social Media: [Facebook](#) and [Next Door](#)
- Email: cityhall@clydehill.org
- Phone: 425.453.7800
- Mail: City of Clyde Hill – Public Works
9605 NE 24th Street
Clyde Hill WA, 98004

S5.C.4 MS4 MAPPING AND DOCUMENTATION

The City of Clyde Hill's MS4 has been previously mapped and includes the elements required by the current Permit. Updates to the map are generally made quarterly by the City's GIS consultant. Privately-owned detention tank systems that are part of planned development are added to the MS4 mapping from record drawings when construction is completed. Ongoing mapping efforts as it pertains to stormwater activities assist in identifying drainage issues within the City.

In 2022 the City will continue to maintain its comprehensive stormwater conveyance map using ArcGIS geodatabase methods and incorporating observations from

annual inspections or previously undiscovered structures, conveyance, etc. Updating and managing data is done according to documented procedures and quality control standards.

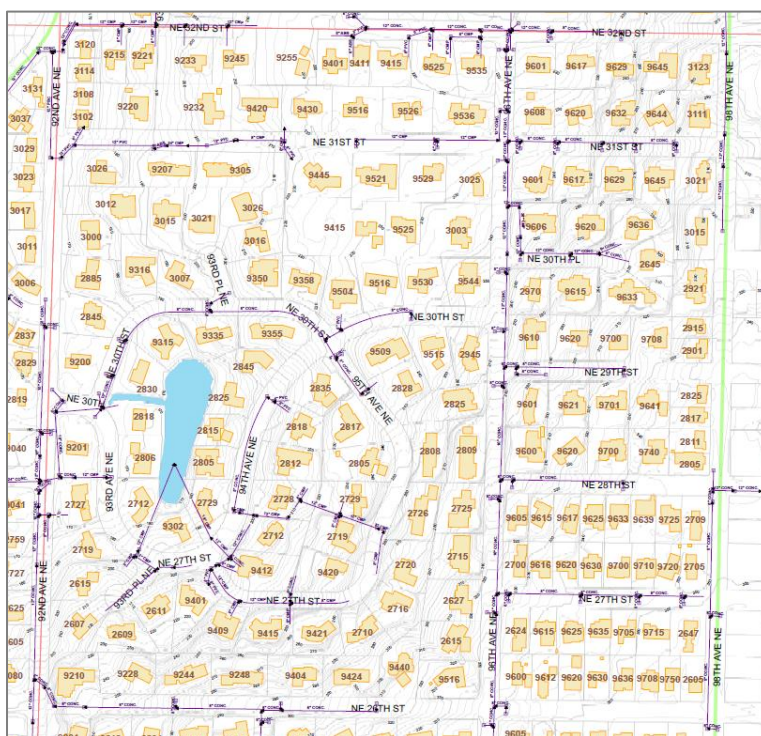


Figure 3 - Example of GIS-based Storm System Map

S5.C.5 ILLICIT DISCHARGE DETECTION AND ELIMINATION

The City's Illicit Discharge Detection and Elimination (IDDE) program was developed in 2008 and is designed to prevent contamination of groundwater and surface water by monitoring, tracking, and removing non-stormwater discharges into the stormwater drainage system. The City's SWMP includes an ongoing program to detect and remove illicit connections and discharges as defined in 40 CFR 122.26(b)(2), including any spills not under the purview of another responding authority, into the municipal separate storm sewers owned or operated by the City.

S5.C.5.(a) Reporting and corrective measures

The City's general phone number is posted to the website with instruction for residents, visitors, and City employees to report illicit discharges, dumping or other stormwater related concerns within City limits: 425.453.7800; emergency after-hours (via Norcom): 425.577.5656. Additionally, reporting parties can email: cityhall@clydehill.org. This information is available on the City's Public Works Department Stormwater web page and under general city contact pages.

During regular business hours calls are received by the Public Works Department. After-hours reporting is managed by the Public Works Director or other assigned personnel.



S5.C.5.(b) Target Stormwater Outreach

Illicit discharge public education to inform public employees, businesses, and the general public of hazards associated with illicit discharges and improper storage of waste have been integrated into the public education efforts described in S5.C.2 of the SWMP Plan.

S5.C.5.(c) Ordinance prohibiting non-stormwater and illicit discharges into MS4

This SWMP includes an ongoing program to prevent, detect, characterize, trace, and eliminate illicit connections and illicit discharges into the municipal separate storm sewer system (MS4). A City IDDE Ordinance was developed and adopted into the Clyde Hill Municipal Code [CHMC 13.10](#), to effectively prohibits non-stormwater, illicit discharges into the City's MS4 to the maximum extent allowable under State and Federal law. The City continues to research and network with surrounding jurisdictions and Ecology to continue to improve and update these policies.

