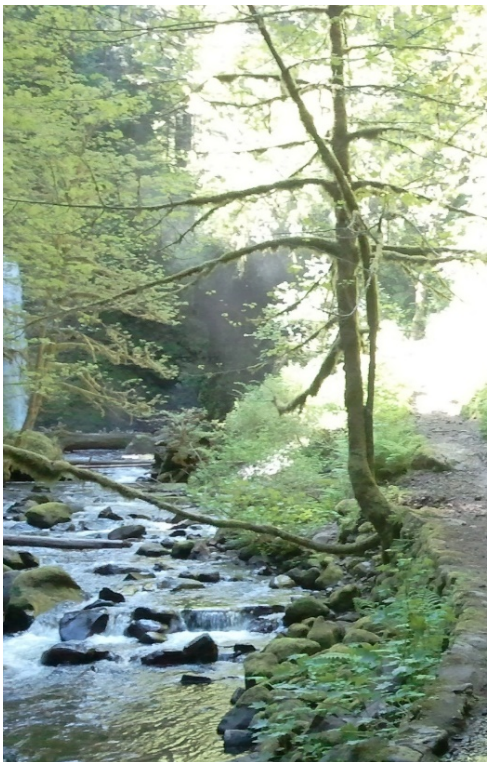
PRELIMINARY - STORMWATER TECHNICAL INFORMATION REPORT

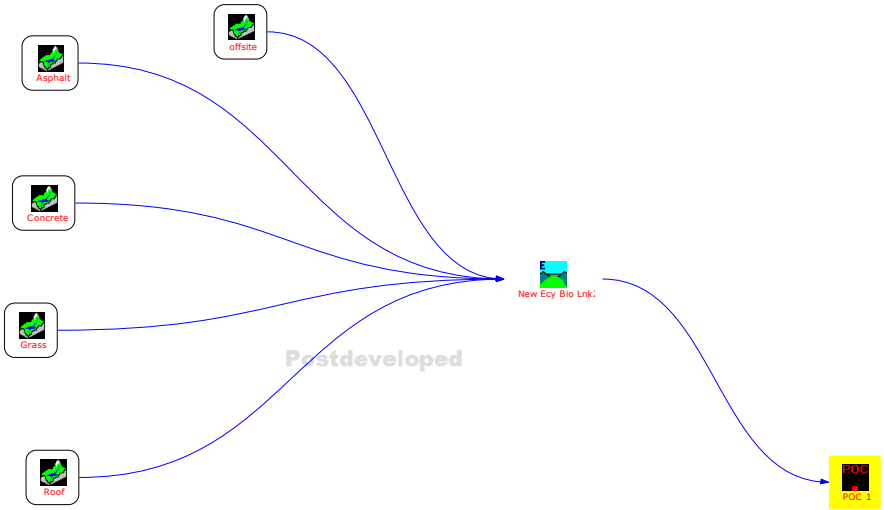
WINDSOR
ENGINEERS

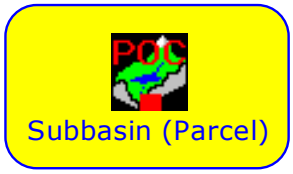


The Lofts at Kalama

Kalama, Washington

7/22/2021


offsite
Asphalt
Concrete
Grass
Roof
New Ecy Bio Lnk:
Postdeveloped
POC
POC 1



Predeveloped

MGS FLOOD
PROJECT REPORT

Program Version: MGSFlood 4.54
Program License Number: 202010002
Project Simulation Performed on: 07/23/2021 3:52 PM
Report Generation Date: 07/23/2021 3:52 PM

Input File Name: TLK_High Level TMS.fld
Project Name: TLK_High Level
Analysis Title:
Comments:

PRECIPITATION INPUT

Computational Time Step (Minutes): 15

Extended Precipitation Time Series Selected
Climatic Region Number: 26

Full Period of Record Available used for Routing
Precipitation Station : 97004805 Vancouver 48 in_5min 10/01/1939-10/01/2060
Evaporation Station : 971048 Vancouver 48 in MAP
Evaporation Scale Factor : 0.750

