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1.0 INTRODUCTION

This report describes existing water resources at the Park District site and evaluates potential impacts to water resources from future redevelopment alternatives for the Park District Redevelopment Draft Environmental Impact Statement (EIS).

Impacts to grading, right-of-way (ROW) alignments, and utilities, and how these impacts affect water resources, are discussed briefly in this report. For a full discussion of grading impacts, see the Geotechnical/Earth Technical Report, for a full discussion of multimodal transportation impacts, see the Transportation Technical Report, and for a full discussion of utility impacts see the Public Utilities Technical Report.

1.1 PROJECT DESCRIPTION

The Everett Housing Authority (EHA) is proposing to redevelop approximately 16 acres of the former Baker Heights affordable housing site and adjacent ROWs (now known as the Park District), located in the Delta neighborhood in northeast Everett. The site is bounded by 12th Street on the north and about 14th Street on the south (the southeasternmost section of the site is bounded by 15th Street) and extends from just beyond Poplar Street on the west to Fir Street on the east.

The 14.8-acre Park District property owned by Everett Housing Authority is distributed among six blocks of land, with City of Everett street ROW through the property. The Park District site currently contains 45 vacant single story buildings that previously provided 139 low-income multi-family housing units. EHA determined that due to the age and condition of the housing development, it was not feasible to continue to maintain and operate the housing. It also would not be cost-effective to modify the housing to current standards. Therefore, the residential buildings are vacant and EHA plans to demolish and remove the buildings. Two of the buildings were demolished as part of the Madrona Square Development.

The proposed redevelopment project would create a mixed-income, mixed-use community including affordable housing; retail, civic/service, and office uses; and outdoor publicly accessible open space. EHA's goals are to offer new housing for people with a range of incomes; provide equitable investment into the diverse and underserved Delta neighborhood; and support the City's desire for walkable communities and decarbonization. Full buildout of the Park District Project is expected to take 12 years to complete, anticipated by 2035, depending on economic and market conditions.

The development concept for the Park District would be guided by a Development Plan that would be implemented based on a Development Agreement, project-specific conditions of approval, and site-specific development permits approved by the City of Everett. The plan would reflect the mixed-use nature of the community, as permitted, and directed by the proposed Planned Development Overlay (PDO), including residential, retail/civic and service/office, and recreational opportunities. As with development plans, the Park District Development Plan would show the land uses in the Park District but would also allow for flexibility to respond to market demands.
1.2 SITE DESCRIPTION

The developed housing site has aging public and private utility infrastructure. In general, east of Poplar Street the site slopes down towards the east at an average slope of 8%. Runoff from the buildings and landscape drains into the street ROW and into existing catch basins at the end of the blocks that then flow into a combined sewer system. West of Poplar, the buildings finish floor is lower than the street elevation. Runoff from this area flows overland across adjacent properties to a wetland offsite or to the combined sewer.

1.3 DESCRIPTION OF ALTERNATIVES

The EIS will address the probable significant adverse environmental impacts of the development of alternatives. EHA will be evaluating the differences among a range of long-term redevelopment scenarios. Therefore, this EIS will analyze a range of density redevelopment options.

To conduct a comprehensive environmental review, a range of redevelopment alternatives are included in the EIS: (1) No Action, (2) Design Alternative, and (3) No Action. Alternative 1 would fully meet the EHA's objectives for the project. Alternative 2 is intended to represent a reasonable range of land uses and densities. This means that while Alternative 2 would have the same development program as Alternative 1, it would not meet one of EHA’s objectives because there would be an increase in building coverage and decrease in useable open space for the community. Alternative 3 analyzes potential future development on the site under existing zoning.

The following is a summary of the three alternatives with regards to utilities and street grid with further description described herein:

- All alternatives will require infrastructure improvements assumed with the redevelopment include new public utilities (water, sewer, storm), building-supporting utilities, improved streets, and landscaping
- Alternatives 1 and 2 show Poplar Street, 12th Street, and 14th Street to remain. ROW widths would be extended to achieve current standards including 72’ width at Poplar Street. This width would accommodate pedestrian and bike improvements
- Alternatives 1 and 2 show a change in the alignment of Hemlock Street and Fir Street. ROW widths would be extended to achieve current standards including 60’ width at Fir Street
- Alternatives 1 and 2 show Larch Street to be removed
- Alternatives 1 and 2 show a new ROW street between Hemlock Street and Poplar Street, New Street
- Alternative 3 shows no change to existing street alignments or configuration. ROW widths would be extended to achieve current standards of 60’ width across the site.
- All alternatives would provide for full replacement (or additional) low-income housing units on the site
• Alternatives 1 and 2 show up to 1,500 housing mixed income housing units and other uses including office, neighborhood commercial, and neighborhood services
• Alternative 3 does not include any non-residential uses
• Alternative 1 shows a new park central to the development

1.3.1 Alternative 1 – Proposed Action

Alternative 1 represents an alternative that maximizes space activation by using taller building with smaller footprints to create more open green spaces. In this alternative, the mixed-use redevelopment of the site would feature new residential, retail, civic/service, and office uses, as well as open space and parking. Land uses under Alternative 1 would include (from Chapter 2 in EIS):

• up to 1,500 multi-family housing units.
• up to 70,600 gross square feet of non-residential use (retail, civic/service and office uses).
• up to 1,018 structured parking spaces.
• approximately 12.4 acres of building/developed site.
• approximately 3.5 acres of natural/landscape areas with 1.1 acres of publicly accessible park.
• 15 buildings would be constructed, four to a maximum of 15 stories in height; and
• up to 3,645 residents and 141 employees.

Fifteen-story buildings are not allowed by the site’s current Residential, Multifamily land use designation and UR3 zoning classification, and would require approval of a Comprehensive Plan text amendment and Planned Development Overlay (PDO) approval.

Additional ROW on some streets will be dedicated per zoning requirements or pedestrian and bike improvements and public easements may be necessary for utility corridors and access. Transportation and utility infrastructure improvements would be required to support proposed uses.

See Chapter 2 of the EIS for further description of this alternative.

1.3.2 Alternative 2 – Design Alternative

Alternative 2 represents an alternative that does not maximize space activation. Alternative 2 proposed redevelopment of the site would feature the same amounts of new residential units, and retail, civic/service, and office uses as Alternative 1. However, in this alternative, buildings would be built to a lower maximum height (10 stories) resulting in the addition of 2 more buildings than in Alternative 1. Since the buildings are shorter but maintain the same dwelling and commercial space, buildings would take up a larger building footprint than Alternative 1, which would reduce the amount of open space and the design would not be able to include the larger central park space. Land uses under Alternative 2 would include (from Chapter 2 in EIS):

• up to 1,500 multi-family housing units.
• up to 70,600 gross square feet of non-residential use (retail, civic/service and office uses).
• up to 1,018 structured parking spaces.
• approximately 12.7 acres of building/developed site.
• approximately 3.3 acres of natural/landscape areas.
• 17 buildings constructed to a maximum of 10 stories in height; and
• up to 3,645 residents and 141 employees.

Ten-story buildings are allowed by the site’s current Residential, Multifamily Comprehensive Plan designation, but not by the site’s UR3 zoning which would require PDO approval.

Additional ROW on some streets will be dedicated per zoning requirements or pedestrian and bike improvements and public easements may be necessary for utility corridors and access. Transportation and utility infrastructure improvements would be required to support proposed uses. See Chapter 2 of the EIS for further description of this alternative.

1.3.3 Alternative 3 – No Action Alternative

Alternative 3 represents a No Action Alternative in which the existing site layout and zoning would remain. This alternative depicts the most likely option if the proposal does not move forward. For analysis purposes in the EIS, the No Action Alternative assumes development under the site’s existing Residential, Multifamily Comprehensive Plan designation and UR3 zoning classification, with no Planned Development Overlay or Comprehensive Plan text amendment required.

Alternative 3 proposed redevelopment of the site would retain the existing grid of streets, but the ROW would be widened and designed to meet the current City of Everett code. This alternative differs from Alternative 1 and 2 in that it only includes residential uses where as the other alternatives include some non-residential/commercial uses. Under existing zoning, buildings would have a lower maximum height than Alternative 1 and 2 and maintain existing building density onsite. This results in less proposed dwelling units than Alternative 1 and 2. This alternative would include the most open space due to low building density and current setback requirements rendering the parcel west of Poplar Street unbuildable so it would become open space. However, no large, central public park is included in this design. Land uses under Alternative 3 would include (from Chapter 2 in EIS):

• Up to approximately 458 multifamily housing units in up to four-story buildings.
• No non-residential use (retail, civic/service and office uses).
• 377 parking spaces.
• Approximately 11.1 acres of building/developed site.
• Approximately 4.9 acres of natural/landscape areas; and
• Up to approximately 1,113 residents and no employees.

