

# ***Subdivision at 10610 SE Home Avenue***

*Milwaukie, OR*

**Developer: Victoria Rystadt**

J.O. SGL 21-60

January 7, 2022

## ***STORMWATER CALCULATIONS***



EXPIRES: 6/30/

### **SISUL ENGINEERING**

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**Narrative:**

The subdivision site location is at 10544, 10586 and 10610 SE Home Avenue in Milwaukie, Oregon. There are currently three existing homes on the site and 5 additional homesites are being proposed. Generally, the site slopes southwesterly, at an approximate 10-15% in the northeast corner of the site and as little as 2% in the southwest corner.

A public street extension through the site (SE Harrison) with some constrained conditions, will connect SE Home to an existing street stub on the east side of the site. Four of the new proposed home sites will access this new street extension and the fifth new home site will have access to Home Avenue.

There is little in the way of a formal storm drain system in the immediate area along Home Avenue, except for one catch basin on the north side of SE Harrison, which appears to drain westerly to a collection of drywells in vicinity of Harrison and SE 47<sup>th</sup>. There is also a storm drain system in newer street system to the east of the site that appears drains to some sort of infiltration system to the east of the subject site, but generally uphill from most of the proposed subdivision site.

From City GIS records it appears that City drywells are used for storm drainage to the north, west and south of the site, along with an infiltration system of some sort to the east.

We have not yet seen an infiltration test report for the subject site, but based on the surrounding facilities, we will assume infiltration is possible at some depth. For the purposes of this preliminary drainage report we are assuming a drywell system in the vicinity of SE Home Avenue and SE Harrison Street will be possible for stormwater disposal, but in case that is not feasible, a shallow infiltration system, either through planters or infiltration chambers will be looked at.

This preliminary study looked at what size water quality planter, in accordance with City of Portland Stormwater Manual, would be necessary for water quality purposes.

**Water Quality:**

Per City of Portland stormwater PAC calculator to meet the pollution reduction requirements for the impervious area of proposed street extension area and the four proposed home sites that could drain to this proposed street extension a street side planter of at least 300 SF will be needed. See the PAC calculation print out that follows in this narrative.

The fifth homesite that would take access to SE Home Avenue would likely require an onsite water quality planter, unless frontage improvements are required along SE Home Avenue, in which case a public storm water quality

facility may be created for additional impervious area in Home Avenue, that could potentially allow the fifth home site (Lot 4) to utilize.

**Stormwater Disposal:**

As no onsite geotechnical infiltration testing has yet been performed, we can only rely on information from NRCS with regards to infiltration rates. From NCRS data it is estimated that the onsite soils can drain at approximately 0.7 inches per hour, in at least the top 60 inches of soil. Such a rate if it were to hold up, by onsite testing would require a significant footprint for infiltration disposal.

Because of the number of drywells being utilized within a few blocks of the proposed subdivision site, it is felt that at a deeper depth, drywells will be feasible. The USGS depth to groundwater, website (see attached) indicates that it is approximately 50 feet to groundwater at the subject site and therefore, reasonably deep drywells, if sands or cobble soil layers are available, should allow for drywells, without restrictions for high groundwater conditions.

**Soil Type:**

This site has two soil types as identified by (Web Soil Survey).

- 71A - Quatama Loam, 0-3 percent slopes – Hydrologic Group ‘C’
- 53B - Latourell Loam, 3 to 8 percent slopes – Hydrologic Group ‘B’

**Area:**

The new impervious area for the site is estimated as follows:

- Lots 5-8 – Proposed Impervious: 2500 sf/each
- New Right-of-way – Estimated Impervious: 10,000 sf

**Rainfall Distribution:**

The rainfall intensity is based on the values locked into the City of Portland stormwater PAC Calculator.

**Time of Concentration – Pre-Developed:**

For conservative results, a minimum time of concentration of 5 minutes will be used.

**Site Conditions & Design Values**

**Water Quality Analysis:**

Based on Portland’s PAC Calculator, for water quality (Pollution Reduction) a 300 SF planter will be able to provide water quality for approximately 20,000 SF of impervious surfaces.

While we did not look specifically at Lot 4, if Lot 4 were developed without any improvements to Home Avenue, under DEQ rules, it would be rule authorized to infiltrate to an onsite drywell or other infiltration system, as a residential system.

### Stormwater Disposal:

As noted above, it is assumed that drywells will be utilized for stormwater disposal, but currently we have insufficient information to model the depth and number of drywells that may be required.

