

**Sparks Short Plat
1220 7th Ave SW**

**Preliminary
Stormwater Site Plan**

Prepared for:

**Straightline Construction
& Development, LLC
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Suite F104 #141
Auburn, WA 98092**

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December 2020

S&H Job Number 17,556

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1.0 PROJECT OVERVIEW

1.1 Scope

The project proposes a 4 lot short plat at 1220 7th Ave SW in Puyallup, Washington. Associated right-of-way improvements include construction and/or replacement of curbs, gutters, sidewalks, and asphalt-paved roadways. Storm drainage, sewer, water, landscaping, and street lighting improvements along 7th Avenue SW and 13th Street SW are also proposed together with the paving of an alley that borders the south portion of the parcel.

This report addresses the requirements of the Washington State Department of Ecology Stormwater Management Manual for Western Washington, as adopted by the City of Puyallup.

1.2 Existing Conditions

This proposal encompasses the improvements required to short plat parcel # 5505202290. The parcel is approximately 1.72 acres and has been previously developed with a single family residential home. The existing single family home located in the northwest corner of the parcel is proposed to remain. The existing single family home is 1,688 square feet according to Pierce County Assessor.

Wetlands have been identified on the southern portion of the parcel. Please see the Wetland Delineation Report prepared by Soundview Consultants (included as a separate document with this submittal). The existing site is gently sloped. Stormwater runoff from the parcel is directed to the south and west. Stormwater is conveyed within the 7th Ave & 13th St right of way (ROW) within a piped City storm drain system.

The project proposes approximately 0.08 acres of new plus replaced pervious surfaces and approximately 0.32 acre of new plus replaced impervious surfaces within the right-of-way. Please see Figure 1 of this report for a summary of existing and proposed surfacing for this project.

1.3 Proposed Conditions

The project proposes right-of-way improvements, driveway access points, storm, sewer and water utility improvements in support of the 4 lot short plat. The existing and proposed surface coverages are summarized in Figure 1 of this report.

Figure 1 - Surface Coverages

Existing		
Coverage Description	Square Feet	Acres
<i>Grass / Landscaping</i>	5,671	0.13
<i>Asphalt</i>	3,838	0.09
<i>Concrete</i>	2,114	0.05
<i>Compacted Gravel</i>	6,088	0.14
Total Impervious	12,040	0.28
Total Coverage	17,711	0.41

Proposed		
Coverage Description	Square Feet	Acres
<i>Grass / Landscaping</i>	3,536	0.08
<i>New/Replaced Asphalt</i>	9,926	0.22
<i>New/Replaced Concrete</i>	4,249	0.10
Total Impervious	14,175	0.32
Total Coverage	17,711	0.41

2.0 DISCUSSION OF MINIMUM REQUIREMENTS

Please reference Figure 1 of this report for a breakdown of the existing and proposed surface coverages. According to Figure 2 of this report, Minimum Requirements 1-10 apply to the new hard surfaces, converted pervious surfaces and the land disturbed. Below is a summary of the Minimum Requirements applicable to this project.

2.1 Minimum Requirement #1 - Prepare a Stormwater Site Plan

This Preliminary Stormwater Site Plan has been provided pursuant to submittal of a Final Site Plan. A final Stormwater Site Plan will be provided during the Final Site Plan permitting process per City requirements to fully satisfy this requirement.

2.2 Minimum Requirement #2 - Construction Stormwater Pollution Prevention

This minimum requirement will be satisfied by the preparation of Construction Stormwater Pollution Prevention Plan and a Temporary Erosion and Sediment Control Plan – to be included with the Final Site Plan Review submittal.

2.3 Minimum Requirement #3 - Source Control for Pollution

Operational and Structural Source Control BMPs will be included in the Operations and Maintenance Manual – to be included with the Final Site Plan Review submittal.

2.4 Minimum Requirement #4 - Preservation of Natural Drainage Systems and Outfalls

We do not propose to alter the downstream flow path from the site. Stormwater runoff generated by the site will continue to discharge within City right-of-way.

2.5 Minimum Requirement #5 - On-site Stormwater Management

Stormwater will be managed onsite in accordance with the City of Puyallup and DOE requirements. Per Figure 2 of this report, the project will consider, in order, the BMP's from List #2. Stormwater will be managed by grading improved areas to drain to the existing and proposed closed conveyance systems, which are comprised of catch basins and storm drain piping.

Lawns and landscaped areas:

- Post Construction Soil Quality and Depth BMP T5.13 shall be applied for all disturbed soil areas as a result of this project's construction.

Roofs:

- The ROW improvements do not propose the addition of any roofs onsite, therefore BMPs have not been included in this phase. However, when new homes are built, perforated stub out connections will be incorporated to manage stormwater from the new roof tops.

