Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 11:03 AM
To: 'dan.liebling+sam@gmail.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Dan,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: D Liebling [mailto:dan.liebling+sam@gmail.com]
Sent: Thursday, January 26, 2017 5:15 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear council members:

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the permit, as submitted.

Cycling and walking on E Lk Sammamish Parkway was dangerous until the existing segments were completed. Now, there is a safe path, EXCEPT for the final segment, awaiting your approval.

Remember that once upon a time, people protested the Burke-Gillman trail, but now that same trail is seen as a huge asset and value-add for those neighbors bordering the trail.

D Liebling
156th Ave NE
Redmond, WA 98052
206-000-0000

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 11:03 AM
To: 'RAMON BELUCHE'
Subject: RE: Comments on East Lake Sammamish Trail - B 60% Plans

Dear Ramon,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

From: RAMON BELUCHE [mailto:ramonandlinda@msn.com]
Sent: Thursday, January 26, 2017 5:07 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Comments on East Lake Sammamish Trail - B 60% Plans

Ms. Ozbolt,

When my wife and I met with County staff during a prescheduled appointment on January 10, we specifically asked about access to the waterfront portion of our property at 1721 E. Lake Sammamish PL. SE. during construction. We were told by Ms. Donahue (I believe that is the name), who assisted us in reviewing the 60% plans, that access would be provided and safety arrangements would be made for it.

I have recently learned from some of my neighbors that they have been told by County staff at the City's plan review desk, that there will not be any access to the waterfront portions of the properties during construction. It would appear as if County staff is arbitrarily planning on preventing access to people's properties during what will likely be a minimum of a 12 month construction period.

Access to the waterfront portion of properties divided by the trail must be maintained during construction and the County must clearly address this particularly sensitive issue as part of the completion of the trail improvement plans. There needs to be clear and specific language in the construction plans and documents to address this issue.

I trust that our comments on the 60% plan review are being also reviewed by the City's staff and elected officials and that they too will participate in formulating solutions to these problems.

Thank you for your consideration,

Ramon A. Beluche

Lindsey Ozbolt

From: Jeff Peterson <jpeterson@tollbrothersinc.com>
Sent: Friday, January 27, 2017 11:35 AM
To: Lindsey Ozbolt
Subject: RE: Comment on SSDP 2016-00415 - Trail

Thank you Lindsey. Hopefully your mailbox returns to normal shortly!
Jeff

From: Lindsey Ozbolt [mailto:LOzbolt@sammamish.us]
Sent: Friday, January 27, 2017 11:02 AM
To: Jeff Peterson
Subject: RE: Comment on SSDP 2016-00415 - Trail

Dear Jeff,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

From: Jeff Peterson [mailto:jpeterson@tollbrothersinc.com]
Sent: Thursday, January 26, 2017 4:48 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Comment on SSDP 2016-00415 - Trail

Lindsey:
Please accept this as public comment regarding plans for the trail improvement project in Sammamish. Early last year we worked on the feasibility of a property for development that receives a significant volume of water discharge from the Tamarack neighborhood. As you know, Tamarack was developed under the regulation and permitting requirements of King County. This trail improvement project represents a key element in the eventual solution to the problematic drainage issues in Tamarack that have developed in that neighborhood and have been the subject of many council meetings and a 2016 drainage study of the area. However, upon my cursory review of the plans, stormwater piping appears to be sized in the realm of 12" diameter pipe with type 1 catchbasins. These sizes appear to be inadequate to handle volumes being produced by the Tamarack neighborhood at this time (table 3 of the attached preliminary modeling memo), which currently discharge onto the property uphill of this project which is the subject of our feasibility. As the city has completed drainage studies for the Tamarack neighborhood, it seems advisable that the discharges be factored into the sizing of the storm system improvements *which appear to have been designed prior to the drainage study*.

As King county was the original approving agency for the Tamarack neighborhood, it seem fair the deficiencies in stormwater for that neighborhood are partially the responsibility of the county, and given the opportunity the county now has to contribute to the solution, it would be a poor use of public funds and effort to not consider these needed drainage facilities in the context of this project.
Thank you for your consideration,

Jeff Peterson
9720 NE 120th PL STE 100
Kirkland, WA 98034

OSBORN
CONSULTING
INCORPORATED

1800 112th Avenue NE Suite 220-E | Bellevue, WA 98004 | P: 425.451.4009 | F: 425.451.4901

DATE MAY 9, 2016

TO DERYA DILMEN, PROJECT ENGINEER, CITY OF SAMMAMISH

CC

FROM ROBERT PARISH, PE, PROJECT MANAGER, OSBORN CONSULTING, INC.
JOSH VAN WIE, PE, PROJECT ENGINEER, OSBORN CONSULTING, INC.

SUBJECT TAMARACK DRAINAGE IMPROVEMENT PROJECT – MODELING MEMORANDUM

INTRODUCTION

The Tamarack neighborhood is located on the west side of the City of Sammamish bordering Lake Sammamish. The neighborhood contains properties in the area near the intersection of East Lake Sammamish Parkway and Louis Thompson Road NE.

The Tamarack basin contributes flow to Lake Sammamish through a culvert at the intersection of East Lake Sammamish Parkway and Louis Thompson Road. The basin is approximately 52 acres in size, and includes a system of storm drains, culverts, and ditches. Properties in the basin are zoned as R-4 residential, and land cover consists primarily of single family residential houses. Topography ranges in elevation from approximately 40 feet to 460 feet with slopes up to approximately 30% in the steepest areas.

The goal of this study is to use hydrologic and hydraulic modeling to assess the existing flows reaching Lake Sammamish and potential changes in peak flow due to future development in the Tamarack neighborhood. Modeling was performed using the Western Washington Hydrology Model (WWHM) and the EPA Storm Water Management Model (SWMM) through the PCSWMM platform.

SUBBASIN DELINEATION

The Tamarack basin was divided into 8 subbasins for performing modeling calculations. Subbasin boundaries were delineated using King County and City of Sammamish GIS data including elevation contours, streams, parcels, drainage pipes, culverts, manholes, and catch basins. Subbasins were divided by choosing specific points in the stormwater conveyance system and separating out the land area that contributes flow to each point.

Site visits were performed to verify subbasin boundaries. Subbasin boundaries were confirmed by locating high points at the edge of subbasins and by visually locating pipes or culverts that redirected flow to create a basin boundary. The subbasin delineations can be seen in **Figure 1**.

Subbasin 4 is currently undeveloped, and consists of forested area. The remaining subbasins are developed, with the majority of lots built out as single family residential. A few individual undeveloped lots exist in Subbasins 2, 6, and 7.

WWHM MODEL

WWHM was used for computing runoff in each subbasin for existing and future conditions. Input data required for WWHM includes impervious and pervious cover, slopes, and soil types.

Existing impervious areas were calculated using aerial imagery databases available in ArcGIS software. The most recent imagery available was from July, 2013. Impervious areas were traced using ArcGIS, and roadway impervious areas were separated from parcel impervious areas. Impervious cover on parcels was assumed to be 70 percent building area and 30 percent driveway area based on aerial photographs. Separation of individual buildings, driveways, and other impervious is beyond the scope of this work. Pervious areas were assumed to be 100 percent lawn in developed subbasins. In Subbasin 4, which is undeveloped, pervious areas were assumed to be 100 percent forest based on aerial imagery and site visit observations.

Proposed impervious areas were calculated assuming parcels will redevelop individually and increase impervious cover to the maximum allowable level. Developments in the Tamarack basin are required to use level 2 flow control standards according to the City of Sammamish flow control map. Under these standards, developments or redevelopments with greater than 5,000 square feet new or replaced impervious surface are required to install flow control. For the WWHM model, it was assumed that any existing lots with less than 5,000 square feet impervious would redevelop and add impervious area to reach 5,000 square feet. This added a total of 2.12 acres of impervious area for an increase in impervious cover of approximately 4 percent over the entire Tamarack Basin. A summary of existing and proposed conditions is provided in **Table 1**.

Subbasin 4 currently consists of a single large tract of land. The tract is expected to be subdivided and developed into residential lots in the future. The subdivision of the land for development will require installation of flow control meeting the level 2 standards for peak flows and flow durations. Subbasin 4 was modeled as forest, assuming that flow control will maintain predeveloped flows in the subbasin.

Slopes for each subbasin were calculated using GIS elevation contours. Slopes for the eight subbasins ranged from 6 to 29 percent, with an average slope of 17 percent. Soil information was taken from the Natural Resources Conservation Service Web Soil Survey, which compiles soil survey data from various sources. Soils in the Tamarack basin consist primarily of glacial outwash soils, which make up 86 percent of the basin. Some areas of glacial till are also present at the highest and lowest elevations in the basin. WWHM requires soils to be categorized as type A/B, type C, or saturated soils. Soil categories were assigned using the Stormwater Management Manual for Western Washington, which classifies the outwash soils in the basin as type A/B and the till soils as type C. Detailed soil information is provided in **Table 1**.

Under existing conditions, runoff from Subbasins 7 and 8 is collected in an 8-inch drainage system located at NE 4th Street and is released to an open channel that passes through Subbasin 4. Soils in Subbasin 4 consist of glacial outwash, and are expected to have a higher infiltration capacity than till soils. Runoff from basins 7 and 8 was routed through Subbasin 4 using a lateral flow basin in WWHM to estimate the infiltration and remaining runoff that continues through Subbasin 4 to the outfall.

Table 1 | Summary of WWHM Parameters						
Subbasin	**Total Area (AC)**	**Existing Percent Impervious**	**Future Percent Impervious**	**Slope**	**Percent Outwash Soil**	**Percent Till Soil**
1	2.15	38%	38%	6%	29%	71%
2	1.61	33%	48%	9%	62%	38%
3	14.07	49%	51%	19%	100%	0%
4	5.82	2%	0%	14%	100%	0%
5	2.70	48%	58%	17%	100%	0%
6	16.25	34%	41%	13%	100%	0%
7	2.22	40%	47%	29%	42%	58%
8	4.51	39%	44%	22%	85%	15%

SWMM MODEL

SWMM was used to model flow from WWHM through the pipes and open channels in the lower part of the Tamarack basin. The drainage system for the model was constructed using survey data, record drawings, and field measurements. Pipes modeled in this study include the mainline pipes that extend from the downstream ends of Subbasins 3, 4, and 6 and continue to Lake Sammamish. A portion of the 8-inch drainage system in Subbasin 8 was also included. The model is meant primarily to provide an estimate of peak flows and velocities in the downstream end of the system. Because of the model's intended use, the full drainage system through the Tamarack basin was not included in the model.

Pipe invert elevations and lengths were taken primarily from survey data and record drawings. Survey data was used for the majority of pipes and culverts along Louis Thompson Road and for the pipes along NE 4th Street in Subbasin 8. Several areas of missing data were encountered for the pipes along Louis Thompson Road where existing manholes could not be located. Based on survey notes and site visits, it appears that existing manholes may have been paved over with asphalt. In these cases, pipe data was taken from record drawings. One area with missing data includes the pipes on the south side of Louis Thompson Road near the intersection with East Lake Sammamish Parkway NE. Record drawings show the system extending to the south along East Lake Sammamish Parkway NE and not connecting into the main Tamarack drainage system. However, no pipes along East Lake Sammamish Parkway NE could be verified during the site visit, and it appears possible that the existing pipes do connect to the main Tamarack system. The model was built assuming the pipes are connected to provide a more conservative estimate of flows. However, it should be noted that the future development will not alter the destination of any flows in the basin. The pipes used in the SWMM model can be seen in **Figure 3**.

Open channel and ditch areas were observed in the field to determine the bottom width, approximate side slope, and estimated channel roughness. Observations were taken at the ditch on the north side of Louis Thompson Drive and at the open channel section between East Lake Sammamish Parkway NE and the East Lake Sammamish Trail to the west of the roadway. The open channel that extends from the trail to Lake Sammamish could not be observed because the channel passes through private property that could not be accessed at the time of the site visit. Parameters for this channel were assigned using engineering judgement based upon the site photographs included as part of the Cooper Beach – Mitigation As built Memorandum (see attached).

Two existing detention systems were included in the model. One is a detention pond located at the Subbasin 5 outlet that provides flow control for the residences near the intersection of 207th Avenue NE and NE 3rd Street. The second is an inline detention pipe located in the 205th Avenue NE right-of-way near the intersection with Louis Thompson Road. Parameters for both detention systems and their orifices were taken from record drawings.

Flows for the SWMM model were taken from WWHM results for 100-year peak runoff. Flow from each subbasin was applied as a constant flow at the appropriate model node. Flows from Subbasin 3 were split between two nodes because a portion of flow from the subbasin does not reach the conveyance system until near the downstream end. The total flow was divided based on contributing area, with 80 percent assigned to the main drainage line and 20 percent assigned to the farthest downstream node in the subbasin.

Shear Stress Calculations

Shear stresses for the open channel at the Lake Sammamish outfall were calculated to determine the potential for erosion. The predicted shear stress for each scenario was calculated using equations developed for channel design by the Federal Highway Administration (Kilgore, 2005). The following equations were used for calculating shear stress applied by the modeled flow and permissible shear stress on the channel soil and vegetation:

$$\tau_0 = \gamma R S_0 \quad \text{(Applied shear stress, FHWA Equation 2.3)}$$

$$\tau_p = \frac{\tau_{p,soil}}{(1-C_f)}\left(\frac{n}{n_s}\right)^2 \quad \text{(Permissible shear stress, FHWA Equation 4.7)}$$

Values for flow rates, velocities and depths, and slopes were taken from the WWHM and SWMM models and used to calculate shear stress. Values for the grass cover factor and roughness were taken from the FHWA document or other literature sources. The bed material grain size where 75% of material is finer (i.e. D_{75}) was estimated to be 2 inches. This estimate was based on observations of the upstream channel near the trail and photos of the constructed channel provided in the Cooper Beach – Mitigation As built Memorandum.

Modeling Results

The peak flow results predicted by WWHM are provided in **Table 2**. Peak flows for future conditions were greater than existing conditions due to increased impervious cover. Subbasins 2, 5, and 6 had flow increases of greater than 10 percent at the 100-year event. Subbasin 4 is predicted to have no significant change in flow due to expected installation of flow control during future development. This will ultimately depend on the design of the future development.

Table 2 | WWHM Modeled Peak Flows

	Flows by Subbasin (CFS)							
Scenario	**1**	**2**	**3**	**4***	**5**	**6**	**7***	**8***
Existing 2-year	0.42	0.27	2.97	0.05	0.57	2.40	-	-
Existing 100-year	1.09	0.71	6.74	1.86	1.30	6.01	-	-
Future 2-year	0.42	0.36	3.07	0.01	0.67	2.78	0.49	0.91
Future 100-year	1.09	0.83	6.92	0.03	1.47	6.67	1.19	2.14

*For existing conditions, subbasins 7 and 8 were modeled as lateral basins with total flow measured at the outlet of subbasin 4

The peak flows and velocities predicted by SWMM for the ditch and open channel sections are listed in **Table 3**. Flows at the Lake Sammamish outfall are estimated to increase from 17.7 CFS under existing conditions to 20.3 CFS under future conditions during the 100-yr event. This constitutes a 15 percent increase in flow at the outfall. The primary reason for the increase is that runoff from Subbasins 7 and 8 will not be infiltrated as it flows over Subbasin 4. A smaller portion of the increase is caused by a higher percentage of impervious cover in all subbasins.

Velocities along Louis Thompson Road are near 10 feet per second for both existing and future conditions at the 100-year event. The high velocities are caused by steep slopes in the roadside ditch and a grass lined channel without rock material to provide increased roughness. Existing velocities in the open channel sections near Lake Washington are predicted to be 3.8 feet per second at the 100-year event, and are predicted to increase slightly with the higher volume of flow in the future.

Table 3 | SWMM Modeled Peak Flows and Velocities

Location	Existing 100 year Peak Flow	Existing 100 year Velocity	Future 100 year Peak Flow	Future 100 year Velocity
Ditch along Louis Thompson Road NE	7.3 cfs	9.0 ft/s	8.1 cfs	10.3 ft/s
Open Channel between East Lake Sammamish Parkway NE and pedestrian trail	17.7 cfs	5.6 ft/s	20.3 cfs	5.8 ft/s
Open Channel between pedestrian trail and Lake Sammamish outfall	17.7 cfs	3.8 ft/s	20.3 cfs	3.9 ft/s

The permissible shear stress at the outfall channel was calculated to be 1.27 lb/sf. Calculated shear stresses for each storm event under existing and proposed conditions are shown in **Table 4**. The shear stresses are not expected to increase dramatically, and all predicted shear stresses are below the permissible shear stress. Because the permissible shear stress is based on site photos rather than field observations, there is room for refining the permissible stress calculation. Additional study is recommended during the design phase to investigate any potential erosive channel concerns and verify the level of shear stress that is appropriate for the channel. However, because of the relatively minor change in shear stress due to increased flows, the future conditions are expected to be similar to the existing conditions. If the existing channel is functioning without erosion concerns, then the future conditions will not likely create additional concern.

Table 4 | Modeled Shear Stress at Outfall Channel

Scenario	Flow	Velocity	Shear Stress
Existing 2-year	6.7 cfs	2.9 ft/s	0.57 lb/sf
Existing 100-year	17.7 cfs	3.8 ft/s	0.88 lb/sf
Future 2-year	8.7 cfs	3.1 ft/s	0.64 lb/sf
Future 100-year	20.3 cfs	3.9 ft/s	0.91 lb/sf

CONCLUSION

This modeling study developed runoff estimates for 8 subbasins in the Tamarack neighborhood for existing and future developed conditions. Peak flows are expected to increase by as much as 15 percent at the Lake Washington outfall due to increased impervious cover and the change in conveyance for Subbasins 7 and 8 to be conveyed through storm drains rather than an open channel that provides some level of infiltration capacity. Changes in velocity in the open channel near Lake Sammamish are expected to increase slightly due to the higher flow, but increases may not be a concern if there are no erosion or degradation concerns with the existing channel. It is recommended that the condition of the existing open channel be investigated prior to design and construction in Subbasin 4 to review erosion concerns and document existing conditions.

REFERENCES

Kilgore, R.T. and Cotton, G.K., 2005, "Design of Roadside Channels with Flexible Linings," U.S. Department of Transportation, Federal Highway Administration, FHWA-NHI-05-114, Hydraulic Engineering Circular No. 15, Third Edition.

APPENDIX A

FIGURES

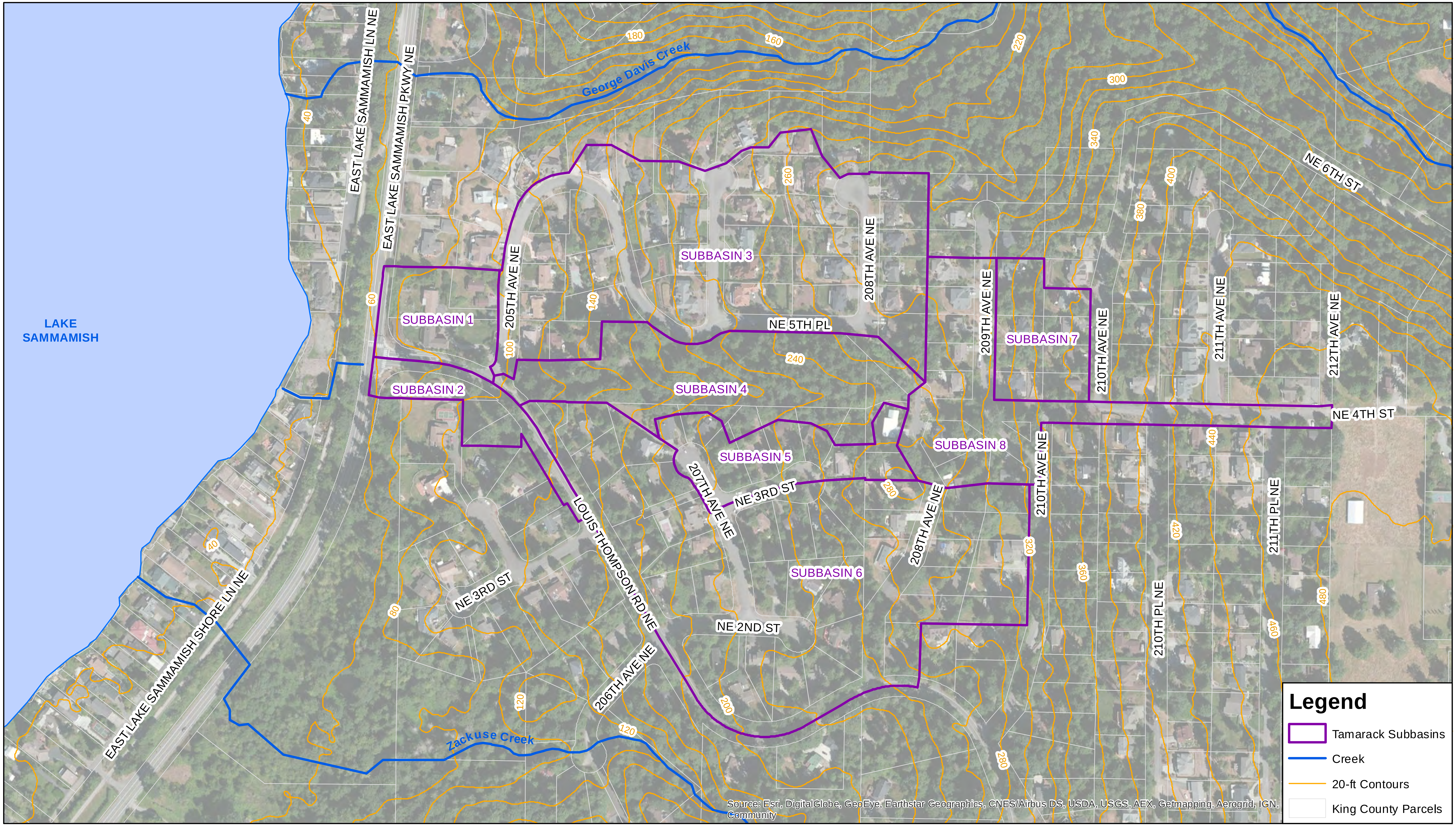
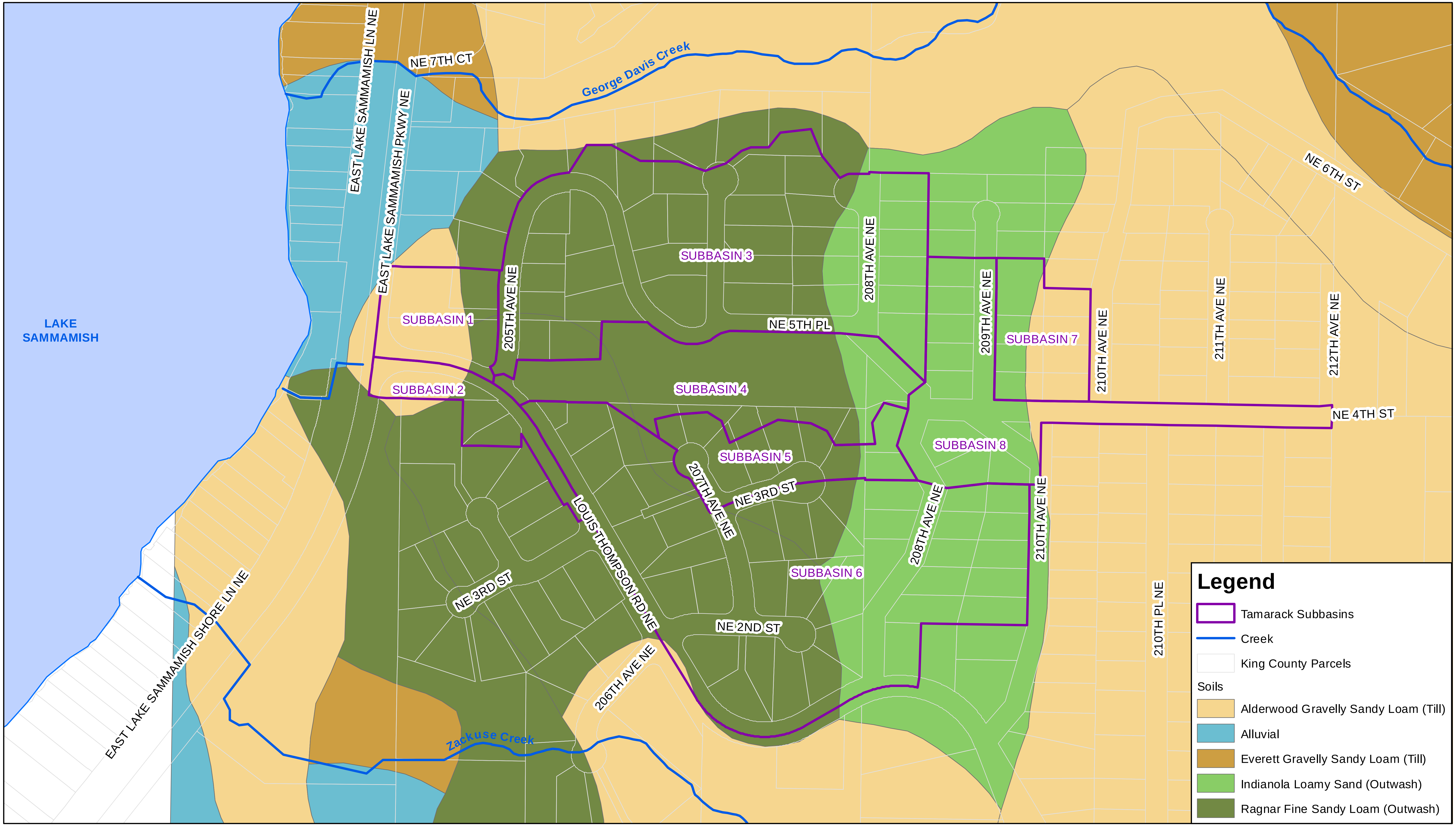


Figure 1: Tamarack Basins

Tamarack Drainage Improvement Project
Sammamish, WA



OSBORN CONSULTING INCORPORATED
SB-261

Figure 2: Tamarack Soils

Tamarack Drainage Improvement Project
Sammamish, WA

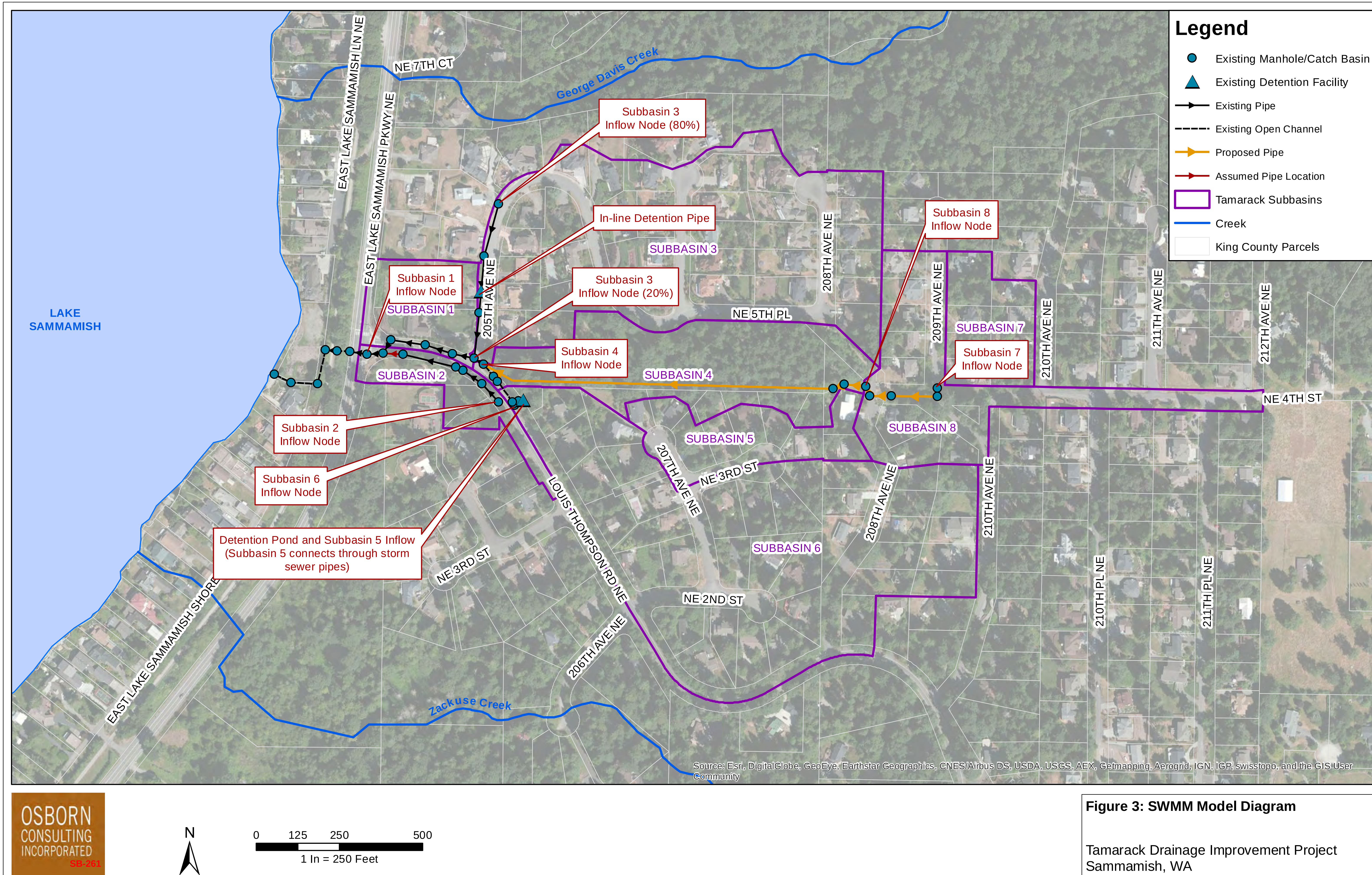


Figure 3: SWMM Model Diagram

Tamarack Drainage Improvement Project
Sammamish, WA

APPENDIX B

MODELING DOCUMENTATION

WWHM2012

PROJECT REPORT

SB-261

General Model Information

Project Name:	Tamarack
Site Name:	Tamarack Basin - Lateral Flow Basin
Site Address:	
City:	
Report Date:	5/9/2016
Gage:	Seatac
Data Start:	1948/10/01
Data End:	2009/09/30
Timestep:	15 Minute
Precip Scale:	1.00
Version Date:	2016/02/25
Version:	4.2.12

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year
Low Flow Threshold for POC2:	50 Percent of the 2 Year
High Flow Threshold for POC2:	50 Year
Low Flow Threshold for POC3:	50 Percent of the 2 Year
High Flow Threshold for POC3:	50 Year
Low Flow Threshold for POC4:	50 Percent of the 2 Year
High Flow Threshold for POC4:	50 Year
Low Flow Threshold for POC5:	50 Percent of the 2 Year
High Flow Threshold for POC5:	50 Year
Low Flow Threshold for POC6:	50 Percent of the 2 Year
High Flow Threshold for POC6:	50 Year
Low Flow Threshold for POC7:	50 Percent of the 2 Year
High Flow Threshold for POC7:	50 Year
Low Flow Threshold for POC8:	50 Percent of the 2 Year
High Flow Threshold for POC8:	50 Year

Landuse Basin Data
Predeveloped Land Use

Subbasin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Mod	0.39
C, Lawn, Mod	0.95
Pervious Total	1.34
Impervious Land Use	acre
ROADS MOD	0.35
ROOF TOPS FLAT	0.32
DRIVEWAYS MOD	0.14
Impervious Total	0.81
Basin Total	2.15

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 2

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Mod	0.67
C, Lawn, Mod	0.41
Pervious Total	1.08

Impervious Land Use	acre
ROADS MOD	0.42
ROOF TOPS FLAT	0.08
DRIVEWAYS MOD	0.04
Impervious Total	0.54
Basin Total	1.62

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 3

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Steep	7.19
Pervious Total	7.19
Impervious Land Use	acre
ROADS STEEP	2.24
ROOF TOPS FLAT	3.25
DRIVEWAYS STEEP	1.39
Impervious Total	6.88
Basin Total	14.07

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 5

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Steep	1.39
Pervious Total	1.39

Impervious Land Use	acre
ROADS STEEP	0.52
ROOF TOPS FLAT	0.55
DRIVEWAYS STEEP	0.24
Impervious Total	1.31
Basin Total	2.7

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 6

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Mod	10.62
C, Lawn, Mod	0.04
Pervious Total	10.66
Impervious Land Use	acre
ROADS MOD	1.77
ROOF TOPS FLAT	2.68
DRIVEWAYS MOD	1.15
Impervious Total	5.6
Basin Total	16.26

Element Flows To:

Surface	Interflow	Groundwater

Basin 4 - Perv Lateral Flow

Bypass: No

GroundWater: No

Pervious Land Use	acre
A B, Forest, Mod	5.73

Element Flows To:

Surface	Interflow	Groundwater

Basin 4,7,8 Imperv Lateral

Bypass:		No
Impervious Land Use		acre
ROADS MOD LAT		2.89
Element Flows To:		
Outlet 1	Outlet 2	
Basin 4 - Perv Lateral Flow		

Subbasin 8 - Perv Lateral Flow A/B

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Steep	2.4

Element Flows To:

Surface	Interflow	Groundwater
Basin 4 - Perv Lateral Flow	Basin 4 - Perv Lateral Flow	Basin 4 - Perv Lateral Flow

Subbasin 7 - Perv Lateral Flow C

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C, Lawn, Steep	.77

Element Flows To:

Surface	Interflow	Groundwater
Basin 4 - Perv Lateral Flow	Basin 4 - Perv Lateral Flow	Basin 4 - Perv Lateral Flow

Subbasin 8 - Perv Lateral Flow C

Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Lawn, Steep	.8

Element Flows To:

Surface	Interflow	Groundwater
Basin 4 - Perv Lateral Flow	Basin 4 - Perv Lateral Flow	Basin 4 - Perv Lateral Flow

Subbasin 7 - Perv Lateral Flow A/B

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Steep	.57

Element Flows To:

Surface	Interflow	Groundwater
Basin 4 - Perv Lateral Flow	Basin 4 - Perv Lateral Flow	Basin 4 - Perv Lateral Flow

Mitigated Land Use

Subbasin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Mod	0.38
C, Lawn, Mod	0.94
Pervious Total	1.32

Impervious Land Use	acre
ROADS MOD	0.35
ROOF TOPS FLAT	0.33
DRIVEWAYS MOD	0.14
Impervious Total	0.82
Basin Total	2.14

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 2

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Mod	0.52
C, Lawn, Mod	0.32
Pervious Total	0.84

Impervious Land Use	acre
ROADS MOD	0.42
ROOF TOPS FLAT	0.25
DRIVEWAYS MOD	0.11
Impervious Total	0.78
Basin Total	1.62

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 3

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Steep	6.93
Pervious Total	6.93
Impervious Land Use	acre
ROADS STEEP	2.24
ROOF TOPS FLAT	3.43
DRIVEWAYS STEEP	1.47
Impervious Total	7.14
Basin Total	14.07

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 4

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Forest, Mod	5.82
Pervious Total	5.82
Impervious Land Use	acre
Impervious Total	0
Basin Total	5.82

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 5

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Steep	1.15
Pervious Total	1.15
Impervious Land Use	acre
ROADS STEEP	0.52
ROOF TOPS FLAT	0.73
DRIVEWAYS STEEP	0.31
Impervious Total	1.56
Basin Total	2.71

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 6

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Mod	9.61
C, Lawn, Mod	0.03
Pervious Total	9.64
Impervious Land Use	acre
ROADS MOD	1.77
ROOF TOPS FLAT	3.38
DRIVEWAYS MOD	1.45
Impervious Total	6.6
Basin Total	16.24

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 7

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Steep	0.5
C, Lawn, Steep	0.68
Pervious Total	1.18
Impervious Land Use	acre
ROOF TOPS FLAT	0.72
DRIVEWAYS STEEP	0.31
Impervious Total	1.03
Basin Total	2.21

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 8

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Steep	2.22
C, Lawn, Steep	0.74
Pervious Total	2.96

Impervious Land Use	acre
ROADS STEEP	1.03
ROOF TOPS FLAT	0.79
DRIVEWAYS STEEP	0.34
Impervious Total	2.16
Basin Total	5.12

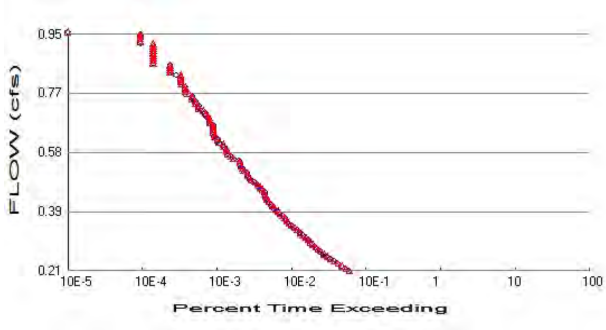
Element Flows To:

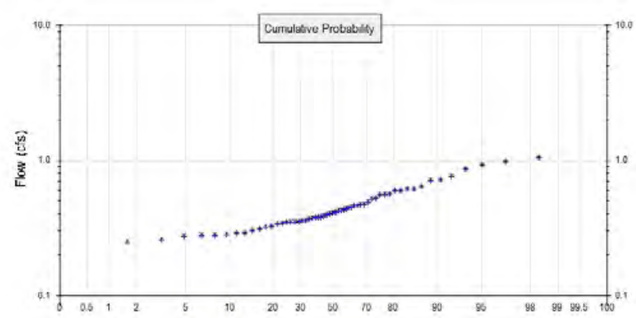
Surface	Interflow	Groundwater

Routing Elements
Predeveloped Routing

Mitigated Routing

Analysis Results
POC 1





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 1.34
Total Impervious Area: 0.81

Mitigated Landuse Totals for POC #1
Total Pervious Area: 1.32
Total Impervious Area: 0.82

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.416796
5 year	0.567316
10 year	0.677895
25 year	0.830552
50 year	0.954007
100 year	1.086099

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.419476
5 year	0.570091
10 year	0.680611
25 year	0.83304
50 year	0.956208
100 year	1.087905

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1949	0.612	0.615
1950	0.594	0.595
1951	0.375	0.376
1952	0.249	0.251
1953	0.279	0.281
1954	0.341	0.343
1955	0.379	0.382
1956	0.346	0.347
1957	0.439	0.442
1958	0.321	0.323

1959	0.300	0.303
1960	0.393	0.395
1961	0.348	0.351
1962	0.274	0.277
1963	0.376	0.378
1964	0.324	0.325
1965	0.459	0.462
1966	0.282	0.284
1967	0.596	0.597
1968	0.613	0.617
1969	0.414	0.417
1970	0.386	0.389
1971	0.470	0.473
1972	0.559	0.561
1973	0.243	0.246
1974	0.459	0.462
1975	0.449	0.452
1976	0.356	0.358
1977	0.338	0.340
1978	0.425	0.428
1979	0.518	0.523
1980	0.717	0.719
1981	0.403	0.406
1982	0.637	0.640
1983	0.436	0.440
1984	0.289	0.291
1985	0.394	0.398
1986	0.366	0.368
1987	0.487	0.492
1988	0.277	0.280
1989	0.423	0.427
1990	1.046	1.046
1991	0.764	0.766
1992	0.309	0.311
1993	0.288	0.290
1994	0.258	0.260
1995	0.356	0.359
1996	0.561	0.562
1997	0.430	0.433
1998	0.377	0.379
1999	0.920	0.925
2000	0.410	0.413
2001	0.408	0.412
2002	0.554	0.557
2003	0.525	0.527
2004	0.856	0.861
2005	0.352	0.355
2006	0.349	0.350
2007	0.987	0.986
2008	0.711	0.714
2009	0.468	0.473

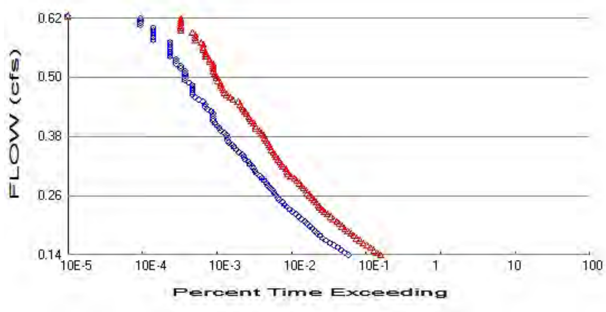
Ranked Annual Peaks

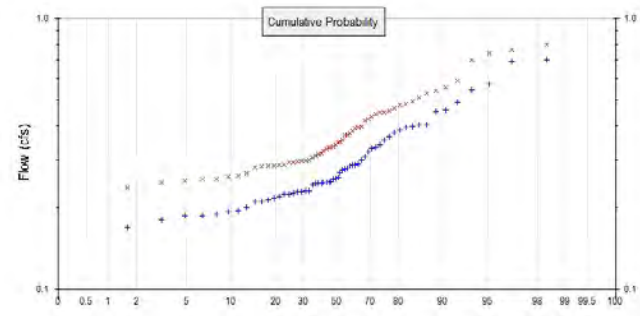
Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	1.0458	1.0461
2	0.9867	0.9861
3	0.9201	0.9251

4	0.8561	0.8610
5	0.7635	0.7655
6	0.7165	0.7187
7	0.7114	0.7138
8	0.6369	0.6402
9	0.6132	0.6173
10	0.6116	0.6146
11	0.5962	0.5974
12	0.5937	0.5946
13	0.5615	0.5617
14	0.5589	0.5607
15	0.5537	0.5569
16	0.5252	0.5274
17	0.5181	0.5233
18	0.4874	0.4924
19	0.4696	0.4729
20	0.4685	0.4727
21	0.4595	0.4622
22	0.4590	0.4617
23	0.4494	0.4520
24	0.4394	0.4422
25	0.4358	0.4400
26	0.4304	0.4326
27	0.4251	0.4277
28	0.4234	0.4275
29	0.4141	0.4167
30	0.4101	0.4129
31	0.4077	0.4116
32	0.4025	0.4058
33	0.3944	0.3976
34	0.3933	0.3953
35	0.3861	0.3888
36	0.3787	0.3816
37	0.3767	0.3788
38	0.3759	0.3782
39	0.3748	0.3764
40	0.3662	0.3683
41	0.3562	0.3592
42	0.3559	0.3580
43	0.3525	0.3548
44	0.3487	0.3507
45	0.3483	0.3503
46	0.3461	0.3467
47	0.3406	0.3429
48	0.3377	0.3399
49	0.3242	0.3252
50	0.3207	0.3234
51	0.3093	0.3111
52	0.3002	0.3034
53	0.2886	0.2909
54	0.2876	0.2898
55	0.2824	0.2844
56	0.2786	0.2815
57	0.2767	0.2800
58	0.2740	0.2767
59	0.2579	0.2604
60	0.2488	0.2508
61	0.2429	0.2455

POC 2





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #2
Total Pervious Area: 1.08
Total Impervious Area: 0.54

Mitigated Landuse Totals for POC #2
Total Pervious Area: 0.84
Total Impervious Area: 0.78

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #2

Return Period	**Flow(cfs)**
2 year	0.272287
5 year	0.368456
10 year	0.440235
25 year	0.540614
50 year	0.622745
100 year	0.71146

Flow Frequency Return Periods for Mitigated. POC #2

Return Period	**Flow(cfs)**
2 year	0.357064
5 year	0.468532
10 year	0.548138
25 year	0.655564
50 year	0.740714
100 year	0.830382

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #2

Year	**Predeveloped**	**Mitigated**
1949	0.378	0.484
1950	0.399	0.466
1951	0.247	0.308
1952	0.164	0.218
1953	0.189	0.263
1954	0.231	0.293
1955	0.249	0.333
1956	0.246	0.297
1957	0.270	0.356
1958	0.210	0.285
1959	0.210	0.293

1960	0.247	0.317
1961	0.224	0.297
1962	0.181	0.250
1963	0.243	0.316
1964	0.224	0.287
1965	0.285	0.370
1966	0.186	0.247
1967	0.405	0.478
1968	0.403	0.531
1969	0.254	0.334
1970	0.247	0.328
1971	0.300	0.398
1972	0.366	0.444
1973	0.169	0.237
1974	0.290	0.377
1975	0.275	0.371
1976	0.229	0.298
1977	0.220	0.288
1978	0.287	0.392
1979	0.355	0.491
1980	0.452	0.556
1981	0.256	0.347
1982	0.387	0.512
1983	0.287	0.396
1984	0.193	0.254
1985	0.248	0.337
1986	0.230	0.299
1987	0.322	0.449
1988	0.195	0.268
1989	0.308	0.419
1990	0.703	0.796
1991	0.489	0.590
1992	0.201	0.260
1993	0.213	0.282
1994	0.187	0.255
1995	0.229	0.311
1996	0.395	0.449
1997	0.278	0.352
1998	0.246	0.325
1999	0.574	0.741
2000	0.258	0.342
2001	0.279	0.383
2002	0.333	0.434
2003	0.340	0.426
2004	0.543	0.704
2005	0.216	0.286
2006	0.226	0.283
2007	0.692	0.763
2008	0.460	0.541
2009	0.331	0.456

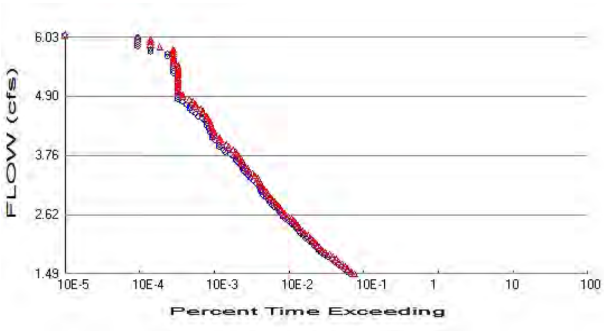
Ranked Annual Peaks

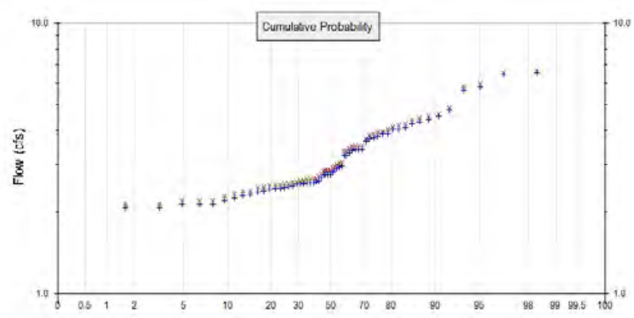
Ranked Annual Peaks for Predeveloped and Mitigated. POC #2

Rank	Predeveloped	Mitigated
1	0.7030	0.7957
2	0.6916	0.7627
3	0.5737	0.7415
4	0.5428	0.7039

5	0.4887	0.5895
6	0.4598	0.5565
7	0.4521	0.5409
8	0.4053	0.5309
9	0.4035	0.5115
10	0.3990	0.4912
11	0.3949	0.4839
12	0.3871	0.4778
13	0.3783	0.4660
14	0.3659	0.4563
15	0.3551	0.4491
16	0.3400	0.4489
17	0.3326	0.4441
18	0.3306	0.4339
19	0.3219	0.4259
20	0.3085	0.4190
21	0.3004	0.3980
22	0.2896	0.3961
23	0.2871	0.3915
24	0.2870	0.3833
25	0.2849	0.3769
26	0.2793	0.3706
27	0.2780	0.3705
28	0.2749	0.3558
29	0.2705	0.3518
30	0.2578	0.3472
31	0.2561	0.3419
32	0.2541	0.3369
33	0.2487	0.3339
34	0.2476	0.3327
35	0.2472	0.3282
36	0.2469	0.3251
37	0.2466	0.3175
38	0.2464	0.3156
39	0.2458	0.3109
40	0.2427	0.3075
41	0.2312	0.2988
42	0.2302	0.2982
43	0.2294	0.2968
44	0.2290	0.2965
45	0.2259	0.2931
46	0.2245	0.2925
47	0.2235	0.2883
48	0.2198	0.2873
49	0.2159	0.2857
50	0.2133	0.2850
51	0.2102	0.2834
52	0.2098	0.2816
53	0.2005	0.2683
54	0.1951	0.2627
55	0.1926	0.2601
56	0.1893	0.2547
57	0.1867	0.2543
58	0.1864	0.2503
59	0.1806	0.2473
60	0.1694	0.2369
61	0.1636	0.2182

POC 3





+ Predeveloped   x Mitigated

Predeveloped Landuse Totals for POC #3
Total Pervious Area: 7.19
Total Impervious Area: 6.88

Mitigated Landuse Totals for POC #3
Total Pervious Area: 6.93
Total Impervious Area: 7.14

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #3

Return Period	**Flow(cfs)**
2 year	2.973468
5 year	3.869482
10 year	4.505279
25 year	5.35887
50 year	6.032374
100 year	6.739069

Flow Frequency Return Periods for Mitigated. POC #3

Return Period	**Flow(cfs)**
2 year	3.072409
5 year	3.989723
10 year	4.63956
25 year	5.510849
50 year	6.197513
100 year	6.917348

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #3

Year	**Predeveloped**	**Mitigated**
1949	3.768	3.901
1950	3.902	4.046
1951	2.580	2.650
1952	1.886	1.957
1953	2.299	2.382
1954	2.484	2.554
1955	2.734	2.833
1956	2.539	2.591
1957	2.809	2.913
1958	2.383	2.470
1959	2.570	2.661

1960	2.537	2.605
1961	2.438	2.525
1962	2.128	2.207
1963	2.565	2.653
1964	2.491	2.581
1965	2.940	3.032
1966	2.070	2.142
1967	4.045	4.131
1968	4.386	4.539
1969	2.609	2.706
1970	2.671	2.769
1971	3.235	3.352
1972	3.646	3.739
1973	2.080	2.155
1974	2.958	3.065
1975	3.252	3.372
1976	2.430	2.514
1977	2.437	2.526
1978	3.410	3.528
1979	4.252	4.404
1980	4.305	4.449
1981	2.860	2.966
1982	4.090	4.241
1983	3.376	3.500
1984	2.132	2.205
1985	2.750	2.854
1986	2.460	2.552
1987	3.825	3.967
1988	2.366	2.453
1989	3.724	3.850
1990	6.539	6.653
1991	4.742	4.870
1992	2.137	2.211
1993	2.532	2.613
1994	2.210	2.286
1995	2.569	2.664
1996	3.903	3.968
1997	2.903	2.990
1998	2.745	2.846
1999	5.815	6.025
2000	2.756	2.857
2001	3.314	3.431
2002	3.408	3.529
2003	3.415	3.527
2004	5.649	5.850
2005	2.256	2.341
2006	2.316	2.384
2007	6.462	6.547
2008	4.529	4.618
2009	4.037	4.179

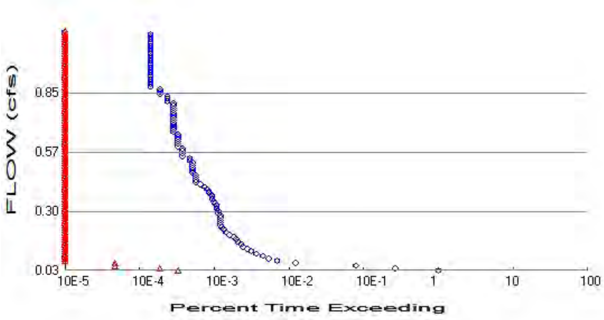
Ranked Annual Peaks

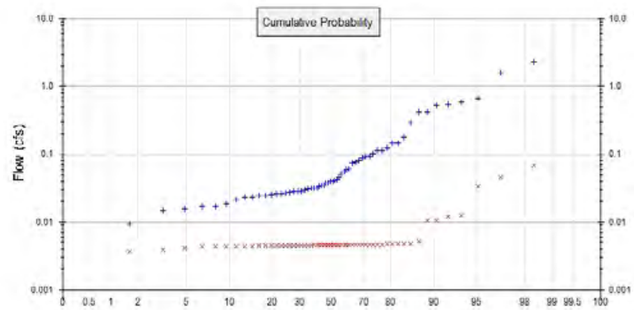
Ranked Annual Peaks for Predeveloped and Mitigated. POC #3

Rank	Predeveloped	Mitigated
1	6.5390	6.6531
2	6.4623	6.5467
3	5.8152	6.0252
4	5.6488	5.8498

5	4.7425	4.8704
6	4.5291	4.6184
7	4.3855	4.5395
8	4.3047	4.4488
9	4.2518	4.4043
10	4.0905	4.2414
11	4.0446	4.1786
12	4.0373	4.1313
13	3.9032	4.0458
14	3.9020	3.9683
15	3.8253	3.9672
16	3.7679	3.9010
17	3.7243	3.8501
18	3.6460	3.7386
19	3.4154	3.5290
20	3.4101	3.5282
21	3.4084	3.5271
22	3.3761	3.5000
23	3.3136	3.4315
24	3.2521	3.3721
25	3.2348	3.3520
26	2.9576	3.0646
27	2.9405	3.0324
28	2.9032	2.9900
29	2.8601	2.9663
30	2.8085	2.9127
31	2.7563	2.8568
32	2.7500	2.8537
33	2.7450	2.8456
34	2.7342	2.8326
35	2.6714	2.7686
36	2.6086	2.7060
37	2.5795	2.6636
38	2.5696	2.6612
39	2.5687	2.6529
40	2.5655	2.6501
41	2.5388	2.6130
42	2.5366	2.6054
43	2.5317	2.5907
44	2.4914	2.5807
45	2.4844	2.5541
46	2.4601	2.5517
47	2.4380	2.5257
48	2.4369	2.5251
49	2.4300	2.5144
50	2.3832	2.4700
51	2.3663	2.4531
52	2.3157	2.3844
53	2.2991	2.3819
54	2.2563	2.3407
55	2.2098	2.2857
56	2.1369	2.2111
57	2.1323	2.2068
58	2.1282	2.2048
59	2.0801	2.1546
60	2.0701	2.1423
61	1.8862	1.9572

POC 4





+ Predeveloped   x Mitigated

Predeveloped Landuse Totals for POC #4
Total Pervious Area: 10.27
Total Impervious Area: 2.89

Mitigated Landuse Totals for POC #4
Total Pervious Area: 5.82
Total Impervious Area: 0

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #4

Return Period	**Flow(cfs)**
2 year	0.051811
5 year	0.156257
10 year	0.302829
25 year	0.655511
50 year	1.120767
100 year	1.862801

Note: Includes basin areas from Predeveloped POC 7 and 8

Flow Frequency Return Periods for Mitigated. POC #4

Return Period	**Flow(cfs)**
2 year	0.005048
5 year	0.008331
10 year	0.011249
25 year	0.015971
50 year	0.020372
100 year	0.025655

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #4

Year	**Predeveloped**	**Mitigated**
1949	0.037	0.004
1950	0.660	0.012
1951	0.146	0.012
1952	0.023	0.005
1953	0.024	0.005
1954	0.095	0.005
1955	0.042	0.005
1956	0.178	0.005
1957	0.031	0.005
1958	0.032	0.005
1959	0.046	0.005

1960	0.114	0.005
1961	0.076	0.005
1962	0.016	0.004
1963	0.030	0.004
1964	0.056	0.005
1965	0.034	0.005
1966	0.025	0.005
1967	0.420	0.005
1968	0.125	0.005
1969	0.028	0.005
1970	0.025	0.004
1971	0.040	0.005
1972	0.530	0.034
1973	0.032	0.005
1974	0.038	0.005
1975	0.060	0.005
1976	0.080	0.005
1977	0.009	0.004
1978	0.028	0.005
1979	0.018	0.004
1980	0.051	0.005
1981	0.028	0.005
1982	0.074	0.005
1983	0.035	0.005
1984	0.026	0.005
1985	0.017	0.005
1986	0.041	0.004
1987	0.094	0.004
1988	0.021	0.005
1989	0.017	0.005
1990	1.581	0.005
1991	0.288	0.011
1992	0.034	0.005
1993	0.023	0.004
1994	0.015	0.004
1995	0.115	0.005
1996	0.549	0.045
1997	0.147	0.005
1998	0.026	0.004
1999	0.597	0.011
2000	0.027	0.004
2001	0.009	0.005
2002	0.040	0.004
2003	0.027	0.005
2004	0.087	0.005
2005	0.032	0.005
2006	0.101	0.005
2007	2.308	0.068
2008	0.420	0.005
2009	0.061	0.005

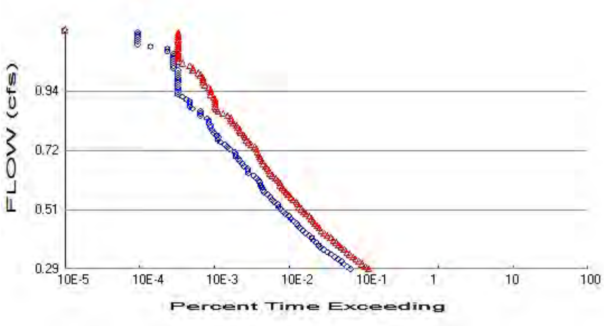
Ranked Annual Peaks

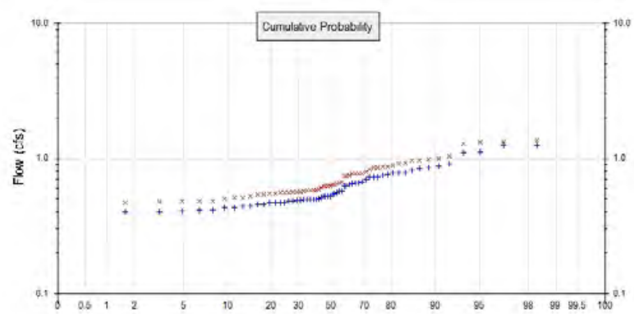
Ranked Annual Peaks for Predeveloped and Mitigated. POC #4

Rank	Predeveloped	Mitigated
1	2.3077	0.0675
2	1.5812	0.0453
3	0.6602	0.0335
4	0.5974	0.0123

5	0.5491	0.0121
6	0.5303	0.0106
7	0.4202	0.0105
8	0.4196	0.0052
9	0.2875	0.0047
10	0.1783	0.0047
11	0.1474	0.0047
12	0.1460	0.0047
13	0.1252	0.0047
14	0.1151	0.0047
15	0.1139	0.0047
16	0.1009	0.0047
17	0.0945	0.0047
18	0.0935	0.0047
19	0.0874	0.0047
20	0.0802	0.0047
21	0.0764	0.0047
22	0.0738	0.0046
23	0.0607	0.0046
24	0.0599	0.0046
25	0.0559	0.0046
26	0.0510	0.0046
27	0.0457	0.0046
28	0.0419	0.0046
29	0.0412	0.0046
30	0.0402	0.0046
31	0.0399	0.0046
32	0.0379	0.0046
33	0.0372	0.0046
34	0.0349	0.0046
35	0.0341	0.0046
36	0.0339	0.0046
37	0.0318	0.0045
38	0.0318	0.0045
39	0.0316	0.0045
40	0.0307	0.0045
41	0.0302	0.0045
42	0.0284	0.0045
43	0.0281	0.0045
44	0.0280	0.0045
45	0.0273	0.0045
46	0.0269	0.0045
47	0.0259	0.0045
48	0.0259	0.0045
49	0.0255	0.0045
50	0.0245	0.0044
51	0.0243	0.0044
52	0.0233	0.0044
53	0.0230	0.0044
54	0.0213	0.0044
55	0.0184	0.0044
56	0.0172	0.0044
57	0.0170	0.0043
58	0.0157	0.0041
59	0.0147	0.0039
60	0.0094	0.0037
61	0.0090	0.0037

POC 5





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #5
Total Pervious Area: 1.39
Total Impervious Area: 1.31

Mitigated Landuse Totals for POC #5
Total Pervious Area: 1.15
Total Impervious Area: 1.56

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #5

Return Period	**Flow(cfs)**
2 year	0.572797
5 year	0.745702
10 year	0.86843
25 year	1.03324
50 year	1.163309
100 year	1.29981

Flow Frequency Return Periods for Mitigated. POC #5

Return Period	**Flow(cfs)**
2 year	0.667922
5 year	0.861329
10 year	0.997605
25 year	1.179534
50 year	1.322365
100 year	1.471646

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #5

Year	**Predeveloped**	**Mitigated**
1949	0.723	0.851
1950	0.748	0.885
1951	0.494	0.562
1952	0.361	0.427
1953	0.443	0.522
1954	0.481	0.548
1955	0.527	0.621
1956	0.496	0.567
1957	0.537	0.637
1958	0.458	0.541
1959	0.496	0.583

1960	0.490	0.569
1961	0.470	0.553
1962	0.407	0.483
1963	0.494	0.577
1964	0.480	0.565
1965	0.571	0.659
1966	0.400	0.469
1967	0.781	0.865
1968	0.849	0.996
1969	0.498	0.592
1970	0.513	0.606
1971	0.622	0.734
1972	0.697	0.787
1973	0.401	0.472
1974	0.569	0.671
1975	0.623	0.738
1976	0.469	0.550
1977	0.468	0.553
1978	0.662	0.774
1979	0.819	0.965
1980	0.840	0.977
1981	0.547	0.649
1982	0.783	0.928
1983	0.647	0.766
1984	0.412	0.481
1985	0.527	0.624
1986	0.470	0.558
1987	0.732	0.868
1988	0.455	0.536
1989	0.727	0.846
1990	1.252	1.364
1991	0.912	1.035
1992	0.414	0.485
1993	0.499	0.576
1994	0.430	0.502
1995	0.492	0.583
1996	0.758	0.824
1997	0.556	0.639
1998	0.526	0.623
1999	1.119	1.320
2000	0.528	0.624
2001	0.640	0.752
2002	0.659	0.774
2003	0.665	0.771
2004	1.090	1.282
2005	0.430	0.511
2006	0.444	0.510
2007	1.241	1.324
2008	0.879	0.965
2009	0.782	0.917

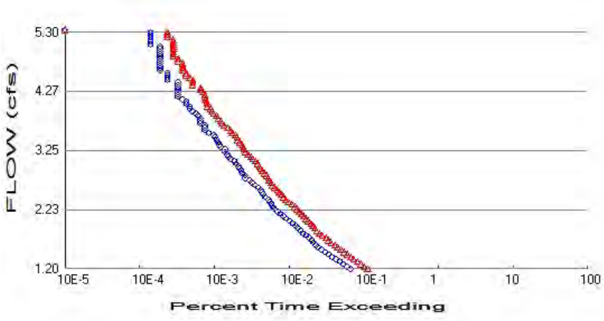
Ranked Annual Peaks

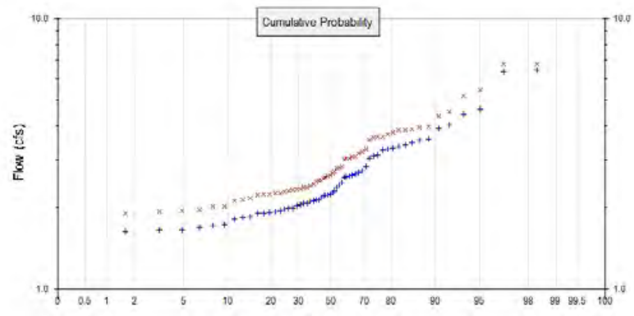
Ranked Annual Peaks for Predeveloped and Mitigated. POC #5

Rank	Predeveloped	Mitigated
1	1.2519	1.3640
2	1.2408	1.3245
3	1.1187	1.3195
4	1.0902	1.2821