This alternative retains existing zoning. See Chapter 2 of the EIS for further description of this alternative.
2.0 AFFECTED ENVIRONMENT

2.1 SURFACE WATER

2.1.1 Hydrologic Setting

The Park District site is located in Everett, Washington, bound by adjacent roadways as shown in Figures 2.1-1 and 2.1-2. The site is steeper in the east-west direction (6-8%) and relatively flat in the north-south direction (0.5-2%). The site is composed of private blocks owned by EHA and City ROW. The existing site generally consists of wood-framed multifamily housing. Surface parking is located on public streets and in small parking lots. There is some open space between buildings and the site currently includes a community garden at the NE corner.

There is a wetland located south-west of the site. Under current conditions, a part of the parcel west of Poplar Street conveys runoff to the wetland. The rest of the site’s runoff is collected and routed into the combined sewer. See Figures 2.1-1 and 2.1-2 to see the difference in basin areas between alternatives. Additional analysis has been conducted by GeoEngineers to determine wetland characteristics and to determine specific requirements for that drainage area. No other wetlands or water bodies are located adjacent to the site.

Figure 2.1-1 Site Boundary and Basin Delineation – Alternatives 1 and 2
2.1.2 Flooding

Although large flooding events associated with excessive rainfall are uncommon in the project area due to the sloping topography, localized flooding and podding are a common occurrence. This is associated with aging catch basins requiring maintenance to remove sediment buildup and inadequate curb height and crowned street design.

2.1.3 Stormwater Management Facilities

The site presently contains a combination of both private and public stormwater conveyance facilities. The primary public system for the conveyance of stormwater onsite is the combined sewer system (a pipe that conveys both sanitary sewer and stormwater). The stormwater runoff within the site is collected and conveyed to the public combined sewer system within the site by a series of catch basins, inlets, and downspout lines. The combined sewer system leaves the site at multiple locations along 12th Street and 14th Street and eventually enters the combined sewer Trunkline C in the northeast corner of the site. The trunkline is conveyed to the City of Everett Wastewater Treatment Plant, also referred to as Everett Water Pollution Control Facility (EWPCF), for treatment and then is discharged to the Snohomish River. Refer to Figure 2.1 – 5 for a visual of the existing public combined sewer system located within the Project.

2.1.3.a Conveyance Basin Delineation

While the Project Area consists of 16.0 acres, a total of 16.8 acres was used to accurately model the Drainage Area of the site. This area is larger to include all contributing area to the future on
site stormwater system including half street area along 12\textsuperscript{th} Street and 14\textsuperscript{th} Street. This 16.8 acre basin was identified in two distinct basins: the West Conveyance Basin (West Basin) where runoff is conveyed into an adjacent wetland and the East Conveyance Basin (East Basin) where runoff is conveyed into the combined sewer.

The West Basin is comprised of approximately 0.8 acres of the site located in the southern portion of the parcel west of Poplar Street. The runoff in this area flows overland across adjacent private property into an existing wetland. The remainder of the site is in the East Basin and is comprised of approximately 16 acres. The existing East Basin runoff is routed to 8” public combined sewer pipes along Poplar Street, Larch Street, Hemlock Street, and Fir Street. These pipe flow continues to 12\textsuperscript{th} street, where the pipe size increases to 10” east of Hemlock Street, or 14\textsuperscript{th} Street, where the pipes size increases to 10” east of Fir Street. 12\textsuperscript{th} Street is routed to the northeast corner of the site where it meets a 48” combined sewer. 14\textsuperscript{th} Street is routed to the southeast corner of the site where it meets a 48” combined sewer at the Pine Street and 14\textsuperscript{th} Street intersection. See Figure 2.1-1, for the West and East Basin delineation of Alternatives 1 and 2.
Figure 2.1-3 Drainage Basins and Watersheds
2.1.3.b Downstream Combined System

The City of Everett’s combined sewer area encompasses approximately 6,500 acres. The East Basin area of the Park District Redevelopment is located within the combined sewer area and drains to Trunkline C where the sewer and stormwater is routed south and across the Snohomish River to the Everett Wastewater Treatment Plant (Figure 2.1-4). There are no known existing capacity constraints within the downstream conveyance system.
Figure 2.1-4 Everett Combined Sewer

Interceptors
- Final Pipes Conveying flows to WPCF
- Central
- Snohomish River
- South End (North Section)
- South End (South Segment)
- Summit Ave
- Mukilteo Beach
- Memorial Stadium
- Southwest
- Trunk B
- Trunk A
- Trunk C
- 17th St (Trunk D)
2.1.3.c  Public Stormwater Facilities

The existing public stormwater conveyance system onsite was installed in the 1940s and consists of catch basins and inlets located along the public streets which collect stormwater runoff and convey piped stormwater to the public combined sewer system. The public combined sewer systems onsite only conveys water from the East Drainage Basin. The portion of the site that is the West Drainage Basin, drains into the existing wetland adjacent to the site (see the above section on Conveyance Basins and Appendix F for details). Existing public stormwater conveyance systems are presented in Figure 2.1-5 Existing Sanitary Sewer and Storm Drain System.

Figure 2.1-5 Existing Sanitary Sewer and Storm Drain System

2.2  GROUNDWATER

There are no known active uses of groundwater, industrial or domestic, on the site. There is an environmental concern due to a historic Everett Smelter which left arsenic and lead in the soils at the site of the smelter and a 1.1 mile area (Figure 2.2-1). According to the WA Department of
Ecology’s Everett Smelter Cleanup website, soil sampling has been performed at the Park District Redevelopment site and determined that cleanup is not required.

Figure 2.2-1 Everett Smelter Arsenic Impacts to Site

Groundwater on site was not encountered in borings (20.5-41 ft depth), but observed seepage was determined to be likely to be due to a perched water table atop glacial till soils. Seepage was observed in testing locations across the site including borings on the north central area of the site. An initial geotechnical investigation of on-site soils determined that due to the glacial soils, infiltration is likely very low and design infiltration rate should not exceed 0.2 inches per hour. For purposes of stormwater modeling for this EIS, the 0.2 inches per hour infiltration rate was used to determine the modeling status of the soils as hydraulic soil group C. Since the proposed design includes landscaped areas over a garage structure this area was modeled with no infiltration and groundwater routed to the piped stormwater system. See Section 4.2-1 for more modeling information.
3.0 MINIMUM REQUIREMENTS

The Park District is being designed in accordance with City of Everett stormwater requirements. There are different requirements depending on whether the site contributes to the combined sewer or not. Since the East Basin contributes to the combined sewer, but the West Basin does not, each basin must be evaluated individually since they trigger different requirements.

3.1 EAST BASIN

Since the East Basin is located within the combined sewer area, stormwater is subject to the City of Everett Design and Construction Standards and Specifications (DCSS) which specifies requirements for combined sewer systems in section 6.10. Although there are no water quality requirements for this area, the East Basin is still subject to applicable flow requirements.

3.1.1 EAST BASIN: FLOW CONTROL

Park District stormwater analysis is being planned as a joint parcel/roadway project. Under City of Everett DCSS section 6-10, the entire East Basin (parcel and roadway) has its own set of standards since it is located with a combined sewer drainage area. This area is not subject to water quality requirements, but is subject to the following flow control standards:

- Stormwater discharges must match developed discharge durations to existing site durations for the range of existing discharge rates from the 10-year peak flow through the full 100-year peak flow.
- Proposed peak runoff rates cannot exceed existing site runoff rates in the 25-year and 100-year intervals.