## Portland PAC Calculator Print outs

### PAC Report


Project Name	Permit No.	Created
Home Street subdivision	none	1/6/22 8:09 AM
Project Address	Designer	Last Modified
10610 SE Home Avenue Milwaukie, OR 97222	Tom Sisul	1/6/22 9:01 AM
	Company	Report Generated
	Sisul Engineering	1/6/22 9:01 AM

### Project Summary

Preliminary design for stormwater

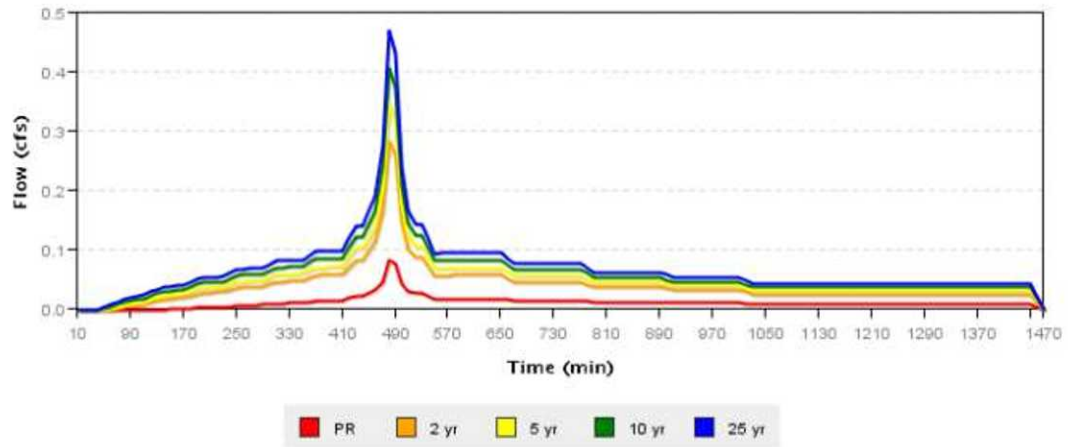
Catchment Name	Impervious Area (sq ft)	Native Soil Design Infiltration Rate	Hierarchy Category	Facility Type	Facility Config	Facility Size (sq ft)	Facility Sizing Ratio	PR Results	Flow Control Results
Facility A	20000	0.70	3	Planter (Flat)	C	300	1.5%	Pass	Fail

## Catchment Facility A

Site Soils & Infiltration Testing Data	Infiltration Testing Procedure	Open Pit Falling Head
	Native Soil Infiltration Rate ( $I_{test}$ )	0.70
<b>Correction Factor</b>	$CF_{test}$	2
<b>Design Infiltration Rates</b>	Native Soil ( $I_{dsgn}$ )	0.35 in/hr 
	Imported Growing Medium	2.00 in/hr
<b>Catchment Information</b>	Hierarchy Category	3
	Disposal Point	C
	Hierarchy Description	Off-site flow to drainageway, river, or storm-only pipe system
	Pollution Reduction Requirement	Pass
	10-year Storm Requirement	N/A
	Flow Control Requirement	The post-development peak rates for the 2, 5 and 10-year design storms must be equal or less than the pre-development rates.
	Impervious Area	20000 sq ft 0.459 acre
	Time of Concentration ( $T_c$ )	5
	Pre-Development Curve Number ( $CN_{pre}$ )	72
	Post-Development Curve Number ( $CN_{post}$ )	98

 Indicates value is outside of recommended range

## SBUH Results



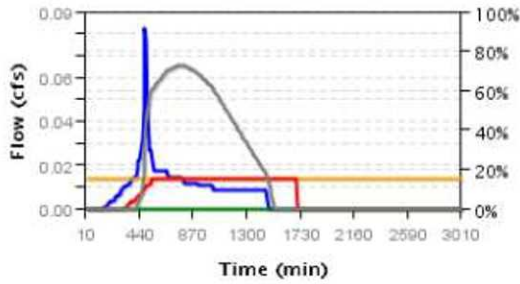
	Pre-Development Rate and Volume		Post-Development Rate and Volume	
	Peak Rate (cfs)	Volume (cf)	Peak Rate (cfs)	Volume (cf)
PR	0	1.153	0.083	1045.056
2 yr	0.025	795.848	0.282	3618.918
5 yr	0.057	1248.751	0.345	4447.831
10 yr	0.095	1760.081	0.407	5277.984
25 yr	0.137	2317.339	0.469	6108.92

