

## **PRELIMINARY STORMWATER SITE PLAN CITY OF PUYALLUP WPCP THIRD SECONDARY CLARIFIER**

### **PROJECT OVERVIEW**

The Water Pollution Control Plant (WPCP) Third Secondary Clarifier Project includes the construction of a new 110 foot diameter Secondary Clarifier, approximately 175 feet of new piping and associated electrical work to connect the new clarifier to the existing hydraulic and SCADA systems, installation of a magnetic flow meter and a 4<sup>th</sup> return activated sludge pump in the lower level of the existing RAS/WAS Building, HVAC, architectural and electrical work in the main floor of the RAS/WAS Building, installation of a new submersible pump, radar level sensor and piping revisions at the existing effluent flowmeter manhole to create a scum pump station. Site restoration will include replacement of existing asphalt impacted by underground trenching and installation of new crushed surfacing gravel on the south and west sides of the new clarifier. The project is located on two of the five parcels that are included in the WPCP site, Parcels No. 0420204132, 0420208044 and 042020136. Parcels No. 0420204132 and 0420208044 are the subject of a current Lot Combination Application. The project site includes existing buildings, equipment pads, asphalt service road and open water surface process tanks.

This preliminary site plan describes the existing and proposed land coverage and preliminary drainage calculations. A complete Stormwater Plan will be prepared following concurrence from the City with the preliminary site plan.

The existing and proposed site surfaces for the combined parcels are summarized in Table 1.

**TABLE 1**

**Project Areas**

|                        |   |                                      | <b>Project Site<br/>(acres)</b> |
|------------------------|---|--------------------------------------|---------------------------------|
| <b><u>Existing</u></b> | Total Hard  |                                      | 2.05                            |
|                        |   | <i>Non-Pollution-Generating Hard</i> | 0.53                            |
|                        |   | <i>Pollution-Generating Hard</i>     | 1.52                            |
|                        | Total Open Water  |                                      | 2.06                            |
|                        | Total Pervious  |                                      | 2.55                            |
|                        | <b>Total Project Area</b>                                   |                                      | <b>6.66</b>                     |
|                        | <b>% Hard Surfaces, and Open Water Tanks<br/>(Existing)</b> |                                      | <b>62%</b>                      |
| <b><u>Proposed</u></b> | Total Hard  |                                      | 2.12                            |
|                        |   | <i>Non-Pollution-Generating Hard</i> | -                               |
|                        |   | Unchanged                            | 0.53                            |
|                        |   | <i>Pollution-Generating Hard</i>     |                                 |
|                        |   | Unchanged                            | 1.42                            |
|                        |   | New                                  | .07                             |
|                        |   | Replaced                             | 0.10                            |
|                        | Total Open Water  |                                      | 2.28                            |
|                        |   | Unchanged                            | 2.06                            |
|                        |   | New                                  | 0.22                            |
|                        |   | Total Pervious                       | 2.26                            |
|                        | <b>Total Project Area</b>                                   |                                      | <b>6.66</b>                     |
|                        | <b>% Hard Surfaces and Open Water Tanks<br/>(Proposed)</b>  |                                      | <b>66%</b>                      |

This Stormwater Site Plan is provided to outline the project stormwater management requirements and compliance with the guidelines in the 2019 Department of Ecology’s Stormwater Management Manual for Western Washington (Ecology Manual). This project is considered a redevelopment project. The percentage of the site covered by hard surfaces and open water tanks (precipitation falling on open water tanks does not discharge to the ground) is 62%. With more than 35 percent existing impervious coverage and open water tanks, the project is defined as redevelopment. Per the attached Flow Chart for Determining Requirements for Redevelopment, Ecology Manual, Minimum Requirements 1 through 5 apply to the new and replaced hard surfaces and the land disturbed. The total of new plus replaced hard surfaces is greater than 5,000 sf;

however, the value of the proposed improvements does not exceed 50% of the replacement value of the existing facilities in the project site.

## **EXISTING CONDITIONS SUMMARY**

As indicated in the Project Overview, the existing conditions on the site include wastewater treatment structures including buildings and open tanks, asphalt driveways and gravel surfaces. The WPCP is served by two north draining stormwater collections systems that convey storm drainage from the WPCP and off-site areas to the Puyallup River. The two collection systems are in a single Threshold Discharge Area (TDA). Stormwater is discharged directly to the Puyallup River via manmade systems. Per Table I-A.1: Flow Control Exempt Receiving Waters (Ecology Manual) the Puyallup River in this vicinity is a flow control exempt receiving water. The combined WPCP and off-site flows are not detained.