S5.C.5.(d) IDDE program to detect and identify non-stormwater discharges and illicit connections

The ongoing IDDE program is also designed to address illicit discharges including spills and illicit connections. The program requires by inspection, characterizing the nature of, and potential public and environmental threat posed by an illicit discharge; and attempt to trace the source and eliminate the illicit connection.

The City is required to screen or inspect 12% of the City's stormwater conveyance and catchment system for illicit connections each year. This is accomplished by dry weather screening City outfalls (pipes) that exceed 12-inches in diameter, annual catch basin inspections and stormwater facility inspections. In 2021 staff performed inspections on 915 of the storm system's catch basins. Any identified illicit connections during these inspections are recorded and documented with inspection sheets or primarily through the city's Mobile 311 system. The inspector would then notify the Public Works Engineering Director for documentation and remedy. Compliance with this provision is achieved by investigating (or referring to the appropriate agency) within 7 days, on average, any complaints, reports or monitoring information that indicates a potential illicit discharge, including spills; and immediately

investigating (or referring) problems and violations determined to be emergencies or otherwise judged to be urgent or severe. This protocol will continue in 2022.

S5.C.5.(e) Implement a program to address Illicit discharges

Under the IDDE program the City responds to and investigates calls and emails regarding environmental concerns such as illegal dumping, spills, illicit discharges, and illicit connections. Procedures for characterizing the nature and potential threat posed by detected or reported illicit discharges are documented in Chapter 6 of the City of Clyde Hill's IDDE Plan. Procedures for tracing the source of an illicit discharge are described in Chapter 5 of the City's IDDE Plan, with references to Chapter 13 of the Center for Urban Watershed Protection's IDDE Manual for detailed procedures for tracing the source of identified illicit discharges. Procedures for eliminating the illicit discharge, including spill response, are contained in Chapter 6 of the City's IDDE Plan. [CHMC 13.10](#) contains notification and enforcement procedures for addressing illicit discharges.

S5.C.5.(f) and (g) IDDE Staff Training and Recordkeeping

Public Works Maintenance Crewmembers and those who might come into contact with or otherwise observe an illicit discharge are trained to identify, document and report illicit discharges or connections to the city's MS4. Clyde Hill staff responsible for the IDDE program initially attended a training seminar in 2017. Staff continue to look for resources that are tailored to specific job-related activities that aid in informing the City's entire workforce and continue to refine new employee orientation and training opportunities. IDDE-specific refresher training will be provided to staff in 2022 and as staff changes occur.

All recordkeeping associated with the City's IDDE program is maintained by the Public Works Director. Records generally include the following:

- Field Screening Data Sheets
- Records of all detected illicit discharges and actions taken
- Reports of all reported spills and illicit discharges and actions taken
- Records of illicit connections and actions taken
- Records of IDDE training provided and staff trained

In 2022, continued field screening and inspections will be performed using the City's "Mobile 311" GIS-based data management system. All IDDE incidences are reported to the *WQ WebIDDE* app for reporting to Ecology.

S5.C.6 CONTROLLING RUNOFF FROM DEVELOPMENT AND REDEVELOPMENT PROJECTS

The City of Clyde Hill has an established program for controlling runoff from new development, redevelopment and construction sites that will continue in 2022. The program shall apply to private and public development, including transportation projects. Development and redevelopment projects in the City can have a significant impact on the health of local creeks, streams, and other waterbodies. City staff review and inspect development sites during

construction to ensure temporary and permanent facilities are maintained and functioning as designed. The following sections describe existing program elements to comply with Permit requirements.

S5.C.6.(a) and (b) Develop Stormwater Management Standards

[CHMC 15.10 \(Drainage\)](#) codifies stormwater management in the City and includes code for construction and stormwater infrastructure design. The municipal code is supplemented by the City's Stormwater Drainage Guidelines which provides additional detail specific to stormwater management & design. CHMC authorizes the City to enforce provisions required by the NPDES permit, including the minimum requirements in [Appendix 1](#). The City will continue to evaluate and, as necessary, update the CHMC to match requirements found in [Appendix 10](#) of the 2019 permit. This requirement is scheduled to be completed by the June 30th 2022 deadline.

The City will continue to modify and update development standards and applicable CHMC as required to include enforceable thresholds by the Permit.

S5.C.6.(c) Review and Inspect Public and Private Development/Redevelopment Projects

Clyde Hill's Public Works Director, building official, and appropriate consulting engineers review permits as submitted for both public and private development/redevelopment and infrastructure improvement projects. This process includes Engineering or Site Plan review and approval, inspections, and enforcement actions necessary to meet standards established by CHMC.