## Facility Facility A

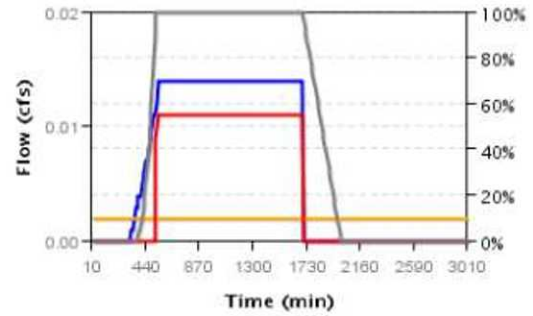
<b>Facility Details</b>	Facility Type	<b>Planter (Flat)</b>
	Facility Configuration	<b>C: Infl. with RS and underdrain (Ud)</b>
	Facility Shape	<b>Planter</b>
<b>Above Grade Storage Data</b>		
	Bottom Area	<b>300 sq ft</b>
	Bottom Width	<b>6.00 ft</b>
	Storage Depth 1	<b>12.0 in</b>
	Growing Medium Depth	<b>18 in</b>
	Surface Capacity at Depth 1	<b>300.0 cu ft</b>
	Design Infiltration Rate for Native Soil	<b>0.002 in/hr</b>
	Infiltration Capacity	<b>0.014 cfs</b>
<b>Below Grade Storage Data</b>		
	Rock Storage Depth	<b>18 in</b>
	Rock Porosity	<b>0.30 in</b>
	Storage Depth 3	<b>6.0 in</b>
<b>Facility Facts</b>	Total Facility Area Including Freeboard	<b>300.00 sq ft</b>
	Sizing Ratio	<b>1.5%</b>
<b>Pollution Reduction Results</b>	Pollution Reduction Score	<b>Pass</b>
	Overflow Volume	<b>808.724 cf</b>
	Surface Capacity Used	<b>74%</b>
	Rock Capacity Used	<b>100%</b>
<b>Flow Control Results</b>	Flow Control Score	<b>Fail</b>
	Overflow Volume	<b>4975.434 cf</b>
	Surface Capacity Used	<b>100%</b>
	Rock Capacity Used	<b>100%</b>

	Post-development outflow (cfs)	≤	Pre-development inflow (cfs)	
2 year	0.28	≤	0.025	Fail
5 year	0.342	≤	0.057	Fail
10 year	0.405	≤	0.095	Fail

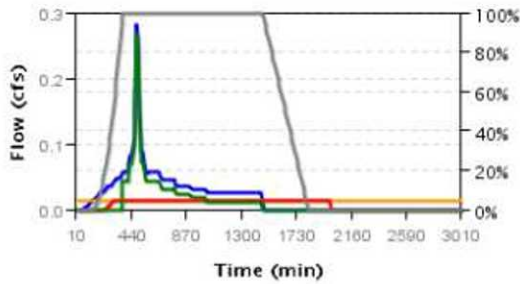
Pollution Reduction Event Surface Facility Modeling



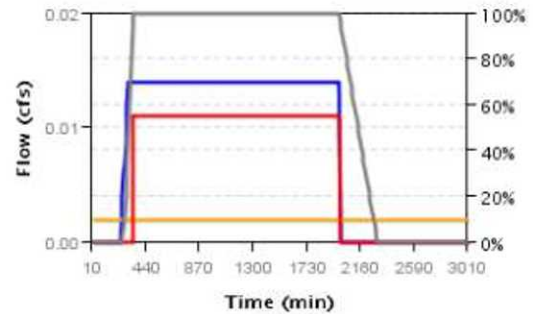
Pollution Reduction Event Below Grade Modeling