5	0.9123	1.0354
6	0.8793	0.9957
7	0.8491	0.9766
8	0.8400	0.9650
9	0.8194	0.9650
10	0.7831	0.9278
11	0.7823	0.9168
12	0.7811	0.8851
13	0.7578	0.8677
14	0.7483	0.8647
15	0.7316	0.8509
16	0.7271	0.8462
17	0.7235	0.8241
18	0.6966	0.7872
19	0.6650	0.7745
20	0.6622	0.7737
21	0.6588	0.7710
22	0.6472	0.7659
23	0.6397	0.7522
24	0.6228	0.7378
25	0.6220	0.7341
26	0.5711	0.6711
27	0.5688	0.6587
28	0.5556	0.6487
29	0.5468	0.6393
30	0.5368	0.6368
31	0.5276	0.6240
32	0.5274	0.6236
33	0.5266	0.6228
34	0.5264	0.6205
35	0.5129	0.6060
36	0.4992	0.5916
37	0.4981	0.5833
38	0.4962	0.5827
39	0.4959	0.5772
40	0.4944	0.5757
41	0.4936	0.5694
42	0.4917	0.5670
43	0.4901	0.5655
44	0.4813	0.5625
45	0.4801	0.5580
46	0.4701	0.5529
47	0.4697	0.5529
48	0.4693	0.5498
49	0.4679	0.5479
50	0.4577	0.5407
51	0.4555	0.5364
52	0.4439	0.5218
53	0.4427	0.5111
54	0.4300	0.5100
55	0.4299	0.5020
56	0.4142	0.4847
57	0.4122	0.4828
58	0.4075	0.4813
59	0.4010	0.4721
60	0.3998	0.4687
61	0.3610	0.4273

POC 6





+ Predeveloped   x Mitigated

Predeveloped Landuse Totals for POC #6
Total Pervious Area: 10.66
Total Impervious Area: 5.6

Mitigated Landuse Totals for POC #6
Total Pervious Area: 9.64
Total Impervious Area: 6.6

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #6

Return Period	**Flow(cfs)**
2 year	2.403278
5 year	3.208207
10 year	3.802683
25 year	4.626862
50 year	5.296037
100 year	6.014415

Flow Frequency Return Periods for Mitigated. POC #6

Return Period	**Flow(cfs)**
2 year	2.779573
5 year	3.662165
10 year	4.30737
25 year	5.194441
50 year	5.909335
100 year	6.672243

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #6

Year	**Predeveloped**	**Mitigated**
1949	3.043	3.548
1950	3.569	3.883
1951	2.231	2.505
1952	1.544	1.818
1953	1.808	2.120
1954	2.052	2.328
1955	2.186	2.559
1956	2.110	2.337
1957	2.276	2.674
1958	1.906	2.236
1959	2.034	2.380

1960	2.116	2.378
1961	1.938	2.251
1962	1.716	2.016
1963	2.079	2.412
1964	1.976	2.314
1965	2.429	2.828
1966	1.630	1.901
1967	3.554	3.892
1968	3.418	3.992
1969	2.128	2.501
1970	2.139	2.508
1971	2.576	3.020
1972	3.305	3.666
1973	1.650	1.931
1974	2.380	2.787
1975	2.620	3.078
1976	1.915	2.231
1977	1.945	2.283
1978	2.654	3.095
1979	3.372	3.949
1980	3.271	3.797
1981	2.311	2.717
1982	3.290	3.864
1983	2.702	3.173
1984	1.691	1.964
1985	2.249	2.648
1986	1.991	2.342
1987	3.099	3.643
1988	1.904	2.235
1989	2.834	3.296
1990	6.355	6.803
1991	4.044	4.536
1992	1.652	1.942
1993	1.843	2.133
1994	1.730	2.014
1995	2.075	2.438
1996	3.472	3.725
1997	2.474	2.811
1998	2.205	2.588
1999	4.633	5.426
2000	2.231	2.614
2001	2.607	3.051
2002	2.731	3.214
2003	2.639	3.050
2004	4.429	5.181
2005	1.846	2.170
2006	1.986	2.250
2007	6.466	6.798
2008	3.936	4.365
2009	3.135	3.662

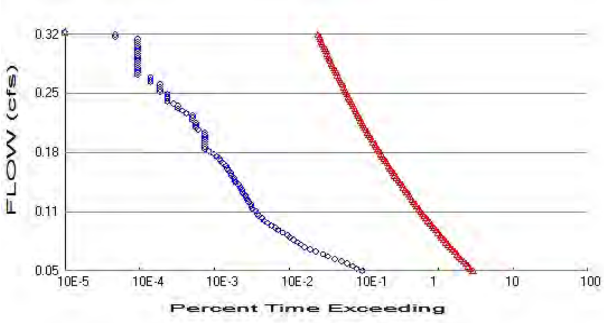
Ranked Annual Peaks

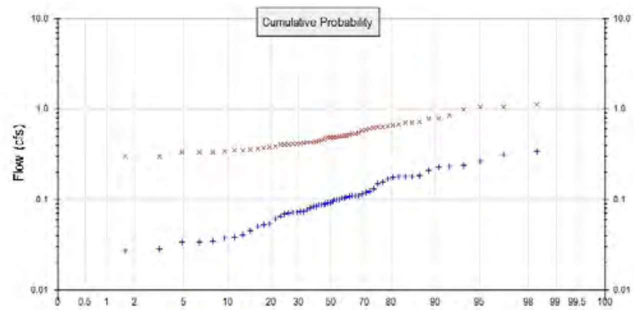
Ranked Annual Peaks for Predeveloped and Mitigated. POC #6

Rank	Predeveloped	Mitigated
1	6.4664	6.8033
2	6.3554	6.7976
3	4.6326	5.4259
4	4.4292	5.1811

5	4.0444	4.5363
6	3.9362	4.3648
7	3.5691	3.9918
8	3.5543	3.9488
9	3.4723	3.8918
10	3.4178	3.8834
11	3.3722	3.8639
12	3.3047	3.7967
13	3.2897	3.7253
14	3.2713	3.6663
15	3.1349	3.6616
16	3.0993	3.6429
17	3.0429	3.5484
18	2.8339	3.2962
19	2.7309	3.2142
20	2.7020	3.1730
21	2.6542	3.0950
22	2.6394	3.0781
23	2.6199	3.0507
24	2.6074	3.0502
25	2.5765	3.0196
26	2.4743	2.8276
27	2.4292	2.8114
28	2.3801	2.7870
29	2.3110	2.7165
30	2.2758	2.6738
31	2.2489	2.6477
32	2.2309	2.6143
33	2.2308	2.5881
34	2.2050	2.5593
35	2.1864	2.5076
36	2.1387	2.5055
37	2.1277	2.5009
38	2.1157	2.4376
39	2.1100	2.4116
40	2.0791	2.3804
41	2.0752	2.3777
42	2.0519	2.3419
43	2.0343	2.3367
44	1.9915	2.3282
45	1.9859	2.3140
46	1.9761	2.2827
47	1.9452	2.2512
48	1.9384	2.2504
49	1.9153	2.2358
50	1.9062	2.2350
51	1.9041	2.2315
52	1.8460	2.1698
53	1.8435	2.1328
54	1.8083	2.1197
55	1.7298	2.0155
56	1.7156	2.0141
57	1.6915	1.9643
58	1.6517	1.9419
59	1.6495	1.9314
60	1.6297	1.9007
61	1.5443	1.8178

POC 7





+ Predeveloped   x Mitigated

Predeveloped Landuse Totals for POC #7
Total Pervious Area: 0.77
Total Impervious Area: 0

Mitigated Landuse Totals for POC #7
Total Pervious Area: 1.18
Total Impervious Area: 1.03

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #7

Return Period	Flow(cfs)
2 year	0.092844
5 year	0.15581[illegible]
10 year	[illegible]3058
25 year	0.26814[illegible]
50 year	0.320137
100 year	0.374869

Included in Predeveloped POC 4

Flow Frequency Return Periods for Mitigated. POC #7

Return Period	Flow(cfs)
2 year	0.487145
5 year	0.649835
10 year	0.767509
25 year	0.92794
50 year	1.056255
100 year	1.192351

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #7

Year	Predeveloped	Mitigated
1949	0.186	0.703
1950	0.178	0.658
1951	0.095	0.436
1952	0.045	0.301
1953	0.034	0.345
1954	0.074	0.409
1955	0.070	0.441
1956	0.099	0.409
1957	0.110	0.510
1958	0.065	0.382
1959	0.053	0.365

1960	0.107	0.449
1961	0.069	0.405
1962	0.028	0.336
1963	0.091	0.442
1964	0.084	0.373
1965	0.119	0.533
1966	0.053	0.337
1967	0.181	0.673
1968	0.109	0.705
1969	0.116	0.488
1970	0.087	0.462
1971	0.103	0.549
1972	0.169	0.644
1973	0.038	0.296
1974	0.111	0.514
1975	0.123	0.521
1976	0.081	0.411
1977	0.073	0.391
1978	0.083	0.485
1979	0.035	0.634
1980	0.231	0.778
1981	0.077	0.489
1982	0.180	0.724
1983	0.108	0.535
1984	0.051	0.344
1985	0.073	0.475
1986	0.099	0.431
1987	0.088	0.601
1988	0.033	0.345
1989	0.027	0.498
1990	0.341	1.132
1991	0.237	0.845
1992	0.072	0.358
1993	0.041	0.331
1994	0.025	0.303
1995	0.061	0.423
1996	0.179	0.624
1997	0.103	0.489
1998	0.087	0.434
1999	0.263	1.043
2000	0.099	0.489
2001	0.037	0.499
2002	0.149	0.630
2003	0.155	0.593
2004	0.209	0.980
2005	0.090	0.415
2006	0.090	0.400
2007	0.316	1.063
2008	0.229	0.788
2009	0.130	0.577

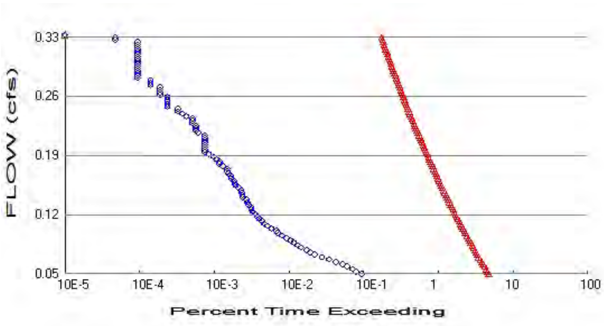
Ranked Annual Peaks

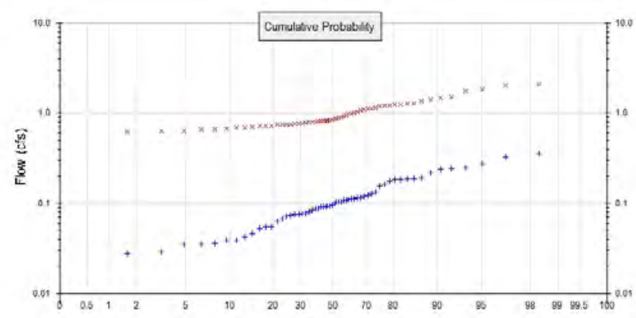
Ranked Annual Peaks for Predeveloped and Mitigated. POC #7

Rank	Predeveloped	Mitigated
1	0.3415	1.1324
2	0.3163	1.0632
3	0.2630	1.0431
4	0.2373	0.9800

5	0.2310	0.8450
6	0.2294	0.7881
7	0.2086	0.7779
8	0.1856	0.7238
9	0.1815	0.7054
10	0.1801	0.7032
11	0.1788	0.6725
12	0.1779	0.6578
13	0.1689	0.6444
14	0.1548	0.6338
15	0.1489	0.6298
16	0.1298	0.6237
17	0.1226	0.6008
18	0.1193	0.5933
19	0.1156	0.5765
20	0.1106	0.5489
21	0.1097	0.5354
22	0.1094	0.5330
23	0.1077	0.5211
24	0.1067	0.5136
25	0.1035	0.5103
26	0.1030	0.4992
27	0.0992	0.4985
28	0.0989	0.4895
29	0.0987	0.4890
30	0.0954	0.4889
31	0.0907	0.4877
32	0.0903	0.4855
33	0.0895	0.4754
34	0.0877	0.4624
35	0.0874	0.4489
36	0.0873	0.4415
37	0.0842	0.4409
38	0.0832	0.4357
39	0.0809	0.4337
40	0.0774	0.4308
41	0.0738	0.4229
42	0.0732	0.4148
43	0.0728	0.4110
44	0.0718	0.4094
45	0.0705	0.4087
46	0.0694	0.4053
47	0.0647	0.4003
48	0.0610	0.3909
49	0.0531	0.3817
50	0.0525	0.3735
51	0.0506	0.3654
52	0.0448	0.3582
53	0.0406	0.3450
54	0.0378	0.3449
55	0.0373	0.3444
56	0.0345	0.3366
57	0.0336	0.3358
58	0.0335	0.3309
59	0.0281	0.3034
60	0.0269	0.3005
61	0.0250	0.2965

POC 8





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #8
Total Pervious Area: 0.8
Total Impervious Area: 0

Mitigated Landuse Totals for POC #8
Total Pervious Area: 2.96
Total Impervious Area: 2.16

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #8

Return Period	**Flow(cfs)**
2 year	0.096461
5 year	0.161387
10 year	0.210969
25 year	0.278591
50 year	0.33261
100 year	0.389474

Included in Predeveloped POC 4

Flow Frequency Return Periods for Mitigated. POC #8

Return Period	**Flow(cfs)**
2 year	0.913203
5 year	1.201425
10 year	1.407677
25 year	1.686463
50 year	1.907754
100 year	2.141053

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #8

Year	**Predeveloped**	**Mitigated**
1949	0.193	1.191
1950	0.185	1.229
1951	0.099	0.799
1952	0.047	0.566
1953	0.035	0.685
1954	0.077	0.769
1955	0.073	0.832
1956	0.103	0.817
1957	0.114	0.867
1958	0.067	0.718
1959	0.055	0.760

1960	0.111	0.792
1961	0.072	0.750
1962	0.029	0.632
1963	0.094	0.797
1964	0.087	0.742
1965	0.124	0.924
1966	0.055	0.637
1967	0.189	1.286
1968	0.114	1.355
1969	0.120	0.810
1970	0.091	0.823
1971	0.108	0.995
1972	0.175	1.140
1973	0.039	0.613
1974	0.115	0.916
1975	0.127	0.948
1976	0.084	0.757
1977	0.076	0.722
1978	0.086	1.028
1979	0.036	1.268
1980	0.240	1.408
1981	0.080	0.867
1982	0.187	1.258
1983	0.112	1.008
1984	0.053	0.655
1985	0.076	0.837
1986	0.103	0.747
1987	0.091	1.131
1988	0.035	0.708
1989	0.028	1.124
1990	0.355	2.073
1991	0.246	1.508
1992	0.075	0.670
1993	0.042	0.783
1994	0.026	0.662
1995	0.063	0.772
1996	0.186	1.255
1997	0.107	0.891
1998	0.091	0.820
1999	0.273	1.821
2000	0.103	0.849
2001	0.039	0.997
2002	0.155	1.072
2003	0.161	1.099
2004	0.217	1.767
2005	0.093	0.694
2006	0.094	0.719
2007	0.329	2.050
2008	0.238	1.466
2009	0.135	1.210

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #8

Rank	Predeveloped	Mitigated
1	0.3548	2.0730
2	0.3286	2.0503
3	0.2732	1.8212
4	0.2465	1.7675

5	0.2400	1.5080
6	0.2383	1.4658
7	0.2168	1.4077
8	0.1928	1.3546
9	0.1886	1.2859
10	0.1871	1.2680
11	0.1857	1.2578
12	0.1849	1.2550
13	0.1755	1.2291
14	0.1608	1.2104
15	0.1547	1.1910
16	0.1348	1.1398
17	0.1273	1.1311
18	0.1239	1.1240
19	0.1201	1.0992
20	0.1149	1.0720
21	0.1140	1.0283
22	0.1137	1.0083
23	0.1119	0.9966
24	0.1108	0.9946
25	0.1075	0.9485
26	0.1070	0.9241
27	0.1031	0.9162
28	0.1028	0.8907
29	0.1026	0.8667
30	0.0991	0.8667
31	0.0942	0.8487
32	0.0938	0.8372
33	0.0930	0.8321
34	0.0911	0.8229
35	0.0908	0.8200
36	0.0907	0.8168
37	0.0875	0.8104
38	0.0865	0.7989
39	0.0841	0.7967
40	0.0804	0.7921
41	0.0766	0.7829
42	0.0761	0.7723
43	0.0756	0.7689
44	0.0746	0.7599
45	0.0732	0.7570
46	0.0721	0.7497
47	0.0672	0.7465
48	0.0634	0.7416
49	0.0552	0.7217
50	0.0546	0.7191
51	0.0526	0.7176
52	0.0465	0.7075
53	0.0422	0.6936
54	0.0392	0.6852
55	0.0388	0.6701
56	0.0358	0.6623
57	0.0349	0.6553
58	0.0348	0.6373
59	0.0292	0.6324
60	0.0279	0.6134
61	0.0260	0.5664

POC 9

POC #9 was not reported because POC must exist in both scenarios and both scenarios must have been run.

POC 10

POC #10 was not reported because POC must exist in both scenarios and both scenarios must have been run.

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

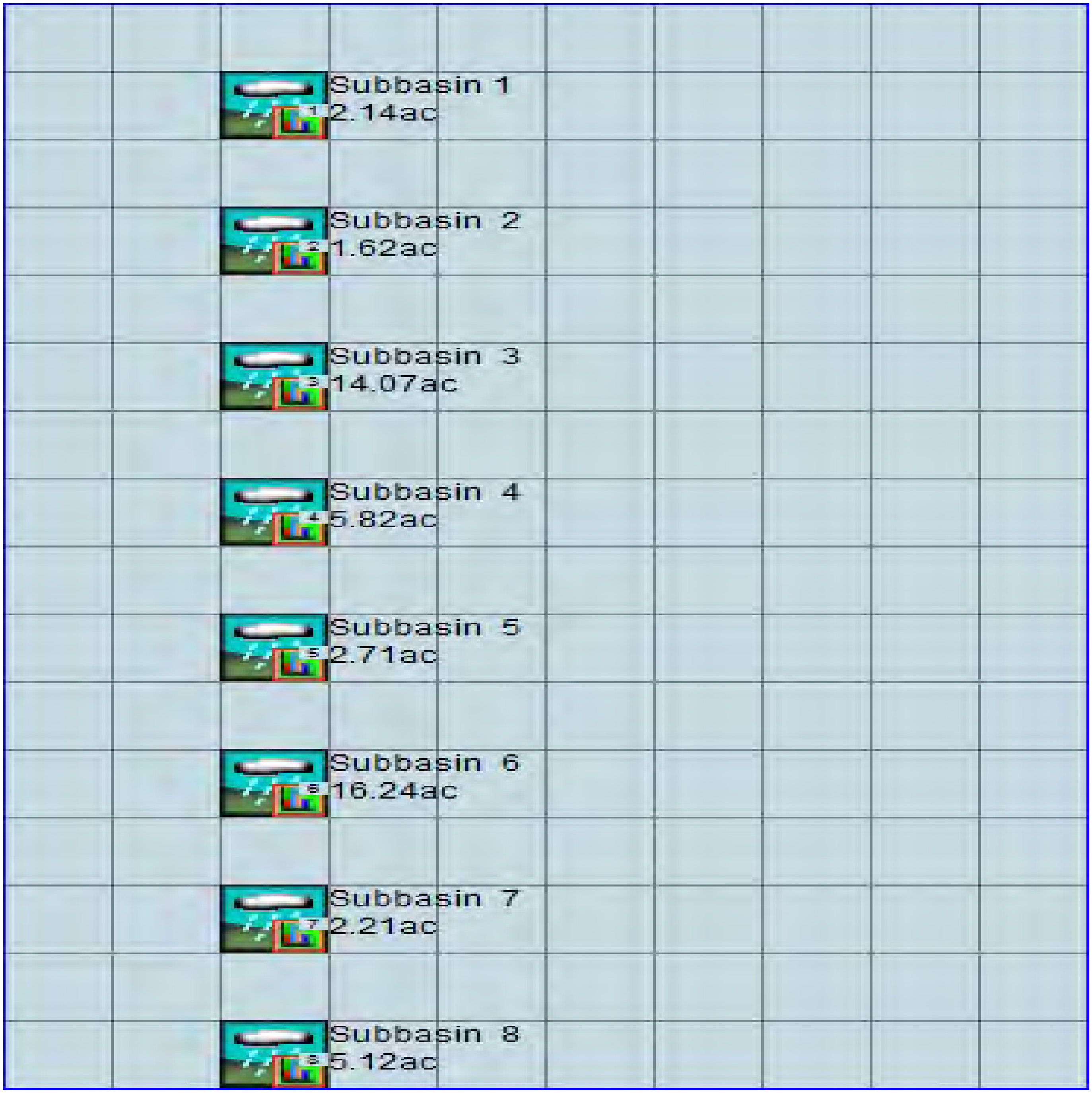
No PERLND changes have been made.

IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic

Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2009 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM        26   Tamarack.wdm
MESSU      25   PreTamarack.MES
           27   PreTamarack.L61
           28   PreTamarack.L62
           30   POCTamarack1.dat
           31   POCTamarack2.dat
           32   POCTamarack3.dat
           34   POCTamarack5.dat
           35   POCTamarack6.dat
           36   POCTamarack7.dat
           37   POCTamarack8.dat
           33   POCTamarack4.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND       8
      PERLND      17
      IMPLND       2
      IMPLND       4
      IMPLND       6
      PERLND       9
      IMPLND       3
      IMPLND       7
      IMPLND      16
      PERLND      40
      PERLND      41
      PERLND      42
      PERLND      43
      PERLND      39
      COPY       501
      COPY       502
      COPY       503
      COPY       505
      COPY       506
      COPY       507
      COPY       508
      COPY       504
      DISPLY       1
      DISPLY       2
      DISPLY       3
      DISPLY       5
      DISPLY       6
      DISPLY       7
      DISPLY       8
      DISPLY       4
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Subbasin 1                  MAX                    1    2   30    9
    2        Subbasin  2                 MAX                    1    2   31    9
    3        Subbasin  3                 MAX                    1    2   32    9
    5        Subbasin  5                 MAX                    1    2   34    9
    6        Subbasin  6                 MAX                    1    2   35    9
```

```
    7        Subbasin  7 - Perv Latera   MAX                        1    2   36    9
    8        Subbasin  8 - Perv Latera   MAX                        1    2   37    9
    4        Basin 4 - Perv Lateral Fl   MAX                        1    2   33    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1        1    1
  501        1    1
  502        1    1
  503        1    1
  505        1    1
  506        1    1
  507        1    1
  508        1    1
  504        1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
    8     A/B, Lawn, Mod           1    1    1    1   27    0
   17     C, Lawn, Mod             1    1    1    1   27    0
    9     A/B, Lawn, Steep         1    1    1    1   27    0
   40     A/B, Lawn, Steep         1    1    1    1   27    0
   41     C, Lawn, Steep           1    1    1    1   27    0
   42     C, Lawn, Steep           1    1    1    1   27    0
   43     A/B, Lawn, Steep         1    1    1    1   27    0
   39     A/B, Forest, Mod         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
    8         0    0    1    0    0    0    0    0    0    0    0    0
   17         0    0    1    0    0    0    0    0    0    0    0    0
    9         0    0    1    0    0    0    0    0    0    0    0    0
   40         0    0    1    0    0    0    0    0    0    0    0    0
   41         0    0    1    0    0    0    0    0    0    0    0    0
   42         0    0    1    0    0    0    0    0    0    0    0    0
   43         0    0    1    0    0    0    0    0    0    0    0    0
   39         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
    8         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   17         0    0    4    0    0    0    0    0    0    0    0    0    1    9
    9         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   40         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   41         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   42         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   43         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   39         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
```

```
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
    8         0    0    0    0    0    0    0    0    0    0    0
   17         0    0    0    0    0    0    0    0    0    0    0
    9         0    0    0    0    0    0    0    0    0    0    0
   40         0    0    0    0    0    0    0    0    0    0    0
   41         0    0    0    0    0    0    0    0    0    0    0
   42         0    0    0    0    0    0    0    0    0    0    0
   43         0    0    0    0    0    0    0    0    0    0    0
   39         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
    8              0         5       0.8       400       0.1       0.3     0.996
   17              0       4.5      0.03       400       0.1       0.5     0.996
    9              0         5       0.8       400      0.15       0.3     0.996
   40              0         5       0.8       400      0.15       0.3     0.996
   41              0       4.5      0.03       400      0.15       0.5     0.996
   42              0       4.5      0.03       400      0.15       0.5     0.996
   43              0         5       0.8       400      0.15       0.3     0.996
   39              0         5         2       400       0.1       0.3     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
    8              0         0         2         2         0         0         0
   17              0         0         2         2         0         0         0
    9              0         0         2         2         0         0         0
   40              0         0         2         2         0         0         0
   41              0         0         2         2         0         0         0
   42              0         0         2         2         0         0         0
   43              0         0         2         2         0         0         0
   39              0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                               ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
    8            0.1       0.5      0.25         0       0.7      0.25
   17            0.1      0.25      0.25         6       0.5      0.25
    9            0.1       0.5      0.25         0       0.7      0.25
   40            0.1       0.5      0.25         0       0.7      0.25
   41            0.1      0.15      0.25         6       0.3      0.25
   42            0.1      0.15      0.25         6       0.3      0.25
   43            0.1       0.5      0.25         0       0.7      0.25
   39            0.2       0.5      0.35         0       0.7       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
              ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
    8              0         0         0         0         3         1         0
   17              0         0         0         0       2.5         1         0
    9              0         0         0         0         3         1         0
   40              0         0         0         0         3         1         0
   41              0         0         0         0       2.5         1         0
   42              0         0         0         0       2.5         1         0
   43              0         0         0         0         3         1         0
   39              0         0         0         0         3         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name-------->   Unit-systems   Printer ***
    # -  #                      User  t-series Engl Metr ***
```

```
                                   in  out           ***
  2      ROADS/MOD             1    1    1   27    0
  4      ROOF TOPS/FLAT        1    1    1   27    0
  6      DRIVEWAYS/MOD         1    1    1   27    0
  3      ROADS/STEEP           1    1    1   27    0
  7      DRIVEWAYS/STEEP       1    1    1   27    0
 16     ROADS/MOD LAT          1    1    1   27    0
END GEN-INFO
*** Section IWATER***

ACTIVITY
  <PLS > ************* Active Sections *****************************
  # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  2         0    0    1    0    0    0
  4         0    0    1    0    0    0
  6         0    0    1    0    0    0
  3         0    0    1    0    0    0
  7         0    0    1    0    0    0
 16         0    0    1    0    0    0
END ACTIVITY

PRINT-INFO
  <ILS > ******** Print-flags ******** PIVL  PYR
  # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  2         0    0    4    0    0    0    1    9
  4         0    0    4    0    0    0    1    9
  6         0    0    4    0    0    0    1    9
  3         0    0    4    0    0    0    1    9
  7         0    0    4    0    0    0    1    9
 16         0    0    4    0    0    0    1    9
END PRINT-INFO

IWAT-PARM1
  <PLS >  IWATER variable monthly parameter value flags  ***
  # -  # CSNO RTOP  VRS  VNN RTLI     ***
  2         0    0    0    0    0
  4         0    0    0    0    0
  6         0    0    0    0    0
  3         0    0    0    0    0
  7         0    0    0    0    0
 16         0    0    0    0    0
END IWAT-PARM1

IWAT-PARM2
  <PLS >      IWATER input info: Part 2         ***
  # -  # ***  LSUR     SLSUR      NSUR     RETSC
  2            400      0.05       0.1      0.08
  4            400      0.01       0.1       0.1
  6            400      0.05       0.1      0.08
  3            400       0.1       0.1      0.05
  7            400       0.1       0.1      0.05
 16            400      0.05       0.1      0.08
END IWAT-PARM2

IWAT-PARM3
  <PLS >      IWATER input info: Part 3         ***
  # -  # ***PETMAX    PETMIN
  2             0         0
  4             0         0
  6             0         0
  3             0         0
  7             0         0
 16             0         0
END IWAT-PARM3

IWAT-STATE1
  <PLS > *** Initial conditions at start of simulation
  # -  # ***  RETS      SURS
  2             0         0
  4             0         0
```

```
    6              0         0
    3              0         0
    7              0         0
   16              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK    ***
<Name>   #                  <-factor->     <Name>   #   Tbl#    ***
Basin 4,7,8 Imperv Lateral ***
IMPLND  16                      0.5044     PERLND  39     50
Subbasin  8 - Perv Lateral Flow A/B***
PERLND  40                      0.4188     PERLND  39     30
PERLND  40                      0.4188     PERLND  39     34
PERLND  40                      0.4188     PERLND  39     38
Subbasin  7 - Perv Lateral Flow A/B***
PERLND  43                      0.0995     PERLND  39     30
PERLND  43                      0.0995     PERLND  39     34
PERLND  43                      0.0995     PERLND  39     38
Subbasin  7 - Perv Lateral Flow C***
PERLND  41                      0.1344     PERLND  39     30
PERLND  41                      0.1344     PERLND  39     34
PERLND  41                      0.1344     PERLND  39     38
Subbasin  8 - Perv Lateral Flow C***
PERLND  42                      0.1396     PERLND  39     30
PERLND  42                      0.1396     PERLND  39     34
PERLND  42                      0.1396     PERLND  39     38
Subbasin 1***
PERLND   8                        0.39     COPY   501     12
PERLND   8                        0.39     COPY   501     13
PERLND  17                        0.95     COPY   501     12
PERLND  17                        0.95     COPY   501     13
IMPLND   2                        0.35     COPY   501     15
IMPLND   4                        0.32     COPY   501     15
IMPLND   6                        0.14     COPY   501     15
Subbasin  2***
PERLND   8                        0.67     COPY   502     12
PERLND   8                        0.67     COPY   502     13
PERLND  17                        0.41     COPY   502     12
PERLND  17                        0.41     COPY   502     13
IMPLND   2                        0.42     COPY   502     15
IMPLND   4                        0.08     COPY   502     15
IMPLND   6                        0.04     COPY   502     15
Subbasin  3***
PERLND   9                        7.19     COPY   503     12
PERLND   9                        7.19     COPY   503     13
IMPLND   3                        2.24     COPY   503     15
IMPLND   4                        3.25     COPY   503     15
IMPLND   7                        1.39     COPY   503     15
Subbasin  5***
PERLND   9                        1.39     COPY   505     12
PERLND   9                        1.39     COPY   505     13
IMPLND   3                        0.52     COPY   505     15
IMPLND   4                        0.55     COPY   505     15
IMPLND   7                        0.24     COPY   505     15
Subbasin  6***
PERLND   8                       10.62     COPY   506     12
PERLND   8                       10.62     COPY   506     13
PERLND  17                        0.04     COPY   506     12
PERLND  17                        0.04     COPY   506     13
IMPLND   2                        1.77     COPY   506     15
IMPLND   4                        2.68     COPY   506     15
IMPLND   6                        1.15     COPY   506     15
Basin 4 - Perv Lateral Flow***
PERLND  39                        5.73     COPY   504     12
PERLND  39                        5.73     COPY   504     13
Subbasin  7 - Perv Lateral Flow C***
PERLND  41                        0.77     COPY   507     12
```

```
PERLND  41                          0.77     COPY   507     13
Subbasin  8 - Perv Lateral Flow C***
PERLND  42                           0.8     COPY   508     12
PERLND  42                           0.8     COPY   508     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1
COPY   502 OUTPUT MEAN   1 1   48.4        DISPLY   2     INPUT  TIMSER 1
COPY   503 OUTPUT MEAN   1 1   48.4        DISPLY   3     INPUT  TIMSER 1
COPY   505 OUTPUT MEAN   1 1   48.4        DISPLY   5     INPUT  TIMSER 1
COPY   506 OUTPUT MEAN   1 1   48.4        DISPLY   6     INPUT  TIMSER 1
COPY   507 OUTPUT MEAN   1 1   48.4        DISPLY   7     INPUT  TIMSER 1
COPY   508 OUTPUT MEAN   1 1   48.4        DISPLY   8     INPUT  TIMSER 1
COPY   504 OUTPUT MEAN   1 1   48.4        DISPLY   4     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                 ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG            ***
                                           in  out                           ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ****************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                      ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *        ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                         ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
         *** ac-ft     for each possible exit       for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
```

```
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.76           PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.76           IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
COPY   502 OUTPUT MEAN   1 1     48.4      WDM    502 FLOW     ENGL      REPL
COPY   503 OUTPUT MEAN   1 1     48.4      WDM    503 FLOW     ENGL      REPL
COPY   505 OUTPUT MEAN   1 1     48.4      WDM    505 FLOW     ENGL      REPL
COPY   506 OUTPUT MEAN   1 1     48.4      WDM    506 FLOW     ENGL      REPL
COPY   504 OUTPUT MEAN   1 1     48.4      WDM    504 FLOW     ENGL      REPL
COPY   507 OUTPUT MEAN   1 1     48.4      WDM    507 FLOW     ENGL      REPL
COPY   508 OUTPUT MEAN   1 1     48.4      WDM    508 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       30
PERLND     PWATER SURO                     PERLND         EXTNL  SURLI
  END MASS-LINK   30

  MASS-LINK       34
PERLND     PWATER IFWO                     PERLND         EXTNL  IFWLI
  END MASS-LINK   34

  MASS-LINK       38
PERLND     PWATER AGWO                     PERLND         EXTNL  AGWLI
  END MASS-LINK   38

  MASS-LINK       50
IMPLND     IWATER SURO                     PERLND         EXTNL  SURLI
  END MASS-LINK   50


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2009 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                             ***
WDM        26   Tamarack.wdm
MESSU      25   MitTamarack.MES
           27   MitTamarack.L61
           28   MitTamarack.L62
           30   POCTamarack1.dat
           31   POCTamarack2.dat
           32   POCTamarack3.dat
           33   POCTamarack4.dat
           34   POCTamarack5.dat
           35   POCTamarack6.dat
           36   POCTamarack7.dat
           37   POCTamarack8.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND       8
      PERLND      17
      IMPLND       2
      IMPLND       4
      IMPLND       6
      PERLND       9
      IMPLND       3
      IMPLND       7
      PERLND       2
      PERLND      18
      COPY       501
      COPY       502
      COPY       503
      COPY       504
      COPY       505
      COPY       506
      COPY       507
      COPY       508
      DISPLY       1
      DISPLY       2
      DISPLY       3
      DISPLY       4
      DISPLY       5
      DISPLY       6
      DISPLY       7
      DISPLY       8
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Subbasin 1                MAX                        1    2   30    9
    2        Subbasin  2               MAX                        1    2   31    9
    3        Subbasin  3               MAX                        1    2   32    9
    4        Subbasin  4               MAX                        1    2   33    9
    5        Subbasin  5               MAX                        1    2   34    9
    6        Subbasin  6               MAX                        1    2   35    9
    7        Subbasin  7               MAX                        1    2   36    9
    8        Subbasin  8               MAX                        1    2   37    9
  END DISPLY-INFO1
```

```
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  502         1    1
  503         1    1
  504         1    1
  505         1    1
  506         1    1
  507         1    1
  508         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
    8     A/B, Lawn, Mod          1    1    1    1   27    0
   17     C, Lawn, Mod            1    1    1    1   27    0
    9     A/B, Lawn, Steep        1    1    1    1   27    0
    2     A/B, Forest, Mod        1    1    1    1   27    0
   18     C, Lawn, Steep          1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
    8         0    0    1    0    0    0    0    0    0    0    0    0
   17         0    0    1    0    0    0    0    0    0    0    0    0
    9         0    0    1    0    0    0    0    0    0    0    0    0
    2         0    0    1    0    0    0    0    0    0    0    0    0
   18         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
    8         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   17         0    0    4    0    0    0    0    0    0    0    0    0    1    9
    9         0    0    4    0    0    0    0    0    0    0    0    0    1    9
    2         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   18         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
    8         0    0    0    0    0    0    0    0    0    0    0
   17         0    0    0    0    0    0    0    0    0    0    0
    9         0    0    0    0    0    0    0    0    0    0    0
    2         0    0    0    0    0    0    0    0    0    0    0
   18         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
    8              0         5       0.8       400       0.1       0.3     0.996
```

```
    17              0       4.5      0.03       400       0.1       0.5     0.996
     9              0         5       0.8       400      0.15       0.3     0.996
     2              0         5         2       400       0.1       0.3     0.996
    18              0       4.5      0.03       400      0.15       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
     8              0         0         2         2         0         0         0
    17              0         0         2         2         0         0         0
     9              0         0         2         2         0         0         0
     2              0         0         2         2         0         0         0
    18              0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                                       ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
     8            0.1       0.5      0.25         0       0.7      0.25
    17            0.1      0.25      0.25         6       0.5      0.25
     9            0.1       0.5      0.25         0       0.7      0.25
     2            0.2       0.5      0.35         0       0.7       0.7
    18            0.1      0.15      0.25         6       0.3      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
              ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
     8              0         0         0         0         3         1         0
    17              0         0         0         0       2.5         1         0
     9              0         0         0         0         3         1         0
     2              0         0         0         0         3         1         0
    18              0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
     2      ROADS/MOD             1    1    1   27    0
     4      ROOF TOPS/FLAT        1    1    1   27    0
     6      DRIVEWAYS/MOD         1    1    1   27    0
     3      ROADS/STEEP           1    1    1   27    0
     7      DRIVEWAYS/STEEP       1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
     2         0    0    1    0    0    0
     4         0    0    1    0    0    0
     6         0    0    1    0    0    0
     3         0    0    1    0    0    0
     7         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
     2         0    0    4    0    0    0    1    9
     4         0    0    4    0    0    0    1    9
     6         0    0    4    0    0    0    1    9
     3         0    0    4    0    0    0    1    9
     7         0    0    4    0    0    0    1    9
  END PRINT-INFO
```

```
  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    2         0    0    0    0    0
    4         0    0    0    0    0
    6         0    0    0    0    0
    3         0    0    0    0    0
    7         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    2            400      0.05       0.1      0.08
    4            400      0.01       0.1       0.1
    6            400      0.05       0.1      0.08
    3            400       0.1       0.1      0.05
    7            400       0.1       0.1      0.05
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    2              0         0
    4              0         0
    6              0         0
    3              0         0
    7              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    2              0         0
    4              0         0
    6              0         0
    3              0         0
    7              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Subbasin 1***
PERLND   8                        0.38     COPY   501     12
PERLND   8                        0.38     COPY   501     13
PERLND  17                        0.94     COPY   501     12
PERLND  17                        0.94     COPY   501     13
IMPLND   2                        0.35     COPY   501     15
IMPLND   4                        0.33     COPY   501     15
IMPLND   6                        0.14     COPY   501     15
Subbasin  2***
PERLND   8                        0.52     COPY   502     12
PERLND   8                        0.52     COPY   502     13
PERLND  17                        0.32     COPY   502     12
PERLND  17                        0.32     COPY   502     13
IMPLND   2                        0.42     COPY   502     15
IMPLND   4                        0.25     COPY   502     15
IMPLND   6                        0.11     COPY   502     15
Subbasin  3***
PERLND   9                        6.93     COPY   503     12
PERLND   9                        6.93     COPY   503     13
IMPLND   3                        2.24     COPY   503     15
IMPLND   4                        3.43     COPY   503     15
IMPLND   7                        1.47     COPY   503     15
Subbasin  4***
PERLND   2                        5.82     COPY   504     12
```

```
PERLND   2                       5.82     COPY   504     13
Subbasin  5***
PERLND   9                       1.15     COPY   505     12
PERLND   9                       1.15     COPY   505     13
IMPLND   3                       0.52     COPY   505     15
IMPLND   4                       0.73     COPY   505     15
IMPLND   7                       0.31     COPY   505     15
Subbasin  6***
PERLND   8                       9.61     COPY   506     12
PERLND   8                       9.61     COPY   506     13
PERLND  17                       0.03     COPY   506     12
PERLND  17                       0.03     COPY   506     13
IMPLND   2                       1.77     COPY   506     15
IMPLND   4                       3.38     COPY   506     15
IMPLND   6                       1.45     COPY   506     15
Subbasin  7***
PERLND   9                        0.5     COPY   507     12
PERLND   9                        0.5     COPY   507     13
PERLND  18                       0.68     COPY   507     12
PERLND  18                       0.68     COPY   507     13
IMPLND   4                       0.72     COPY   507     15
IMPLND   7                       0.31     COPY   507     15
Subbasin  8***
PERLND   9                       2.16     COPY   508     12
PERLND   9                       2.16     COPY   508     13
PERLND  18                       0.37     COPY   508     12
PERLND  18                       0.37     COPY   508     13
IMPLND   3                       0.92     COPY   508     15
IMPLND   4                       0.74     COPY   508     15
IMPLND   7                       0.32     COPY   508     15

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1
COPY   502 OUTPUT MEAN   1 1   48.4        DISPLY   2     INPUT  TIMSER 1
COPY   503 OUTPUT MEAN   1 1   48.4        DISPLY   3     INPUT  TIMSER 1
COPY   504 OUTPUT MEAN   1 1   48.4        DISPLY   4     INPUT  TIMSER 1
COPY   505 OUTPUT MEAN   1 1   48.4        DISPLY   5     INPUT  TIMSER 1
COPY   506 OUTPUT MEAN   1 1   48.4        DISPLY   6     INPUT  TIMSER 1
COPY   507 OUTPUT MEAN   1 1   48.4        DISPLY   7     INPUT  TIMSER 1
COPY   508 OUTPUT MEAN   1 1   48.4        DISPLY   8     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                 ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG            ***
                                         in  out                             ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO
```

```
  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                         ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                         ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC      ENGL    1             PERLND   1 999 EXTNL  PREC
WDM      2 PREC      ENGL    1             IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP      ENGL    0.76          PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP      ENGL    0.76          IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
COPY     2 OUTPUT MEAN   1 1     48.4      WDM    702 FLOW     ENGL      REPL
COPY   502 OUTPUT MEAN   1 1     48.4      WDM    802 FLOW     ENGL      REPL
COPY     3 OUTPUT MEAN   1 1     48.4      WDM    703 FLOW     ENGL      REPL
COPY   503 OUTPUT MEAN   1 1     48.4      WDM    803 FLOW     ENGL      REPL
COPY     4 OUTPUT MEAN   1 1     48.4      WDM    704 FLOW     ENGL      REPL
COPY   504 OUTPUT MEAN   1 1     48.4      WDM    804 FLOW     ENGL      REPL
COPY     5 OUTPUT MEAN   1 1     48.4      WDM    705 FLOW     ENGL      REPL
COPY   505 OUTPUT MEAN   1 1     48.4      WDM    805 FLOW     ENGL      REPL
COPY     6 OUTPUT MEAN   1 1     48.4      WDM    706 FLOW     ENGL      REPL
COPY   506 OUTPUT MEAN   1 1     48.4      WDM    806 FLOW     ENGL      REPL
COPY     7 OUTPUT MEAN   1 1     48.4      WDM    707 FLOW     ENGL      REPL
COPY   507 OUTPUT MEAN   1 1     48.4      WDM    807 FLOW     ENGL      REPL
COPY     8 OUTPUT MEAN   1 1     48.4      WDM    708 FLOW     ENGL      REPL
COPY   508 OUTPUT MEAN   1 1     48.4      WDM    808 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15
```

```
END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

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```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
Tamarack Basin - Existing Condition 2-year flows

*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Flow Routing Method ...... DYNWAVE
Starting Date ............ MAR-16-2016 00:00:00
Ending Date .............. MAR-17-2016 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Routing Time Step ........ 5.00 sec


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 0
Number of nodes ........... 35
Number of links ........... 36
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                        Data        Recording
Name                Data Source         Type        Interval
-------------------------------------------------------------
Design              2-year              INTENSITY    15 min.


