

**PRELIMINARY STORMWATER
SITE PLAN FOR
PILCHUCK RENTALS
MARYSVILLE, WASHINGTON**

JULY 5, 2023



7/5/23



LAND SURVEYING • LAND USE PLANNING • CIVIL ENGINEERING

SNOHOMISH COUNTY

2822 Colby Ave, Suite 300
Everett, Washington 98201
tel: 360.794.7811 | fax: 360.805.9732

ISLAND COUNTY

840 SE 8th Avenue, Suite 102
Oak Harbor, Washington 98277
tel: 360.675.5973 | fax: 360.675.7255

SKAGIT COUNTY

603 South First Street
Mount Vernon, Washington 98273
tel: 360.336.9199 | fax: 360.982.2637

www.HarmsenLLC.com

MR 1: PREPARATION OF STORMWATER SITE PLANS

DRAINAGE PLAN DESCRIPTION

This Stormwater Site Plan has been prepared for the Pilchuck Rentals project located on a 3.2 ac parcel at the southwest corner of the intersection of Smokey Point Blvd and 156th Street NW. Figure 1: Vicinity Map depicts the location of the project. The proposed construction consists of a 11,000 sf building located centrally on the site with a new paved parking lot along Smokey point Blvd. Access for the proposed development will be from Smokey Point Blvd. See Figure 3: Developed Site Conditions for the layout.

The site currently contains two larger buildings and several small sheds that will remain on the site. The majority of the site is gravel with a smaller paved parking area near Smokey Point Blvd. Other than the new building and parking area, the existing gravel will remain.

METHODOLOGY

The 2019 Department of Ecology Stormwater Manual as adopted by the City of Marysville was used as the basis of design. The site has the following characteristics:

- Approximately 1.0 ac disturbed area.
- More than 35% existing impervious. The site is RE-development.
- The project will result in greater than 5,000 sf of new impervious.

This requires the drainage system to meet Minimum Requirements 1-9.

SOILS DESCRIPTION

According to the geotechnical report prepared by GeoTest, Inc. titled *Geotechnical Engineering Report* and dated June 19, 2023, the soils underlying the site are Marysville Sand. The Marysville Sand is described as medium dense, tan to gray, mottled, damp to moist, slightly silty sands. Groundwater seepage and caving limited the depth of excavation to 6-7 feet. Above the Marysville Sand, the test pits showed a surface gravel layer about 6" thick underlain by a layer of previously placed fill material about 1' thick over 6" of topsoil with a was observed in all test pits. GeoTest provided a long-term infiltration rate of 8.5 inches per hour.

CRITICAL AREAS

There are no critical areas on or near the site. Quilceda Creek, located about 2000 feet west of the site, is on the 303d list upstream of I-5 as Cat 5 for dissolved oxygen and a Cat 4A for Bacteria. Hayho Creek and its tributary is located about 800 feet east of the site are fish bearing waterways. As infiltration is proposed, no impact to these water bodies is anticipated.

MR 2: SWPPP NARRATIVE

With about 1 acre of disturbance, a Department of Ecology Construction Stormwater Permit will be required. A DOE SWPPP narrative will be provided with the construction permitting phase of the project.

MR 3: WATER POLLUTION SOURCE CONTROL

Source control will consist of both construction BMP's and long term source controls. The temporary measures are included in the SWPPP. Permanent Source Control will be done as follows:

- Container storage of wastes;
- Vegetation management;
- Cleaning of paved surfaces;
- Storm drainage maintenance.

MR 4: PRESERVATION OF NATURAL DRAINAGE

There are no natural drainage systems in the local area. The City has storm drainage systems in both roadways that collects and conveys runoff. The site will use infiltration to control runoff and will not impact the City system.

MR 5: ON-SITE STORMWATER MANAGEMENT

As the site is located in the City of Marysville and will be required to meet MR #1-9, it can achieve MR 5 requirement either through the use of List #2 or by meeting the Low Impact Development Performance Standard. The LID Performance Standard will be used.

LAWN AND LANDSCAPED AREAS:

BMP T5.13 Post Construction Soil Quality and Depth will be implemented on disturbed and landscaped areas. It is expected that most disturbed soil will be covered with new impervious. Select site topsoil will be used for those small areas where pervious surfaced need restoration.

LOW IMPACT DEVELOPMENT PERFORMANCE STANDARD:

The site will achieve 100% infiltration of runoff from the re-developed portions of the site. based on the WWHM calculations using infiltration trenches. These are discussed in MR 7. With 100% infiltration, the site meets the Performance Standard.

MR 6: RUNOFF TREATMENT REQUIREMENTS

With more than 5,000 sf of pollution generating impervious surface the site requires runoff treatment. Per Figure 2.1 – Treatment Facility Selection Flow Chart, the site requires the following measures:

Oil Control: The site does not meet the threshold of 100 vehicles per day/1,000 sf of building area.

Infiltration for Treatment: There is no organic soil at infiltration depths.

Phosphorous Control: We have reviewed the 303d listing and there are no listed water bodies in the local area.

Enhanced Treatment: Enhanced treatment is required when a commercial site discharges directly to fresh waters or conveyance systems tributary to fresh waters designated for aquatic life use or that have an existing aquatic life use. It is also required when infiltration is used for flow control within $\frac{1}{4}$ mile of a fresh water designated for aquatic life use. The project will infiltrate runoff and is within a $\frac{1}{4}$ mile of Quilceda Creek. Enhanced Treatment is required.

The proposed treatment system is a Biopod from Old Castle Infrastructure. The system has GULD from the Department of Ecology for Enhanced treatment.

BUILDING BASIN

The Building Basin, containing only roof runoff, does not require treatment and directly connect to a separate infiltration system.

PARKING BASIN

According to the WWHM calculations, the Parking Basin has an offline water quality flow rate of 0.0616 cfs. See attached WWHM for sizing calculations. A Biopod BPU481B has a treatment flow rate capacity of 0.085 cfs, exceeding the minimum requirement.