The City will continue its current stormwater permitting process with plan review, inspection and enforcement capability to ensure compliance with code requirements for both private and public projects, using qualified personnel. This includes:

- Review of all stormwater site plans
- Inspection of all submitted development sites that have a high potential for sediment transport prior to clearing and construction
- Inspection of all permitted development sites during construction to verify proper installation and maintenance of required erosion and sediment controls with enforcement as necessary, based on the inspections
- Inspection of all permitted development sites upon completion of construction and prior to final approval or occupancy to ensure proper installation of permanent stormwater controls, such as stormwater facilities and structural BMPs
- Verification that a maintenance plan has been completed and responsibility for maintenance has been assigned with enforcement as necessary, based on the inspections
- Ensuring compliance with inspection requirements by the presence and records of an established inspection program that is designed to inspect all sites and achieve at least 80% of scheduled inspections

S5.C.6.(d) Notice of Intent (NOI)

In 2022 the City will continue to make the application for NOIs for coverage under the NPDES Construction Stormwater General Permit and the NPDES General Industrial Stormwater Permit available to the development community. These forms are available on Ecology's website.

S5.C.6.(e) Staff Training

Staff responsible for implementing the program to control stormwater runoff from new development, redevelopment and construction sites, including permitting, plan review, construction site inspections, and enforcement, are trained to conduct these activities. Follow-up staff training, including peer-to-peer training, will be provided in 2022 as needed to address changes in standards, procedures, and techniques. Staff responsible for inspecting temporary erosion and sediment control (TESC) measures at construction sites are Certified Erosion and Sediment Control Lead (CESCL) certified. Records of training provided as well as records of staff that received training are maintained by the Public Works Director. The City will continue to document and maintain all relevant staff training records.

S5.C.7 OPERATIONS & MAINTENANCE

The City has taken many steps to ensure operational and maintenance activities are done in a manner that protects and reduces potential impacts to stormwater infrastructure and creeks, streams, rivers, wetlands, and lakes.

S5.C.7.(a) Maintenance Standards

[Chapter 15.10.100](#) of Clyde Hill's municipal code requires that private stormwater facilities be maintained to the standards & requirements of "the most current version of Washington State Department of Ecology's Stormwater Management Manual for Western Washington" by "the person or persons holding title to the property." This requirement, and duty, is formalized in a county-recorded Declaration of Covenant for Maintenance and Inspection of Stormwater BMP's.

S5.C.7.(b) Maintenance of Facilities Regulated by the City

The City verifies adequate long-term operation and maintenance (O&M) of permanent stormwater facilities and BMPs for private projects by working with owners & operators of private stormwater facilities to ensure they continue functioning as designed. All stormwater infrastructure, including runoff treatment and flow control facilities, are inspected prior to final formal approval or acceptance by the City. Once this occurs on private sites, these facilities are added to the long-term private system inspection program. In 2019 the City implemented a program to inspect all permitted, privately-maintained stormwater facilities within Clyde Hill. The steps to implement this program will be as follows:

- The City's GIS consultant will add private detention systems to the GIS-mapping based on record drawings
- City field staff will field check facility locations and update GIS records using Mobile 311.

- City field staff will perform inspections in accordance with CHMC 15.10.100 and CHMC 15.10.110, utilizing maintenance standards from Chapter 4 of Volume V of the 2014 SWMMWW. Inspections will be documented using Mobile 311.
- Notifications will be delivered to property owners when an inspection identifies an exceedance of maintenance standards, requiring maintenance be performed within 1 year for typical facility maintenance, or within 6 months for catch basins. Maintenance requiring capital construction will be required to be performed within 2 years.
- Follow-up inspections will be performed after maintenance has been performed.
- Enforcement of maintenance requirements, if required, will be performed in accordance with CHMC 15.10.120.

After four years of annual facility inspections, the City will review maintenance records and evaluate if a reduced inspection frequency is appropriate.

55.C.7.(c) Maintenance of Facilities Owned & Operated by the City

The City completes annual inspections of all stormwater treatment and flow control BMPs and or facilities in accordance with adopted maintenance standards.

The City will continue to implement its municipal catch basin inspection program. Catch basins, inlets, and control structures owned or operated by the City are inspected annually. Catch basins are cleaned if the inspection indicates cleaning is needed to comply with maintenance standards established in the ***Stormwater Management Manual for Western Washington***. In 2021 Public Works performed inspections of 915 catch basins, with 35 identified for follow up, and subsequently cleaned by vector truck.

Any identified maintenance actions occurred within the timeframe outlined by the NPDES Permit. Decant water shall be disposed of in accordance with Appendix 6 – Street Waste Disposal.