HSPF Parameter Region Number: 1
HSPF Parameter Region Name : USGS Default

********** Default HSPF Parameters Used (Not Modified by User) **********

********** WATERSHED DEFINITION **********

Predevelopment/Post Development Tributary Area Summary

	Predeveloped	Post Developed
Total Subbasin Area (acres)	17.119	16.930
Area of Links that Include Precip/Evap (acres)	0.000	0.189
Total (acres)	17.119	17.119

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1

---------- Subbasin : Subbasin (Parcel) ----------

	-------Area (Acres) --------
Till Forest	17.119
Subbasin Total	17.119

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 5

---------- Subbasin : Asphalt ----------

	-------Area (Acres) --------
Impervious	5.157
Subbasin Total	5.157

---------- Subbasin : Concrete ----------

	-------Area (Acres) --------
Impervious	1.134
Subbasin Total	1.134

---------- Subbasin : Grass ----------
-------Area (Acres) --------
Till Grass 2.679

Subbasin Total 2.679

---------- Subbasin : Roof ----------
-------Area (Acres) --------
Impervious 2.960

Subbasin Total 2.960

---------- Subbasin : offsite ----------
-------Area (Acres) --------
Impervious 5.000

Subbasin Total 5.000

********** **LINK DATA** **********

----------SCENARIO: PREDEVELOPED
Number of Links: 0

********** **LINK DATA** **********

----------SCENARIO: POSTDEVELOPED
Number of Links: 2

Link Name: POC 1
Link Type: Copy
Downstream Link: None

Link Name: New Ecy Bio Lnk2
Link Type: Ecology Bioretention Facility
Downstream Link Name: POC 1

Floor Elevation (ft) : 100.00
Riser Crest Elevation (ft) : 103.00
Storage Depth (ft) : 3.00
Bottom Length (ft) : 550.0
Bottom Width (ft) : 15.0
Bottom Slope (ft/ft) : 0.030
Side Slopes (ft/ft) : L1= 3.00 L2= 3.00 W1= 3.00 W2= 3.00
Bottom Area (sq-ft) : 8250.
Area at Riser Crest El (sq-ft) : 3,597.
(acres) : 0.083
Volume at Riser Crest (cu-ft) : 5,598.
(ac-ft) : 0.129

Infiltration on Bottom and Sideslopes Selected

Soil Properties
Layer No Soil Name Thickness (ft)
1 ASTM 100 0.250
2 SMMWW 12 in/hr (Ecol 1.500
3 GRAVEL 1.500

KSat Safety Factor: None
Native Soil Infiltration Rate (in/hr) : 2.00

Underdrain Not Present

Riser Geometry
Riser Structure Type : Circular
Riser Diameter (in) : 16.00
Common Length (ft) : 0.000
Riser Crest Elevation : 103.00 ft

Hydraulic Structure Geometry

Number of Devices: 0

**********FLOOD FREQUENCY AND DURATION STATISTICS**********

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1
Number of Links: 0

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 5
Number of Links: 2

********** Subbasin: Asphalt **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	2.125
5-Year	2.815
10-Year	3.218
25-Year	4.062
50-Year	4.545
100-Year	5.541
200-Year	6.106
500-Year	6.854

********** Subbasin: Concrete **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	0.467
5-Year	0.619
10-Year	0.708
25-Year	0.893
50-Year	0.999
100-Year	1.218
200-Year	1.343
500-Year	1.507

********** Subbasin: Grass **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	0.310
5-Year	0.576
10-Year	0.824
25-Year	1.055
50-Year	1.335
100-Year	1.590
200-Year	1.658
500-Year	1.747

********** **Subbasin: Roof** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.220
5-Year	1.616
10-Year	1.847
25-Year	2.331
50-Year	2.609
100-Year	3.180
200-Year	3.505
500-Year	3.934

********** **Subbasin: offsite** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	2.060
5-Year	2.729
10-Year	3.120
25-Year	3.938
50-Year	4.407
100-Year	5.372
200-Year	5.920
500-Year	6.646

********** Link: POC 1 ********** Link Inflow Frequency Stats

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	3.963
5-Year	5.033
10-Year	6.027
25-Year	6.760
50-Year	6.908
100-Year	7.016
200-Year	7.186
500-Year	7.410

********** Link: New Ecy Bio Lnk2 ********** Link Inflow Frequency Stats

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	6.247
5-Year	8.334
10-Year	9.533
25-Year	12.343
50-Year	13.645
100-Year	16.609
200-Year	17.441
500-Year	18.541