MR 7: FLOW CONTROL

Flow control is required for the site development. The on-site system will receive flow from the building, walks and parking of the development. Infiltration will be used for Flow Control with two separate facilities, one for the building and the other for the new paved parking area. With no change to the current surface conditions rainfall on the existing gravel yard area will continue to infiltrate.

The infiltration facilities have been sized using WWHM, with an infiltration rate of 8.5 inches per hour. This infiltration rate is based on the results of geotechnical evaluation prepared for the

project by GeoTest. For more information see the GeoTest report dated 6/19/23 under separate cover.

This portion of Marysville is known to have high groundwater that can impact the ability of the soil to accept infiltrated runoff. It is expected that a mounding analysis by the geotechnical engineer will be required to verify the preliminary design prior to preparation of construction documents.

The infiltration systems for the two basins are summarized as follows:

BUILDING BASIN

The Building Basin consists of the building roof area, 0.28 ac. The infiltration trench has the following characteristics:

Total Bottom Area	75 ft x 10 ft
Depth	2.0 ft
Side Slopes	Vertical
Rock Porosity	0.35
Percentage Infiltrated	100%

PARKING BASIN

The Parking Basin, containing 0. consists of the new paved parking (0.55 ac), adjacent planters and the eastern sidewalk adjacent to the parking. The conceptual trench has the following characteristics:

Total Bottom Area	75 ft x 20 ft
Depth	2.0 ft
Side Slopes	Vertical
Rock Porosity	0.35
Percentage Infiltrated	100%

With those parameters, the site meets the Stream Protection Duration standard as well as the Low Impact Development Performance Standard for the re-developed portions of the site. See Appendix for WWHM2012 output.

MR 8: WETLANDS PROTECTION

There are no wetlands on or near the site.

MR 9: OPERATION AND MAINTENANCE MANUAL

An Operations and Maintenance Manual will be provided under separate cover.