Other Hard Surfaces:

- Full Dispersion – Full dispersion requires that runoff be dispersed across an available naturally vegetated area which meets the criterion presented in BMP T5.30 of the 2014 Manual. Full Dispersion cannot be implemented on the site or within the right of way because of the dispersion length the manual requires (100 feet). In addition, the site is about four feet higher in elevation than the conveyance system. Routing the stormwater from the right-of-way to the site for dispersion so that it could return to the right of way (the site does not readily infiltrate) is neither practicable nor reasonable.
- Permeable Pavement – Permeable pavement requires soils which support infiltration. Based on the geotechnical engineer's recommendations, the soils do not readily infiltrate. In addition, permeable pavement requires at least 1 foot of separation between the seasonal high groundwater table. Permeable pavement cannot be located onsite since the groundwater table is located within the required 1 foot separation. In addition, the City of Puyallup does not typically allow permeable pavement in their right-of-way. Please reference BMP T5.15 of the 2014 Manual.
- Bioretention BMP's - A bioretention facility cannot be located onsite or within the right-of-way to treat stormwater runoff from the proposed improvements. The conveyance system located within right-of-way has invert elevations that do not allow for runoff to be discharged and managed onsite. The existing season high water table onsite does not allow for a minimum vertical separation of 3 feet to the bottom layer of the bioretention facility. Please reference 'Infiltration' in Section 2.6 of this report for information on vertical drop limitations and BMP T7.30 from the 2014 Manual.
- Sheet Flow Dispersion / Concentrated Flow Dispersion – Neither Sheet Flow or Concentrated flow dispersion are feasible, this BMP requires a 10 foot wide minimum of vegetated surface for runoff to disperse across, which is not feasible, given the City's required roadway cross section.

2.6 Minimum Requirement #6 - Runoff Treatment

This project proposes more than 5,000 SF of new hard surface within the right-of-way. Per the Minimum Requirement flow chart, this surface conversion triggers water quality treatment for all new hard surfaces and converted vegetation areas. Due to site constrictions and City limitations, the project seeks an Adjustment (or Exception/Variance if deemed necessary by the review of this Preliminary Plan) to Minimum Requirement #6 – Runoff Treatment. Nearly all of the project's proposed new impervious surfaces are comprised of a) the addition of a concrete sidewalk along 13th St. SW and b) paving of the existing compacted gravel alley. The proposed sidewalk improvements along 13th improve pedestrian safety; overall function within the right-of-way is greatly enhanced when sidewalks are provided alongside roadways. Further, the proposed sidewalks are not considered pollution generating hard surfaces. The project will enhance the existing site's environmental impact through the proposed hard surface upgrades. The existing compacted gravel alley to the south of the existing parcel has the potential to erode and contribute to an increase in sediment-laden runoff. By improving this alley to a fully stabilized asphalt paved surface, the potential to contribute sediment-laden runoff is greatly mitigated. In efforts to satisfy

the runoff treatment standard, the project proposes to implement BMP T5.13: Post-construction Soil Quality and Depth where feasible.

This project prompts the Basic Treatment requirement outlined in the Manual for the new hard surfaces and converted vegetated areas. The City does not typically allow water quality facilities or pump stations to be installed within the right-of-way. There is little to no room within the right-of-way for a new water quality facility; in addition, the flat nature of the site and the presence of high groundwater poses limitations to the feasibility of a new water quality facility onsite. The following options for Basic Treatment were taken from the Basic Treatment Menu on page 3-9 from Volume V, Section 3.5 of the 2014 Manual. Below is a list of the Basic Treatment options, together with a brief discussion that addresses the item's feasibility.

- **Infiltration** – Stormwater quality facilities that utilize infiltration, including rain gardens, porous pavement, bioretention, etc. require input from a geotechnical engineer for infiltration suitability and 1 foot of separation to the seasonal high water table. Per the geotechnical report, Section 3.4, infiltration is not recommended. In addition, the site's groundwater table is close to or at existing grade. The existing R.O.W. conveyance system is at elevation 29±; while the site is at elevation 33±. Seasonal high groundwater is at elevation 31.5±. Water quality/quantity control facilities that utilize infiltration cannot be reasonably implemented onsite or within the right-of-way due to soil unsuitability, separation from high groundwater, and required vertical drop from the right-of-way conveyance system to an infiltration facility.
- **Sand Filters** – Per BMP T8.10, 'Site Suitability'; a Sand Filter requires 4 feet of vertical drop from inlet to outlet. There is not enough vertical drop on the existing site to reasonably install a new sand filter. In addition, the criteria outlined in the same BMP indicates that high groundwater may damage or negatively affect the performance of a sand filter; at least 2 feet of separation is recommended between the high water table and the bottom of the sand filter.
- **Biofiltration Swales** – There is not enough available drop to situate a sloped biofiltration swale onsite or within the right-of-way. In addition, the existing invert elevations of the conveyance system within the right-of-way will not allow for discharge to such a facility (reference 'Infiltration' section for a summary of vertical drop limitations).
- **Vegetated Filter Strip** – A vegetated filter strip cannot be positioned on the site or within the right-of-way to treat stormwater runoff from the proposed improvements; the required horizontal and vertical drop is not available. Please reference the City's standard roadway section (see C2.0 and C2.1 of the plan set) as well as the figure included with BMP T9.40 from the 2014 Manual.
- **Compost-amended Vegetated Filter Strip (CAVFS)** – A CAVFS cannot be positioned on the site or within the right-of-way to treat stormwater runoff from the proposed improvements; the required horizontal and vertical drop is not available. Please reference the City's standard roadway section (see C2.0 and C2.1 of the plan set) as well as BMP T7.40 / Figure 7.4.3 from the 2014 Manual.
- **Basic Wetpond** – A wetpond cannot be located onsite or within the right-of-way to treat stormwater runoff from the proposed improvements, there is not sufficient vertical elevation to