The City inspects known “hotspots” in the stormwater system during and immediately after any large storm events (requirement: 24-hour storm event with a 10 year or greater reoccurrence interval). For the purpose of hotspot checks, a large storm in Clyde Hill is considered two or more inches of rainfall in a 24-hour period, unless otherwise directed by the Public Works Director

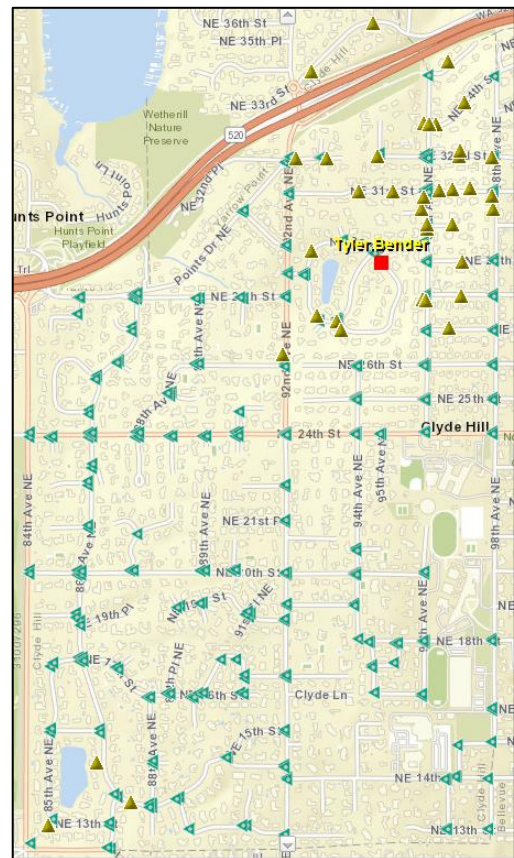


Figure 4 - Basins marked for follow up cleaning 2021

S5.C.7.(d) Practices, Policies, Procedures to Reduce Stormwater Impacts of Municipal Operations

The City has developed and Implemented practices, policies, and procedures to reduce stormwater impacts associated with runoff from all lands owned or maintained by the City, and road maintenance activities under the functional control of the City include, but are not limited to: streets, parking lots, roads, highways, buildings, parks, open space, road rights-of-way, maintenance yards, and stormwater treatment and flow control BMPs/facilities. Specific examples of these policies are provided below:

City Parks: The City of Clyde Hill operates two small parks: Clyde Hill City Park (0.8 acre), which contains two tennis courts, located at the south end of 95th Avenue NE, west of Clyde Hill Elementary; and Clyde Hill View Park, a short segment of public right-of-way (approx. 0.1 acre) along NE 26th Street immediately east of 92nd Avenue NE that contains a landscaped stairway and small lawn area with park bench. The City uses native and adapted vegetation to reduce water, fertilizer and pesticide needs, and uses integrated pest management to minimize the use of pesticides.

Road and Street Maintenance: The City of Clyde Hill performs street sweeping of major streets on a monthly basis, weather permitting. Roadside area and vegetation are generally maintained without use of herbicides or pesticides. Road repair and resurfacing is performed by contractors in accordance with requirements for construction stormwater pollution prevention as documented in the 2014 SWMMWW. During snow and ice events, crews apply deicer sparingly to dry surfaces in anticipation of a forthcoming event with sand or sand/salt mixes applied to areas determined to be potentially hazardous. Following an event, sand and grit is swept to reduce material ending up in catch basins.

S5.C.7.(e) Employee Training

The training program addresses the importance of protecting water quality, operation and maintenance standards, inspection procedures, relevant SWPPPs, selecting appropriate BMPs, ways to perform their job activities to prevent or minimize impacts to water quality, and procedures for reporting water quality concerns. The City maintains records of ongoing training program for employees whose primary construction, operations, or maintenance job functions may impact stormwater quality. This practice will continue in 2022.

S5.C.7.(f) Stormwater Pollution Prevention Plan for City Facilities

A SWPPP has been prepared for the City's main maintenance/storage facility located at [2119 96th Avenue NE](#). The current SWPPP will be update as required to fully meet detailed permit requirements.

S5.C.7.(g) Record Maintenance

The City maintains records of inspection, maintenance, and repair to City-operated stormwater facilities as detailed in this section.

S5.C.8 SOURCE CONTROL FOR EXISTING DEVELOPMENT

The City currently uses the existing GIS inventory and annual inspections of public and privately-owned stormwater facilities and catch basins to satisfy this requirement and prevent and reduce pollutants in runoff from areas that discharge to the MS4. The City will continue to require pollution preventing BMPs and facilities for pollution generating sources based on land use and activities.

The City is reviewing current Municipal Code with a goal to identify any revisions or additions to ordinances that will be required to meet the August 1, 2022 deadline for the enforcement of source control BMPs to existing, developed sites. The City will also identify the level of effort to identify and inventory potential sources of pollutants.

S8 MONITORING AND ASSESSMENT

The City is a member of the Stormwater Action Monitoring (SAM) consortium, which coordinates a regional monitoring program that includes (1) Status and Trends monitoring, (2) Stormwater Program Effectiveness monitoring, and (3) Source Identification and diagnostic monitoring. The City has opted to fully participate in SAM under the current permit cycle to maintain compliance. For information about SAM-sponsored monitoring projects, please visit the [SAM website](#).

S8.A STATUS AND TRENDS MONITORING

The City has chosen to participate in the program described above to satisfy this requirement and notified Ecology prior to the deadline.