FIGURES & BASIN MAPS

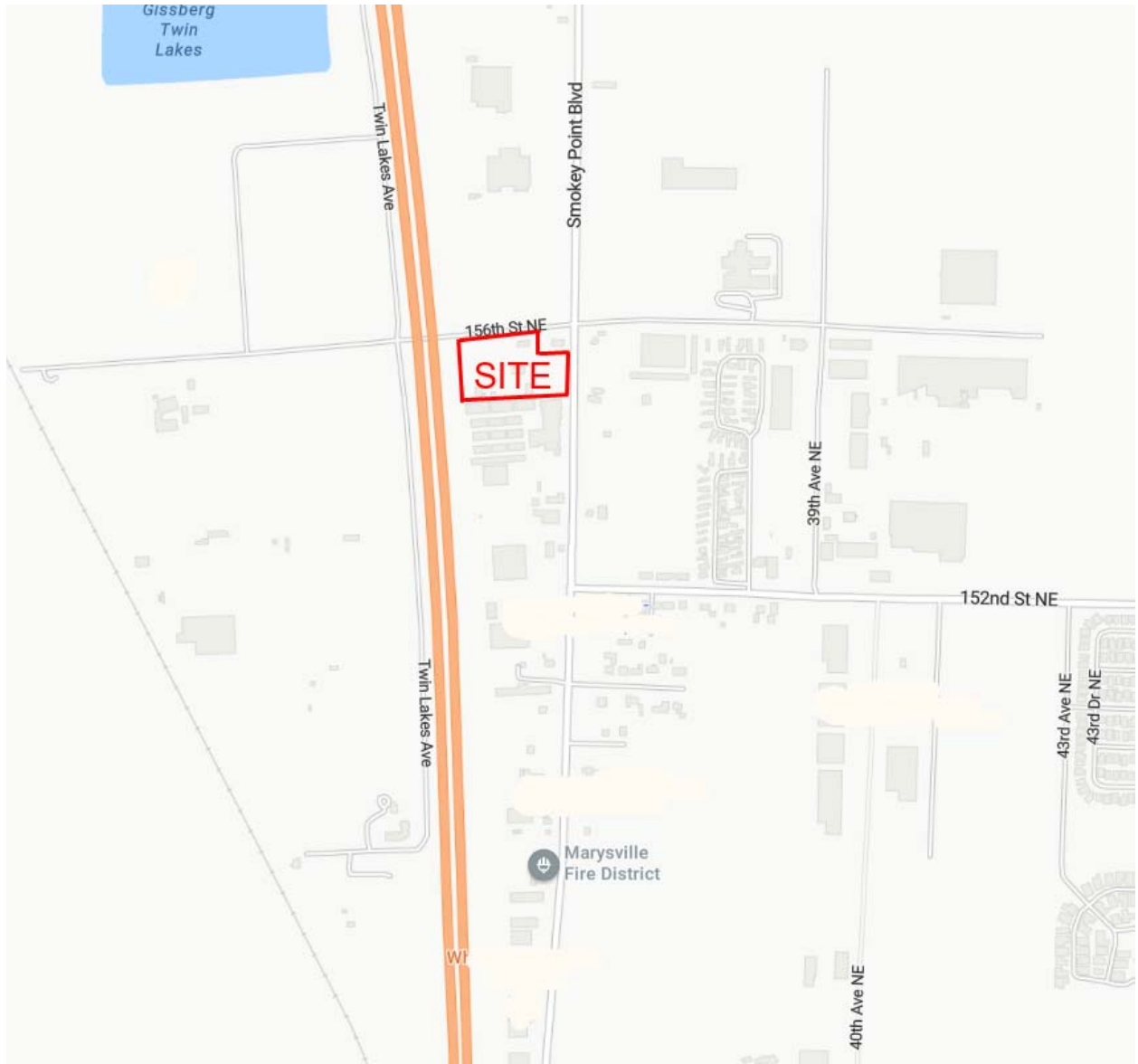


FIGURE 1: VICINITY MAP



FIGURE 2: EXISTING SITE MAP

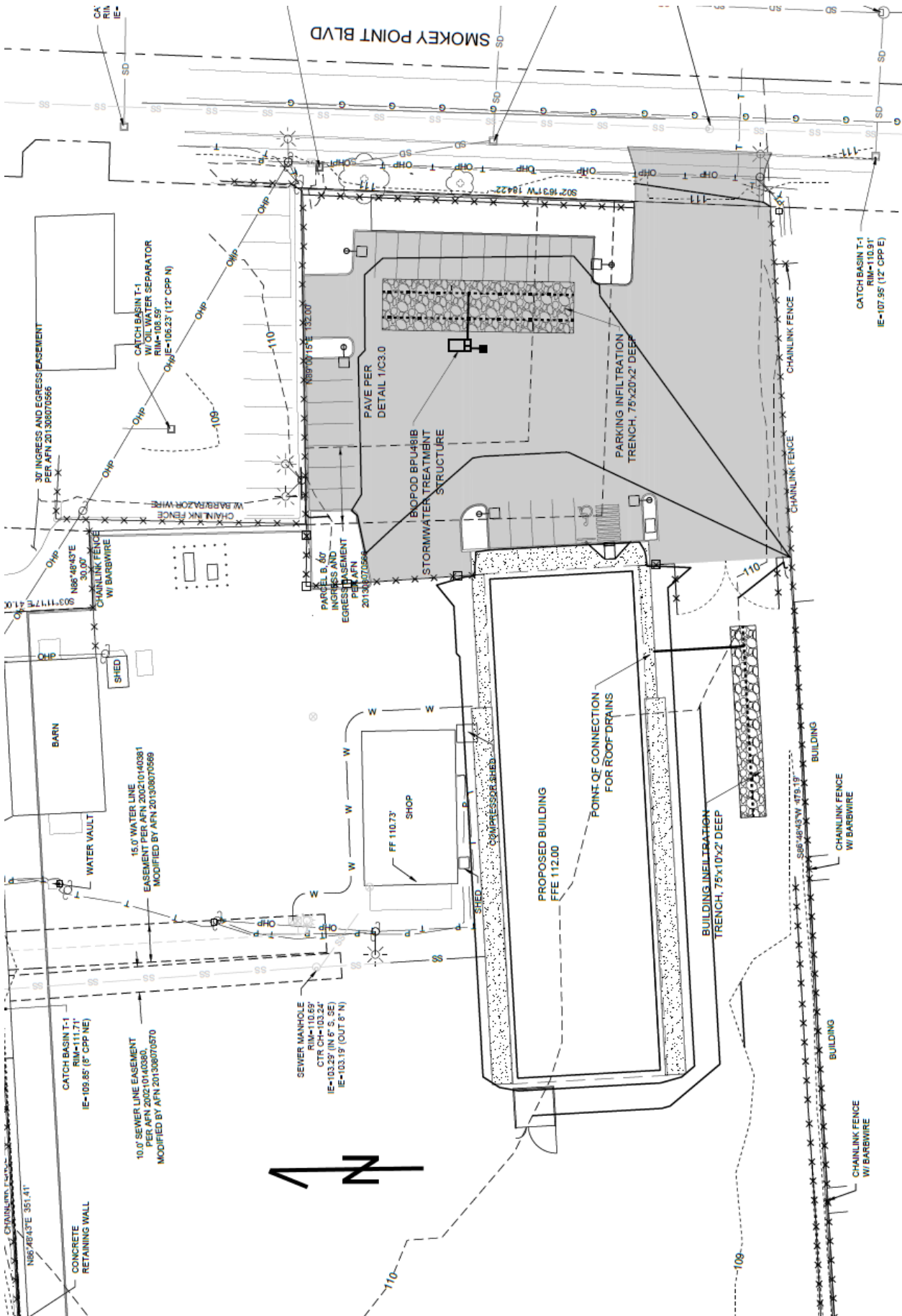


FIGURE 3: DEVELOPED SITE MAP

APPENDIX A
WWHM CALCULATIONS

WWHM2012
PROJECT REPORT

Project Name: PILCHUCK
Report Date: 6/27/2023
Gage : Everett
Data Start : 1948/10/01
Data End : 2009/09/30
Precip Scale: 1.20
Version Date: 2021/08/18
Version : 4.2.18

Low Flow Threshold for POC: 50 Percent of the 2 Year
High Flow Threshold for POC: 50 year

PREDEVELOPED LAND USE

Name : Basin 1
Bypass: No
GroundWater: No

<u>Pervious Land Use</u>	<u>acre</u>
C, Forest, Flat	.28
Pervious Total	0.28
<u>Impervious Land Use</u>	<u>acre</u>
Impervious Total	0
Basin Total	0.28

Element Flows To:		
Surface	Interflow	Groundwater

Name : Basin 2
Bypass: No
GroundWater: No

<u>Pervious Land Use</u>	<u>acre</u>
C, Forest, Flat	.65
Pervious Total	0.65
<u>Impervious Land Use</u>	<u>acre</u>
Impervious Total	0
Basin Total	0.65

Element Flows To:		
Surface	Interflow	Groundwater

MITIGATED LAND USE

Name : Basin 1 - Building Basin
 Bypass: No
 GroundWater: No

Pervious Land Use acre
 Pervious Total 0

Impervious Land Use acre
 ROOF TOPS FLAT 0.28
 Impervious Total 0.28
 Basin Total 0.28

Element Flows To:
 Surface Interflow Groundwater
 Gravel Trench Bed 1 Gravel Trench Bed 1

Name : Gravel Trench Bed 1
 Bottom Length: 75.00 ft.
 Bottom Width: 10.00 ft.
 Trench bottom slope 1: 0 To 1
 Trench Left side slope 0: 0 To 1
 Trench right side slope 2: 0 To 1
 Material thickness of first layer: 2.5
 Pour Space of material for first layer: 0.35
 Material thickness of second layer: 0
 Pour Space of material for second layer: 0
 Material thickness of third layer: 0
 Pour Space of material for third layer: 0
 Infiltration On
 Infiltration rate: 8.5
 Infiltration safety factor: 1
 Total Volume Infiltrated (ac-ft.): 53.758
 Total Volume Through Riser (ac-ft.): 0.001
 Total Volume Through Facility (ac-ft.): 53.76
 Percent Infiltrated: 100
 Total Precip Applied to Facility: 0
 Total Evap From Facility: 0
Discharge Structure
 Riser Height: 2 ft.
 Riser Diameter: 12 in.