discharge from the right-of-way, to an onsite wetpond, then back into the City's system. In addition, the high groundwater conditions would result in a prohibitively large wetpond. Please reference 'Infiltration' section for a summary of vertical drop limitations as well as BMP T10.10 from the 2014 Manual.

- **Wetvault** – A wetvault cannot be located onsite or within the right-of-way to treat stormwater runoff from the proposed improvements due to the aforementioned vertical constraints outlined in 'Infiltration.' In addition, wetvaults are highly discouraged for residential projects per BMP T10.20 / V-3.5 from the 2014 Manual, page 3-9.
- **Stormwater Treatment Wetland** – A stormwater treatment wetland cannot be located onsite or within the right-of-way to treat stormwater runoff from the proposed improvements; the required vertical drop is not available. The existing conveyance system's invert elevations within the right-of-way will not allow for discharge to such a facility located onsite. Please reference 'Infiltration' for a summary of vertical drop limitations and BMP T10.30 from the 2014 Manual.
- **Combined Detention and Wetpool Facilities** – A combined detention and wetpool facility cannot be located onsite or within the right-of-way to treat stormwater runoff from the proposed improvements. Please reference 'Basic Wetpond,' 'Wetvault,' and 'Stormwater Treatment Wetland' sections for a summary of facility limitations.
- **Bioretention** – Please reference Section 2.5 of this report for a summary of Bioretention facility limitations.
- **Media Filter Drain (MFD)** – A MFD would be compromised due to the backwater effects and lack of sufficient hydraulic gradient from the existing seasonal high groundwater table. In addition, a MFD cannot be positioned on the site or within the right-of-way to treat stormwater runoff from the proposed improvements; the required horizontal and vertical drop is not available. Please reference the City's standard roadway section (see C2.0 and C2.1 of the plan set) as well as BMP T8.40 / Figure 8.5.8-8.5.10 from the 2014 Manual.

2.7 Minimum Requirement #7 - Flow Control

The project triggers Minimum Requirement #7 – Flow Control, more than 5,000 SF of new/replaced hard surfaces are proposed within the right-of-way. Flow control BMPs cannot be feasibly implemented for these improvements within the right-of-way and the project seeks to make an Adjustment (or Exception/Variance) for Minimum Requirement #7. Please reference the limitations of the site and the existing conveyance system outlined in Section 2.6 of this report.

As previously discussed, the new/replaced hard surfaces within the project site that trigger the flow control requirement are almost entirely comprised of the new sidewalk along 13th and the paving of the existing compacted gravel alley. The project will not, through a combination of effective hard surfaces and converted vegetation areas, cause a 0.10 cubic feet per second increase in the 100-year flow frequency when comparing the post developed project runoff to the existing site condition runoff. The project has considered the following in efforts to provide a suitable Adjustment to the Manual:

1. **The exception will not increase risk to public health and welfare, nor be injurious to other properties in the vicinity and/or downstream, and to the quality of waters of the state.** The existing conditions will be improved as a result of this project. The proposed sidewalk improvements along 13th improve pedestrian safety; overall function within the right-of-way is greatly enhanced when sidewalks are provided alongside roadways. The existing compacted gravel alley to the south of the existing parcel has the potential to erode and contribute to a potential increase in sediment-laden runoff. By

improving this alley to a fully stabilized asphalt paved surface, the potential to contribute sediment-laden runoff is greatly mitigated.

2. **The exception is the least possible exception that could be granted to comply with the intent of the minimum requirements.** If this exception is granted, the intent of the manual will be met. There is no substantial negative impact to downstream systems based on the comparison of compacted gravel (impervious) to asphalt (impervious). There is no change in surface coverage when modeling these two scenarios in WWHM; therefore, by inspection, there is no net change in discharge during the 100-year event.