3.2 WEST BASIN

Since the West Basin does not contribute to the combined sewer, it is subject to the typical stormwater requirements for City of Everett which refer the 2019 Department of Ecology Stormwater Management Manual for Western Washington (SWMMWW). A flow chart of triggered Minimum Requirements (MR) can be reviewed in Figure 3.2-1 and a summary of MRs can be reviewed in Table 3.2-1.
Figure 3.2-1 Minimum Requirement Overview Flow Chart for the West Drainage Basin
Table 3.2 - 1 Summary of Applicable Stormwater Requirements for the West Drainage Basin

<table>
<thead>
<tr>
<th>Minimum Requirement No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MR1: Preparation of Stormwater Site Plans</td>
<td>Stormwater Site Plan must be developed.</td>
</tr>
<tr>
<td>MR2: Construction Stormwater Prevention Plan (SWPPP)</td>
<td>SWPPP must be developed. The entire project (East and West Basin) will include more than 1 acre of disturbed area and therefore will need to apply for coverage under the State Construction General Permit.</td>
</tr>
<tr>
<td>MR3: Source Control of Pollution</td>
<td>All known, available, and reasonable source control BMPs must be applied.</td>
</tr>
<tr>
<td>MR4: Preservation of Natural Drainage Systems and Outfalls</td>
<td>The proposed design will match the current drainage pattern and outfall.</td>
</tr>
<tr>
<td>MR5: On-Site Stormwater Management</td>
<td>Proposed design must apply the LID BMPs from List #2 from Table 1-3.2 in the SWMMWW. See Section 3.2.1 for more information.</td>
</tr>
<tr>
<td>MR6: Runoff Treatment</td>
<td>Since the proposed West Basin TDA has less than 5,000 square feet of pollution generating hard surface, construction of Runoff Treatment BMPs is not required.</td>
</tr>
</tbody>
</table>
| MR7: Flow Control | If the proposed West Basin TDA has more than 10,000 square feet of effective impervious surfaces, construction of Flow Control BMPs is not required.  
  • Alternatives 1 and 2 MR7 applies  
  • Alternative 3 MR7 does not apply  
  See Section 3.2.2 for more information. |
| MR8: Wetland Protection | Requirement is applicable. The wetland is defined as a Category II Wetland, for more information pertaining to the wetland refer to the GeoEngineers report in Appendix A. Refer to section 3.2 for a summary of how the Project will meet MR 8. See Section 3.2.3 for more information. |
| MR9: Operation and Maintenance | An O&M manual will be required for any installed BMPs. |

Note: This table is applicable to the proposed West Basin in Alternative 1, 2, and 3.

### 3.2.1 WEST BASIN: MR 5 WATER QUALITY

Within the West Basin, the proposed design must apply the LID BMPs from List #2 from Table 1-3.2 per the 2019 SWMMWW. A summary of BMP feasibility can be reviewed in Table 3.2-2.
### List #2
(For MR #1 - #9 Projects That Are Not Flow Control Exempt)

#### Surface Type: Lawn and Landscaped Areas

<table>
<thead>
<tr>
<th>BMP #</th>
<th>Feasibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMP T5.13: Post-Construction Soil Quality and Depth</td>
<td>Not feasible due to a very low infiltration capacity.</td>
</tr>
</tbody>
</table>

#### Surface Type: Roofs

<table>
<thead>
<tr>
<th>BMP</th>
<th>Feasibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMP T5.30: Full Dispersion or BMP T5.10A: Downspout Full Infiltration</td>
<td>Not feasible due to lack of existing vegetation area for dispersion and very low infiltration rates (see attached Geotech letter). Downspout Full Infiltration not feasible due to glacial till (silt and clay type soil) found in the area.</td>
</tr>
<tr>
<td>BMP T7.30: Bioretention</td>
<td>Unless otherwise stated by Geotechnical Engineer, the near-surface glacially consolidated soils are considered an impervious layer, therefore T7.30 criteria for minimum vertical separation of 1 foot to impervious layer would not be achievable.</td>
</tr>
<tr>
<td>BMP T5.10B: Downspout Dispersion Systems</td>
<td>Not feasible due to vegetated flow path being less than 25 feet.</td>
</tr>
<tr>
<td>BMP T5.10C: Perforated Stub-out Connections</td>
<td>Unless perforated stub-out connections connects to a bubbler, this BMP is not feasible due to not having a storm drain or water duct to tie into.</td>
</tr>
</tbody>
</table>

#### Surface Type: Other Hard Surfaces

<table>
<thead>
<tr>
<th>BMP</th>
<th>Feasibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMP T5.30: Full Dispersion</td>
<td>Not feasible due to lack of existing vegetation areas for dispersion.</td>
</tr>
<tr>
<td>BMP T5.15: Permeable Pavements</td>
<td>Permeable pavement may be feasible.</td>
</tr>
<tr>
<td>BMP T7.30: Bioretention</td>
<td>The near-surface glacially consolidated soils are considered an impervious layer, therefore T7.30 criteria for minimum vertical separation of 1 foot to impervious layer would not be achievable. In the fill areas, Vol V, Section 5.6, SSC-6 cannot be met since bioretention soil media would be placed over uncontrolled fill soils.</td>
</tr>
<tr>
<td>BMP T5.12: Sheet Flow Dispersion or BMP T5.11: Concentrated Flow Dispersion</td>
<td>Not feasible due to lack of existing vegetation areas for dispersion.</td>
</tr>
</tbody>
</table>

### 3.2.2 WEST BASIN: MR 7 FLOW CONTROL

Within the West Basin, the proposed design is subject to MR 7 Flow Control. Per Section I-3.4.7 Predeveloped condition will be modeled as existing land cover since area is within 40% impervious total area as of 1985. Since the proposed West Basin in Alternative 1, 2, and 3 will decrease impervious surfaces, discharge from the site is reduced. Therefore the proposed
designs in all alternatives meet the 2019 SWMMWW requirement to match the predeveloped discharge durations to pre-developed durations for the range of pre-developed discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow.

3.2.3 WEST BASIN: MR 8 WETLAND PROTECTION

Within the West Basin, the proposed design is subject to MR 8 Wetland Protection. From Figure 3.2-2, a flow chart depicting the MR 8 sub requirements, shows that the project triggers three wetland requirements:

- General Protection (See section 3.2.3.a)
- Protection from Pollutants (See section 3.2.3.b)
- Wetland Hydoperiod Protection (Method 2) (See section 3.2.3.c)
3.2.3.a General Protection

A summary of how the Project will meet MR 8 General Protection is listed in Table 3.2-3. This section references the Everett Municipal Code (EMC).

Table 3.2-3 General Protection

| 1. Consult Regulation issued under federal and state laws that regulate the discharge of pollutants to surface waters, including the Construction Stormwater General NPDES Permit | The Project Site does not meet the threshold for requiring runoff treatment due to the limited amount of new and replaced pollution generating surface. Construction stormwater will be managed as indicated in |
2. Maintain the wetland buffer required by local and/or state regulations

EMC 18.37.110 indicates a 100-foot buffer is required, or a 75-foot buffer could be implemented with mitigation measures. *

3. Retain areas of native vegetation connecting the wetlands and its buffer with nearby wetlands and other contiguous areas of native vegetation

EMC 18.37.110 indicates a 100-foot buffer is required, or a 75-foot buffer could be implemented with mitigation measures. *

4. Avoid compaction of soil and introduction of invasive plant or animal species in the wetlands and its buffer

EMC 18.37.110 indicates a 100-foot buffer is required, or a 75-foot buffer could be implemented with mitigation measures. *

5. Take measures to avoid general physical impacts (e.g. littering and vegetation destruction). Examples are protecting existing buffer zones; discouraging access, especially by vehicles, by planting outside the wetland, and encouragement of stewardship and signage by landowners.

EMC 18.37.110 indicates a 100-foot buffer is required, or a 75-foot buffer could be implemented with mitigation measures. *

6. Any stormwater management practices, such as Runoff Treatment or Flow Control BMP implementation, must be done outside of the wetland buffer boundary, except limited circumstances where the wetland and/or buffer may be used for additional Runoff Treatment and/or Flow Control of stormwater

EMC 18.37.110 indicates a 100-foot buffer is required, or a 75-foot buffer could be implemented with mitigation measures. *

7. Discharge from a BMP or project site should be dispersed using a method to diffuse the flow before entering the wetland buffer

Runoff will match the existing pattern of overland flow in the wetland. Concentrated flows will be dispersed prior to leaving the site.

8. Consider fences to restrict human access, but make sure it doesn’t interfere with wildlife movement. They should be used when wildlife passage is not a major issue and the potential for intrusive impacts is high. When wildlife movement and intrusion are both issues, the circumstances will have to be weighed to make a decision about fencing. Check with the local and/or state agencies to determine if fencing would be allowed.

There will be a temporary construction fence protecting the buffer on site.

*Note: Mitigation measures can be found under code EMC 19.37.110(C)
### 3.2.3.b Protection from Pollutants

A summary of how the Project will meet MR 8 Protection from Pollutants is listed in Table 3.2-4.