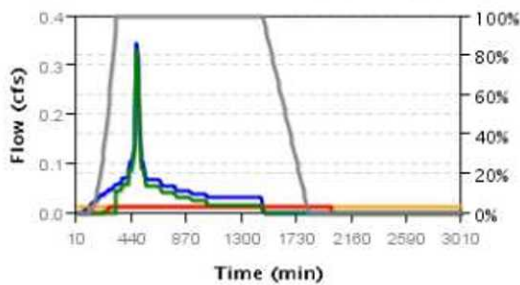
2 Year Event Surface Facility Modeling



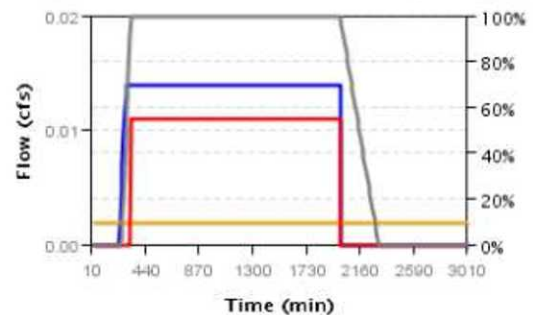
2 Year Event Below Grade Modeling



5 Year Event Surface Facility Modeling

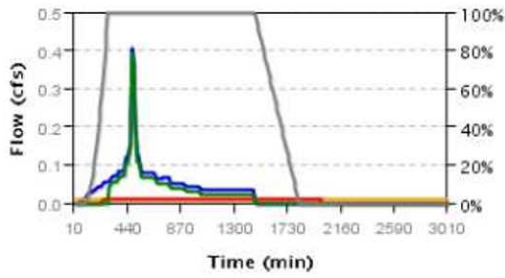


5 Year Event Below Grade Modeling

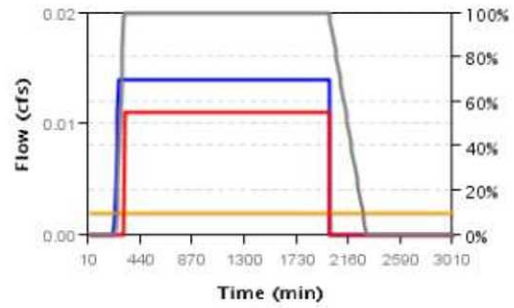




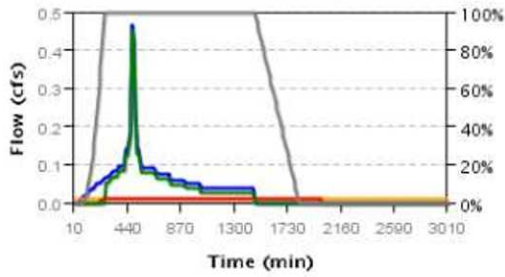
10 Year Event Surface Facility Modeling



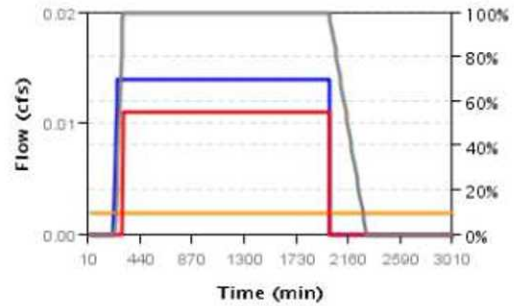
10 Year Event Below Grade Modeling



25 Year Event Surface Facility Modeling



25 Year Event Below Grade Modeling



# Hydrologic Soil Group Information



### MAP LEGEND

**Area of Interest (AOI)**  
 Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

**Soil Rating Lines**

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

**Soil Rating Points**

- A
- A/D
- B
- B/D

### MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.  
 Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clackamas County Area, Oregon  
 Survey Area Data: Version 18, Oct 27, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 13, 2019—Jul 25, 2019

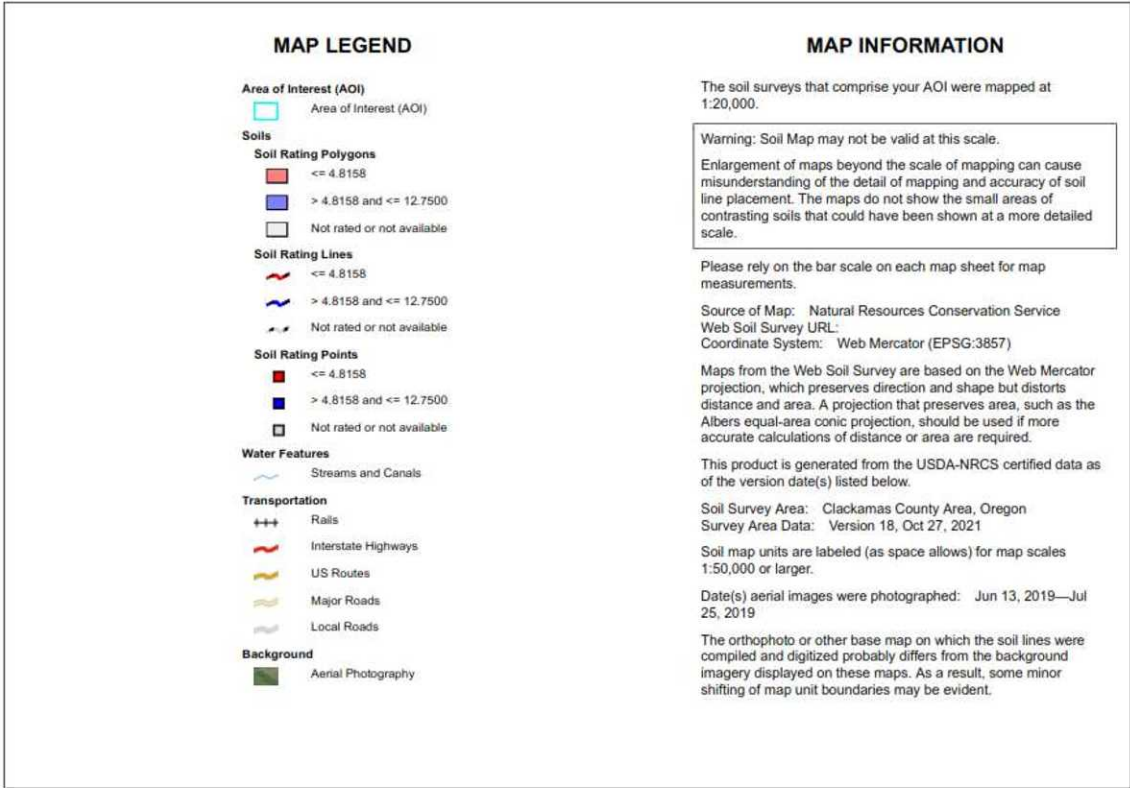
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
53B	Latourell loam, 3 to 8 percent slopes	B	0.0	3.4%
71A	Quatama loam, 0 to 3 percent slopes	C	1.2	96.6%
<b>Totals for Area of Interest</b>			<b>1.3</b>	<b>100.0%</b>