********** Link: New Ecy Bio Lnk2 ********** Link Outflow 1 Frequency Stats

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	3.963
5-Year	5.033
10-Year	6.027
25-Year	6.760
50-Year	6.908
100-Year	7.016
200-Year	7.186
500-Year	7.410

********** Link: New Ecy Bio Lnk2 ********** Link WSEL Stats

WSEL Frequency Data(ft)

(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	WSEL Peak (ft)
1.05-Year	103.274
1.11-Year	103.319
1.25-Year	103.374
2.00-Year	103.526
3.33-Year	103.689
5-Year	103.808
10-Year	104.159
25-Year	104.458
50-Year	104.522
100-Year	104.571

************Groundwater Recharge Summary **************

Recharge is computed as input to Perlnd Groundwater Plus Infiltration in Structures

Total Predeveloped Recharge During Simulation

Model Element	Recharge Amount (ac-ft)
Subbasin: Subbasin (Parcel)	2689.602
Total:	2689.602

Total Post Developed Recharge During Simulation

Model Element		Recharge Amount (ac-ft)
Subbasin: Asphalt		0.000
Subbasin: Concrete		0.000
Subbasin: Grass		271.963
Subbasin: Roof		0.000
Subbasin: offsite		0.000
Link: POC 1	0.000	
Link: New Ecy Bio Lnk2		6161.367
Total:		6433.331

Total Predevelopment Recharge is Less than Post Developed
Average Recharge Per Year, (Number of Years= 121)
Predeveloped: 22.228 ac-ft/year, Post Developed: 53.168 ac-ft/year

************Water Quality Facility Data **************

----------SCENARIO: PREDEVELOPED

Number of Links: 0

----------SCENARIO: POSTDEVELOPED

Number of Links: 2

********** Link: POC 1 **********

Infiltration/Filtration Statistics----------
Inflow Volume (ac-ft): 527.39
Inflow Volume Including PPT-Evap (ac-ft): 527.39
Total Runoff Infiltrated (ac-ft): 0.00, 0.00%
Total Runoff Filtered (ac-ft): 0.00, 0.00%
Primary Outflow To Downstream System (ac-ft): 527.39
Secondary Outflow To Downstream System (ac-ft): 0.00
Volume Lost to ET (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered+ET)/Total Volume: 0.00%

********** Link: New Ecy Bio Lnk2 **********

Infiltration/Filtration Statistics----------
Inflow Volume (ac-ft): 6686.79
Inflow Volume Including PPT-Evap (ac-ft): 6703.40
Total Runoff Infiltrated (ac-ft): 6161.37, 91.91%
Total Runoff Filtered (ac-ft): 0.00, 0.00%
Primary Outflow To Downstream System (ac-ft): 527.39
Secondary Outflow To Downstream System (ac-ft): 0.00
Volume Lost to ET (ac-ft): 14.64
Percent Treated (Infiltrated+Filtered+ET)/Total Volume: 92.13%

*************Compliance Point Results ***************

Scenario Predeveloped Compliance Subbasin: Subbasin (Parcel)

Scenario Postdeveloped Compliance Link: POC 1

***** Point of Compliance Flow Frequency Data *****
Recurrence Interval Computed Using Gringorten Plotting Position

Predevelopment Runoff		Postdevelopment Runoff	
Tr (Years)	Discharge (cfs)	Tr (Years)	Discharge (cfs)
2-Year	0.550	2-Year	3.963
5-Year	0.834	5-Year	5.033
10-Year	1.138	10-Year	6.027
25-Year	1.571	25-Year	6.760
50-Year	2.164	50-Year	6.908
100-Year	2.773	100-Year	7.016
200-Year	3.345	200-Year	7.186
500-Year	4.100	500-Year	7.410

** Record too Short to Compute Peak Discharge for These Recurrence Intervals

****** LID Duration Performance ******

Excursion at Predeveloped 8%Q2 (Must be Less Than 0%):	-94.7%	PASS
Maximum Excursion from 8%Q2 to 50%Q2 (Must be Less Than 0%):	-53.6%	PASS

MEETS ALL LID DURATION DESIGN CRITERIA: PASS