<table>
<thead>
<tr>
<th>Protection from Pollutants</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Provide Construction Stormwater BMPs as directed in MR2 to prevent sediment and other pollutants from entering the wetland</td>
<td>Construction stormwater BMPs will be provided in accordance with a City-approved SWPPP</td>
</tr>
<tr>
<td>2. Provide Source Control BMPs as directed in MR3</td>
<td>Source Control BMPs will be provided in accordance with a City-approved SWPPP</td>
</tr>
<tr>
<td>3. Provide On-Site Stormwater Management and use LID principles as much as practicable for the site, as directed in MR5</td>
<td>On-site Stormwater Management BMPs will be provided in accordance with a City-approved SWPPP</td>
</tr>
<tr>
<td>4. Provide Runoff Treatment BMPs as directed in MR6 to treat runoff prior to entering the wetland buffer.</td>
<td>As noted in 2019 SWMMWW, since thresholds for MR6 are not met for the TDA, then it’s not required to provide Runoff Treatment BMPs</td>
</tr>
</tbody>
</table>

### 3.2.3.c Hydroperiod Protection

Hydroperiod Protection requires that the proposed mean daily total discharge volume from the site must be within 20% of existing conditions and that the proposed mean monthly total discharge volumes from the site must be within 15% of existing conditions. The proposed improvement in Alternative 1, 2, and 3 for the West Basin includes a decrease in impervious from existing condition. All three alternatives were modeled in MGS Flood with the existing condition as the predeveloped condition per the 2019 SWMMWW. The results show a predicted decrease in discharge volume greater than the 15% mean daily and 20% mean monthly to the wetland.

By only considering the discharge volume requirement, the proposed site would need to increase impervious surface to meet the requirement. However, increased impervious surface is often associated with negative stormwater impacts that should be considered. Reviewing the logic that although stormwater will likely have a higher time of concentration (considering the point that it enters the wetland) due to increased vegetated cover, the total storm volume of water logically would stay fairly consistent but spread through groundwater and surface flow. Additionally in the 2019 SWMMWW there are listed Strategies to meet the Wetland Hydroperiod Protection Criteria as follows:

- Increasing the retention of natural pervious cover
- Reducing the level of development
- Reducing the total amount of impervious surfaces
- Increasing infiltration using on-site LID techniques
- Increasing or maintaining larger wetland buffer zones
- Increasing infiltration and/or storage capacity of Flow Control BMPs
The proposed condition in all three alternatives would reduce the amount of development and impervious surfaces and will implement LID techniques were feasible. The Project will work in close coordination with City of Everett to determine the balance of meeting MR 8 hydroperiod protection and conveying the designed protection of the wetland.

3.3 CONVEYANCE REQUIREMENTS

The East Drainage Basin is part of the combined sewer and per the City of Everett DCSS, Section 4-2.2: All conveyances within public roads or other public ROWs shall be designed to pass a 25-year recurrence interval peak flow rate from the contributing drainage area under fully developed conditions.
4.0 IMPACT OF ALTERNATIVES

This section evaluates the water resource impacts at full buildout of the redevelopment alternatives. Operational impacts are presented at full buildout when maximum impacts to stormwater runoff would occur due to the increased amounts of new and replaced impervious surface areas (i.e. building roofs, sidewalks and parking areas), relative to existing conditions.

4.1 CONSTRUCTION IMPACTS

The construction activities associated with Alternatives 1, 2, and 3 would have an impact on stormwater management on the site. Some level of grading and clearing would be incorporated into all the redevelopment alternatives. Exposed soils would increase the risk of erosion and sediment transport. Potential for erosion and sediment transport during construction is greatly increased during wet weather.

In accordance with the DCSS, a Construction Surface Water Pollution Prevention Plan would be required since the project adds more than 2,000 square feet of new and replaced impervious surface. As required by the DCSS, the Construction Surface Water Pollution Prevention Plan would use Best Management Practices (BMPs) that fall within these 18 elements of water quality and downstream resources protection:

1. Preserve Vegetation / Mark Clearing Limits
2. Establish Construction Access
3. Control Flow Rates
4. Install Sediment Controls
5. Stabilize Soils
6. Protect Slopes
7. Protect Drain Inlets
8. Stabilize Channels and Outfalls
9. Control Pollutants
10. Control Dewatering
11. Maintain BMPs
12. Manage the Project
13. Protect Low Impact Development

4.1.1 FLOW CONTROL

As the site is developed with an increase in the amount of impervious surface there is a reduction in the amount of infiltration and ground water recharge resulting in an increase of stormwater runoff flows. The existing combined sewer upstream of the 48-inch combined sewer does not have capacity for the increase of the stormwater and dry weather flows in the Post Developed condition. Following DCSS requirements, permanent flow control facilities will be installed to mitigate the increased stormwater flow and potential downstream impacts. To do this, a separated storm drain system will be designed to collect on-site stormwater that will be conveyed to the block development flow control facilities prior to being conveyed directly to the
48-inch combined sewer trunkline that is located in the northeast corner of the site. Flow control facilities within each phase will be installed prior to placement of new hard surfaces.

4.1.2 WATER QUALITY

Temporary Erosion and Sediment Control (TESC) measures will be installed prior to site disturbance and maintained throughout construction. TESC measures will be determined during design per DCSS and SWWMM requirements for Best Management Practices (BMPs).

Construction under Alternatives 1 and 2 would be more likely to adversely affect water quality since these alternatives include more removal of existing impervious surface and earthwork compared to Alternative 3. The primary risk to water quality during construction would be from sediments carried in stormwater from erodible soils, as described above. Pollution from concrete work and construction machinery, as well as accidental spills (i.e. of vehicle fuel and oil) could also have impacts on water quality. Temporary water quality treatment facilities would be constructed onsite in accordance with the DCSS and would include BMPs to limit water quality impacts. With the proper use of BMPs and effective accidental spill response planning, significant impacts to water quality and downstream resources would not be expected.

In the permanent built condition, there would be pollution sources like motor vehicles, pet waste, and potentially landscape chemicals. Stormwater in the east basin would be conveyed to the combined sewer where it would receive treatment at the City of Everett Wastewater Treatment Plant. The west basin is not subject to motor vehicles and will be designed in accordance with the DCSS.

4.1.3 RIGHT-OF-WAY (ROW) IMPROVEMENTS

Within the project boundary, a separated stormwater system will be developed to convey stormwater in a separate conveyance pipe system to the existing 48-inch combined sewer located east of Fir Street. Catch basin inlets will be provided spaced on the requirements in the DCSS to reduce excessive roadside flow lengths or volumes. Full street improvements are replacing existing streets with existing alignments. Proposed streets will be completely new streets and not follow existing alignments. It is assumed that full street improvements and proposed streets would include sidewalks, planter areas, curb and gutter, and roadway. In Alternative 1 and 2, bicycle facilities will be provided on Poplar and 12th St and parking would be located in garage structures under the proposed buildings. By moving most of the parking under building and courtyard space, this provides room for vehicular, bike, and pedestrian improvements within the ROW. In Alternative 3, surface parking will be provided. In full street improvements, ROW widths would be increased to meet current code requirements. In all alternatives, half street improvements would include street improvements for only half of the ROW adjacent to the site.

Alternative 1 – Preferred Alternative
• Full street improvements: Poplar Street
• Half street improvements: 12th Street and 14th Street
• ROW vacated: Larch Street, Hemlock Street, and Fir Street
• Proposed streets: Hemlock Street, Fir Street, and New Street

Alternative 2 – This alternative would match the ROW layout in Alternative 1
• Full street improvements: Poplar Street
• Half street improvements: 12th Street and 14th Street
• ROW vacated: Larch Street, Hemlock Street, and Fir Street
• Proposed streets: Hemlock Street, Fir Street, and New Street

Alternative 3 – This alternative keeps existing zoning and street alignments
• Full street improvements: Poplar Street, Larch St, Hemlock Street, Fir Street
• Half street improvements: 12th Street and 14th Street

4.1.4 SURFACE GRADING

In general, the site will follow the existing drainage patterns with the site sloping to the East. Within private blocks, the site surface would be graded to promote drainage away from future buildings in the Park District redevelopment. Within the ROW, new and full street improvement roads would be graded with a typical crown section so that stormwater runoff would flow into inlet structures.