************
Node Summary
************
                                        Invert      Max.    Ponded    External
Name                Type                 Elev.     Depth      Area    Inflow
------------------------------------------------------------------------------
A01_UNK             JUNCTION            239.24      5.00    5000.0
A02_CB              JUNCTION            244.01      4.05    5000.0
A03_CB              JUNCTION            253.10      4.15    5000.0
A04_CB              JUNCTION            253.52      4.18    5000.0
A05_CB              JUNCTION            253.64      7.01    5000.0
A06_CB              JUNCTION            292.11     11.18    5000.0
B01_MH              JUNCTION             37.39      8.44       0.0
B02_CUL             JUNCTION             42.64      5.00    5000.0
```

B03_CUL	JUNCTION	53.47	5.00	5000.0	
B04_MH	JUNCTION	54.00	6.60	5000.0	Yes
B05_MH	JUNCTION	56.60	5.80	5000.0	
B06_CB	JUNCTION	61.90	5.00	5000.0	
B07_CB	JUNCTION	75.81	4.20	5000.0	
B08_CB	JUNCTION	82.20	5.00	5000.0	
B09_MH	JUNCTION	89.30	8.60	5000.0	Yes
B10_MH_a	JUNCTION	91.09	9.10	5000.0	
B10_MH_b	JUNCTION	91.09	9.10	5000.0	
B11_MH	JUNCTION	91.91	10.10	5000.0	
B12_CB	JUNCTION	107.91	5.76	5000.0	Yes
B13_CUL	JUNCTION	97.57	5.00	5000.0	Yes
B14_CUL	JUNCTION	101.21	5.00	5000.0	
B15_CUL	JUNCTION	102.54	5.00	5000.0	
B16_CUL	JUNCTION	108.82	5.00	5000.0	
B17_CB	JUNCTION	109.12	2.25	5000.0	
B18_CUL	JUNCTION	109.31	5.00	5000.0	Yes
C02_CB	JUNCTION	67.80	4.40	5000.0	
C03_CB	JUNCTION	88.95	2.63	5000.0	
C04_CB	JUNCTION	90.95	2.90	5000.0	
C05_CB	JUNCTION	96.92	3.40	5000.0	
C06_CB	JUNCTION	105.33	1.90	5000.0	Yes
D02_CHAN	JUNCTION	33.07	4.00	0.0	
D03_CHAN	JUNCTION	34.94	4.00	0.0	
STO_1_ORIFICE	JUNCTION	113.60	9.00	5000.0	
D01_CHAN	OUTFALL	31.76	4.00	0.0	
STORAGE_1	STORAGE	113.60	7.00	0.0	Yes

****
Link Summary
****

Name	From Node	To Node	Type	Length	%Slope	Roughness
A01_UNK_B13_CUL	A01_UNK	B13_CUL	CONDUIT	1053.0	13.5773	0.1000
A02_CB_A01_UNK	A02_CB	A01_UNK	CONDUIT	34.8	14.1462	0.0130
A03_CB_A02_CB	A03_CB	A02_CB	CONDUIT	66.1	13.8744	0.0130
A04_CB_A03_CB	A04_CB	A03_CB	CONDUIT	30.7	0.7169	0.0130
A05_CB_A04_CB	A05_CB	A04_CB	CONDUIT	64.7	0.4794	0.0130
A06_CB_A05_CB	A06_CB	A05_CB	CONDUIT	137.1	29.1111	0.0130
B01_MH_D03_CHAN	B01_MH	D03_CHAN	CONDUIT	104.8	2.3375	0.0450
B02_CUL_B01_MH	B02_CUL	B01_MH	CONDUIT	35.5	5.8066	0.0130
B03_CUL_B02_CUL	B03_CUL	B02_CUL	CONDUIT	37.2	30.4221	0.1000
B04_MH_B03_CUL	B04_MH	B03_CUL	CONDUIT	53.2	0.9957	0.0130
B05_MH_B04_MH	B05_MH	B04_MH	CONDUIT	47.3	5.5100	0.0130
B06_CB_B05_MH	B06_CB	B05_MH	CONDUIT	46.1	11.5762	0.0130
B07_CB_B06_CB	B07_CB	B06_CB	CONDUIT	103.6	13.5437	0.0130
B08_CB_B07_CB	B08_CB	B07_CB	CONDUIT	86.2	7.3191	0.0130
B09_MH_B08_CB	B09_MH	B08_CB	CONDUIT	67.0	10.6616	0.0130
B10_MH_b_B09_MH	B10_MH_b	B09_MH	CONDUIT	138.6	1.2551	0.0240
B11_MH_B10_MH_a	B11_MH	B10_MH_a	CONDUIT	170.7	0.4805	0.0240
B12_CB_B11_MH	B12_CB	B11_MH	CONDUIT	163.0	8.6232	0.0240
B13_CUL_B09_MH	B13_CUL	B09_MH	CONDUIT	33.0	8.8326	0.0130
B14_CUL_B13_CUL	B14_CUL	B13_CUL	CONDUIT	47.0	7.7747	0.0300
B15_CUL_B14_CUL	B15_CUL	B14_CUL	CONDUIT	19.5	6.8351	0.0130
B16_CUL_B15_CUL	B16_CUL	B15_CUL	CONDUIT	76.9	8.1960	0.0300
B17_CB_B16_CUL	B17_CB	B16_CUL	CONDUIT	6.1	4.8875	0.0130
B18_CUL_B17_CB	B18_CUL	B17_CB	CONDUIT	6.2	3.0701	0.0130
C02_CB_B05_MH	C02_CB	B05_MH	CONDUIT	137.2	8.3368	0.0240
C03_CB_C02_CB	C03_CB	C02_CB	CONDUIT	162.5	13.0041	0.0240
C04_CB_C03_CB	C04_CB	C03_CB	CONDUIT	24.1	8.3244	0.0240
C05_CB_C04_CB	C05_CB	C04_CB	CONDUIT	69.4	8.5667	0.0240
C06_CB_C05_CB	C06_CB	C05_CB	CONDUIT	73.7	11.3550	0.0240
D02_CHAN_D01_CHAN	D02_CHAN	D01_CHAN	CONDUIT	56.2	2.3333	0.0450

D03_CHAN_D02_CHAN	D03_CHAN	D02_CHAN	CONDUIT	80.2	2.3335	0.0450
STO_1_ORIFICE_B17_CB	STO_1_ORIFICE	B17_CB	CONDUIT	17.1	27.1186	0.0130
OR1	STORAGE_1	STO_1_ORIFICE	ORIFICE			
OR1_RISER	STORAGE_1	STO_1_ORIFICE	ORIFICE			
OR2	B10_MH_a	B10_MH_b	ORIFICE			
OR2_RISER	B10_MH_a	B10_MH_b	ORIFICE			

****
Cross Section Summary
****

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
A01_UNK_B13_CUL	TRAPEZOIDAL	2.00	8.00	1.04	6.00	1	45.10
A02_CB_A01_UNK	CIRCULAR	0.67	0.35	0.17	0.67	1	4.55
A03_CB_A02_CB	CIRCULAR	0.67	0.35	0.17	0.67	1	4.50
A04_CB_A03_CB	CIRCULAR	0.67	0.35	0.17	0.67	1	1.02
A05_CB_A04_CB	CIRCULAR	0.67	0.35	0.17	0.67	1	0.84
A06_CB_A05_CB	CIRCULAR	0.67	0.35	0.17	0.67	1	6.52
B01_MH_D03_CHAN	TRAPEZOIDAL	4.00	60.00	2.12	27.00	1	499.96
B02_CUL_B01_MH	CIRCULAR	3.00	7.07	0.75	3.00	1	160.72
B03_CUL_B02_CUL	TRAPEZOIDAL	4.00	44.00	2.11	19.00	1	592.60
B04_MH_B03_CUL	CIRCULAR	2.00	3.14	0.50	2.00	1	22.57
B05_MH_B04_MH	CIRCULAR	1.50	1.77	0.38	1.50	1	24.66
B06_CB_B05_MH	CIRCULAR	1.50	1.77	0.38	1.50	1	35.74
B07_CB_B06_CB	CIRCULAR	1.50	1.77	0.38	1.50	1	38.66
B08_CB_B07_CB	CIRCULAR	1.50	1.77	0.38	1.50	1	28.42
B09_MH_B08_CB	CIRCULAR	1.50	1.77	0.38	1.50	1	34.30
B10_MH_b_B09_MH	CIRCULAR	1.50	1.77	0.38	1.50	1	6.37
B11_MH_B10_MH_a	CIRCULAR	6.00	28.27	1.50	6.00	1	159.01
B12_CB_B11_MH	CIRCULAR	1.00	0.79	0.25	1.00	1	5.67
B13_CUL_B09_MH	CIRCULAR	1.00	0.79	0.25	1.00	1	10.59
B14_CUL_B13_CUL	TRAPEZOIDAL	2.00	8.00	1.04	6.00	1	113.77
B15_CUL_B14_CUL	CIRCULAR	1.00	0.79	0.25	1.00	1	9.31
B16_CUL_B15_CUL	TRAPEZOIDAL	2.00	8.00	1.04	6.00	1	116.81
B17_CB_B16_CUL	CIRCULAR	1.00	0.79	0.25	1.00	1	7.88
B18_CUL_B17_CB	CIRCULAR	1.00	0.79	0.25	1.00	1	6.24
C02_CB_B05_MH	CIRCULAR	1.00	0.79	0.25	1.00	1	5.57
C03_CB_C02_CB	CIRCULAR	1.00	0.79	0.25	1.00	1	6.96
C04_CB_C03_CB	CIRCULAR	1.00	0.79	0.25	1.00	1	5.57
C05_CB_C04_CB	CIRCULAR	1.00	0.79	0.25	1.00	1	5.65
C06_CB_C05_CB	CIRCULAR	1.00	0.79	0.25	1.00	1	6.50
D02_CHAN_D01_CHAN	TRAPEZOIDAL	4.00	60.00	2.12	27.00	1	499.50
D03_CHAN_D02_CHAN	TRAPEZOIDAL	4.00	60.00	2.12	27.00	1	499.52
STO_1_ORIFICE_B17_CB	CIRCULAR	1.00	0.79	0.25	1.00	1	18.55

Flow Routing Continuity	Volume acre-feet	Volume 10^6 gal
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.000	0.000
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	13.270	4.324
External Outflow	13.094	4.267
Internal Outflow	0.000	0.000
Storage Losses	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.158	0.051
Continuity Error (%)	0.134	

****
Highest Continuity Errors
****

Node B10_MH_a (1.42%)
Node B11_MH (1.31%)

****
Time-Step Critical Elements
****

Link B17_CB_B16_CUL (99.99%)

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Highest Flow Instability Indexes
****

All links are stable.

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Routing Time Step Summary
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Minimum Time Step	:	0.50 sec
Average Time Step	:	0.50 sec
Maximum Time Step	:	2.82 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.00

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Node Depth Summary
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Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days	Time of Max Occurrence hr:min
A01_UNK	JUNCTION	0.00	0.00	239.24	0	00:00
A02_CB	JUNCTION	0.00	0.00	244.01	0	00:00
A03_CB	JUNCTION	0.00	0.00	253.10	0	00:00
A04_CB	JUNCTION	0.00	0.00	253.52	0	00:00
A05_CB	JUNCTION	0.00	0.00	253.64	0	00:00
A06_CB	JUNCTION	0.00	0.00	292.11	0	00:00
B01_MH	JUNCTION	0.53	0.54	37.93	0	06:12
B02_CUL	JUNCTION	0.42	0.42	43.06	0	06:27
B03_CUL	JUNCTION	0.44	0.44	53.91	0	06:49
B04_MH	JUNCTION	0.74	0.75	54.75	0	06:11
B05_MH	JUNCTION	0.51	0.52	57.12	0	06:22
B06_CB	JUNCTION	0.41	0.42	62.32	0	06:25
B07_CB	JUNCTION	0.40	0.40	76.21	0	06:16
B08_CB	JUNCTION	0.46	0.47	82.67	0	06:25
B09_MH	JUNCTION	0.42	0.42	89.72	0	06:11
B10_MH_a	JUNCTION	7.22	7.34	98.43	0	01:21
B10_MH_b	JUNCTION	0.63	0.64	91.73	0	01:34
B11_MH	JUNCTION	6.40	6.52	98.43	0	01:00
B12_CB	JUNCTION	0.45	0.45	108.36	0	00:09
B13_CUL	JUNCTION	0.37	0.37	97.94	0	06:10
B14_CUL	JUNCTION	0.26	0.28	101.49	0	00:01
B15_CUL	JUNCTION	0.41	0.41	102.95	0	06:09
B16_CUL	JUNCTION	0.26	0.26	109.08	0	06:09
B17_CB	JUNCTION	0.43	0.43	109.55	0	06:10
B18_CUL	JUNCTION	0.43	0.46	109.77	0	00:00

C02_CB	JUNCTION	0.35	0.35	68.15	0	00:26
C03_CB	JUNCTION	0.13	0.14	89.09	0	00:10
C04_CB	JUNCTION	0.15	0.16	91.11	0	00:01
C05_CB	JUNCTION	0.15	0.15	97.07	0	00:08
C06_CB	JUNCTION	0.14	0.14	105.47	0	00:08
D02_CHAN	JUNCTION	0.56	0.56	33.63	0	06:31
D03_CHAN	JUNCTION	0.53	0.54	35.48	0	06:14
STO_1_ORIFICE	JUNCTION	0.12	0.12	113.72	0	06:08
D01_CHAN	OUTFALL	0.45	0.46	32.22	0	06:14
STORAGE_1	STORAGE	0.61	0.61	114.21	0	06:10

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal
A01_UNK	JUNCTION	0.00	0.00	0	00:00	0.000	0.000
A02_CB	JUNCTION	0.00	0.00	0	00:00	0.000	0.000
A03_CB	JUNCTION	0.00	0.00	0	00:00	0.000	0.000
A04_CB	JUNCTION	0.00	0.00	0	00:00	0.000	0.000
A05_CB	JUNCTION	0.00	0.00	0	00:00	0.000	0.000
A06_CB	JUNCTION	0.00	0.00	0	00:00	0.000	0.000
B01_MH	JUNCTION	0.00	6.69	0	06:27	0.000	4.271
B02_CUL	JUNCTION	0.00	6.69	0	06:11	0.000	4.271
B03_CUL	JUNCTION	0.00	6.69	0	06:11	0.000	4.272
B04_MH	JUNCTION	0.42	6.69	0	05:58	0.269	4.272
B05_MH	JUNCTION	0.00	6.27	0	06:11	0.000	4.003
B06_CB	JUNCTION	0.00	6.00	0	06:11	0.000	3.828
B07_CB	JUNCTION	0.00	6.00	0	06:25	0.000	3.828
B08_CB	JUNCTION	0.00	6.00	0	05:56	0.000	3.828
B09_MH	JUNCTION	0.59	6.00	0	06:11	0.384	3.829
B10_MH_a	JUNCTION	0.00	3.13	0	00:49	0.000	1.517
B10_MH_b	JUNCTION	0.00	2.38	0	01:21	0.000	1.495
B11_MH	JUNCTION	0.00	2.38	0	00:19	0.000	1.537
B12_CB	JUNCTION	2.38	2.38	0	00:00	1.537	1.537
B13_CUL	JUNCTION	0.05	3.03	0	06:00	0.033	1.953
B14_CUL	JUNCTION	0.00	2.98	0	06:15	0.000	1.920
B15_CUL	JUNCTION	0.00	2.98	0	06:08	0.000	1.920
B16_CUL	JUNCTION	0.00	2.98	0	05:57	0.000	1.921
B17_CB	JUNCTION	0.00	2.98	0	06:06	0.000	1.921
B18_CUL	JUNCTION	2.40	2.40	0	00:00	1.553	1.553
C02_CB	JUNCTION	0.00	0.27	0	00:10	0.000	0.176
C03_CB	JUNCTION	0.00	0.27	0	00:02	0.000	0.176
C04_CB	JUNCTION	0.00	0.27	0	00:08	0.000	0.176
C05_CB	JUNCTION	0.00	0.27	0	00:08	0.000	0.176
C06_CB	JUNCTION	0.27	0.27	0	00:00	0.176	0.176
D02_CHAN	JUNCTION	0.00	6.69	0	06:14	0.000	4.268
D03_CHAN	JUNCTION	0.00	6.69	0	06:12	0.000	4.270
STO_1_ORIFICE	JUNCTION	0.00	0.57	0	06:10	0.000	0.368
D01_CHAN	OUTFALL	0.00	6.69	0	06:14	0.000	4.267
STORAGE_1	STORAGE	0.57	0.57	0	00:00	0.370	0.370

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Node Surcharge Summary
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Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Feet	Min. Depth Below Rim Feet
B11_MH	JUNCTION	23.20	0.522	3.578

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Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 ft3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 ft3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CFS
STORAGE_1	0.355	7	0	0.357	8	0 06:10	0.57

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CFS	Max. Flow CFS	Total Volume 10^6 gal
D01_CHAN	99.83	6.61	6.69	4.267
System	99.83	6.61	6.69	4.267

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
A01_UNK_B13_CUL	CONDUIT	0.00	0 00:00	0.00	0.00	0.09
A02_CB_A01_UNK	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
A03_CB_A02_CB	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
A04_CB_A03_CB	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
A05_CB_A04_CB	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
A06_CB_A05_CB	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
B01_MH_D03_CHAN	CONDUIT	6.69	0 06:12	2.69	0.01	0.13
B02_CUL_B01_MH	CONDUIT	6.69	0 06:27	11.23	0.04	0.14
B03_CUL_B02_CUL	CONDUIT	6.69	0 06:11	4.02	0.01	0.11
B04_MH_B03_CUL	CONDUIT	6.69	0 06:11	8.54	0.30	0.30
B05_MH_B04_MH	CONDUIT	6.27	0 05:58	8.88	0.25	0.42
B06_CB_B05_MH	CONDUIT	6.00	0 06:11	12.82	0.17	0.31
B07_CB_B06_CB	CONDUIT	6.00	0 06:11	15.44	0.16	0.27
B08_CB_B07_CB	CONDUIT	6.00	0 06:25	12.74	0.21	0.31

B09_MH_B08_CB	CONDUIT	6.00	0	05:56	13.60	0.17	0.30
B10_MH_b_B09_MH	CONDUIT	2.38	0	01:33	3.50	0.37	0.41
B11_MH_B10_MH_a	CONDUIT	3.13	0	00:49	2.71	0.02	1.00
B12_CB_B11_MH	CONDUIT	2.38	0	00:19	6.89	0.42	0.73
B13_CUL_B09_MH	CONDUIT	3.03	0	06:11	11.62	0.29	0.37
B14_CUL_B13_CUL	CONDUIT	2.98	0	06:00	7.13	0.03	0.16
B15_CUL_B14_CUL	CONDUIT	2.98	0	06:15	12.91	0.32	0.33
B16_CUL_B15_CUL	CONDUIT	2.98	0	06:08	5.20	0.03	0.17
B17_CB_B16_CUL	CONDUIT	2.98	0	05:57	17.04	0.38	0.34
B18_CUL_B17_CB	CONDUIT	2.61	0	00:00	9.46	0.42	0.43
C02_CB_B05_MH	CONDUIT	0.27	0	00:26	2.04	0.05	0.33
C03_CB_C02_CB	CONDUIT	0.27	0	00:10	4.20	0.04	0.14
C04_CB_C03_CB	CONDUIT	0.27	0	00:02	4.92	0.05	0.14
C05_CB_C04_CB	CONDUIT	0.27	0	00:08	3.71	0.05	0.15
C06_CB_C05_CB	CONDUIT	0.27	0	00:08	4.09	0.04	0.14
D02_CHAN_D01_CHAN	CONDUIT	6.69	0	06:14	2.90	0.01	0.13
D03_CHAN_D02_CHAN	CONDUIT	6.69	0	06:14	2.61	0.01	0.14
STO_1_ORIFICE_B17_CB	CONDUIT	0.57	0	06:06	3.29	0.03	0.27
OR1	ORIFICE	0.57	0	06:10			1.00
OR1_RISER	ORIFICE	0.00	0	00:00			0.00
OR2	ORIFICE	0.74	0	00:50			1.00
OR2_RISER	ORIFICE	1.64	0	01:21			0.35

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
A01_UNK_B13_CUL	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
A02_CB_A01_UNK	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
A03_CB_A02_CB	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
A04_CB_A03_CB	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
A05_CB_A04_CB	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
A06_CB_A05_CB	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
B01_MH_D03_CHAN	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.75	0.0000
B02_CUL_B01_MH	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	3.69	0.0000
B03_CUL_B02_CUL	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.19	0.0000
B04_MH_B03_CUL	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.30	0.0000
B05_MH_B04_MH	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.26	0.0000
B06_CB_B05_MH	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	3.89	0.0000
B07_CB_B06_CB	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	5.04	0.0000
B08_CB_B07_CB	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	3.85	0.0000
B09_MH_B08_CB	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	4.23	0.0000
B10_MH_b_B09_MH	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.90	0.0000
B11_MH_B10_MH_a	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.0000
B12_CB_B11_MH	1.00	0.00	0.00	0.00	0.98	0.00	0.00	0.01	0.85	0.0000
B13_CUL_B09_MH	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	3.94	0.0000
B14_CUL_B13_CUL	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.37	0.0000
B15_CUL_B14_CUL	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	4.60	0.0000
B16_CUL_B15_CUL	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.25	0.0000
B17_CB_B16_CUL	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	4.40	0.0000
B18_CUL_B17_CB	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.32	0.0000
C02_CB_B05_MH	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.43	0.0000
C03_CB_C02_CB	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.23	0.0000
C04_CB_C03_CB	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.18	0.0000
C05_CB_C04_CB	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	2.03	0.0000
C06_CB_C05_CB	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	2.33	0.0000
D02_CHAN_D01_CHAN	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.83	0.0000
D03_CHAN_D02_CHAN	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.72	0.0000

STO_1_ORIFICE_B17_CB	1.00	0.00	0.00	0.00	0.01	0.99	0.00	0.00	1.30	0.0000

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Conduit Surcharge Summary
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Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
B11_MH_B10_MH_a	23.20	23.20	23.20	0.01	0.01

Analysis begun on: Mon May 09 18:10:57 2016
Analysis ended on: Mon May 09 18:11:04 2016
Total elapsed time: 00:00:07

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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
Tamarack Basin - Existing Condition 100-year flows

*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
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Analysis Options
****************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Flow Routing Method ...... DYNWAVE
Starting Date ............ MAR-16-2016 00:00:00
Ending Date .............. MAR-17-2016 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Routing Time Step ........ 5.00 sec


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 0
Number of nodes ........... 35
Number of links ........... 36
Number of pollutants ...... 0
Number of land uses ....... 0


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Raingage Summary
****************
                                        Data        Recording
Name                Data Source         Type        Interval
-------------------------------------------------------------
Design              100-year            INTENSITY    15 min.


************
Node Summary
************
                                        Invert      Max.    Ponded    External
Name                Type                 Elev.     Depth      Area    Inflow
-------------------------------------------------------------------------------
A01_UNK             JUNCTION            239.24      5.00    5000.0
A02_CB              JUNCTION            244.01      4.05    5000.0
A03_CB              JUNCTION            253.10      4.15    5000.0
A04_CB              JUNCTION            253.52      4.18    5000.0
A05_CB              JUNCTION            253.64      7.01    5000.0
A06_CB              JUNCTION            292.11     11.18    5000.0
B01_MH              JUNCTION             37.39      8.44       0.0
B02_CUL             JUNCTION             42.64      5.00    5000.0
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B03_CUL	JUNCTION	53.47	5.00	5000.0	
B04_MH	JUNCTION	54.00	6.60	5000.0	Yes
B05_MH	JUNCTION	56.60	5.80	5000.0	
B06_CB	JUNCTION	61.90	5.00	5000.0	
B07_CB	JUNCTION	75.81	4.20	5000.0	
B08_CB	JUNCTION	82.20	5.00	5000.0	
B09_MH	JUNCTION	89.30	8.60	5000.0	Yes
B10_MH_a	JUNCTION	91.09	9.10	5000.0	
B10_MH_b	JUNCTION	91.09	9.10	5000.0	
B11_MH	JUNCTION	91.91	10.10	5000.0	
B12_CB	JUNCTION	107.91	5.76	5000.0	Yes
B13_CUL	JUNCTION	97.57	5.00	5000.0	Yes
B14_CUL	JUNCTION	101.21	5.00	5000.0	
B15_CUL	JUNCTION	102.54	5.00	5000.0	
B16_CUL	JUNCTION	108.82	5.00	5000.0	
B17_CB	JUNCTION	109.12	2.25	5000.0	
B18_CUL	JUNCTION	109.31	5.00	5000.0	Yes
C02_CB	JUNCTION	67.80	4.40	5000.0	
C03_CB	JUNCTION	88.95	2.63	5000.0	
C04_CB	JUNCTION	90.95	2.90	5000.0	
C05_CB	JUNCTION	96.92	3.40	5000.0	
C06_CB	JUNCTION	105.33	1.90	5000.0	Yes
D02_CHAN	JUNCTION	33.07	4.00	0.0	
D03_CHAN	JUNCTION	34.94	4.00	0.0	
STO_1_ORIFICE	JUNCTION	113.60	9.00	5000.0	
D01_CHAN	OUTFALL	31.76	4.00	0.0	
STORAGE_1	STORAGE	113.60	7.00	0.0	Yes

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Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
A01_UNK_B13_CUL	A01_UNK	B13_CUL	CONDUIT	1053.0	13.5773	0.1000
A02_CB_A01_UNK	A02_CB	A01_UNK	CONDUIT	34.8	14.1462	0.0130
A03_CB_A02_CB	A03_CB	A02_CB	CONDUIT	66.1	13.8744	0.0130
A04_CB_A03_CB	A04_CB	A03_CB	CONDUIT	30.7	0.7169	0.0130
A05_CB_A04_CB	A05_CB	A04_CB	CONDUIT	64.7	0.4794	0.0130
A06_CB_A05_CB	A06_CB	A05_CB	CONDUIT	137.1	29.1111	0.0130
B01_MH_D03_CHAN	B01_MH	D03_CHAN	CONDUIT	104.8	2.3375	0.0450
B02_CUL_B01_MH	B02_CUL	B01_MH	CONDUIT	35.5	5.8066	0.0130
B03_CUL_B02_CUL	B03_CUL	B02_CUL	CONDUIT	37.2	30.4221	0.1000
B04_MH_B03_CUL	B04_MH	B03_CUL	CONDUIT	53.2	0.9957	0.0130
B05_MH_B04_MH	B05_MH	B04_MH	CONDUIT	47.3	5.5100	0.0130
B06_CB_B05_MH	B06_CB	B05_MH	CONDUIT	46.1	11.5762	0.0130
B07_CB_B06_CB	B07_CB	B06_CB	CONDUIT	103.6	13.5437	0.0130
B08_CB_B07_CB	B08_CB	B07_CB	CONDUIT	86.2	7.3191	0.0130
B09_MH_B08_CB	B09_MH	B08_CB	CONDUIT	67.0	10.6616	0.0130
B10_MH_b_B09_MH	B10_MH_b	B09_MH	CONDUIT	138.6	1.2551	0.0240
B11_MH_B10_MH_a	B11_MH	B10_MH_a	CONDUIT	170.7	0.4805	0.0240
B12_CB_B11_MH	B12_CB	B11_MH	CONDUIT	163.0	8.6232	0.0240
B13_CUL_B09_MH	B13_CUL	B09_MH	CONDUIT	33.0	8.8326	0.0130
B14_CUL_B13_CUL	B14_CUL	B13_CUL	CONDUIT	47.0	7.7747	0.0300
B15_CUL_B14_CUL	B15_CUL	B14_CUL	CONDUIT	19.5	6.8351	0.0130
B16_CUL_B15_CUL	B16_CUL	B15_CUL	CONDUIT	76.9	8.1960	0.0300
B17_CB_B16_CUL	B17_CB	B16_CUL	CONDUIT	6.1	4.8875	0.0130
B18_CUL_B17_CB	B18_CUL	B17_CB	CONDUIT	6.2	3.0701	0.0130
C02_CB_B05_MH	C02_CB	B05_MH	CONDUIT	137.2	8.3368	0.0240
C03_CB_C02_CB	C03_CB	C02_CB	CONDUIT	162.5	13.0041	0.0240
C04_CB_C03_CB	C04_CB	C03_CB	CONDUIT	24.1	8.3244	0.0240
C05_CB_C04_CB	C05_CB	C04_CB	CONDUIT	69.4	8.5667	0.0240
C06_CB_C05_CB	C06_CB	C05_CB	CONDUIT	73.7	11.3550	0.0240
D02_CHAN_D01_CHAN	D02_CHAN	D01_CHAN	CONDUIT	56.2	2.3333	0.0450

D03_CHAN_D02_CHAN	D03_CHAN	D02_CHAN	CONDUIT	80.2	2.3335	0.0450
STO_1_ORIFICE_B17_CB	STO_1_ORIFICE	B17_CB	CONDUIT	17.1	27.1186	0.0130
OR1	STORAGE_1	STO_1_ORIFICE	ORIFICE			
OR1_RISER	STORAGE_1	STO_1_ORIFICE	ORIFICE			
OR2	B10_MH_a	B10_MH_b	ORIFICE			
OR2_RISER	B10_MH_a	B10_MH_b	ORIFICE			

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
A01_UNK_B13_CUL	TRAPEZOIDAL	2.00	8.00	1.04	6.00	1	45.10
A02_CB_A01_UNK	CIRCULAR	0.67	0.35	0.17	0.67	1	4.55
A03_CB_A02_CB	CIRCULAR	0.67	0.35	0.17	0.67	1	4.50
A04_CB_A03_CB	CIRCULAR	0.67	0.35	0.17	0.67	1	1.02
A05_CB_A04_CB	CIRCULAR	0.67	0.35	0.17	0.67	1	0.84
A06_CB_A05_CB	CIRCULAR	0.67	0.35	0.17	0.67	1	6.52
B01_MH_D03_CHAN	TRAPEZOIDAL	4.00	60.00	2.12	27.00	1	499.96
B02_CUL_B01_MH	CIRCULAR	3.00	7.07	0.75	3.00	1	160.72
B03_CUL_B02_CUL	TRAPEZOIDAL	4.00	44.00	2.11	19.00	1	592.60
B04_MH_B03_CUL	CIRCULAR	2.00	3.14	0.50	2.00	1	22.57
B05_MH_B04_MH	CIRCULAR	1.50	1.77	0.38	1.50	1	24.66
B06_CB_B05_MH	CIRCULAR	1.50	1.77	0.38	1.50	1	35.74
B07_CB_B06_CB	CIRCULAR	1.50	1.77	0.38	1.50	1	38.66
B08_CB_B07_CB	CIRCULAR	1.50	1.77	0.38	1.50	1	28.42
B09_MH_B08_CB	CIRCULAR	1.50	1.77	0.38	1.50	1	34.30
B10_MH_b_B09_MH	CIRCULAR	1.50	1.77	0.38	1.50	1	6.37
B11_MH_B10_MH_a	CIRCULAR	6.00	28.27	1.50	6.00	1	159.01
B12_CB_B11_MH	CIRCULAR	1.00	0.79	0.25	1.00	1	5.67
B13_CUL_B09_MH	CIRCULAR	1.00	0.79	0.25	1.00	1	10.59
B14_CUL_B13_CUL	TRAPEZOIDAL	2.00	8.00	1.04	6.00	1	113.77
B15_CUL_B14_CUL	CIRCULAR	1.00	0.79	0.25	1.00	1	9.31
B16_CUL_B15_CUL	TRAPEZOIDAL	2.00	8.00	1.04	6.00	1	116.81
B17_CB_B16_CUL	CIRCULAR	1.00	0.79	0.25	1.00	1	7.88
B18_CUL_B17_CB	CIRCULAR	1.00	0.79	0.25	1.00	1	6.24
C02_CB_B05_MH	CIRCULAR	1.00	0.79	0.25	1.00	1	5.57
C03_CB_C02_CB	CIRCULAR	1.00	0.79	0.25	1.00	1	6.96
C04_CB_C03_CB	CIRCULAR	1.00	0.79	0.25	1.00	1	5.57
C05_CB_C04_CB	CIRCULAR	1.00	0.79	0.25	1.00	1	5.65
C06_CB_C05_CB	CIRCULAR	1.00	0.79	0.25	1.00	1	6.50
D02_CHAN_D01_CHAN	TRAPEZOIDAL	4.00	60.00	2.12	27.00	1	499.50
D03_CHAN_D02_CHAN	TRAPEZOIDAL	4.00	60.00	2.12	27.00	1	499.52
STO_1_ORIFICE_B17_CB	CIRCULAR	1.00	0.79	0.25	1.00	1	18.55

****
Flow Routing Continuity
****

	Volume acre-feet	Volume 10^6 gal
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.000	0.000
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	35.108	11.440
External Outflow	34.868	11.362
Internal Outflow	0.000	0.000
Storage Losses	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.220	0.072
Continuity Error (%)	0.057	

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Time-Step Critical Elements
****
Link B17_CB_B16_CUL (99.99%)

****
Highest Flow Instability Indexes
****
All links are stable.

****
Routing Time Step Summary
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Minimum Time Step	:	0.50 sec
Average Time Step	:	0.50 sec
Maximum Time Step	:	1.18 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.00

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Node Depth Summary
****

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days	hr:min
A01_UNK	JUNCTION	0.00	0.00	239.24	0	00:00
A02_CB	JUNCTION	0.00	0.00	244.01	0	00:00
A03_CB	JUNCTION	0.00	0.00	253.10	0	00:00
A04_CB	JUNCTION	0.00	0.00	253.52	0	00:00
A05_CB	JUNCTION	0.00	0.00	253.64	0	00:00
A06_CB	JUNCTION	0.00	0.00	292.11	0	00:00
B01_MH	JUNCTION	0.88	0.89	38.28	0	14:27
B02_CUL	JUNCTION	0.67	0.67	43.31	0	14:50
B03_CUL	JUNCTION	0.76	0.76	54.23	0	14:25
B04_MH	JUNCTION	1.33	1.33	55.33	0	14:25
B05_MH	JUNCTION	0.90	0.90	57.50	0	15:23
B06_CB	JUNCTION	0.70	0.70	62.60	0	14:44
B07_CB	JUNCTION	0.67	0.67	76.48	0	14:35
B08_CB	JUNCTION	0.80	0.80	83.00	0	14:36
B09_MH	JUNCTION	0.71	0.72	90.02	0	14:34
B10_MH_a	JUNCTION	7.81	7.87	98.96	0	00:46
B10_MH_b	JUNCTION	1.08	1.09	92.18	0	00:47
B11_MH	JUNCTION	6.99	7.05	98.96	0	00:46
B12_CB	JUNCTION	3.72	5.76	113.67	0	00:19
B13_CUL	JUNCTION	0.72	0.72	98.29	0	14:34
B14_CUL	JUNCTION	0.45	0.46	101.67	0	00:00
B15_CUL	JUNCTION	0.68	0.68	103.22	0	14:37
B16_CUL	JUNCTION	0.44	0.44	109.26	0	14:36
B17_CB	JUNCTION	0.76	0.76	109.88	0	14:36
B18_CUL	JUNCTION	0.79	0.87	110.18	0	00:00
C02_CB	JUNCTION	0.44	0.44	68.24	0	00:22
C03_CB	JUNCTION	0.22	0.22	89.17	0	00:24
C04_CB	JUNCTION	0.25	0.25	91.20	0	00:01
C05_CB	JUNCTION	0.24	0.24	97.16	0	00:06
C06_CB	JUNCTION	0.22	0.22	105.55	0	00:05
D02_CHAN	JUNCTION	0.90	0.90	33.97	0	14:47
D03_CHAN	JUNCTION	0.88	0.89	35.83	0	14:41

STO_1_ORIFICE	JUNCTION	0.18	0.18	113.78	0	14:36
D01_CHAN	OUTFALL	0.78	0.79	32.55	0	16:24
STORAGE_1	STORAGE	2.12	2.15	115.75	0	14:36

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal
A01_UNK	JUNCTION	0.00	0.00	0 00:00	0.000	0.000
A02_CB	JUNCTION	0.00	0.00	0 00:00	0.000	0.000
A03_CB	JUNCTION	0.00	0.00	0 00:00	0.000	0.000
A04_CB	JUNCTION	0.00	0.00	0 00:00	0.000	0.000
A05_CB	JUNCTION	0.00	0.00	0 00:00	0.000	0.000
A06_CB	JUNCTION	0.00	0.00	0 00:00	0.000	0.000
B01_MH	JUNCTION	0.00	17.70	0 14:35	0.000	11.370
B02_CUL	JUNCTION	0.00	17.70	0 14:35	0.000	11.370
B03_CUL	JUNCTION	0.00	17.70	0 14:24	0.000	11.371
B04_MH	JUNCTION	1.09	17.70	0 14:23	0.702	11.372
B05_MH	JUNCTION	0.00	16.61	0 14:23	0.000	10.671
B06_CB	JUNCTION	0.00	15.90	0 14:23	0.000	10.212
B07_CB	JUNCTION	0.00	15.90	0 14:34	0.000	10.213
B08_CB	JUNCTION	0.00	15.90	0 14:23	0.000	10.213
B09_MH	JUNCTION	1.35	15.90	0 14:34	0.871	10.214
B10_MH_a	JUNCTION	0.00	7.29	0 00:18	0.000	3.465
B10_MH_b	JUNCTION	0.00	5.39	0 00:46	0.000	3.441
B11_MH	JUNCTION	0.00	7.05	0 00:16	0.000	3.484
B12_CB	JUNCTION	5.39	5.39	0 00:00	3.484	3.484
B13_CUL	JUNCTION	1.86	9.16	0 14:26	1.204	5.911
B14_CUL	JUNCTION	0.00	7.30	0 14:35	0.000	4.708
B15_CUL	JUNCTION	0.00	7.30	0 14:33	0.000	4.708
B16_CUL	JUNCTION	0.00	7.30	0 14:34	0.000	4.709
B17_CB	JUNCTION	0.00	7.30	0 14:33	0.000	4.709
B18_CUL	JUNCTION	6.00	6.00	0 00:00	3.879	3.879
C02_CB	JUNCTION	0.00	0.71	0 00:07	0.000	0.459
C03_CB	JUNCTION	0.00	0.71	0 00:01	0.000	0.460
C04_CB	JUNCTION	0.00	0.71	0 00:19	0.000	0.460
C05_CB	JUNCTION	0.00	0.71	0 00:05	0.000	0.460
C06_CB	JUNCTION	0.71	0.71	0 00:00	0.460	0.460
D02_CHAN	JUNCTION	0.00	17.70	0 14:41	0.000	11.364
D03_CHAN	JUNCTION	0.00	17.70	0 14:34	0.000	11.368
STO_1_ORIFICE	JUNCTION	0.00	1.30	0 14:36	0.000	0.830
D01_CHAN	OUTFALL	0.00	17.70	0 16:24	0.000	11.361
STORAGE_1	STORAGE	1.30	1.30	0 00:00	0.840	0.840

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Feet	Min. Depth Below Rim Feet
B11_MH	JUNCTION	23.69	1.047	3.053
B12_CB	JUNCTION	23.67	4.760	0.000

****
Node Flooding Summary
****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate CFS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 gal	Maximum Ponded Depth Feet
B12_CB	0.01	0.35	0 00:19	0.000	5.76

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 ft3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 ft3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CFS
STORAGE_1	1.283	27	0	1.305	27	0 14:36	1.30

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CFS	Max. Flow CFS	Total Volume 10^6 gal
D01_CHAN	99.88	17.60	17.70	11.361
System	99.88	17.60	17.70	11.361

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
A01_UNK_B13_CUL	CONDUIT	0.00	0 00:00	0.00	0.00	0.18
A02_CB_A01_UNK	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
A03_CB_A02_CB	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
A04_CB_A03_CB	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
A05_CB_A04_CB	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
A06_CB_A05_CB	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
B01_MH_D03_CHAN	CONDUIT	17.70	0 14:34	3.52	0.04	0.22
B02_CUL_B01_MH	CONDUIT	17.70	0 14:35	14.94	0.11	0.22
B03_CUL_B02_CUL	CONDUIT	17.70	0 14:35	5.56	0.03	0.18
B04_MH_B03_CUL	CONDUIT	17.70	0 14:24	10.61	0.78	0.52
B05_MH_B04_MH	CONDUIT	16.61	0 14:23	11.76	0.67	0.75
B06_CB_B05_MH	CONDUIT	15.90	0 14:23	16.55	0.44	0.53
B07_CB_B06_CB	CONDUIT	15.90	0 14:23	20.20	0.41	0.46

B08_CB_B07_CB	CONDUIT	15.90	0	14:34	16.52	0.56	0.54
B09_MH_B08_CB	CONDUIT	15.90	0	14:23	17.68	0.46	0.51
B10_MH_b_B09_MH	CONDUIT	5.39	0	00:47	4.35	0.85	0.66
B11_MH_B10_MH_a	CONDUIT	7.29	0	00:18	3.47	0.05	1.00
B12_CB_B11_MH	CONDUIT	5.40	0	00:09	8.20	0.95	1.00
B13_CUL_B09_MH	CONDUIT	9.16	0	14:34	15.15	0.87	0.72
B14_CUL_B13_CUL	CONDUIT	7.30	0	14:26	9.05	0.06	0.29
B15_CUL_B14_CUL	CONDUIT	7.30	0	14:35	15.97	0.78	0.56
B16_CUL_B15_CUL	CONDUIT	7.30	0	14:33	7.01	0.06	0.28
B17_CB_B16_CUL	CONDUIT	7.30	0	14:34	20.72	0.93	0.60
B18_CUL_B17_CB	CONDUIT	6.50	0	00:00	11.56	1.04	0.78
C02_CB_B05_MH	CONDUIT	0.71	0	00:12	2.47	0.13	0.57
C03_CB_C02_CB	CONDUIT	0.71	0	00:07	5.57	0.10	0.23
C04_CB_C03_CB	CONDUIT	0.71	0	00:01	6.56	0.13	0.23
C05_CB_C04_CB	CONDUIT	0.71	0	00:19	4.92	0.13	0.24
C06_CB_C05_CB	CONDUIT	0.71	0	00:05	5.42	0.11	0.22
D02_CHAN_D01_CHAN	CONDUIT	17.70	0	16:24	3.79	0.04	0.21
D03_CHAN_D02_CHAN	CONDUIT	17.70	0	14:41	3.48	0.04	0.22
STO_1_ORIFICE_B17_CB	CONDUIT	1.30	0	14:33	3.58	0.07	0.47
OR1	ORIFICE	1.30	0	14:36			1.00
OR1_RISER	ORIFICE	0.00	0	00:00			0.00
OR2	ORIFICE	0.75	0	00:20			1.00
OR2_RISER	ORIFICE	4.65	0	00:46			0.70

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
A01_UNK_B13_CUL	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
A02_CB_A01_UNK	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
A03_CB_A02_CB	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
A04_CB_A03_CB	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
A05_CB_A04_CB	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
A06_CB_A05_CB	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
B01_MH_D03_CHAN	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.80	0.0000
B02_CUL_B01_MH	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	3.82	0.0000
B03_CUL_B02_CUL	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.33	0.0000
B04_MH_B03_CUL	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.05	0.0000
B05_MH_B04_MH	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.00	0.0000
B06_CB_B05_MH	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	3.64	0.0000
B07_CB_B06_CB	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	4.91	0.0000
B08_CB_B07_CB	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	3.63	0.0000
B09_MH_B08_CB	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	4.03	0.0000
B10_MH_b_B09_MH	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.82	0.0000
B11_MH_B10_MH_a	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.0000
B12_CB_B11_MH	1.00	0.00	0.00	0.00	0.99	0.01	0.00	0.01	0.02	0.0000
B13_CUL_B09_MH	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	3.26	0.0000
B14_CUL_B13_CUL	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.24	0.0000
B15_CUL_B14_CUL	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	4.15	0.0000
B16_CUL_B15_CUL	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.32	0.0000
B17_CB_B16_CUL	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	3.69	0.0000
B18_CUL_B17_CB	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.84	0.0000
C02_CB_B05_MH	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.40	0.0000
C03_CB_C02_CB	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.31	0.0000
C04_CB_C03_CB	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.26	0.0000
C05_CB_C04_CB	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	2.10	0.0000
C06_CB_C05_CB	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	2.41	0.0000
D02_CHAN_D01_CHAN	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.87	0.0000

D03_CHAN_D02_CHAN	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.79	0.0000
STO_1_ORIFICE_B17_CB	1.00	0.00	0.00	0.00	0.04	0.96	0.00	0.00	1.04	0.0000

****
Conduit Surcharge Summary
****

Conduit	--------- Hours Full -------- Both Ends	Upstream	Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
B11_MH_B10_MH_a	23.69	23.69	23.69	0.01	0.01
B12_CB_B11_MH	23.67	23.67	23.67	0.01	0.01
B18_CUL_B17_CB	0.01	0.01	0.01	0.01	0.01

Analysis begun on: Mon May 09 18:08:33 2016
Analysis ended on: Mon May 09 18:08:41 2016
Total elapsed time: 00:00:08

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------
Tamarack Basin - Proposed Condition 2-year flows

*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Flow Routing Method ...... DYNWAVE
Starting Date ............ MAR-16-2016 00:00:00
Ending Date .............. MAR-17-2016 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Routing Time Step ........ 5.00 sec


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 0
Number of nodes ........... 35
Number of links ........... 36
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                        Data        Recording
Name                Data Source         Type        Interval
-------------------------------------------------------------
Design              2-year              INTENSITY    15 min.


************
Node Summary
************
                                        Invert      Max.    Ponded    External
Name                Type                 Elev.     Depth      Area    Inflow
-------------------------------------------------------------------------------
A01_UNK             JUNCTION            239.24      5.00    5000.0    Yes
A02_CB              JUNCTION            244.01      4.05    5000.0
A03_CB              JUNCTION            253.10      4.15    5000.0
A04_CB              JUNCTION            253.52      4.18    5000.0
A05_CB              JUNCTION            253.64      7.01    5000.0
A06_CB              JUNCTION            292.11     11.18    5000.0    Yes
B01_MH              JUNCTION             37.39      8.44       0.0
B02_CUL             JUNCTION             42.64      5.00    5000.0
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B03_CUL	JUNCTION	53.47	5.00	5000.0	
B04_MH	JUNCTION	54.00	6.60	5000.0	Yes
B05_MH	JUNCTION	56.60	5.80	5000.0	
B06_CB	JUNCTION	61.90	5.00	5000.0	
B07_CB	JUNCTION	75.81	4.20	5000.0	
B08_CB	JUNCTION	82.20	5.00	5000.0	
B09_MH	JUNCTION	89.30	8.60	5000.0	Yes
B10_MH_a	JUNCTION	91.09	9.10	5000.0	
B10_MH_b	JUNCTION	91.09	9.10	5000.0	
B11_MH	JUNCTION	91.91	10.10	5000.0	
B12_CB	JUNCTION	107.91	5.76	5000.0	Yes
B13_CUL	JUNCTION	97.57	5.00	5000.0	Yes
B14_CUL	JUNCTION	101.21	5.00	5000.0	
B15_CUL	JUNCTION	102.54	5.00	5000.0	
B16_CUL	JUNCTION	108.82	5.00	5000.0	
B17_CB	JUNCTION	109.12	2.25	5000.0	
B18_CUL	JUNCTION	109.31	5.00	5000.0	Yes
C02_CB	JUNCTION	67.80	4.40	5000.0	
C03_CB	JUNCTION	88.95	2.63	5000.0	
C04_CB	JUNCTION	90.95	2.90	5000.0	
C05_CB	JUNCTION	96.92	3.40	5000.0	
C06_CB	JUNCTION	105.33	1.90	5000.0	Yes
D02_CHAN	JUNCTION	33.07	4.00	0.0	
D03_CHAN	JUNCTION	34.94	4.00	0.0	
STO_1_ORIFICE	JUNCTION	113.60	9.00	5000.0	
D01_CHAN	OUTFALL	31.76	4.00	0.0	
STORAGE_1	STORAGE	113.60	7.00	0.0	Yes

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Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
A01_UNK_B13_CUL	A01_UNK	B13_CUL	CONDUIT	1053.0	13.5773	0.1000
A02_CB_A01_UNK	A02_CB	A01_UNK	CONDUIT	34.8	14.1462	0.0130
A03_CB_A02_CB	A03_CB	A02_CB	CONDUIT	66.1	13.8744	0.0130
A04_CB_A03_CB	A04_CB	A03_CB	CONDUIT	30.7	0.7169	0.0130
A05_CB_A04_CB	A05_CB	A04_CB	CONDUIT	64.7	0.4794	0.0130
A06_CB_A05_CB	A06_CB	A05_CB	CONDUIT	137.1	29.1111	0.0130
B01_MH_D03_CHAN	B01_MH	D03_CHAN	CONDUIT	104.8	2.3375	0.0450
B02_CUL_B01_MH	B02_CUL	B01_MH	CONDUIT	35.5	5.8066	0.0130
B03_CUL_B02_CUL	B03_CUL	B02_CUL	CONDUIT	37.2	30.4221	0.1000
B04_MH_B03_CUL	B04_MH	B03_CUL	CONDUIT	53.2	0.9957	0.0130
B05_MH_B04_MH	B05_MH	B04_MH	CONDUIT	47.3	5.5100	0.0130
B06_CB_B05_MH	B06_CB	B05_MH	CONDUIT	46.1	11.5762	0.0130
B07_CB_B06_CB	B07_CB	B06_CB	CONDUIT	103.6	13.5437	0.0130
B08_CB_B07_CB	B08_CB	B07_CB	CONDUIT	86.2	7.3191	0.0130
B09_MH_B08_CB	B09_MH	B08_CB	CONDUIT	67.0	10.6616	0.0130
B10_MH_b_B09_MH	B10_MH_b	B09_MH	CONDUIT	138.6	1.2551	0.0240
B11_MH_B10_MH_a	B11_MH	B10_MH_a	CONDUIT	170.7	0.4805	0.0240
B12_CB_B11_MH	B12_CB	B11_MH	CONDUIT	163.0	8.6232	0.0240
B13_CUL_B09_MH	B13_CUL	B09_MH	CONDUIT	33.0	8.8326	0.0130
B14_CUL_B13_CUL	B14_CUL	B13_CUL	CONDUIT	47.0	7.7747	0.0300
B15_CUL_B14_CUL	B15_CUL	B14_CUL	CONDUIT	19.5	6.8351	0.0130
B16_CUL_B15_CUL	B16_CUL	B15_CUL	CONDUIT	76.9	8.1960	0.0300
B17_CB_B16_CUL	B17_CB	B16_CUL	CONDUIT	6.1	4.8875	0.0130
B18_CUL_B17_CB	B18_CUL	B17_CB	CONDUIT	6.2	3.0701	0.0130
C02_CB_B05_MH	C02_CB	B05_MH	CONDUIT	137.2	8.3368	0.0240
C03_CB_C02_CB	C03_CB	C02_CB	CONDUIT	162.5	13.0041	0.0240
C04_CB_C03_CB	C04_CB	C03_CB	CONDUIT	24.1	8.3244	0.0240
C05_CB_C04_CB	C05_CB	C04_CB	CONDUIT	69.4	8.5667	0.0240
C06_CB_C05_CB	C06_CB	C05_CB	CONDUIT	73.7	11.3550	0.0240
D02_CHAN_D01_CHAN	D02_CHAN	D01_CHAN	CONDUIT	56.2	2.3333	0.0450

D03_CHAN_D02_CHAN	D03_CHAN	D02_CHAN	CONDUIT	80.2	2.3335	0.0450
STO_1_ORIFICE_B17_CB	STO_1_ORIFICE	B17_CB	CONDUIT	17.1	27.1186	0.0130
OR1	STORAGE_1	STO_1_ORIFICE	ORIFICE			
OR1_RISER	STORAGE_1	STO_1_ORIFICE	ORIFICE			
OR2	B10_MH_a	B10_MH_b	ORIFICE			
OR2_RISER	B10_MH_a	B10_MH_b	ORIFICE			

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Cross Section Summary

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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
A01_UNK_B13_CUL	TRAPEZOIDAL	2.00	8.00	1.04	6.00	1	45.10
A02_CB_A01_UNK	CIRCULAR	0.67	0.35	0.17	0.67	1	4.55
A03_CB_A02_CB	CIRCULAR	0.67	0.35	0.17	0.67	1	4.50
A04_CB_A03_CB	CIRCULAR	0.67	0.35	0.17	0.67	1	1.02
A05_CB_A04_CB	CIRCULAR	0.67	0.35	0.17	0.67	1	0.84
A06_CB_A05_CB	CIRCULAR	0.67	0.35	0.17	0.67	1	6.52
B01_MH_D03_CHAN	TRAPEZOIDAL	4.00	60.00	2.12	27.00	1	499.96
B02_CUL_B01_MH	CIRCULAR	3.00	7.07	0.75	3.00	1	160.72
B03_CUL_B02_CUL	TRAPEZOIDAL	4.00	44.00	2.11	19.00	1	592.60
B04_MH_B03_CUL	CIRCULAR	2.00	3.14	0.50	2.00	1	22.57
B05_MH_B04_MH	CIRCULAR	1.50	1.77	0.38	1.50	1	24.66
B06_CB_B05_MH	CIRCULAR	1.50	1.77	0.38	1.50	1	35.74
B07_CB_B06_CB	CIRCULAR	1.50	1.77	0.38	1.50	1	38.66
B08_CB_B07_CB	CIRCULAR	1.50	1.77	0.38	1.50	1	28.42
B09_MH_B08_CB	CIRCULAR	1.50	1.77	0.38	1.50	1	34.30
B10_MH_b_B09_MH	CIRCULAR	1.50	1.77	0.38	1.50	1	6.37
B11_MH_B10_MH_a	CIRCULAR	6.00	28.27	1.50	6.00	1	159.01
B12_CB_B11_MH	CIRCULAR	1.00	0.79	0.25	1.00	1	5.67
B13_CUL_B09_MH	CIRCULAR	1.00	0.79	0.25	1.00	1	10.59
B14_CUL_B13_CUL	TRAPEZOIDAL	2.00	8.00	1.04	6.00	1	113.77
B15_CUL_B14_CUL	CIRCULAR	1.00	0.79	0.25	1.00	1	9.31
B16_CUL_B15_CUL	TRAPEZOIDAL	2.00	8.00	1.04	6.00	1	116.81
B17_CB_B16_CUL	CIRCULAR	1.00	0.79	0.25	1.00	1	7.88
B18_CUL_B17_CB	CIRCULAR	1.00	0.79	0.25	1.00	1	6.24
C02_CB_B05_MH	CIRCULAR	1.00	0.79	0.25	1.00	1	5.57
C03_CB_C02_CB	CIRCULAR	1.00	0.79	0.25	1.00	1	6.96
C04_CB_C03_CB	CIRCULAR	1.00	0.79	0.25	1.00	1	5.57
C05_CB_C04_CB	CIRCULAR	1.00	0.79	0.25	1.00	1	5.65
C06_CB_C05_CB	CIRCULAR	1.00	0.79	0.25	1.00	1	6.50
D02_CHAN_D01_CHAN	TRAPEZOIDAL	4.00	60.00	2.12	27.00	1	499.50
D03_CHAN_D02_CHAN	TRAPEZOIDAL	4.00	60.00	2.12	27.00	1	499.52
STO_1_ORIFICE_B17_CB	CIRCULAR	1.00	0.79	0.25	1.00	1	18.55

************************* Flow Routing Continuity *************************	Volume acre-feet	Volume 10^6 gal
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.000	0.000
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	17.259	5.624
External Outflow	17.063	5.560
Internal Outflow	0.000	0.000
Storage Losses	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.178	0.058
Continuity Error (%)	0.106	

****
Highest Continuity Errors
****
Node B10_MH_a (1.38%)
Node B11_MH (1.26%)

****
Time-Step Critical Elements
****
Link B17_CB_B16_CUL (99.99%)

****
Highest Flow Instability Indexes
****
All links are stable.

****
Routing Time Step Summary
****

Minimum Time Step	:	0.50 sec
Average Time Step	:	0.50 sec
Maximum Time Step	:	2.45 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.00

****
Node Depth Summary
****

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days	Time of Max Occurrence hr:min
A01_UNK	JUNCTION	0.29	0.29	239.53	0	01:32
A02_CB	JUNCTION	0.25	0.25	244.26	0	00:25
A03_CB	JUNCTION	0.15	0.15	253.25	0	00:21
A04_CB	JUNCTION	0.32	0.32	253.84	0	00:53
A05_CB	JUNCTION	0.67	0.67	254.31	0	00:20
A06_CB	JUNCTION	0.12	0.12	292.23	0	00:47
B01_MH	JUNCTION	0.61	0.62	38.01	0	09:08
B02_CUL	JUNCTION	0.47	0.47	43.11	0	08:41
B03_CUL	JUNCTION	0.51	0.52	53.99	0	08:19
B04_MH	JUNCTION	0.86	0.86	54.86	0	07:03
B05_MH	JUNCTION	0.59	0.60	57.20	0	07:11
B06_CB	JUNCTION	0.48	0.48	62.38	0	07:20
B07_CB	JUNCTION	0.46	0.46	76.27	0	07:05
B08_CB	JUNCTION	0.54	0.54	82.74	0	07:07
B09_MH	JUNCTION	0.49	0.49	89.79	0	07:20
B10_MH_a	JUNCTION	7.24	7.36	98.45	0	01:17
B10_MH_b	JUNCTION	0.64	0.66	91.75	0	01:33
B11_MH	JUNCTION	6.42	6.54	98.45	0	00:54
B12_CB	JUNCTION	0.46	0.46	108.37	0	00:09
B13_CUL	JUNCTION	0.47	0.48	98.05	0	07:20
B14_CUL	JUNCTION	0.29	0.30	101.51	0	00:00
B15_CUL	JUNCTION	0.44	0.44	102.98	0	07:13
B16_CUL	JUNCTION	0.28	0.28	109.10	0	07:14
B17_CB	JUNCTION	0.46	0.47	109.59	0	00:00
B18_CUL	JUNCTION	0.47	0.51	109.82	0	00:00

C02_CB	JUNCTION	0.37	0.37	68.17	0	00:22
C03_CB	JUNCTION	0.15	0.15	89.10	0	00:09
C04_CB	JUNCTION	0.18	0.18	91.13	0	00:01
C05_CB	JUNCTION	0.17	0.17	97.09	0	00:08
C06_CB	JUNCTION	0.16	0.16	105.49	0	00:07
D02_CHAN	JUNCTION	0.63	0.64	33.71	0	09:12
D03_CHAN	JUNCTION	0.61	0.62	35.56	0	08:01
STO_1_ORIFICE	JUNCTION	0.13	0.13	113.73	0	07:14
D01_CHAN	OUTFALL	0.53	0.53	32.29	0	08:02
STORAGE_1	STORAGE	0.74	0.74	114.34	0	07:16

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal
A01_UNK	JUNCTION	0.91	1.40	0	00:18	0.590	0.905
A02_CB	JUNCTION	0.00	0.49	0	00:21	0.000	0.314
A03_CB	JUNCTION	0.00	0.49	0	00:23	0.000	0.314
A04_CB	JUNCTION	0.00	0.49	0	00:20	0.000	0.314
A05_CB	JUNCTION	0.00	0.49	0	00:03	0.000	0.315
A06_CB	JUNCTION	0.49	0.49	0	00:00	0.315	0.315
B01_MH	JUNCTION	0.00	8.70	0	09:08	0.000	5.565
B02_CUL	JUNCTION	0.00	8.70	0	07:29	0.000	5.565
B03_CUL	JUNCTION	0.00	8.70	0	07:01	0.000	5.566
B04_MH	JUNCTION	0.42	8.70	0	07:00	0.271	5.566
B05_MH	JUNCTION	0.00	8.28	0	07:00	0.000	5.296
B06_CB	JUNCTION	0.00	7.93	0	06:59	0.000	5.066
B07_CB	JUNCTION	0.00	7.93	0	07:20	0.000	5.066
B08_CB	JUNCTION	0.00	7.93	0	07:03	0.000	5.066
B09_MH	JUNCTION	0.61	7.93	0	07:20	0.397	5.067
B10_MH_a	JUNCTION	0.00	3.56	0	00:47	0.000	1.568
B10_MH_b	JUNCTION	0.00	2.46	0	01:17	0.000	1.546
B11_MH	JUNCTION	0.00	2.46	0	00:19	0.000	1.588
B12_CB	JUNCTION	2.46	2.46	0	00:00	1.588	1.588
B13_CUL	JUNCTION	0.01	4.85	0	07:02	0.003	3.129
B14_CUL	JUNCTION	0.00	3.45	0	07:14	0.000	2.224
B15_CUL	JUNCTION	0.00	3.45	0	07:10	0.000	2.224
B16_CUL	JUNCTION	0.00	3.45	0	07:13	0.000	2.225
B17_CB	JUNCTION	0.00	3.45	0	07:09	0.000	2.225
B18_CUL	JUNCTION	2.78	2.78	0	00:00	1.796	1.796
C02_CB	JUNCTION	0.00	0.36	0	00:09	0.000	0.231
C03_CB	JUNCTION	0.00	0.36	0	00:02	0.000	0.231
C04_CB	JUNCTION	0.00	0.36	0	00:48	0.000	0.231
C05_CB	JUNCTION	0.00	0.36	0	00:07	0.000	0.231
C06_CB	JUNCTION	0.36	0.36	0	00:00	0.231	0.231
D02_CHAN	JUNCTION	0.00	8.70	0	08:20	0.000	5.562
D03_CHAN	JUNCTION	0.00	8.70	0	07:10	0.000	5.564
STO_1_ORIFICE	JUNCTION	0.00	0.67	0	07:16	0.000	0.428
D01_CHAN	OUTFALL	0.00	8.70	0	08:02	0.000	5.560
STORAGE_1	STORAGE	0.67	0.67	0	00:00	0.432	0.432

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Feet	Min. Depth Below Rim Feet
B11_MH	JUNCTION	23.23	0.539	3.561

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 ft3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 ft3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CFS
STORAGE_1	0.433	9	0	0.437	9	0 07:16	0.67

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CFS	Max. Flow CFS	Total Volume 10^6 gal
D01_CHAN	99.83	8.62	8.70	5.560
System	99.83	8.62	8.70	5.560

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
A01_UNK_B13_CUL	CONDUIT	1.40	0 01:32	1.54	0.03	0.19
A02_CB_A01_UNK	CONDUIT	0.49	0 00:18	8.69	0.11	0.33
A03_CB_A02_CB	CONDUIT	0.49	0 00:21	6.87	0.11	0.30
A04_CB_A03_CB	CONDUIT	0.49	0 00:23	2.89	0.48	0.49
A05_CB_A04_CB	CONDUIT	0.49	0 00:20	2.67	0.58	0.52
A06_CB_A05_CB	CONDUIT	0.49	0 00:03	9.72	0.07	0.48
B01_MH_D03_CHAN	CONDUIT	8.70	0 07:10	2.90	0.02	0.15
B02_CUL_B01_MH	CONDUIT	8.70	0 09:08	12.13	0.05	0.16
B03_CUL_B02_CUL	CONDUIT	8.70	0 07:29	4.41	0.01	0.12
B04_MH_B03_CUL	CONDUIT	8.70	0 07:01	9.08	0.39	0.34
B05_MH_B04_MH	CONDUIT	8.28	0 07:00	9.70	0.34	0.49
B06_CB_B05_MH	CONDUIT	7.93	0 07:00	13.85	0.22	0.36
B07_CB_B06_CB	CONDUIT	7.93	0 06:59	16.71	0.21	0.31
B08_CB_B07_CB	CONDUIT	7.93	0 07:20	13.77	0.28	0.36

B09_MH_B08_CB	CONDUIT	7.93	0	07:03	14.71	0.23	0.34
B10_MH_b_B09_MH	CONDUIT	2.46	0	01:34	3.53	0.39	0.42
B11_MH_B10_MH_a	CONDUIT	3.56	0	00:47	2.73	0.02	1.00
B12_CB_B11_MH	CONDUIT	2.46	0	00:19	6.95	0.43	0.73
B13_CUL_B09_MH	CONDUIT	4.85	0	07:20	13.18	0.46	0.48
B14_CUL_B13_CUL	CONDUIT	3.45	0	07:02	7.56	0.03	0.19
B15_CUL_B14_CUL	CONDUIT	3.45	0	07:14	13.38	0.37	0.36
B16_CUL_B15_CUL	CONDUIT	3.45	0	07:10	5.46	0.03	0.18
B17_CB_B16_CUL	CONDUIT	3.45	0	07:13	17.93	0.44	0.37
B18_CUL_B17_CB	CONDUIT	3.08	0	00:00	9.54	0.49	0.47
C02_CB_B05_MH	CONDUIT	0.36	0	00:22	2.49	0.06	0.39
C03_CB_C02_CB	CONDUIT	0.36	0	00:09	4.55	0.05	0.16
C04_CB_C03_CB	CONDUIT	0.36	0	00:02	5.34	0.06	0.16
C05_CB_C04_CB	CONDUIT	0.36	0	00:48	4.00	0.06	0.17
C06_CB_C05_CB	CONDUIT	0.36	0	00:07	4.43	0.05	0.16
D02_CHAN_D01_CHAN	CONDUIT	8.70	0	08:02	3.13	0.02	0.15
D03_CHAN_D02_CHAN	CONDUIT	8.70	0	08:20	2.83	0.02	0.16
STO_1_ORIFICE_B17_CB	CONDUIT	0.67	0	07:09	3.43	0.04	0.30
OR1	ORIFICE	0.67	0	07:16			1.00
OR1_RISER	ORIFICE	0.00	0	00:00			0.00
OR2	ORIFICE	0.74	0	00:48			1.00
OR2_RISER	ORIFICE	1.72	0	01:17			0.36

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
A01_UNK_B13_CUL	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.47	0.0000
A02_CB_A01_UNK	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.15	0.0000
A03_CB_A02_CB	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.62	0.0000
A04_CB_A03_CB	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.01	0.0000
A05_CB_A04_CB	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.90	0.0000
A06_CB_A05_CB	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.05	0.0000
B01_MH_D03_CHAN	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.76	0.0000
B02_CUL_B01_MH	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	3.73	0.0000
B03_CUL_B02_CUL	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.23	0.0000
B04_MH_B03_CUL	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.26	0.0000
B05_MH_B04_MH	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.26	0.0000
B06_CB_B05_MH	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	3.87	0.0000
B07_CB_B06_CB	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	5.04	0.0000
B08_CB_B07_CB	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	3.84	0.0000
B09_MH_B08_CB	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	4.22	0.0000
B10_MH_b_B09_MH	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.90	0.0000
B11_MH_B10_MH_a	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.0000
B12_CB_B11_MH	1.00	0.00	0.00	0.00	0.98	0.00	0.00	0.01	0.86	0.0000
B13_CUL_B09_MH	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	3.82	0.0000
B14_CUL_B13_CUL	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.17	0.0000
B15_CUL_B14_CUL	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	4.55	0.0000
B16_CUL_B15_CUL	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.27	0.0000
B17_CB_B16_CUL	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	4.33	0.0000
B18_CUL_B17_CB	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.29	0.0000
C02_CB_B05_MH	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.43	0.0000
C03_CB_C02_CB	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.25	0.0000
C04_CB_C03_CB	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.21	0.0000
C05_CB_C04_CB	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	2.05	0.0000
C06_CB_C05_CB	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	2.35	0.0000
D02_CHAN_D01_CHAN	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.84	0.0000
D03_CHAN_D02_CHAN	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.74	0.0000

```
STO_1_ORIFICE_B17_CB    1.00   0.00  0.00  0.00  0.01  0.99  0.00  0.00     1.30   0.0000


*************************
Conduit Surcharge Summary
*************************

----------------------------------------------------------------------------
                                                           Hours        Hours
                         --------- Hours Full --------   Above Full   Capacity
Conduit                  Both Ends  Upstream  Dnstream   Normal Flow   Limited
----------------------------------------------------------------------------
B11_MH_B10_MH_a              23.23     23.23     23.23       0.01          0.01