2.8 Minimum Requirement #8 - Wetland Protection

Soundview Consultants performed a Wetland Delineation and Fish and Wildlife Habitat Assessment Report and Biological Assessment for the subject site. The wetlands provide only a limited degree of function for improving water quality. Please see the Wetland Assessment Report attached under separate cover for more information.

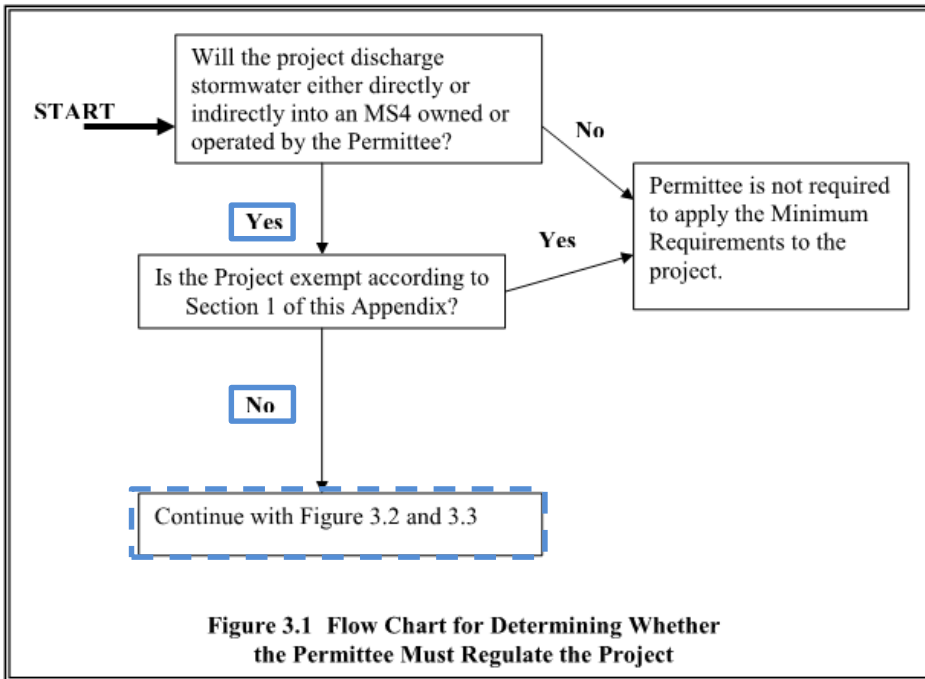
2.9 Minimum Requirement #9 - Basin Watershed Planning

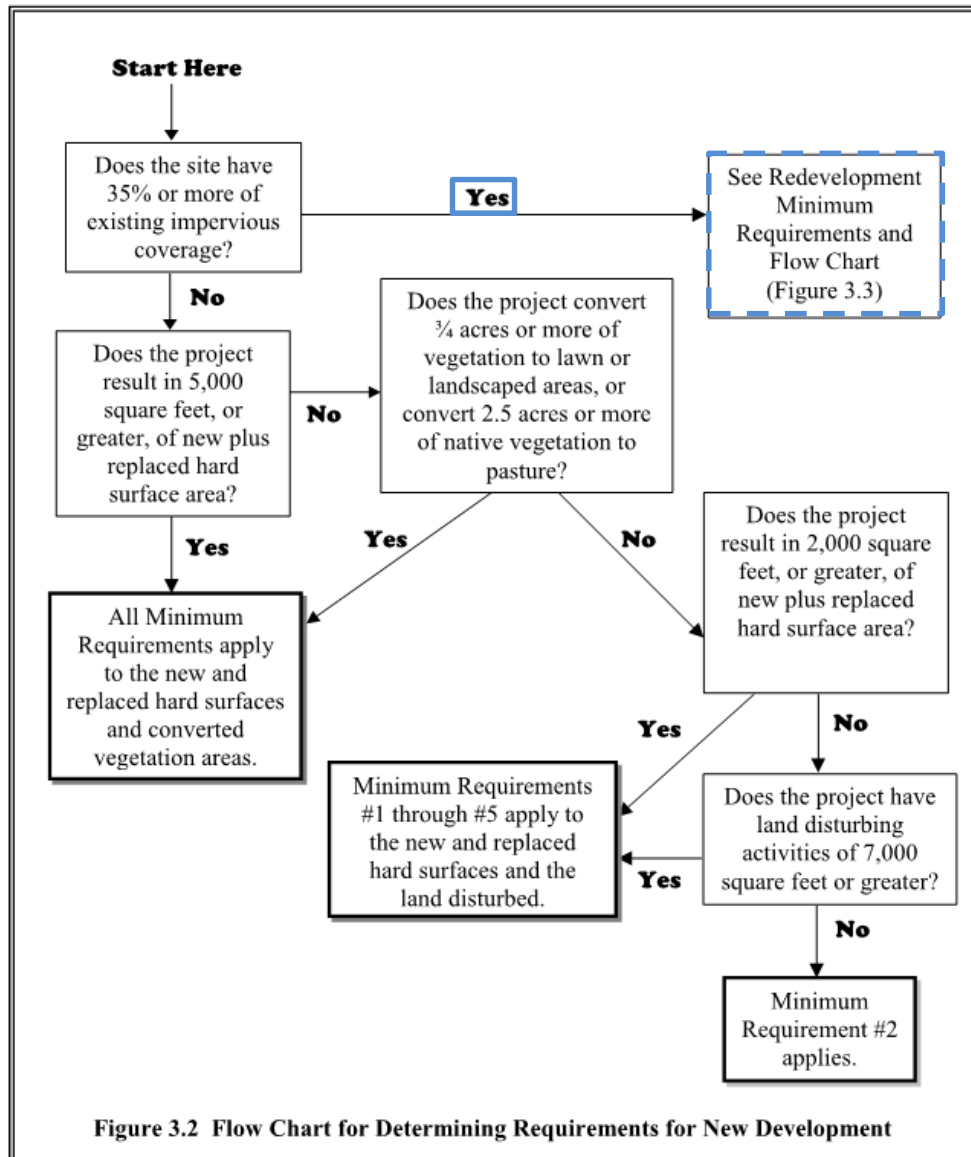
The project is within the Clarks Creek Drainage Basin. There are no approved DOE or City drainage/basin plans we are aware of that necessitate additional planning requirements for the improvements proposed.