4.2 OPERATIONAL IMPACTS

4.2.1 HYDROLOGY AND FLOW RATES

In order to evaluate the hydrology of the site, models for each basin and each alternative were created in accordance with 2019 SWMMWW and DCSS. The Project was divided into the East and West Basin as described in Section 2.1.3.a. The East and West Basin are based on the limits of area that drains to a certain discharge point. For this reason, these areas are subject to minor variance due to the change in proposed ROW widths which slightly shift the edge between the West and East Basins. See Table 4.2-1 and 4.2-2 for a review of existing inputs. Proposed inputs into the models can be reviewed in section 4.2.1.a-4.2.1.c.
Table 4.2 - 1 Existing Summary of Areas for Alternative 1 and 2

<table>
<thead>
<tr>
<th>Basin Name</th>
<th>Total Area</th>
<th>Slope</th>
<th>Soil Type</th>
<th>Roof</th>
<th>Lawn</th>
<th>Sidewalk + Paving</th>
<th>Road (Mod Slope)</th>
<th>Road (Flat Slope)</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Basin</td>
<td>16.02</td>
<td>Mod</td>
<td>C</td>
<td>3.72</td>
<td>7.54</td>
<td>1.67</td>
<td>0.73</td>
<td>2.36</td>
</tr>
<tr>
<td>West Basin</td>
<td>0.82</td>
<td>Flat</td>
<td>C</td>
<td>0.37</td>
<td>0.36</td>
<td>0.09</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Total</td>
<td>16.84</td>
<td>-</td>
<td>-</td>
<td>4.09</td>
<td>7.90</td>
<td>1.76</td>
<td>0.73</td>
<td>2.36</td>
</tr>
</tbody>
</table>

Table 4.2 - 2 Existing Summary of Areas for Alternative 3

<table>
<thead>
<tr>
<th>Basin Name</th>
<th>Total Area</th>
<th>Slope</th>
<th>Soil Type</th>
<th>Roof</th>
<th>Lawn</th>
<th>Sidewalk + Paving</th>
<th>Road (Mod Slope)</th>
<th>Road (Flat Slope)</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Basin</td>
<td>15.89</td>
<td>Mod</td>
<td>C</td>
<td>3.72</td>
<td>7.42</td>
<td>1.67</td>
<td>0.73</td>
<td>2.36</td>
</tr>
<tr>
<td>West Basin</td>
<td>0.94</td>
<td>Flat</td>
<td>C</td>
<td>0.37</td>
<td>0.49</td>
<td>0.09</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Total</td>
<td>16.84</td>
<td>-</td>
<td>-</td>
<td>4.09</td>
<td>7.91</td>
<td>1.75</td>
<td>0.73</td>
<td>2.36</td>
</tr>
</tbody>
</table>

4.2.1.a Alternative 1

For a summary of proposed areas refer to Tables 4.2-4 through 4.2-5. This information was used as input to MGSFlood for stormwater modeling to determine discharge flow for design storms.

Table 4.2 - 3 Alt 1 Proposed Summary of East Basin Proposed Block Areas

<table>
<thead>
<tr>
<th>Block</th>
<th>Total Area</th>
<th>Slope</th>
<th>Soil Type</th>
<th>Roof</th>
<th>Lawn Over Structure</th>
<th>Lawn</th>
<th>Sidewalk+ Paving</th>
<th>Surface parking</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>AC</td>
<td>ft/ft</td>
<td>-</td>
<td>AC</td>
<td>AC</td>
<td>AC</td>
<td>AC</td>
<td>AC</td>
</tr>
<tr>
<td>1</td>
<td>2.60</td>
<td>Mod</td>
<td>C</td>
<td>0.99</td>
<td>0.33</td>
<td>0.58</td>
<td>0.70</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td>2.07</td>
<td>Mod</td>
<td>C</td>
<td>1.14</td>
<td>0.09</td>
<td>0.28</td>
<td>0.56</td>
<td>0.00</td>
</tr>
<tr>
<td>3</td>
<td>2.58</td>
<td>Mod</td>
<td>C</td>
<td>1.26</td>
<td>0.31</td>
<td>0.57</td>
<td>0.44</td>
<td>0.00</td>
</tr>
<tr>
<td>4</td>
<td>0.87</td>
<td>Mod</td>
<td>C</td>
<td>0.00</td>
<td>0.00</td>
<td>0.65</td>
<td>0.23</td>
<td>0.00</td>
</tr>
<tr>
<td>5</td>
<td>1.69</td>
<td>Mod</td>
<td>C</td>
<td>0.96</td>
<td>0.11</td>
<td>0.14</td>
<td>0.48</td>
<td>0.00</td>
</tr>
<tr>
<td>6</td>
<td>0.24</td>
<td>Flat</td>
<td>C</td>
<td>0.00</td>
<td>0.00</td>
<td>0.20</td>
<td>0.05</td>
<td>0.00</td>
</tr>
<tr>
<td>7</td>
<td>0.56</td>
<td>Flat</td>
<td>C</td>
<td>0.25</td>
<td>0.00</td>
<td>0.20</td>
<td>0.05</td>
<td>0.06</td>
</tr>
<tr>
<td>Subtotal</td>
<td>10.62</td>
<td>-</td>
<td>-</td>
<td>4.60</td>
<td>0.85</td>
<td>2.61</td>
<td>2.50</td>
<td>0.06</td>
</tr>
</tbody>
</table>
Table 4.2 - 4 Alt 1 Proposed Summary of East Basin ROW Areas

<table>
<thead>
<tr>
<th>ROW Name</th>
<th>Total Area</th>
<th>Slope</th>
<th>Soil Type</th>
<th>Road</th>
<th>Lawn</th>
<th>Sidewalk + Paving</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>AC</td>
<td>ft/ft</td>
<td>AC</td>
<td>AC</td>
<td>AC</td>
<td>AC</td>
</tr>
<tr>
<td>Poplar</td>
<td>1.65</td>
<td>1.00</td>
<td>C</td>
<td>0.15</td>
<td>1.15</td>
<td>0.39</td>
</tr>
<tr>
<td>Hemlock</td>
<td>1.32</td>
<td>1.30</td>
<td>C</td>
<td>0.72</td>
<td>0.19</td>
<td>0.42</td>
</tr>
<tr>
<td>Fir</td>
<td>1.24</td>
<td>0.80</td>
<td>C</td>
<td>0.58</td>
<td>0.09</td>
<td>0.56</td>
</tr>
<tr>
<td>14th</td>
<td>0.40</td>
<td>6.80</td>
<td>C</td>
<td>0.25</td>
<td>0.04</td>
<td>0.11</td>
</tr>
<tr>
<td>New/Cross</td>
<td>0.34</td>
<td>8.20</td>
<td>C</td>
<td>0.14</td>
<td>0.09</td>
<td>0.12</td>
</tr>
<tr>
<td>12th</td>
<td>0.45</td>
<td>8.40</td>
<td>C</td>
<td>0.29</td>
<td>0.03</td>
<td>0.13</td>
</tr>
<tr>
<td>Total</td>
<td>5.40</td>
<td>-</td>
<td>-</td>
<td>3.13</td>
<td>0.54</td>
<td>1.73</td>
</tr>
</tbody>
</table>

All landscape areas within the project are modeled as C, Lawn with a variation on slope depending on location on the site. In this alternative, there is some landscaping located over the underground garage structure. For the purpose of modeling, landscape (lawn) over structure is considered to be impervious.

For the East Basin, peak flow rates for a 25 to 100-year return interval as well as a flow duration of a 10 to 100-year period is to match existing conditions in accordance with DCSS requirements. To meet this requirement, Blocks 1, 2, 3, and 5 have their own respective detention facilities which manage runoff from the block’s respective roof, lawn, sidewalk, and paving. Preliminary detention tank sizing was determined to be 5 feet deep live storage with a bottom area of 575 square feet and vertical sides allowing for a volume of 2,875 cubic feet at the riser crest, at each block. The riser is a circular structure with a diameter of 24 inches. There is one circular orifice on the structure with a diameter of 2.5 inches. Site-wide detention volumes would equal 11,500 cubic feet. As the design is furthered the opportunity to reduce detention volume by applying green stormwater infrastructure will be evaluated.

Table 4.2 - 5 Alt 1 Proposed Summary of West Basin Areas

<table>
<thead>
<tr>
<th>Area Name</th>
<th>Total Area</th>
<th>Slope</th>
<th>Soil Type</th>
<th>Roof</th>
<th>Lawn</th>
<th>Sidewalk + Paving</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>AC</td>
<td>ft/ft</td>
<td>AC</td>
<td>AC</td>
<td>AC</td>
<td>AC</td>
</tr>
<tr>
<td>West Basin</td>
<td>0.82</td>
<td>Flat</td>
<td>C</td>
<td>0.17</td>
<td>0.55</td>
<td>0.10</td>
</tr>
</tbody>
</table>

For the West Basin, the flow control requirement per the 2019 SWMMWW, states that the proposed design must match 50% of the 2-year to 100% of the 50-year discharge. No detention facilities are required due to the proposed discharge flow being less than existing. This is due to the proposed impervious area being less than the existing impervious area.