Analysis begun on:  Mon May 09 18:17:20 2016
Analysis ended on:  Mon May 09 18:17:29 2016
Total elapsed time: 00:00:09
```

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

Tamarack Basin - Proposed Condition 100-year flows

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units .... CFS
Process Models:
  Rainfall/Runoff .... YES
  Snowmelt .... NO
  Groundwater .... NO
  Flow Routing .... YES
  Ponding Allowed .... NO
  Water Quality .... NO
Flow Routing Method ...... DYNWAVE
Starting Date MAR-16-2016 00:00:00
Ending Date MAR-17-2016 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:01:00
Routing Time Step .... 5.00 sec

****
Element Count
****
Number of rain gages 1
Number of subcatchments ... 0
Number of nodes 35
Number of links 36
Number of pollutants 0
Number of land uses 0

****
Raingage Summary
****

Name	Data Source	Data Type	Recording Interval
Design	100-year	INTENSITY	15 min.

****
Node Summary
****

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
A01_UNK	JUNCTION	239.24	5.00	5000.0	Yes
A02_CB	JUNCTION	244.01	4.05	5000.0	
A03_CB	JUNCTION	253.10	4.15	5000.0	
A04_CB	JUNCTION	253.52	4.18	5000.0	
A05_CB	JUNCTION	253.64	7.01	5000.0	
A06_CB	JUNCTION	292.11	11.18	5000.0	Yes
B01_MH	JUNCTION	37.39	8.44	0.0	
B02_CUL	JUNCTION	42.64	5.00	5000.0	

B03_CUL	JUNCTION	53.47	5.00	5000.0	
B04_MH	JUNCTION	54.00	6.60	5000.0	Yes
B05_MH	JUNCTION	56.60	5.80	5000.0	
B06_CB	JUNCTION	61.90	5.00	5000.0	
B07_CB	JUNCTION	75.81	4.20	5000.0	
B08_CB	JUNCTION	82.20	5.00	5000.0	
B09_MH	JUNCTION	89.30	8.60	5000.0	Yes
B10_MH_a	JUNCTION	91.09	9.10	5000.0	
B10_MH_b	JUNCTION	91.09	9.10	5000.0	
B11_MH	JUNCTION	91.91	10.10	5000.0	
B12_CB	JUNCTION	107.91	5.76	5000.0	Yes
B13_CUL	JUNCTION	97.57	5.00	5000.0	Yes
B14_CUL	JUNCTION	101.21	5.00	5000.0	
B15_CUL	JUNCTION	102.54	5.00	5000.0	
B16_CUL	JUNCTION	108.82	5.00	5000.0	
B17_CB	JUNCTION	109.12	2.25	5000.0	
B18_CUL	JUNCTION	109.31	5.00	5000.0	Yes
C02_CB	JUNCTION	67.80	4.40	5000.0	
C03_CB	JUNCTION	88.95	2.63	5000.0	
C04_CB	JUNCTION	90.95	2.90	5000.0	
C05_CB	JUNCTION	96.92	3.40	5000.0	
C06_CB	JUNCTION	105.33	1.90	5000.0	Yes
D02_CHAN	JUNCTION	33.07	4.00	0.0	
D03_CHAN	JUNCTION	34.94	4.00	0.0	
STO_1_ORIFICE	JUNCTION	113.60	9.00	5000.0	
D01_CHAN	OUTFALL	31.76	4.00	0.0	
STORAGE_1	STORAGE	113.60	7.00	0.0	Yes

****
Link Summary
****

Name	From Node	To Node	Type	Length	%Slope	Roughness
A01_UNK_B13_CUL	A01_UNK	B13_CUL	CONDUIT	1053.0	13.5773	0.1000
A02_CB_A01_UNK	A02_CB	A01_UNK	CONDUIT	34.8	14.1462	0.0130
A03_CB_A02_CB	A03_CB	A02_CB	CONDUIT	66.1	13.8744	0.0130
A04_CB_A03_CB	A04_CB	A03_CB	CONDUIT	30.7	0.7169	0.0130
A05_CB_A04_CB	A05_CB	A04_CB	CONDUIT	64.7	0.4794	0.0130
A06_CB_A05_CB	A06_CB	A05_CB	CONDUIT	137.1	29.1111	0.0130
B01_MH_D03_CHAN	B01_MH	D03_CHAN	CONDUIT	104.8	2.3375	0.0450
B02_CUL_B01_MH	B02_CUL	B01_MH	CONDUIT	35.5	5.8066	0.0130
B03_CUL_B02_CUL	B03_CUL	B02_CUL	CONDUIT	37.2	30.4221	0.1000
B04_MH_B03_CUL	B04_MH	B03_CUL	CONDUIT	53.2	0.9957	0.0130
B05_MH_B04_MH	B05_MH	B04_MH	CONDUIT	47.3	5.5100	0.0130
B06_CB_B05_MH	B06_CB	B05_MH	CONDUIT	46.1	11.5762	0.0130
B07_CB_B06_CB	B07_CB	B06_CB	CONDUIT	103.6	13.5437	0.0130
B08_CB_B07_CB	B08_CB	B07_CB	CONDUIT	86.2	7.3191	0.0130
B09_MH_B08_CB	B09_MH	B08_CB	CONDUIT	67.0	10.6616	0.0130
B10_MH_b_B09_MH	B10_MH_b	B09_MH	CONDUIT	138.6	1.2551	0.0240
B11_MH_B10_MH_a	B11_MH	B10_MH_a	CONDUIT	170.7	0.4805	0.0240
B12_CB_B11_MH	B12_CB	B11_MH	CONDUIT	163.0	8.6232	0.0240
B13_CUL_B09_MH	B13_CUL	B09_MH	CONDUIT	33.0	8.8326	0.0130
B14_CUL_B13_CUL	B14_CUL	B13_CUL	CONDUIT	47.0	7.7747	0.0300
B15_CUL_B14_CUL	B15_CUL	B14_CUL	CONDUIT	19.5	6.8351	0.0130
B16_CUL_B15_CUL	B16_CUL	B15_CUL	CONDUIT	76.9	8.1960	0.0300
B17_CB_B16_CUL	B17_CB	B16_CUL	CONDUIT	6.1	4.8875	0.0130
B18_CUL_B17_CB	B18_CUL	B17_CB	CONDUIT	6.2	3.0701	0.0130
C02_CB_B05_MH	C02_CB	B05_MH	CONDUIT	137.2	8.3368	0.0240
C03_CB_C02_CB	C03_CB	C02_CB	CONDUIT	162.5	13.0041	0.0240
C04_CB_C03_CB	C04_CB	C03_CB	CONDUIT	24.1	8.3244	0.0240
C05_CB_C04_CB	C05_CB	C04_CB	CONDUIT	69.4	8.5667	0.0240
C06_CB_C05_CB	C06_CB	C05_CB	CONDUIT	73.7	11.3550	0.0240
D02_CHAN_D01_CHAN	D02_CHAN	D01_CHAN	CONDUIT	56.2	2.3333	0.0450

D03_CHAN_D02_CHAN	D03_CHAN	D02_CHAN	CONDUIT	80.2	2.3335	0.0450
STO_1_ORIFICE_B17_CB	STO_1_ORIFICE	B17_CB	CONDUIT	17.1	27.1186	0.0130
OR1	STORAGE_1	STO_1_ORIFICE	ORIFICE			
OR1_RISER	STORAGE_1	STO_1_ORIFICE	ORIFICE			
OR2	B10_MH_a	B10_MH_b	ORIFICE			
OR2_RISER	B10_MH_a	B10_MH_b	ORIFICE			

****
Cross Section Summary
****

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
A01_UNK_B13_CUL	TRAPEZOIDAL	2.00	8.00	1.04	6.00	1	45.10
A02_CB_A01_UNK	CIRCULAR	0.67	0.35	0.17	0.67	1	4.55
A03_CB_A02_CB	CIRCULAR	0.67	0.35	0.17	0.67	1	4.50
A04_CB_A03_CB	CIRCULAR	0.67	0.35	0.17	0.67	1	1.02
A05_CB_A04_CB	CIRCULAR	0.67	0.35	0.17	0.67	1	0.84
A06_CB_A05_CB	CIRCULAR	0.67	0.35	0.17	0.67	1	6.52
B01_MH_D03_CHAN	TRAPEZOIDAL	4.00	60.00	2.12	27.00	1	499.96
B02_CUL_B01_MH	CIRCULAR	3.00	7.07	0.75	3.00	1	160.72
B03_CUL_B02_CUL	TRAPEZOIDAL	4.00	44.00	2.11	19.00	1	592.60
B04_MH_B03_CUL	CIRCULAR	2.00	3.14	0.50	2.00	1	22.57
B05_MH_B04_MH	CIRCULAR	1.50	1.77	0.38	1.50	1	24.66
B06_CB_B05_MH	CIRCULAR	1.50	1.77	0.38	1.50	1	35.74
B07_CB_B06_CB	CIRCULAR	1.50	1.77	0.38	1.50	1	38.66
B08_CB_B07_CB	CIRCULAR	1.50	1.77	0.38	1.50	1	28.42
B09_MH_B08_CB	CIRCULAR	1.50	1.77	0.38	1.50	1	34.30
B10_MH_b_B09_MH	CIRCULAR	1.50	1.77	0.38	1.50	1	6.37
B11_MH_B10_MH_a	CIRCULAR	6.00	28.27	1.50	6.00	1	159.01
B12_CB_B11_MH	CIRCULAR	1.00	0.79	0.25	1.00	1	5.67
B13_CUL_B09_MH	CIRCULAR	1.00	0.79	0.25	1.00	1	10.59
B14_CUL_B13_CUL	TRAPEZOIDAL	2.00	8.00	1.04	6.00	1	113.77
B15_CUL_B14_CUL	CIRCULAR	1.00	0.79	0.25	1.00	1	9.31
B16_CUL_B15_CUL	TRAPEZOIDAL	2.00	8.00	1.04	6.00	1	116.81
B17_CB_B16_CUL	CIRCULAR	1.00	0.79	0.25	1.00	1	7.88
B18_CUL_B17_CB	CIRCULAR	1.00	0.79	0.25	1.00	1	6.24
C02_CB_B05_MH	CIRCULAR	1.00	0.79	0.25	1.00	1	5.57
C03_CB_C02_CB	CIRCULAR	1.00	0.79	0.25	1.00	1	6.96
C04_CB_C03_CB	CIRCULAR	1.00	0.79	0.25	1.00	1	5.57
C05_CB_C04_CB	CIRCULAR	1.00	0.79	0.25	1.00	1	5.65
C06_CB_C05_CB	CIRCULAR	1.00	0.79	0.25	1.00	1	6.50
D02_CHAN_D01_CHAN	TRAPEZOIDAL	4.00	60.00	2.12	27.00	1	499.50
D03_CHAN_D02_CHAN	TRAPEZOIDAL	4.00	60.00	2.12	27.00	1	499.52
STO_1_ORIFICE_B17_CB	CIRCULAR	1.00	0.79	0.25	1.00	1	18.55

****
Flow Routing Continuity
****

	Volume acre-feet	Volume 10^6 gal
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.000	0.000
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	40.339	13.145
External Outflow	40.027	13.043
Internal Outflow	0.000	0.000
Storage Losses	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.293	0.096
Continuity Error (%)	0.049	

****
Time-Step Critical Elements
****
Link B17_CB_B16_CUL (99.99%)

****
Highest Flow Instability Indexes
****
All links are stable.

****
Routing Time Step Summary
****

Minimum Time Step	:	0.50 sec
Average Time Step	:	0.50 sec
Maximum Time Step	:	1.07 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.00

****
Node Depth Summary
****

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days	hr:min
A01_UNK	JUNCTION	0.48	0.49	239.73	0	01:17
A02_CB	JUNCTION	0.33	0.33	244.34	0	00:03
A03_CB	JUNCTION	0.23	0.23	253.33	0	00:03
A04_CB	JUNCTION	0.60	0.60	254.12	0	00:02
A05_CB	JUNCTION	1.16	2.88	256.52	0	00:01
A06_CB	JUNCTION	0.19	0.19	292.30	0	00:02
B01_MH	JUNCTION	0.95	0.95	38.34	0	17:20
B02_CUL	JUNCTION	0.72	0.72	43.36	0	17:21
B03_CUL	JUNCTION	0.82	0.82	54.29	0	17:25
B04_MH	JUNCTION	1.48	1.49	55.49	0	17:14
B05_MH	JUNCTION	0.99	1.00	57.60	0	17:14
B06_CB	JUNCTION	0.76	0.76	62.66	0	17:14
B07_CB	JUNCTION	0.73	0.73	76.54	0	17:10
B08_CB	JUNCTION	0.88	0.88	83.08	0	17:14
B09_MH	JUNCTION	0.78	0.78	90.08	0	17:37
B10_MH_a	JUNCTION	7.83	7.89	98.98	0	00:46
B10_MH_b	JUNCTION	1.10	1.11	92.20	0	00:47
B11_MH	JUNCTION	7.01	7.07	98.98	0	00:46
B12_CB	JUNCTION	4.42	5.76	113.67	0	00:18
B13_CUL	JUNCTION	1.49	1.54	99.11	0	23:36
B14_CUL	JUNCTION	0.48	0.51	101.72	0	00:00
B15_CUL	JUNCTION	0.74	0.74	103.28	0	17:16
B16_CUL	JUNCTION	0.47	0.47	109.29	0	17:00
B17_CB	JUNCTION	0.85	0.85	109.97	0	17:01
B18_CUL	JUNCTION	0.91	0.95	110.26	0	00:00
C02_CB	JUNCTION	0.46	0.46	68.26	0	00:18
C03_CB	JUNCTION	0.23	0.23	89.18	0	00:09
C04_CB	JUNCTION	0.27	0.28	91.23	0	00:01
C05_CB	JUNCTION	0.26	0.26	97.18	0	00:06
C06_CB	JUNCTION	0.24	0.24	105.57	0	00:06
D02_CHAN	JUNCTION	0.96	0.96	34.03	0	17:05
D03_CHAN	JUNCTION	0.95	0.95	35.89	0	17:02

STO_1_ORIFICE	JUNCTION	0.19	0.19	113.79	0	16:59
D01_CHAN	OUTFALL	0.84	0.85	32.61	0	17:05
STORAGE_1	STORAGE	2.64	2.69	116.29	0	16:59

****
Node Inflow Summary
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Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal
A01_UNK	JUNCTION	2.14	3.33	0 00:03	1.384	2.154
A02_CB	JUNCTION	0.00	1.19	0 00:03	0.000	0.770
A03_CB	JUNCTION	0.00	1.19	0 00:02	0.000	0.770
A04_CB	JUNCTION	0.00	1.21	0 00:02	0.000	0.770
A05_CB	JUNCTION	0.00	1.19	0 00:02	0.000	0.771
A06_CB	JUNCTION	1.19	1.19	0 00:00	0.771	0.771
B01_MH	JUNCTION	0.00	20.34	0 17:25	0.000	13.051
B02_CUL	JUNCTION	0.00	20.34	0 17:19	0.000	13.052
B03_CUL	JUNCTION	0.00	20.34	0 17:14	0.000	13.053
B04_MH	JUNCTION	1.09	20.34	0 17:10	0.703	13.054
B05_MH	JUNCTION	0.00	19.25	0 17:09	0.000	12.352
B06_CB	JUNCTION	0.00	18.42	0 17:10	0.000	11.817
B07_CB	JUNCTION	0.00	18.42	0 17:10	0.000	11.817
B08_CB	JUNCTION	0.00	18.42	0 17:03	0.000	11.818
B09_MH	JUNCTION	1.38	18.42	0 17:37	0.894	11.819
B10_MH_a	JUNCTION	0.00	9.04	0 00:18	0.000	3.557
B10_MH_b	JUNCTION	0.00	5.53	0 00:46	0.000	3.533
B11_MH	JUNCTION	0.00	7.17	0 00:16	0.000	3.576
B12_CB	JUNCTION	5.53	5.53	0 00:00	3.576	3.576
B13_CUL	JUNCTION	0.03	11.50	0 17:04	0.017	7.414
B14_CUL	JUNCTION	0.00	8.14	0 17:16	0.000	5.249
B15_CUL	JUNCTION	0.00	8.14	0 17:00	0.000	5.250
B16_CUL	JUNCTION	0.00	8.14	0 17:01	0.000	5.250
B17_CB	JUNCTION	0.00	8.14	0 16:59	0.000	5.251
B18_CUL	JUNCTION	6.67	6.67	0 00:00	4.312	4.312
C02_CB	JUNCTION	0.00	0.83	0 00:08	0.000	0.536
C03_CB	JUNCTION	0.00	0.83	0 00:01	0.000	0.536
C04_CB	JUNCTION	0.00	0.83	0 00:06	0.000	0.536
C05_CB	JUNCTION	0.00	0.83	0 00:06	0.000	0.537
C06_CB	JUNCTION	0.83	0.83	0 00:00	0.537	0.537
D02_CHAN	JUNCTION	0.00	20.34	0 17:02	0.000	13.045
D03_CHAN	JUNCTION	0.00	20.34	0 17:20	0.000	13.049
STO_1_ORIFICE	JUNCTION	0.00	1.47	0 16:59	0.000	0.939
D01_CHAN	OUTFALL	0.00	20.34	0 17:05	0.000	13.042
STORAGE_1	STORAGE	1.47	1.47	0 00:00	0.951	0.951

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Node Surcharge Summary
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Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Feet	Min. Depth Below Rim Feet
A05_CB	JUNCTION	23.97	1.906	4.127
B11_MH	JUNCTION	23.70	1.068	3.032

B12_CB	JUNCTION	23.70	4.760	0.000

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Node Flooding Summary
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Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate CFS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 gal	Maximum Ponded Depth Feet
B12_CB	0.01	0.41	0 00:18	0.000	5.76

****
Storage Volume Summary
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Storage Unit	Average Volume 1000 ft3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 ft3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CFS
STORAGE_1	1.620	34	0	1.653	35	0 16:59	1.47

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Outfall Loading Summary
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Outfall Node	Flow Freq. Pcnt.	Avg. Flow CFS	Max. Flow CFS	Total Volume 10^6 gal
D01_CHAN	99.88	20.20	20.34	13.042
System	99.88	20.20	20.34	13.042

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Link Flow Summary
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Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
A01_UNK_B13_CUL	CONDUIT	3.33	0 01:17	1.92	0.07	0.51
A02_CB_A01_UNK	CONDUIT	1.19	0 00:03	10.91	0.26	0.54
A03_CB_A02_CB	CONDUIT	1.19	0 00:03	8.57	0.26	0.43
A04_CB_A03_CB	CONDUIT	1.19	0 00:02	3.83	1.17	0.83
A05_CB_A04_CB	CONDUIT	1.21	0 00:02	3.69	1.45	0.90
A06_CB_A05_CB	CONDUIT	1.19	0 00:02	12.14	0.18	0.64
B01_MH_D03_CHAN	CONDUIT	20.34	0 17:20	3.66	0.04	0.24
B02_CUL_B01_MH	CONDUIT	20.34	0 17:25	15.57	0.13	0.24
B03_CUL_B02_CUL	CONDUIT	20.34	0 17:19	5.80	0.03	0.19
B04_MH_B03_CUL	CONDUIT	20.34	0 17:14	10.83	0.90	0.58
B05_MH_B04_MH	CONDUIT	19.25	0 17:10	12.31	0.78	0.83
B06_CB_B05_MH	CONDUIT	18.42	0 17:09	17.09	0.52	0.59

B07_CB_B06_CB	CONDUIT	18.42	0	17:10	20.97	0.48	0.50
B08_CB_B07_CB	CONDUIT	18.42	0	17:10	17.09	0.65	0.59
B09_MH_B08_CB	CONDUIT	18.42	0	17:03	18.39	0.54	0.55
B10_MH_b_B09_MH	CONDUIT	5.53	0	00:47	4.38	0.87	0.67
B11_MH_B10_MH_a	CONDUIT	9.04	0	00:18	3.50	0.06	1.00
B12_CB_B11_MH	CONDUIT	5.55	0	00:09	8.21	0.98	1.00
B13_CUL_B09_MH	CONDUIT	11.50	0	17:37	15.35	1.09	1.00
B14_CUL_B13_CUL	CONDUIT	8.14	0	17:04	10.30	0.07	0.50
B15_CUL_B14_CUL	CONDUIT	8.14	0	17:16	16.33	0.87	0.61
B16_CUL_B15_CUL	CONDUIT	8.14	0	17:00	7.21	0.07	0.30
B17_CB_B16_CUL	CONDUIT	8.14	0	17:01	20.91	1.03	0.66
B18_CUL_B17_CB	CONDUIT	6.72	0	00:00	11.38	1.08	0.88
C02_CB_B05_MH	CONDUIT	0.83	0	00:12	3.19	0.15	0.63
C03_CB_C02_CB	CONDUIT	0.83	0	00:08	5.83	0.12	0.25
C04_CB_C03_CB	CONDUIT	0.83	0	00:01	6.87	0.15	0.25
C05_CB_C04_CB	CONDUIT	0.83	0	00:06	5.14	0.15	0.26
C06_CB_C05_CB	CONDUIT	0.83	0	00:06	5.68	0.13	0.24
D02_CHAN_D01_CHAN	CONDUIT	20.34	0	17:05	3.93	0.04	0.23
D03_CHAN_D02_CHAN	CONDUIT	20.34	0	17:02	3.62	0.04	0.24
STO_1_ORIFICE_B17_CB	CONDUIT	1.47	0	16:59	3.55	0.08	0.52
OR1	ORIFICE	1.47	0	16:59			1.00
OR1_RISER	ORIFICE	0.00	0	00:00			0.00
OR2	ORIFICE	0.75	0	00:19			1.00
OR2_RISER	ORIFICE	4.79	0	00:46			0.71

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Flow Classification Summary

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Conduit	Adjusted /Actual Length	--- Fraction of Time in Flow Class ---- Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
A01_UNK_B13_CUL	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.24	0.0000
A02_CB_A01_UNK	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.04	0.0000
A03_CB_A02_CB	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	3.20	0.0000
A04_CB_A03_CB	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.85	0.0000
A05_CB_A04_CB	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.73	0.0000
A06_CB_A05_CB	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.45	0.0000
B01_MH_D03_CHAN	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.81	0.0000
B02_CUL_B01_MH	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	3.84	0.0000
B03_CUL_B02_CUL	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.34	0.0000
B04_MH_B03_CUL	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.96	0.0000
B05_MH_B04_MH	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.85	0.0000
B06_CB_B05_MH	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	3.53	0.0000
B07_CB_B06_CB	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	4.83	0.0000
B08_CB_B07_CB	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	3.53	0.0000
B09_MH_B08_CB	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	3.93	0.0000
B10_MH_b_B09_MH	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.81	0.0000
B11_MH_B10_MH_a	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.0000
B12_CB_B11_MH	1.00	0.00	0.00	0.00	0.99	0.01	0.00	0.01	0.02	0.0000
B13_CUL_B09_MH	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.11	0.0000
B14_CUL_B13_CUL	1.00	0.00	0.00	0.00	0.96	0.04	0.00	0.00	0.58	0.0000
B15_CUL_B14_CUL	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	4.03	0.0000
B16_CUL_B15_CUL	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.31	0.0000
B17_CB_B16_CUL	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	3.41	0.0000
B18_CUL_B17_CB	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.51	0.0000
C02_CB_B05_MH	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.39	0.0000
C03_CB_C02_CB	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.31	0.0000
C04_CB_C03_CB	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	2.27	0.0000
C05_CB_C04_CB	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	2.11	0.0000
C06_CB_C05_CB	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	2.42	0.0000

D02_CHAN_D01_CHAN	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.88	0.0000
D03_CHAN_D02_CHAN	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.79	0.0000
STO_1_ORIFICE_B17_CB	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.96	0.0000

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Conduit Surcharge Summary
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Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
A04_CB_A03_CB	0.01	0.01	0.01	23.97	0.01
A05_CB_A04_CB	0.01	0.01	0.01	23.98	0.01
B11_MH_B10_MH_a	23.70	23.70	23.70	0.01	0.01
B12_CB_B11_MH	23.70	23.70	23.70	0.01	0.01
B13_CUL_B09_MH	22.71	22.71	22.71	23.80	22.71
B17_CB_B16_CUL	0.01	0.01	0.01	23.47	0.01
B18_CUL_B17_CB	0.01	0.01	0.01	24.00	0.01

Analysis begun on: Mon May 09 18:18:17 2016
Analysis ended on: Mon May 09 18:18:26 2016
Total elapsed time: 00:00:09

APPENDIX C

COOPERS BEACH – MITIGATION AS BUILT

Altmann Oliver Associates, LLC

AOA

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Environmental
Planning &
Landscape
Architecture

May 5, 2011

AOA-3985

Kathy Curry
City of Sammamish
801 228th Avenue SE
Sammamish, WA 98075

REFERENCE: **Cooper's Beach – 42x E. Lake Sammamish Shore Lane NE, Sammamish, WA (Corps # NWS-2009-476 Heen/Leseberg)**

SUBJECT: Revised Mitigation As-built - Baseline Assessment Report

Dear Kathy:

This report has been prepared to document baseline conditions following installation of the wetland and shoreline mitigation area at the Cooper's Beach project site, and has been revised to address the comments presented in your March 3, 2011 e-mail to Evan Maxim (see Section 1.0 below). Also included in this report are the vegetation sample plots and photo-points that will be reviewed as part of the five year monitoring program.

1.0 PROJECT SUMMARY

Installation of the wetland mitigation area at the Cooper's Beach project site was generally completed in January 2011 according to the *Shoreline Restoration, Wetland Restoration, Clearing and Grading Permit* Plan (revised June 15, 2010), prepared by The Watershed Company. Site visits for the initial baseline assessment were conducted by AOA and occurred on January 13, and February 3, 2011. Following the initial baseline review, the mitigation area was slightly revised to ensure compliance with SMC 21A.50.351(3)(b). Under this code section, no more than 25% of the total lake frontage may be used for shoreline access.

As depicted on the current as-built plan, the mitigation area has been revised such that the existing bulkhead to remain is now 60 feet in total length (i.e., 25% of the total 240 feet of lake frontage). The remaining 180 feet of shoreline has been planted and will remain in a natural condition. In addition, the northern edge of the mitigation area has been revised slightly to ensure a minimum 45-foot buffer (Photos 1 and 2).

Photo 1: Revised maximum 60-foot long bulkhead to remain.

Photo 2: Revised log along northern edge of mitigation area (note darker bark coloration depicting revised location).

The large logs that have been placed along the 45-foot buffer boundary in lieu of fencing have been staked into the ground with re-bar to ensure that they will remain in place (Photo 3). In addition, the required critical areas sign on the 45-foot buffer boundary has also been installed (Photo 4).

Photo 3: Rebar stake through log along buffer boundary.

Photo 4: Installed critical area sign.

It is our understanding that the origin of the one remaining pipe in the northern portion of the site that discharges into the lake is likely from a rockery drain (Comment 1.e). The origin of this pipe will be confirmed during construction of the house and a plan will be designed to divert all water currently carried in this feature into the mitigation area during house construction.

The existing standpipe and drain line located along the northern edge of the mitigation area will be left in place for perpetuity or until such time as the upstream sediment problems are fixed (Comment 1.f). Since sediment from an off-site upstream ditch continues to erode and enter the on-site mitigation area, periodic maintenance may be required. It is our understanding that it is the subject property owner's intention to attempt to rectify this off-site condition. If the erosion is stabilized and the sediment source is eliminated or significantly reduced, then the standpipe and drain line could be removed.

The only plant substitution approved by The Watershed Company was that deer fern was substituted for lady fern. The revised as-built drawing for the site (**Figure 1**) depicts the actual location of the graded ponds and large woody debris placement. Grading was generally conducted per the approved plan, with some minor modifications in the southwest corner of the mitigation area to preserve two existing red alder trees. In addition, at our recommendation several of the conifers located within ponded areas were moved into drier portions of the mitigation site.

This as-built figure also includes the final total plant quantities and the location of the vegetation sample plots and photo-points. Dimensions were added to the as-built figure that reflect the approved mitigation boundaries and minor changes made in the field to ensure code compliance.

2.0 PERFORMANCE MONITORING

This report summarizes the baseline conditions encountered during our January 13, 2011 site review. The data collected during future site visits will be compared to the data collected during the baseline assessment.

Monitoring field reviews followed by preparation and submittal of annual summary reports will continue for a period of at least five years. This report, as well as future reports, will include: a) photo-documentation, b) estimates of percent vegetative cover, plant survival and undesirable species, c) wildlife usage, d) water quality, hydrology, and site stability, and e) an overall qualitative assessment of project success.

2.1 VEGETATION SAMPLE PLOTS AND PHOTO-POINT LOCATIONS

During the baseline assessment, three vegetation sample plots and three photo-point locations were established. These locations will continue to be monitored throughout the five-year performance monitoring period. Within the vegetation sample plot locations, all plant species will be recorded as well as relative percent cover of the dominant species within the vegetative strata. Photos will be taken throughout the monitoring period to document the general appearance and progress in plant community establishment. Review of the photos over time will provide a visual representation of success of the planting plan.

Attachment 1 contains photographs from the established photo-point locations.

2.2 VEGETATION DATA FROM SAMPLE PLOTS

VEGETATION SAMPLE PLOT 1 (Wetland Buffer)

Plant Species	Baseline
Western red cedar (*Thuja plicata*)	1
Douglas fir (*Pseudotsuga menziesii*)	1
Red flowering currant (*Ribes sanguineum*)	9
Tall Oregongrape (*Mahonia aquifolium*)	24
Red-osier dogwood (*Cornus sericea*)	3
Deer fern (*Blechnum spicant*)	5

SUMMARY OF PLOT 1 CONDITIONS

- Woody areal coverage of installed woody plants~20%
- Survival rate of installed plants: 100%
- No herbaceous vegetation coverage – plot entirely mulched.
- No invasive coverage.
- MAINTENANCE: Continue on-going routine maintenance.
- SUCCESS CRITERIA: This plot is currently meeting the approved success criteria for woody plant survival (see Section 2.5 below).

VEGETATION SAMPLE PLOT 2 (Southwest Wetland).

Plant Species	Baseline
Western red cedar (*Thuja plicata)*	1
Sitka willow (*Salix sitchensis*)	1
Sitka spruce (*Picea sitchensis*)	1
Nootka rose (*Rosa nutkana*)	4
Salmonberry (*Rubus spectabilis*)	5
Small-fruited bulrush (*Scirpus microcarpus*)	~20%
Watercress (*Rorippa nasturtium-aquaticum*)	~5%
Velvet grass (*Holcus lanatus*)	~5%

SUMMARY OF PLOT 2 CONDITIONS

- Woody areal coverage ~15%.
- Survival rate of installed plants: 100%
- Herbaceous coverage is ~30%.
- No significant invasive coverage (no control of velvet grass necessary).
- MAINTENANCE: Continue on-going routine maintenance.

- SUCCESS CRITERIA: This plot is currently meeting the approved success criteria for woody plant survival.

VEGETATION SAMPLE PLOT 3 (Southeast Wetland)

Plant Species	Baseline
Nootka rose (*Rosa nutkana*)	4
Red-osier dogwood (*Cornus sericea*)	11
Deer fern (*Blechnum spicant*)	4
Watercress (*Rorippa nasturtium-aquaticum*)	~25%
Dagger-leaf rush (*Juncus ensifolius*)	~25%
Mannagrass (*Glyceria* sp.)	~5%

SUMMARY OF PLOT 3 CONDITIONS

- Woody areal coverage ~15%.
- Survival rate of installed plants: 100%.
- Herbaceous coverage ~55%.
- No invasive coverage.
- MAINTENANCE: Continue on-going routine maintenance.
- SUCCESS CRITERIA: This plot is currently meeting the approved success criteria for woody plant survival.

2.3 WATER QUALITY AND HYDROLOGY

During each monitoring event, an assessment will be made of the water regime within the mitigation area to ensure that hydrological conditions within the wetland and buffer are suitable to support the desired native plant communities. General observations will also be made of the extent and depth of soil saturation or inundation.

Water quality will be assessed qualitatively; unless it is evident there is a serious problem. In such an event, water samples will be taken and analyzed in a laboratory for suspected pollutants. Results will be reported quantitatively. Qualitative assessments of water quality include:

- oil sheen or other surface films,
- abnormal color or odor,
- stressed or dead vegetation or aquatic fauna,
- turbidity.

Observations and evaluations will be made of slope and soil stability in the mitigation area. Any erosion or slumping of soils will be recorded and reported so that corrective measures may be taken.

At the time of the baseline field investigation, soils throughout the created wetland were generally saturated to the surface with shallow ponding observed within the graded depressions. Water quality appeared good and no significant erosion or other soil stability problems were observed within the mitigation area.

2.4 WILDLIFE

Wildlife species observed in the wetland and buffer areas (either by direct or direct means) will be identified and recorded during the monitoring events. Direct observations include actual sightings, while indirect observations include tracks, scat, nests, burrows, song, or other indicative signs.

Wildlife signs or observations at the Cooper's Beach site during the baseline review included the following: black-tailed deer (browse and scat), mallard, mole (uplift mounds), and American coot.

3.0 SUCCESS CRITERIA & CURRENT STATUS

The approved performance standards for the project as developed by The Watershed Company included:

- *100 percent survival of all planting during the first year of monitoring, 100 percent survival of trees during years 2-5, and an 80 percent survival of shrubs during years 2-5 of monitoring.*

- *80 percent survival of groundcover and emergent vegetation in year 2*

- *75 cover standard of groundcover and emergent vegetation by year 5*

It is assumed based on the approved maintenance requirements that invasive species will be controlled at levels below 15% coverage. At the time of the January 2011 baseline monitoring there was 100% survival of all planted species and invasive species coverage was well below the 15% coverage threshold. Therefore all of success criteria are currently being met.

4.0 SUMMARY & MONITORING SCHEDULE

Overall, the site is performing well and is currently meeting the defined success criteria for the project. With proper on-going maintenance, the site should continue to establish successfully.

Assuming approval by the City, the next long-term monitoring event is scheduled for the late spring of 2011. The next report will then be prepared following the fall 2011 site visit. Monitoring will continue twice yearly, with the submittal of annual reports.

Should you have any questions or would like to schedule a site review, please call Simone Oliver or me at (425) 333-4535.

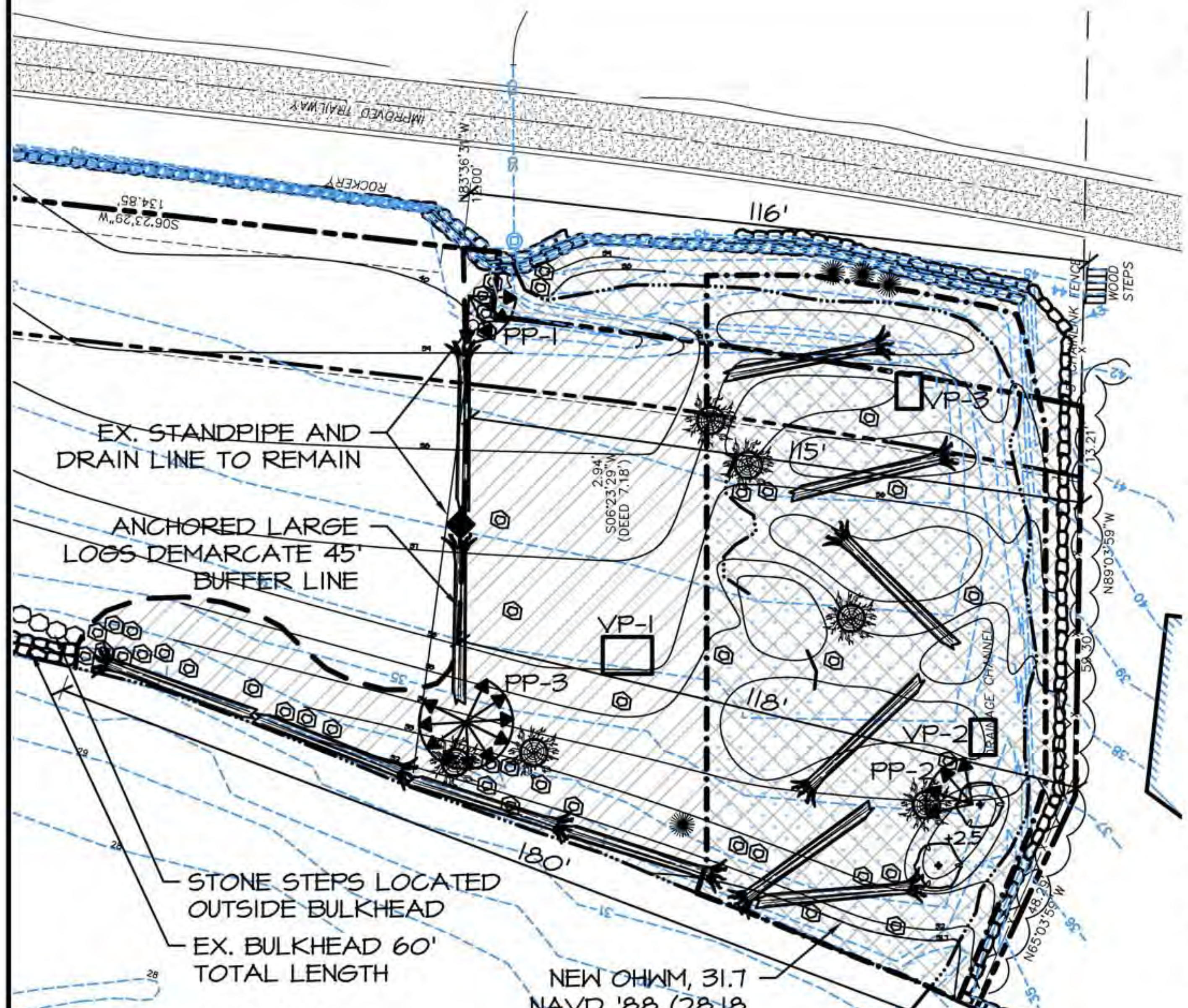
Sincerely,

ALTMANN OLIVER ASSOCIATES, LLC

John Altmann
Ecologist

Attachments
1. Photographs
2. Figure 1 - As-built

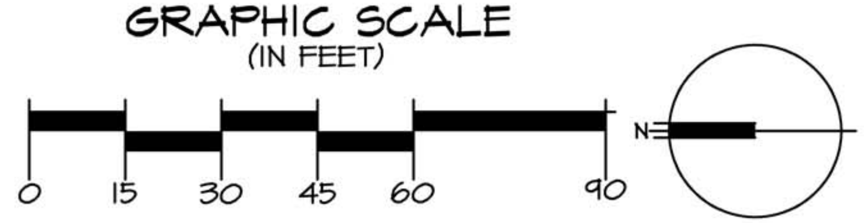
cc: Roger MacPherson



PLAN LEGEND

- PROPERTY LINE
- CREATED WETLAND
- APPROX. CENTERLINE OF STREAM
- BUFFER BOUNDARY
- ENHANCED STREAM/WETLAND (8,467 SF)
- ENHANCED BUFFER (5,783 SF)
- WOODY DEBRIS
- EXISTING STUMP
- EXISTING WILLOW
- EXISTING RED ALDER
- EXISTING BOULDER
- PP-# APPROX. LOCATION OF PHOTO-POINTS
- VP-# APPROX. LOCATION OF VEGETATION SAMPLING PLOTS
- CRITICAL AREA SIGN

GRAPHIC SCALE
(IN FEET)



SCALE: 1:30

PLANT LIST

TREES

SCIENTIFIC NAME	COMMON NAME	TOTAL PROJECT QTY.	SIZE/SPACING
BETULA PAPYRIFERA	PAPER BIRCH	3	2 GAL.
PICEA SITCHESIS	SITKA SPRUCE	2	2 GAL.
PSEUDOTSUGA MENSIEZII	DOUGLAS FIR	3	5 GAL.
THUJA PLICATA	WESTERN RED CEDAR	14	5 GAL.

SHRUBS

SCIENTIFIC NAME	COMMON NAME	TOTAL PROJECT QTY.	SIZE/SPACING
ACER CIRCINATUM	VINE MAPLE	23	2 GAL.
CORNUS SERICEA	RED-OSIER DOGWOOD	88	1 GAL.
CORYLUS CORNUTA	BEAKED HAZELNUT	5	2 GAL.
HOLODISCUS DISCOLOR	OCEAN SPRAY	7	1 GAL.
MAHONIA AQUIFOLLIUM	TALL OREGON GRAPE	35	2 GAL.
PHYSOCARPUS CAPITATUS	NINEBARK	29	1 GAL.
PRUNUS EMARGINATA	BITTER CHERRY	12	2 GAL.
RIBES SANGUINEUM	RED FLOWERING CURRENT	34	1 GAL.
ROSA NUTKANA	NOOTKA ROSE	34	1 GAL.
RUBUS SPECTABILIS	SALMONBERRY	25	1 GAL.
SALIX LASIANDRA	PACIFIC WILLOW	8	1 GAL.
SALIX SITCHENSIS	SITKA WILLOW	19	1 GAL.
SAMBUCUS RACEMOSA	RED ELDERBERRY	10	1 GAL.
VACCINIUM OVATUM	EVERGREEN HUCKLEBERRY	11	1 GAL.

PERENNIALS/GROUNDCOVER

SCIENTIFIC NAME	COMMON NAME	TOTAL PROJECT QTY.	SIZE/SPACING
BLECHUM SPICANT	DEER FERN	98	4" POTS
GAULTHERIA SHALLON	SALAL	30	1 GAL.
MAHONIA NERVOSA	LOW OREGON GRAPE	60	1 GAL.
POLYSTICHUM MUNITUM	SWORD FERN	53	4" POTS

EMERGENTS

SCIENTIFIC NAME	COMMON NAME	TOTAL PROJECT QTY.	SIZE/SPACING
ELEOCHARIS PALUSTRIS	SPIKERUSH	800	10 CU. IN POTS @ 18" O.C.
JUNCUS ENSIFOLIUS	DAGGER-LEAVED RUSH	240	10 CU. IN POTS @ 18" O.C.
SCIRPUS MICROCARPUS	SMALL-FRUITED BULRUSH	220	10 CU. IN POTS @ 18" O.C.
SCIRPUS LACUSTRIS	HARD-STEM BULRUSH	315	10 CU. IN POTS @ 24" O.C.

NOTES

1. BASE INFORMATION PROVIDED BY MACPHERSON CONSTRUCTION & DESIGN, (425) 391-3333.
2. SITE PLAN AND ORIGINAL DESIGN PREPARED BY THE WATERSHED COMPANY, KIRKLAND, WA, (425) 822-5242.
3. BASED ON APPROVED DRAWING 'SHORELINE RESTORATION, WETLAND RESTORATION, CLEARING AND GRADING PERMIT' DATED 6/15/2010, DRAWINGS 1-7 BY THE WATERSHED COMPANY.

PROJECT 3985
DRAWN SO
SCALE AS NOTED
DATE 02-08-11
REVISED 05-05-11
1/1

FIGURE 1: AS-BUILT MITIGATION PLAN
COOPER'S BEACH
42X EAST LAKE SAMMAMISH SHORE LANE NE
SAMMAMISH, WA 98074

Altmann Oliver Associates, LLC
AOA Environmental Planning & Landscape Architecture

3985-AB-05-05-11.dwg

Photo-point 1: View looking south.

Photo-point 1: View looking southwest.

Photo-point 1: View looking west.

Photo-point 2: View looking east.

Photo-point 2: View looking northeast.

Photo-point 2: View looking north.

Photo-point 3: View looking south.

Photo-point 3: View looking southwest.

Photo-point 3: View looking north.

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 11:01 AM
To: 'williamrissberger@comcast.net'
Subject: RE: ELST corrections

Dear William,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

From: williamrissberger@comcast.net [mailto:williamrissberger@comcast.net]
Sent: Thursday, January 26, 2017 4:46 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Cc: Valderrama, Ramiro <rvalderr2001@yahoo.com>
Subject: ELST corrections

January 26, 2017
Lindsey Ozbolt

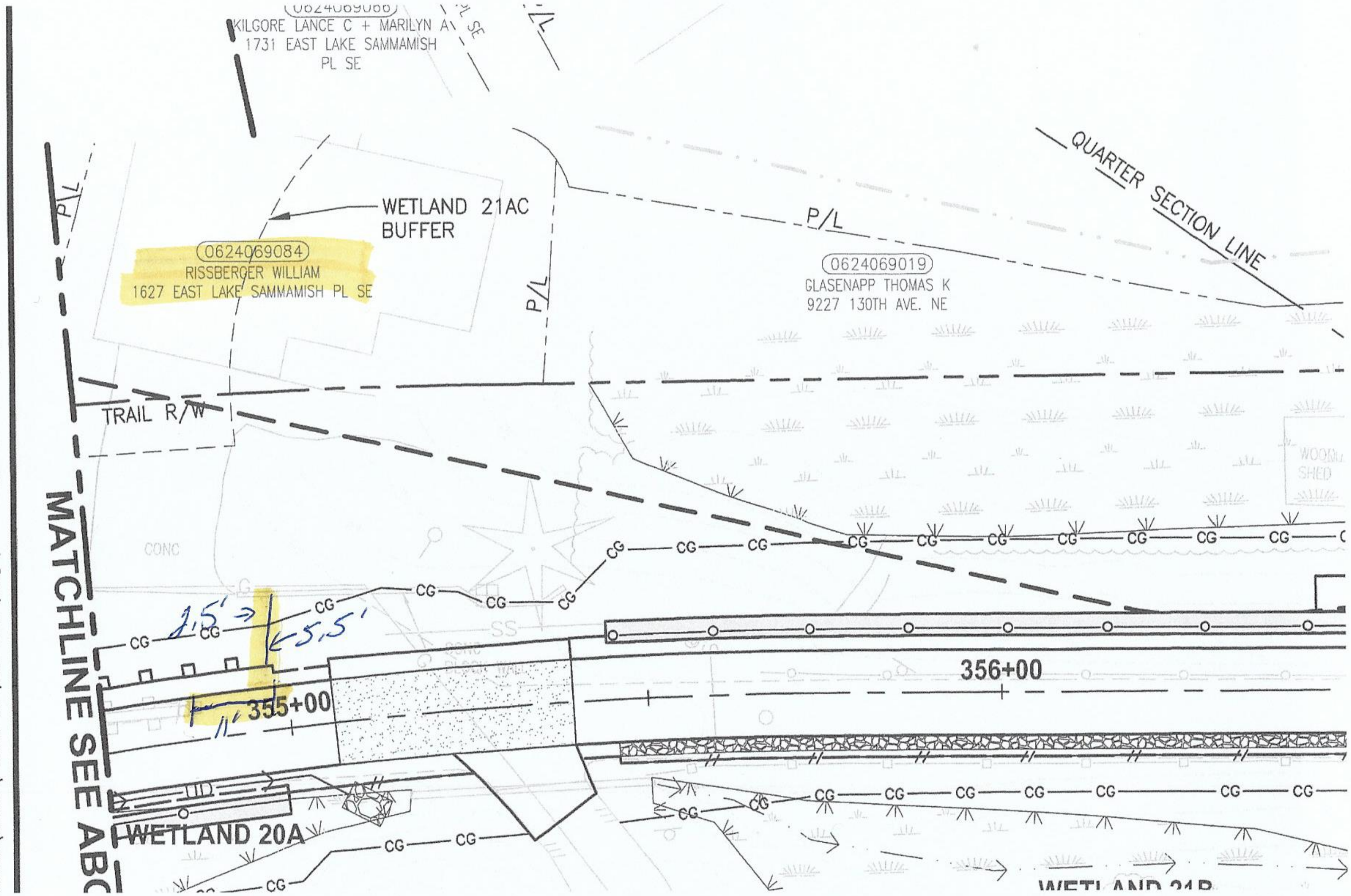
Associate Planner
City of Sammamish
Department of Community Development
LOzbolt@sammamish.us
425.295.0527
Lindsey,
Per our meeting with Kelly Donahue, King County Department of Natural Resources, I am sending you this letter to document two unacceptable errors at location 355 in the ELST 60% build plan. They are:

1. The proposed wood guardrail extending from 352 to 355 along the West side of the proposed trail is at least 3 feet too far west at point 355. It eliminates all vehicle access to my home and three neighbors during construction. It also eliminates access for basic emergency and commercial trucks to my home and my neighbors after construction is complete.
2. The same proposed wood guardrail extends approximately 11 feet too far to its Northern termination at 355. It eliminates access to my home and my neighbors during construction. It also eliminates access for basic emergency and commercial trucks to my home and my neighbors after construction is complete.

These errors must be corrected since I am sure you do not intend to block access to my home. The proposed wood guardrail will have to be moved East and shortened. It needs to follow the track of the existing wood guardrail or be East of it. I have attached 2 images to illustrate where errors are located and why they are unacceptable.
Please let me know the proper steps I can take to insure these errors are corrected in the final build plan.
Regards,
Bill
William Rissberger
1627 East Lake Sammamish PL SE
Sammamish, WA 98075
williamrissberger@comcast.net
cc: Ramiro Valderrama, RVALDERR2001@yahoo.com

William Rissberger
206-484-2759

9Svcs\CADD\Phase 19\T03 Civil\Dwg\ PLOTTED BY: purgabut DATE: Wednesday, October 12,



SB-262

Proposed CG line

Proposed Wood Barrier

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 11:00 AM
To: 'wuffer@comcast.net'
Subject: RE: Jim Wolfe Trail Comments

Dear Jim,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

From: wuffer@comcast.net [mailto:wuffer@comcast.net]
Sent: Thursday, January 26, 2017 4:30 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Jim Wolfe Trail Comments

Hi Lindsey,
I am attaching ten pages of PDF files with my comments and some diagrams and pix.
Please let me know that you got all ten.
Good luck with your work overload.
Thanks,
Jim

Review of Sammamish Trail Plans Near Location 457

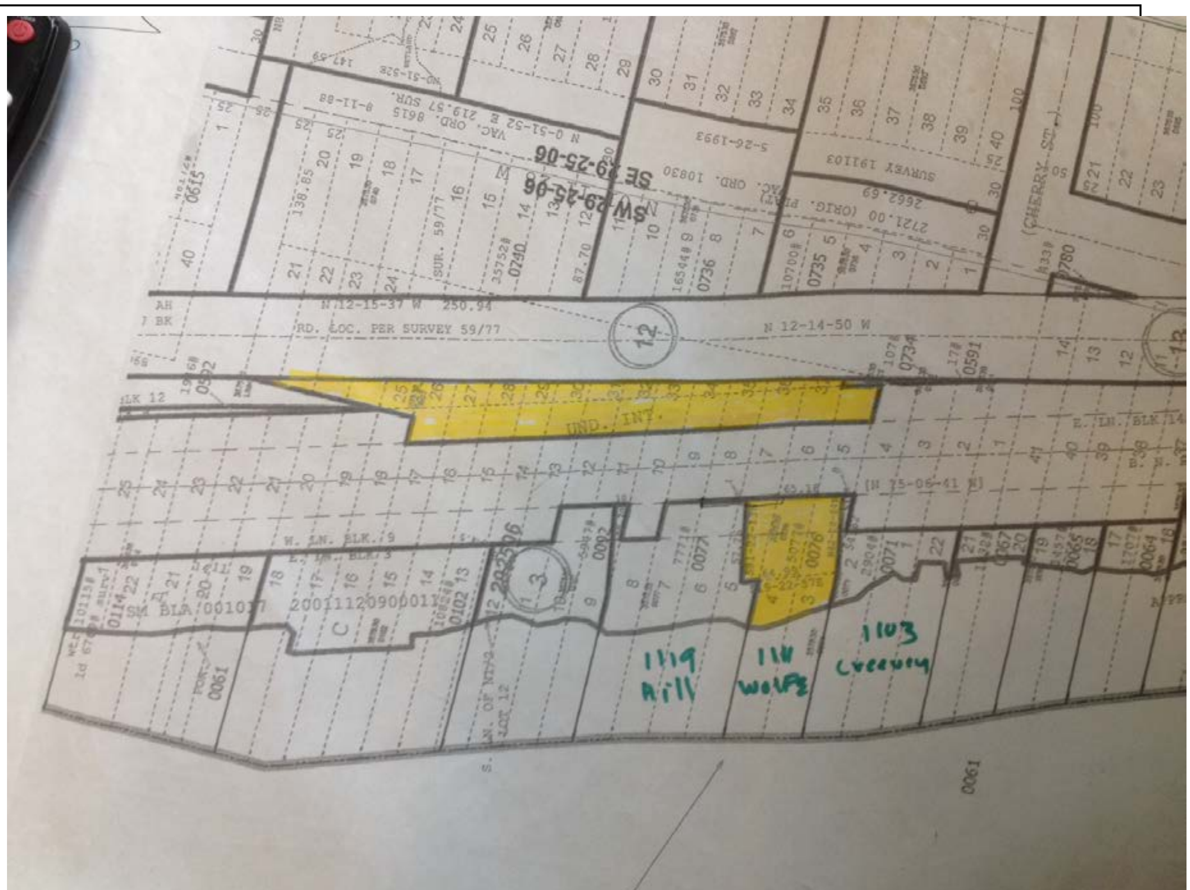
Submitted By: Jim Wolfe, 1111 E. Lk. Sammamish Pkwy NE

Submitted To: Lindsey Ozbolt, Associate Planner, City of Sammamish

Date: 1/26/2017

Item One: Ownership of Parking Lot

On the King County Tract Maps you will find parcel number **357530TRCT**. This parcel is jointly owned by myself and the two neighbors on either side of me. (Jim Creevey—1103 and Ty Hill—1119) This is our driveway and parking area. It is highlighted in yellow in this map:



Note that this parcel is 25’ from the centerline of the RR right of way. The current stakes put up by the County in this area indicate a 50’ right of way, which is wrong.

Jim Wolfe Review of Sammamish Trail Plans near 457—Page 2

Item Two: Carport

I have had a carport and storage shed combination which I have been using for at least 25 years. It is pictured here:

This carport houses two antique cars---1950 Willys Wagon and Jeepster. The shed has equipment which has to go into and out of my recording studio which is located in my house. The carport is built on a poured concrete foundation wall with a curb. The curb, at its nearest point to the centerline of the trail is 13 feet.

Jim Wolfe Review of Sammamish Trail Plans near 457—Page 3

Here is a picture showing a side view of the curb with the 13' marked in blue:

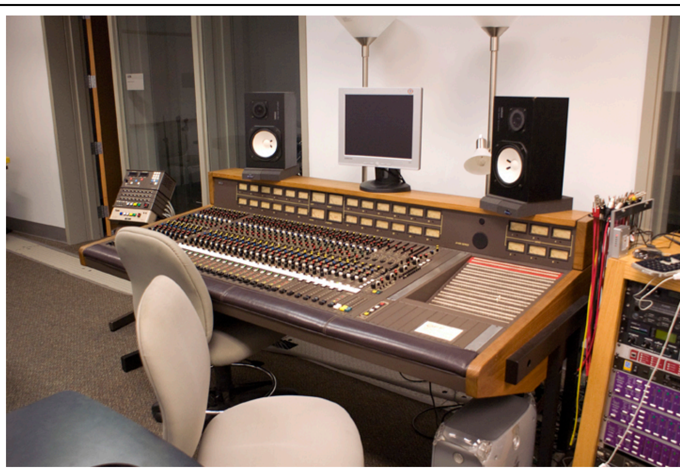
Note that the broken concrete upon which the poured foundation rests could be removed back to the 13' from centerline mark and that the structure would still be stable. This is also true for the parking area on the north side of Stair #82 which go from the parking lot to the trail. This would allow you to build a wall which starts at 10' from the centerline and which is up to 2' thick and still have room to leave my carport/shed. You could back fill from the broken concrete to the new wall. There is no need to remove the carport/shed. Keeping them where they are would not impact the trail in any way.

Item Three: Stair #82

On the 60% plans the county shows the elimination of my stairway which goes from my parking lot to the trail (Stair #82) as well as designing a 90 degree turn in the new stairs from the trail to my home (Stair #81). Neither of these design decisions are necessary and both would put my business at risk.

As stated earlier, I have a home recording studio and I bring equipment in and out of the house constantly. One recording machine which is currently stored in the shed next to the carport is a 24 track recorder which weighs around 500 pounds.

This machine has to be hauled down to my studio periodically. It would be nearly impossible to take it down without the current wide stairway from the parking lot to the trail. (Stair #82) In addition, on an almost daily basis musicians bring down heavy guitar amplifiers and drum kits. The existing wide stairway was made that way for a reason, and it is necessary for my business that it not be removed.



In addition, from time to time I need to bring in an MCI recording console pictured at the left. It weighs more than 600 pounds and is over six feet long. There is no way this console could ever be taken down the stairs with the 90 degree turn. (Stair #81) And the width of the upper stairs (Stair #82) makes negotiating the transport of this console possible.

Stairway discussion continued:

The edge of the bottom riser on Stair #82 going from the parking lot down to the trail is more than 15 feet away from the centerline. This would leave room for at least a 3 foot landing at the bottom of the stairs and that landing would still be more than 12 away from the centerline. There is no need or reason to remove these stairs—and from the discussion above you can see that removal of these stairs would have a severe financial impact on my home business.

Regarding Stair #81:

In addition, there is room for a stairway without a ninety degree turn to go from the trail down to my home (stair #81). There is plenty of linear space for a building code designed stairway to be installed there. From the previous discussion you can see that the currently designed stairway with the ninety degree turn would make it impossible for me to move large, heavy and expensive equipment in and out of my home recording business, which, again, would have a devastating effect on my main source of income.

In addition, because of the nearly constant transportation of heavy musical equipment into and out of my home recording studio, it is important for my clients and hired musicians to have access to my home and enough room for transporting their equipment *during the construction phase of this project* as well as when the trail is complete.

Anything that impedes this flow of equipment would have a severe negative impact on my business and my ability to make a living and would thus produce extreme hardship for me.

Jim Wolfe Review of Sammamish Trail Plans near 457—Page 6

Item Four: Discussion of Parking Requirements

Here is a picture of our driveway and parking lot looking toward the south.

As you can see, there is not a lot of room to maneuver cars in there. My neighbors to the north (Hill family) currently have 4 cars and there are 6 cars owned by those living in my home. Creevey, at the end of the driveway, owns 2 cars. So that's 12 full time cars before any guests or clients come.

Any trail design that allows any less parking than currently available would have a devastating effect on our ability to come and go and also would make it impossible for my clients and musicians to have any place to park to unload equipment. The next part of this discussion will be about the wall on our parking lot side of the trail and how it impacts the parking situation. (Wall #35)

Jim Wolfe Review of Sammamish Trail Plans near 457—Page 7

Item Five: Discussion of Wall #35

Wall #35 is currently shown to be a structural earth wall. For purposes of maximizing our final parking area that wall needs to be as vertical as possible for the whole length of our driveway---that is, adjacent to my home and Hill's home.

To maximize our parking area, a Soldier Pile wall would work better since it can be vertical and not subtract useful space from our parking area.

In addition, as previously discussed, the existing broken concrete foundation could be removed as far back as the curb on our parking area (and also the curb on my carport) and this would allow a Soldier Pile wall to be constructed and then back filled to the line of the existing curb. This would allow you to have a fence at the top of the new wall and still allow our cars to park with our wheels up to the existing curb and the bodies of the cars to hang out past the curb and still not be touching your fence.

The following picture gives you a good idea what I'm talking about:

You can see the mark at 13 feet from the centerline of the trail. (Incidentally, I am an engineer and actually ran a line from two of your pink centerline stakes and measured from the straight line, so the 13 foot dimension is accurate within a couple inches.)
Our cars currently hang out past the curb. If the curb was left in place and a car hung out 3 feet past the curb, the bumper of the car would still be 10 from the centerline of the trail. This would give you room for a fence on top of your Soldier Pile wall without our cars touching it.

Item Six: Discussion of Stream

I have noted the location of this stream to several people with the county in the past but just today I had a discussion with one of the wetland consultants to whom the route of this stream is a mystery.

The stream which I am discussing comes under the parkway and shows up on our property in the parking area just to the north of the garage. It then goes underground in a pretty straight path towards the lake and may be heard bubbling next to the trail (on the east side) just about exactly west of where it appears in the parking lot.

Then it takes a mysterious path to its final destination on the beach in front of my house. From where it may be heard bubbling up near the Hill's home, it runs south in a buried culvert parallel to the trail under the broken concrete that supports the parking area.

It takes a turn to the west somewhere around 456 + 60 and continues underground toward the lake. It comes out on the beach in front of my house and fills a pond which continuously flows into the lake.

I have lived in my home since 1978 and this stream has never dried up.

Care will have to be taken not to disturb the flow of this stream. At one time the stream backed up on the lake side due to sand and rocks being washed into the pipe in which the stream flows and my back yard flooded. Due to the current configuration of ponds in front of my residence this backing up can no longer happen.

Item Seven: Electricity in the parking area

There is currently power in the parking area. This power comes from my house and shows up at my carport. However I have no clear idea of how the electrical wires are routed under the old rail bed. I believe this power was put in when the water lines were installed, however I'm not sure. It is something that will need to be considered when the heavy equipment moves in.

Item Eight: Water and Sewer

Our water supply starts up on the parkway and is routed to a distribution box in our parking area, just to the south of the tan shed. This box is often overgrown with blackberry bushes and is not obvious. From there, the high pressure lines cross the parking area and travel under the rail bed and supply Creevey and myself. I mention that these are high pressure lines because both Creevey and I use pressure reducing valves down at our residences, but the lines in the parking lot are upstream from the PRVs.

In the past we have had problems with large construction equipment causing one of these supply lines to rupture and we incurred quite a bit of expense in fixing the problem.

It hasn't been an issue for many years, but the heavy equipment that will be used for trail construction might prove to be a problem, expecially if the exact location of the water lines is not mapped out exactly.

In addition, we are on a pumping sewer system and so waste runs back under the old rail bed and up to the main sewer lines along the parkway. I know that this happens everywhere on the east side, but I just want to be on record as having some concern that the sewer lines not be disturbed, just as I am concerned with the electrical and water.

Item Nine: Clearing and Grubbing

I understand that the CG line will have to extend around the new stairway from the trail to my residence (Stair #81), however there is no need to have the CG line come down into my yard nearly as far as it is currently shown. I have several trees within the current CG line that I would like to preserve.

In fact the current drawing shows the CG line at the bottom of Stair 81 to be 30 feet from the centerline and your property only extends 25 feet in that direction.

In addition, on the parking lot side of the trail the CG line is shown as over 20 feet from the centerline. There is no reason for this much width along our parking area.

Jim Wolfe Review of Sammamish Trail Plans near 457—Page 10

Item 10: Unnamed Stream #13

The City of Sammamish has regulations about trails crossing wetland buffers. The buffer for Unnamed Stream #13 includes all of the area next to my property where the trail runs. I would like a clarification from the City and the County as to what the requirements are for the trail passing through a stream buffer and want to see how the County addresses the City's requirements.

That concludes my Review of the Sammamish Trail Plans.

I may be reached by phone at:

425-241-7234

I may be reached by email at:

wuffer@comcast.net

I may be reached by mail at:

1111 E. Lk. Sammamish Pkwy NE
Sammamish WA 98074

I hope that I have clearly discussed the many problems I have with the current 60% trail design.

I would like to be contacted by a representative of the County to discuss some of these items in person at my property where it is easy to see the adverse consequences that the current 60% design would have on my business and my life.

Thank you for your consideration,

JIM WOLFE

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 11:00 AM
To: 'jalschul@gmail.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Joan,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Joan Alschuler [mailto:jalschul@gmail.com]
Sent: Thursday, January 26, 2017 4:28 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear City of Sammamish,

As a cyclist, I am so happy to learn of trails that are paved and thus safer for cyclists like me who like to ride on the safest surfaces possible due to 2 replaced hips. I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the trail permit, as submitted, so that users of all ages and abilities can safely use the trail. A trail built to national standards (AASHTO), that is 12 ft, plus 2 ft gravel shoulders, will allow for safe use by a variety of different users, including people who walk and bike.

As proposed in the permit, priority at trail crossings should be given to the trail and trail users. Consistent crossing priority is intuitive and safe for users of both the trail and the driveways and roads that cross the trail.

When complete, the trail will be an even greater community amenity, and provide a safe option for people who bike to travel to and through Sammamish. Please complete the trail.

Sincerely,

Joan Alschuler
23836 NE 126th PL
Redmond, WA 98053
608-239-5080

Lindsey Ozbolt

From:	Lindsey Ozbolt
Sent:	Friday, January 27, 2017 11:00 AM
To:	'Fred Mattison'
Subject:	RE: King County Trail File #SSDP2016-00415..Comments

Dear Fred,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

From: Fred Mattison [mailto:FredMattison@msn.com]
Sent: Thursday, January 26, 2017 4:16 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: King County Trail File #SSDP2016-00415..Comments

Hi Lindsey,
I reviewed the plans for the East Lake Sammamish Trail and have the following comments:
1) Tamarack and Many! other parcels in the area to the east of Louis Thompson Hill Road were created by King County prior to
the City of Sammamish being formed.
2) There was no overall drainage system or treatment system built to address the runoff from these areas that currently direct
runoff into Lake Sammamish.
3) The property owners have all been charged surface water management fees for years while no/minimal management of the
surface water from this area around Tamarack Louis Thompson Hill Road has occurred.
4) With the Tamarack Modeling/surface water management study being complete as of November, 2016 (see attached) and King
County's plan being dated September, 2016, it is clear that the drainage system that collects water near the trail, East Lake
Sammamish Parkway and limited drainage uphill near the Louis Thompson Hill Road has not been considered in the sizing of
the culvert/pipe from East Lake Sammamish Parkway to Lake Sammamish at station 436 + 30 where a 12" HDPE pipe is

scheduled to be installed. This pipe/outfall does not address the drainage challenges of the Tamarack area and future
density/parcels to be developed in the next 2- 10 years.

5) To develop the trail with a substandard drainage pipe running under it to the lake is a major step backwards.

6) Please do not settle for the current pipe sizing that does not address the current and future drainage needs of the area east of
Lake Sammamish Parkway at Louis Thompson Hill Road when the City of Sammamish has just completed several
runoff/drainage studies in the area.

7) It is time for King County to update and correct the drainage system rather than the City being responsible for the cost of this
improvement.

Thank You for all of your efforts that are in the best interest of the City of Sammamish and it's residents.

Call text or email if you need clarification.

We have been residents here for over 30 years. (prior to Sammamish)

Thank You!

Fred Mattison
21319 SE 1ST
Sammamish, WA 98074
206-947-4639 phone
fredmattison@msn.com email

OSBORN CONSULTING INCORPORATED

1800 112th Avenue NE Suite 220-E | Bellevue, WA 98004 | P: 425.451.4009 | F: 425.451.4901

DATE	NOVEMBER 17, 2016
TO	BEN RESSLER, PROJECT ENGINEER, CITY OF SAMMAMISH
CC	
FROM	ROBERT PARISH, PE, PROJECT MANAGER, OSBORN CONSULTING, INC. JOSH VAN WIE, PE, PROJECT ENGINEER, OSBORN CONSULTING, INC.
SUBJECT	TAMARACK DRAINAGE IMPROVEMENT PROJECT – MODELING MEMORANDUM

INTRODUCTION

The Tamarack subdivision is located on the west side of the City of Sammamish near Lake Sammamish. The subdivision contains properties in the area near NE 4th Street between 208th Avenue NE and 212th Avenue NE.

A portion of the storm runoff from the Tamarack subdivision flows west, and is combined with flows from residential properties located between the Tamarack subdivision and the intersection of East Lake Sammamish Parkway and Louis Thompson Road NE. This combined area is referred to as the "Project Basin" in this report. The Project Basin is located within the larger Monohon Drainage Basin. The remaining flows from the Tamarack subdivision not included in the Project Basin flow either north to George Davis Creek in the Inglewood Basin, or flow south to contribute flow to Zackuse Creek. The areas flowing north and south were not studied as part of this report.

The Project Basin contributes flow to Lake Sammamish through a culvert at the intersection of East Lake Sammamish Parkway and Louis Thompson Road that is connected with an open channel to the lake. The basin is approximately 52 acres in size, and includes a system of storm drains, culverts, and ditches. Properties in the basin are zoned as R-4 residential, and land cover consists primarily of single family residential houses. Topography ranges in elevation from approximately 40 feet to 460 feet with slopes up to approximately 30% in the steepest areas.

The goal of this study is to use hydrologic and hydraulic modeling to assess the existing flows reaching Lake Sammamish and potential changes in peak flow due to future development in the Tamarack subdivision. Modeling was performed using the Western Washington Hydrology Model (WWHM) and the EPA Storm Water Management Model (SWMM) through the PCSWMM platform.

SUBBASIN DELINEATION

The Project Basin was divided into 8 subbasins for performing modeling calculations. Subbasin boundaries were delineated using King County and City of Sammamish GIS data including elevation contours, streams, drainage pipes, culverts, manholes, and catch basins. Subbasins were divided by choosing specific points in the stormwater conveyance system and separating out the land area that contributes flow to each point.

Site visits were performed to verify subbasin boundaries. Subbasin boundaries were confirmed by locating high points at the edge of subbasins and by visually locating pipes or culverts that redirected flow to create a basin boundary. The subbasin delineations can be seen in **Figure 1**.

Subbasin 4 is currently undeveloped, and consists of forested area. The remaining subbasins are developed, with the majority of lots built out as single family residential. A few individual undeveloped lots exist in Subbasins 2, 6, and 7.

WWHM MODEL

WWHM was used for computing runoff in each subbasin for three scenarios. The three scenarios included existing conditions, proposed conditions after drainage improvements, and future fully developed conditions. Additionally, WWHM was used to size several flow control facility options. Input data required for WWHM includes impervious and pervious cover, slopes, and soil types.

Slopes for each subbasin were calculated using GIS elevation contours. Slopes for the eight subbasins ranged from 6 to 29 percent, with an average slope of 17 percent. Soil information was taken from the Natural Resources Conservation Service Web Soil Survey, which compiles soil survey data from various sources. Soils in the Project Basin consist primarily of glacial outwash soils, which make up 86 percent of the basin. Some areas of glacial till are also present at the highest and lowest elevations in the basin. WWHM requires soils to be categorized as type A/B, type C, or saturated soils. Soil categories were assigned using the Stormwater Management Manual for Western Washington, which classifies the outwash soils in the basin as type A/B and the till soils as type C. Detailed soil information is provided in **Table 1**.

Existing Conditions

Existing impervious areas were calculated using aerial imagery databases available in ArcGIS software. The most recent imagery available was from July, 2013. Impervious areas were traced using ArcGIS, and roadway impervious areas were separated from parcel impervious areas. Impervious cover on parcels was assumed to be 70 percent building area and 30 percent driveway area based on aerial photographs. Separation of individual buildings, driveways, and other impervious is beyond the scope of this work. Pervious areas were assumed to be 100 percent lawn in developed subbasins. In Subbasin 4, which is undeveloped, pervious areas were assumed to be 100 percent forest based on aerial imagery and site visit observations.

Under existing conditions, runoff from Subbasins 7 and 8 is collected in an 8-inch drainage system located at NE 4th Street and is released to an open channel that passes through Subbasin 4. Soils in Subbasin 4 consist of glacial outwash, and are expected to have a higher infiltration capacity than till soils. Runoff from basins 7 and 8 was routed through Subbasin 4 using a lateral flow basin in WWHM to estimate the infiltration and remaining runoff that continues through Subbasin 4 to the outfall.

Proposed Conditions after Drainage Improvements

The proposed drainage improvements will collect surface runoff from Subbasins 7 and 8 and convey flows through the proposed pipes to the existing storm drains in Louis Thompson Road. In the proposed conditions model, runoff from subbasins 7 and 8 was routed directly to the outlet of Subbasin 4 rather than being routed onto the surface of Subbasin 4 through lateral basins. This eliminates the potential for infiltration that occurs under existing conditions as flows from Subbasins 7 and 8 pass through the natural open channel in Subbasin 4.

Future Fully Developed Conditions

Fully developed conditions were modeled to determine the total increase in flow that may occur in the system over time. Impervious areas were calculated assuming parcels will redevelop individually and increase impervious cover to the maximum allowable level. Developments in the Project Basin are required to use level 2 flow control standards according to the City of Sammamish flow control map. Under these standards, redevelopments with greater than 5,000 square feet new or replaced impervious surface are required to install flow control. For the WWHM model, it was assumed that any existing lots with less than 5,000 square feet impervious would redevelop and add impervious area to reach 5,000 square feet. This added a total of 2.12 acres of impervious area for an increase in impervious cover of approximately 4 percent over the entire Project Basin. In reality, future increases in impervious area may require construction of flow control facilities, particularly if the new impervious cover is in a critical drainage or erosion area. The Samm amish Municipal Code (SMC) outlines additional requirements for these areas in SMC 13.20.040. For the sake of this work, it was more conservative to assume that no flow control would be required in the future to estimate the greatest potential increase in flow through the system. A summary of existing and proposed conditions is provided in **Table 1**.

Subbasin 4 currently consists of a single large tract of land. The tract is expected to be subdivided and developed into residential lots in the future. The subdivision of the land for development will require installation of flow control meeting the level 2 standards for peak flows and flow durations. Subbasin 4 was modeled as forest, assuming that flow control will maintain predeveloped flows in the subbasin.

Table 1 | Summary of WWHM Parameters

Subbasin	Total Area (AC)	Existing Percent Impervious	Future Percent Impervious	Slope	Percent Outwash Soil	Percent Till Soil
1	2.15	38%	38%	6%	29%	71%
2	1.61	33%	48%	9%	62%	38%
3	14.07	49%	51%	19%	100%	0%
4	5.82	2%	0%	14%	100%	0%
5	2.70	48%	58%	17%	100%	0%
6	16.25	34%	41%	13%	100%	0%
7	2.22	40%	47%	29%	42%	58%
8	4.51	39%	44%	22%	85%	15%

Flow Control Facility Options

Several flow control options were modeled to determine required detention facility sized at different locations in the Project Basin. Flow control facilities were designed so flows to the basin outfall were less than or equal to existing flows for storm events ranging from the 2-year to 100-year events. The following facility options were investigated:

- Standard flow control vault downstream of Subbasins 7 and 8.
- Infiltration vault downstream of Subbasins 7 and 8
- Standard flow control vault downstream of Subbasin 4, assuming Subbasin 4 does not develop in the future.
- Standard flow control vault downstream of Subbasins 3 through 8, assuming Subbasin 4 does not develop in the future.

- Standard flow control vault downstream of Subbasins 3 through 8, assuming Subbasin 4 develops in the future and Subbasins 7 and 8 are piped to the outlet of Subbasin 4.

SWMM Model

SWMM was used to model flow from WWHM through the pipes and open channels in the lower part of the Project Basin. The drainage system for the model was constructed using survey data, record drawings, and field measurements. Pipes modeled in this study include the mainline pipes that extend from the downstream ends of Subbasins 3, 4, and 6 and continue toward Lake Sammamish through several open channel sections. The open channel sections include the ditch along Louis Thompson Road, and two channel sections near the Lake Sammamish outfall. A portion of the 8-inch drainage system in Subbasin 8 was also included. The model is meant primarily to provide an estimate of peak flows and velocities in the downstream end of the system. Because of the model's intended use, the full drainage system through the Project Basin was not included in the model.

Pipe invert elevations and lengths were taken primarily from survey data and record drawings. Survey data was used for the majority of pipes and culverts along Louis Thompson Road and for the pipes along NE 4th Street in Subbasin 8. Several areas of missing data were encountered for the pipes along Louis Thompson Road where existing manholes could not be located. Based on survey notes and site visits, it appears that existing manholes may have been paved over with asphalt. In these cases, pipe data was taken from record drawings. One area with missing data includes the pipes on the south side of Louis Thompson Road near the intersection with East Lake Sammamish Parkway NE. Record drawings show the system extending to the south along East Lake Sammamish Parkway NE and not connecting into the main drainage system. However, no pipes along East Lake Sammamish Parkway NE could be verified during the site visit, and it appears possible that the existing pipes do connect to the main system. The model was built assuming the pipes are connected to provide a more conservative estimate of flows. However, it should be noted that the future development will not alter the destination of any flows in the basin. The pipes used in the SWMM model can be seen in **Figure 3**.

Open channel and ditch areas were observed in the field to determine the bottom width, approximate side slope, and estimated channel roughness. Observations were taken at the ditch on the north side of Louis Thompson Drive and at the open channel section between East Lake Sammamish Parkway NE and the East Lake Sammamish Trail to the west of the roadway. The open channel that extends from the trail to Lake Sammamish could not be observed because the channel passes through private property that could not be accessed at the time of the site visit. Parameters for this channel were assigned using engineering judgement based upon the site photographs included as part of the Cooper Beach – Mitigation As built Memorandum (see attached).

Two existing detention systems were included in the model. One is a detention pond located at the Subbasin 5 outlet that provides flow control for the residences near the intersection of 207th Avenue NE and NE 3rd Street. The second is an inline detention pipe located in the 205th Avenue NE right-of-way near the intersection with Louis Thompson Road. Parameters for both detention systems and their orifices were taken from record drawings.

Flows for the SWMM model were taken from WWHM results for 100-year peak runoff. Flow from each subbasin was applied as a constant flow at the appropriate model node. Flows from Subbasin 3 were split between two nodes because a portion of flow from the subbasin does not reach the conveyance system until near the downstream end. The total flow was divided based on contributing area, with 80 percent assigned to the main drainage line and 20 percent assigned to the farthest downstream node in the subbasin.

Shear Stress Calculations

Shear stresses for the open channel at the Lake Sammamish outfall were calculated to determine the potential for erosion. The predicted shear stress for each scenario was calculated using equations developed for channel design by the Federal Highway Administration (Kilgore, 2005). The following equations were used for calculating shear stress applied by the modeled flow and permissible shear stress on the channel soil and vegetation:

$$\tau_0 = \gamma R S_0$$ (Applied shear stress, FHWA Equation 2.3)

$$\tau_p = \frac{\tau_{p,soil}}{(1-C_f)}\left(\frac{n}{n_s}\right)^2$$ (Permissible shear stress, FHWA Equation 4.7)

Values for flow rates, velocities and depths, and slopes were taken from the WWHM and SWMM models and used to calculate shear stress. Values for the grass cover factor and roughness were taken from the FHWA document or other literature sources. The bed material grain size where 75% of material is finer (i.e. D_{75}) was estimated to be 2 inches. This estimate was based on observations of the upstream channel near the trail and photos of the constructed channel provided in the Cooper Beach – Mitigation As built Memorandum.

Modeling Results

The peak flow results predicted by WWHM are provided in **Table 2**. Peak flows for the proposed drainage improvements increased only downstream of Subbasin 4. This is because flows from Subbasins 7 and 8 will no longer partially infiltrate into the channel in Subbasin 4, but will bypass the subbasin through the proposed drainage system. Peak flows for future fully developed conditions were greater than existing conditions due to increased impervious cover. Subbasins 2, 5, and 6 had flow increases of greater than 10 percent at the 100-year event. Subbasin 4 is predicted to have no significant change in flow due to expected installation of flow control during future development. This will ultimately depend on the design of the future development.

Table 2 | WWHM Modeled Peak Flows**

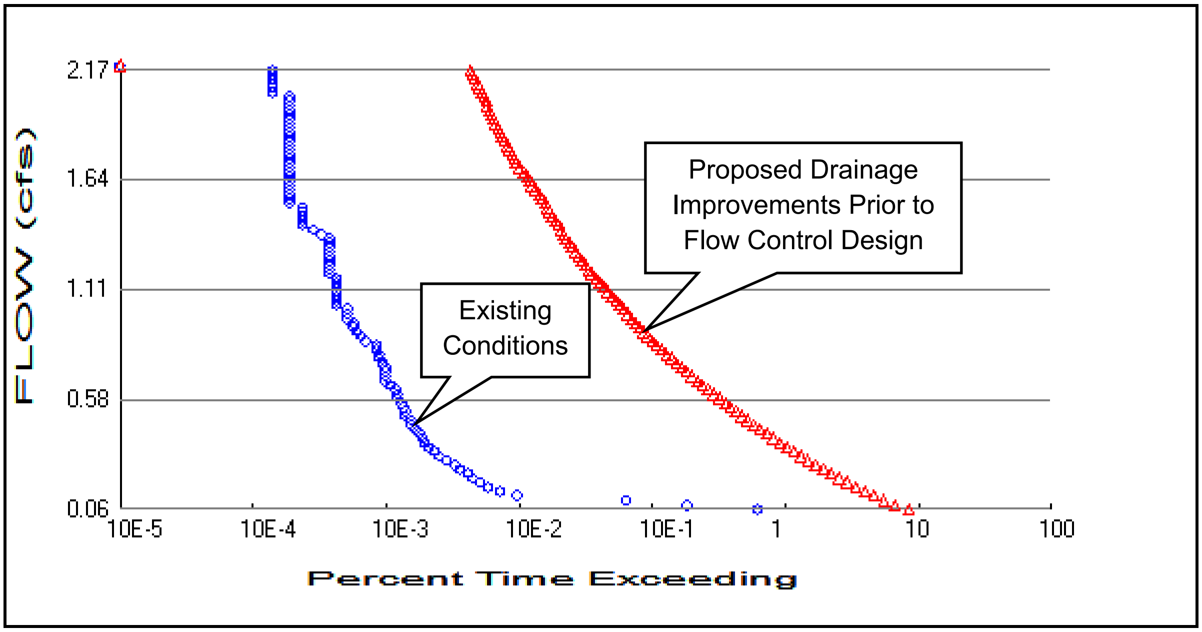
	Flows by Subbasin (CFS)					
Scenario	**1**	**2**	**3**	**4,7,8***	**5**	**6**
Existing 2-year	0.42	0.27	2.38	0.12	0.50	2.35
Existing 100-year	1.09	0.71	6.81	3.47	1.00	5.88
Proposed 2-year	0.42	0.27	2.38	2.05	0.50	2.35
Proposed 100-year	1.09	0.71	6.81	5.13	1.00	5.88
Future 2-year	0.42	0.36	2.52	2.15	0.57	2.73
Future 100-year	1.09	0.83	6.88	5.25	1.11	6.55

*For existing conditions, Subbasins 7 and 8 were modeled as lateral basins with total flow measured at the outlet of subbasin 4. For proposed conditions, Subbasins 7 and 8 were routed to the outlet of Subbasin 4 to simulate the proposed drainage system that will bypass Subbasin 4.

** These flows assumed no proposed detention

A comparison of flow durations for existing conditions and proposed drainage improvements is shown in **Figure 5**. Flows durations are expected to exceed the existing conditions . This exceedance is a result of the flows from Subbasins 7 and 8 being piped directly to the outlet of Subbasin 4, rather than being allowed to partially infiltrate in Subbasin 4. The exceedance in flow durations create an erosion concern for the small wetland and downstream channel sections near the Lake Sammamish outfall. Flow control to match existing durations will be needed as part of the proposed drainage improvements in order to protect the downstream channel.

Figure 5: Flow durations for existing conditions and proposed drainage improvements. Flow control will be required during the design phase to match existing durations.



The peak flows and velocities predicted by SWMM for the ditch and open channel sections are listed in **Table 3**. Flows at the Lake Sammamish outfall are estimated to increase from 17.7 CFS under existing conditions to 22.1 CFS under future conditions during the 100-yr event. This constitutes a 25 percent increase in flow at the outfall. The primary reason for the increase is that runoff from Subbasins 7 and 8 will not be infiltrated as it flows over Subbasin 4. A smaller portion of the increase is caused by a higher percentage of impervious cover in all subbasins.

Velocities along Louis Thompson Road are near 10 feet per second for both existing and future conditions at the 100-year event. The high velocities are caused by steep slopes in the roadside ditch and a grass lined channel without rock material to provide increased roughness. Existing velocities in the open channel sections near Lake Sammamish are predicted to be 3.8 feet per second at the 100-year event, and are predicted to increase slightly with the higher volume of flow in the future.

Table 3 | SWMM Modeled Peak Flows and Velocities				
Location	**Existing 100 year Peak Flow**	**Existing 100 year Velocity**	**Future 100 year Peak Flow**	**Future 100 year Velocity**
Ditch along Louis Thompson Road NE	7.3 cfs	9.0 ft/s	8.1 cfs	10.3 ft/s
Open Channel between East Lake Sammamish Parkway NE and pedestrian trail	17.7 cfs	6.0 ft/s	22.1 cfs	5.8 ft/s
Open Channel between pedestrian trail and Lake Sammamish outfall	17.7 cfs	3.8 ft/s	22.1 cfs	4.0 ft/s

The permissible shear stress at the outfall channel was calculated to be 1.27 lb/sf. Calculated shear stresses for each storm event under existing and proposed conditions are shown in **Table 4**. The shear stresses are not expected to increase dramatically, and all predicted shear stresses are below the permissible shear stress. Because the permissible shear stress is based on site photos rather than field observations, there is room for refining the permissible stress calculation. Additional study is recommended during the design phase to investigate any potential erosive channel concerns and verify the level of shear stress that is appropriate for the channel. However, because of the relatively minor change in shear stress due to increased flows, the future conditions are expected to be similar to the existing conditions. If the existing channel is functioning without erosion concerns, then the future conditions will not likely create additional concern.

Table 4 | Modeled Shear Stress at Outfall Channel			
Scenario	**Flow**	**Velocity**	**Shear Stress**
Existing 2-year	6.7 cfs	2.9 ft/s	0.57 lb/sf
Existing 100-year	17.7 cfs	3.8 ft/s	0.88 lb/sf
Future 2-year	9.4 cfs	3.2 ft/s	0.67 lb/sf
Future 100-year	22.1 cfs	4.0 ft/s	0.98 lb/sf

FLOW CONTROL OPTIONS

An approach to match the existing peak flows is to provide a detention or infiltration system. The flow control options are summarized below in **Table 5**. Length and width options for each vault were standardized to 20 feet wide and 7 feet deep to provide an easier comparison between options.

Detention Option #1 & #2: For future developed conditions, flows from Subbasins 7 and 8 before entering Subbasin 4 can be reduced to a minimal level by installing a very large detention vault on the order of 850 feet long (for a standard vault: Detention Option #1) to 500 feet long (for an infiltration vault: Detention Option #2) . However, even with one of these large-sized vaults, the peak flows at the Lake Sammamish outfall are predicted to increase at the 2-year and 100-year events. This is due to the modeled overall future increase in impervious cover through the other basins. In addition to not meeting the goal of matching existing flows at the Lake Sammamish outfall, these options are not likely be feasible due to the high cost and impractical size of the facilities. This option would not be further considered.

Detention Option #3: A similar reduction in flow could be obtained by installing a 50-foot long vault at the outlet of Subbasin 4. This option assumes that flows from Subbasins 7 and 8 are not piped across Subbasin 4 but are allowed to flow in an open channel that allows infiltration. As with Option #1 and #2, peak flows at the Lake Sammamish outfall are predicted to increase at the 2-year and 100-year events. This is due to the modeled overall future increase in impervious cover through the other basins. This option is feasible, but would not meet the goal of matching existing flows at the Lake Sammamish outfall. This option would not be further considered.

Detention Option #4 & #5: Two options for installing a vault downstream of Subbasins 3 through 8 are able to provide a reduction in peak flows to the Lake Sammamish outfall. These options would collect flow from over 90 percent of the total basin area. Detention Option #4 could be as small as 50-feet long if flows from Subbasins 7 and 8 are not piped across Subbasin 4 but are allowed to flow in an open channel that allows infiltration.

Detention Option #5 assumes that Subbasins 7 and 8 are piped down the hill through Subbasin 4, requiring a 200-foot long vault to provide an adequate reduction in peak flows to the Lake Sammamish outfall.

Table 5 | Flow Control Facility Summary

Flow Control Location	Vault Type	Size	Future 2 year Peak Flow at Lake Sammamish Outfall	Future 100 year Peak Flow at Lake Sammamish Outfall
Detention Option #1 Downstream of Subbasins 7 & 8	Standard	850ft L x 20ft W x 7ft H	10.1 cfs*	23.4 cfs*
Detention Option #2 Downstream of Subbasins 7 & 8	Infiltration Vault	500ft L x 20ft W x 7ft H	10.1 cfs*	23.4 cfs*
Detention Option #3 Downstream of Subbasin 4, assuming Subbasins 7 & 8 are **not** piped through Subbasin 4	Standard	50ft L x 20ft W x 7ft H	10.7 cfs*	23.9 cfs*
Detention Option #4 Downstream of Subbasins 3,4,5,6,7,8, assuming Subbasins 7 & 8 are **not** piped through Subbasin 4	Standard	50ft L x 20ft W x 7ft H	5.79 cfs	17.2 cfs
Detention Option #5 Downstream of Subbasins 3,4,5,6,7,8, assuming Subbasins 7 & 8 are piped through Subbasin 4	Standard	200ft L x 20ft W x 7ft H	5.88 cfs	17.1 cfs

* These flows exceed the existing flow at the Lake Sammamish outfall

CONCLUSION

This modeling study developed runoff estimates for 8 subbasins in the Project Basin for existing conditions, proposed drainage improvements, and future fully developed conditions. The proposed drainage improvements are not expected to trigger flow control requirements because new or replaced impervious surface will not be added. However, peak flows and flow durations are expected to increase at the Lake Sammamish outfall due to the change in conveyance for Subbasins 7 and 8 to be conveyed through storm drains rather than an open channel on Subbasins 4 that provides some infiltration. An additional increase in peak flows will occur at the outfall due to an expected increased impervious cover throughout the Project Basin as individual properties redevelop. Peak flows are expected to increase by as much as 25 percent at the outfall for future fully developed conditions.

Several flow control options were investigated to match or decrease peak flows to the outfall under future fully developed conditions with Subbasins 7 and 8 piped to Louis Thompson Road. Assuming that runoff will not be piped across Subbasins 4, then the most feasible option is a 50-foot long by 20-foot wide by 7-foot deep detention vault that would collect runoff from Subbasins 3 through 8, or roughly 90 percent of the Project Basin's total area. This vault would provide a reduction in peak flows to the outfall. The vault would need to be installed in the right-of-way somewhere near the intersection of Louis Thompson Road NE and 205th Avenue NE.

Flow control facilities have been sized to match or provide a reduction from existing peak flows at the Lake Sammamish outfall. If design progresses, flow durations should also be considered so that erosive flows at lower flow rates do not create a concern.

Detention will be required for any developments or redevelopments that trigger flow control requirements. To ensure that increases in impervious cover are mitigated in the future, the City should investigate whether updates to the existing drainage code would be beneficial.

The existing wetland area near the Lake Sammamish outfall must be protected according to drainage code requirements. This will include controlling the wetland's hydroperiod to maintain habitat for wetland plant and animal communities. A hydrologic assessment will be required during the design phase to ensure the proposed drainage improvements will match the existing volume and pattern of water stored in the wetland. This assessment would require a review of the exiting condition to approximate how much water the wetland currently receives.

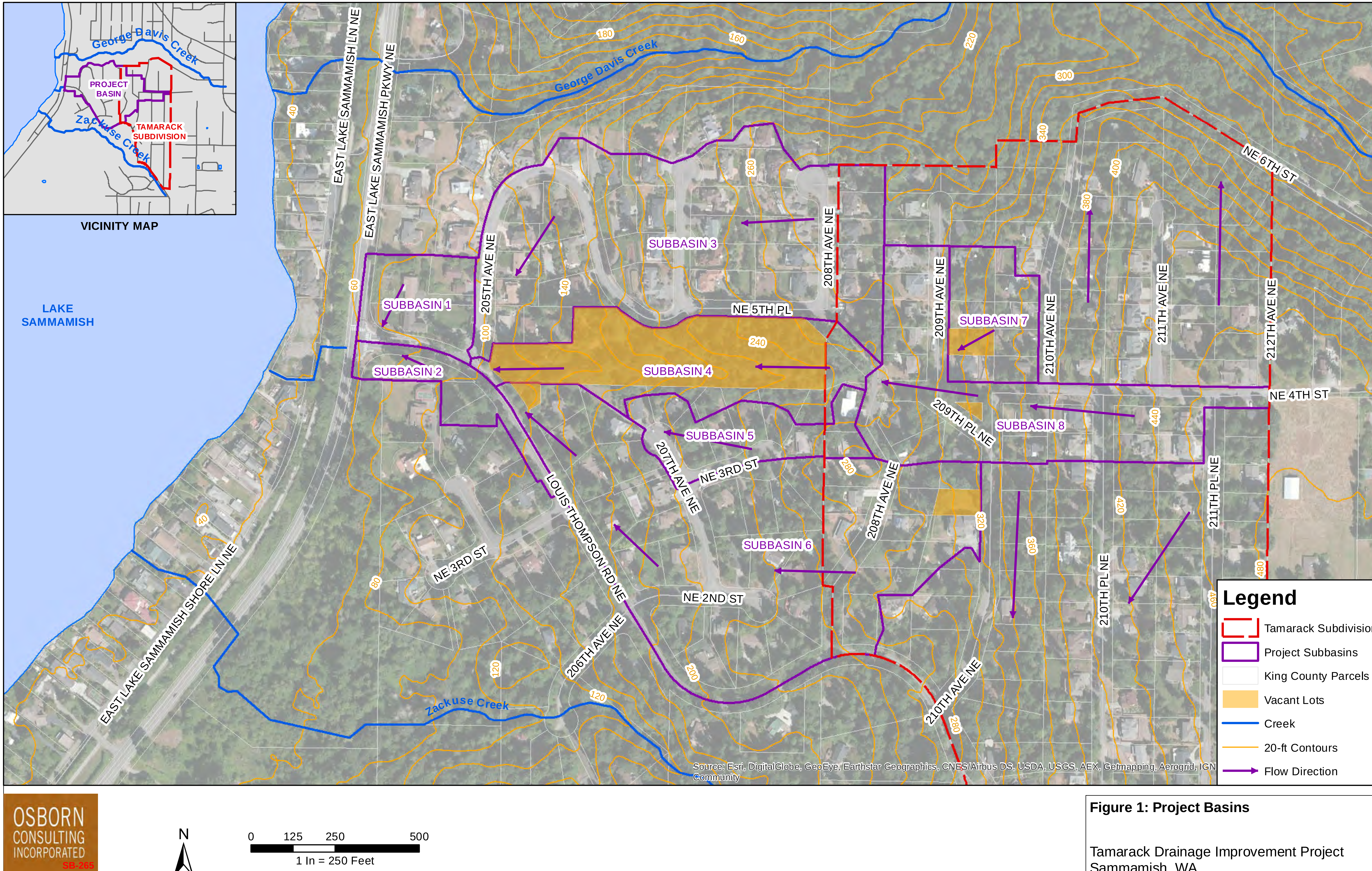
Additionally, it is recommended that the condition of the existing open channel be investigated prior to design and construction in Subbasin 4 to review wetland condition and erosion concerns and to document existing conditions.

REFERENCES

Kilgore, R.T. and Cotton, G.K., 2005, "Design of Roadside Channels with Flexible Linings," U.S. Department of Transportation, Federal Highway Administration, FHWA-NHI-05-114, Hydraulic Engineering Circular No. 15, Third Edition.

APPENDIX A

FIGURES



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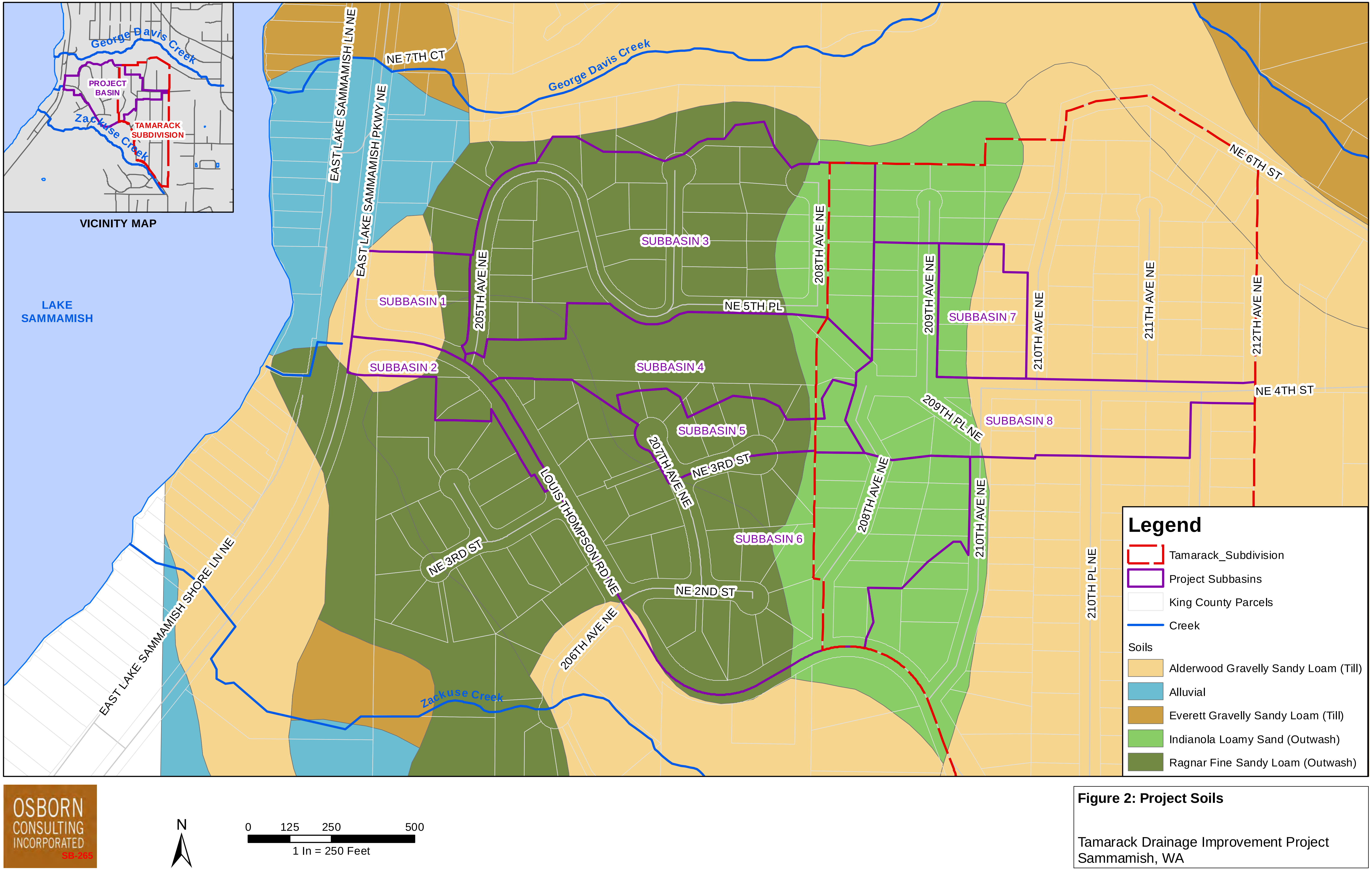
SB-265

Figure 1: Project Basins

Tamarack Drainage Improvement Project
Sammamish, WA



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SB-265

Figure 2: Project Soils

Tamarack Drainage Improvement Project
Sammamish, WA

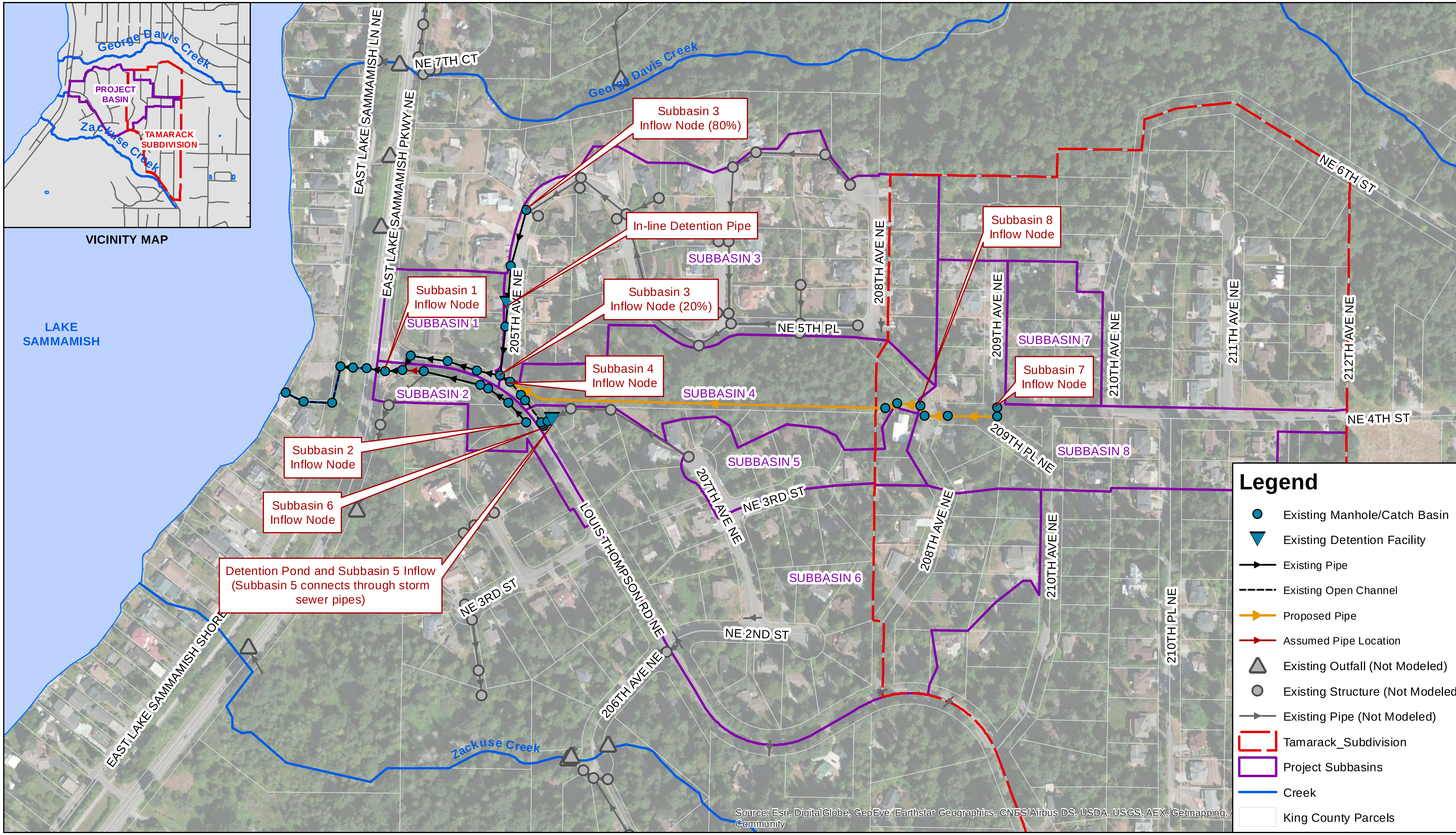

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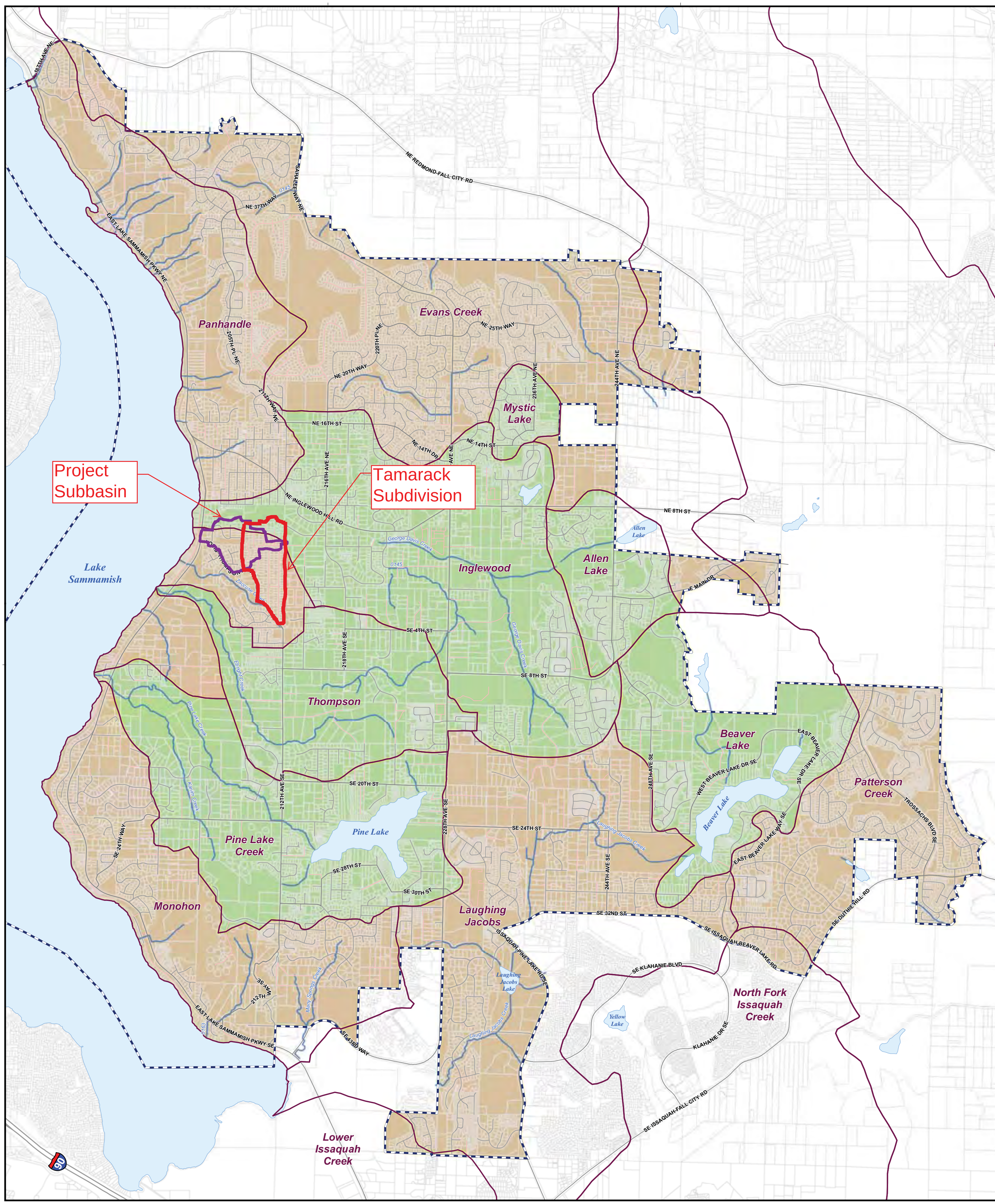
Figure 3: SWMM Model Diagram

Tamarack Drainage Improvement Project
Sammamish, WA



Conservation Flow Control (Level 2)

Flood Problem Flow Control (Level 3)

Drainage Basins

SB 265

Sammamish City Limits

Streets - Public

Streets - Private

Basin boundaries expressed on this map are approximate, and will need to be verified during the Downstream Analysis to determine the approximate flow control standard.

N

0 1,000 2,000 3,000 4,000 5,000 6,000 Feet

0 0.25 0.5 0.75 1 Miles

Flow Control Map

City of Sammamish

The information included on this map has been compiled from a variety of sources and is subject to change without notice.

1_FlowControl.mxd 12-17-2014

APPENDIX B

MODELING DOCUMENTATION

WWHM2012

PROJECT REPORT

Tamarack Project Basin
Proposed Drainage Improvements

General Model Information

Project Name:	Tamarack - Durations Existing
Site Name:	Tamarack Basin - Lateral Flow Basin
Site Address:	
City:	
Report Date:	5/23/2016
Gage:	Seatac
Data Start:	1948/10/01
Data End:	2009/09/30
Timestep:	15 Minute
Precip Scale:	1.00
Version Date:	2016/02/25
Version:	4.2.12

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year
Low Flow Threshold for POC2:	50 Percent of the 2 Year
High Flow Threshold for POC2:	50 Year
Low Flow Threshold for POC3:	50 Percent of the 2 Year
High Flow Threshold for POC3:	50 Year
Low Flow Threshold for POC4:	50 Percent of the 2 Year
High Flow Threshold for POC4:	50 Year
Low Flow Threshold for POC5:	50 Percent of the 2 Year
High Flow Threshold for POC5:	50 Year
Low Flow Threshold for POC6:	50 Percent of the 2 Year
High Flow Threshold for POC6:	50 Year
Low Flow Threshold for POC7:	50 Percent of the 2 Year
High Flow Threshold for POC7:	50 Year
Low Flow Threshold for POC8:	50 Percent of the 2 Year
High Flow Threshold for POC8:	50 Year

Landuse Basin Data
Predeveloped Land Use

Subbasin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Mod	0.39
C, Lawn, Mod	0.95
Pervious Total	1.34
Impervious Land Use	acre
ROADS MOD	0.35
ROOF TOPS FLAT	0.32
DRIVEWAYS MOD	0.14
Impervious Total	0.81
Basin Total	2.15

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 2

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Mod	0.67
C, Lawn, Mod	0.41
Pervious Total	1.08

Impervious Land Use	acre
ROADS MOD	0.42
ROOF TOPS FLAT	0.08
DRIVEWAYS MOD	0.04
Impervious Total	0.54
Basin Total	1.62

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 3A

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Steep	5.75
Pervious Total	5.75
Impervious Land Use	acre
ROADS STEEP	1.79
ROOF TOPS FLAT	2.6
DRIVEWAYS STEEP	1.11
Impervious Total	5.5
Basin Total	11.25

Element Flows To:

Surface	Interflow	Groundwater
Subbasin 3 Detention	Subbasin 3 Detention	

Subbasin 5

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Steep	1.39
Pervious Total	1.39
Impervious Land Use	acre
ROADS STEEP	0.52
ROOF TOPS FLAT	0.55
DRIVEWAYS STEEP	0.24
Impervious Total	1.31
Basin Total	2.7

Element Flows To:

Surface	Interflow	Groundwater
Subbasin 5 Detention	Subbasin 5 Detention	

Subbasin 6

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Mod	10.37
C, Lawn, Mod	0.04
Pervious Total	10.41
Impervious Land Use	acre
ROADS MOD	1.77
ROOF TOPS FLAT	2.59
DRIVEWAYS MOD	1.11
Impervious Total	5.47
Basin Total	15.88

Element Flows To:

Surface	Interflow	Groundwater

Basin 4 - Perv Lateral Flow

Bypass:	No	
GroundWater:	No	
Pervious Land Use	acre	
A B, Forest, Mod	5.73	
Element Flows To:		
Surface	Interflow	Groundwater

Basin 4,7,8 Imperv Lateral

Bypass:	No
Impervious Land Use	acre
ROADS MOD LAT	3.96

Element Flows To:

Outlet 1	Outlet 2
Basin 4 - Perv Lateral Flow	

Subbasin 8 - Perv Lateral Flow A/B

Bypass: No

GroundWater: No

Pervious Land Use	acre
A B, Lawn, Steep	2.33

Element Flows To:

Surface	Interflow	Groundwater
Basin 4 - Perv Lateral Flow	Basin 4 - Perv Lateral Flow	Basin 4 - Perv Lateral Flow

Subbasin 7 - Perv Lateral Flow C

Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Lawn, Steep	.86

Element Flows To:

Surface	Interflow	Groundwater
Basin 4 - Perv Lateral Flow	Basin 4 - Perv Lateral Flow	Basin 4 - Perv Lateral Flow

Subbasin 8 - Perv Lateral Flow C

Bypass:	No	
GroundWater:	No	
Pervious Land Use	acre	
C, Lawn, Steep	2.25	

Element Flows To:

Surface	Interflow	Groundwater
Basin 4 - Perv Lateral Flow	Basin 4 - Perv Lateral Flow	Basin 4 - Perv Lateral Flow

Subbasin 7 - Perv Lateral Flow A/B

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Steep	.59

Element Flows To:

Surface	Interflow	Groundwater
Basin 4 - Perv Lateral Flow	Basin 4 - Perv Lateral Flow	Basin 4 - Perv Lateral Flow

Subbasin 3B

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Steep	1.44
Pervious Total	1.44
Impervious Land Use	acre
ROADS STEEP	0.45
ROOF TOPS FLAT	0.65
DRIVEWAYS STEEP	0.28
Impervious Total	1.38
Basin Total	2.82

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Subbasin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Mod	0.39
C, Lawn, Mod	0.95
Pervious Total	1.34

Impervious Land Use	acre
ROADS MOD	0.35
ROOF TOPS FLAT	0.32
DRIVEWAYS MOD	0.14
Impervious Total	0.81
Basin Total	2.15

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 2

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Mod	0.67
C, Lawn, Mod	0.41
Pervious Total	1.08
Impervious Land Use	acre
ROADS MOD	0.42
ROOF TOPS FLAT	0.08
DRIVEWAYS MOD	0.04
Impervious Total	0.54
Basin Total	1.62

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 3A

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Steep	5.75
Pervious Total	5.75
Impervious Land Use	acre
ROADS STEEP	1.79
ROOF TOPS FLAT	2.6
DRIVEWAYS STEEP	1.11
Impervious Total	5.5
Basin Total	11.25

Element Flows To:

Surface	Interflow	Groundwater
Tank 1	Tank 1	

Subbasin 4

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Forest, Mod	5.73
Pervious Total	5.73
Impervious Land Use	acre
ROADS FLAT	0.06
ROOF TOPS FLAT	0.02
DRIVEWAYS MOD	0.01
Impervious Total	0.09
Basin Total	5.82

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 5

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Steep	1.39
Pervious Total	1.39
Impervious Land Use	acre
ROADS STEEP	0.52
ROOF TOPS FLAT	0.55
DRIVEWAYS STEEP	0.24
Impervious Total	1.31
Basin Total	2.7

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Subbasin 6

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Mod	10.37
C, Lawn, Mod	0.04
Pervious Total	10.41
Impervious Land Use	acre
ROADS MOD	1.77
ROOF TOPS FLAT	2.59
DRIVEWAYS MOD	1.11
Impervious Total	5.47
Basin Total	15.88

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 7

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Steep	0.59
C, Lawn, Steep	0.86
Pervious Total	1.45
Impervious Land Use	acre
ROOF TOPS FLAT	0.62
DRIVEWAYS STEEP	0.26
Impervious Total	0.88
Basin Total	2.33

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 8

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Steep	2.33
C, Lawn, Steep	2.25
Pervious Total	4.58
Impervious Land Use	acre
ROADS STEEP	1.78
ROOF TOPS FLAT	0.85
DRIVEWAYS STEEP	0.36
Impervious Total	2.99
Basin Total	7.57

Element Flows To:

Surface	Interflow	Groundwater

Basin 3B

Bypass: Yes

GroundWater: No

Pervious Land Use	acre
A B, Lawn, Steep	1.44
Pervious Total	1.44

Impervious Land Use	acre
ROADS STEEP	0.45
ROOF TOPS FLAT	0.65
DRIVEWAYS STEEP	0.28
Impervious Total	1.38

Basin Total	2.82

Element Flows To:

Surface	Interflow	Groundwater

Routing Elements
Predeveloped Routing

Subbasin 5 Detention

Bottom Length:	24.00 ft.	
Bottom Width:	24.00 ft.	
Depth:	8 ft.	
Volume at riser head:	0.1096 acre-feet.	
Side slope 1:	0.292 To 1	
Side slope 2:	0.292 To 1	
Side slope 3:	0.292 To 1	
Side slope 4:	0.292 To 1	
Discharge Structure		
Riser Height:	7 ft.	
Riser Diameter:	24 in.	
Orifice 1 Diameter:	5.75 in.	Elevation:0 ft.
Orifice 2 Diameter:	1 in.	Elevation:6.5 ft.
Element Flows To:		
Outlet 1	Outlet 2	

Pond Hydraulic Table

Stage(feet)	**Area(ac.)**	**Volume(ac-ft.)**	**Discharge(cfs)**	**Infilt(cfs)**
0.0000	0.013	0.000	0.000	0.000
0.0889	0.013	0.001	0.267	0.000
0.1778	0.013	0.002	0.378	0.000
0.2667	0.013	0.003	0.463	0.000
0.3556	0.013	0.004	0.535	0.000
0.4444	0.013	0.005	0.598	0.000
0.5333	0.013	0.007	0.655	0.000
0.6222	0.013	0.008	0.707	0.000
0.7111	0.013	0.009	0.756	0.000
0.8000	0.013	0.010	0.802	0.000
0.8889	0.013	0.012	0.845	0.000
0.9778	0.013	0.013	0.887	0.000
1.0667	0.013	0.014	0.926	0.000
1.1556	0.014	0.015	0.964	0.000
1.2444	0.014	0.017	1.000	0.000
1.3333	0.014	0.018	1.036	0.000
1.4222	0.014	0.019	1.070	0.000
1.5111	0.014	0.020	1.102	0.000
1.6000	0.014	0.022	1.134	0.000
1.6889	0.014	0.023	1.166	0.000
1.7778	0.014	0.024	1.196	0.000
1.8667	0.014	0.025	1.225	0.000
1.9556	0.014	0.027	1.254	0.000
2.0444	0.014	0.028	1.282	0.000
2.1333	0.014	0.029	1.310	0.000
2.2222	0.014	0.031	1.337	0.000
2.3111	0.014	0.032	1.364	0.000
2.4000	0.014	0.033	1.390	0.000
2.4889	0.014	0.034	1.415	0.000
2.5778	0.014	0.036	1.440	0.000
2.6667	0.015	0.037	1.465	0.000
2.7556	0.015	0.038	1.489	0.000

2.8444	0.015	0.040	1.513	0.000
2.9333	0.015	0.041	1.536	0.000
3.0222	0.015	0.043	1.559	0.000
3.1111	0.015	0.044	1.582	0.000
3.2000	0.015	0.045	1.605	0.000
3.2889	0.015	0.047	1.627	0.000
3.3778	0.015	0.048	1.649	0.000
3.4667	0.015	0.049	1.670	0.000
3.5556	0.015	0.051	1.691	0.000
3.6444	0.015	0.052	1.712	0.000
3.7333	0.015	0.054	1.733	0.000
3.8222	0.015	0.055	1.754	0.000
3.9111	0.015	0.056	1.774	0.000
4.0000	0.015	0.058	1.794	0.000
4.0889	0.016	0.059	1.814	0.000
4.1778	0.016	0.061	1.833	0.000
4.2667	0.016	0.062	1.853	0.000
4.3556	0.016	0.063	1.872	0.000
4.4444	0.016	0.065	1.891	0.000
4.5333	0.016	0.066	1.910	0.000
4.6222	0.016	0.068	1.928	0.000
4.7111	0.016	0.069	1.947	0.000
4.8000	0.016	0.071	1.965	0.000
4.8889	0.016	0.072	1.983	0.000
4.9778	0.016	0.074	2.001	0.000
5.0667	0.016	0.075	2.019	0.000
5.1556	0.016	0.077	2.037	0.000
5.2444	0.016	0.078	2.054	0.000
5.3333	0.016	0.080	2.072	0.000
5.4222	0.016	0.081	2.089	0.000
5.5111	0.017	0.083	2.106	0.000
5.6000	0.017	0.084	2.123	0.000
5.6889	0.017	0.086	2.140	0.000
5.7778	0.017	0.087	2.156	0.000
5.8667	0.017	0.089	2.173	0.000
5.9556	0.017	0.090	2.189	0.000
6.0444	0.017	0.092	2.205	0.000
6.1333	0.017	0.093	2.222	0.000
6.2222	0.017	0.095	2.238	0.000
6.3111	0.017	0.096	2.254	0.000
6.4000	0.017	0.098	2.269	0.000
6.4889	0.017	0.100	2.285	0.000
6.5778	0.017	0.101	2.308	0.000
6.6667	0.017	0.103	2.327	0.000
6.7556	0.017	0.104	2.345	0.000
6.8444	0.018	0.106	2.363	0.000
6.9333	0.018	0.108	2.380	0.000
7.0222	0.018	0.109	2.467	0.000
7.1111	0.018	0.111	3.198	0.000
7.2000	0.018	0.112	4.316	0.000
7.2889	0.018	0.114	5.685	0.000
7.3778	0.018	0.116	7.207	0.000
7.4667	0.018	0.117	8.785	0.000
7.5556	0.018	0.119	10.32	0.000
7.6444	0.018	0.121	11.71	0.000
7.7333	0.018	0.122	12.90	0.000
7.8222	0.018	0.124	13.83	0.000
7.9111	0.018	0.126	14.51	0.000

8.0000	0.018	0.127	15.03	0.000
8.0889	0.018	0.129	15.73	0.000

Subbasin 3 Detention

Dimensions
Depth: 6 ft.
Tank Type: Circular
Diameter: 6 ft.
Length: 171 ft.
Discharge Structure
Riser Height: 5 ft.
Riser Diameter: 24 in.
Orifice 1 Diameter: 3.17 in. Elevation:0 ft.
Element Flows To:
Outlet 1 Outlet 2

Tank Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.000	0.000	0.000	0.000
0.0667	0.004	0.000	0.070	0.000
0.1333	0.006	0.000	0.099	0.000
0.2000	0.008	0.001	0.122	0.000
0.2667	0.009	0.001	0.140	0.000
0.3333	0.010	0.002	0.157	0.000
0.4000	0.011	0.003	0.172	0.000
0.4667	0.012	0.004	0.186	0.000
0.5333	0.013	0.004	0.199	0.000
0.6000	0.014	0.005	0.211	0.000
0.6667	0.014	0.006	0.222	0.000
0.7333	0.015	0.007	0.233	0.000
0.8000	0.016	0.008	0.243	0.000
0.8667	0.016	0.009	0.253	0.000
0.9333	0.017	0.011	0.263	0.000
1.0000	0.017	0.012	0.272	0.000
1.0667	0.018	0.013	0.281	0.000
1.1333	0.018	0.014	0.290	0.000
1.2000	0.018	0.015	0.298	0.000
1.2667	0.019	0.017	0.306	0.000
1.3333	0.019	0.018	0.314	0.000
1.4000	0.019	0.019	0.322	0.000
1.4667	0.020	0.021	0.330	0.000
1.5333	0.020	0.022	0.337	0.000
1.6000	0.020	0.023	0.344	0.000
1.6667	0.021	0.025	0.352	0.000
1.7333	0.021	0.026	0.359	0.000
1.8000	0.021	0.028	0.365	0.000
1.8667	0.021	0.029	0.372	0.000
1.9333	0.022	0.030	0.379	0.000
2.0000	0.022	0.032	0.385	0.000
2.0667	0.022	0.033	0.392	0.000
2.1333	0.022	0.035	0.398	0.000
2.2000	0.022	0.036	0.404	0.000
2.2667	0.022	0.038	0.410	0.000
2.3333	0.023	0.039	0.416	0.000
2.4000	0.023	0.041	0.422	0.000
2.4667	0.023	0.043	0.428	0.000
2.5333	0.023	0.044	0.434	0.000
2.6000	0.023	0.046	0.439	0.000

2.6667	0.023	0.047	0.445	0.000
2.7333	0.023	0.049	0.450	0.000
2.8000	0.023	0.050	0.456	0.000
2.8667	0.023	0.052	0.461	0.000
2.9333	0.023	0.053	0.467	0.000
3.0000	0.023	0.055	0.472	0.000
3.0667	0.023	0.057	0.477	0.000
3.1333	0.023	0.058	0.482	0.000
3.2000	0.023	0.060	0.487	0.000
3.2667	0.023	0.061	0.492	0.000
3.3333	0.023	0.063	0.497	0.000
3.4000	0.023	0.064	0.502	0.000
3.4667	0.023	0.066	0.507	0.000
3.5333	0.023	0.068	0.512	0.000
3.6000	0.023	0.069	0.517	0.000
3.6667	0.023	0.071	0.522	0.000
3.7333	0.022	0.072	0.526	0.000
3.8000	0.022	0.074	0.531	0.000
3.8667	0.022	0.075	0.536	0.000
3.9333	0.022	0.077	0.540	0.000
4.0000	0.022	0.078	0.545	0.000
4.0667	0.022	0.080	0.549	0.000
4.1333	0.021	0.081	0.554	0.000
4.2000	0.021	0.083	0.558	0.000
4.2667	0.021	0.084	0.563	0.000
4.3333	0.021	0.085	0.567	0.000
4.4000	0.020	0.087	0.572	0.000
4.4667	0.020	0.088	0.576	0.000
4.5333	0.020	0.090	0.580	0.000
4.6000	0.019	0.091	0.584	0.000
4.6667	0.019	0.092	0.589	0.000
4.7333	0.019	0.093	0.593	0.000
4.8000	0.018	0.095	0.597	0.000
4.8667	0.018	0.096	0.601	0.000
4.9333	0.018	0.097	0.605	0.000
5.0000	0.017	0.098	0.609	0.000
5.0667	0.017	0.100	0.978	0.000
5.1333	0.016	0.101	1.648	0.000
5.2000	0.016	0.102	2.508	0.000
5.2667	0.015	0.103	3.508	0.000
5.3333	0.014	0.104	4.609	0.000
5.4000	0.014	0.105	5.768	0.000
5.4667	0.013	0.106	6.945	0.000
5.5333	0.012	0.107	8.097	0.000
5.6000	0.011	0.107	9.185	0.000
5.6667	0.010	0.108	10.17	0.000
5.7333	0.009	0.109	11.03	0.000
5.8000	0.008	0.109	11.74	0.000
5.8667	0.006	0.110	12.31	0.000
5.9333	0.004	0.110	12.76	0.000
6.0000	0.000	0.111	13.13	0.000
6.0667	0.000	0.000	13.68	0.000

Mitigated Routing

Tank 1

Dimensions
Depth: 6 ft.
Tank Type: Circular
Diameter: 6 ft.
Length: 171 ft.
Discharge Structure
Riser Height: 5 ft.
Riser Diameter: 24 in.
Orifice 1 Diameter: 3.17 in. Elevation:0 ft.
Element Flows To:
Outlet 1 Outlet 2

Tank Hydraulic Table

Stage(feet)	**Area(ac.)**	**Volume(ac-ft.)**	**Discharge(cfs)**	**Infilt(cfs)**
0.0000	0.000	0.000	0.000	0.000
0.0667	0.004	0.000	0.070	0.000
0.1333	0.006	0.000	0.099	0.000
0.2000	0.008	0.001	0.122	0.000
0.2667	0.009	0.001	0.140	0.000
0.3333	0.010	0.002	0.157	0.000
0.4000	0.011	0.003	0.172	0.000
0.4667	0.012	0.004	0.186	0.000
0.5333	0.013	0.004	0.199	0.000
0.6000	0.014	0.005	0.211	0.000
0.6667	0.014	0.006	0.222	0.000
0.7333	0.015	0.007	0.233	0.000
0.8000	0.016	0.008	0.243	0.000
0.8667	0.016	0.009	0.253	0.000
0.9333	0.017	0.011	0.263	0.000
1.0000	0.017	0.012	0.272	0.000
1.0667	0.018	0.013	0.281	0.000
1.1333	0.018	0.014	0.290	0.000
1.2000	0.018	0.015	0.298	0.000
1.2667	0.019	0.017	0.306	0.000
1.3333	0.019	0.018	0.314	0.000
1.4000	0.019	0.019	0.322	0.000
1.4667	0.020	0.021	0.330	0.000
1.5333	0.020	0.022	0.337	0.000
1.6000	0.020	0.023	0.344	0.000
1.6667	0.021	0.025	0.352	0.000
1.7333	0.021	0.026	0.359	0.000
1.8000	0.021	0.028	0.365	0.000
1.8667	0.021	0.029	0.372	0.000
1.9333	0.022	0.030	0.379	0.000
2.0000	0.022	0.032	0.385	0.000
2.0667	0.022	0.033	0.392	0.000
2.1333	0.022	0.035	0.398	0.000
2.2000	0.022	0.036	0.404	0.000
2.2667	0.022	0.038	0.410	0.000
2.3333	0.023	0.039	0.416	0.000
2.4000	0.023	0.041	0.422	0.000
2.4667	0.023	0.043	0.428	0.000

2.5333	0.023	0.044	0.434	0.000
2.6000	0.023	0.046	0.439	0.000
2.6667	0.023	0.047	0.445	0.000
2.7333	0.023	0.049	0.450	0.000
2.8000	0.023	0.050	0.456	0.000
2.8667	0.023	0.052	0.461	0.000
2.9333	0.023	0.053	0.467	0.000
3.0000	0.023	0.055	0.472	0.000
3.0667	0.023	0.057	0.477	0.000
3.1333	0.023	0.058	0.482	0.000
3.2000	0.023	0.060	0.487	0.000
3.2667	0.023	0.061	0.492	0.000
3.3333	0.023	0.063	0.497	0.000
3.4000	0.023	0.064	0.502	0.000
3.4667	0.023	0.066	0.507	0.000
3.5333	0.023	0.068	0.512	0.000
3.6000	0.023	0.069	0.517	0.000
3.6667	0.023	0.071	0.522	0.000
3.7333	0.022	0.072	0.526	0.000
3.8000	0.022	0.074	0.531	0.000
3.8667	0.022	0.075	0.536	0.000
3.9333	0.022	0.077	0.540	0.000
4.0000	0.022	0.078	0.545	0.000
4.0667	0.022	0.080	0.549	0.000
4.1333	0.021	0.081	0.554	0.000
4.2000	0.021	0.083	0.558	0.000
4.2667	0.021	0.084	0.563	0.000
4.3333	0.021	0.085	0.567	0.000
4.4000	0.020	0.087	0.572	0.000
4.4667	0.020	0.088	0.576	0.000
4.5333	0.020	0.090	0.580	0.000
4.6000	0.019	0.091	0.584	0.000
4.6667	0.019	0.092	0.589	0.000
4.7333	0.019	0.093	0.593	0.000
4.8000	0.018	0.095	0.597	0.000
4.8667	0.018	0.096	0.601	0.000
4.9333	0.018	0.097	0.605	0.000
5.0000	0.017	0.098	0.609	0.000
5.0667	0.017	0.100	0.978	0.000
5.1333	0.016	0.101	1.648	0.000
5.2000	0.016	0.102	2.508	0.000
5.2667	0.015	0.103	3.508	0.000
5.3333	0.014	0.104	4.609	0.000
5.4000	0.014	0.105	5.768	0.000
5.4667	0.013	0.106	6.945	0.000
5.5333	0.012	0.107	8.097	0.000
5.6000	0.011	0.107	9.185	0.000
5.6667	0.010	0.108	10.17	0.000
5.7333	0.009	0.109	11.03	0.000
5.8000	0.008	0.109	11.74	0.000
5.8667	0.006	0.110	12.31	0.000
5.9333	0.004	0.110	12.76	0.000
6.0000	0.000	0.111	13.13	0.000
6.0667	0.000	0.000	13.68	0.000

Trapezoidal Pond 1

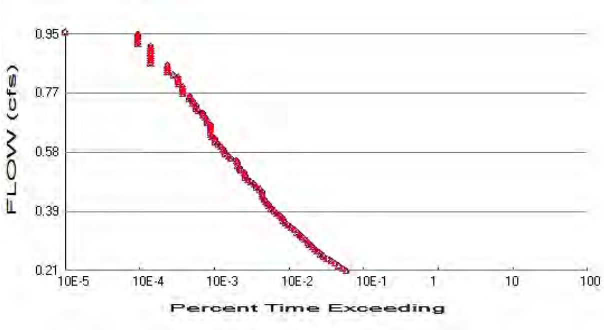
Bottom Length: 24.00 ft.
Bottom Width: 24.00 ft.
Depth: 8 ft.
Volume at riser head: 0.1096 acre-feet.
Side slope 1: 0.292 To 1
Side slope 2: 0.292 To 1
Side slope 3: 0.292 To 1
Side slope 4: 0.292 To 1
Discharge Structure
Riser Height: 7 ft.
Riser Diameter: 24 in.
Orifice 1 Diameter: 5.75 in. Elevation:0 ft.
Orifice 2 Diameter: 1 in. Elevation:6.5 ft.
Element Flows To:
Outlet 1 Outlet 2

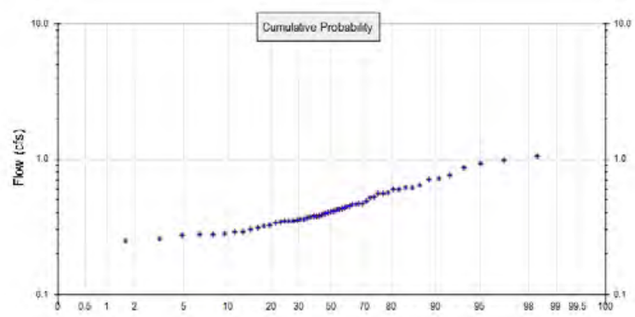
Pond Hydraulic Table

Stage(feet)	**Area(ac.)**	**Volume(ac-ft.)**	**Discharge(cfs)**	**Infilt(cfs)**
0.0000	0.013	0.000	0.000	0.000
0.0889	0.013	0.001	0.267	0.000
0.1778	0.013	0.002	0.378	0.000
0.2667	0.013	0.003	0.463	0.000
0.3556	0.013	0.004	0.535	0.000
0.4444	0.013	0.005	0.598	0.000
0.5333	0.013	0.007	0.655	0.000
0.6222	0.013	0.008	0.707	0.000
0.7111	0.013	0.009	0.756	0.000
0.8000	0.013	0.010	0.802	0.000
0.8889	0.013	0.012	0.845	0.000
0.9778	0.013	0.013	0.887	0.000
1.0667	0.013	0.014	0.926	0.000
1.1556	0.014	0.015	0.964	0.000
1.2444	0.014	0.017	1.000	0.000
1.3333	0.014	0.018	1.036	0.000
1.4222	0.014	0.019	1.070	0.000
1.5111	0.014	0.020	1.102	0.000
1.6000	0.014	0.022	1.134	0.000
1.6889	0.014	0.023	1.166	0.000
1.7778	0.014	0.024	1.196	0.000
1.8667	0.014	0.025	1.225	0.000
1.9556	0.014	0.027	1.254	0.000
2.0444	0.014	0.028	1.282	0.000
2.1333	0.014	0.029	1.310	0.000
2.2222	0.014	0.031	1.337	0.000
2.3111	0.014	0.032	1.364	0.000
2.4000	0.014	0.033	1.390	0.000
2.4889	0.014	0.034	1.415	0.000
2.5778	0.014	0.036	1.440	0.000
2.6667	0.015	0.037	1.465	0.000
2.7556	0.015	0.038	1.489	0.000
2.8444	0.015	0.040	1.513	0.000
2.9333	0.015	0.041	1.536	0.000
3.0222	0.015	0.043	1.559	0.000
3.1111	0.015	0.044	1.582	0.000

3.2000	0.015	0.045	1.605	0.000
3.2889	0.015	0.047	1.627	0.000
3.3778	0.015	0.048	1.649	0.000
3.4667	0.015	0.049	1.670	0.000
3.5556	0.015	0.051	1.691	0.000
3.6444	0.015	0.052	1.712	0.000
3.7333	0.015	0.054	1.733	0.000
3.8222	0.015	0.055	1.754	0.000
3.9111	0.015	0.056	1.774	0.000
4.0000	0.015	0.058	1.794	0.000
4.0889	0.016	0.059	1.814	0.000
4.1778	0.016	0.061	1.833	0.000
4.2667	0.016	0.062	1.853	0.000
4.3556	0.016	0.063	1.872	0.000
4.4444	0.016	0.065	1.891	0.000
4.5333	0.016	0.066	1.910	0.000
4.6222	0.016	0.068	1.928	0.000
4.7111	0.016	0.069	1.947	0.000
4.8000	0.016	0.071	1.965	0.000
4.8889	0.016	0.072	1.983	0.000
4.9778	0.016	0.074	2.001	0.000
5.0667	0.016	0.075	2.019	0.000
5.1556	0.016	0.077	2.037	0.000
5.2444	0.016	0.078	2.054	0.000
5.3333	0.016	0.080	2.072	0.000
5.4222	0.016	0.081	2.089	0.000
5.5111	0.017	0.083	2.106	0.000
5.6000	0.017	0.084	2.123	0.000
5.6889	0.017	0.086	2.140	0.000
5.7778	0.017	0.087	2.156	0.000
5.8667	0.017	0.089	2.173	0.000
5.9556	0.017	0.090	2.189	0.000
6.0444	0.017	0.092	2.205	0.000
6.1333	0.017	0.093	2.222	0.000
6.2222	0.017	0.095	2.238	0.000
6.3111	0.017	0.096	2.254	0.000
6.4000	0.017	0.098	2.269	0.000
6.4889	0.017	0.100	2.285	0.000
6.5778	0.017	0.101	2.308	0.000
6.6667	0.017	0.103	2.327	0.000
6.7556	0.017	0.104	2.345	0.000
6.8444	0.018	0.106	2.363	0.000
6.9333	0.018	0.108	2.380	0.000
7.0222	0.018	0.109	2.467	0.000
7.1111	0.018	0.111	3.198	0.000
7.2000	0.018	0.112	4.316	0.000
7.2889	0.018	0.114	5.685	0.000
7.3778	0.018	0.116	7.207	0.000
7.4667	0.018	0.117	8.785	0.000
7.5556	0.018	0.119	10.32	0.000
7.6444	0.018	0.121	11.71	0.000
7.7333	0.018	0.122	12.90	0.000
7.8222	0.018	0.124	13.83	0.000
7.9111	0.018	0.126	14.51	0.000
8.0000	0.018	0.127	15.03	0.000
8.0889	0.018	0.129	15.73	0.000

Analysis Results
POC 1





+ Predeveloped   x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 1.34
Total Impervious Area: 0.81

Mitigated Landuse Totals for POC #1
Total Pervious Area: 1.34
Total Impervious Area: 0.81

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.416796
5 year	0.567316
10 year	0.677895
25 year	0.830552
50 year	0.954007
100 year	1.086099

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.416796
5 year	0.567316
10 year	0.677895
25 year	0.830552
50 year	0.954007
100 year	1.086099

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1949	0.612	0.612
1950	0.594	0.594
1951	0.375	0.375
1952	0.249	0.249
1953	0.279	0.279
1954	0.341	0.341
1955	0.379	0.379
1956	0.346	0.346
1957	0.439	0.439
1958	0.321	0.321

1959	0.300	0.300
1960	0.393	0.393
1961	0.348	0.348
1962	0.274	0.274
1963	0.376	0.376
1964	0.324	0.324
1965	0.459	0.459
1966	0.282	0.282
1967	0.596	0.596
1968	0.613	0.613
1969	0.414	0.414
1970	0.386	0.386
1971	0.470	0.470
1972	0.559	0.559
1973	0.243	0.243
1974	0.459	0.459
1975	0.449	0.449
1976	0.356	0.356
1977	0.338	0.338
1978	0.425	0.425
1979	0.518	0.518
1980	0.717	0.717
1981	0.403	0.403
1982	0.637	0.637
1983	0.436	0.436
1984	0.289	0.289
1985	0.394	0.394
1986	0.366	0.366
1987	0.487	0.487
1988	0.277	0.277
1989	0.423	0.423
1990	1.046	1.046
1991	0.764	0.764
1992	0.309	0.309
1993	0.288	0.288
1994	0.258	0.258
1995	0.356	0.356
1996	0.561	0.561
1997	0.430	0.430
1998	0.377	0.377
1999	0.920	0.920
2000	0.410	0.410
2001	0.408	0.408
2002	0.554	0.554
2003	0.525	0.525
2004	0.856	0.856
2005	0.352	0.352
2006	0.349	0.349
2007	0.987	0.987
2008	0.711	0.711
2009	0.468	0.468

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	1.0458	1.0458
2	0.9867	0.9867
3	0.9201	0.9201

4	0.8561	0.8561
5	0.7635	0.7635
6	0.7165	0.7165
7	0.7114	0.7114
8	0.6369	0.6369
9	0.6132	0.6132
10	0.6116	0.6116
11	0.5962	0.5962
12	0.5937	0.5937
13	0.5615	0.5615
14	0.5589	0.5589
15	0.5537	0.5537
16	0.5252	0.5252
17	0.5181	0.5181
18	0.4874	0.4874
19	0.4696	0.4696
20	0.4685	0.4685
21	0.4595	0.4595
22	0.4590	0.4590
23	0.4494	0.4494
24	0.4394	0.4394
25	0.4358	0.4358
26	0.4304	0.4304
27	0.4251	0.4251
28	0.4234	0.4234
29	0.4141	0.4141
30	0.4101	0.4101
31	0.4077	0.4077
32	0.4025	0.4025
33	0.3944	0.3944
34	0.3933	0.3933
35	0.3861	0.3861
36	0.3787	0.3787
37	0.3767	0.3767
38	0.3759	0.3759
39	0.3748	0.3748
40	0.3662	0.3662
41	0.3562	0.3562
42	0.3559	0.3559
43	0.3525	0.3525
44	0.3487	0.3487
45	0.3483	0.3483
46	0.3461	0.3461
47	0.3406	0.3406
48	0.3377	0.3377
49	0.3242	0.3242
50	0.3207	0.3207
51	0.3093	0.3093
52	0.3002	0.3002
53	0.2886	0.2886
54	0.2876	0.2876
55	0.2824	0.2824
56	0.2786	0.2786
57	0.2767	0.2767
58	0.2740	0.2740
59	0.2579	0.2579
60	0.2488	0.2488
61	0.2429	0.2429

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.2084	1243	1243	100	Pass
0.2159	1126	1126	100	Pass
0.2235	985	985	100	Pass
0.2310	885	885	100	Pass
0.2385	786	786	100	Pass
0.2461	697	697	100	Pass
0.2536	625	625	100	Pass
0.2611	571	571	100	Pass
0.2686	515	515	100	Pass
0.2762	474	474	100	Pass
0.2837	443	443	100	Pass
0.2912	403	403	100	Pass
0.2988	379	379	100	Pass
0.3063	352	352	100	Pass
0.3138	321	321	100	Pass
0.3214	297	297	100	Pass
0.3289	274	274	100	Pass
0.3364	250	250	100	Pass
0.3440	229	229	100	Pass
0.3515	210	210	100	Pass
0.3590	190	190	100	Pass
0.3666	182	182	100	Pass
0.3741	172	172	100	Pass
0.3816	162	162	100	Pass
0.3892	148	148	100	Pass
0.3967	137	137	100	Pass
0.4042	124	124	100	Pass
0.4117	116	116	100	Pass
0.4193	110	110	100	Pass
0.4268	103	103	100	Pass
0.4343	100	100	100	Pass
0.4419	94	94	100	Pass
0.4494	93	93	100	Pass
0.4569	92	92	100	Pass
0.4645	87	87	100	Pass
0.4720	79	79	100	Pass
0.4795	73	73	100	Pass
0.4871	67	67	100	Pass
0.4946	60	60	100	Pass
0.5021	56	56	100	Pass
0.5097	55	55	100	Pass
0.5172	54	54	100	Pass
0.5247	48	48	100	Pass
0.5322	46	46	100	Pass
0.5398	44	44	100	Pass
0.5473	43	43	100	Pass
0.5548	42	42	100	Pass
0.5624	35	35	100	Pass
0.5699	33	33	100	Pass
0.5774	30	30	100	Pass
0.5850	29	29	100	Pass
0.5925	28	28	100	Pass
0.6000	26	26	100	Pass

0.6076	24	24	100	Pass
0.6151	22	22	100	Pass
0.6226	22	22	100	Pass
0.6302	20	20	100	Pass
0.6377	19	19	100	Pass
0.6452	19	19	100	Pass
0.6528	19	19	100	Pass
0.6603	19	19	100	Pass
0.6678	19	19	100	Pass
0.6753	17	17	100	Pass
0.6829	17	17	100	Pass
0.6904	16	16	100	Pass
0.6979	15	15	100	Pass
0.7055	15	15	100	Pass
0.7130	13	13	100	Pass
0.7205	12	12	100	Pass
0.7281	12	12	100	Pass
0.7356	11	11	100	Pass
0.7431	11	11	100	Pass
0.7507	10	10	100	Pass
0.7582	10	10	100	Pass
0.7657	8	8	100	Pass
0.7733	8	8	100	Pass
0.7808	8	8	100	Pass
0.7883	8	8	100	Pass
0.7958	7	7	100	Pass
0.8034	7	7	100	Pass
0.8109	7	7	100	Pass
0.8184	7	7	100	Pass
0.8260	6	6	100	Pass
0.8335	5	5	100	Pass
0.8410	5	5	100	Pass
0.8486	5	5	100	Pass
0.8561	5	5	100	Pass
0.8636	3	3	100	Pass
0.8712	3	3	100	Pass
0.8787	3	3	100	Pass
0.8862	3	3	100	Pass
0.8938	3	3	100	Pass
0.9013	3	3	100	Pass
0.9088	3	3	100	Pass
0.9163	3	3	100	Pass
0.9239	2	2	100	Pass
0.9314	2	2	100	Pass
0.9389	2	2	100	Pass
0.9465	2	2	100	Pass
0.9540	2	2	100	Pass

Water Quality

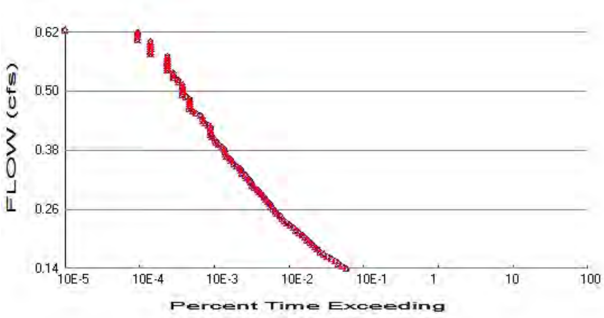
Water Quality BMP Flow and Volume for POC #1

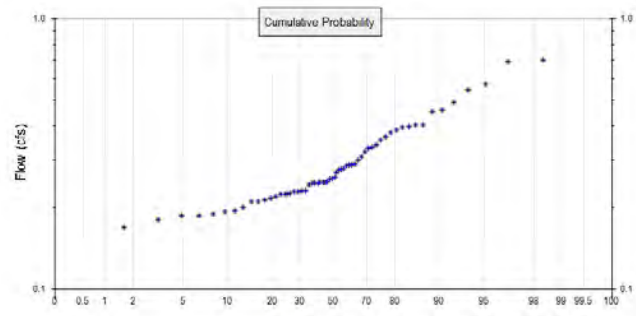
On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

POC 2





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #2
Total Pervious Area: 1.08
Total Impervious Area: 0.54

Mitigated Landuse Totals for POC #2
Total Pervious Area: 1.08
Total Impervious Area: 0.54

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #2

Return Period	**Flow(cfs)**
2 year	0.272287
5 year	0.368456
10 year	0.440235
25 year	0.540614
50 year	0.622745
100 year	0.71146

Flow Frequency Return Periods for Mitigated. POC #2

Return Period	**Flow(cfs)**
2 year	0.272287
5 year	0.368456
10 year	0.440235
25 year	0.540614
50 year	0.622745
100 year	0.71146

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #2

Year	**Predeveloped**	**Mitigated**
1949	0.378	0.378
1950	0.399	0.399
1951	0.247	0.247
1952	0.164	0.164
1953	0.189	0.189
1954	0.231	0.231
1955	0.249	0.249
1956	0.246	0.246
1957	0.270	0.270
1958	0.210	0.210
1959	0.210	0.210

1960	0.247	0.247
1961	0.224	0.224
1962	0.181	0.181
1963	0.243	0.243
1964	0.224	0.224
1965	0.285	0.285
1966	0.186	0.186
1967	0.405	0.405
1968	0.403	0.403
1969	0.254	0.254
1970	0.247	0.247
1971	0.300	0.300
1972	0.366	0.366
1973	0.169	0.169
1974	0.290	0.290
1975	0.275	0.275
1976	0.229	0.229
1977	0.220	0.220
1978	0.287	0.287
1979	0.355	0.355
1980	0.452	0.452
1981	0.256	0.256
1982	0.387	0.387
1983	0.287	0.287
1984	0.193	0.193
1985	0.248	0.248
1986	0.230	0.230
1987	0.322	0.322
1988	0.195	0.195
1989	0.308	0.308
1990	0.703	0.703
1991	0.489	0.489
1992	0.201	0.201
1993	0.213	0.213
1994	0.187	0.187
1995	0.229	0.229
1996	0.395	0.395
1997	0.278	0.278
1998	0.246	0.246
1999	0.574	0.574
2000	0.258	0.258
2001	0.279	0.279
2002	0.333	0.333
2003	0.340	0.340
2004	0.543	0.543
2005	0.216	0.216
2006	0.226	0.226
2007	0.692	0.692
2008	0.460	0.460
2009	0.331	0.331

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #2

Rank	**Predeveloped**	**Mitigated**
1	0.7030	0.7030
2	0.6916	0.6916
3	0.5737	0.5737
4	0.5428	0.5428

5	0.4887	0.4887
6	0.4598	0.4598
7	0.4521	0.4521
8	0.4053	0.4053
9	0.4035	0.4035
10	0.3990	0.3990
11	0.3949	0.3949
12	0.3871	0.3871
13	0.3783	0.3783
14	0.3659	0.3659
15	0.3551	0.3551
16	0.3400	0.3400
17	0.3326	0.3326
18	0.3306	0.3306
19	0.3219	0.3219
20	0.3085	0.3085
21	0.3004	0.3004
22	0.2896	0.2896
23	0.2871	0.2871
24	0.2870	0.2870
25	0.2849	0.2849
26	0.2793	0.2793
27	0.2780	0.2780
28	0.2749	0.2749
29	0.2705	0.2705
30	0.2578	0.2578
31	0.2561	0.2561
32	0.2541	0.2541
33	0.2487	0.2487
34	0.2476	0.2476
35	0.2472	0.2472
36	0.2469	0.2469
37	0.2466	0.2466
38	0.2464	0.2464
39	0.2458	0.2458
40	0.2427	0.2427
41	0.2312	0.2312
42	0.2302	0.2302
43	0.2294	0.2294
44	0.2290	0.2290
45	0.2259	0.2259
46	0.2245	0.2245
47	0.2235	0.2235
48	0.2198	0.2198
49	0.2159	0.2159
50	0.2133	0.2133
51	0.2102	0.2102
52	0.2098	0.2098
53	0.2005	0.2005
54	0.1951	0.1951
55	0.1926	0.1926
56	0.1893	0.1893
57	0.1867	0.1867
58	0.1864	0.1864
59	0.1806	0.1806
60	0.1694	0.1694
61	0.1636	0.1636

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.1361	1238	1238	100	Pass
0.1411	1100	1100	100	Pass
0.1460	992	992	100	Pass
0.1509	887	887	100	Pass
0.1558	786	786	100	Pass
0.1607	701	701	100	Pass
0.1656	622	622	100	Pass
0.1705	557	557	100	Pass
0.1755	512	512	100	Pass
0.1804	471	471	100	Pass
0.1853	442	442	100	Pass
0.1902	409	409	100	Pass
0.1951	377	377	100	Pass
0.2000	347	347	100	Pass
0.2050	319	319	100	Pass
0.2099	293	293	100	Pass
0.2148	266	266	100	Pass
0.2197	246	246	100	Pass
0.2246	221	221	100	Pass
0.2295	202	202	100	Pass
0.2344	185	185	100	Pass
0.2394	174	174	100	Pass
0.2443	161	161	100	Pass
0.2492	146	146	100	Pass
0.2541	140	140	100	Pass
0.2590	131	131	100	Pass
0.2639	125	125	100	Pass
0.2689	117	117	100	Pass
0.2738	111	111	100	Pass
0.2787	103	103	100	Pass
0.2836	99	99	100	Pass
0.2885	91	91	100	Pass
0.2934	85	85	100	Pass
0.2983	80	80	100	Pass
0.3033	73	73	100	Pass
0.3082	69	69	100	Pass
0.3131	65	65	100	Pass
0.3180	63	63	100	Pass
0.3229	58	58	100	Pass
0.3278	56	56	100	Pass
0.3328	51	51	100	Pass
0.3377	49	49	100	Pass
0.3426	46	46	100	Pass
0.3475	42	42	100	Pass
0.3524	39	39	100	Pass
0.3573	36	36	100	Pass
0.3622	34	34	100	Pass
0.3672	31	31	100	Pass
0.3721	30	30	100	Pass
0.3770	30	30	100	Pass
0.3819	29	29	100	Pass
0.3868	27	27	100	Pass
0.3917	24	24	100	Pass

0.3966	23	23	100	Pass
0.4016	22	22	100	Pass
0.4065	20	20	100	Pass
0.4114	19	19	100	Pass
0.4163	19	19	100	Pass
0.4212	19	19	100	Pass
0.4261	19	19	100	Pass
0.4311	18	18	100	Pass
0.4360	16	16	100	Pass
0.4409	15	15	100	Pass
0.4458	15	15	100	Pass
0.4507	14	14	100	Pass
0.4556	12	12	100	Pass
0.4605	11	11	100	Pass
0.4655	10	10	100	Pass
0.4704	10	10	100	Pass
0.4753	10	10	100	Pass
0.4802	10	10	100	Pass
0.4851	10	10	100	Pass
0.4900	9	9	100	Pass
0.4950	8	8	100	Pass
0.4999	8	8	100	Pass
0.5048	8	8	100	Pass
0.5097	8	8	100	Pass
0.5146	8	8	100	Pass
0.5195	7	7	100	Pass
0.5244	7	7	100	Pass
0.5294	6	6	100	Pass
0.5343	6	6	100	Pass
0.5392	6	6	100	Pass
0.5441	5	5	100	Pass
0.5490	5	5	100	Pass
0.5539	5	5	100	Pass
0.5588	5	5	100	Pass
0.5638	5	5	100	Pass
0.5687	5	5	100	Pass
0.5736	5	5	100	Pass
0.5785	3	3	100	Pass
0.5834	3	3	100	Pass
0.5883	3	3	100	Pass
0.5933	3	3	100	Pass
0.5982	3	3	100	Pass
0.6031	3	3	100	Pass
0.6080	2	2	100	Pass
0.6129	2	2	100	Pass
0.6178	2	2	100	Pass
0.6227	2	2	100	Pass

Water Quality

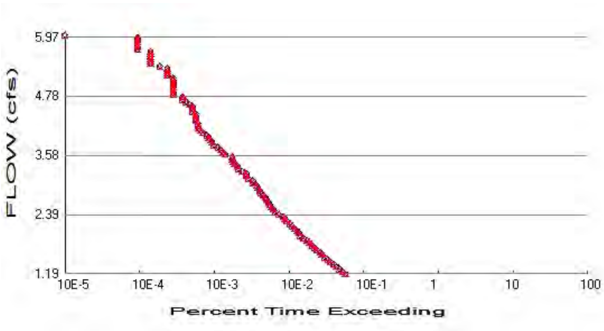
Water Quality BMP Flow and Volume for POC #2

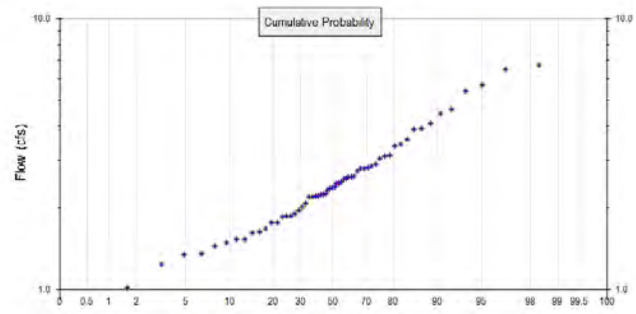
On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

POC 3





+ Predeveloped   x Mitigated

Predeveloped Landuse Totals for POC #3
Total Pervious Area: 7.19
Total Impervious Area: 6.88

Mitigated Landuse Totals for POC #3
Total Pervious Area: 7.19
Total Impervious Area: 6.88

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #3

Return Period	Flow(cfs)
2 year	2.378656
5 year	3.418804
10 year	4.165974
25 year	5.17525
50 year	5.974148
100 year	6.813226

Flow Frequency Return Periods for Mitigated. POC #3

Return Period	Flow(cfs)
2 year	2.378656
5 year	3.418804
10 year	4.165974
25 year	5.17525
50 year	5.974148
100 year	6.813226

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #3

Year	Predeveloped	Mitigated
1949	3.131	3.131
1950	3.894	3.894
1951	2.572	2.572
1952	1.864	1.864
1953	2.249	2.249
1954	1.528	1.528
1955	2.461	2.461
1956	2.259	2.259
1957	2.802	2.802
1958	1.530	1.530
1959	1.671	1.671

1960	2.456	2.456
1961	2.385	2.385
1962	1.236	1.236
1963	1.485	1.485
1964	1.866	1.866
1965	2.361	2.361
1966	1.958	1.958
1967	3.927	3.927
1968	2.625	2.625
1969	2.214	2.214
1970	1.901	1.901
1971	2.212	2.212
1972	3.043	3.043
1973	1.768	1.768
1974	1.613	1.613
1975	2.801	2.801
1976	1.625	1.625
1977	1.847	1.847
1978	2.731	2.731
1979	2.485	2.485
1980	2.564	2.564
1981	2.886	2.886
1982	4.085	4.085
1983	3.389	3.389
1984	1.441	1.441
1985	2.812	2.812
1986	2.374	2.374
1987	2.605	2.605
1988	2.198	2.198
1989	1.356	1.356
1990	6.720	6.720
1991	4.633	4.633
1992	2.016	2.016
1993	0.882	0.882
1994	1.011	1.011
1995	2.236	2.236
1996	3.582	3.582
1997	2.845	2.845
1998	1.757	1.757
1999	5.697	5.697
2000	2.598	2.598
2001	2.076	2.076
2002	3.439	3.439
2003	1.343	1.343
2004	5.407	5.407
2005	2.319	2.319
2006	2.196	2.196
2007	6.481	6.481
2008	4.449	4.449
2009	3.114	3.114

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #3

Rank	Predeveloped	Mitigated
1	6.7202	6.7202
2	6.4813	6.4813
3	5.6972	5.6972
4	5.4074	5.4074

5	4.6332	4.6332
6	4.4492	4.4492
7	4.0852	4.0852
8	3.9267	3.9267
9	3.8940	3.8940
10	3.5825	3.5825
11	3.4391	3.4391
12	3.3887	3.3887
13	3.1314	3.1314
14	3.1144	3.1144
15	3.0427	3.0427
16	2.8861	2.8861
17	2.8452	2.8452
18	2.8120	2.8120
19	2.8020	2.8020
20	2.8006	2.8006
21	2.7309	2.7309
22	2.6254	2.6254
23	2.6052	2.6052
24	2.5982	2.5982
25	2.5724	2.5724
26	2.5640	2.5640
27	2.4852	2.4852
28	2.4609	2.4609
29	2.4561	2.4561
30	2.3851	2.3851
31	2.3739	2.3739
32	2.3613	2.3613
33	2.3189	2.3189
34	2.2595	2.2595
35	2.2488	2.2488
36	2.2364	2.2364
37	2.2140	2.2140
38	2.2115	2.2115
39	2.1977	2.1977
40	2.1956	2.1956
41	2.0760	2.0760
42	2.0161	2.0161
43	1.9577	1.9577
44	1.9013	1.9013
45	1.8659	1.8659
46	1.8640	1.8640
47	1.8468	1.8468
48	1.7676	1.7676
49	1.7570	1.7570
50	1.6711	1.6711
51	1.6247	1.6247
52	1.6125	1.6125
53	1.5303	1.5303
54	1.5283	1.5283
55	1.4848	1.4848
56	1.4407	1.4407
57	1.3557	1.3557
58	1.3432	1.3432
59	1.2356	1.2356
60	1.0109	1.0109
61	0.8821	0.8821

Duration Flows
The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
1.1893	1220	1220	100	Pass
1.2377	1117	1117	100	Pass
1.2860	1029	1029	100	Pass
1.3343	923	923	100	Pass
1.3827	838	838	100	Pass
1.4310	763	763	100	Pass
1.4793	709	709	100	Pass
1.5276	635	635	100	Pass
1.5760	590	590	100	Pass
1.6243	553	553	100	Pass
1.6726	502	502	100	Pass
1.7210	470	470	100	Pass
1.7693	437	437	100	Pass
1.8176	405	405	100	Pass
1.8660	375	375	100	Pass
1.9143	333	333	100	Pass
1.9626	306	306	100	Pass
2.0110	287	287	100	Pass
2.0593	274	274	100	Pass
2.1076	254	254	100	Pass
2.1560	238	238	100	Pass
2.2043	222	222	100	Pass
2.2526	198	198	100	Pass
2.3010	189	189	100	Pass
2.3493	177	177	100	Pass
2.3976	157	157	100	Pass
2.4459	140	140	100	Pass
2.4943	131	131	100	Pass
2.5426	123	123	100	Pass
2.5909	117	117	100	Pass
2.6393	113	113	100	Pass
2.6876	106	106	100	Pass
2.7359	102	102	100	Pass
2.7843	96	96	100	Pass
2.8326	90	90	100	Pass
2.8809	87	87	100	Pass
2.9293	81	81	100	Pass
2.9776	79	79	100	Pass
3.0259	72	72	100	Pass
3.0743	70	70	100	Pass
3.1226	61	61	100	Pass
3.1709	57	57	100	Pass
3.2193	57	57	100	Pass
3.2676	51	51	100	Pass
3.3159	45	45	100	Pass
3.3642	43	43	100	Pass
3.4126	40	40	100	Pass
3.4609	38	38	100	Pass
3.5092	37	37	100	Pass
3.5576	37	37	100	Pass
3.6059	30	30	100	Pass
3.6542	28	28	100	Pass
3.7026	26	26	100	Pass

3.7509	24	24	100	Pass
3.7992	21	21	100	Pass
3.8476	20	20	100	Pass
3.8959	19	19	100	Pass
3.9442	18	18	100	Pass
3.9926	17	17	100	Pass
4.0409	15	15	100	Pass
4.0892	14	14	100	Pass
4.1376	13	13	100	Pass
4.1859	13	13	100	Pass
4.2342	13	13	100	Pass
4.2825	12	12	100	Pass
4.3309	12	12	100	Pass
4.3792	12	12	100	Pass
4.4275	12	12	100	Pass
4.4759	11	11	100	Pass
4.5242	11	11	100	Pass
4.5725	11	11	100	Pass
4.6209	10	10	100	Pass
4.6692	9	9	100	Pass
4.7175	8	8	100	Pass
4.7659	8	8	100	Pass
4.8142	6	6	100	Pass
4.8625	6	6	100	Pass
4.9109	6	6	100	Pass
4.9592	6	6	100	Pass
5.0075	6	6	100	Pass
5.0558	6	6	100	Pass
5.1042	6	6	100	Pass
5.1525	6	6	100	Pass
5.2008	5	5	100	Pass
5.2492	5	5	100	Pass
5.2975	5	5	100	Pass
5.3458	5	5	100	Pass
5.3942	4	4	100	Pass
5.4425	3	3	100	Pass
5.4908	3	3	100	Pass
5.5392	3	3	100	Pass
5.5875	3	3	100	Pass
5.6358	3	3	100	Pass
5.6842	3	3	100	Pass
5.7325	2	2	100	Pass
5.7808	2	2	100	Pass
5.8292	2	2	100	Pass
5.8775	2	2	100	Pass
5.9258	2	2	100	Pass
5.9741	2	2	100	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #3

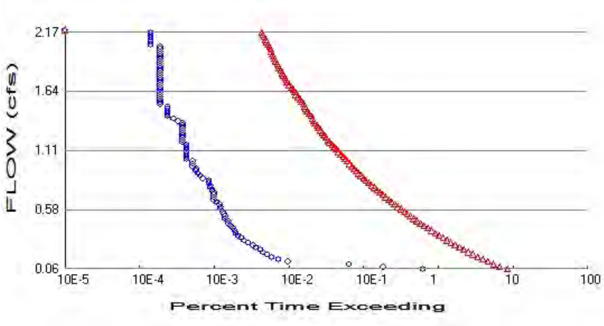
On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

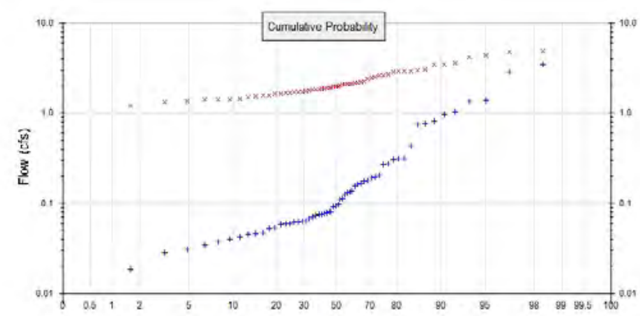
LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Tank 1 POC	☐	809.70			☐	0.00			
Total Volume Infiltrated		809.70	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

SB-265

POC 4





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #4

Total Pervious Area:	11.76
Total Impervious Area:	3.96

Mitigated Landuse Totals for POC #4

Total Pervious Area:	11.76
Total Impervious Area:	3.96

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #4

Return Period	**Flow(cfs)**
2 year	0.1159
5 year	0.338036
10 year	0.63464
25 year	1.312858
50 year	2.165686
100 year	3.469708

Flow Frequency Return Periods for Mitigated. POC #4

Return Period	**Flow(cfs)**
2 year	2.052285
5 year	2.75609
10 year	3.267799
25 year	3.968342
50 year	4.530714
100 year	5.128923

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #4

Year	**Predeveloped**	**Mitigated**
1949	0.312	2.935
1950	1.365	2.848
1951	0.308	1.827
1952	0.070	1.231
1953	0.053	1.427
1954	0.166	1.701
1955	0.094	1.842
1956	0.276	1.836
1957	0.076	2.068
1958	0.063	1.564
1959	0.091	1.524

1960	0.193	1.902
1961	0.155	1.700
1962	0.031	1.351
1963	0.109	1.853
1964	0.176	1.671
1965	0.073	2.159
1966	0.068	1.429
1967	0.958	2.966
1968	0.194	3.031
1969	0.077	1.979
1970	0.047	1.910
1971	0.080	2.280
1972	1.027	2.681
1973	0.063	1.230
1974	0.080	2.140
1975	0.126	2.115
1976	0.130	1.751
1977	0.019	1.664
1978	0.058	2.123
1979	0.038	2.633
1980	0.098	3.501
1981	0.062	1.974
1982	0.137	2.950
1983	0.079	2.171
1984	0.046	1.450
1985	0.034	1.882
1986	0.112	1.783
1987	0.162	2.395
1988	0.042	1.405
1989	0.040	2.236
1990	2.872	4.849
1991	0.750	3.620
1992	0.063	1.552
1993	0.046	1.583
1994	0.028	1.318
1995	0.179	1.710
1996	0.816	2.901
1997	0.312	2.018
1998	0.060	1.894
1999	1.400	4.367
2000	0.054	1.995
2001	0.018	2.100
2002	0.134	2.540
2003	0.075	2.646
2004	0.427	4.161
2005	0.059	1.664
2006	0.204	1.669
2007	3.489	4.725
2008	0.764	3.438
2009	0.270	2.471

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #4

Rank	Predeveloped	Mitigated
1	3.4888	4.8489
2	2.8717	4.7247
3	1.3996	4.3672
4	1.3649	4.1611

5	1.0265	3.6199
6	0.9575	3.5011
7	0.8164	3.4383
8	0.7644	3.0308
9	0.7504	2.9662
10	0.4265	2.9495
11	0.3125	2.9355
12	0.3121	2.9012
13	0.3083	2.8475
14	0.2757	2.6812
15	0.2699	2.6457
16	0.2036	2.6332
17	0.1941	2.5396
18	0.1935	2.4706
19	0.1785	2.3955
20	0.1761	2.2797
21	0.1656	2.2357
22	0.1622	2.1706
23	0.1548	2.1593
24	0.1370	2.1402
25	0.1344	2.1230
26	0.1298	2.1154
27	0.1262	2.0996
28	0.1123	2.0684
29	0.1093	2.0183
30	0.0981	1.9948
31	0.0938	1.9793
32	0.0908	1.9736
33	0.0804	1.9098
34	0.0801	1.9024
35	0.0786	1.8940
36	0.0769	1.8823
37	0.0756	1.8529
38	0.0745	1.8419
39	0.0735	1.8365
40	0.0702	1.8268
41	0.0679	1.7830
42	0.0632	1.7510
43	0.0630	1.7103
44	0.0625	1.7007
45	0.0622	1.6999
46	0.0595	1.6706
47	0.0594	1.6689
48	0.0583	1.6639
49	0.0538	1.6636
50	0.0525	1.5831
51	0.0468	1.5637
52	0.0462	1.5522
53	0.0456	1.5240
54	0.0423	1.4500
55	0.0399	1.4288
56	0.0377	1.4265
57	0.0341	1.4051
58	0.0311	1.3509
59	0.0282	1.3181
60	0.0185	1.2306
61	0.0178	1.2295

Duration Flows

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0580	13242	179473	1355	Fail
0.0792	3908	141957	3632	Fail
0.1005	1346	117638	8739	Fail
0.1218	204	99137	48596	Fail
0.1431	154	83823	54430	Fail
0.1644	124	72209	58233	Fail
0.1857	109	62327	57180	Fail
0.2070	96	54178	56435	Fail
0.2283	88	46927	53326	Fail
0.2496	77	41152	53444	Fail
0.2709	71	36104	50850	Fail
0.2921	60	31570	52616	Fail
0.3134	53	27934	52705	Fail
0.3347	49	24768	50546	Fail
0.3560	44	21859	49679	Fail
0.3773	41	19453	47446	Fail
0.3986	40	17293	43232	Fail
0.4199	38	15483	40744	Fail
0.4412	35	13755	39300	Fail
0.4625	33	12329	37360	Fail
0.4838	33	11120	33696	Fail
0.5050	30	10004	33346	Fail
0.5263	30	9050	30166	Fail
0.5476	29	8237	28403	Fail
0.5689	28	7484	26728	Fail
0.5902	26	6757	25988	Fail
0.6115	26	6158	23684	Fail
0.6328	25	5576	22304	Fail
0.6541	23	5080	22086	Fail
0.6754	21	4639	22090	Fail
0.6967	21	4209	20042	Fail
0.7179	21	3850	18333	Fail
0.7392	21	3529	16804	Fail
0.7605	20	3228	16139	Fail
0.7818	19	2988	15726	Fail
0.8031	19	2723	14331	Fail
0.8244	18	2494	13855	Fail
0.8457	18	2304	12800	Fail
0.8670	15	2128	14186	Fail
0.8883	14	1962	14014	Fail
0.9096	13	1828	14061	Fail
0.9309	12	1692	14100	Fail
0.9521	12	1578	13150	Fail
0.9734	11	1487	13518	Fail
0.9947	11	1384	12581	Fail
1.0160	11	1296	11781	Fail
1.0373	9	1223	13588	Fail
1.0586	9	1147	12744	Fail
1.0799	9	1065	11833	Fail
1.1012	9	988	10977	Fail
1.1225	9	924	10266	Fail
1.1438	9	865	9611	Fail
1.1650	9	816	9066	Fail
1.1863	8	753	9412	Fail

1.2076	8	710	8875	Fail
1.2289	8	669	8362	Fail
1.2502	8	629	7862	Fail
1.2715	8	593	7412	Fail
1.2928	8	564	7050	Fail
1.3141	8	533	6662	Fail
1.3354	8	505	6312	Fail
1.3567	8	473	5912	Fail
1.3779	7	457	6528	Fail
1.3992	6	442	7366	Fail
1.4205	5	421	8420	Fail
1.4418	5	398	7960	Fail
1.4631	5	378	7560	Fail
1.4844	5	361	7219	Fail
1.5057	5	350	7000	Fail
1.5270	4	336	8400	Fail
1.5483	4	315	7875	Fail
1.5696	4	301	7525	Fail
1.5908	4	286	7150	Fail
1.6121	4	265	6625	Fail
1.6334	4	256	6400	Fail
1.6547	4	245	6125	Fail
1.6760	4	231	5775	Fail
1.6973	4	215	5375	Fail
1.7186	4	203	5075	Fail
1.7399	4	198	4950	Fail
1.7612	4	191	4775	Fail
1.7825	4	181	4525	Fail
1.8038	4	173	4325	Fail
1.8250	4	166	4150	Fail
1.8463	4	159	3975	Fail
1.8676	4	155	3875	Fail
1.8889	4	150	3750	Fail
1.9102	4	141	3525	Fail
1.9315	4	136	3400	Fail
1.9528	4	132	3300	Fail
1.9741	4	127	3175	Fail
1.9954	4	122	3050	Fail
2.0167	4	121	3025	Fail
2.0379	4	117	2925	Fail
2.0592	3	112	3733	Fail
2.0805	3	108	3600	Fail
2.1018	3	105	3500	Fail
2.1231	3	99	3300	Fail
2.1444	3	96	3200	Fail
2.1657	3	92	3066	Fail

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.
The development has an increase in flow durations for more than 50% of the flows for the range of the duration analysis.

Water Quality

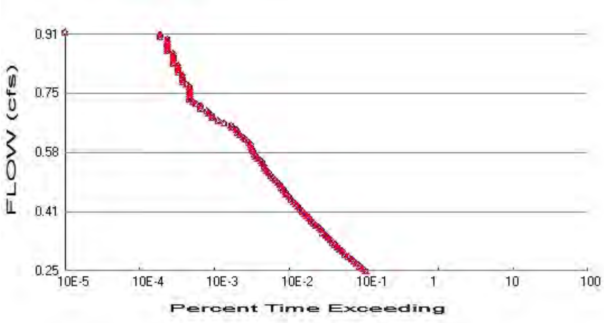
Water Quality BMP Flow and Volume for POC #4

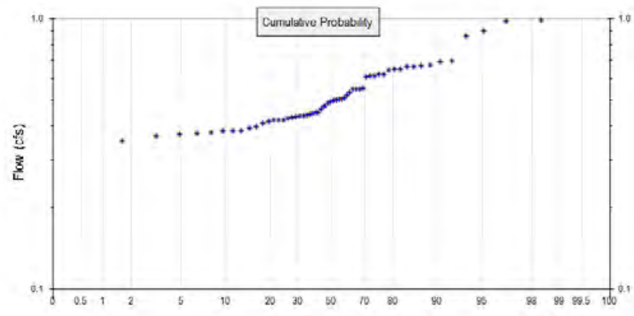
On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Failed

POC 5





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #5
Total Pervious Area: 1.39
Total Impervious Area: 1.31

Mitigated Landuse Totals for POC #5
Total Pervious Area: 1.39
Total Impervious Area: 1.31

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #5

Return Period	**Flow(cfs)**
2 year	0.498655
5 year	0.624019
10 year	0.710318
25 year	0.823401
50 year	0.91073
100 year	1.000817

Flow Frequency Return Periods for Mitigated. POC #5

Return Period	**Flow(cfs)**
2 year	0.498655
5 year	0.624019
10 year	0.710318
25 year	0.823401
50 year	0.91073
100 year	1.000817

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #5

Year	**Predeveloped**	**Mitigated**
1949	0.624	0.624
1950	0.648	0.648
1951	0.437	0.437
1952	0.351	0.351
1953	0.383	0.383
1954	0.417	0.417
1955	0.462	0.462
1956	0.472	0.472
1957	0.495	0.495
1958	0.397	0.397
1959	0.422	0.422

1960	0.411	0.411
1961	0.447	0.447
1962	0.380	0.380
1963	0.449	0.449
1964	0.434	0.434
1965	0.546	0.546
1966	0.368	0.368
1967	0.675	0.675
1968	0.625	0.625
1969	0.486	0.486
1970	0.437	0.437
1971	0.505	0.505
1972	0.648	0.648
1973	0.353	0.353
1974	0.502	0.502
1975	0.549	0.549
1976	0.375	0.375
1977	0.429	0.429
1978	0.520	0.520
1979	0.612	0.612
1980	0.698	0.698
1981	0.496	0.496
1982	0.670	0.670
1983	0.549	0.549
1984	0.384	0.384
1985	0.509	0.509
1986	0.443	0.443
1987	0.647	0.647
1988	0.423	0.423
1989	0.551	0.551
1990	0.981	0.981
1991	0.666	0.666
1992	0.375	0.375
1993	0.392	0.392
1994	0.385	0.385
1995	0.441	0.441
1996	0.614	0.614
1997	0.499	0.499
1998	0.451	0.451
1999	0.899	0.899
2000	0.476	0.476
2001	0.498	0.498
2002	0.609	0.609
2003	0.533	0.533
2004	0.863	0.863
2005	0.431	0.431
2006	0.421	0.421
2007	0.989	0.989
2008	0.693	0.693
2009	0.663	0.663

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #5

Rank	Predeveloped	Mitigated
1	0.9894	0.9894
2	0.9812	0.9812
3	0.8995	0.8995
4	0.8626	0.8626

5	0.6975	0.6975
6	0.6926	0.6926
7	0.6751	0.6751
8	0.6702	0.6702
9	0.6658	0.6658
10	0.6628	0.6628
11	0.6479	0.6479
12	0.6478	0.6478
13	0.6472	0.6472
14	0.6248	0.6248
15	0.6239	0.6239
16	0.6143	0.6143
17	0.6118	0.6118
18	0.6085	0.6085
19	0.5513	0.5513
20	0.5487	0.5487
21	0.5485	0.5485
22	0.5463	0.5463
23	0.5328	0.5328
24	0.5202	0.5202
25	0.5092	0.5092
26	0.5049	0.5049
27	0.5018	0.5018
28	0.4995	0.4995
29	0.4984	0.4984
30	0.4965	0.4965
31	0.4945	0.4945
32	0.4864	0.4864
33	0.4760	0.4760
34	0.4716	0.4716
35	0.4620	0.4620
36	0.4506	0.4506
37	0.4489	0.4489
38	0.4467	0.4467
39	0.4430	0.4430
40	0.4411	0.4411
41	0.4366	0.4366
42	0.4366	0.4366
43	0.4343	0.4343
44	0.4312	0.4312
45	0.4289	0.4289
46	0.4230	0.4230
47	0.4216	0.4216
48	0.4212	0.4212
49	0.4171	0.4171
50	0.4107	0.4107
51	0.3971	0.3971
52	0.3920	0.3920
53	0.3846	0.3846
54	0.3844	0.3844
55	0.3833	0.3833
56	0.3804	0.3804
57	0.3751	0.3751
58	0.3750	0.3750
59	0.3681	0.3681
60	0.3527	0.3527
61	0.3511	0.3511

Duration Flows
The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.2493	2267	2267	100	Pass
0.2560	2066	2066	100	Pass
0.2627	1900	1900	100	Pass
0.2694	1727	1727	100	Pass
0.2761	1579	1579	100	Pass
0.2827	1458	1458	100	Pass
0.2894	1340	1340	100	Pass
0.2961	1205	1205	100	Pass
0.3028	1110	1110	100	Pass
0.3095	1029	1029	100	Pass
0.3161	958	958	100	Pass
0.3228	893	893	100	Pass
0.3295	824	824	100	Pass
0.3362	761	761	100	Pass
0.3429	711	711	100	Pass
0.3495	664	664	100	Pass
0.3562	609	609	100	Pass
0.3629	577	577	100	Pass
0.3696	541	541	100	Pass
0.3763	498	498	100	Pass
0.3829	458	458	100	Pass
0.3896	428	428	100	Pass
0.3963	398	398	100	Pass
0.4030	375	375	100	Pass
0.4097	351	351	100	Pass
0.4163	325	325	100	Pass
0.4230	299	299	100	Pass
0.4297	283	283	100	Pass
0.4364	262	262	100	Pass
0.4431	246	246	100	Pass
0.4498	227	227	100	Pass
0.4564	213	213	100	Pass
0.4631	196	196	100	Pass
0.4698	191	191	100	Pass
0.4765	182	182	100	Pass
0.4832	170	170	100	Pass
0.4898	160	160	100	Pass
0.4965	151	151	100	Pass
0.5032	139	139	100	Pass
0.5099	132	132	100	Pass
0.5166	123	123	100	Pass
0.5232	113	113	100	Pass
0.5299	107	107	100	Pass
0.5366	100	100	100	Pass
0.5433	99	99	100	Pass
0.5500	94	94	100	Pass
0.5566	90	90	100	Pass
0.5633	82	82	100	Pass
0.5700	77	77	100	Pass
0.5767	74	74	100	Pass
0.5834	70	70	100	Pass
0.5901	68	68	100	Pass
0.5967	66	66	100	Pass

0.6034	65	65	100	Pass
0.6101	61	61	100	Pass
0.6168	55	55	100	Pass
0.6235	52	52	100	Pass
0.6301	47	47	100	Pass
0.6368	44	44	100	Pass
0.6435	42	42	100	Pass
0.6502	37	37	100	Pass
0.6569	36	36	100	Pass
0.6635	29	29	100	Pass
0.6702	24	24	100	Pass
0.6769	20	20	100	Pass
0.6836	20	20	100	Pass
0.6903	18	18	100	Pass
0.6969	17	17	100	Pass
0.7036	14	14	100	Pass
0.7103	14	14	100	Pass
0.7170	12	12	100	Pass
0.7237	11	11	100	Pass
0.7303	10	10	100	Pass
0.7370	10	10	100	Pass
0.7437	10	10	100	Pass
0.7504	10	10	100	Pass
0.7571	10	10	100	Pass
0.7638	10	10	100	Pass
0.7704	9	9	100	Pass
0.7771	8	8	100	Pass
0.7838	8	8	100	Pass
0.7905	8	8	100	Pass
0.7972	8	8	100	Pass
0.8038	7	7	100	Pass
0.8105	7	7	100	Pass
0.8172	7	7	100	Pass
0.8239	7	7	100	Pass
0.8306	6	6	100	Pass
0.8372	6	6	100	Pass
0.8439	6	6	100	Pass
0.8506	6	6	100	Pass
0.8573	6	6	100	Pass
0.8640	5	5	100	Pass
0.8706	5	5	100	Pass
0.8773	5	5	100	Pass
0.8840	5	5	100	Pass
0.8907	5	5	100	Pass
0.8974	5	5	100	Pass
0.9040	4	4	100	Pass
0.9107	4	4	100	Pass

Water Quality

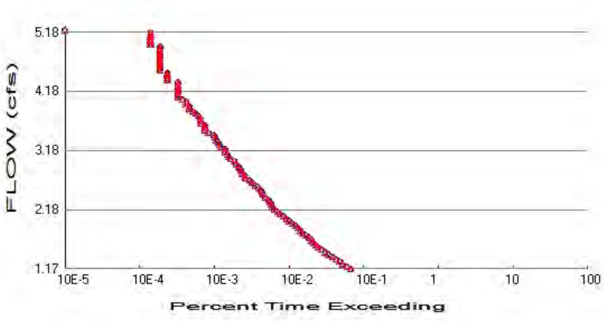
Water Quality BMP Flow and Volume for POC #5

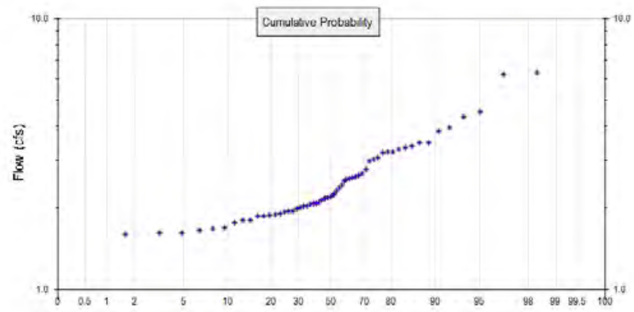
On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Trapezoidal Pond 1 POC	☐	193.34			☐	0.00			
Total Volume Infiltrated		193.34	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Failed

POC 6





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #6
Total Pervious Area: 10.41
Total Impervious Area: 5.47

Mitigated Landuse Totals for POC #6
Total Pervious Area: 10.41
Total Impervious Area: 5.47

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #6

Return Period	**Flow(cfs)**
2 year	2.349287
5 year	3.13595
10 year	3.71691
25 year	4.52232
50 year	5.176234
100 year	5.878212

Flow Frequency Return Periods for Mitigated. POC #6

Return Period	**Flow(cfs)**
2 year	2.349287
5 year	3.13595
10 year	3.71691
25 year	4.52232
50 year	5.176234
100 year	5.878212

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #6

Year	**Predeveloped**	**Mitigated**
1949	2.974	2.974
1950	3.487	3.487
1951	2.180	2.180
1952	1.508	1.508
1953	1.768	1.768
1954	2.007	2.007
1955	2.138	2.138
1956	2.064	2.064
1957	2.224	2.224
1958	1.863	1.863
1959	1.989	1.989

1960	2.068	2.068
1961	1.894	1.894
1962	1.677	1.677
1963	2.033	2.033
1964	1.932	1.932
1965	2.373	2.373
1966	1.594	1.594
1967	3.474	3.474
1968	3.343	3.343
1969	2.079	2.079
1970	2.091	2.091
1971	2.519	2.519
1972	3.228	3.228
1973	1.613	1.613
1974	2.327	2.327
1975	2.560	2.560
1976	1.873	1.873
1977	1.901	1.901
1978	2.597	2.597
1979	3.297	3.297
1980	3.201	3.201
1981	2.258	2.258
1982	3.215	3.215
1983	2.641	2.641
1984	1.654	1.654
1985	2.197	2.197
1986	1.946	1.946
1987	3.029	3.029
1988	1.861	1.861
1989	2.774	2.774
1990	6.208	6.208
1991	3.953	3.953
1992	1.614	1.614
1993	1.806	1.806
1994	1.693	1.693
1995	2.028	2.028
1996	3.395	3.395
1997	2.418	2.418
1998	2.155	2.155
1999	4.529	4.529
2000	2.180	2.180
2001	2.550	2.550
2002	2.668	2.668
2003	2.582	2.582
2004	4.331	4.331
2005	1.803	1.803
2006	1.941	1.941
2007	6.317	6.317
2008	3.846	3.846
2009	3.066	3.066

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #6

Rank	Predeveloped	Mitigated
1	6.3171	6.3171
2	6.2081	6.2081
3	4.5290	4.5290
4	4.3308	4.3308

5	3.9528	3.9528
6	3.8459	3.8459
7	3.4873	3.4873
8	3.4743	3.4743
9	3.3949	3.3949
10	3.3428	3.3428
11	3.2971	3.2971
12	3.2282	3.2282
13	3.2147	3.2147
14	3.2014	3.2014
15	3.0662	3.0662
16	3.0286	3.0286
17	2.9743	2.9743
18	2.7736	2.7736
19	2.6678	2.6678
20	2.6406	2.6406
21	2.5967	2.5967
22	2.5824	2.5824
23	2.5603	2.5603
24	2.5496	2.5496
25	2.5187	2.5187
26	2.4175	2.4175
27	2.3734	2.3734
28	2.3270	2.3270
29	2.2581	2.2581
30	2.2238	2.2238
31	2.1969	2.1969
32	2.1800	2.1800
33	2.1797	2.1797
34	2.1551	2.1551
35	2.1377	2.1377
36	2.0905	2.0905
37	2.0790	2.0790
38	2.0683	2.0683
39	2.0642	2.0642
40	2.0325	2.0325
41	2.0280	2.0280
42	2.0067	2.0067
43	1.9892	1.9892
44	1.9459	1.9459
45	1.9405	1.9405
46	1.9320	1.9320
47	1.9013	1.9013
48	1.8945	1.8945
49	1.8728	1.8728
50	1.8632	1.8632
51	1.8608	1.8608
52	1.8056	1.8056
53	1.8034	1.8034
54	1.7678	1.7678
55	1.6927	1.6927
56	1.6765	1.6765
57	1.6541	1.6541
58	1.6139	1.6139
59	1.6128	1.6128
60	1.5936	1.5936
61	1.5084	1.5084

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
1.1746	1423	1423	100	Pass
1.2151	1277	1277	100	Pass
1.2555	1128	1128	100	Pass
1.2959	1021	1021	100	Pass
1.3363	913	913	100	Pass
1.3767	811	811	100	Pass
1.4172	721	721	100	Pass
1.4576	654	654	100	Pass
1.4980	585	585	100	Pass
1.5384	524	524	100	Pass
1.5788	491	491	100	Pass
1.6193	459	459	100	Pass
1.6597	434	434	100	Pass
1.7001	394	394	100	Pass
1.7405	363	363	100	Pass
1.7809	326	326	100	Pass
1.8214	304	304	100	Pass
1.8618	282	282	100	Pass
1.9022	263	263	100	Pass
1.9426	238	238	100	Pass
1.9830	216	216	100	Pass
2.0235	197	197	100	Pass
2.0639	179	179	100	Pass
2.1043	163	163	100	Pass
2.1447	152	152	100	Pass
2.1851	136	136	100	Pass
2.2256	129	129	100	Pass
2.2660	125	125	100	Pass
2.3064	117	117	100	Pass
2.3468	113	113	100	Pass
2.3872	104	104	100	Pass
2.4277	95	95	100	Pass
2.4681	92	92	100	Pass
2.5085	89	89	100	Pass
2.5489	83	83	100	Pass
2.5893	75	75	100	Pass
2.6298	68	68	100	Pass
2.6702	63	63	100	Pass
2.7106	55	55	100	Pass
2.7510	55	55	100	Pass
2.7914	51	51	100	Pass
2.8319	49	49	100	Pass
2.8723	46	46	100	Pass
2.9127	45	45	100	Pass
2.9531	42	42	100	Pass
2.9935	40	40	100	Pass
3.0340	35	35	100	Pass
3.0744	33	33	100	Pass
3.1148	32	32	100	Pass
3.1552	30	30	100	Pass
3.1956	30	30	100	Pass
3.2361	26	26	100	Pass
3.2765	25	25	100	Pass

3.3169	24	24	100	Pass
3.3573	23	23	100	Pass
3.3977	22	22	100	Pass
3.4382	21	21	100	Pass
3.4786	18	18	100	Pass
3.5190	16	16	100	Pass
3.5594	16	16	100	Pass
3.5998	16	16	100	Pass
3.6403	14	14	100	Pass
3.6807	14	14	100	Pass
3.7211	14	14	100	Pass
3.7615	13	13	100	Pass
3.8020	12	12	100	Pass
3.8424	11	11	100	Pass
3.8828	10	10	100	Pass
3.9232	10	10	100	Pass
3.9636	9	9	100	Pass
4.0041	9	9	100	Pass
4.0445	8	8	100	Pass
4.0849	7	7	100	Pass
4.1253	7	7	100	Pass
4.1657	7	7	100	Pass
4.2062	7	7	100	Pass
4.2466	7	7	100	Pass
4.2870	7	7	100	Pass
4.3274	7	7	100	Pass
4.3678	5	5	100	Pass
4.4083	5	5	100	Pass
4.4487	5	5	100	Pass
4.4891	5	5	100	Pass
4.5295	4	4	100	Pass
4.5699	4	4	100	Pass
4.6104	4	4	100	Pass
4.6508	4	4	100	Pass
4.6912	4	4	100	Pass
4.7316	4	4	100	Pass
4.7720	4	4	100	Pass
4.8125	4	4	100	Pass
4.8529	4	4	100	Pass
4.8933	4	4	100	Pass
4.9337	4	4	100	Pass
4.9741	3	3	100	Pass
5.0146	3	3	100	Pass
5.0550	3	3	100	Pass
5.0954	3	3	100	Pass
5.1358	3	3	100	Pass
5.1762	3	3	100	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #6
On-line facility volume: 0 acre-feet
On-line facility target flow: 0 cfs.
Adjusted for 15 min: 0 cfs.
Off-line facility target flow: 0 cfs.
Adjusted for 15 min: 0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Failed

SB-265

POC 7

POC #7 was not reported because POC must exist in both scenarios and both scenarios must have been run.

POC 8

POC #8 was not reported because POC must exist in both scenarios and both scenarios must have been run.

POC 9

POC #9 was not reported because POC must exist in both scenarios and both scenarios must have been run.

POC 10

POC #10 was not reported because POC must exist in both scenarios and both scenarios must have been run.

POC 11

POC #11 was not reported because POC must exist in both scenarios and both scenarios must have been run.

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

No PERLND changes have been made.

IMPLND Changes

No IMPLND changes have been made.

Appendix

Predeveloped Schematic

Mitigated Schematic

Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2009 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                             ***
WDM        26   Tamarack - Durations Existing.wdm
MESSU      25   PreTamarack - Durations Existing.MES
           27   PreTamarack - Durations Existing.L61
           28   PreTamarack - Durations Existing.L62
           30   POCTamarack - Durations Existing1.dat
           31   POCTamarack - Durations Existing2.dat
           35   POCTamarack - Durations Existing6.dat
           36   POCTamarack - Durations Existing7.dat
           37   POCTamarack - Durations Existing8.dat
           32   POCTamarack - Durations Existing3.dat
           34   POCTamarack - Durations Existing5.dat
           33   POCTamarack - Durations Existing4.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND       8
      PERLND      17
      IMPLND       2
      IMPLND       4
      IMPLND       6
      PERLND       9
      IMPLND       3
      IMPLND       7
      IMPLND      16
      PERLND      40
      PERLND      41
      PERLND      42
      PERLND      43
      RCHRES       1
      RCHRES       2
      PERLND      39
      COPY       501
      COPY       502
      COPY       506
      COPY       507
      COPY       508
      COPY       503
      COPY       505
      COPY       504
      DISPLY       1
      DISPLY       2
      DISPLY       6
      DISPLY       7
      DISPLY       8
      DISPLY       3
      DISPLY       5
      DISPLY       4
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Subbasin 1                 MAX                    1    2   30    9
    2        Subbasin  2                MAX                    1    2   31    9
    6        Subbasin  6                MAX                    1    2   35    9
```

```
    7        Subbasin  7 - Perv Latera   MAX                      1    2   36    9
    8        Subbasin  8 - Perv Latera   MAX                      1    2   37    9
    3        Subbasin 3B                 MAX                      1    2   32    9
    5        Subbasin 5 Detention        MAX                      1    2   34    9
    4        Basin 4 - Perv Lateral Fl   MAX                      1    2   33    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  502         1    1
  506         1    1
  507         1    1
  508         1    1
  503         1    1
  505         1    1
  504         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
    8     A/B, Lawn, Mod          1    1    1    1   27    0
   17     C, Lawn, Mod            1    1    1    1   27    0
    9     A/B, Lawn, Steep        1    1    1    1   27    0
   40     A/B, Lawn, Steep        1    1    1    1   27    0
   41     C, Lawn, Steep          1    1    1    1   27    0
   42     C, Lawn, Steep          1    1    1    1   27    0
   43     A/B, Lawn, Steep        1    1    1    1   27    0
   39     A/B, Forest, Mod        1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
    8         0    0    1    0    0    0    0    0    0    0    0    0
   17         0    0    1    0    0    0    0    0    0    0    0    0
    9         0    0    1    0    0    0    0    0    0    0    0    0
   40         0    0    1    0    0    0    0    0    0    0    0    0
   41         0    0    1    0    0    0    0    0    0    0    0    0
   42         0    0    1    0    0    0    0    0    0    0    0    0
   43         0    0    1    0    0    0    0    0    0    0    0    0
   39         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
    8         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   17         0    0    4    0    0    0    0    0    0    0    0    0    1    9
    9         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   40         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   41         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   42         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   43         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   39         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
    8         0    0    0    0    0    0    0    0    0    0    0
   17         0    0    0    0    0    0    0    0    0    0    0
    9         0    0    0    0    0    0    0    0    0    0    0
   40         0    0    0    0    0    0    0    0    0    0    0
   41         0    0    0    0    0    0    0    0    0    0    0
   42         0    0    0    0    0    0    0    0    0    0    0
   43         0    0    0    0    0    0    0    0    0    0    0
   39         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
    8              0         5       0.8       400       0.1       0.3     0.996
   17              0       4.5      0.03       400       0.1       0.5     0.996
    9              0         5       0.8       400      0.15       0.3     0.996
   40              0         5       0.8       400      0.15       0.3     0.996
   41              0       4.5      0.03       400      0.15       0.5     0.996
   42              0       4.5      0.03       400      0.15       0.5     0.996
   43              0         5       0.8       400      0.15       0.3     0.996
   39              0         5         2       400       0.1       0.3     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
    8              0         0         2         2         0         0         0
   17              0         0         2         2         0         0         0
    9              0         0         2         2         0         0         0
   40              0         0         2         2         0         0         0
   41              0         0         2         2         0         0         0
   42              0         0         2         2         0         0         0
   43              0         0         2         2         0         0         0
   39              0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                               ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
    8            0.1       0.5      0.25         0       0.7      0.25
   17            0.1      0.25      0.25         6       0.5      0.25
    9            0.1       0.5      0.25         0       0.7      0.25
   40            0.1       0.5      0.25         0       0.7      0.25
   41            0.1      0.15      0.25         6       0.3      0.25
   42            0.1      0.15      0.25         6       0.3      0.25
   43            0.1       0.5      0.25         0       0.7      0.25
   39            0.2       0.5      0.35         0       0.7       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
              ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
    8              0         0         0         0         3         1         0
   17              0         0         0         0       2.5         1         0
    9              0         0         0         0         3         1         0
   40              0         0         0         0         3         1         0
   41              0         0         0         0       2.5         1         0
   42              0         0         0         0       2.5         1         0
   43              0         0         0         0         3         1         0
   39              0         0         0         0         3         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
```

```
  <PLS ><-------Name------->   Unit-systems   Printer ***
  # -  #                     User  t-series Engl Metr ***
                                    in  out           ***
  2      ROADS/MOD              1    1    1   27    0
  4      ROOF TOPS/FLAT         1    1    1   27    0
  6      DRIVEWAYS/MOD          1    1    1   27    0
  3      ROADS/STEEP            1    1    1   27    0
  7      DRIVEWAYS/STEEP        1    1    1   27    0
 16     ROADS/MOD LAT           1    1    1   27    0
END GEN-INFO
*** Section IWATER***

ACTIVITY
  <PLS > ************* Active Sections *****************************
  # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  2         0    0    1    0    0    0
  4         0    0    1    0    0    0
  6         0    0    1    0    0    0
  3         0    0    1    0    0    0
  7         0    0    1    0    0    0
 16         0    0    1    0    0    0
END ACTIVITY

PRINT-INFO
  <ILS > ******** Print-flags ******** PIVL  PYR
  # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  2         0    0    4    0    0    0    1    9
  4         0    0    4    0    0    0    1    9
  6         0    0    4    0    0    0    1    9
  3         0    0    4    0    0    0    1    9
  7         0    0    4    0    0    0    1    9
 16         0    0    4    0    0    0    1    9
END PRINT-INFO

IWAT-PARM1
  <PLS >  IWATER variable monthly parameter value flags  ***
  # -  # CSNO RTOP  VRS  VNN RTLI     ***
  2         0    0    0    0    0
  4         0    0    0    0    0
  6         0    0    0    0    0
  3         0    0    0    0    0
  7         0    0    0    0    0
 16         0    0    0    0    0
END IWAT-PARM1

IWAT-PARM2
  <PLS >      IWATER input info: Part 2         ***
  # -  # ***  LSUR     SLSUR      NSUR     RETSC
  2            400      0.05       0.1      0.08
  4            400      0.01       0.1       0.1
  6            400      0.05       0.1      0.08
  3            400       0.1       0.1      0.05
  7            400       0.1       0.1      0.05
 16            400      0.05       0.1      0.08
END IWAT-PARM2

IWAT-PARM3
  <PLS >      IWATER input info: Part 3         ***
  # -  # ***PETMAX    PETMIN
  2              0         0
  4              0         0
  6              0         0
  3              0         0
  7              0         0
 16              0         0
END IWAT-PARM3

IWAT-STATE1
  <PLS > *** Initial conditions at start of simulation
  # -  # ***  RETS      SURS
```

```
    2             0         0
    4             0         0
    6             0         0
    3             0         0
    7             0         0
   16             0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK    ***
<Name>   #                  <-factor->     <Name>   #   Tbl#    ***
Basin 4,7,8 Imperv Lateral ***
IMPLND  16                      0.6911     PERLND  39     50
Subbasin  8 - Perv Lateral Flow A/B***
PERLND  40                      0.4066     PERLND  39     30
PERLND  40                      0.4066     PERLND  39     34
PERLND  40                      0.4066     PERLND  39     38
Subbasin  3A***
PERLND   9                        5.75     RCHRES   2      2
PERLND   9                        5.75     RCHRES   2      3
IMPLND   3                        1.79     RCHRES   2      5
IMPLND   4                         2.6     RCHRES   2      5
IMPLND   7                        1.11     RCHRES   2      5
Subbasin  5***
PERLND   9                        1.39     RCHRES   1      2
PERLND   9                        1.39     RCHRES   1      3
IMPLND   3                        0.52     RCHRES   1      5
IMPLND   4                        0.55     RCHRES   1      5
IMPLND   7                        0.24     RCHRES   1      5
Subbasin  7 - Perv Lateral Flow A/B***
PERLND  43                       0.103     PERLND  39     30
PERLND  43                       0.103     PERLND  39     34
PERLND  43                       0.103     PERLND  39     38
Subbasin  7 - Perv Lateral Flow C***
PERLND  41                      0.1501     PERLND  39     30
PERLND  41                      0.1501     PERLND  39     34
PERLND  41                      0.1501     PERLND  39     38
Subbasin  8 - Perv Lateral Flow C***
PERLND  42                      0.3927     PERLND  39     30
PERLND  42                      0.3927     PERLND  39     34
PERLND  42                      0.3927     PERLND  39     38
Subbasin 1***
PERLND   8                        0.39     COPY   501     12
PERLND   8                        0.39     COPY   501     13
PERLND  17                        0.95     COPY   501     12
PERLND  17                        0.95     COPY   501     13
IMPLND   2                        0.35     COPY   501     15
IMPLND   4                        0.32     COPY   501     15
IMPLND   6                        0.14     COPY   501     15
Subbasin  2***
PERLND   8                        0.67     COPY   502     12
PERLND   8                        0.67     COPY   502     13
PERLND  17                        0.41     COPY   502     12
PERLND  17                        0.41     COPY   502     13
IMPLND   2                        0.42     COPY   502     15
IMPLND   4                        0.08     COPY   502     15
IMPLND   6                        0.04     COPY   502     15
Subbasin  6***
PERLND   8                       10.37     COPY   506     12
PERLND   8                       10.37     COPY   506     13
PERLND  17                        0.04     COPY   506     12
PERLND  17                        0.04     COPY   506     13
IMPLND   2                        1.77     COPY   506     15
IMPLND   4                        2.59     COPY   506     15
IMPLND   6                        1.11     COPY   506     15
Basin 4 - Perv Lateral Flow***
PERLND  39                        5.73     COPY   504     12
PERLND  39                        5.73     COPY   504     13
```

```
Subbasin  7 - Perv Lateral Flow C***
PERLND  41                        0.86     COPY   507     12
PERLND  41                        0.86     COPY   507     13
Subbasin  8 - Perv Lateral Flow C***
PERLND  42                        2.25     COPY   508     12
PERLND  42                        2.25     COPY   508     13
Subbasin 3B***
PERLND   9                        1.44     COPY   503     12
PERLND   9                        1.44     COPY   503     13
IMPLND   3                        0.45     COPY   503     15
IMPLND   4                        0.65     COPY   503     15
IMPLND   7                        0.28     COPY   503     15

******Routing******
RCHRES   1                           1     COPY   505     16
RCHRES   2                           1     COPY   503     16
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1
COPY   502 OUTPUT MEAN   1 1   48.4        DISPLY   2     INPUT  TIMSER 1
COPY   506 OUTPUT MEAN   1 1   48.4        DISPLY   6     INPUT  TIMSER 1
COPY   507 OUTPUT MEAN   1 1   48.4        DISPLY   7     INPUT  TIMSER 1
COPY   508 OUTPUT MEAN   1 1   48.4        DISPLY   8     INPUT  TIMSER 1
COPY   503 OUTPUT MEAN   1 1   48.4        DISPLY   3     INPUT  TIMSER 1
COPY   505 OUTPUT MEAN   1 1   48.4        DISPLY   5     INPUT  TIMSER 1
COPY   504 OUTPUT MEAN   1 1   48.4        DISPLY   4     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                 ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG            ***
                                         in  out                             ***
    1     Subbasin 5 Deten-049    1    1    1    1   28    0    1
    2     Subbasin 3 Deten-052    1    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
    2         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
    2         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                      ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible   exit *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *        ***
    1        0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
    2        0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
```

```
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
    1            1      0.01       0.0       0.0       0.5       0.0
    2            2      0.03       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                         ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit       for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1          0          4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    2          0          4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   91    4
     Depth      Area    Volume  Outflow1 Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.013223  0.000000  0.000000
  0.088889  0.013280  0.001178  0.267497
  0.177778  0.013338  0.002361  0.378297
  0.266667  0.013395  0.003549  0.463318
  0.355556  0.013453  0.004742  0.534993
  0.444444  0.013511  0.005941  0.598140
  0.533333  0.013569  0.007144  0.655230
  0.622222  0.013627  0.008353  0.707729
  0.711111  0.013685  0.009567  0.756594
  0.800000  0.013743  0.010786  0.802490
  0.888889  0.013801  0.012010  0.845898
  0.977778  0.013860  0.013239  0.887186
  1.066667  0.013918  0.014474  0.926635
  1.155556  0.013977  0.015714  0.964472
  1.244444  0.014036  0.016959  1.000880
  1.333333  0.014095  0.018209  1.036010
  1.422222  0.014154  0.019465  1.069986
  1.511111  0.014213  0.020725  1.102916
  1.600000  0.014273  0.021991  1.134892
  1.688889  0.014332  0.023263  1.165990
  1.777778  0.014392  0.024539  1.196281
  1.866667  0.014452  0.025821  1.225823
  1.955556  0.014512  0.027109  1.254670
  2.044444  0.014572  0.028401  1.282868
  2.133333  0.014632  0.029699  1.310460
  2.222222  0.014692  0.031002  1.337483
  2.311111  0.014752  0.032311  1.363970
  2.400000  0.014813  0.033625  1.389953
  2.488889  0.014873  0.034944  1.415459
  2.577778  0.014934  0.036269  1.440513
  2.666667  0.014995  0.037599  1.465139
  2.755556  0.015056  0.038935  1.489358
  2.844444  0.015117  0.040276  1.513189
  2.933333  0.015178  0.041622  1.536651
  3.022222  0.015240  0.042974  1.559759
  3.111111  0.015301  0.044332  1.582531
  3.200000  0.015363  0.045694  1.604979
  3.288889  0.015424  0.047063  1.627118
  3.377778  0.015486  0.048437  1.648959
  3.466667  0.015548  0.049816  1.670515
  3.555556  0.015610  0.051201  1.691797
  3.644444  0.015672  0.052591  1.712814
  3.733333  0.015735  0.053987  1.733576
  3.822222  0.015797  0.055388  1.754092
  3.911111  0.015860  0.056795  1.774371
  4.000000  0.015923  0.058208  1.794421
  4.088889  0.015985  0.059626  1.814250
  4.177778  0.016048  0.061050  1.833864
```