S8.B EFFECTIVENESS AND SOURCE IDENTIFICATION STUDIES

The City has chosen to participate in the SAM effectiveness and source identification programs in order to meet this requirement.

GLOSSARY

Best Management Practices (BMPs): The schedules of activities, prohibitions of practices, maintenance procedures, and structural and/or managerial practices approved by the Department of Ecology that, when used singly or in combination, prevent or reduce the release of pollutants and other adverse impacts to waters of Washington State. For example, a structural BMP is the use of catch basin cloth inserts to capture sediment from turbid water prior to the water discharging into the stormwater system.

Clean Water Act (CWA): Formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972, Pub. L. 92-500, as amended Pub. L. 95-217, Pub L. 95-576, Pub L. 6-483 and Pub. L. 97-117, 33 U.S.C. 1251 et seq.

Illicit Connection: Any man-made conveyance that is connected to a municipal separate storm sewer without a permit, excluding roof drains and other similar type connections.

Illicit Discharge: Examples include sanitary sewer connections, floor drains, channels, pipelines, conduits, inlets, or outlets that are connected directly to the municipal separate storm sewer system. Any discharge to a municipal separate storm sewer that is not composed entirely of stormwater except discharges pursuant to an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from firefighting activities.

Low Impact Development (LID): A stormwater management and land development strategy applied at the parcel and subdivision scale that emphasizes conservation and use of onsite natural features integrated with engineered, small-scale hydrologic controls to more closely mimic predevelopment hydrologic functions. It aims to capture water, slow it down, allow it to enter our soil, and clean and cool the water before it reaches our streams.

Municipal Separate Storm Sewer System (MS4): A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains):

- i. Owned or operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State Law) having jurisdiction over disposal of wastes, stormwater, or other wastes, including special districts under State Law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe of an authorized Indian tribal organization, or a designated and approved management agency under Section 208 of the CWA that discharges to water of the United States;
- ii. Designed or used for collecting or conveying stormwater;
- iii. Which is not a combined sewer; and
- iv. Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

National Pollution Discharge Elimination System (NPDES): The national program for issuing, modifying, revoking, and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318, and 405 of the Federal Clean Water Act, for the discharge of pollutants to surface waters of the state from point sources. These permits are referred to as NPDES permits and, in Washington State, are administered by the Washington State Department of Ecology.

Non-Point Source Pollution (NPS): NPS pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters, and ground waters.

Point Source Pollution: Any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture.

Stormwater: Runoff during and following precipitation and snowmelt events, including surface runoff and drainage.

Stormwater Management Program (SWMP): A set of actions and activities designed to reduce the discharge of pollutants from the regulated small MS4 to the maximum extent practicable and to protect water quality, and comprising the components listed in S5 and S6 of the NPDES permit and any additional actions necessary to meet the requirements of the NPDES permit.

Surface Water: Includes lakes, rivers, ponds, streams, inland waters, saltwaters, wetlands, other surface waters, and water courses as well as shallow groundwater.

Total Maximum Daily Load (TMDL): A water cleanup plan. A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. The calculation must include a margin of safety to ensure that the water body can be used for the purposes the state has designated. The calculation must also account for seasonable variation in water quality. Water quality standards are set by states, territories, and tribes. They identify the uses for each water body (i.e. drinking water supply, contact recreation such as swimming, and aquatic life support such as fishing), and the scientific criteria to support that use. The Clean Water Act, Section 303, establishes the water quality standards and TMDL programs.

Appendix A – Stormwater Mitigation Action Plan (SMAP) Receiving Water Assessment



Stormwater Management Action Plan

Receiving Water Assessment

1.1.1 Overview

A receiving water assessment was performed for the City of Clyde Hill to assess and document the existing information and conditions related to local receiving waters and contributing areas. The purpose of the assessment is to aid in identifying the receiving waters that would most likely benefit from stormwater management planning.

The NPDES permit requires a watershed inventory, provided as a table, to be submitted no later than March 31, 2022, and a brief description of the receiving waters that are in Clyde Hill. Four waterbodies were identified as receiving waters for the City of Clyde Hill. Assessment was performed using 303(d) listing information, Puget Sound Watershed Characterization Project, and the Coastal Atlas Map.

1.1.2 Receiving Waters

Stormwater in the Northeastern portion of Clyde Hill drains to Yarrow Creek (A499), a water with the designated use of anadromous fishery. The total area of the Yarrow Creek basin is approximately 640 acres, of which Clyde Hill makes up 100 acres or 16% of the total drainage basin. Water Quality Assessment review showed that, of the four outfalls to which the City contributed runoff, the Yarrow Creek basin had the lowest water quality concerns. The Water flow Assessment revealed low surface storage and high discharge rates. Of all the basin outfalls, the Yarrow Creek basin is likely the best receiving water to which the City MS4 contributes.