The stormwater drainage system within the WPCP is shown in the attached Figure 2 from the City of Puyallup WPCP Flood Plan. The eastern drainage system collects off-site flow from approximately 20 acres of the City to the south and east of the WPCP. The attached screen shot of the City's stormwater map identifies the off-site drainage areas.

Stormwater that falls on the surface of the open water tanks is conveyed through the treatment process and is discharged as treated effluent.

## **HYDRAULIC MODEL**

The Western Washington Hydraulic Model (WVHM) was used to evaluate the existing and proposed flows for the project area. As discussed above, stormwater that falls on the surface of the open water tanks does not contribute to stormwater flow. The open water tanks are not included in the areas contributing to stormwater runoff.

The model input parameters and results are shown in Table 2. The total area of the project site is less in the mitigated (developed condition) since the third Secondary Clarifier is an open water tank that has not been included in the model. Screen shots of the WVHM model are attached. Flow control is not required for this project since storm drainage from the WPCP discharges directly to a flow control exempt water body. If this project were subject to flow control requirements the project would not meet the required 0.15 cfs or greater increase in the 100-year flow frequency using a model based on the 15-minute time step that would trigger a need to provide flow control.

**TABLE 2**

**WWHM Model Parameters**

| Parameter               | Existing   | Developed  |
|-------------------------|------------|------------|
| Land Coverage           |            |            |
| Pervious Surface        | 2.55 acres | 2.26 acres |
| Impervious Surface      |            |            |
| Roof                    | 0.53 acres | 0.53 acres |
| Driveway                | 1.52 acres | 1.59 acres |
|                         |            |            |
| Flow (15 min time step) |            |            |
| 2-year                  | 0.8208 cfs | 0.8336 cfs |
| 10-year                 | 1.4040 cfs | 1.4101 cfs |
| 100-year                | 2.3620 cfs | 2.3469 cfs |

Western Washington Hydrology Model DOE Version  
 File Edit View Help Summary Report

Basin Help

Schematic Basin 1 Predeveloped

SCENARIOS

Predeveloped  
 Mitigated

Run Scenario

Basic Elements

Pro Elements

LID Toolbox

Commercial Toolbox

Move Elements

Save x,y Load x,y

Fri 12:33p - default[10] - Finish Predeveloped

Subbasin Name: Basin 1

Surface Interflow Groundwater

Flows To :

Area in Basin  Show Only Selected

| Available Pervious                                |  | Acres | Available Impervious                               |  | Acres |
|---|--|-------|--|--|-------|
| <input type="checkbox"/> A/B, Forest, Flat        |  | 0     | <input type="checkbox"/> ROADS/FLAT                |  | 0     |
| <input type="checkbox"/> A/B, Forest, Mod         |  | 0     | <input type="checkbox"/> ROADS/MOD                 |  | 0     |
| <input type="checkbox"/> A/B, Forest, Steep       |  | 0     | <input type="checkbox"/> ROADS/STEEP               |  | 0     |
| <input type="checkbox"/> A/B, Pasture, Flat       |  | 0     | <input checked="" type="checkbox"/> ROOF TOPS/FLAT |  | 0.53  |
| <input type="checkbox"/> A/B, Pasture, Mod        |  | 0     | <input checked="" type="checkbox"/> DRIVEWAYS/FLAT |  | 1.52  |
| <input type="checkbox"/> A/B, Pasture, Steep      |  | 0     | <input type="checkbox"/> DRIVEWAYS/MOD             |  | 0     |
| <input type="checkbox"/> A/B, Lawn, Flat          |  | 0     | <input type="checkbox"/> DRIVEWAYS/STEEP           |  | 0     |
| <input type="checkbox"/> A/B, Lawn, Mod           |  | 0     | <input type="checkbox"/> SIDEWALKS/FLAT            |  | 0     |
| <input type="checkbox"/> A/B, Lawn, Steep         |  | 0     | <input type="checkbox"/> SIDEWALKS/MOD             |  | 0     |
| <input type="checkbox"/> C, Forest, Flat          |  | 0     | <input type="checkbox"/> SIDEWALKS/STEEP           |  | 0     |
| <input type="checkbox"/> C, Forest, Mod           |  | 0     | <input type="checkbox"/> PARKING/FLAT              |  | 0     |
| <input type="checkbox"/> C, Forest, Steep         |  | 0     | <input type="checkbox"/> PARKING/MOD               |  | 0     |
| <input type="checkbox"/> C, Pasture, Flat         |  | 0     | <input type="checkbox"/> PARKING/STEEP             |  | 0     |
| <input type="checkbox"/> C, Pasture, Mod          |  | 0     | <input type="checkbox"/> POND                      |  | 0     |
| <input type="checkbox"/> C, Pasture, Steep        |  | 0     | <input type="checkbox"/> Porous Pavement           |  | 0     |
| <input checked="" type="checkbox"/> C, Lawn, Flat |  | 2.55  |  |  |       |
| <input type="checkbox"/> C, Lawn, Mod             |  | 0     |  |  |       |
| <input type="checkbox"/> C, Lawn, Steep           |  | 0     |  |  |       |
| <input type="checkbox"/> SAT, Forest, Flat        |  | 0     |  |  |       |
| <input type="checkbox"/> SAT, Forest, Mod         |  | 0     |  |  |       |
| <input type="checkbox"/> SAT, Forest, Steep       |  | 0     |  |  |       |