2.10 Minimum Requirement #10 - Operation and Maintenance

An Operations and Maintenance Plan will be provided to the City of Puyallup as a part of the Final Site Plan Review.

Figure 2 - Minimum Requirements Flow Chart





Western Washington Phase II Municipal Stormwater Permit

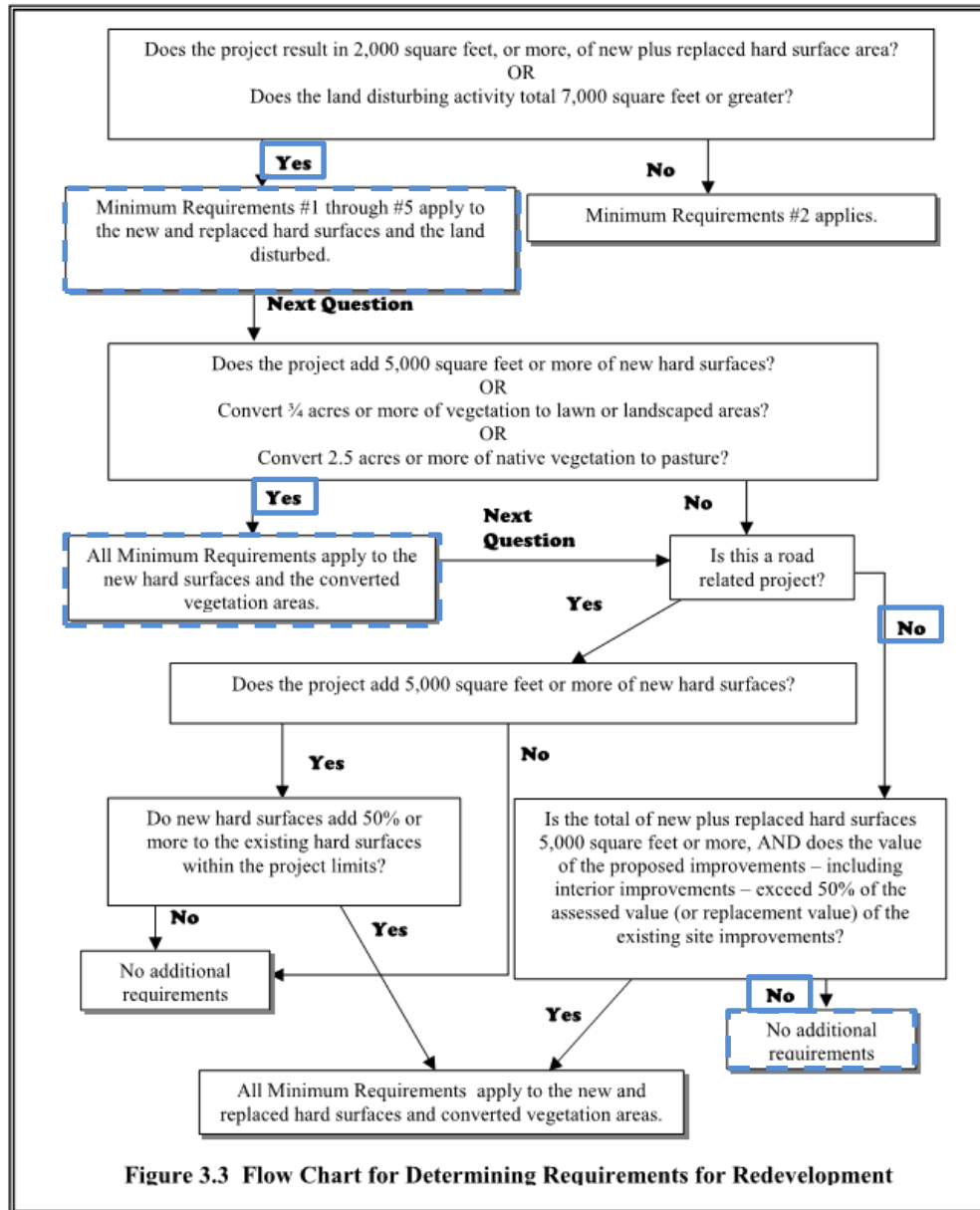
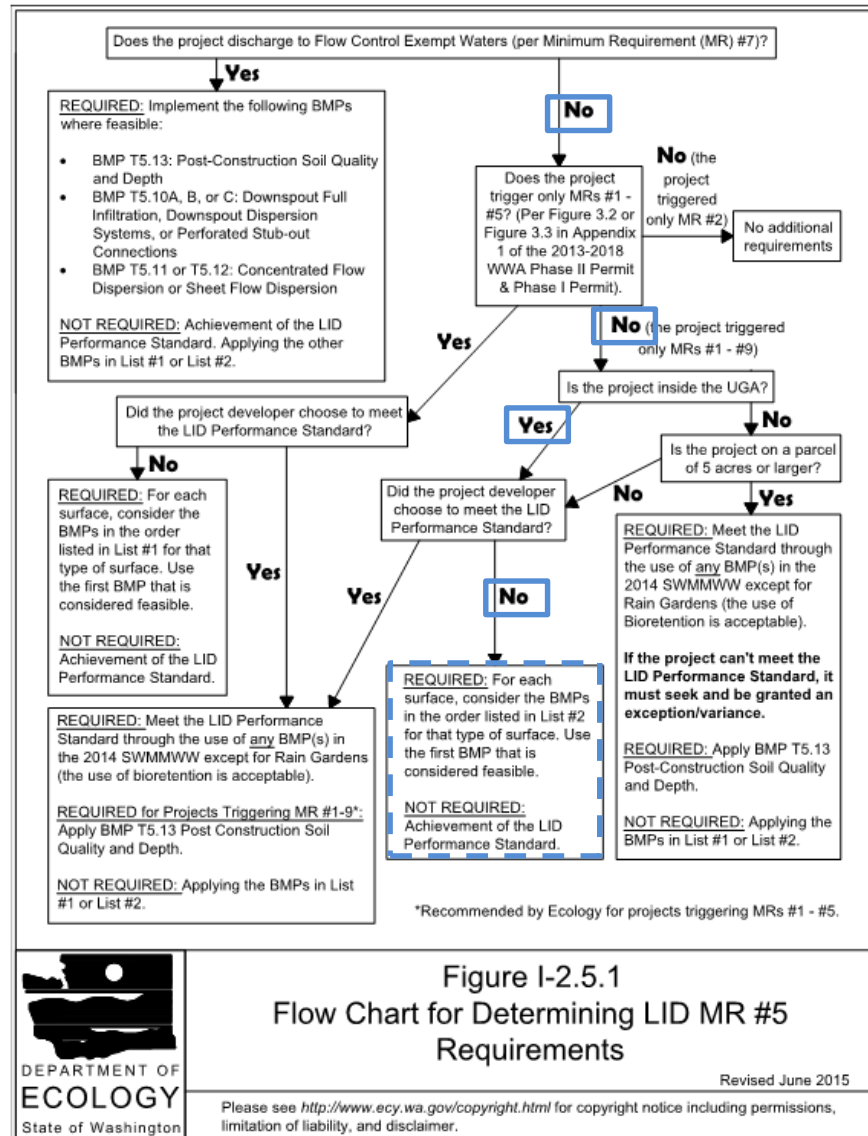


Figure I-2.5.1 Flow Chart for Determining LID MR #5 Requirements



3.0 OFFSITE ANALYSIS

An offsite analysis is required for this project because stormwater generated by the proposed project will discharge to a City-owned (offsite) conveyance system. This analysis will be completed, as necessary, as a part of the Final Site Plan Review.

3.1 Offsite Analysis Study Area

The project site was originally developed with one single-family residence within a residential zone in Puyallup. The site is bordered by 7th Ave SW to the north, single family homes to the east, a compacted gravel driveway used by single family residences to the south, and 14th St SW to the west.