Stormwater in the Northwestern portion of Clyde Hill contributes to the Fairweather Creek basin (0498), a water with the designated use of anadromous fishery, and an unnamed tributary to Cozy Cove Bay (called Cozy Cove Creek), which also has the designated use of anadromous fishery. Both water bodies are under the same Analysis Unit ID in the Puget Sound Watershed Characterization Project. Therefore, it is assumed both water bodies share the same characteristics, outside of the 303(d) listing applied to Fairweather Creek.

The total area of the Fairweather Creek basin is approximately 420 acres, of which Clyde Hill makes up 218 acres or 52% of the total drainage basin. The total area of the Cozy Cove basin is approximately 180 acres, of which Clyde Hill makes up 116 acres or 64% of the total drainage basin. Water Quality Assessment review showed that the Fairweather Creek/ Cozy Cove basins had high sediment and moderate levels of phosphorous, which could be attributed to a golf course located outside of the City of Clyde Hill limits. The Water flow Assessment revealed low surface storage and high discharge rates. Of all the outfalls, the Fairweather Creek/Cozy Cove basin is likely the worst receiving water to which the City MS4 contributes. Additionally, Fairweather Creek has a 303(d) listing for bacteria, temperature, dissolved oxygen, and copper.

The southern portion of Clyde Hill drains to the Medina Coastline via two main outfalls: an unnamed open channel and the storm pipe network. Because both downstream pathways are under the same Analysis Unit ID in the Puget Sound Watershed Characterization Project and are also constructed pathways, their contributing basins are treated as a single basin for this analysis. The Medina Coastline



Stormwater Management Action Plan

Receiving Water Assessment

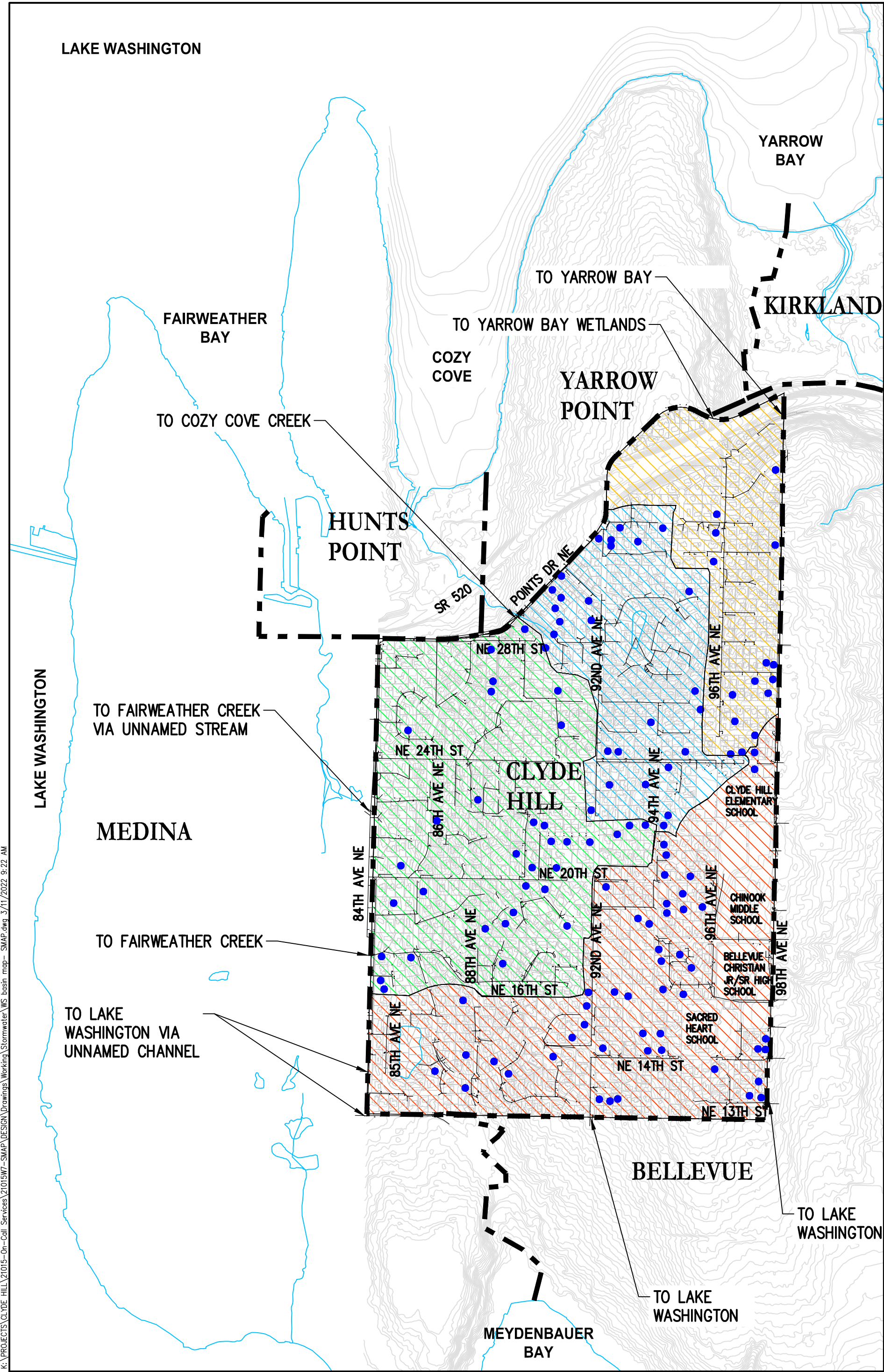
of Lake Washington has the designated use of anadromous fishery. The total area of the Medina basin is approximately 2,557 acres, of which Clyde Hill makes up 236 acres or 9% of the total drainage basin. Water Quality Assessment review showed that, this basin water quality concerns related to high levels of metals, nitrogen, and sediment. The Water flow Assessment revealed low surface storage and high discharge rates.