Pervious Total 2.55 Acres  
 Impervious Total 2.05 Acres  
 Basin Total 4.6 Acres

Deselect Zero Select By: GO

Western Washington Hydrology Model DOE Version  
 File Edit View Help Summary Report

Basin Help

Schematic

Basin 1 Mitigated

Subbasin Name: Basin 1  Designate as Bypass for POC:

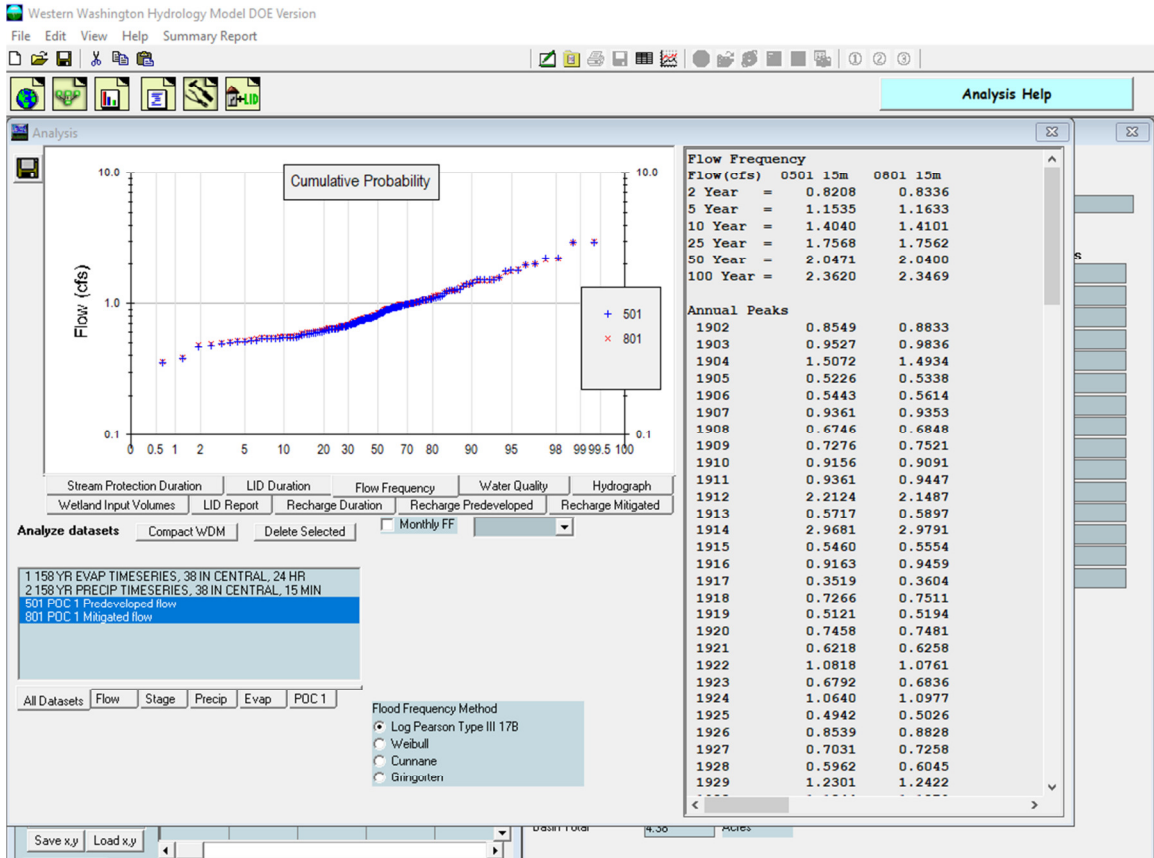
Flows To : Surface Interflow Groundwater