3.2 Review of Available Information on the Study Area

A Vicinity Map, a City of Puyallup Basin Map, a FEMA Floodplain Map, an Inventoried Wetlands & Streams Map, and an Aquifer Recharge & Wellhead Protection Areas Map have been included at the end of this section. Based on the reviewed information, the site lies within the Clarks Creek Basin, the site is within the “AE, AO, and X” Flood Zones per FEMA and, the site contains a wetland located on in the southwestern area of the property which was delineated in 2009, and the site is within an aquifer recharge area.

4.0 CRITICAL AREAS

4.1 Flood Zone

The project site is located within three different flood zones according to FEMA. Commencing at the northwest corner towards the southeast corner, the site transitions from Zone “X” to an area with 0.2% annual change flood hazard, to Zone “AE” with a base flood elevation of approximately 33. Please see Figure 5.

4.2 Wetlands

Please see the Report attached under separate cover by Soundview Consultants.

4.3 Aquifer Recharge and Wellhead Protection Zone

The project lies within an aquifer recharge area, as defined by the City of Puyallup’s Aquifer Recharge and Wellhead Protection Areas, see Figure 7. This project does not negatively impact the Aquifer Recharge or Wellhead protection area. We are not aware of any other critical areas on or near the site.

5.0 STORM DRAINAGE CALCULATIONS

Conveyance calculations will be provided, if/as required, as a part of the Final Stormwater Site Plan.