# Saturated Hydraulic Conductivity Information



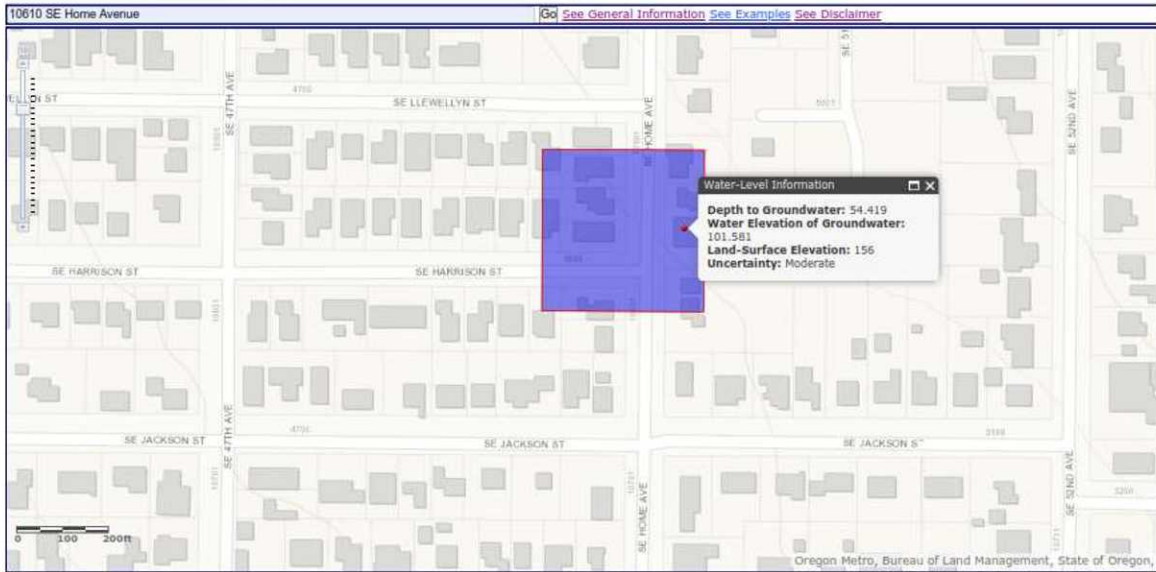


## Saturated Hydraulic Conductivity (Ksat)

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
53B	Latourell loam, 3 to 8 percent slopes	12.7500	0.0	3.4%
71A	Quatama loam, 0 to 3 percent slopes	4.8158 <b>=0.68 in/hr</b>	1.2	96.6%
<b>Totals for Area of Interest</b>			<b>1.3</b>	<b>100.0%</b>

# Estimated Depth to Groundwater Information

Prepared in cooperation with the City of Portland, the City of Gresham, Clackamas County's Water Environment Services, Multnomah County, and the Oregon Department of Human Services under



Cursor coordinates: Longitude/Latitude: -122.612, 45.447 UTM: 530374.786, 5032673.308 meters Zone 10 State Plane: 7660244.621, 656116.687 feet

## City Drywells in the Area