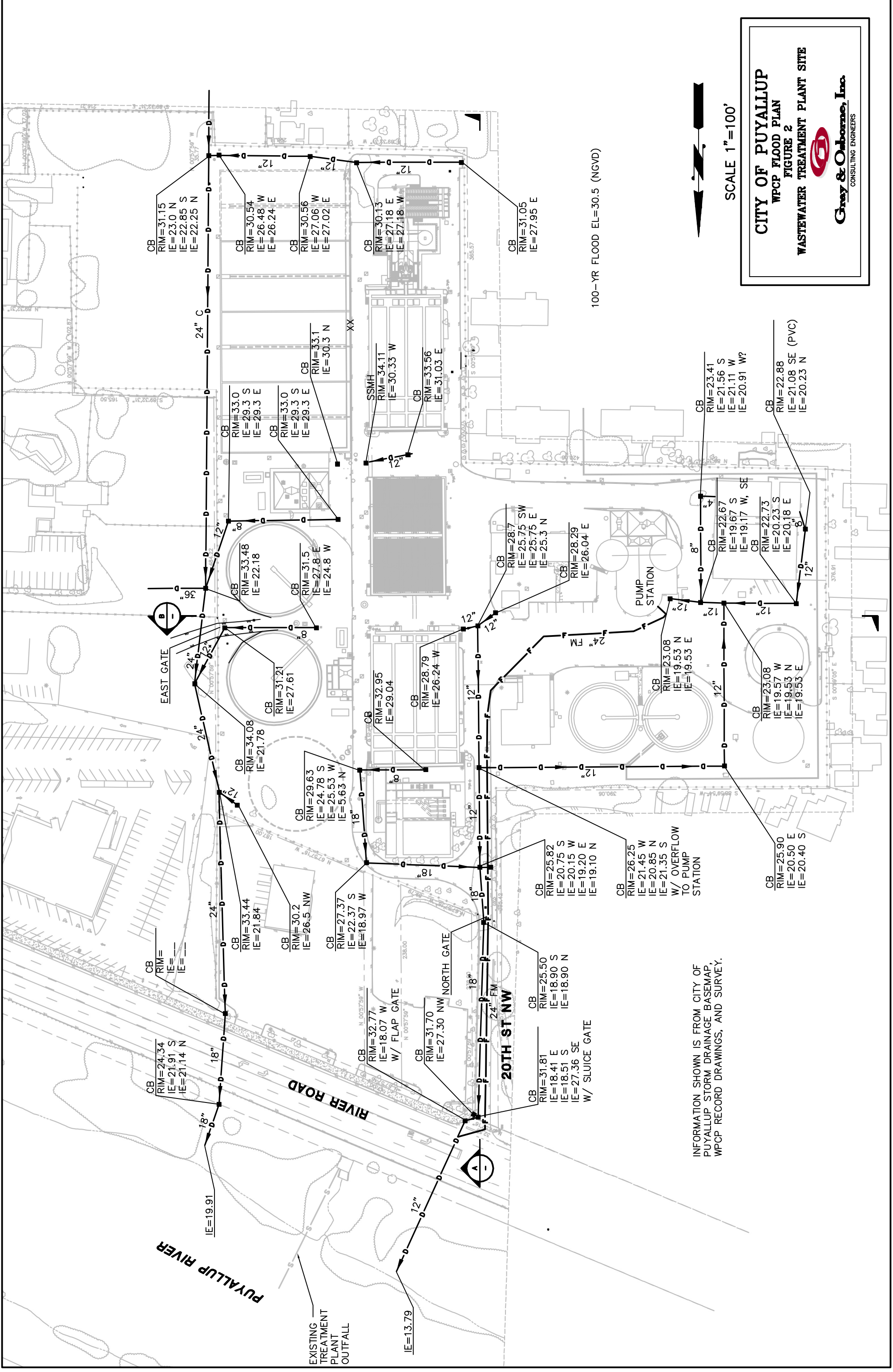
Area in Basin  Show Only Selected

| Available Pervious                                |       | Available Impervious                               |       |
|---|-------|--|-------|
|   | Acres |  | Acres |
| <input type="checkbox"/> A/B, Forest, Flat        | 0     | <input type="checkbox"/> ROADS/FLAT                | 0     |
| <input type="checkbox"/> A/B, Forest, Mod         | 0     | <input type="checkbox"/> ROADS/MOD                 | 0     |
| <input type="checkbox"/> A/B, Forest, Steep       | 0     | <input type="checkbox"/> ROADS/STEEP               | 0     |
| <input type="checkbox"/> A/B, Pasture, Flat       | 0     | <input type="checkbox"/> ROOF TOPS/FLAT            | 0.53  |
| <input type="checkbox"/> A/B, Pasture, Mod        | 0     | <input checked="" type="checkbox"/> DRIVEWAYS/FLAT | 1.59  |
| <input type="checkbox"/> A/B, Pasture, Steep      | 0     | <input type="checkbox"/> DRIVEWAYS/MOD             | 0     |
| <input type="checkbox"/> A/B, Lawn, Flat          | 0     | <input type="checkbox"/> DRIVEWAYS/STEEP           | 0     |
| <input type="checkbox"/> A/B, Lawn, Mod           | 0     | <input type="checkbox"/> SIDEWALKS/FLAT            | 0     |
| <input type="checkbox"/> A/B, Lawn, Steep         | 0     | <input type="checkbox"/> SIDEWALKS/MOD             | 0     |
| <input type="checkbox"/> C, Forest, Flat          | 0     | <input type="checkbox"/> SIDEWALKS/STEEP           | 0     |