Element Flows To:
 Outlet 1 Outlet 2

Gravel Trench Bed Hydraulic Table

<u>Stage(feet)</u>	<u>Area(ac.)</u>	<u>Volume(ac-ft.)</u>	<u>Discharge(cfs)</u>	<u>Infilt(cfs)</u>
0.0000	0.017	0.000	0.000	0.000
0.0278	0.017	0.000	0.000	0.147
0.0556	0.017	0.000	0.000	0.147
0.0833	0.017	0.000	0.000	0.147
0.1111	0.017	0.000	0.000	0.147
0.1389	0.017	0.000	0.000	0.147
0.1667	0.017	0.001	0.000	0.147
0.1944	0.017	0.001	0.000	0.147
0.2222	0.017	0.001	0.000	0.147
0.2500	0.017	0.001	0.000	0.147

0.2778	0.017	0.001	0.000	0.147
0.3056	0.017	0.001	0.000	0.147
0.3333	0.017	0.002	0.000	0.147
0.3611	0.017	0.002	0.000	0.147
0.3889	0.017	0.002	0.000	0.147
0.4167	0.017	0.002	0.000	0.147
0.4444	0.017	0.002	0.000	0.147
0.4722	0.017	0.002	0.000	0.147
0.5000	0.017	0.003	0.000	0.147
0.5278	0.017	0.003	0.000	0.147
0.5556	0.017	0.003	0.000	0.147
0.5833	0.017	0.003	0.000	0.147
0.6111	0.017	0.003	0.000	0.147
0.6389	0.017	0.003	0.000	0.147
0.6667	0.017	0.004	0.000	0.147
0.6944	0.017	0.004	0.000	0.147
0.7222	0.017	0.004	0.000	0.147
0.7500	0.017	0.004	0.000	0.147
0.7778	0.017	0.004	0.000	0.147
0.8056	0.017	0.004	0.000	0.147
0.8333	0.017	0.005	0.000	0.147
0.8611	0.017	0.005	0.000	0.147
0.8889	0.017	0.005	0.000	0.147
0.9167	0.017	0.005	0.000	0.147
0.9444	0.017	0.005	0.000	0.147
0.9722	0.017	0.005	0.000	0.147
1.0000	0.017	0.006	0.000	0.147
1.0278	0.017	0.006	0.000	0.147
1.0556	0.017	0.006	0.000	0.147
1.0833	0.017	0.006	0.000	0.147
1.1111	0.017	0.006	0.000	0.147
1.1389	0.017	0.006	0.000	0.147
1.1667	0.017	0.007	0.000	0.147
1.1944	0.017	0.007	0.000	0.147
1.2222	0.017	0.007	0.000	0.147
1.2500	0.017	0.007	0.000	0.147
1.2778	0.017	0.007	0.000	0.147
1.3056	0.017	0.007	0.000	0.147
1.3333	0.017	0.008	0.000	0.147
1.3611	0.017	0.008	0.000	0.147
1.3889	0.017	0.008	0.000	0.147
1.4167	0.017	0.008	0.000	0.147
1.4444	0.017	0.008	0.000	0.147
1.4722	0.017	0.008	0.000	0.147
1.5000	0.017	0.009	0.000	0.147
1.5278	0.017	0.009	0.000	0.147
1.5556	0.017	0.009	0.000	0.147
1.5833	0.017	0.009	0.000	0.147
1.6111	0.017	0.009	0.000	0.147
1.6389	0.017	0.009	0.000	0.147
1.6667	0.017	0.010	0.000	0.147
1.6944	0.017	0.010	0.000	0.147
1.7222	0.017	0.010	0.000	0.147
1.7500	0.017	0.010	0.000	0.147
1.7778	0.017	0.010	0.000	0.147
1.8056	0.017	0.010	0.000	0.147
1.8333	0.017	0.011	0.000	0.147
1.8611	0.017	0.011	0.000	0.147
1.8889	0.017	0.011	0.000	0.147
1.9167	0.017	0.011	0.000	0.147
1.9444	0.017	0.011	0.000	0.147
1.9722	0.017	0.011	0.000	0.147
2.0000	0.017	0.012	0.000	0.147

2.0278	0.017	0.012	0.049	0.147
2.0556	0.017	0.012	0.138	0.147
2.0833	0.017	0.012	0.254	0.147
2.1111	0.017	0.012	0.389	0.147
2.1389	0.017	0.012	0.540	0.147
2.1667	0.017	0.013	0.703	0.147
2.1944	0.017	0.013	0.873	0.147
2.2222	0.017	0.013	1.046	0.147
2.2500	0.017	0.013	1.217	0.147
2.2778	0.017	0.013	1.383	0.147
2.3056	0.017	0.013	1.540	0.147
2.3333	0.017	0.014	1.683	0.147
2.3611	0.017	0.014	1.811	0.147
2.3889	0.017	0.014	1.921	0.147
2.4167	0.017	0.014	2.013	0.147
2.4444	0.017	0.014	2.088	0.147
2.4722	0.017	0.014	2.149	0.147
2.5000	0.017	0.015	2.203	0.147