Onsite stormwater management BMPs will be implemented from list number two where feasible. It is assumed that only permeable pavement for walkways would be feasible, depending on additional geotechnical testing information. However, since MR 8 Wetland
protection requires that the site match current discharge, implementing permeable pavement would move the Project into further exceedance. Per the 2019 SWMMWW, MR 8 Wetland protection should govern when in conflict with MR 7 Flow Control.

4.2.1.b Alternative 2

For a summary of existing and proposed areas refer to Tables 4.2-6 through 4.2-8. This information was used as input to MGSFlood for stormwater modeling to determine discharge flow for design storms.

Table 4.2 - 6 Alt 2 Proposed Summary of East Basin Block Areas

<table>
<thead>
<tr>
<th>Block</th>
<th>Total Area</th>
<th>Slope</th>
<th>Soil Type</th>
<th>Roof</th>
<th>Lawn Over Structure</th>
<th>Lawn</th>
<th>Sidewalk+ Paving</th>
<th>Parking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.60</td>
<td>Mod</td>
<td>C</td>
<td>1.19</td>
<td>0.15</td>
<td>0.42</td>
<td>0.85</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td>2.07</td>
<td>Mod</td>
<td>C</td>
<td>1.14</td>
<td>0.09</td>
<td>0.28</td>
<td>0.56</td>
<td>0.00</td>
</tr>
<tr>
<td>3</td>
<td>2.58</td>
<td>Mod</td>
<td>C</td>
<td>1.26</td>
<td>0.31</td>
<td>0.57</td>
<td>0.44</td>
<td>0.00</td>
</tr>
<tr>
<td>4</td>
<td>0.86</td>
<td>Mod</td>
<td>C</td>
<td>0.31</td>
<td>0.00</td>
<td>0.34</td>
<td>0.14</td>
<td>0.00</td>
</tr>
<tr>
<td>5</td>
<td>1.69</td>
<td>Mod</td>
<td>C</td>
<td>0.97</td>
<td>0.11</td>
<td>0.14</td>
<td>0.55</td>
<td>0.00</td>
</tr>
<tr>
<td>6</td>
<td>0.25</td>
<td>Flat</td>
<td>C</td>
<td>0.00</td>
<td>0.00</td>
<td>0.20</td>
<td>0.05</td>
<td>0.00</td>
</tr>
<tr>
<td>7</td>
<td>0.56</td>
<td>Flat</td>
<td>C</td>
<td>0.25</td>
<td>0.00</td>
<td>0.20</td>
<td>0.05</td>
<td>0.06</td>
</tr>
<tr>
<td>Total</td>
<td>10.62</td>
<td></td>
<td></td>
<td></td>
<td>5.13</td>
<td>2.14</td>
<td>2.62</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Table 4.2 - 7 Alt 2 Proposed Summary of East Basin ROW Areas

<table>
<thead>
<tr>
<th>ROW Name</th>
<th>Total Area</th>
<th>Slope</th>
<th>Soil Type</th>
<th>Road</th>
<th>Lawn</th>
<th>Sidewalk + Paving</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>AC</td>
<td>ft/ft</td>
<td>-</td>
<td>AC</td>
<td>AC</td>
<td>AC</td>
</tr>
<tr>
<td>Poplar</td>
<td>1.65</td>
<td>1.00</td>
<td>C</td>
<td>1.15</td>
<td>0.10</td>
<td>0.39</td>
</tr>
<tr>
<td>Hemlock</td>
<td>1.32</td>
<td>1.30</td>
<td>C</td>
<td>0.72</td>
<td>0.19</td>
<td>0.42</td>
</tr>
<tr>
<td>Fir</td>
<td>1.24</td>
<td>0.80</td>
<td>C</td>
<td>0.58</td>
<td>0.09</td>
<td>0.56</td>
</tr>
<tr>
<td>14th</td>
<td>0.40</td>
<td>6.80</td>
<td>C</td>
<td>0.25</td>
<td>0.04</td>
<td>0.11</td>
</tr>
<tr>
<td>New/Cross</td>
<td>0.34</td>
<td>8.20</td>
<td>C</td>
<td>0.14</td>
<td>0.09</td>
<td>0.12</td>
</tr>
<tr>
<td>12th</td>
<td>0.45</td>
<td>8.40</td>
<td>C</td>
<td>0.29</td>
<td>0.03</td>
<td>0.13</td>
</tr>
<tr>
<td>Total</td>
<td>5.40</td>
<td></td>
<td>3.13</td>
<td>0.54</td>
<td></td>
<td>1.73</td>
</tr>
</tbody>
</table>

All landscape areas within the project are modeled as C, Lawn with a variation on slope depending on location on the site. In this alternative, there is some landscaping located over the underground garage structure. For the purpose of modeling, landscape (lawn) over structure is considered to be impervious.
For the East Basin, peak flow rates for a 25 to 100-year return interval as well as a flow duration of a 10 to 100-year period is to match existing conditions in accordance with DCSS requirements. To meet this requirement, Blocks 1, 2, 3, and 5 have their own respective detention facilities which manage runoff from the block’s respective roof, lawn, sidewalk, and paving. Preliminary detention tank sizing was determined to be 5 feet deep live storage with a bottom area of 700 square feet and vertical sides allowing for a volume of 3,500 cubic feet at the riser crest, at each block. The riser is a circular structure with a diameter of 24 inches. There is one circular orifice on the structure with a diameter of 2.5 inches. Site-wide detention volumes would equal 14,000 cubic feet. As the design is furthered the opportunity to reduce detention volume by applying green stormwater infrastructure will be evaluated.

Table 4.2 - 8 Alt 2 Proposed Summary of West Basin Areas

<table>
<thead>
<tr>
<th>Area Name</th>
<th>Total Area</th>
<th>Slope</th>
<th>Soil Type</th>
<th>Roof</th>
<th>Lawn</th>
<th>Sidewalk + Paving</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>AC</td>
<td>ft/ft</td>
<td>-</td>
<td>AC</td>
<td>AC</td>
<td>AC</td>
</tr>
<tr>
<td>West Basin</td>
<td>0.82</td>
<td>Flat</td>
<td>C</td>
<td>0.17</td>
<td>0.55</td>
<td>0.10</td>
</tr>
</tbody>
</table>

For the West Basin, the flow control requirement per the 2019 SWMMWW, states that the proposed design must match 50% of the 2-year to 100% of the 50-year discharge. No detention facilities are required due to the proposed discharge flow being less than existing. This is due to the proposed impervious area being less than the existing impervious area.

Onsite stormwater management BMPs will be implemented from list number two where feasible. It is assumed that only permeable pavement for walkways would be feasible, depending on additional geotechnical testing information. However, since MR 8 Wetland protection requires that the site match current discharge, implementing permeable pavement would move the Project into further exceedance. Per the 2019 SWMMWW, MR 8 Wetland protection should govern when in conflict with MR 7 Flow Control.

4.2.1.c Alternative 3

For a summary of proposed land cover refer to Tables 4.2-9 through 4.2-11. This information was used as input to MGSFlood for stormwater modeling.