| <input type="checkbox"/> C, Forest, Mod           | 0     | <input type="checkbox"/> PARKING/FLAT              | 0     |
| <input type="checkbox"/> C, Forest, Steep         | 0     | <input type="checkbox"/> PARKING/MOD               | 0     |
| <input type="checkbox"/> C, Pasture, Flat         | 0     | <input type="checkbox"/> PARKING/STEEP             | 0     |
| <input type="checkbox"/> C, Pasture, Mod          | 0     | <input type="checkbox"/> POND                      | 0     |
| <input type="checkbox"/> C, Pasture, Steep        | 0     | <input type="checkbox"/> Porous Pavement           | 0     |
| <input checked="" type="checkbox"/> C, Lawn, Flat | 2.26  |  |       |
| <input type="checkbox"/> C, Lawn, Mod             | 0     |  |       |
| <input type="checkbox"/> C, Lawn, Steep           | 0     |  |       |
| <input type="checkbox"/> SAT, Forest, Flat        | 0     |  |       |
| <input type="checkbox"/> SAT, Forest, Mod         | 0     |  |       |
| <input type="checkbox"/> SAT, Forest, Steep       | 0     |  |       |

Pervious Total 2.26 Acres  
 Impervious Total 2.12 Acres  
 Basin Total 4.38 Acres

Deselect Zero **Select By:**





100-YR FLOOD EL=30.5 (NGVD)



SCALE 1"=100'

**CITY OF PUYALLUP**  
**WPCP FLOOD PLAN**  
**FIGURE 2**  
**WASTEWATER TREATMENT PLANT SITE**

**Gray & Osborne, Inc.**  
 CONSULTING ENGINEERS

INFORMATION SHOWN IS FROM CITY OF PUYALLUP STORM DRAINAGE BASEMAP, WPCP RECORD DRAWINGS, AND SURVEY.