4.266667	0.016111	0.062479	1.853270
4.355556	0.016175	0.063914	1.872476
4.444444	0.016238	0.065354	1.891486
4.533333	0.016301	0.066801	1.910307
4.622222	0.016365	0.068253	1.928945
4.711111	0.016429	0.069710	1.947404
4.800000	0.016492	0.071173	1.965690
4.888889	0.016556	0.072642	1.983807
4.977778	0.016620	0.074117	2.001761
5.066667	0.016685	0.075597	2.019555
5.155556	0.016749	0.077083	2.037193
5.244444	0.016813	0.078574	2.054680
5.333333	0.016878	0.080072	2.072019
5.422222	0.016943	0.081575	2.089215
5.511111	0.017007	0.083084	2.106270
5.600000	0.017072	0.084598	2.123188
5.688889	0.017137	0.086119	2.139972
5.777778	0.017203	0.087645	2.156626
5.866667	0.017268	0.089177	2.173152
5.955556	0.017333	0.090715	2.189553
6.044444	0.017399	0.092259	2.205833
6.133333	0.017465	0.093808	2.221993
6.222222	0.017530	0.095363	2.238037
6.311111	0.017596	0.096925	2.253966
6.400000	0.017662	0.098492	2.269783
6.488889	0.017729	0.100065	2.285491
6.577778	0.017795	0.101643	2.308660
6.666667	0.017861	0.103228	2.327666
6.755556	0.017928	0.104819	2.345699
6.844444	0.017995	0.106415	2.363199
6.933333	0.018061	0.108018	2.380329
7.022222	0.018128	0.109626	2.467500
7.111111	0.018195	0.111241	3.198544
7.200000	0.018262	0.112861	4.316850
7.288889	0.018330	0.114487	5.685745
7.377778	0.018397	0.116120	7.207863
7.466667	0.018465	0.117758	8.785919
7.555556	0.018532	0.119402	10.32063
7.644444	0.018600	0.121053	11.71823
7.733333	0.018668	0.122709	12.90286
7.822222	0.018736	0.124371	13.83219
7.911111	0.018804	0.126040	14.51567
8.000000	0.018872	0.127714	15.03487