The existing and proposed East and West Basins have a different total area than those of Alternatives 1 and 2 (Table 4.2-2). This is due to the different ROW requirements used in Alternative 3, where Poplar Street will have a 60’ ROW rather than that of 72’ used in Alternatives 1 and 2. Alternative 3 also uses the existing blocks and ROW’s and denotes them alphabetically rather than numerically. Due to the different proposed ROW width of Poplar Street between Alternative 3 and Alternatives 1 and 2 the West Basin has a larger area of 0.94 acres.
Table 4.2 - 9 Stormwater Modeling Coverage Areas – East Basin Proposed Block Areas

<table>
<thead>
<tr>
<th>Block</th>
<th>Total Area</th>
<th>Slope</th>
<th>Soil Type</th>
<th>Roof</th>
<th>Lawn</th>
<th>Sidewalk+</th>
<th>Parking</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-</td>
<td>AC</td>
<td>ft/ft</td>
<td>-</td>
<td>AC</td>
<td>AC</td>
<td>AC</td>
</tr>
<tr>
<td>A</td>
<td>0.29</td>
<td>Mod</td>
<td>C</td>
<td>0.00</td>
<td>0.26</td>
<td>0.03</td>
<td>0.00</td>
</tr>
<tr>
<td>B</td>
<td>2.40</td>
<td>Mod</td>
<td>C</td>
<td>0.53</td>
<td>0.74</td>
<td>0.24</td>
<td>0.89</td>
</tr>
<tr>
<td>C</td>
<td>2.45</td>
<td>Mod</td>
<td>C</td>
<td>0.54</td>
<td>0.75</td>
<td>0.24</td>
<td>0.91</td>
</tr>
<tr>
<td>D</td>
<td>2.70</td>
<td>Mod</td>
<td>C</td>
<td>0.60</td>
<td>0.84</td>
<td>0.26</td>
<td>1.00</td>
</tr>
<tr>
<td>E</td>
<td>2.03</td>
<td>Mod</td>
<td>C</td>
<td>0.43</td>
<td>0.80</td>
<td>0.25</td>
<td>0.55</td>
</tr>
<tr>
<td>F</td>
<td>0.57</td>
<td>Flat</td>
<td>C</td>
<td>0.10</td>
<td>0.26</td>
<td>0.08</td>
<td>0.13</td>
</tr>
<tr>
<td>Total</td>
<td>10.44</td>
<td>-</td>
<td>-</td>
<td>2.20</td>
<td>3.62</td>
<td>1.13</td>
<td>3.48</td>
</tr>
</tbody>
</table>

Table 4.2 - 10 Stormwater Modeling Coverage Areas – East Basin Proposed ROW Areas

<table>
<thead>
<tr>
<th>ROW</th>
<th>Total Area</th>
<th>Slope</th>
<th>Soil Type</th>
<th>Road</th>
<th>Lawn</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>AC</td>
<td>ft/ft</td>
<td>-</td>
<td>AC</td>
<td>AC</td>
</tr>
<tr>
<td>12th</td>
<td>0.45</td>
<td>Mod</td>
<td>C</td>
<td>0.43</td>
<td>0.02</td>
</tr>
<tr>
<td>14th</td>
<td>0.60</td>
<td>Mod</td>
<td>C</td>
<td>0.57</td>
<td>0.03</td>
</tr>
<tr>
<td>Cross streets</td>
<td>4.41</td>
<td>Flat</td>
<td>C</td>
<td>4.19</td>
<td>0.22</td>
</tr>
<tr>
<td>Subtotal</td>
<td>5.46</td>
<td>-</td>
<td>-</td>
<td>5.19</td>
<td>0.27</td>
</tr>
</tbody>
</table>

For the East Basin, peak flow rates for a 25 to 100-year return interval as well as a flow duration of a 10 to 100-year period is to match existing conditions in accordance with DCSS requirements. Blocks B, C, D, and E each have their own detention facility which manages runoff from the block’s respective roof, lawn, sidewalk, and paving. Preliminary detention sizing was determined to have 5 feet deep live storage with a bottom area of 360 square feet with vertical sides allowing for a volume of 1,800 cubic feet at the riser crest, at each block. The riser is a circular structure with a diameter of 24 inches. There is one circular orifice on the structure with a diameter of 2.5 inches. Site-wide detention would equal 7,200 cubic feet. As the design is furthered the opportunity to reduce detention volume by applying green stormwater infrastructure will be evaluated.

Table 4.2 - 11 Stormwater Modeling Coverage Areas – West Basin Proposed Areas

<table>
<thead>
<tr>
<th>Area Name</th>
<th>Total Area</th>
<th>Slope</th>
<th>Soil Type</th>
<th>Roof</th>
<th>Lawn</th>
<th>Sidewalk+</th>
<th>Parking</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>AC</td>
<td>ft/ft</td>
<td>-</td>
<td>AC</td>
<td>AC</td>
<td>AC</td>
<td>AC</td>
</tr>
<tr>
<td>West Basin</td>
<td>0.94</td>
<td>Flat</td>
<td>C</td>
<td>0.00</td>
<td>0.85</td>
<td>0.09</td>
<td>0.00</td>
</tr>
</tbody>
</table>

The West Basin will contain no detention facilities. No detention facilities are required for the West Basin due to the area being less than 10,000 square feet, refer to Table 3.1-1. Onsite stormwater management BMPs will be implemented from list number two where feasible. It is
assumed that only permeable pavement for walkways would be feasible, depending on additional geotechnical testing information.

4.2.2 PERMANENT STORMWATER MANAGEMENT SYSTEM OVERVIEW

A permanent stormwater management system would be provided to serve the redeveloped EHA Park District project area. The stormwater management system would consist of both public and private infrastructure. The proposed separated storm sewer system for Alternative 1 & 2 will connect to the existing combined sewer Trunkline C in two separate locations located in the Proposed Fir St and easement just east of Fir Street. Alternative 3 would provide new private storm lines and facilities but connect into existing combined sewer infrastructure which leads to Trunkline C along 12th Street or 14th Street.

The model indicates that using detention facilities, the peak stormwater discharge to the combined sewer system in Alternatives 1 - 3 would decrease from current conditions. Table 4.2-12 includes the difference in estimated stormwater release rates from predeveloped to proposed conditions. Per applicable manual requirements, for the East Basin, the predeveloped condition is forested and for the West Basin, the predeveloped condition is the existing condition (See section 3.0 for more information).
### Table 4.2 - Change in Peak Runoff Rates from Predeveloped to Postdeveloped

<table>
<thead>
<tr>
<th>Return Interval</th>
<th>Alt 1</th>
<th>Alt 2</th>
<th>Alt 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alt 2</td>
<td>cfs</td>
<td>cfs</td>
<td>cfs</td>
</tr>
<tr>
<td>Alt 3</td>
<td>cfs</td>
<td>cfs</td>
<td>cfs</td>
</tr>
<tr>
<td>East Basin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-yr</td>
<td>-1.418</td>
<td>-1.402</td>
<td>-1.606</td>
</tr>
<tr>
<td>100-yr</td>
<td>-4.231</td>
<td>-5.555</td>
<td>-0.78</td>
</tr>
<tr>
<td>West Basin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-yr</td>
<td>-0.135</td>
<td>-0.108</td>
<td>-0.152</td>
</tr>
<tr>
<td>100-yr</td>
<td>-0.317</td>
<td>-0.201</td>
<td>-0.391</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-yr</td>
<td>-1.553</td>
<td>-1.51</td>
<td>-1.758</td>
</tr>
<tr>
<td>100-yr</td>
<td>-4.548</td>
<td>-5.756</td>
<td>-1.171</td>
</tr>
</tbody>
</table>

For a more in-depth review of Water Quality and Flow Control requirements, see Section 3.0. For stormwater conveyance, it is assumed that the stormwater runoff from each private block is equal to the 100-year Peak Flow Standard release rate. This was a conservative design storm since the requirement in the DCSS is only 25-year storm. As the Project progresses in design, a smaller storm can be evaluated. Manning’s Formula was used to review storm drainpipe capacity based on the estimated stormwater flows in the proposed pipe network using the proposed slope, pipe diameter, and pipe material. For a discussion of downstream combined sewer conveyance, see the EIS Utilities Technical Report.

### 4.2.3 Permanent Stormwater Control System by Project Area

#### 4.2.3.a Alternative 1

#### 4.2.3.a.i Summary of Sectors

Under Alternative 1, the permanent stormwater control system for the privately-owned portions of the site would include catch basins, detention facilities, inlets, downspouts, footing drains, and private stormwater conveyance pipes that would collect and convey stormwater runoff to new public separated storm sewer system located within the ROW. Flow control would be provided by detention facilities located under Blocks 1, 2, 3, and 5. By using these detention facilities, stormwater discharge to the combined sewer system in Alternative 1 is predicted to decrease from predeveloped conditions (see Table 4.2-12).

The permanent stormwater control system for public ROWs improvements under Alternative 1 would include catch basins, inlets, and a new onsite separated storm sewer system.

The new separated storm sewer system will connect to existing at two places along Fir Street. One connection will be from the north from the pipe system coming from 12th Street, the other will be from the south of Fir Street, receiving the runoff of Blocks 3, 4, and 5. Runoff in the West
basin would flow overland across adjacent private property to wetland located West of the site.

4.2.3.a.ii Blocks 1, 2, 3, and 5

Each of these Blocks is a part of the East Basin. As stated previously, Blocks 1, 2, 3, and 5 each have their own detention facilities. For preliminary sizing, refer to Section 4.2.1a.