Name : Basin 2 - Parking Basin
Bypass: No
GroundWater: No

<u>Pervious Land Use</u>	<u>acre</u>
C, Lawn, Flat	.08
Pervious Total	0.08
<u>Impervious Land Use</u>	<u>acre</u>
PARKING FLAT	0.57
Impervious Total	0.57
Basin Total	0.65

Element Flows To:

Surface	Interflow	Groundwater
Gravel Trench Bed 2	Gravel Trench Bed 2	

Name : Gravel Trench Bed 2
Bottom Length: 20.00 ft.
Bottom Width: 75.00 ft.
Trench bottom slope 1: 0 To 1
Trench Left side slope 0: 0 To 1
Trench right side slope 2: 0 To 1
Material thickness of first layer: 2
Pour Space of material for first layer: 0.35
Material thickness of second layer: 0
Pour Space of material for second layer: 0
Material thickness of third layer: 0
Pour Space of material for third layer: 0
Infiltration On
Infiltration rate: 8.5
Infiltration safety factor: 1
Total Volume Infiltrated (ac-ft.): 118.235
Total Volume Through Riser (ac-ft.): 0.005
Total Volume Through Facility (ac-ft.): 118.24
Percent Infiltrated: 100
Total Precip Applied to Facility: 0
Total Evap From Facility: 0
Discharge Structure

Riser Height: 2 ft.
Riser Diameter: 12 in.

Element Flows To:
Outlet 1 Outlet 2

Gravel Trench Bed Hydraulic Table

<u>Stage(feet)</u>	<u>Area(ac.)</u>	<u>Volume(ac-ft.)</u>	<u>Discharge(cfs)</u>	<u>Infilt(cfs)</u>
0.0000	0.034	0.000	0.000	0.000
0.0278	0.034	0.000	0.000	0.295
0.0556	0.034	0.000	0.000	0.295
0.0833	0.034	0.001	0.000	0.295
0.1111	0.034	0.001	0.000	0.295
0.1389	0.034	0.001	0.000	0.295
0.1667	0.034	0.002	0.000	0.295
0.1944	0.034	0.002	0.000	0.295
0.2222	0.034	0.002	0.000	0.295
0.2500	0.034	0.003	0.000	0.295
0.2778	0.034	0.003	0.000	0.295
0.3056	0.034	0.003	0.000	0.295
0.3333	0.034	0.004	0.000	0.295
0.3611	0.034	0.004	0.000	0.295
0.3889	0.034	0.004	0.000	0.295
0.4167	0.034	0.005	0.000	0.295
0.4444	0.034	0.005	0.000	0.295
0.4722	0.034	0.005	0.000	0.295
0.5000	0.034	0.006	0.000	0.295
0.5278	0.034	0.006	0.000	0.295
0.5556	0.034	0.006	0.000	0.295
0.5833	0.034	0.007	0.000	0.295
0.6111	0.034	0.007	0.000	0.295
0.6389	0.034	0.007	0.000	0.295
0.6667	0.034	0.008	0.000	0.295
0.6944	0.034	0.008	0.000	0.295
0.7222	0.034	0.008	0.000	0.295
0.7500	0.034	0.009	0.000	0.295
0.7778	0.034	0.009	0.000	0.295
0.8056	0.034	0.009	0.000	0.295
0.8333	0.034	0.010	0.000	0.295
0.8611	0.034	0.010	0.000	0.295
0.8889	0.034	0.010	0.000	0.295
0.9167	0.034	0.011	0.000	0.295
0.9444	0.034	0.011	0.000	0.295
0.9722	0.034	0.011	0.000	0.295
1.0000	0.034	0.012	0.000	0.295
1.0278	0.034	0.012	0.000	0.295
1.0556	0.034	0.012	0.000	0.295
1.0833	0.034	0.013	0.000	0.295
1.1111	0.034	0.013	0.000	0.295
1.1389	0.034	0.013	0.000	0.295
1.1667	0.034	0.014	0.000	0.295
1.1944	0.034	0.014	0.000	0.295
1.2222	0.034	0.014	0.000	0.295
1.2500	0.034	0.015	0.000	0.295
1.2778	0.034	0.015	0.000	0.295
1.3056	0.034	0.015	0.000	0.295
1.3333	0.034	0.016	0.000	0.295
1.3611	0.034	0.016	0.000	0.295
1.3889	0.034	0.016	0.000	0.295
1.4167	0.034	0.017	0.000	0.295
1.4444	0.034	0.017	0.000	0.295
1.4722	0.034	0.017	0.000	0.295

1.5000	0.034	0.018	0.000	0.295
1.5278	0.034	0.018	0.000	0.295
1.5556	0.034	0.018	0.000	0.295
1.5833	0.034	0.019	0.000	0.295
1.6111	0.034	0.019	0.000	0.295
1.6389	0.034	0.019	0.000	0.295
1.6667	0.034	0.020	0.000	0.295
1.6944	0.034	0.020	0.000	0.295
1.7222	0.034	0.020	0.000	0.295
1.7500	0.034	0.021	0.000	0.295
1.7778	0.034	0.021	0.000	0.295
1.8056	0.034	0.021	0.000	0.295
1.8333	0.034	0.022	0.000	0.295
1.8611	0.034	0.022	0.000	0.295
1.8889	0.034	0.022	0.000	0.295
1.9167	0.034	0.023	0.000	0.295
1.9444	0.034	0.023	0.000	0.295
1.9722	0.034	0.023	0.000	0.295
2.0000	0.034	0.024	0.000	0.295
2.0278	0.034	0.025	0.049	0.295
2.0556	0.034	0.026	0.138	0.295
2.0833	0.034	0.027	0.254	0.295
2.1111	0.034	0.027	0.389	0.295
2.1389	0.034	0.028	0.540	0.295
2.1667	0.034	0.029	0.703	0.295
2.1944	0.034	0.030	0.873	0.295
2.2222	0.034	0.031	1.046	0.295
2.2500	0.034	0.032	1.217	0.295
2.2778	0.034	0.033	1.383	0.295
2.3056	0.034	0.034	1.540	0.295
2.3333	0.034	0.035	1.683	0.295
2.3611	0.034	0.036	1.811	0.295
2.3889	0.034	0.037	1.921	0.295
2.4167	0.034	0.038	2.013	0.295
2.4444	0.034	0.039	2.088	0.295
2.4722	0.034	0.040	2.149	0.295
2.5000	0.034	0.041	2.203	0.295