END FTABLE 1
FTABLE 2
91 4

Depth (ft)	Area (acres)	Volume (acre-ft)	Outflow1 (cfs)	Velocity (ft/sec)	Travel Time*** (Minutes)***
0.000000	0.000000	0.000000	0.000000		
0.066667	0.004938	0.000220	0.070410		
0.133333	0.006944	0.000620	0.099574		
0.200000	0.008456	0.001135	0.121953		
0.266667	0.009708	0.001742	0.140819		
0.333333	0.010790	0.002426	0.157441		
0.400000	0.011751	0.003178	0.172467		
0.466667	0.012616	0.003991	0.186286		
0.533333	0.013406	0.004858	0.199148		
0.600000	0.014132	0.005777	0.211229		
0.666667	0.014804	0.006741	0.222655		
0.733333	0.015430	0.007749	0.233522		
0.800000	0.016013	0.008798	0.243906		
0.866667	0.016560	0.009884	0.253865		
0.933333	0.017073	0.011005	0.263448		
1.000000	0.017556	0.012160	0.272695		
1.066667	0.018010	0.013345	0.281638		
1.133333	0.018439	0.014560	0.290306		
1.200000	0.018843	0.015803	0.298722		
1.266667	0.019224	0.017072	0.306908		
1.333333	0.019584	0.018366	0.314881		
1.400000	0.019924	0.019683	0.322657		