Blocks 1, 2, 3 and 5 will be routed to the new separated combined sewer system.

4.2.3.a.iii Block 4

This entire Block is a part of the East Basin and is the location of the proposed centralized park. All the water collected at its surface would flow to the proposed low point located due east of the block, to be picked up by four catch basins and routed to the new separated storm sewer system.

4.2.3.a.iv Block 6

This entire block is part of the East Basin. Located on the northwest portion of the site, Block 6 takes up the area North of Poplar Street ROW and ending approximately where Cross/New Street would appear to intersect. The runoff from this block will be routed directly to the existing combined sewer system in 12th Street.

4.2.3.a.v Block 7

This entire block drains to the East Basin. Located in the southeast portion of the project, west of the 14th and Fir Street ROW intersection, Block 7 will bypass the proposed storm drain and enter the combined sewer along 14th Street.

4.2.3.a.vi ROW

All of the ROWs are a part of the East Basin. The beginning of the proposed storm drain system begins to the north and south of Cross/New Street along Poplar Street. There are eight catch basins proposed to be located along Poplar that will flow to a centrally located manhole located West of Cross/New Street. The water will drain east, picking up four more catch basins along the way, and then tied into the Hemlock Street ROW. The first manhole on Hemlock Street is located near the 14th Street ROW. This segment of storm drain conveys flows from Block 1 and flows north, collecting flow from four catch basins along the way, then tying into the manhole located east of New/Cross street. Proceeding north to the 12th Street ROW, the storm drain collects Block 2’s drainage as well as flow from six more catch basins. The 12th Street storm drain flows east to the Fir Street ROW. Along Fir Street the storm drain flows south towards the Trunkline C combined sewer located in the Proposed Fir St and easement just east of Fir Street, collecting runoff from four catch basins and receiving Block 5’s runoff. The remainder of the storm drain
system begins on the south side of Fir Street, receiving the runoff of Block 3. This drains north towards the combined sewer and collects flow from eight catch basins.

The storm drain is not designed to include Block’s 6 or 7 as they are assumed to be routed directly to the existing combined sewer system along 12th and 14th Streets.

4.2.3.a.vii  West Basin

The West Basin takes up a small portion of the Northwest portion of the site, located west of the Poplar Street ROW and north of New/Cross Street. The West Basin flows overland across adjacent private property to wetland located West of the site.

4.2.3.b  Alternative 2

4.2.3.b.i  Summary of Sectors

The stormwater control system under Alternative 2 would be similar to the system described in Alternative 1. The street/parcel layout would be similar to Alternative 1. The main difference is that Alternative 2 would include larger building footprints which results in the loss of the central park space in Block 4 which would be taken up by building area under Alternative 2. Block 4 would then act similar the Block 1,2,3, and 5 in Section 4.2.3.a.ii. The area of detention facilities required for Alternative 2 would be slightly more than Alternative 1 due to the increased amount of impervious surface area in this sector. The result of this difference would be about a 5% increase in volume for each detention facility. For preliminary sizing, refer to Section 4.2.1b. Similar to Alternative 1, by using detention facilities, the peak stormwater discharge to the combined sewer system under Alternative 2 would decrease from current conditions.
4.2.3.c Alternative 3

4.2.3.c.i Summary of Sectors

Under Alternative 3, all the current street alignments would remain, only the ROW widths would increase to accommodate current ROW requirements. This alternative represents the lowest density alternative. This alternative would include private storm improvements that would connect into the combined sewer. The only public storm facilities would be new catch basins and inlets in the ROW. Due to the age and condition of the existing combined sewer, the existing combined sewer will be replaced with the road. Note that the ROW width for Poplar Street is smaller in Alternative 3 than in Alternative 1 and 2, causing the West Basin to slightly increase in area.

4.2.3.c.ii Block A

Half of this block, approximately 0.9 acres, is a part of the West Basin. All the surface water collected will flow overland across adjacent private property to the wetland located west of the site.
The rest of the block, approximately 0.29 acres, is part of the East Basin. All the stormwater will enter into storm inlets to be routed into the combined sewer in 12th street.

4.2.3.c.iii Blocks B, C, D, and E

Each of these blocks are a part of the East Basin. Blocks B, C, D, and E each have their own detention facilities. For preliminary sizing, refer to Section 4.2.1c. The private stormwater conveyance and detention will meet the combined sewer in the ROW.

4.2.3.c.iv Block F

This entire block drains to the East Basin. Located in the southeast portion of the project, West of the 14th and Fir Street ROW intersection, Block F’s runoff will be routed to existing catch basins located along 14th street.

4.2.3.c.v ROW

All the ROW are a part of the East Basin. It is assumed that the proposed sewer will follow the same path as existing, refer to figure 2.1-5. Beginning with Poplar Street, the sewer begins on the north side of Poplar Street and flows south to connect to the sewer line located along 14th Street, to be connected to the existing Trunkline C combined sewer at the Pine Street and 14th Street intersection. For each Larch Street and Hemlock Street, sewer lines will begin on the south side of the site and flow north towards the sewer line located along 12th street, to be connected to the existing combined sewer Trunkline C located in the Proposed Fir St and easement just east of Fir Street. As there is no information regarding the existing path of the sewer along Fir Street, the proposed path will begin on the south end of Fir Street and flow north to be connected to the existing combined sewer Trunkline C before it reaches 12th Street. The storm drain is not designed to include Blocks A or F as they are assumed to be routed directly to the existing combined sewer system along 12th and 14th Streets.
5.0 CUMULATIVE IMPACTS

Per DCSS, Section 6-10.1, requirements for development with the combined sewer basin, the site has been designed with controls such that stormwater discharges shall match developed discharge durations to existing site durations for the range of existing discharge rates from the 10-year peak flow through the full 100-year peak flow. Peak runoff rates from the developed site shall not exceed existing site runoff rates in the 25-year and 100-year return intervals for the east basin. The West Basin flows into an existing wetland and only includes parcels (no roadway). This area follows the 2019 SMMWW. The manual describes that for this area of the site, all minimum requirements apply. The West Basin stormwater will continue to flow overland across adjacent private property to wetland located West of the site.

Any local construction would also be subject to these requirements and as a result, no significant cumulative impacts on water resources would be anticipated from adjacent projects, in combination with the Park District Redevelopment.
6.0 MITIGATION MEASURES

The following measures would be incorporated into the Park District redevelopment to reduce or offset potential impacts to water resources resulting from redevelopment.

6.1 CONSTRUCTION

Temporary erosion and sedimentation control measures and BMPs would be utilized during construction in accordance with the DCSS and SMMWW. A Stormwater Pollution Prevention Plan (SWPPP) would be prepared and implemented as required by the DCSS and SMMWW. Construction entrances, wheel washes, street cleaning, and other BMPs would be used to prevent the tracking of soils beyond the project limits. Measures to control any impacts of excavation dewatering on groundwater could include: site-specific design and careful control of dewatering systems, minimizing the extent and duration of dewatering, and reinfiltration of extracted groundwater (see Appendix D for details).

Since wetlands are located adjacent to the site, impacts to these wetlands will be minimized as required in SWMMWW.

6.2 OPERATION

The City of Everett noted the downstream combined sewer has capacity for the proposed development with the design and construction of the permanent stormwater control facilities. These stormwater facilities would be in accordance with the DCSS. The city did determine the stormwater and sewer for the project site and upstream of the 48-inch combined sewer does need to be separated as the existing 10-inch in 12th St and the 8-inch in 14th St surcharge during heavy storms.

Park District redevelopment East Drainage Basin would mitigate for the increase in runoff duration and peak flow. The flow control facilities would be designed so that at the point that stormwater leaves the site, it matches the peak stormwater discharge and duration for the 10 to 100-year storm. This could reduce combined sewer overflows (CSO), which can occur during heavy rainfall events. During design, the implementation of GSI would be evaluated to reduce storage size for flow control facilities and meet On-site Stormwater BMP requirements.

Park District redevelopment West Drainage Basin would mitigate for development within the basin. This drainage basin will follow the requirements outlined in the 2019 SWMMWW for water quality and flow control facilities. Since this part of the site is upstream of a wetland, additional protection are required including a General Protection, Protection from Pollutants, and Hydroperiod Protection. A Stormwater Operation and Maintenance Plan would be prepared for both public and private stormwater systems.
7.0 SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

No significant Unavoidable Adverse Impacts are anticipated under any of the alternatives with implementation of the required and proposed mitigation measures listed above.