BUILDING BASIN

ANALYSIS RESULTS

Stream Protection Duration

Predeveloped Landuse Totals for POC #1
Total Pervious Area:0.28
Total Impervious Area:0

Mitigated Landuse Totals for POC #1
Total Pervious Area:0
Total Impervious Area:0.28

Flow Frequency Return Periods for Predeveloped. POC #1

<u>Return Period</u>	<u>Flow(cfs)</u>
2 year	0.009408
5 year	0.014432
10 year	0.018307
25 year	0.023851
50 year	0.028468
100 year	0.033517

Flow Frequency Return Periods for Mitigated. POC #1

<u>Return Period</u>	<u>Flow(cfs)</u>
2 year	0
5 year	0
10 year	0
25 year	0
50 year	0
100 year	0

Stream Protection Duration

Annual Peaks for Predeveloped and Mitigated. POC #1

<u>Year</u>	<u>Predeveloped</u>	<u>Mitigated</u>
1949	0.009	0.000
1950	0.010	0.000
1951	0.009	0.000
1952	0.007	0.000
1953	0.006	0.000
1954	0.031	0.000
1955	0.012	0.000
1956	0.011	0.000
1957	0.013	0.000
1958	0.010	0.000
1959	0.009	0.000
1960	0.009	0.000
1961	0.017	0.027
1962	0.008	0.000
1963	0.014	0.000
1964	0.010	0.000
1965	0.008	0.000
1966	0.005	0.000
1967	0.010	0.000
1968	0.012	0.000
1969	0.029	0.000
1970	0.007	0.000

1971	0.011	0.000
1972	0.008	0.000
1973	0.007	0.000
1974	0.016	0.000
1975	0.007	0.000
1976	0.007	0.000
1977	0.006	0.000
1978	0.007	0.000
1979	0.019	0.000
1980	0.009	0.000
1981	0.007	0.000
1982	0.009	0.000
1983	0.015	0.000
1984	0.009	0.000
1985	0.011	0.000
1986	0.026	0.000
1987	0.013	0.000
1988	0.006	0.000
1989	0.007	0.000
1990	0.009	0.000
1991	0.009	0.000
1992	0.007	0.000
1993	0.006	0.000
1994	0.006	0.000
1995	0.009	0.000
1996	0.016	0.000
1997	0.031	0.000
1998	0.006	0.000
1999	0.007	0.000
2000	0.006	0.000
2001	0.002	0.000
2002	0.009	0.000
2003	0.007	0.000
2004	0.011	0.000
2005	0.008	0.000
2006	0.021	0.000
2007	0.017	0.000
2008	0.023	0.000
2009	0.007	0.000

Stream Protection Duration

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.0312	0.0270
2	0.0307	0.0000
3	0.0287	0.0000
4	0.0263	0.0000
5	0.0232	0.0000
6	0.0209	0.0000
7	0.0188	0.0000
8	0.0167	0.0000
9	0.0165	0.0000
10	0.0161	0.0000
11	0.0157	0.0000
12	0.0153	0.0000
13	0.0136	0.0000
14	0.0132	0.0000
15	0.0125	0.0000
16	0.0121	0.0000
17	0.0118	0.0000
18	0.0113	0.0000
19	0.0112	0.0000

20	0.0107	0.0000
21	0.0107	0.0000
22	0.0098	0.0000
23	0.0097	0.0000
24	0.0096	0.0000
25	0.0096	0.0000
26	0.0095	0.0000
27	0.0094	0.0000
28	0.0092	0.0000
29	0.0092	0.0000
30	0.0090	0.0000
31	0.0090	0.0000
32	0.0088	0.0000
33	0.0088	0.0000
34	0.0088	0.0000
35	0.0086	0.0000
36	0.0085	0.0000
37	0.0082	0.0000
38	0.0082	0.0000
39	0.0079	0.0000
40	0.0078	0.0000
41	0.0075	0.0000
42	0.0075	0.0000
43	0.0071	0.0000
44	0.0069	0.0000
45	0.0069	0.0000
46	0.0068	0.0000
47	0.0068	0.0000
48	0.0068	0.0000
49	0.0068	0.0000
50	0.0067	0.0000
51	0.0066	0.0000
52	0.0066	0.0000
53	0.0065	0.0000
54	0.0063	0.0000
55	0.0057	0.0000
56	0.0057	0.0000
57	0.0057	0.0000
58	0.0057	0.0000
59	0.0056	0.0000
60	0.0048	0.0000
61	0.0023	0.0000

Stream Protection Duration

POC #1

The Facility PASSED

The Facility PASSED.