City of Clyde Hill
Stormwater Mitigation Action Plan - Receiving Water Assessment

March 2022

	Analysis Unit ID	8120	8118	8118	8121
	Water Body Name	Yarrow Creek	Fairweather Creek	Unnamed Tributary to Cozy Cove Bay/"Cozy Cove Creek"	Medina Direct Discharge
	Stream ID	A499	498	N/A	N/A
Step 1	Total area of WS (acre)	640	420	180	2556.60
Step 1	Area of WS in CH (sf)	4356984.94	9476050	5039630.07	10286622.3
Step 1	Area of WS in CH (acre)	100.02	217.54	116.00	236.15
Step 1	Percent of the total watershed area that is in the Permittee's jurisdiction	16%	52%	64%	9%
Step 2	Designated Use	anadromous fishery	anadromous fishery	anadromous fishery	n/a
Step 2	R-1 Res	63%	47%	82%	66%
Step 2	B-1 Business	0%	0%	0%	0%
Step 2	G-1 Gov	0%	0%	0%	0%
Step 2	S-1 School	0%	1%	0%	19%
Step 2	ROW	37%	52%	18%	14%
Step 2	Population	502	1091	582	1184
Step 2	Existing FC BMPs	15	35	27	48
Step 2	Existing WQ BMPs	unk	unk	unk	unk
Step 2	Fish and Wildlife	poor	very poor	very poor	very poor
Step 2	How much growth is directed toward this area	low	low	low	low
Step 2	How is transportation planning likely to affect the basin	no plans to substantially alter transportation network	no plans to substantially alter transportation network	no plans to substantially alter transportation network	no plans to substantially alter transportation network
Step 2	Are headwaters, riparian areas, and other sensitive portions of the basin likely to be protected under current zoning and plans?	There are no substantial riparian areas within the City of Clyde Hill. Current zoning codes include environmental protections for sensitive areas to prevent degradation in accordance with DOE standards.	There are no substantial riparian areas within the City of Clyde Hill. Current zoning codes include environmental protections for sensitive areas to prevent degradation in accordance with DOE standards.	There are no substantial riparian areas within the City of Clyde Hill. Current zoning codes include environmental protections for sensitive areas to prevent degradation in accordance with DOE standards.	There are no substantial riparian areas within the City of Clyde Hill. Current zoning codes include environmental protections for sensitive areas to prevent degradation in accordance with DOE standards.
Step 2	Is the receiving water impaired?	No	Yes	No	No
Step 2	303(d) listing reason	n/a	Bact, Temp, Copper, DO	n/a	n/a
Step 2	If yes, What sources/activities are the main contributors to the pollutant load targeted for reduction (e.g., polluting activities associated with particular land use or land cover types)?	n/a	Primary contributor is untreated roadway surface runoff.	n/a	n/a
Step 2	When does the impairment occur? Is it seasonal, or flow-dependent?	n/a	Year round	n/a	n/a
Step 2	Can these sources be addressed (or are they already being addressed) through BMPs found in the SWMMWW and applied through your SWMP?	n/a	Yes. Additional mitigation can be provided by enhanced water quality treatment facilities (vaults, surface BMPs) to treat roadway runoff.	n/a	n/a
Step 2	Will enhanced municipal stormwater management actions result in meeting loading targets?	n/a	Yes	n/a	n/a
Step 2	Are substantial non-stormwater management actions needed to address the impairment?	n/a	None identified.	n/a	n/a
Step 2	What combination of additional stormwater management actions will most effectively reduce current and future loadings?	n/a	Provide additional water quality treatment for surface runoff from contributing sources.	n/a	n/a
Step 2	Evaluate information related to overburdened communities within the contributing areas to help determine where overlap may exist with improving receiving water conditions for water quality and human health.	West of 92nd Ave NE	West of 92nd Ave NE	West of 92nd Ave NE	West of 92nd Ave NE
Step 2	Likely best receiving water CH MS4 Contributors	1	4	3	2
Step 2	Likely worst receiving water CH MS4 Contributors	4	1	2	3