1.466667	0.020245	0.021022	0.330250
1.533333	0.020547	0.022382	0.337672
1.600000	0.020832	0.023761	0.344935
1.666667	0.021100	0.025159	0.352048
1.733333	0.021351	0.026574	0.359020
1.800000	0.021587	0.028006	0.365859
1.866667	0.021808	0.029452	0.372572
1.933333	0.022015	0.030913	0.379167
2.000000	0.022207	0.032387	0.385649
2.066667	0.022385	0.033874	0.392024
2.133333	0.022549	0.035372	0.398297
2.200000	0.022701	0.036880	0.404472
2.266667	0.022839	0.038398	0.410555
2.333333	0.022965	0.039925	0.416549
2.400000	0.023078	0.041460	0.422457
2.466667	0.023179	0.043002	0.428285
2.533333	0.023267	0.044550	0.434034
2.600000	0.023343	0.046104	0.439708
2.666667	0.023408	0.047662	0.445309
2.733333	0.023460	0.049224	0.450841
2.800000	0.023501	0.050790	0.456306
2.866667	0.023530	0.052358	0.461706
2.933333	0.023548	0.053927	0.467044
3.000000	0.023554	0.055497	0.472322
3.066667	0.023548	0.057067	0.477541
3.133333	0.023530	0.058637	0.482704
3.200000	0.023501	0.060204	0.487812
3.266667	0.023460	0.061770	0.492867
3.333333	0.023408	0.063332	0.497871
3.400000	0.023343	0.064891	0.502825
3.466667	0.023267	0.066444	0.507731
3.533333	0.023179	0.067993	0.512589
3.600000	0.023078	0.069535	0.517402
3.666667	0.022965	0.071069	0.522171
3.733333	0.022839	0.072596	0.526897
3.800000	0.022701	0.074114	0.531581
3.866667	0.022549	0.075623	0.536223
3.933333	0.022385	0.077121	0.540826
4.000000	0.022207	0.078607	0.545390
4.066667	0.022015	0.080081	0.549916
4.133333	0.021808	0.081542	0.554405
4.200000	0.021587	0.082989	0.558859
4.266667	0.021351	0.084420	0.563276
4.333333	0.021100	0.085835	0.567660
4.400000	0.020832	0.087233	0.572010
4.466667	0.020547	0.088612	0.576327
4.533333	0.020245	0.089972	0.580612
4.600000	0.019924	0.091311	0.584866
4.666667	0.019584	0.092628	0.589089
4.733333	0.019224	0.093922	0.593281
4.800000	0.018843	0.095191	0.597445
4.866667	0.018439	0.096434	0.601580
4.933333	0.018010	0.097649	0.605686
5.000000	0.017556	0.098835	0.609765
5.066667	0.017073	0.099989	0.978910
5.133333	0.016560	0.101111	1.648713
5.200000	0.016013	0.102196	2.508517
5.266667	0.015430	0.103245	3.508899
5.333333	0.014804	0.104253	4.608973
5.400000	0.014132	0.105218	5.768278
5.466667	0.013406	0.106136	6.945177
5.533333	0.012616	0.107004	8.097647
5.600000	0.011751	0.107816	9.185308
5.666667	0.010790	0.108568	10.17228
5.733333	0.009708	0.109252	11.03063
5.800000	0.008456	0.109859	11.74437
5.866667	0.006944	0.110374	12.31382
5.933333	0.004938	0.110774	12.76044
6.000000	0.000000	0.110994	13.13191

END FTABLE 2

```
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.76           PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.76           IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
COPY   502 OUTPUT MEAN   1 1     48.4      WDM    502 FLOW     ENGL      REPL
COPY   506 OUTPUT MEAN   1 1     48.4      WDM    506 FLOW     ENGL      REPL
COPY   504 OUTPUT MEAN   1 1     48.4      WDM    504 FLOW     ENGL      REPL
COPY   507 OUTPUT MEAN   1 1     48.4      WDM    507 FLOW     ENGL      REPL
COPY   508 OUTPUT MEAN   1 1     48.4      WDM    508 FLOW     ENGL      REPL
RCHRES   1 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL      REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1001 STAG     ENGL      REPL
COPY   505 OUTPUT MEAN   1 1     48.4      WDM    505 FLOW     ENGL      REPL
COPY   503 OUTPUT MEAN   1 1     48.4      WDM    503 FLOW     ENGL      REPL
RCHRES   2 HYDR   RO     1 1        1      WDM   1002 FLOW     ENGL      REPL
RCHRES   2 HYDR   STAGE  1 1        1      WDM   1003 STAG     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       16
RCHRES     ROFLOW                          COPY           INPUT  MEAN
  END MASS-LINK   16

  MASS-LINK       30
PERLND     PWATER SURO                     PERLND         EXTNL  SURLI
  END MASS-LINK   30

  MASS-LINK       34
PERLND     PWATER IFWO                     PERLND         EXTNL  IFWLI
  END MASS-LINK   34

  MASS-LINK       38
PERLND     PWATER AGWO                     PERLND         EXTNL  AGWLI
```

```
  END MASS-LINK   38

  MASS-LINK       50
IMPLND     IWATER SURO                         PERLND         EXTNL  SURLI
  END MASS-LINK   50


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2009 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM        26   Tamarack - Durations Existing.wdm
MESSU      25   MitTamarack - Durations Existing.MES
           27   MitTamarack - Durations Existing.L61
           28   MitTamarack - Durations Existing.L62
           30   POCTamarack - Durations Existing1.dat
           31   POCTamarack - Durations Existing2.dat
           33   POCTamarack - Durations Existing4.dat
           35   POCTamarack - Durations Existing6.dat
           32   POCTamarack - Durations Existing3.dat
           34   POCTamarack - Durations Existing5.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND       8
      PERLND      17
      IMPLND       2
      IMPLND       4
      IMPLND       6
      PERLND       9
      IMPLND       3
      IMPLND       7
      PERLND       2
      IMPLND       1
      PERLND      18
      RCHRES       1
      RCHRES       2
      COPY       501
      COPY       502
      COPY       504
      COPY       506
      COPY         3
      COPY       503
      COPY       603
      COPY         5
      COPY       505
      COPY       605
      DISPLY       1
      DISPLY       2
      DISPLY       4
      DISPLY       6
      DISPLY       3
      DISPLY       5
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Subbasin 1                MAX                      1    2   30    9
    2        Subbasin  2               MAX                      1    2   31    9
    4        Subbasin  4               MAX                      1    2   33    9
    6        Subbasin  6               MAX                      1    2   35    9
    3        Tank  1                   MAX                      1    2   32    9
    5        Trapezoidal Pond  1       MAX                      1    2   34    9
  END DISPLY-INFO1
END DISPLY
```

```
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  502         1    1
  504         1    1
  506         1    1
    3         1    1
  503         1    1
  603         1    1
    5         1    1
  505         1    1
  605         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
    8     A/B, Lawn, Mod          1    1    1    1   27    0
   17     C, Lawn, Mod            1    1    1    1   27    0
    9     A/B, Lawn, Steep        1    1    1    1   27    0
    2     A/B, Forest, Mod        1    1    1    1   27    0
   18     C, Lawn, Steep          1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
    8         0    0    1    0    0    0    0    0    0    0    0    0
   17         0    0    1    0    0    0    0    0    0    0    0    0
    9         0    0    1    0    0    0    0    0    0    0    0    0
    2         0    0    1    0    0    0    0    0    0    0    0    0
   18         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
    8         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   17         0    0    4    0    0    0    0    0    0    0    0    0    1    9
    9         0    0    4    0    0    0    0    0    0    0    0    0    1    9
    2         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   18         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
    8         0    0    0    0    0    0    0    0    0    0    0
   17         0    0    0    0    0    0    0    0    0    0    0
    9         0    0    0    0    0    0    0    0    0    0    0
    2         0    0    0    0    0    0    0    0    0    0    0
   18         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
```

```
    8             0         5       0.8       400       0.1       0.3     0.996
   17             0       4.5      0.03       400       0.1       0.5     0.996
    9             0         5       0.8       400      0.15       0.3     0.996
    2             0         5         2       400       0.1       0.3     0.996
   18             0       4.5      0.03       400      0.15       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
    8             0         0         2         2         0         0         0
   17             0         0         2         2         0         0         0
    9             0         0         2         2         0         0         0
    2             0         0         2         2         0         0         0
   18             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                               ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
    8           0.1       0.5      0.25         0       0.7      0.25
   17           0.1      0.25      0.25         6       0.5      0.25
    9           0.1       0.5      0.25         0       0.7      0.25
    2           0.2       0.5      0.35         0       0.7       0.7
   18           0.1      0.15      0.25         6       0.3      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
              ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
    8             0         0         0         0         3         1         0
   17             0         0         0         0       2.5         1         0
    9             0         0         0         0         3         1         0
    2             0         0         0         0         3         1         0
   18             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name-------->   Unit-systems   Printer ***
    # -  #                      User  t-series Engl Metr ***
                                        in  out          ***
    2      ROADS/MOD               1    1    1   27    0
    4      ROOF TOPS/FLAT          1    1    1   27    0
    6      DRIVEWAYS/MOD           1    1    1   27    0
    3      ROADS/STEEP             1    1    1   27    0
    7      DRIVEWAYS/STEEP         1    1    1   27    0
    1      ROADS/FLAT              1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    2         0    0    1    0    0    0
    4         0    0    1    0    0    0
    6         0    0    1    0    0    0
    3         0    0    1    0    0    0
    7         0    0    1    0    0    0
    1         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   *********
    2         0    0    4    0    0    0    1    9
    4         0    0    4    0    0    0    1    9
    6         0    0    4    0    0    0    1    9
```

```
    3         0    0    4    0    0    0    1    9
    7         0    0    4    0    0    0    1    9
    1         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    2         0    0    0    0    0
    4         0    0    0    0    0
    6         0    0    0    0    0
    3         0    0    0    0    0
    7         0    0    0    0    0
    1         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    2            400      0.05       0.1      0.08
    4            400      0.01       0.1       0.1
    6            400      0.05       0.1      0.08
    3            400       0.1       0.1      0.05
    7            400       0.1       0.1      0.05
    1            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    2              0         0
    4              0         0
    6              0         0
    3              0         0
    7              0         0
    1              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    2              0         0
    4              0         0
    6              0         0
    3              0         0
    7              0         0
    1              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Subbasin  3A***
PERLND   9                        5.75     RCHRES   1      2
PERLND   9                        5.75     RCHRES   1      3
IMPLND   3                        1.79     RCHRES   1      5
IMPLND   4                         2.6     RCHRES   1      5
IMPLND   7                        1.11     RCHRES   1      5
Subbasin  5***
PERLND   9                        1.39     RCHRES   2      2
PERLND   9                        1.39     RCHRES   2      3
IMPLND   3                        0.52     RCHRES   2      5
IMPLND   4                        0.55     RCHRES   2      5
IMPLND   7                        0.24     RCHRES   2      5
Subbasin 1***
PERLND   8                        0.39     COPY   501     12
PERLND   8                        0.39     COPY   501     13
PERLND  17                        0.95     COPY   501     12
```

```
PERLND  17                        0.95     COPY   501      13
IMPLND   2                        0.35     COPY   501      15
IMPLND   4                        0.32     COPY   501      15
IMPLND   6                        0.14     COPY   501      15
Subbasin  2***
PERLND   8                        0.67     COPY   502      12
PERLND   8                        0.67     COPY   502      13
PERLND  17                        0.41     COPY   502      12
PERLND  17                        0.41     COPY   502      13
IMPLND   2                        0.42     COPY   502      15
IMPLND   4                        0.08     COPY   502      15
IMPLND   6                        0.04     COPY   502      15
Subbasin  4***
PERLND   2                        5.73     COPY   504      12
PERLND   2                        5.73     COPY   504      13
IMPLND   1                        0.06     COPY   504      15
IMPLND   4                        0.02     COPY   504      15
IMPLND   6                        0.01     COPY   504      15
Subbasin  6***
PERLND   8                       10.37     COPY   506      12
PERLND   8                       10.37     COPY   506      13
PERLND  17                        0.04     COPY   506      12
PERLND  17                        0.04     COPY   506      13
IMPLND   2                        1.77     COPY   506      15
IMPLND   4                        2.59     COPY   506      15
IMPLND   6                        1.11     COPY   506      15
Subbasin  7***
PERLND   9                        0.59     COPY   504      12
PERLND   9                        0.59     COPY   504      13
PERLND  18                        0.86     COPY   504      12
PERLND  18                        0.86     COPY   504      13
IMPLND   4                        0.62     COPY   504      15
IMPLND   7                        0.26     COPY   504      15
Subbasin  8***
PERLND   9                        2.33     COPY   504      12
PERLND   9                        2.33     COPY   504      13
PERLND  18                        2.25     COPY   504      12
PERLND  18                        2.25     COPY   504      13
IMPLND   3                        1.78     COPY   504      15
IMPLND   4                        0.85     COPY   504      15
IMPLND   7                        0.36     COPY   504      15
Basin  3B***
PERLND   9                        1.44     COPY   503      12
PERLND   9                        1.44     COPY   603      12
PERLND   9                        1.44     COPY   503      13
PERLND   9                        1.44     COPY   603      13
IMPLND   3                        0.45     COPY   503      15
IMPLND   3                        0.45     COPY   603      15
IMPLND   4                        0.65     COPY   503      15
IMPLND   4                        0.65     COPY   603      15
IMPLND   7                        0.28     COPY   503      15
IMPLND   7                        0.28     COPY   603      15

******Routing******
PERLND   9                        5.75     COPY     3      12
IMPLND   3                        1.79     COPY     3      15
IMPLND   4                         2.6     COPY     3      15
IMPLND   7                        1.11     COPY     3      15
PERLND   9                        5.75     COPY     3      13
PERLND   9                        1.39     COPY     5      12
IMPLND   3                        0.52     COPY     5      15
IMPLND   4                        0.55     COPY     5      15
IMPLND   7                        0.24     COPY     5      15
PERLND   9                        1.39     COPY     5      13
RCHRES   1                           1     COPY   503      16
RCHRES   2                           1     COPY   505      16
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
```

```
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1
COPY   502 OUTPUT MEAN   1 1   48.4        DISPLY   2     INPUT  TIMSER 1
COPY   504 OUTPUT MEAN   1 1   48.4        DISPLY   4     INPUT  TIMSER 1
COPY   506 OUTPUT MEAN   1 1   48.4        DISPLY   6     INPUT  TIMSER 1
COPY   503 OUTPUT MEAN   1 1   48.4        DISPLY   3     INPUT  TIMSER 1
COPY   505 OUTPUT MEAN   1 1   48.4        DISPLY   5     INPUT  TIMSER 1


<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                 ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG            ***
                                          in  out                            ***
    1     Tank  1                 1    1    1    1   28    0    1
    2     Trapezoidal Pond-056    1    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
    2         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
    2         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                      ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *     *  *  *  *  *       *  *  *  *  *        ***
    1        0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
    2        0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
    1             1      0.03       0.0       0.0       0.5       0.0
    2             2      0.01       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                         ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
         *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1           0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    2           0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE       1
   91    4
     Depth      Area    Volume  Outflow1 Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
```

0.000000	0.000000	0.000000	0.000000
0.066667	0.004938	0.000220	0.070410
0.133333	0.006944	0.000620	0.099574
0.200000	0.008456	0.001135	0.121953
0.266667	0.009708	0.001742	0.140819
0.333333	0.010790	0.002426	0.157441
0.400000	0.011751	0.003178	0.172467
0.466667	0.012616	0.003991	0.186286
0.533333	0.013406	0.004858	0.199148
0.600000	0.014132	0.005777	0.211229
0.666667	0.014804	0.006741	0.222655
0.733333	0.015430	0.007749	0.233522
0.800000	0.016013	0.008798	0.243906
0.866667	0.016560	0.009884	0.253865
0.933333	0.017073	0.011005	0.263448
1.000000	0.017556	0.012160	0.272695
1.066667	0.018010	0.013345	0.281638
1.133333	0.018439	0.014560	0.290306
1.200000	0.018843	0.015803	0.298722
1.266667	0.019224	0.017072	0.306908
1.333333	0.019584	0.018366	0.314881
1.400000	0.019924	0.019683	0.322657
1.466667	0.020245	0.021022	0.330250
1.533333	0.020547	0.022382	0.337672
1.600000	0.020832	0.023761	0.344935
1.666667	0.021100	0.025159	0.352048
1.733333	0.021351	0.026574	0.359020
1.800000	0.021587	0.028006	0.365859
1.866667	0.021808	0.029452	0.372572
1.933333	0.022015	0.030913	0.379167
2.000000	0.022207	0.032387	0.385649
2.066667	0.022385	0.033874	0.392024
2.133333	0.022549	0.035372	0.398297
2.200000	0.022701	0.036880	0.404472
2.266667	0.022839	0.038398	0.410555
2.333333	0.022965	0.039925	0.416549
2.400000	0.023078	0.041460	0.422457
2.466667	0.023179	0.043002	0.428285
2.533333	0.023267	0.044550	0.434034
2.600000	0.023343	0.046104	0.439708
2.666667	0.023408	0.047662	0.445309
2.733333	0.023460	0.049224	0.450841
2.800000	0.023501	0.050790	0.456306
2.866667	0.023530	0.052358	0.461706
2.933333	0.023548	0.053927	0.467044
3.000000	0.023554	0.055497	0.472322
3.066667	0.023548	0.057067	0.477541
3.133333	0.023530	0.058637	0.482704
3.200000	0.023501	0.060204	0.487812
3.266667	0.023460	0.061770	0.492867
3.333333	0.023408	0.063332	0.497871
3.400000	0.023343	0.064891	0.502825
3.466667	0.023267	0.066444	0.507731
3.533333	0.023179	0.067993	0.512589
3.600000	0.023078	0.069535	0.517402
3.666667	0.022965	0.071069	0.522171
3.733333	0.022839	0.072596	0.526897
3.800000	0.022701	0.074114	0.531581
3.866667	0.022549	0.075623	0.536223
3.933333	0.022385	0.077121	0.540826
4.000000	0.022207	0.078607	0.545390
4.066667	0.022015	0.080081	0.549916
4.133333	0.021808	0.081542	0.554405
4.200000	0.021587	0.082989	0.558859
4.266667	0.021351	0.084420	0.563276
4.333333	0.021100	0.085835	0.567660
4.400000	0.020832	0.087233	0.572010
4.466667	0.020547	0.088612	0.576327
4.533333	0.020245	0.089972	0.580612
4.600000	0.019924	0.091311	0.584866

4.666667	0.019584	0.092628	0.589089
4.733333	0.019224	0.093922	0.593281
4.800000	0.018843	0.095191	0.597445
4.866667	0.018439	0.096434	0.601580
4.933333	0.018010	0.097649	0.605686
5.000000	0.017556	0.098835	0.609765
5.066667	0.017073	0.099989	0.978910
5.133333	0.016560	0.101111	1.648713
5.200000	0.016013	0.102196	2.508517
5.266667	0.015430	0.103245	3.508899
5.333333	0.014804	0.104253	4.608973
5.400000	0.014132	0.105218	5.768278
5.466667	0.013406	0.106136	6.945177
5.533333	0.012616	0.107004	8.097647
5.600000	0.011751	0.107816	9.185308
5.666667	0.010790	0.108568	10.17228
5.733333	0.009708	0.109252	11.03063
5.800000	0.008456	0.109859	11.74437
5.866667	0.006944	0.110374	12.31382
5.933333	0.004938	0.110774	12.76044
6.000000	0.000000	0.110994	13.13191