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0047	19590	2	0	Pass
0.0049	16987	2	0	Pass
0.0052	14662	2	0	Pass
0.0054	12722	2	0	Pass
0.0057	10919	2	0	Pass
0.0059	9437	2	0	Pass
0.0061	8164	2	0	Pass
0.0064	7075	2	0	Pass
0.0066	6126	2	0	Pass
0.0069	5311	2	0	Pass
0.0071	4654	2	0	Pass
0.0073	4066	2	0	Pass

0.0076	3548	2	0	Pass
0.0078	3136	2	0	Pass
0.0081	2759	2	0	Pass
0.0083	2447	2	0	Pass
0.0085	2145	2	0	Pass
0.0088	1893	2	0	Pass
0.0090	1656	2	0	Pass
0.0093	1508	2	0	Pass
0.0095	1370	2	0	Pass
0.0097	1250	2	0	Pass
0.0100	1154	2	0	Pass
0.0102	1071	2	0	Pass
0.0105	1009	2	0	Pass
0.0107	951	2	0	Pass
0.0109	890	2	0	Pass
0.0112	826	2	0	Pass
0.0114	777	2	0	Pass
0.0117	734	2	0	Pass
0.0119	687	2	0	Pass
0.0121	649	2	0	Pass
0.0124	622	2	0	Pass
0.0126	602	2	0	Pass
0.0129	583	2	0	Pass
0.0131	561	2	0	Pass
0.0133	538	2	0	Pass
0.0136	507	2	0	Pass
0.0138	488	2	0	Pass
0.0141	473	2	0	Pass
0.0143	457	2	0	Pass
0.0145	440	2	0	Pass
0.0148	424	2	0	Pass
0.0150	410	2	0	Pass
0.0153	394	2	0	Pass
0.0155	380	2	0	Pass
0.0157	368	2	0	Pass
0.0160	353	2	0	Pass
0.0162	341	2	0	Pass
0.0165	333	2	0	Pass
0.0167	322	2	0	Pass
0.0169	313	2	0	Pass
0.0172	304	2	0	Pass
0.0174	293	2	0	Pass
0.0177	284	2	0	Pass
0.0179	276	2	0	Pass
0.0181	266	2	0	Pass
0.0184	257	2	0	Pass
0.0186	242	2	0	Pass
0.0189	234	2	0	Pass
0.0191	226	2	0	Pass
0.0193	212	2	0	Pass
0.0196	205	2	0	Pass
0.0198	195	2	1	Pass
0.0201	187	2	1	Pass
0.0203	177	2	1	Pass
0.0205	166	2	1	Pass
0.0208	160	2	1	Pass
0.0210	150	2	1	Pass
0.0213	146	2	1	Pass
0.0215	135	2	1	Pass
0.0217	128	2	1	Pass
0.0220	120	2	1	Pass
0.0222	111	2	1	Pass
0.0225	99	2	2	Pass

0.0227	85	2	2	Pass
0.0229	75	2	2	Pass
0.0232	63	2	3	Pass
0.0234	59	2	3	Pass
0.0237	56	2	3	Pass
0.0239	50	2	4	Pass
0.0241	42	2	4	Pass
0.0244	40	2	5	Pass
0.0246	37	2	5	Pass
0.0249	36	2	5	Pass
0.0251	30	2	6	Pass
0.0253	28	2	7	Pass
0.0256	26	2	7	Pass
0.0258	20	2	10	Pass
0.0261	16	2	12	Pass
0.0263	13	2	15	Pass
0.0265	8	2	25	Pass
0.0268	6	2	33	Pass
0.0270	5	0	0	Pass
0.0273	4	0	0	Pass
0.0275	4	0	0	Pass
0.0277	3	0	0	Pass
0.0280	3	0	0	Pass
0.0282	3	0	0	Pass
0.0285	3	0	0	Pass

PARKING BASIN

Stream Protection Duration

Predeveloped Landuse Totals for POC #2

Total Pervious Area:0.65

Total Impervious Area:0

Mitigated Landuse Totals for POC #2

Total Pervious Area:0.08

Total Impervious Area:0.57

Flow Frequency Return Periods for Predeveloped. POC #2

<u>Return Period</u>	<u>Flow(cfs)</u>
2 year	0.02184
5 year	0.033504
10 year	0.042499
25 year	0.055368
50 year	0.066086
100 year	0.077808

Flow Frequency Return Periods for Mitigated. POC #2

<u>Return Period</u>	<u>Flow(cfs)</u>
2 year	0
5 year	0
10 year	0
25 year	0
50 year	0
100 year	0

Stream Protection Duration

Annual Peaks for Predeveloped and Mitigated. POC #2

<u>Year</u>	<u>Predeveloped</u>	<u>Mitigated</u>
1949	0.022	0.000
1950	0.022	0.000
1951	0.020	0.000
1952	0.016	0.000
1953	0.013	0.000
1954	0.071	0.000
1955	0.028	0.000
1956	0.025	0.000
1957	0.031	0.000
1958	0.022	0.000
1959	0.022	0.000
1960	0.021	0.000
1961	0.039	0.123
1962	0.019	0.000
1963	0.032	0.000
1964	0.023	0.000
1965	0.019	0.000
1966	0.011	0.000
1967	0.023	0.000
1968	0.027	0.000
1969	0.067	0.000
1970	0.016	0.000
1971	0.025	0.000
1972	0.018	0.000

1973	0.017	0.000
1974	0.037	0.000
1975	0.015	0.000
1976	0.016	0.000
1977	0.013	0.000
1978	0.016	0.000
1979	0.044	0.000
1980	0.020	0.000
1981	0.016	0.000
1982	0.021	0.000
1983	0.035	0.000
1984	0.021	0.000
1985	0.026	0.000
1986	0.061	0.000
1987	0.029	0.000
1988	0.015	0.000
1989	0.015	0.000
1990	0.020	0.000
1991	0.021	0.000
1992	0.016	0.000
1993	0.013	0.000
1994	0.015	0.000
1995	0.021	0.000
1996	0.036	0.000
1997	0.072	0.000
1998	0.013	0.000
1999	0.017	0.000
2000	0.013	0.000
2001	0.005	0.000
2002	0.020	0.000
2003	0.016	0.000
2004	0.026	0.000
2005	0.018	0.000
2006	0.048	0.000
2007	0.038	0.000
2008	0.054	0.000
2009	0.016	0.000