Figure 3 – Vicinity Map



Figure 4 – City Drainage Basin Map

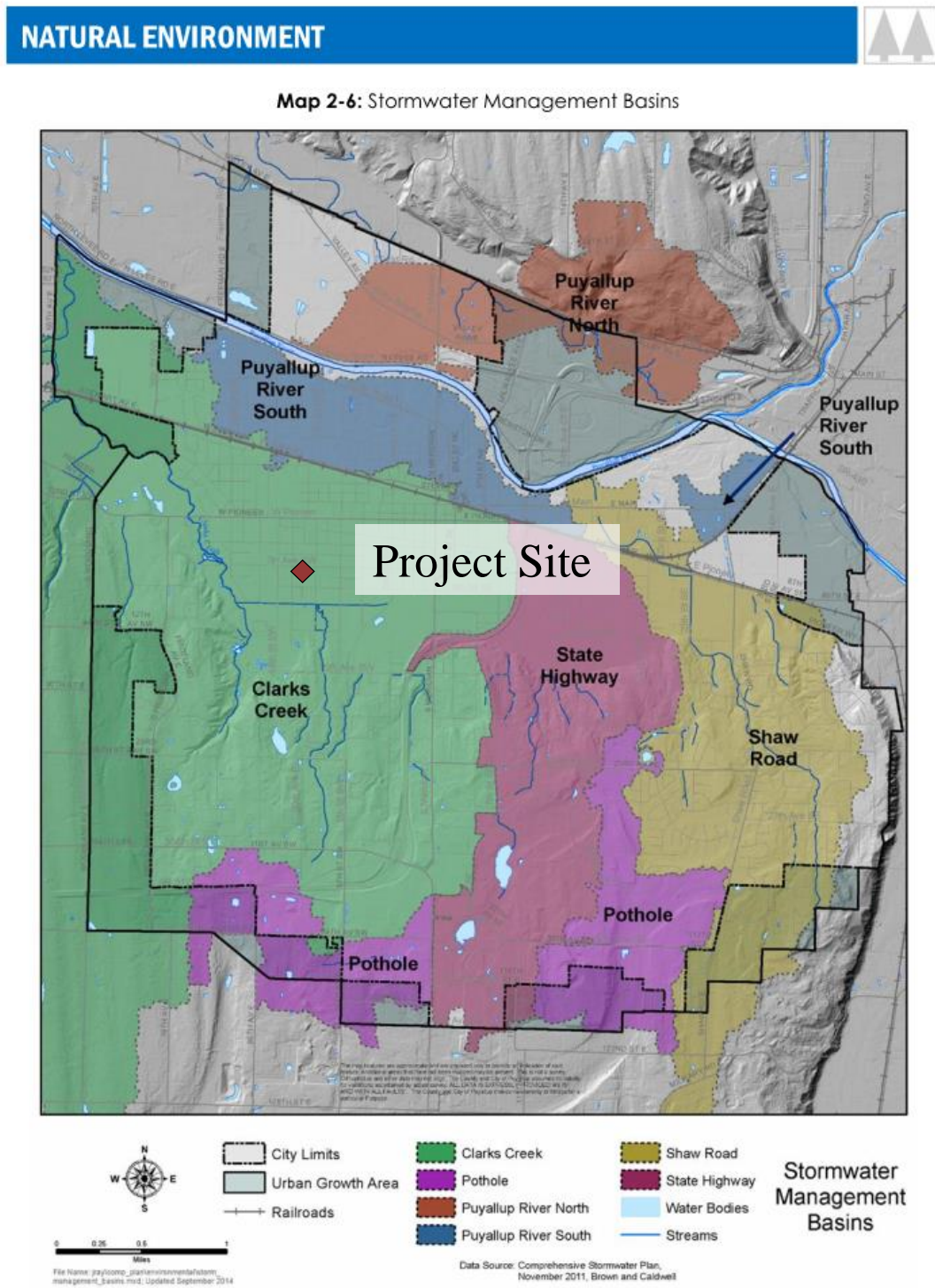


Figure 5 – FEMA Map

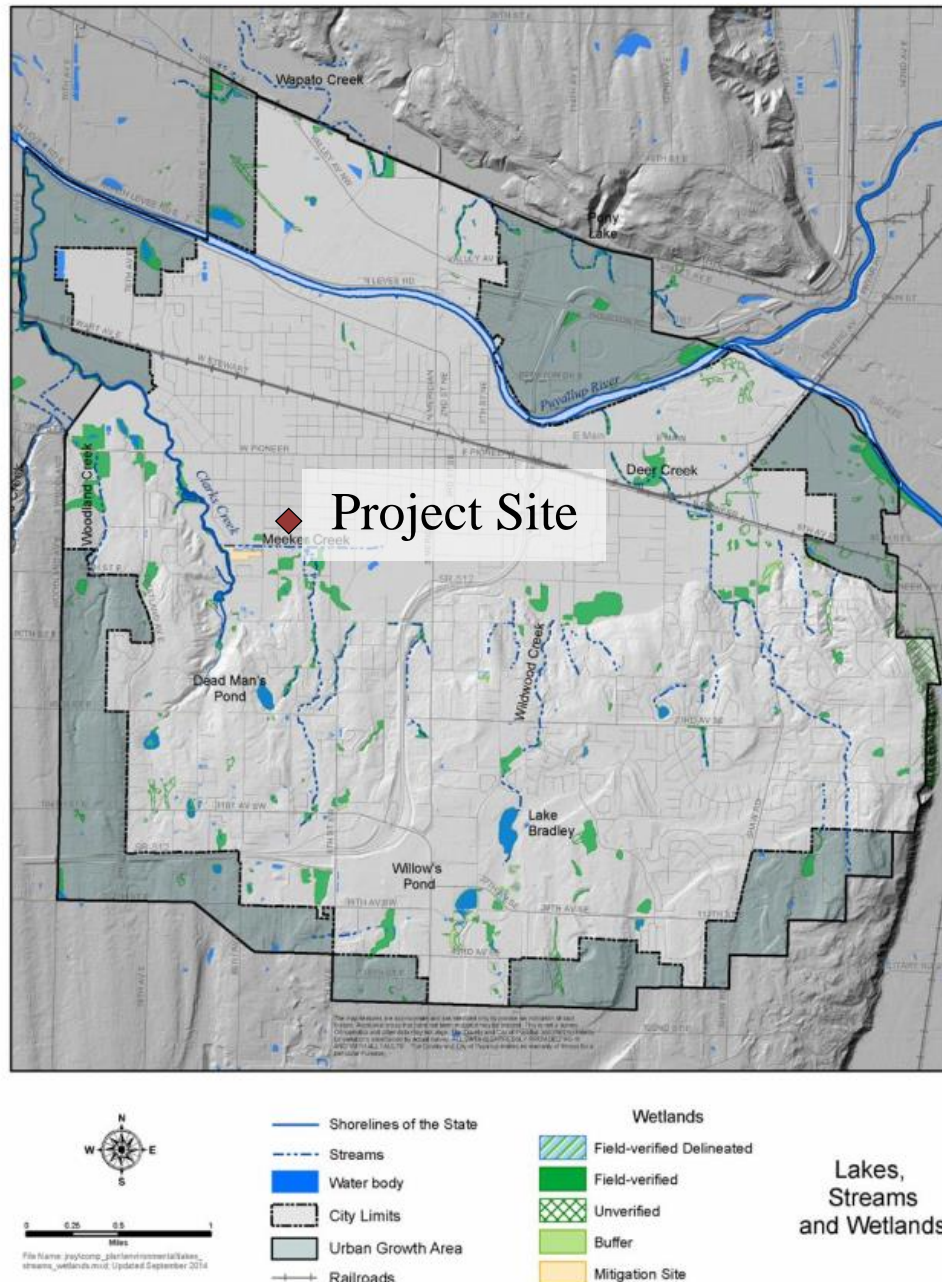
FEMA's National Flood Hazard Layer (Official)



NATURAL ENVIRONMENT



Map 2-7: Lakes, Streams and Wetlands



PUYALLUP COMPREHENSIVE PLAN

PAGE 2.15

Figure 6 – Lakes, Streams and Wetlands Protection Areas

Figure 7 – Aquifer Recharge Areas and Wellhead Protection Areas