	Analysis Unit ID	8120	8118	8118	8121
	Water Body Name	Yarrow Creek	Fairweather Creek	Unnamed Tributary to Cozy Cove Bay/"Cozy Cove Creek"	Medina Direct Discharge
	Stream ID	A499	498	N/A	N/A
Step 3	Sources Used	Puget Sound Watershed Characterization Project	Puget Sound Watershed Characterization Project, 303(d) listing	Puget Sound Watershed Characterization Project	Puget Sound Watershed Characterization Project
Step 3	What are the major pollutants and/or flow impacts associated with individual point sources versus non-point sources?	Metals, Phosphorous, Hydrocarbons, Increased Runoff from Development	Metals, Phosphorous, Hydrocarbons, Increased Runoff from Development	Metals, Phosphorous, Hydrocarbons, Increased Runoff from Development	Metals, Phosphorous, Hydrocarbons, Increased Runoff from Development
Step 3	Will the loadings and/or runoff volumes increase under expected future land use conditions?	No	No	No	No
Step 3	Can these sources be addressed through other land management strategies, including policies, code, or development standards?	Modifications to the WQ requirements for redevelopment affecting pollution generating surfaces or modifications to detention requirements for development, continue public education and outreach, pursue retrofit projects for water quality and detention facilities for public right-of-way	Modifications to the WQ requirements for redevelopment affecting pollution generating surfaces or modifications to detention requirements for development, continue public education and outreach, pursue retrofit projects for water quality and detention facilities for public right-of-way	Modifications to the WQ requirements for redevelopment affecting pollution generating surfaces or modifications to detention requirements for development, continue public education and outreach, pursue retrofit projects for water quality and detention facilities for public right-of-way	Modifications to the WQ requirements for redevelopment affecting pollution generating surfaces or modifications to detention requirements for development, continue public education and outreach, pursue retrofit projects for water quality and detention facilities for public right-of-way
Step 3	Can future growth be managed to minimize adverse stormwater impacts?	Yes by modifying building requirements or through installing stormwater retrofits	Yes by modifying building requirements or through installing stormwater retrofits	Yes by modifying building requirements or through installing stormwater retrofits	Yes by modifying building requirements or through installing stormwater retrofits
Step 3	Expected Hydrologic Impact	Mod	Mod	Low	Low
Step 4	Expected Pollutant Loading	Mod	Mod	Mod	Mod
Step 4	Planned Land Use in Basin (20 years)	No Change	No Change	No Change	No Change
Step 4	Water Flow Importance	High	High	Moderate High	Moderate High
Step 4	Water Flow Degradation	Moderate High	High	High	High
Step 4	Water Flow Overall Protection & Restoration	Highest Restoration	Highest Restoration	Restoration	Restoration
Step 4	Water Quality Degradation (Moderate High or above)	n/a	Sediment	Sediment, Phosphorous, Metals, Nitrogen, Pathogens	Sediment, Phosphorous, Metals, Nitrogen, Pathogens
Step 4	WQ issues	sediment, nitrogen, phosphorous, metals	sediment, nitrogen, phosphorous, metals	sediment, nitrogen, phosphorous, metals	sediment, nitrogen, phosphorous, metals
Step 4	Water Flow Assessment	low surface storage, high discharge	low surface storage, high discharge	low surface storage, high discharge	low surface storage, high discharge
Step 4	Protection or Restoration Goals	Increase runoff attenuation prior to entering SD system	Lower copper and heavy metal loading, increase runoff attenuation prior to entering SD system	Increase runoff attenuation prior to entering SD system	Increase runoff attenuation prior to entering SD system
Step 4	Rationale as to where targeted stormwater investments and actions are most likely to protect/improve receiving water conditions	Water Flow and Water Quality Degradation Ranking	303(d) listing, Water Flow Degradation Ranking	Water Flow and Water Quality Degradation Ranking	Water Flow and Water Quality Degradation Ranking
Step 4	Prioritized Catchments	Detention/WQ facilities NE 24th Ave	WQ BMPs at intersections along NE 24th Ave, NE 20th Ave, 92nd Ave NE, Points Drive NE/NE28th St, Roads with high ADT, Infiltrating Facilities (possibly) on NE 24th if upslope of areas not prone to groundwater seep, Detention Facilities	Detention and WQ BMPs E/SE portion of CH	Detention and WQ BMPs E/SE portion of CH

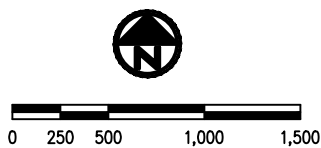


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- DETENTION BMP LOCATION
- WQ BMP LOCATION

(DRAFT)
CLYDE HILL SD BASIN MAP
Stormwater Management Action Plan



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