Stream Protection Duration

Ranked Annual Peaks for Predeveloped and Mitigated. POC #2

Rank	Predeveloped	Mitigated
1	0.0723	0.1229
2	0.0713	0.0000
3	0.0666	0.0000
4	0.0610	0.0000
5	0.0538	0.0000
6	0.0484	0.0000
7	0.0437	0.0000
8	0.0388	0.0000
9	0.0383	0.0000
10	0.0374	0.0000
11	0.0364	0.0000
12	0.0355	0.0000
13	0.0316	0.0000
14	0.0307	0.0000
15	0.0291	0.0000
16	0.0281	0.0000
17	0.0274	0.0000
18	0.0261	0.0000
19	0.0259	0.0000
20	0.0248	0.0000
21	0.0248	0.0000

22	0.0227	0.0000
23	0.0225	0.0000
24	0.0223	0.0000
25	0.0222	0.0000
26	0.0220	0.0000
27	0.0218	0.0000
28	0.0214	0.0000
29	0.0213	0.0000
30	0.0210	0.0000
31	0.0208	0.0000
32	0.0205	0.0000
33	0.0205	0.0000
34	0.0204	0.0000
35	0.0199	0.0000
36	0.0198	0.0000
37	0.0192	0.0000
38	0.0190	0.0000
39	0.0183	0.0000
40	0.0182	0.0000
41	0.0174	0.0000
42	0.0173	0.0000
43	0.0164	0.0000
44	0.0160	0.0000
45	0.0160	0.0000
46	0.0157	0.0000
47	0.0157	0.0000
48	0.0157	0.0000
49	0.0157	0.0000
50	0.0155	0.0000
51	0.0153	0.0000
52	0.0152	0.0000
53	0.0151	0.0000
54	0.0145	0.0000
55	0.0133	0.0000
56	0.0132	0.0000
57	0.0132	0.0000
58	0.0132	0.0000
59	0.0131	0.0000
60	0.0111	0.0000
61	0.0052	0.0000

Stream Protection Duration

POC #2

The Facility PASSED

The Facility PASSED.

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0109	19590	3	0	Pass
0.0115	17015	3	0	Pass
0.0120	14677	3	0	Pass
0.0126	12728	3	0	Pass
0.0131	10945	3	0	Pass
0.0137	9445	3	0	Pass
0.0143	8173	3	0	Pass
0.0148	7075	3	0	Pass
0.0154	6141	3	0	Pass
0.0159	5315	3	0	Pass
0.0165	4654	3	0	Pass
0.0170	4075	3	0	Pass
0.0176	3555	3	0	Pass
0.0182	3140	3	0	Pass

0.0187	2759	3	0	Pass
0.0193	2449	3	0	Pass
0.0198	2150	3	0	Pass
0.0204	1894	3	0	Pass
0.0210	1656	3	0	Pass
0.0215	1509	3	0	Pass
0.0221	1370	3	0	Pass
0.0226	1250	3	0	Pass
0.0232	1154	3	0	Pass
0.0237	1069	3	0	Pass
0.0243	1009	3	0	Pass
0.0249	949	3	0	Pass
0.0254	888	3	0	Pass
0.0260	825	3	0	Pass
0.0265	777	3	0	Pass
0.0271	734	3	0	Pass
0.0276	687	3	0	Pass
0.0282	648	3	0	Pass
0.0288	622	3	0	Pass
0.0293	602	3	0	Pass
0.0299	583	3	0	Pass
0.0304	561	3	0	Pass
0.0310	538	3	0	Pass
0.0315	507	3	0	Pass
0.0321	487	3	0	Pass
0.0327	473	3	0	Pass
0.0332	457	3	0	Pass
0.0338	440	3	0	Pass
0.0343	424	3	0	Pass
0.0349	408	3	0	Pass
0.0354	394	3	0	Pass
0.0360	380	3	0	Pass
0.0366	368	3	0	Pass
0.0371	353	3	0	Pass
0.0377	341	3	0	Pass
0.0382	333	3	0	Pass
0.0388	322	3	0	Pass
0.0393	313	3	0	Pass
0.0399	302	3	0	Pass
0.0405	293	3	1	Pass
0.0410	284	3	1	Pass
0.0416	276	3	1	Pass
0.0421	265	3	1	Pass
0.0427	257	3	1	Pass
0.0432	241	3	1	Pass
0.0438	234	3	1	Pass
0.0444	226	3	1	Pass
0.0449	212	3	1	Pass
0.0455	205	3	1	Pass
0.0460	195	3	1	Pass
0.0466	187	3	1	Pass
0.0471	177	3	1	Pass
0.0477	166	3	1	Pass
0.0483	160	3	1	Pass
0.0488	150	3	2	Pass
0.0494	146	3	2	Pass
0.0499	135	3	2	Pass
0.0505	128	3	2	Pass
0.0510	120	3	2	Pass
0.0516	111	3	2	Pass
0.0522	99	3	3	Pass
0.0527	85	3	3	Pass
0.0533	75	3	4	Pass

0.0538	63	3	4	Pass
0.0544	59	3	5	Pass
0.0549	56	3	5	Pass
0.0555	50	3	6	Pass
0.0561	42	3	7	Pass
0.0566	39	3	7	Pass
0.0572	37	3	8	Pass
0.0577	36	3	8	Pass
0.0583	30	3	10	Pass
0.0588	28	2	7	Pass
0.0594	26	2	7	Pass
0.0600	20	2	10	Pass
0.0605	16	2	12	Pass
0.0611	13	2	15	Pass
0.0616	8	2	25	Pass
0.0622	6	2	33	Pass
0.0627	5	2	40	Pass
0.0633	4	2	50	Pass
0.0639	4	2	50	Pass
0.0644	3	1	33	Pass
0.0650	3	1	33	Pass
0.0655	3	1	33	Pass
0.0661	3	1	33	Pass

Water Quality BMP Flow and Volume for POC #2 - PARKING BASIN

On-line facility volume: 0.0709 acre-feet

On-line facility target flow: 0.1087 cfs.

Adjusted for 15 min: 0.1087 cfs.

Off-line facility target flow: 0.0616 cfs.

Adjusted for 15 min: 0.0616 cfs.