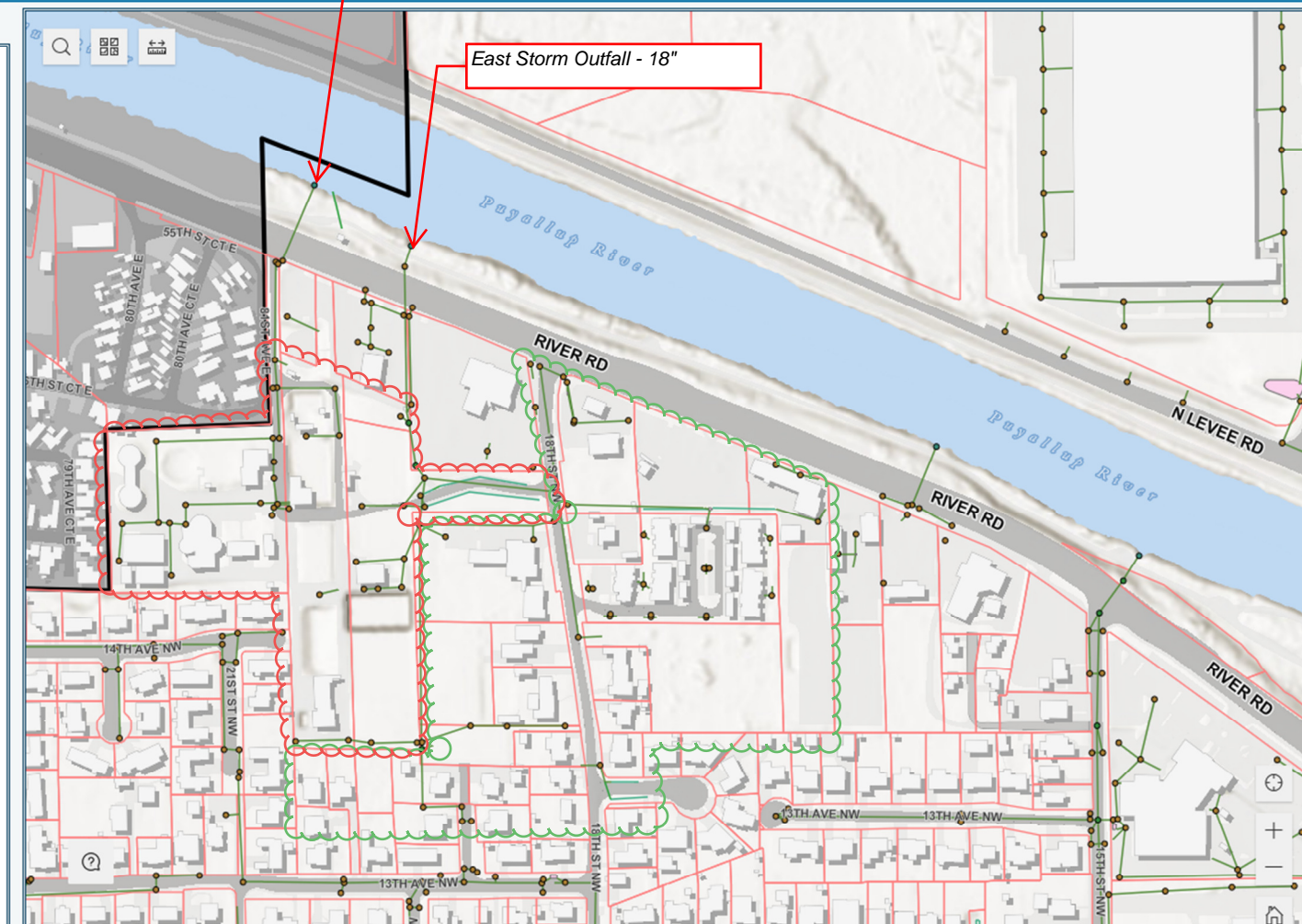


WPCP Drainage Collection System

# City of Puyallup Public Data Viewer

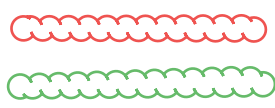
West Storm Outfall - 12"

East Storm Outfall - 18"



## Legend

- Utilities
- Storm Water
- Outfalls
- Manholes
- Inlets
- Control Structures
- Culverts
- Pipes
- Channels
- Facilities



WPCP Basin - total 12.15 acres

Off-site Basin - approx. 20 acres