END FTABLE 1
FTABLE 2
91 4

Depth (ft)	Area (acres)	Volume (acre-ft)	Outflow1 (cfs)	Velocity (ft/sec)	Travel Time*** (Minutes)***
0.000000	0.013223	0.000000	0.000000		
0.088889	0.013280	0.001178	0.267497		
0.177778	0.013338	0.002361	0.378297		
0.266667	0.013395	0.003549	0.463318		
0.355556	0.013453	0.004742	0.534993		
0.444444	0.013511	0.005941	0.598140		
0.533333	0.013569	0.007144	0.655230		
0.622222	0.013627	0.008353	0.707729		
0.711111	0.013685	0.009567	0.756594		
0.800000	0.013743	0.010786	0.802490		
0.888889	0.013801	0.012010	0.845898		
0.977778	0.013860	0.013239	0.887186		
1.066667	0.013918	0.014474	0.926635		
1.155556	0.013977	0.015714	0.964472		
1.244444	0.014036	0.016959	1.000880		
1.333333	0.014095	0.018209	1.036010		
1.422222	0.014154	0.019465	1.069986		
1.511111	0.014213	0.020725	1.102916		
1.600000	0.014273	0.021991	1.134892		
1.688889	0.014332	0.023263	1.165990		
1.777778	0.014392	0.024539	1.196281		
1.866667	0.014452	0.025821	1.225823		
1.955556	0.014512	0.027109	1.254670		
2.044444	0.014572	0.028401	1.282868		
2.133333	0.014632	0.029699	1.310460		
2.222222	0.014692	0.031002	1.337483		
2.311111	0.014752	0.032311	1.363970		
2.400000	0.014813	0.033625	1.389953		
2.488889	0.014873	0.034944	1.415459		
2.577778	0.014934	0.036269	1.440513		
2.666667	0.014995	0.037599	1.465139		
2.755556	0.015056	0.038935	1.489358		
2.844444	0.015117	0.040276	1.513189		
2.933333	0.015178	0.041622	1.536651		
3.022222	0.015240	0.042974	1.559759		
3.111111	0.015301	0.044332	1.582531		
3.200000	0.015363	0.045694	1.604979		
3.288889	0.015424	0.047063	1.627118		
3.377778	0.015486	0.048437	1.648959		
3.466667	0.015548	0.049816	1.670515		
3.555556	0.015610	0.051201	1.691797		
3.644444	0.015672	0.052591	1.712814		
3.733333	0.015735	0.053987	1.733576		
3.822222	0.015797	0.055388	1.754092		

```
  3.911111  0.015860  0.056795  1.774371
  4.000000  0.015923  0.058208  1.794421
  4.088889  0.015985  0.059626  1.814250
  4.177778  0.016048  0.061050  1.833864
  4.266667  0.016111  0.062479  1.853270
  4.355556  0.016175  0.063914  1.872476
  4.444444  0.016238  0.065354  1.891486
  4.533333  0.016301  0.066801  1.910307
  4.622222  0.016365  0.068253  1.928945
  4.711111  0.016429  0.069710  1.947404
  4.800000  0.016492  0.071173  1.965690
  4.888889  0.016556  0.072642  1.983807
  4.977778  0.016620  0.074117  2.001761
  5.066667  0.016685  0.075597  2.019555
  5.155556  0.016749  0.077083  2.037193
  5.244444  0.016813  0.078574  2.054680
  5.333333  0.016878  0.080072  2.072019
  5.422222  0.016943  0.081575  2.089215
  5.511111  0.017007  0.083084  2.106270
  5.600000  0.017072  0.084598  2.123188
  5.688889  0.017137  0.086119  2.139972
  5.777778  0.017203  0.087645  2.156626
  5.866667  0.017268  0.089177  2.173152
  5.955556  0.017333  0.090715  2.189553
  6.044444  0.017399  0.092259  2.205833
  6.133333  0.017465  0.093808  2.221993
  6.222222  0.017530  0.095363  2.238037
  6.311111  0.017596  0.096925  2.253966
  6.400000  0.017662  0.098492  2.269783
  6.488889  0.017729  0.100065  2.285491
  6.577778  0.017795  0.101643  2.308660
  6.666667  0.017861  0.103228  2.327666
  6.755556  0.017928  0.104819  2.345699
  6.844444  0.017995  0.106415  2.363199
  6.933333  0.018061  0.108018  2.380329
  7.022222  0.018128  0.109626  2.467500
  7.111111  0.018195  0.111241  3.198544
  7.200000  0.018262  0.112861  4.316850
  7.288889  0.018330  0.114487  5.685745
  7.377778  0.018397  0.116120  7.207863
  7.466667  0.018465  0.117758  8.785919
  7.555556  0.018532  0.119402  10.32063
  7.644444  0.018600  0.121053  11.71823
  7.733333  0.018668  0.122709  12.90286
  7.822222  0.018736  0.124371  13.83219
  7.911111  0.018804  0.126040  14.51567
  8.000000  0.018872  0.127714  15.03487
  END FTABLE  2
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.76           PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.76           IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
COPY   601 OUTPUT MEAN   1 1     48.4      WDM    901 FLOW     ENGL      REPL
COPY     2 OUTPUT MEAN   1 1     48.4      WDM    702 FLOW     ENGL      REPL
COPY   502 OUTPUT MEAN   1 1     48.4      WDM    802 FLOW     ENGL      REPL
COPY   602 OUTPUT MEAN   1 1     48.4      WDM    902 FLOW     ENGL      REPL
COPY     4 OUTPUT MEAN   1 1     48.4      WDM    704 FLOW     ENGL      REPL
```

```
COPY    504 OUTPUT MEAN   1 1     48.4       WDM    804 FLOW     ENGL      REPL
COPY    604 OUTPUT MEAN   1 1     48.4       WDM    904 FLOW     ENGL      REPL
COPY      6 OUTPUT MEAN   1 1     48.4       WDM    706 FLOW     ENGL      REPL
COPY    506 OUTPUT MEAN   1 1     48.4       WDM    806 FLOW     ENGL      REPL
COPY    606 OUTPUT MEAN   1 1     48.4       WDM    906 FLOW     ENGL      REPL
COPY      3 OUTPUT MEAN   1 1     48.4       WDM    703 FLOW     ENGL      REPL
COPY    503 OUTPUT MEAN   1 1     48.4       WDM    803 FLOW     ENGL      REPL
COPY    603 OUTPUT MEAN   1 1     48.4       WDM    903 FLOW     ENGL      REPL
RCHRES    1 HYDR   RO     1 1        1       WDM   1004 FLOW     ENGL      REPL
RCHRES    1 HYDR   STAGE  1 1        1       WDM   1005 STAG     ENGL      REPL
RCHRES    2 HYDR   RO     1 1        1       WDM   1006 FLOW     ENGL      REPL
RCHRES    2 HYDR   STAGE  1 1        1       WDM   1007 STAG     ENGL      REPL
COPY      5 OUTPUT MEAN   1 1     48.4       WDM    705 FLOW     ENGL      REPL
COPY    505 OUTPUT MEAN   1 1     48.4       WDM    805 FLOW     ENGL      REPL
COPY    605 OUTPUT MEAN   1 1     48.4       WDM    905 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       16
RCHRES     ROFLOW                          COPY           INPUT  MEAN
  END MASS-LINK   16


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

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WWHM2012

PROJECT REPORT

Tamarack Project Basin
Future Fully Developed Conditions

General Model Information

Project Name:	Tamarack - Durations
Site Name:	Tamarack Basin - Lateral Flow Basin
Site Address:	
City:	
Report Date:	5/18/2016
Gage:	Seatac
Data Start:	1948/10/01
Data End:	2009/09/30
Timestep:	15 Minute
Precip Scale:	1.00
Version Date:	2016/02/25
Version:	4.2.12

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year
Low Flow Threshold for POC2:	50 Percent of the 2 Year
High Flow Threshold for POC2:	50 Year
Low Flow Threshold for POC3:	50 Percent of the 2 Year
High Flow Threshold for POC3:	50 Year
Low Flow Threshold for POC4:	50 Percent of the 2 Year
High Flow Threshold for POC4:	50 Year
Low Flow Threshold for POC5:	50 Percent of the 2 Year
High Flow Threshold for POC5:	50 Year
Low Flow Threshold for POC6:	50 Percent of the 2 Year
High Flow Threshold for POC6:	50 Year
Low Flow Threshold for POC7:	50 Percent of the 2 Year
High Flow Threshold for POC7:	50 Year
Low Flow Threshold for POC8:	50 Percent of the 2 Year
High Flow Threshold for POC8:	50 Year

Landuse Basin Data
Predeveloped Land Use

Subbasin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Mod	0.39
C, Lawn, Mod	0.95
Pervious Total	1.34

Impervious Land Use	acre
ROADS MOD	0.35
ROOF TOPS FLAT	0.32
DRIVEWAYS MOD	0.14
Impervious Total	0.81
Basin Total	2.15

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 2

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Mod	0.67
C, Lawn, Mod	0.41
Pervious Total	1.08

Impervious Land Use	acre
ROADS MOD	0.42
ROOF TOPS FLAT	0.08
DRIVEWAYS MOD	0.04
Impervious Total	0.54
Basin Total	1.62

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 3A

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Steep	5.75
Pervious Total	5.75

Impervious Land Use	acre
ROADS STEEP	1.79
ROOF TOPS FLAT	2.6
DRIVEWAYS STEEP	1.11
Impervious Total	5.5
Basin Total	11.25

Element Flows To:

Surface	Interflow	Groundwater
Subbasin 3 Detention	Subbasin 3 Detention	

Subbasin 5

Bypass: No

GroundWater: No

Pervious Land Use	acre
A B, Lawn, Steep	1.39
Pervious Total	1.39

Impervious Land Use	acre
ROADS STEEP	0.52
ROOF TOPS FLAT	0.55
DRIVEWAYS STEEP	0.24
Impervious Total	1.31

Basin Total	2.7

Element Flows To:

Surface	Interflow	Groundwater
Subbasin 5 Detention	Subbasin 5 Detention	

Subbasin 6

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Mod	10.37
C, Lawn, Mod	0.04
Pervious Total	10.41
Impervious Land Use	acre
ROADS MOD	1.77
ROOF TOPS FLAT	2.59
DRIVEWAYS MOD	1.11
Impervious Total	5.47
Basin Total	15.88

Element Flows To:

Surface	Interflow	Groundwater

Basin 4 - Perv Lateral Flow

Bypass:	No	
GroundWater:	No	
Pervious Land Use	acre	
A B, Forest, Mod	5.73	
Element Flows To:		
Surface	Interflow	Groundwater

Basin 4,7,8 Imperv Lateral

Bypass:	No
Impervious Land Use	acre
ROADS MOD LAT	3.96

Element Flows To:

Outlet 1	Outlet 2
Basin 4 - Perv Lateral Flow	

Subbasin 8 - Perv Lateral Flow A/B

Bypass: No

GroundWater: No

Pervious Land Use	acre
A B, Lawn, Steep	2.33

Element Flows To:

Surface	Interflow	Groundwater
Basin 4 - Perv Lateral Flow	Basin 4 - Perv Lateral Flow	Basin 4 - Perv Lateral Flow

Subbasin 7 - Perv Lateral Flow C

Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Lawn, Steep	.86

Element Flows To:

Surface	Interflow	Groundwater
Basin 4 - Perv Lateral Flow	Basin 4 - Perv Lateral Flow	Basin 4 - Perv Lateral Flow

Subbasin 8 - Perv Lateral Flow C

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Lawn, Steep	2.25

Element Flows To:

Surface	Interflow	Groundwater
Basin 4 - Perv Lateral Flow	Basin 4 - Perv Lateral Flow	Basin 4 - Perv Lateral Flow

Subbasin 7 - Perv Lateral Flow A/B

Bypass: No

GroundWater: No

Pervious Land Use	acre
A B, Lawn, Steep	.59

Element Flows To:

Surface	Interflow	Groundwater
Basin 4 - Perv Lateral Flow	Basin 4 - Perv Lateral Flow	Basin 4 - Perv Lateral Flow

Subbasin 3B

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Forest, Steep	1.44
Pervious Total	1.44
Impervious Land Use	acre
ROADS STEEP	0.45
ROOF TOPS FLAT	0.65
DRIVEWAYS STEEP	0.28
Impervious Total	1.38
Basin Total	2.82

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Subbasin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Mod	0.38
C, Lawn, Mod	0.94
Pervious Total	1.32
Impervious Land Use	acre
ROADS MOD	0.35
ROOF TOPS FLAT	0.33
DRIVEWAYS MOD	0.14
Impervious Total	0.82
Basin Total	2.14

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 2

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Mod	0.52
C, Lawn, Mod	0.32
Pervious Total	0.84

Impervious Land Use	acre
ROADS MOD	0.42
ROOF TOPS FLAT	0.25
DRIVEWAYS MOD	0.11
Impervious Total	0.78
Basin Total	1.62

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 3A

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Steep	5.54
Pervious Total	5.54
Impervious Land Use	acre
ROADS STEEP	1.79
ROOF TOPS FLAT	2.74
DRIVEWAYS STEEP	1.18
Impervious Total	5.71
Basin Total	11.25

Element Flows To:

Surface	Interflow	Groundwater
Tank 1	Tank 1	

Subbasin 4

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Forest, Mod	5.82
Pervious Total	5.82
Impervious Land Use	acre
Impervious Total	0
Basin Total	5.82

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 5

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Steep	1.15
Pervious Total	1.15
Impervious Land Use	acre
ROADS STEEP	0.52
ROOF TOPS FLAT	0.73
DRIVEWAYS STEEP	0.31
Impervious Total	1.56
Basin Total	2.71

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Subbasin 6

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Mod	9.37
C, Lawn, Mod	0.03
Pervious Total	9.4
Impervious Land Use	acre
ROADS MOD	1.77
ROOF TOPS FLAT	3.3
DRIVEWAYS MOD	1.41
Impervious Total	6.48
Basin Total	15.88

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 7

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Steep	0.52
C, Lawn, Steep	0.77
Pervious Total	1.29

Impervious Land Use	acre
ROOF TOPS FLAT	0.72
DRIVEWAYS STEEP	0.31
Impervious Total	1.03
Basin Total	2.32

Element Flows To:

Surface	Interflow	Groundwater

Subbasin 8

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Steep	2.2
C, Lawn, Steep	2.13
Pervious Total	4.33
Impervious Land Use	acre
ROADS STEEP	1.78
ROOF TOPS FLAT	1.02
DRIVEWAYS STEEP	0.44
Impervious Total	3.24
Basin Total	7.57

Element Flows To:

Surface	Interflow	Groundwater

Basin 3B

Bypass:	Yes
GroundWater:	No
Pervious Land Use	acre
A B, Lawn, Steep	1.39
Pervious Total	1.39
Impervious Land Use	acre
ROADS STEEP	0.45
ROOF TOPS FLAT	0.69
DRIVEWAYS STEEP	0.29
Impervious Total	1.43
Basin Total	2.82

Element Flows To:

Surface	Interflow	Groundwater

Routing Elements
Predeveloped Routing

Subbasin 5 Detention

Bottom Length: 24.00 ft.
Bottom Width: 24.00 ft.
Depth: 8 ft.
Volume at riser head: 0.1096 acre-feet.
Side slope 1: 0.292 To 1
Side slope 2: 0.292 To 1
Side slope 3: 0.292 To 1
Side slope 4: 0.292 To 1
Discharge Structure
Riser Height: 7 ft.
Riser Diameter: 24 in.
Orifice 1 Diameter: 5.75 in. Elevation:0 ft.
Orifice 2 Diameter: 1 in. Elevation:6.5 ft.
Element Flows To:
Outlet 1 Outlet 2

Pond Hydraulic Table

Stage(feet)	**Area(ac.)**	**Volume(ac-ft.)**	**Discharge(cfs)**	**Infilt(cfs)**
0.0000	0.013	0.000	0.000	0.000
0.0889	0.013	0.001	0.267	0.000
0.1778	0.013	0.002	0.378	0.000
0.2667	0.013	0.003	0.463	0.000
0.3556	0.013	0.004	0.535	0.000
0.4444	0.013	0.005	0.598	0.000
0.5333	0.013	0.007	0.655	0.000
0.6222	0.013	0.008	0.707	0.000
0.7111	0.013	0.009	0.756	0.000
0.8000	0.013	0.010	0.802	0.000
0.8889	0.013	0.012	0.845	0.000
0.9778	0.013	0.013	0.887	0.000
1.0667	0.013	0.014	0.926	0.000
1.1556	0.014	0.015	0.964	0.000
1.2444	0.014	0.017	1.000	0.000
1.3333	0.014	0.018	1.036	0.000
1.4222	0.014	0.019	1.070	0.000
1.5111	0.014	0.020	1.102	0.000
1.6000	0.014	0.022	1.134	0.000
1.6889	0.014	0.023	1.166	0.000
1.7778	0.014	0.024	1.196	0.000
1.8667	0.014	0.025	1.225	0.000
1.9556	0.014	0.027	1.254	0.000
2.0444	0.014	0.028	1.282	0.000
2.1333	0.014	0.029	1.310	0.000
2.2222	0.014	0.031	1.337	0.000
2.3111	0.014	0.032	1.364	0.000
2.4000	0.014	0.033	1.390	0.000
2.4889	0.014	0.034	1.415	0.000
2.5778	0.014	0.036	1.440	0.000
2.6667	0.015	0.037	1.465	0.000
2.7556	0.015	0.038	1.489	0.000

2.8444	0.015	0.040	1.513	0.000
2.9333	0.015	0.041	1.536	0.000
3.0222	0.015	0.043	1.559	0.000
3.1111	0.015	0.044	1.582	0.000
3.2000	0.015	0.045	1.605	0.000
3.2889	0.015	0.047	1.627	0.000
3.3778	0.015	0.048	1.649	0.000
3.4667	0.015	0.049	1.670	0.000
3.5556	0.015	0.051	1.691	0.000
3.6444	0.015	0.052	1.712	0.000
3.7333	0.015	0.054	1.733	0.000
3.8222	0.015	0.055	1.754	0.000
3.9111	0.015	0.056	1.774	0.000
4.0000	0.015	0.058	1.794	0.000
4.0889	0.016	0.059	1.814	0.000
4.1778	0.016	0.061	1.833	0.000
4.2667	0.016	0.062	1.853	0.000
4.3556	0.016	0.063	1.872	0.000
4.4444	0.016	0.065	1.891	0.000
4.5333	0.016	0.066	1.910	0.000
4.6222	0.016	0.068	1.928	0.000
4.7111	0.016	0.069	1.947	0.000
4.8000	0.016	0.071	1.965	0.000
4.8889	0.016	0.072	1.983	0.000
4.9778	0.016	0.074	2.001	0.000
5.0667	0.016	0.075	2.019	0.000
5.1556	0.016	0.077	2.037	0.000
5.2444	0.016	0.078	2.054	0.000
5.3333	0.016	0.080	2.072	0.000
5.4222	0.016	0.081	2.089	0.000
5.5111	0.017	0.083	2.106	0.000
5.6000	0.017	0.084	2.123	0.000
5.6889	0.017	0.086	2.140	0.000
5.7778	0.017	0.087	2.156	0.000
5.8667	0.017	0.089	2.173	0.000
5.9556	0.017	0.090	2.189	0.000
6.0444	0.017	0.092	2.205	0.000
6.1333	0.017	0.093	2.222	0.000
6.2222	0.017	0.095	2.238	0.000
6.3111	0.017	0.096	2.254	0.000
6.4000	0.017	0.098	2.269	0.000
6.4889	0.017	0.100	2.285	0.000
6.5778	0.017	0.101	2.308	0.000
6.6667	0.017	0.103	2.327	0.000
6.7556	0.017	0.104	2.345	0.000
6.8444	0.018	0.106	2.363	0.000
6.9333	0.018	0.108	2.380	0.000
7.0222	0.018	0.109	2.467	0.000
7.1111	0.018	0.111	3.198	0.000
7.2000	0.018	0.112	4.316	0.000
7.2889	0.018	0.114	5.685	0.000
7.3778	0.018	0.116	7.207	0.000
7.4667	0.018	0.117	8.785	0.000
7.5556	0.018	0.119	10.32	0.000
7.6444	0.018	0.121	11.71	0.000
7.7333	0.018	0.122	12.90	0.000
7.8222	0.018	0.124	13.83	0.000
7.9111	0.018	0.126	14.51	0.000

8.0000	0.018	0.127	15.03	0.000
8.0889	0.018	0.129	15.73	0.000

Subbasin 3 Detention

Dimensions

Depth:	6 ft.	
Tank Type:	Circular	
Diameter:	6 ft.	
Length:	171 ft.	

Discharge Structure

Riser Height:	5 ft.	
Riser Diameter:	24 in.	
Orifice 1 Diameter:	3.17 in.	Elevation:0 ft.

Element Flows To:

Outlet 1	Outlet 2

Tank Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.000	0.000	0.000	0.000
0.0667	0.004	0.000	0.070	0.000
0.1333	0.006	0.000	0.099	0.000
0.2000	0.008	0.001	0.122	0.000
0.2667	0.009	0.001	0.140	0.000
0.3333	0.010	0.002	0.157	0.000
0.4000	0.011	0.003	0.172	0.000
0.4667	0.012	0.004	0.186	0.000
0.5333	0.013	0.004	0.199	0.000
0.6000	0.014	0.005	0.211	0.000
0.6667	0.014	0.006	0.222	0.000
0.7333	0.015	0.007	0.233	0.000
0.8000	0.016	0.008	0.243	0.000
0.8667	0.016	0.009	0.253	0.000
0.9333	0.017	0.011	0.263	0.000
1.0000	0.017	0.012	0.272	0.000
1.0667	0.018	0.013	0.281	0.000
1.1333	0.018	0.014	0.290	0.000
1.2000	0.018	0.015	0.298	0.000
1.2667	0.019	0.017	0.306	0.000
1.3333	0.019	0.018	0.314	0.000
1.4000	0.019	0.019	0.322	0.000
1.4667	0.020	0.021	0.330	0.000
1.5333	0.020	0.022	0.337	0.000
1.6000	0.020	0.023	0.344	0.000
1.6667	0.021	0.025	0.352	0.000
1.7333	0.021	0.026	0.359	0.000
1.8000	0.021	0.028	0.365	0.000
1.8667	0.021	0.029	0.372	0.000
1.9333	0.022	0.030	0.379	0.000
2.0000	0.022	0.032	0.385	0.000
2.0667	0.022	0.033	0.392	0.000
2.1333	0.022	0.035	0.398	0.000
2.2000	0.022	0.036	0.404	0.000
2.2667	0.022	0.038	0.410	0.000
2.3333	0.023	0.039	0.416	0.000
2.4000	0.023	0.041	0.422	0.000
2.4667	0.023	0.043	0.428	0.000
2.5333	0.023	0.044	0.434	0.000
2.6000	0.023	0.046	0.439	0.000

2.6667	0.023	0.047	0.445	0.000
2.7333	0.023	0.049	0.450	0.000
2.8000	0.023	0.050	0.456	0.000
2.8667	0.023	0.052	0.461	0.000
2.9333	0.023	0.053	0.467	0.000
3.0000	0.023	0.055	0.472	0.000
3.0667	0.023	0.057	0.477	0.000
3.1333	0.023	0.058	0.482	0.000
3.2000	0.023	0.060	0.487	0.000
3.2667	0.023	0.061	0.492	0.000
3.3333	0.023	0.063	0.497	0.000
3.4000	0.023	0.064	0.502	0.000
3.4667	0.023	0.066	0.507	0.000
3.5333	0.023	0.068	0.512	0.000
3.6000	0.023	0.069	0.517	0.000
3.6667	0.023	0.071	0.522	0.000
3.7333	0.022	0.072	0.526	0.000
3.8000	0.022	0.074	0.531	0.000
3.8667	0.022	0.075	0.536	0.000
3.9333	0.022	0.077	0.540	0.000
4.0000	0.022	0.078	0.545	0.000
4.0667	0.022	0.080	0.549	0.000
4.1333	0.021	0.081	0.554	0.000
4.2000	0.021	0.083	0.558	0.000
4.2667	0.021	0.084	0.563	0.000
4.3333	0.021	0.085	0.567	0.000
4.4000	0.020	0.087	0.572	0.000
4.4667	0.020	0.088	0.576	0.000
4.5333	0.020	0.090	0.580	0.000
4.6000	0.019	0.091	0.584	0.000
4.6667	0.019	0.092	0.589	0.000
4.7333	0.019	0.093	0.593	0.000
4.8000	0.018	0.095	0.597	0.000
4.8667	0.018	0.096	0.601	0.000
4.9333	0.018	0.097	0.605	0.000
5.0000	0.017	0.098	0.609	0.000
5.0667	0.017	0.100	0.978	0.000
5.1333	0.016	0.101	1.648	0.000
5.2000	0.016	0.102	2.508	0.000
5.2667	0.015	0.103	3.508	0.000
5.3333	0.014	0.104	4.609	0.000
5.4000	0.014	0.105	5.768	0.000
5.4667	0.013	0.106	6.945	0.000
5.5333	0.012	0.107	8.097	0.000
5.6000	0.011	0.107	9.185	0.000
5.6667	0.010	0.108	10.17	0.000
5.7333	0.009	0.109	11.03	0.000
5.8000	0.008	0.109	11.74	0.000
5.8667	0.006	0.110	12.31	0.000
5.9333	0.004	0.110	12.76	0.000
6.0000	0.000	0.111	13.13	0.000
6.0667	0.000	0.000	13.68	0.000

Mitigated Routing

Tank 1

Dimensions
Depth: 6 ft.
Tank Type: Circular
Diameter: 6 ft.
Length: 171 ft.
Discharge Structure
Riser Height: 5 ft.
Riser Diameter: 24 in.
Orifice 1 Diameter: 3.17 in. Elevation:0 ft.
Element Flows To:
Outlet 1 Outlet 2

Tank Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.000	0.000	0.000	0.000
0.0667	0.004	0.000	0.070	0.000
0.1333	0.006	0.000	0.099	0.000
0.2000	0.008	0.001	0.122	0.000
0.2667	0.009	0.001	0.140	0.000
0.3333	0.010	0.002	0.157	0.000
0.4000	0.011	0.003	0.172	0.000
0.4667	0.012	0.004	0.186	0.000
0.5333	0.013	0.004	0.199	0.000
0.6000	0.014	0.005	0.211	0.000
0.6667	0.014	0.006	0.222	0.000
0.7333	0.015	0.007	0.233	0.000
0.8000	0.016	0.008	0.243	0.000
0.8667	0.016	0.009	0.253	0.000
0.9333	0.017	0.011	0.263	0.000
1.0000	0.017	0.012	0.272	0.000
1.0667	0.018	0.013	0.281	0.000
1.1333	0.018	0.014	0.290	0.000
1.2000	0.018	0.015	0.298	0.000
1.2667	0.019	0.017	0.306	0.000
1.3333	0.019	0.018	0.314	0.000
1.4000	0.019	0.019	0.322	0.000
1.4667	0.020	0.021	0.330	0.000
1.5333	0.020	0.022	0.337	0.000
1.6000	0.020	0.023	0.344	0.000
1.6667	0.021	0.025	0.352	0.000
1.7333	0.021	0.026	0.359	0.000
1.8000	0.021	0.028	0.365	0.000
1.8667	0.021	0.029	0.372	0.000
1.9333	0.022	0.030	0.379	0.000
2.0000	0.022	0.032	0.385	0.000
2.0667	0.022	0.033	0.392	0.000
2.1333	0.022	0.035	0.398	0.000
2.2000	0.022	0.036	0.404	0.000
2.2667	0.022	0.038	0.410	0.000
2.3333	0.023	0.039	0.416	0.000
2.4000	0.023	0.041	0.422	0.000
2.4667	0.023	0.043	0.428	0.000

2.5333	0.023	0.044	0.434	0.000
2.6000	0.023	0.046	0.439	0.000
2.6667	0.023	0.047	0.445	0.000
2.7333	0.023	0.049	0.450	0.000
2.8000	0.023	0.050	0.456	0.000
2.8667	0.023	0.052	0.461	0.000
2.9333	0.023	0.053	0.467	0.000
3.0000	0.023	0.055	0.472	0.000
3.0667	0.023	0.057	0.477	0.000
3.1333	0.023	0.058	0.482	0.000
3.2000	0.023	0.060	0.487	0.000
3.2667	0.023	0.061	0.492	0.000
3.3333	0.023	0.063	0.497	0.000
3.4000	0.023	0.064	0.502	0.000
3.4667	0.023	0.066	0.507	0.000
3.5333	0.023	0.068	0.512	0.000
3.6000	0.023	0.069	0.517	0.000
3.6667	0.023	0.071	0.522	0.000
3.7333	0.022	0.072	0.526	0.000
3.8000	0.022	0.074	0.531	0.000
3.8667	0.022	0.075	0.536	0.000
3.9333	0.022	0.077	0.540	0.000
4.0000	0.022	0.078	0.545	0.000
4.0667	0.022	0.080	0.549	0.000
4.1333	0.021	0.081	0.554	0.000
4.2000	0.021	0.083	0.558	0.000
4.2667	0.021	0.084	0.563	0.000
4.3333	0.021	0.085	0.567	0.000
4.4000	0.020	0.087	0.572	0.000
4.4667	0.020	0.088	0.576	0.000
4.5333	0.020	0.090	0.580	0.000
4.6000	0.019	0.091	0.584	0.000
4.6667	0.019	0.092	0.589	0.000
4.7333	0.019	0.093	0.593	0.000
4.8000	0.018	0.095	0.597	0.000
4.8667	0.018	0.096	0.601	0.000
4.9333	0.018	0.097	0.605	0.000
5.0000	0.017	0.098	0.609	0.000
5.0667	0.017	0.100	0.978	0.000
5.1333	0.016	0.101	1.648	0.000
5.2000	0.016	0.102	2.508	0.000
5.2667	0.015	0.103	3.508	0.000
5.3333	0.014	0.104	4.609	0.000
5.4000	0.014	0.105	5.768	0.000
5.4667	0.013	0.106	6.945	0.000
5.5333	0.012	0.107	8.097	0.000
5.6000	0.011	0.107	9.185	0.000
5.6667	0.010	0.108	10.17	0.000
5.7333	0.009	0.109	11.03	0.000
5.8000	0.008	0.109	11.74	0.000
5.8667	0.006	0.110	12.31	0.000
5.9333	0.004	0.110	12.76	0.000
6.0000	0.000	0.111	13.13	0.000
6.0667	0.000	0.000	13.68	0.000

Trapezoidal Pond 1

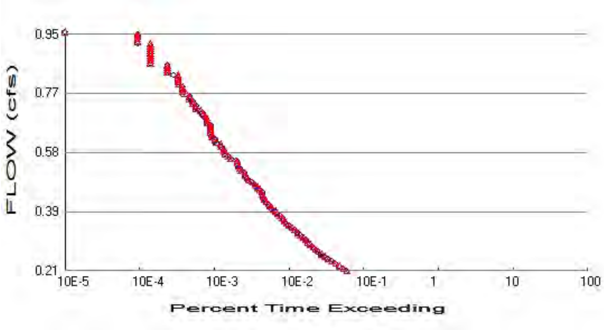
Bottom Length: 24.00 ft.
Bottom Width: 24.00 ft.
Depth: 8 ft.
Volume at riser head: 0.1096 acre-feet.
Side slope 1: 0.292 To 1
Side slope 2: 0.292 To 1
Side slope 3: 0.292 To 1
Side slope 4: 0.292 To 1
Discharge Structure
Riser Height: 7 ft.
Riser Diameter: 24 in.
Orifice 1 Diameter: 5.75 in. Elevation:0 ft.
Orifice 2 Diameter: 1 in. Elevation:6.5 ft.
Element Flows To:
Outlet 1 Outlet 2

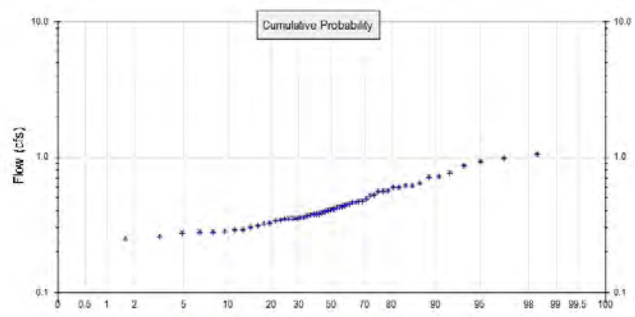
Pond Hydraulic Table

Stage(feet)	**Area(ac.)**	**Volume(ac-ft.)**	**Discharge(cfs)**	**Infilt(cfs)**
0.0000	0.013	0.000	0.000	0.000
0.0889	0.013	0.001	0.267	0.000
0.1778	0.013	0.002	0.378	0.000
0.2667	0.013	0.003	0.463	0.000
0.3556	0.013	0.004	0.535	0.000
0.4444	0.013	0.005	0.598	0.000
0.5333	0.013	0.007	0.655	0.000
0.6222	0.013	0.008	0.707	0.000
0.7111	0.013	0.009	0.756	0.000
0.8000	0.013	0.010	0.802	0.000
0.8889	0.013	0.012	0.845	0.000
0.9778	0.013	0.013	0.887	0.000
1.0667	0.013	0.014	0.926	0.000
1.1556	0.014	0.015	0.964	0.000
1.2444	0.014	0.017	1.000	0.000
1.3333	0.014	0.018	1.036	0.000
1.4222	0.014	0.019	1.070	0.000
1.5111	0.014	0.020	1.102	0.000
1.6000	0.014	0.022	1.134	0.000
1.6889	0.014	0.023	1.166	0.000
1.7778	0.014	0.024	1.196	0.000
1.8667	0.014	0.025	1.225	0.000
1.9556	0.014	0.027	1.254	0.000
2.0444	0.014	0.028	1.282	0.000
2.1333	0.014	0.029	1.310	0.000
2.2222	0.014	0.031	1.337	0.000
2.3111	0.014	0.032	1.364	0.000
2.4000	0.014	0.033	1.390	0.000
2.4889	0.014	0.034	1.415	0.000
2.5778	0.014	0.036	1.440	0.000
2.6667	0.015	0.037	1.465	0.000
2.7556	0.015	0.038	1.489	0.000
2.8444	0.015	0.040	1.513	0.000
2.9333	0.015	0.041	1.536	0.000
3.0222	0.015	0.043	1.559	0.000
3.1111	0.015	0.044	1.582	0.000

3.2000	0.015	0.045	1.605	0.000
3.2889	0.015	0.047	1.627	0.000
3.3778	0.015	0.048	1.649	0.000
3.4667	0.015	0.049	1.670	0.000
3.5556	0.015	0.051	1.691	0.000
3.6444	0.015	0.052	1.712	0.000
3.7333	0.015	0.054	1.733	0.000
3.8222	0.015	0.055	1.754	0.000
3.9111	0.015	0.056	1.774	0.000
4.0000	0.015	0.058	1.794	0.000
4.0889	0.016	0.059	1.814	0.000
4.1778	0.016	0.061	1.833	0.000
4.2667	0.016	0.062	1.853	0.000
4.3556	0.016	0.063	1.872	0.000
4.4444	0.016	0.065	1.891	0.000
4.5333	0.016	0.066	1.910	0.000
4.6222	0.016	0.068	1.928	0.000
4.7111	0.016	0.069	1.947	0.000
4.8000	0.016	0.071	1.965	0.000
4.8889	0.016	0.072	1.983	0.000
4.9778	0.016	0.074	2.001	0.000
5.0667	0.016	0.075	2.019	0.000
5.1556	0.016	0.077	2.037	0.000
5.2444	0.016	0.078	2.054	0.000
5.3333	0.016	0.080	2.072	0.000
5.4222	0.016	0.081	2.089	0.000
5.5111	0.017	0.083	2.106	0.000
5.6000	0.017	0.084	2.123	0.000
5.6889	0.017	0.086	2.140	0.000
5.7778	0.017	0.087	2.156	0.000
5.8667	0.017	0.089	2.173	0.000
5.9556	0.017	0.090	2.189	0.000
6.0444	0.017	0.092	2.205	0.000
6.1333	0.017	0.093	2.222	0.000
6.2222	0.017	0.095	2.238	0.000
6.3111	0.017	0.096	2.254	0.000
6.4000	0.017	0.098	2.269	0.000
6.4889	0.017	0.100	2.285	0.000
6.5778	0.017	0.101	2.308	0.000
6.6667	0.017	0.103	2.327	0.000
6.7556	0.017	0.104	2.345	0.000
6.8444	0.018	0.106	2.363	0.000
6.9333	0.018	0.108	2.380	0.000
7.0222	0.018	0.109	2.467	0.000
7.1111	0.018	0.111	3.198	0.000
7.2000	0.018	0.112	4.316	0.000
7.2889	0.018	0.114	5.685	0.000
7.3778	0.018	0.116	7.207	0.000
7.4667	0.018	0.117	8.785	0.000
7.5556	0.018	0.119	10.32	0.000
7.6444	0.018	0.121	11.71	0.000
7.7333	0.018	0.122	12.90	0.000
7.8222	0.018	0.124	13.83	0.000
7.9111	0.018	0.126	14.51	0.000
8.0000	0.018	0.127	15.03	0.000
8.0889	0.018	0.129	15.73	0.000

Analysis Results
POC 1





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 1.34
Total Impervious Area: 0.81

Mitigated Landuse Totals for POC #1
Total Pervious Area: 1.32
Total Impervious Area: 0.82

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.416796
5 year	0.567316
10 year	0.677895
25 year	0.830552
50 year	0.954007
100 year	1.086099

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.419476
5 year	0.570091
10 year	0.680611
25 year	0.83304
50 year	0.956208
100 year	1.087905

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1949	0.612	0.615
1950	0.594	0.595
1951	0.375	0.376
1952	0.249	0.251
1953	0.279	0.281
1954	0.341	0.343
1955	0.379	0.382
1956	0.346	0.347
1957	0.439	0.442
1958	0.321	0.323

1959	0.300	0.303
1960	0.393	0.395
1961	0.348	0.351
1962	0.274	0.277
1963	0.376	0.378
1964	0.324	0.325
1965	0.459	0.462
1966	0.282	0.284
1967	0.596	0.597
1968	0.613	0.617
1969	0.414	0.417
1970	0.386	0.389
1971	0.470	0.473
1972	0.559	0.561
1973	0.243	0.246
1974	0.459	0.462
1975	0.449	0.452
1976	0.356	0.358
1977	0.338	0.340
1978	0.425	0.428
1979	0.518	0.523
1980	0.717	0.719
1981	0.403	0.406
1982	0.637	0.640
1983	0.436	0.440
1984	0.289	0.291
1985	0.394	0.398
1986	0.366	0.368
1987	0.487	0.492
1988	0.277	0.280
1989	0.423	0.427
1990	1.046	1.046
1991	0.764	0.766
1992	0.309	0.311
1993	0.288	0.290
1994	0.258	0.260
1995	0.356	0.359
1996	0.561	0.562
1997	0.430	0.433
1998	0.377	0.379
1999	0.920	0.925
2000	0.410	0.413
2001	0.408	0.412
2002	0.554	0.557
2003	0.525	0.527
2004	0.856	0.861
2005	0.352	0.355
2006	0.349	0.350
2007	0.987	0.986
2008	0.711	0.714
2009	0.468	0.473

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	1.0458	1.0461
2	0.9867	0.9861
3	0.9201	0.9251

4	0.8561	0.8610
5	0.7635	0.7655
6	0.7165	0.7187
7	0.7114	0.7138
8	0.6369	0.6402
9	0.6132	0.6173
10	0.6116	0.6146
11	0.5962	0.5974
12	0.5937	0.5946
13	0.5615	0.5617
14	0.5589	0.5607
15	0.5537	0.5569
16	0.5252	0.5274
17	0.5181	0.5233
18	0.4874	0.4924
19	0.4696	0.4729
20	0.4685	0.4727
21	0.4595	0.4622
22	0.4590	0.4617
23	0.4494	0.4520
24	0.4394	0.4422
25	0.4358	0.4400
26	0.4304	0.4326
27	0.4251	0.4277
28	0.4234	0.4275
29	0.4141	0.4167
30	0.4101	0.4129
31	0.4077	0.4116
32	0.4025	0.4058
33	0.3944	0.3976
34	0.3933	0.3953
35	0.3861	0.3888
36	0.3787	0.3816
37	0.3767	0.3788
38	0.3759	0.3782
39	0.3748	0.3764
40	0.3662	0.3683
41	0.3562	0.3592
42	0.3559	0.3580
43	0.3525	0.3548
44	0.3487	0.3507
45	0.3483	0.3503
46	0.3461	0.3467
47	0.3406	0.3429
48	0.3377	0.3399
49	0.3242	0.3252
50	0.3207	0.3234
51	0.3093	0.3111
52	0.3002	0.3034
53	0.2886	0.2909
54	0.2876	0.2898
55	0.2824	0.2844
56	0.2786	0.2815
57	0.2767	0.2800
58	0.2740	0.2767
59	0.2579	0.2604
60	0.2488	0.2508
61	0.2429	0.2455

Duration Flows

The Development Failed :duration increase
for more than 50% of the flows.

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.2084	1243	1278	102	Fail
0.2159	1126	1152	102	Fail
0.2235	985	1019	103	Fail
0.2310	885	907	102	Fail
0.2385	786	804	102	Fail
0.2461	697	724	103	Fail
0.2536	625	650	104	Fail
0.2611	571	588	102	Fail
0.2686	515	536	104	Fail
0.2762	474	484	102	Fail
0.2837	443	453	102	Fail
0.2912	403	411	101	Fail
0.2988	379	384	101	Fail
0.3063	352	360	102	Fail
0.3138	321	337	104	Fail
0.3214	297	304	102	Fail
0.3289	274	280	102	Fail
0.3364	250	257	102	Fail
0.3440	229	237	103	Fail
0.3515	210	214	101	Fail
0.3590	190	197	103	Fail
0.3666	182	186	102	Fail
0.3741	172	173	100	Pass
0.3816	162	165	101	Fail
0.3892	148	150	101	Fail
0.3967	137	141	102	Fail
0.4042	124	130	104	Fail
0.4117	116	120	103	Fail
0.4193	110	113	102	Pass
0.4268	103	107	103	Pass
0.4343	100	101	101	Pass
0.4419	94	97	103	Pass
0.4494	93	94	101	Pass
0.4569	92	92	100	Pass
0.4645	87	88	101	Pass
0.4720	79	82	103	Pass
0.4795	73	75	102	Pass
0.4871	67	70	104	Pass
0.4946	60	62	103	Pass
0.5021	56	59	105	Pass
0.5097	55	56	101	Pass
0.5172	54	55	101	Pass
0.5247	48	49	102	Pass
0.5322	46	47	102	Pass
0.5398	44	45	102	Pass
0.5473	43	43	100	Pass
0.5548	42	43	102	Pass
0.5624	35	36	102	Pass
0.5699	33	33	100	Pass
0.5774	30	30	100	Pass
0.5850	29	29	100	Pass
0.5925	28	29	103	Pass
0.6000	26	26	100	Pass

0.6076	24	26	108	Pass
0.6151	22	23	104	Pass
0.6226	22	22	100	Pass
0.6302	20	20	100	Pass
0.6377	19	20	105	Pass
0.6452	19	19	100	Pass
0.6528	19	19	100	Pass
0.6603	19	19	100	Pass
0.6678	19	19	100	Pass
0.6753	17	17	100	Pass
0.6829	17	17	100	Pass
0.6904	16	17	106	Pass
0.6979	15	16	106	Pass
0.7055	15	15	100	Pass
0.7130	13	14	107	Pass
0.7205	12	12	100	Pass
0.7281	12	12	100	Pass
0.7356	11	11	100	Pass
0.7431	11	11	100	Pass
0.7507	10	10	100	Pass
0.7582	10	10	100	Pass
0.7657	8	9	112	Fail
0.7733	8	8	100	Pass
0.7808	8	8	100	Pass
0.7883	8	8	100	Pass
0.7958	7	7	100	Pass
0.8034	7	7	100	Pass
0.8109	7	7	100	Pass
0.8184	7	7	100	Pass
0.8260	6	7	116	Fail
0.8335	5	5	100	Pass
0.8410	5	5	100	Pass
0.8486	5	5	100	Pass
0.8561	5	5	100	Pass
0.8636	3	3	100	Pass
0.8712	3	3	100	Pass
0.8787	3	3	100	Pass
0.8862	3	3	100	Pass
0.8938	3	3	100	Pass
0.9013	3	3	100	Pass
0.9088	3	3	100	Pass
0.9163	3	3	100	Pass
0.9239	2	3	150	Fail
0.9314	2	2	100	Pass
0.9389	2	2	100	Pass
0.9465	2	2	100	Pass
0.9540	2	2	100	Pass

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.
The development has an increase in flow durations for more than 50% of the flows for the range of the duration analysis.

Water Quality

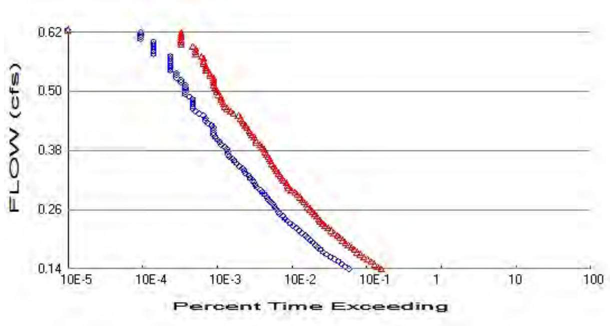
Water Quality BMP Flow and Volume for POC #1

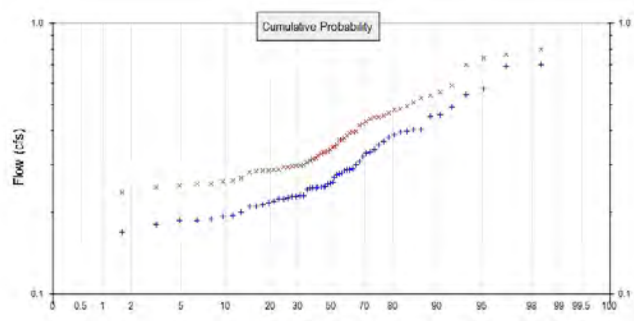
On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

POC 2





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #2
Total Pervious Area: 1.08
Total Impervious Area: 0.54

Mitigated Landuse Totals for POC #2
Total Pervious Area: 0.84
Total Impervious Area: 0.78

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #2

Return Period	Flow(cfs)
2 year	0.272287
5 year	0.368456
10 year	0.440235
25 year	0.540614
50 year	0.622745
100 year	0.71146

Flow Frequency Return Periods for Mitigated. POC #2

Return Period	Flow(cfs)
2 year	0.357064
5 year	0.468532
10 year	0.548138
25 year	0.655564
50 year	0.740714
100 year	0.830382

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #2

Year	Predeveloped	Mitigated
1949	0.378	0.484
1950	0.399	0.466
1951	0.247	0.308
1952	0.164	0.218
1953	0.189	0.263
1954	0.231	0.293
1955	0.249	0.333
1956	0.246	0.297
1957	0.270	0.356
1958	0.210	0.285
1959	0.210	0.293

1960	0.247	0.317
1961	0.224	0.297
1962	0.181	0.250
1963	0.243	0.316
1964	0.224	0.287
1965	0.285	0.370
1966	0.186	0.247
1967	0.405	0.478
1968	0.403	0.531
1969	0.254	0.334
1970	0.247	0.328
1971	0.300	0.398
1972	0.366	0.444
1973	0.169	0.237
1974	0.290	0.377
1975	0.275	0.371
1976	0.229	0.298
1977	0.220	0.288
1978	0.287	0.392
1979	0.355	0.491
1980	0.452	0.556
1981	0.256	0.347
1982	0.387	0.512
1983	0.287	0.396
1984	0.193	0.254
1985	0.248	0.337
1986	0.230	0.299
1987	0.322	0.449
1988	0.195	0.268
1989	0.308	0.419
1990	0.703	0.796
1991	0.489	0.590
1992	0.201	0.260
1993	0.213	0.282
1994	0.187	0.255
1995	0.229	0.311
1996	0.395	0.449
1997	0.278	0.352
1998	0.246	0.325
1999	0.574	0.741
2000	0.258	0.342
2001	0.279	0.383
2002	0.333	0.434
2003	0.340	0.426
2004	0.543	0.704
2005	0.216	0.286
2006	0.226	0.283
2007	0.692	0.763
2008	0.460	0.541
2009	0.331	0.456

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #2

Rank	Predeveloped	Mitigated
1	0.7030	0.7957
2	0.6916	0.7627
3	0.5737	0.7415
4	0.5428	0.7039

5	0.4887	0.5895
6	0.4598	0.5565
7	0.4521	0.5409
8	0.4053	0.5309
9	0.4035	0.5115
10	0.3990	0.4912
11	0.3949	0.4839
12	0.3871	0.4778
13	0.3783	0.4660
14	0.3659	0.4563
15	0.3551	0.4491
16	0.3400	0.4489
17	0.3326	0.4441
18	0.3306	0.4339
19	0.3219	0.4259
20	0.3085	0.4190
21	0.3004	0.3980
22	0.2896	0.3961
23	0.2871	0.3915
24	0.2870	0.3833
25	0.2849	0.3769
26	0.2793	0.3706
27	0.2780	0.3705
28	0.2749	0.3558
29	0.2705	0.3518
30	0.2578	0.3472
31	0.2561	0.3419
32	0.2541	0.3369
33	0.2487	0.3339
34	0.2476	0.3327
35	0.2472	0.3282
36	0.2469	0.3251
37	0.2466	0.3175
38	0.2464	0.3156
39	0.2458	0.3109
40	0.2427	0.3075
41	0.2312	0.2988
42	0.2302	0.2982
43	0.2294	0.2968
44	0.2290	0.2965
45	0.2259	0.2931
46	0.2245	0.2925
47	0.2235	0.2883
48	0.2198	0.2873
49	0.2159	0.2857
50	0.2133	0.2850
51	0.2102	0.2834
52	0.2098	0.2816
53	0.2005	0.2683
54	0.1951	0.2627
55	0.1926	0.2601
56	0.1893	0.2547
57	0.1867	0.2543
58	0.1864	0.2503
59	0.1806	0.2473
60	0.1694	0.2369
61	0.1636	0.2182

Duration Flows

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.1361	1238	3345	270	Fail
0.1411	1100	2971	270	Fail
0.1460	992	2716	273	Fail
0.1509	887	2447	275	Fail
0.1558	786	2192	278	Fail
0.1607	701	1956	279	Fail
0.1656	622	1767	284	Fail
0.1705	557	1599	287	Fail
0.1755	512	1468	286	Fail
0.1804	471	1340	284	Fail
0.1853	442	1221	276	Fail
0.1902	409	1115	272	Fail
0.1951	377	1020	270	Fail
0.2000	347	936	269	Fail
0.2050	319	871	273	Fail
0.2099	293	777	265	Fail
0.2148	266	713	268	Fail
0.2197	246	649	263	Fail
0.2246	221	591	267	Fail
0.2295	202	548	271	Fail
0.2344	185	514	277	Fail
0.2394	174	485	278	Fail
0.2443	161	459	285	Fail
0.2492	146	428	293	Fail
0.2541	140	404	288	Fail
0.2590	131	372	283	Fail
0.2639	125	352	281	Fail
0.2689	117	336	287	Fail
0.2738	111	310	279	Fail
0.2787	103	292	283	Fail
0.2836	99	273	275	Fail
0.2885	91	250	274	Fail
0.2934	85	234	275	Fail
0.2983	80	209	261	Fail
0.3033	73	196	268	Fail
0.3082	69	184	266	Fail
0.3131	65	180	276	Fail
0.3180	63	165	261	Fail
0.3229	58	157	270	Fail
0.3278	56	149	266	Fail
0.3328	51	141	276	Fail
0.3377	49	132	269	Fail
0.3426	46	128	278	Fail
0.3475	42	121	288	Fail
0.3524	39	114	292	Fail
0.3573	36	111	308	Fail
0.3622	34	107	314	Fail
0.3672	31	102	329	Fail
0.3721	30	98	326	Fail
0.3770	30	93	310	Fail
0.3819	29	90	310	Fail
0.3868	27	84	311	Fail
0.3917	24	79	329	Fail
0.3966	23	72	313	Fail

0.4016	22	70	318	Fail
0.4065	20	67	335	Fail
0.4114	19	62	326	Fail
0.4163	19	59	310	Fail
0.4212	19	57	300	Fail
0.4261	19	53	278	Fail
0.4311	18	51	283	Fail
0.4360	16	48	300	Fail
0.4409	15	46	306	Fail
0.4458	15	44	293	Fail
0.4507	14	41	292	Fail
0.4556	12	35	291	Fail
0.4605	11	32	290	Fail
0.4655	10	29	290	Fail
0.4704	10	27	270	Fail
0.4753	10	26	260	Fail
0.4802	10	25	250	Fail
0.4851	10	24	240	Fail
0.4900	9	24	266	Fail
0.4950	8	22	275	Fail
0.4999	8	21	262	Fail
0.5048	8	21	262	Fail
0.5097	8	20	250	Fail
0.5146	8	19	237	Fail
0.5195	7	19	271	Fail
0.5244	7	19	271	Fail
0.5294	6	19	316	Fail
0.5343	6	17	283	Fail
0.5392	6	17	283	Fail
0.5441	5	15	300	Fail
0.5490	5	15	300	Fail
0.5539	5	15	300	Fail
0.5588	5	14	280	Fail
0.5638	5	14	280	Fail
0.5687	5	14	280	Fail
0.5736	5	13	260	Fail
0.5785	3	11	366	Fail
0.5834	3	11	366	Fail
0.5883	3	11	366	Fail
0.5933	3	10	333	Fail
0.5982	3	7	233	Fail
0.6031	3	7	233	Fail
0.6080	2	7	350	Fail
0.6129	2	7	350	Fail
0.6178	2	7	350	Fail
0.6227	2	7	350	Fail

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.
The development has an increase in flow durations for more than 50% of the flows for the range of the duration analysis.

Water Quality

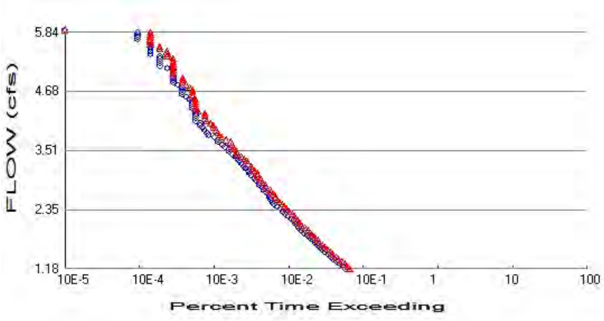
Water Quality BMP Flow and Volume for POC #2

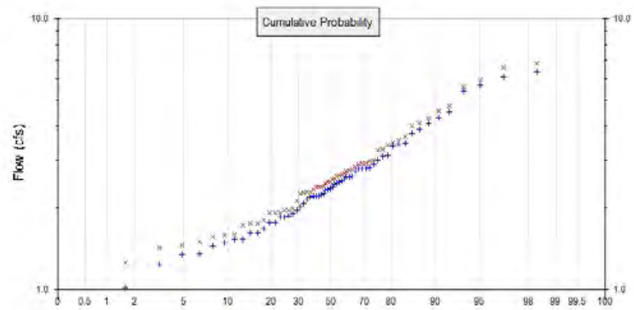
On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Failed

POC 3





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #3
Total Pervious Area: 7.19
Total Impervious Area: 6.88

Mitigated Landuse Totals for POC #3
Total Pervious Area: 6.93
Total Impervious Area: 7.14

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #3

Return Period	**Flow(cfs)**
2 year	2.364141
5 year	3.37629
10 year	4.099862
25 year	5.073688
50 year	5.842112
100 year	6.647232

Flow Frequency Return Periods for Mitigated. POC #3

Return Period	**Flow(cfs)**
2 year	2.524029
5 year	3.567112
10 year	4.306955
25 year	5.296724
50 year	6.073725
100 year	6.884618

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #3

Year	**Predeveloped**	**Mitigated**
1949	3.128	3.399
1950	3.894	4.085
1951	2.506	2.642
1952	1.863	1.912
1953	2.249	2.297
1954	1.525	1.587
1955	2.462	2.566
1956	2.260	2.396
1957	2.801	2.904
1958	1.530	1.750
1959	1.672	1.729

1960	2.449	2.546
1961	2.385	2.495
1962	1.235	1.493
1963	1.484	1.599
1964	1.856	1.958
1965	2.345	2.653
1966	1.956	1.993
1967	3.767	4.017
1968	2.626	2.738
1969	2.204	2.290
1970	1.901	2.255
1971	2.211	2.496
1972	2.998	3.268
1973	1.765	1.800
1974	1.613	1.744
1975	2.798	2.911
1976	1.619	1.961
1977	1.846	1.922
1978	2.731	2.839
1979	2.485	2.620
1980	2.561	2.670
1981	2.887	2.997
1982	4.085	4.269
1983	3.389	3.483
1984	1.440	1.567
1985	2.813	2.907
1986	2.362	2.457
1987	2.605	2.776
1988	2.197	2.347
1989	1.356	1.460
1990	6.364	6.844
1991	4.511	4.764
1992	2.017	2.126
1993	0.882	0.901
1994	1.010	1.252
1995	2.214	2.383
1996	3.462	3.651
1997	2.788	2.975
1998	1.756	1.919
1999	5.697	5.937
2000	2.594	2.751
2001	2.076	2.389
2002	3.440	3.566
2003	1.343	1.425
2004	5.407	5.596
2005	2.318	2.408
2006	2.150	2.278
2007	6.078	6.579
2008	4.300	4.556
2009	3.114	3.285

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #3

Rank	Predeveloped	Mitigated
1	6.3638	6.8444
2	6.0782	6.5788
3	5.6967	5.9367
4	5.4067	5.5961

5	4.5113	4.7636
6	4.2998	4.5556
7	4.0850	4.2694
8	3.8942	4.0846
9	3.7672	4.0174
10	3.4624	3.6510
11	3.4399	3.5661
12	3.3893	3.4832
13	3.1279	3.3993
14	3.1145	3.2854
15	2.9975	3.2685
16	2.8871	2.9965
17	2.8126	2.9748
18	2.8012	2.9112
19	2.7983	2.9071
20	2.7878	2.9037
21	2.7312	2.8390
22	2.6258	2.7761
23	2.6055	2.7515
24	2.5944	2.7384
25	2.5611	2.6703
26	2.5057	2.6527
27	2.4854	2.6419
28	2.4618	2.6196
29	2.4490	2.5656
30	2.3853	2.5455
31	2.3622	2.4959
32	2.3447	2.4953
33	2.3180	2.4571
34	2.2599	2.4082
35	2.2489	2.3965
36	2.2138	2.3891
37	2.2114	2.3833
38	2.2042	2.3470
39	2.1965	2.2973
40	2.1495	2.2903
41	2.0762	2.2783
42	2.0171	2.2554
43	1.9555	2.1256
44	1.9008	1.9931
45	1.8631	1.9613
46	1.8559	1.9578
47	1.8458	1.9218
48	1.7650	1.9185
49	1.7559	1.9123
50	1.6720	1.8002
51	1.6193	1.7497
52	1.6129	1.7436
53	1.5303	1.7291
54	1.5245	1.5994
55	1.4839	1.5867
56	1.4395	1.5672
57	1.3556	1.4932
58	1.3428	1.4596
59	1.2352	1.4250
60	1.0104	1.2519
61	0.8819	0.9013

Duration Flows

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
1.1821	1236	1413	114	Fail
1.2291	1131	1312	116	Fail
1.2762	1047	1202	114	Fail
1.3233	938	1104	117	Fail
1.3704	855	1005	117	Fail
1.4174	782	923	118	Fail
1.4645	728	844	115	Fail
1.5116	652	784	120	Fail
1.5586	602	712	118	Fail
1.6057	562	644	114	Fail
1.6528	520	603	115	Fail
1.6999	479	559	116	Fail
1.7469	453	525	115	Fail
1.7940	414	483	116	Fail
1.8411	386	445	115	Fail
1.8881	345	418	121	Fail
1.9352	316	385	121	Fail
1.9823	293	350	119	Fail
2.0294	279	319	114	Fail
2.0764	262	301	114	Fail
2.1235	248	282	113	Fail
2.1706	231	267	115	Fail
2.2176	208	253	121	Fail
2.2647	191	238	124	Fail
2.3118	181	220	121	Fail
2.3588	167	203	121	Fail
2.4059	151	188	124	Fail
2.4530	137	174	127	Fail
2.5001	129	158	122	Fail
2.5471	122	149	122	Fail
2.5942	117	143	122	Fail
2.6413	113	133	117	Fail
2.6883	106	125	117	Fail
2.7354	98	120	122	Fail
2.7825	94	108	114	Fail
2.8296	87	104	119	Fail
2.8766	85	96	112	Fail
2.9237	79	91	115	Fail
2.9708	74	88	118	Fail
3.0178	67	81	120	Fail
3.0649	64	81	126	Fail
3.1120	61	74	121	Fail
3.1591	56	70	125	Fail
3.2061	54	68	125	Fail
3.2532	50	60	120	Fail
3.3003	46	58	126	Fail
3.3473	44	54	122	Fail
3.3944	41	49	119	Fail
3.4415	38	44	115	Fail
3.4886	34	43	126	Fail
3.5356	34	40	117	Fail
3.5827	30	39	130	Fail
3.6298	28	37	132	Fail
3.6768	24	36	150	Fail

3.7239	24	31	129	Fail
3.7710	22	27	122	Fail
3.8181	18	25	138	Fail
3.8651	17	24	141	Fail
3.9122	16	23	143	Fail
3.9593	15	21	140	Fail
4.0063	14	21	150	Fail
4.0534	14	19	135	Fail
4.1005	12	17	141	Fail
4.1476	12	16	133	Fail
4.1946	12	16	133	Fail
4.2417	12	16	133	Fail
4.2888	12	13	108	Pass
4.3358	11	12	109	Pass
4.3829	11	12	109	Pass
4.4300	11	12	109	Pass
4.4770	11	12	109	Pass
4.5241	10	12	120	Fail
4.5712	9	11	122	Fail
4.6183	8	11	137	Fail
4.6653	8	11	137	Fail
4.7124	8	11	137	Fail
4.7595	8	10	125	Fail
4.8065	7	9	128	Fail
4.8536	6	8	133	Fail
4.9007	6	8	133	Fail
4.9478	6	8	133	Fail
4.9948	6	6	100	Pass
5.0419	6	6	100	Pass
5.0890	6	6	100	Pass
5.1360	5	6	120	Fail
5.1831	4	6	150	Fail
5.2302	4	6	150	Fail
5.2773	4	6	150	Fail
5.3243	4	6	150	Fail
5.3714	4	5	125	Fail
5.4185	3	5	166	Fail
5.4655	3	5	166	Fail
5.5126	3	4	133	Fail
5.5597	3	4	133	Fail
5.6068	3	3	100	Pass
5.6538	3	3	100	Pass
5.7009	2	3	150	Fail
5.7480	2	3	150	Fail
5.7950	2	3	150	Fail
5.8421	2	3	150	Fail

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.
The development has an increase in flow durations for more than 50% of the flows for the range of the duration analysis.

Water Quality

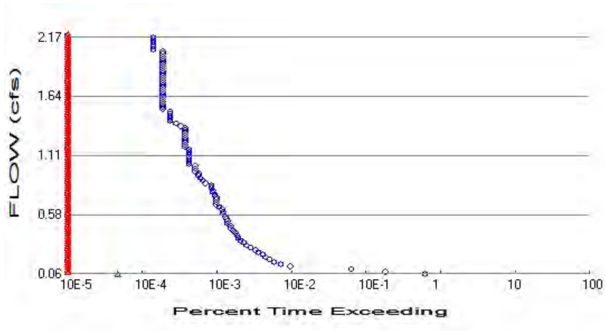
Water Quality BMP Flow and Volume for POC #3

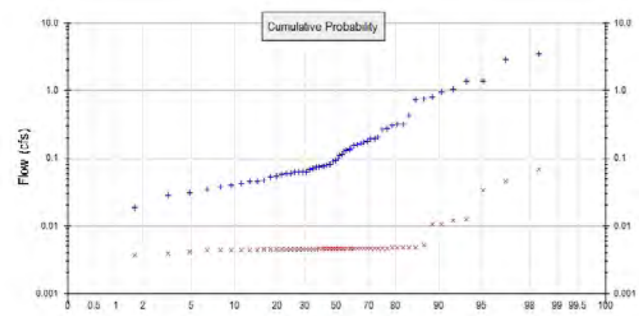
On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Tank 1 POC	☐	840.12			☐	0.00			
Total Volume Infiltrated		840.12	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Failed

POC 4





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #4
Total Pervious Area: 11.76
Total Impervious Area: 3.96

Mitigated Landuse Totals for POC #4
Total Pervious Area: 5.82
Total Impervious Area: 0

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #4

Return Period	Flow(cfs)
2 year	0.1159
5 year	0.338036
10 year	0.63464
25 year	1.312858
50 year	2.165686
100 year	3.469708

Flow Frequency Return Periods for Mitigated. POC #4

Return Period	Flow(cfs)
2 year	0.005048
5 year	0.008331
10 year	0.011249
25 year	0.015971
50 year	0.020372
100 year	0.025655

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #4

Year	Predeveloped	Mitigated
1949	0.312	0.004
1950	1.365	0.012
1951	0.308	0.012
1952	0.070	0.005
1953	0.053	0.005
1954	0.166	0.005
1955	0.094	0.005
1956	0.276	0.005
1957	0.076	0.005
1958	0.063	0.005
1959	0.091	0.005

1960	0.193	0.005
1961	0.155	0.005
1962	0.031	0.004
1963	0.109	0.004
1964	0.176	0.005
1965	0.073	0.005
1966	0.068	0.005
1967	0.958	0.005
1968	0.194	0.005
1969	0.077	0.005
1970	0.047	0.004
1971	0.080	0.005
1972	1.027	0.034
1973	0.063	0.005
1974	0.080	0.005
1975	0.126	0.005
1976	0.130	0.005
1977	0.019	0.004
1978	0.058	0.005
1979	0.038	0.004
1980	0.098	0.005
1981	0.062	0.005
1982	0.137	0.005
1983	0.079	0.005
1984	0.046	0.005
1985	0.034	0.005
1986	0.112	0.004
1987	0.162	0.004
1988	0.042	0.005
1989	0.040	0.005
1990	2.872	0.005
1991	0.750	0.011
1992	0.063	0.005
1993	0.046	0.004
1994	0.028	0.004
1995	0.179	0.005
1996	0.816	0.045
1997	0.312	0.005
1998	0.060	0.004
1999	1.400	0.011
2000	0.054	0.004
2001	0.018	0.005
2002	0.134	0.004
2003	0.075	0.005
2004	0.427	0.005
2005	0.059	0.005
2006	0.204	0.005
2007	3.489	0.068
2008	0.764	0.005
2009	0.270	0.005

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #4

Rank	**Predeveloped**	**Mitigated**
1	3.4888	0.0675
2	2.8717	0.0453
3	1.3996	0.0335
4	1.3649	0.0123

5	1.0265	0.0121
6	0.9575	0.0106
7	0.8164	0.0105
8	0.7644	0.0052
9	0.7504	0.0047
10	0.4265	0.0047
11	0.3125	0.0047
12	0.3121	0.0047
13	0.3083	0.0047
14	0.2757	0.0047
15	0.2699	0.0047
16	0.2036	0.0047
17	0.1941	0.0047
18	0.1935	0.0047
19	0.1785	0.0047
20	0.1761	0.0047
21	0.1656	0.0047
22	0.1622	0.0046
23	0.1548	0.0046
24	0.1370	0.0046
25	0.1344	0.0046
26	0.1298	0.0046
27	0.1262	0.0046
28	0.1123	0.0046
29	0.1093	0.0046
30	0.0981	0.0046
31	0.0938	0.0046
32	0.0908	0.0046
33	0.0804	0.0046
34	0.0801	0.0046
35	0.0786	0.0046
36	0.0769	0.0046
37	0.0756	0.0045
38	0.0745	0.0045
39	0.0735	0.0045
40	0.0702	0.0045
41	0.0679	0.0045
42	0.0632	0.0045
43	0.0630	0.0045
44	0.0625	0.0045
45	0.0622	0.0045
46	0.0595	0.0045
47	0.0594	0.0045
48	0.0583	0.0045
49	0.0538	0.0045
50	0.0525	0.0044
51	0.0468	0.0044
52	0.0462	0.0044
53	0.0456	0.0044
54	0.0423	0.0044
55	0.0399	0.0044
56	0.0377	0.0044
57	0.0341	0.0043
58	0.0311	0.0041
59	0.0282	0.0039
60	0.0185	0.0037
61	0.0178	0.0037

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0580	13242	1	0	Pass
0.0792	3908	0	0	Pass
0.1005	1346	0	0	Pass
0.1218	204	0	0	Pass
0.1431	154	0	0	Pass
0.1644	124	0	0	Pass
0.1857	109	0	0	Pass
0.2070	96	0	0	Pass
0.2283	88	0	0	Pass
0.2496	77	0	0	Pass
0.2709	71	0	0	Pass
0.2921	60	0	0	Pass
0.3134	53	0	0	Pass
0.3347	49	0	0	Pass
0.3560	44	0	0	Pass
0.3773	41	0	0	Pass
0.3986	40	0	0	Pass
0.4199	38	0	0	Pass
0.4412	35	0	0	Pass
0.4625	33	0	0	Pass
0.4838	33	0	0	Pass
0.5050	30	0	0	Pass
0.5263	30	0	0	Pass
0.5476	29	0	0	Pass
0.5689	28	0	0	Pass
0.5902	26	0	0	Pass
0.6115	26	0	0	Pass
0.6328	25	0	0	Pass
0.6541	23	0	0	Pass
0.6754	21	0	0	Pass
0.6967	21	0	0	Pass
0.7179	21	0	0	Pass
0.7392	21	0	0	Pass
0.7605	20	0	0	Pass
0.7818	19	0	0	Pass
0.8031	19	0	0	Pass
0.8244	18	0	0	Pass
0.8457	18	0	0	Pass
0.8670	15	0	0	Pass
0.8883	14	0	0	Pass
0.9096	13	0	0	Pass
0.9309	12	0	0	Pass
0.9521	12	0	0	Pass
0.9734	11	0	0	Pass
0.9947	11	0	0	Pass
1.0160	11	0	0	Pass
1.0373	9	0	0	Pass
1.0586	9	0	0	Pass
1.0799	9	0	0	Pass
1.1012	9	0	0	Pass
1.1225	9	0	0	Pass
1.1438	9	0	0	Pass
1.1650	9	0	0	Pass

1.1863	8	0	0	Pass
1.2076	8	0	0	Pass
1.2289	8	0	0	Pass
1.2502	8	0	0	Pass
1.2715	8	0	0	Pass
1.2928	8	0	0	Pass
1.3141	8	0	0	Pass
1.3354	8	0	0	Pass
1.3567	8	0	0	Pass
1.3779	7	0	0	Pass
1.3992	6	0	0	Pass
1.4205	5	0	0	Pass
1.4418	5	0	0	Pass
1.4631	5	0	0	Pass
1.4844	5	0	0	Pass
1.5057	5	0	0	Pass
1.5270	4	0	0	Pass
1.5483	4	0	0	Pass
1.5696	4	0	0	Pass
1.5908	4	0	0	Pass
1.6121	4	0	0	Pass
1.6334	4	0	0	Pass
1.6547	4	0	0	Pass
1.6760	4	0	0	Pass
1.6973	4	0	0	Pass
1.7186	4	0	0	Pass
1.7399	4	0	0	Pass
1.7612	4	0	0	Pass
1.7825	4	0	0	Pass
1.8038	4	0	0	Pass
1.8250	4	0	0	Pass
1.8463	4	0	0	Pass
1.8676	4	0	0	Pass
1.8889	4	0	0	Pass
1.9102	4	0	0	Pass
1.9315	4	0	0	Pass
1.9528	4	0	0	Pass
1.9741	4	0	0	Pass
1.9954	4	0	0	Pass
2.0167	4	0	0	Pass
2.0379	4	0	0	Pass
2.0592	3	0	0	Pass
2.0805	3	0	0	Pass
2.1018	3	0	0	Pass
2.1231	3	0	0	Pass
2.1444	3	0	0	Pass
2.1657	3	0	0	Pass

Water Quality

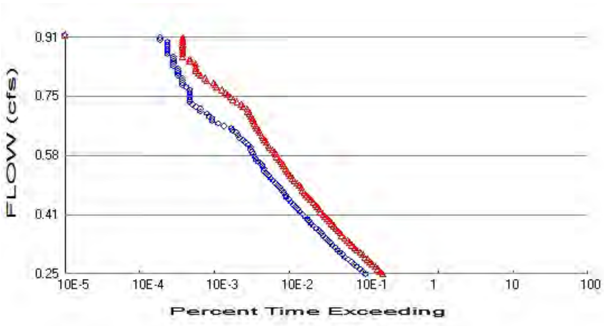
Water Quality BMP Flow and Volume for POC #4

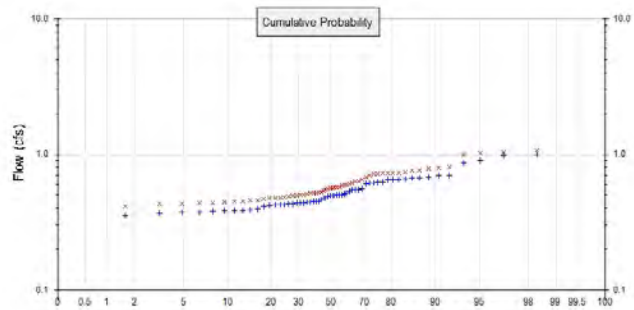
On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Failed

POC 5





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #5
Total Pervious Area: 1.39
Total Impervious Area: 1.31

Mitigated Landuse Totals for POC #5
Total Pervious Area: 1.15
Total Impervious Area: 1.56

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #5

Return Period	Flow(cfs)
2 year	0.498655
5 year	0.624019
10 year	0.710318
25 year	0.823401
50 year	0.91073
100 year	1.000817

Flow Frequency Return Periods for Mitigated. POC #5

Return Period	Flow(cfs)
2 year	0.571506
5 year	0.70847
10 year	0.802065
25 year	0.923993
50 year	1.017665
100 year	1.1139

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #5

Year	Predeveloped	Mitigated
1949	0.624	0.723
1950	0.648	0.727
1951	0.437	0.499
1952	0.351	0.414
1953	0.383	0.438
1954	0.417	0.475
1955	0.462	0.543
1956	0.472	0.526
1957	0.495	0.573
1958	0.397	0.455
1959	0.422	0.478

1960	0.411	0.474
1961	0.447	0.520
1962	0.380	0.444
1963	0.449	0.524
1964	0.434	0.509
1965	0.546	0.616
1966	0.368	0.432
1967	0.675	0.738
1968	0.625	0.722
1969	0.486	0.557
1970	0.437	0.502
1971	0.505	0.593
1972	0.648	0.718
1973	0.353	0.403
1974	0.502	0.567
1975	0.549	0.632
1976	0.375	0.437
1977	0.429	0.485
1978	0.520	0.599
1979	0.612	0.714
1980	0.698	0.786
1981	0.496	0.574
1982	0.670	0.783
1983	0.549	0.646
1984	0.384	0.448
1985	0.509	0.588
1986	0.443	0.515
1987	0.647	0.728
1988	0.423	0.497
1989	0.551	0.635
1990	0.981	1.060
1991	0.666	0.763
1992	0.375	0.430
1993	0.392	0.457
1994	0.385	0.447
1995	0.441	0.503
1996	0.614	0.675
1997	0.499	0.565
1998	0.451	0.520
1999	0.899	1.025
2000	0.476	0.549
2001	0.498	0.571
2002	0.609	0.697
2003	0.533	0.605
2004	0.863	0.988
2005	0.431	0.492
2006	0.421	0.468
2007	0.989	1.043
2008	0.693	0.802
2009	0.663	0.759

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #5

Rank	Predeveloped	Mitigated
1	0.9894	1.0597
2	0.9812	1.0434
3	0.8995	1.0252
4	0.8626	0.9877

5	0.6975	0.8019
6	0.6926	0.7864
7	0.6751	0.7834
8	0.6702	0.7629
9	0.6658	0.7589
10	0.6628	0.7383
11	0.6479	0.7281
12	0.6478	0.7266
13	0.6472	0.7233
14	0.6248	0.7222
15	0.6239	0.7178
16	0.6143	0.7136
17	0.6118	0.6968
18	0.6085	0.6749
19	0.5513	0.6464
20	0.5487	0.6347
21	0.5485	0.6316
22	0.5463	0.6155
23	0.5328	0.6048
24	0.5202	0.5992
25	0.5092	0.5934
26	0.5049	0.5876
27	0.5018	0.5740
28	0.4995	0.5734
29	0.4984	0.5705
30	0.4965	0.5670
31	0.4945	0.5648
32	0.4864	0.5574
33	0.4760	0.5490
34	0.4716	0.5431
35	0.4620	0.5264
36	0.4506	0.5239
37	0.4489	0.5205
38	0.4467	0.5197
39	0.4430	0.5151
40	0.4411	0.5085
41	0.4366	0.5029
42	0.4366	0.5015
43	0.4343	0.4987
44	0.4312	0.4972
45	0.4289	0.4919
46	0.4230	0.4848
47	0.4216	0.4781
48	0.4212	0.4747
49	0.4171	0.4740
50	0.4107	0.4684
51	0.3971	0.4570
52	0.3920	0.4548
53	0.3846	0.4482
54	0.3844	0.4467
55	0.3833	0.4437
56	0.3804	0.4376
57	0.3751	0.4374
58	0.3750	0.4323
59	0.3681	0.4303
60	0.3527	0.4145
61	0.3511	0.4027

Duration Flows

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.2493	2267	3844	169	Fail
0.2560	2066	3540	171	Fail
0.2627	1900	3296	173	Fail
0.2694	1727	3048	176	Fail
0.2761	1579	2789	176	Fail
0.2827	1458	2614	179	Fail
0.2894	1340	2411	179	Fail
0.2961	1205	2222	184	Fail
0.3028	1110	2095	188	Fail
0.3095	1029	1931	187	Fail
0.3161	958	1731	180	Fail
0.3228	893	1614	180	Fail
0.3295	824	1498	181	Fail
0.3362	761	1378	181	Fail
0.3429	711	1297	182	Fail
0.3495	664	1190	179	Fail
0.3562	609	1097	180	Fail
0.3629	577	1031	178	Fail
0.3696	541	966	178	Fail
0.3763	498	906	181	Fail
0.3829	458	851	185	Fail
0.3896	428	803	187	Fail
0.3963	398	754	189	Fail
0.4030	375	704	187	Fail
0.4097	351	657	187	Fail
0.4163	325	615	189	Fail
0.4230	299	572	191	Fail
0.4297	283	544	192	Fail
0.4364	262	511	195	Fail
0.4431	246	482	195	Fail
0.4498	227	454	200	Fail
0.4564	213	419	196	Fail
0.4631	196	389	198	Fail
0.4698	191	364	190	Fail
0.4765	182	342	187	Fail
0.4832	170	327	192	Fail
0.4898	160	311	194	Fail
0.4965	151	294	194	Fail
0.5032	139	271	194	Fail
0.5099	132	251	190	Fail
0.5166	123	240	195	Fail
0.5232	113	221	195	Fail
0.5299	107	211	197	Fail
0.5366	100	202	202	Fail
0.5433	99	191	192	Fail
0.5500	94	182	193	Fail
0.5566	90	175	194	Fail
0.5633	82	166	202	Fail
0.5700	77	157	203	Fail
0.5767	74	147	198	Fail
0.5834	70	143	204	Fail
0.5901	68	136	200	Fail
0.5967	66	128	193	Fail
0.6034	65	118	181	Fail

0.6101	61	113	185	Fail
0.6168	55	107	194	Fail
0.6235	52	101	194	Fail
0.6301	47	96	204	Fail
0.6368	44	92	209	Fail
0.6435	42	87	207	Fail
0.6502	37	84	227	Fail
0.6569	36	79	219	Fail
0.6635	29	76	262	Fail
0.6702	24	74	308	Fail
0.6769	20	70	350	Fail
0.6836	20	69	345	Fail
0.6903	18	66	366	Fail
0.6969	17	64	376	Fail
0.7036	14	60	428	Fail
0.7103	14	59	421	Fail
0.7170	12	52	433	Fail
0.7237	11	49	445	Fail
0.7303	10	43	430	Fail
0.7370	10	38	380	Fail
0.7437	10	35	350	Fail
0.7504	10	32	320	Fail
0.7571	10	30	300	Fail
0.7638	10	27	270	Fail
0.7704	9	23	255	Fail
0.7771	8	22	275	Fail
0.7838	8	21	262	Fail
0.7905	8	17	212	Fail
0.7972	8	16	200	Fail
0.8038	7	14	200	Fail
0.8105	7	13	185	Fail
0.8172	7	12	171	Fail
0.8239	7	12	171	Fail
0.8306	6	12	200	Fail
0.8372	6	12	200	Fail
0.8439	6	10	166	Fail
0.8506	6	10	166	Fail
0.8573	6	8	133	Fail
0.8640	5	8	160	Fail
0.8706	5	8	160	Fail
0.8773	5	8	160	Fail
0.8840	5	8	160	Fail
0.8907	5	8	160	Fail
0.8974	5	8	160	Fail
0.9040	4	8	200	Fail
0.9107	4	8	200	Fail

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.
The development has an increase in flow durations for more than 50% of the flows for the range of the duration analysis.

Water Quality

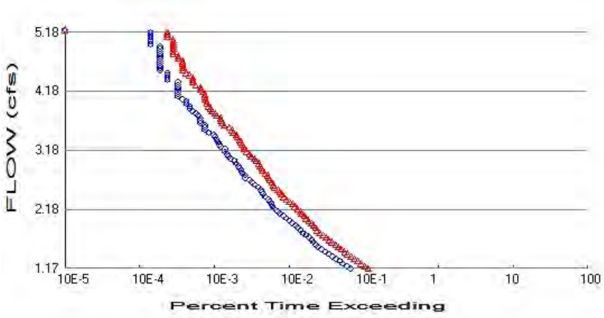
Water Quality BMP Flow and Volume for POC #5

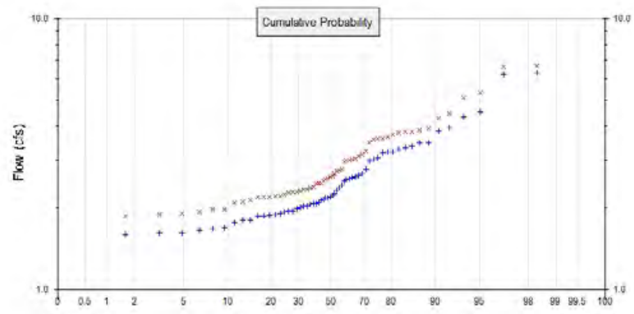
On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Trapezoidal Pond 1 POC	☐	229.46			☐	0.00			
Total Volume Infiltrated		229.46	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Failed

POC 6





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #6
Total Pervious Area: 10.41
Total Impervious Area: 5.47

Mitigated Landuse Totals for POC #6
Total Pervious Area: 9.4
Total Impervious Area: 6.48

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #6

Return Period	Flow(cfs)
2 year	2.349287
5 year	3.13595
10 year	3.71691
25 year	4.52232
50 year	5.176234
100 year	5.878212

Flow Frequency Return Periods for Mitigated. POC #6

Return Period	Flow(cfs)
2 year	2.729423
5 year	3.594909
10 year	4.227448
25 year	5.096922
50 year	5.797504
100 year	6.545027

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #6

Year	Predeveloped	Mitigated
1949	2.974	3.485
1950	3.487	3.807
1951	2.180	2.458
1952	1.508	1.785
1953	1.768	2.082
1954	2.007	2.286
1955	2.138	2.514
1956	2.064	2.295
1957	2.224	2.626
1958	1.863	2.196
1959	1.989	2.339

1960	2.068	2.334
1961	1.894	2.211
1962	1.677	1.979
1963	2.033	2.368
1964	1.932	2.273
1965	2.373	2.776
1966	1.594	1.867
1967	3.474	3.817
1968	3.343	3.922
1969	2.079	2.456
1970	2.091	2.463
1971	2.519	2.966
1972	3.228	3.595
1973	1.613	1.897
1974	2.327	2.738
1975	2.560	3.023
1976	1.873	2.192
1977	1.901	2.242
1978	2.597	3.041
1979	3.297	3.879
1980	3.201	3.732
1981	2.258	2.668
1982	3.215	3.795
1983	2.641	3.116
1984	1.654	1.930
1985	2.197	2.600
1986	1.946	2.300
1987	3.029	3.577
1988	1.861	2.195
1989	2.774	3.240
1990	6.208	6.665
1991	3.953	4.451
1992	1.614	1.907
1993	1.806	2.097
1994	1.693	1.980
1995	2.028	2.394
1996	3.395	3.652
1997	2.418	2.759
1998	2.155	2.542
1999	4.529	5.330
2000	2.180	2.567
2001	2.550	2.997
2002	2.668	3.156
2003	2.582	2.997
2004	4.331	5.090
2005	1.803	2.131
2006	1.941	2.208
2007	6.317	6.657
2008	3.846	4.281
2009	3.066	3.598

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #6

Rank	**Predeveloped**	**Mitigated**
1	6.3171	6.6651
2	6.2081	6.6570
3	4.5290	5.3298
4	4.3308	5.0899

5	3.9528	4.4507
6	3.8459	4.2806
7	3.4873	3.9221
8	3.4743	3.8791
9	3.3949	3.8168
10	3.3428	3.8068
11	3.2971	3.7945
12	3.2282	3.7315
13	3.2147	3.6525
14	3.2014	3.5978
15	3.0662	3.5949
16	3.0286	3.5775
17	2.9743	3.4848
18	2.7736	3.2399
19	2.6678	3.1559
20	2.6406	3.1163
21	2.5967	3.0414
22	2.5824	3.0229
23	2.5603	2.9971
24	2.5496	2.9971
25	2.5187	2.9660
26	2.4175	2.7760
27	2.3734	2.7586
28	2.3270	2.7377
29	2.2581	2.6676
30	2.2238	2.6256
31	2.1969	2.5997
32	2.1800	2.5673
33	2.1797	2.5419
34	2.1551	2.5142
35	2.1377	2.4629
36	2.0905	2.4578
37	2.0790	2.4559
38	2.0683	2.3939
39	2.0642	2.3684
40	2.0325	2.3385
41	2.0280	2.3335
42	2.0067	2.2997
43	1.9892	2.2945
44	1.9459	2.2856
45	1.9405	2.2732
46	1.9320	2.2420
47	1.9013	2.2113
48	1.8945	2.2082
49	1.8728	2.1960
50	1.8632	2.1949
51	1.8608	2.1920
52	1.8056	2.1305
53	1.8034	2.0973
54	1.7678	2.0821
55	1.6927	1.9796
56	1.6765	1.9794
57	1.6541	1.9295
58	1.6139	1.9070
59	1.6128	1.8973
60	1.5936	1.8671
61	1.5084	1.7847

Duration Flows

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
1.1746	1423	2453	172	Fail
1.2151	1277	2199	172	Fail
1.2555	1128	1978	175	Fail
1.2959	1021	1789	175	Fail
1.3363	913	1595	174	Fail
1.3767	811	1452	179	Fail
1.4172	721	1304	180	Fail
1.4576	654	1194	182	Fail
1.4980	585	1078	184	Fail
1.5384	524	975	186	Fail
1.5788	491	898	182	Fail
1.6193	459	806	175	Fail
1.6597	434	733	168	Fail
1.7001	394	670	170	Fail
1.7405	363	611	168	Fail
1.7809	326	550	168	Fail
1.8214	304	510	167	Fail
1.8618	282	482	170	Fail
1.9022	263	455	173	Fail
1.9426	238	430	180	Fail
1.9830	216	395	182	Fail
2.0235	197	364	184	Fail
2.0639	179	342	191	Fail
2.1043	163	316	193	Fail
2.1447	152	302	198	Fail
2.1851	136	279	205	Fail
2.2256	129	258	200	Fail
2.2660	125	238	190	Fail
2.3064	117	216	184	Fail
2.3468	113	197	174	Fail
2.3872	104	183	175	Fail
2.4277	95	170	178	Fail
2.4681	92	160	173	Fail
2.5085	89	153	171	Fail
2.5489	83	136	163	Fail
2.5893	75	132	176	Fail
2.6298	68	126	185	Fail
2.6702	63	118	187	Fail
2.7106	55	113	205	Fail
2.7510	55	111	201	Fail
2.7914	51	102	200	Fail
2.8319	49	93	189	Fail
2.8723	46	92	200	Fail
2.9127	45	87	193	Fail
2.9531	42	85	202	Fail
2.9935	40	78	195	Fail
3.0340	35	73	208	Fail
3.0744	33	67	203	Fail
3.1148	32	63	196	Fail
3.1552	30	58	193	Fail
3.1956	30	54	180	Fail
3.2361	26	53	203	Fail
3.2765	25	51	204	Fail
3.3169	24	49	204	Fail

3.3573	23	46	200	Fail
3.3977	22	43	195	Fail
3.4382	21	42	200	Fail
3.4786	18	38	211	Fail
3.5190	16	37	231	Fail
3.5594	16	34	212	Fail
3.5998	16	29	181	Fail
3.6403	14	27	192	Fail
3.6807	14	26	185	Fail
3.7211	14	26	185	Fail
3.7615	13	23	176	Fail
3.8020	12	22	183	Fail
3.8424	11	20	181	Fail
3.8828	10	19	190	Fail
3.9232	10	18	180	Fail
3.9636	9	17	188	Fail
4.0041	9	17	188	Fail
4.0445	8	16	200	Fail
4.0849	7	16	228	Fail
4.1253	7	16	228	Fail
4.1657	7	15	214	Fail
4.2062	7	14	200	Fail
4.2466	7	14	200	Fail
4.2870	7	12	171	Fail
4.3274	7	11	157	Fail
4.3678	5	11	220	Fail
4.4083	5	11	220	Fail
4.4487	5	10	200	Fail
4.4891	5	9	180	Fail
4.5295	4	8	200	Fail
4.5699	4	8	200	Fail
4.6104	4	8	200	Fail
4.6508	4	8	200	Fail
4.6912	4	8	200	Fail
4.7316	4	7	175	Fail
4.7720	4	7	175	Fail
4.8125	4	6	150	Fail
4.8529	4	6	150	Fail
4.8933	4	6	150	Fail
4.9337	4	6	150	Fail
4.9741	3	6	200	Fail
5.0146	3	6	200	Fail
5.0550	3	6	200	Fail
5.0954	3	5	166	Fail
5.1358	3	5	166	Fail
5.1762	3	5	166	Fail

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.
The development has an increase in flow durations for more than 50% of the flows for the range of the duration analysis.

Water Quality

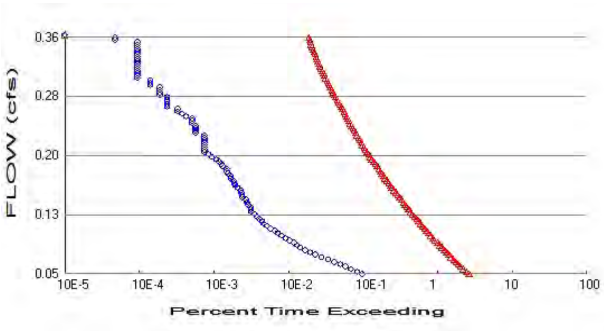
Water Quality BMP Flow and Volume for POC #6

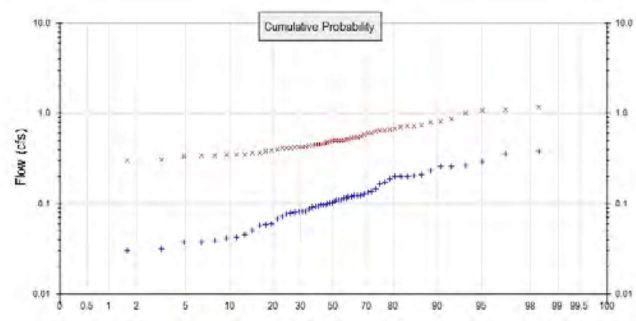
On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Failed

POC 7





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #7
Total Pervious Area: 0.86
Total Impervious Area: 0

Mitigated Landuse Totals for POC #7
Total Pervious Area: 1.29
Total Impervious Area: 1.03

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #7

Return Period	**Flow(cfs)**
2 year	0.103696
5 year	0.174028
10 year	0.226792
25 year	0.299486
50 year	0.357556
100 year	0.418685

Flow Frequency Return Periods for Mitigated. POC #7

Return Period	**Flow(cfs)**
2 year	0.496902
5 year	0.666664
10 year	0.789999
25 year	0.958747
50 year	1.094141
100 year	1.238102

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #7

Year	**Predeveloped**	**Mitigated**
1949	0.207	0.725
1950	0.199	0.681
1951	0.107	0.448
1952	0.050	0.306
1953	0.037	0.347
1954	0.082	0.418
1955	0.079	0.448
1956	0.111	0.415
1957	0.123	0.523
1958	0.072	0.387
1959	0.059	0.366

1960	0.119	0.461
1961	0.077	0.413
1962	0.031	0.339
1963	0.101	0.452
1964	0.094	0.380
1965	0.133	0.547
1966	0.059	0.343
1967	0.203	0.696
1968	0.122	0.718
1969	0.129	0.501
1970	0.098	0.473
1971	0.116	0.560
1972	0.189	0.666
1973	0.042	0.297
1974	0.124	0.525
1975	0.137	0.535
1976	0.090	0.421
1977	0.081	0.399
1978	0.093	0.493
1979	0.039	0.638
1980	0.258	0.805
1981	0.086	0.498
1982	0.201	0.741
1983	0.120	0.541
1984	0.057	0.350
1985	0.082	0.484
1986	0.110	0.443
1987	0.098	0.606
1988	0.037	0.345
1989	0.030	0.499
1990	0.381	1.177
1991	0.265	0.874
1992	0.080	0.367
1993	0.045	0.332
1994	0.028	0.303
1995	0.068	0.429
1996	0.200	0.647
1997	0.115	0.501
1998	0.097	0.440
1999	0.294	1.071
2000	0.110	0.501
2001	0.042	0.504
2002	0.166	0.647
2003	0.173	0.612
2004	0.233	1.004
2005	0.100	0.425
2006	0.101	0.412
2007	0.353	1.106
2008	0.256	0.815
2009	0.145	0.579

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #7

Rank	Predeveloped	Mitigated
1	0.3814	1.1772
2	0.3533	1.1060
3	0.2937	1.0711
4	0.2650	1.0044

5	0.2580	0.8744
6	0.2562	0.8154
7	0.2330	0.8050
8	0.2073	0.7406
9	0.2027	0.7250
10	0.2011	0.7182
11	0.1997	0.6959
12	0.1987	0.6810
13	0.1887	0.6659
14	0.1729	0.6473
15	0.1663	0.6472
16	0.1449	0.6378
17	0.1369	0.6116
18	0.1332	0.6060
19	0.1291	0.5790
20	0.1235	0.5602
21	0.1226	0.5472
22	0.1222	0.5414
23	0.1203	0.5354
24	0.1191	0.5255
25	0.1156	0.5232
26	0.1151	0.5035
27	0.1108	0.5015
28	0.1105	0.5012
29	0.1103	0.5006
30	0.1066	0.4987
31	0.1013	0.4979
32	0.1008	0.4927
33	0.1000	0.4839
34	0.0979	0.4726
35	0.0976	0.4614
36	0.0975	0.4523
37	0.0940	0.4477
38	0.0930	0.4477
39	0.0904	0.4425
40	0.0864	0.4402
41	0.0824	0.4291
42	0.0818	0.4253
43	0.0813	0.4206
44	0.0802	0.4184
45	0.0787	0.4149
46	0.0775	0.4132
47	0.0722	0.4115
48	0.0682	0.3994
49	0.0594	0.3867
50	0.0587	0.3801
51	0.0565	0.3666
52	0.0500	0.3659
53	0.0453	0.3504
54	0.0422	0.3472
55	0.0417	0.3450
56	0.0385	0.3428
57	0.0375	0.3391
58	0.0374	0.3323
59	0.0314	0.3058
60	0.0300	0.3034
61	0.0279	0.2967

Duration Flows

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0518	2082	55953	2687	Fail
0.0549	1781	51782	2907	Fail
0.0580	1461	46820	3204	Fail
0.0611	1243	43355	3487	Fail
0.0642	1063	40254	3786	Fail
0.0673	884	37409	4231	Fail
0.0704	725	34907	4814	Fail
0.0735	591	32490	5497	Fail
0.0766	488	30265	6201	Fail
0.0796	417	28212	6765	Fail
0.0827	355	26244	7392	Fail
0.0858	307	24490	7977	Fail
0.0889	279	22886	8202	Fail
0.0920	253	21432	8471	Fail
0.0951	219	19611	8954	Fail
0.0982	194	18375	9471	Fail
0.1013	172	17222	10012	Fail
0.1043	153	16084	10512	Fail
0.1074	141	15145	10741	Fail
0.1105	123	14230	11569	Fail
0.1136	110	13387	12170	Fail
0.1167	100	12583	12583	Fail
0.1198	94	11884	12642	Fail
0.1229	86	11169	12987	Fail
0.1260	81	10519	12986	Fail
0.1290	75	9755	13006	Fail
0.1321	68	9225	13566	Fail
0.1352	67	8735	13037	Fail
0.1383	65	8258	12704	Fail
0.1414	62	7824	12619	Fail
0.1445	59	7407	12554	Fail
0.1476	57	7001	12282	Fail
0.1507	52	6605	12701	Fail
0.1538	51	6235	12225	Fail
0.1568	50	5903	11806	Fail
0.1599	49	5576	11379	Fail
0.1630	44	5202	11822	Fail
0.1661	41	4941	12051	Fail
0.1692	40	4712	11780	Fail
0.1723	39	4453	11417	Fail
0.1754	36	4239	11775	Fail
0.1785	35	4025	11500	Fail
0.1815	33	3820	11575	Fail
0.1846	32	3634	11356	Fail
0.1877	32	3465	10828	Fail
0.1908	28	3300	11785	Fail
0.1939	27	3144	11644	Fail
0.1970	25	2990	11960	Fail
0.2001	23	2796	12156	Fail
0.2032	20	2656	13280	Fail
0.2062	18	2541	14116	Fail
0.2093	16	2411	15068	Fail
0.2124	16	2295	14343	Fail
0.2155	16	2203	13768	Fail

0.2186	16	2111	13193	Fail
0.2217	16	2016	12600	Fail
0.2248	16	1927	12043	Fail
0.2279	16	1854	11587	Fail
0.2309	16	1772	11075	Fail
0.2340	12	1691	14091	Fail
0.2371	12	1628	13566	Fail
0.2402	12	1560	13000	Fail
0.2433	12	1503	12525	Fail
0.2464	11	1447	13154	Fail
0.2495	11	1386	12600	Fail
0.2526	11	1331	12100	Fail
0.2557	9	1282	14244	Fail
0.2587	8	1233	15412	Fail
0.2618	7	1186	16942	Fail
0.2649	7	1141	16300	Fail
0.2680	5	1083	21660	Fail
0.2711	5	1041	20820	Fail
0.2742	5	1005	20100	Fail
0.2773	5	963	19260	Fail
0.2804	5	916	18320	Fail
0.2834	4	879	21975	Fail
0.2865	4	843	21075	Fail
0.2896	4	809	20225	Fail
0.2927	4	781	19525	Fail
0.2958	3	755	25166	Fail
0.2989	3	732	24400	Fail
0.3020	3	709	23633	Fail
0.3051	2	679	33950	Fail
0.3081	2	649	32450	Fail
0.3112	2	632	31600	Fail
0.3143	2	606	30300	Fail
0.3174	2	581	29050	Fail
0.3205	2	560	28000	Fail
0.3236	2	543	27150	Fail
0.3267	2	524	26200	Fail
0.3298	2	513	25650	Fail
0.3329	2	500	25000	Fail
0.3359	2	483	24150	Fail
0.3390	2	472	23600	Fail
0.3421	2	459	22950	Fail
0.3452	2	444	22200	Fail
0.3483	2	430	21500	Fail
0.3514	2	421	21050	Fail
0.3545	1	413	41300	Fail
0.3576	1	399	39900	Fail

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.
The development has an increase in flow durations for more than 50% of the flows for the range of the duration analysis.

Water Quality

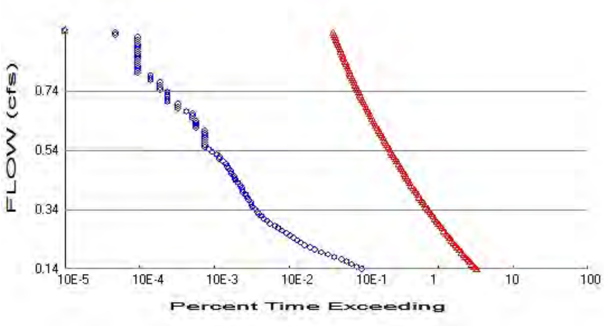
Water Quality BMP Flow and Volume for POC #7

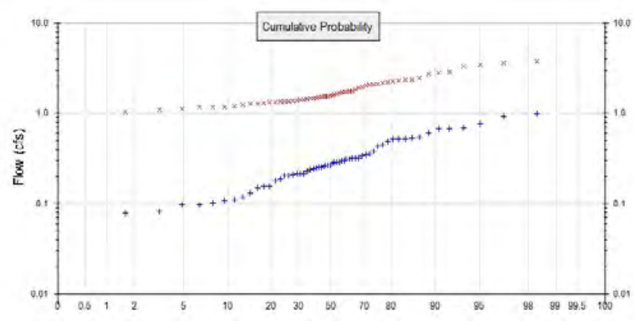
On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Failed

POC 8





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #8
Total Pervious Area: 2.25
Total Impervious Area: 0

Mitigated Landuse Totals for POC #8
Total Pervious Area: 4.33
Total Impervious Area: 3.24

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #8

Return Period	Flow(cfs)
2 year	0.271296
5 year	0.455306
10 year	0.593352
25 year	0.783538
50 year	0.935466
100 year	1.095396

Flow Frequency Return Periods for Mitigated. POC #8

Return Period	Flow(cfs)
2 year	1.654455
5 year	2.198737
10 year	2.591282
25 year	3.125213
50 year	3.551386
100 year	4.002663

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #8

Year	Predeveloped	Mitigated
1949	0.542	2.321
1950	0.520	2.217
1951	0.279	1.439
1952	0.131	1.013
1953	0.098	1.174
1954	0.216	1.360
1955	0.206	1.494
1956	0.290	1.479
1957	0.321	1.640
1958	0.189	1.270
1959	0.153	1.269

1960	0.312	1.520
1961	0.203	1.374
1962	0.082	1.097
1963	0.265	1.483
1964	0.246	1.351
1965	0.349	1.705
1966	0.155	1.160
1967	0.530	2.340
1968	0.320	2.472
1969	0.338	1.559
1970	0.255	1.531
1971	0.302	1.835
1972	0.494	2.089
1973	0.110	1.021
1974	0.323	1.717
1975	0.358	1.671
1976	0.236	1.412
1977	0.213	1.342
1978	0.243	1.760
1979	0.101	2.170
1980	0.675	2.813
1981	0.226	1.578
1982	0.526	2.352
1983	0.315	1.762
1984	0.148	1.180
1985	0.214	1.514
1986	0.289	1.415
1987	0.256	1.947
1988	0.098	1.199
1989	0.079	1.893
1990	0.998	3.742
1991	0.693	2.845
1992	0.210	1.257
1993	0.119	1.351
1994	0.073	1.111
1995	0.178	1.377
1996	0.522	2.258
1997	0.301	1.599
1998	0.255	1.540
1999	0.768	3.486
2000	0.289	1.588
2001	0.109	1.729
2002	0.435	2.042
2003	0.452	2.132
2004	0.610	3.345
2005	0.262	1.312
2006	0.264	1.319
2007	0.924	3.601
2008	0.670	2.716
2009	0.379	2.059

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #8

Rank	**Predeveloped**	**Mitigated**
1	0.9978	3.7423
2	0.9243	3.6005
3	0.7684	3.4857
4	0.6933	3.3452

5	0.6751	2.8453
6	0.6702	2.8128
7	0.6096	2.7159
8	0.5423	2.4718
9	0.5303	2.3519
10	0.5262	2.3396
11	0.5224	2.3214
12	0.5200	2.2579
13	0.4936	2.2171
14	0.4523	2.1703
15	0.4351	2.1316
16	0.3791	2.0889
17	0.3582	2.0593
18	0.3485	2.0423
19	0.3378	1.9471
20	0.3232	1.8934
21	0.3207	1.8353
22	0.3197	1.7625
23	0.3148	1.7604
24	0.3117	1.7290
25	0.3024	1.7167
26	0.3010	1.7048
27	0.2900	1.6709
28	0.2891	1.6404
29	0.2885	1.5994
30	0.2788	1.5883
31	0.2649	1.5776
32	0.2637	1.5588
33	0.2616	1.5404
34	0.2562	1.5310
35	0.2553	1.5201
36	0.2550	1.5136
37	0.2460	1.4943
38	0.2432	1.4830
39	0.2365	1.4785
40	0.2261	1.4395
41	0.2155	1.4153
42	0.2139	1.4120
43	0.2127	1.3768
44	0.2099	1.3744
45	0.2059	1.3602
46	0.2027	1.3515
47	0.1890	1.3506
48	0.1784	1.3424
49	0.1553	1.3190
50	0.1535	1.3118
51	0.1479	1.2703
52	0.1309	1.2687
53	0.1186	1.2574
54	0.1103	1.1991
55	0.1091	1.1803
56	0.1008	1.1740
57	0.0981	1.1601
58	0.0978	1.1110
59	0.0821	1.0966
60	0.0785	1.0211
61	0.0731	1.0129

Duration Flows

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.1356	2023	69214	3421	Fail
0.1437	1715	64573	3765	Fail
0.1518	1484	60423	4071	Fail
0.1599	1258	56552	4495	Fail
0.1680	1072	52980	4942	Fail
0.1760	866	49258	5687	Fail
0.1841	714	46264	6479	Fail
0.1922	574	43505	7579	Fail
0.2003	474	40853	8618	Fail
0.2084	407	38414	9438	Fail
0.2164	348	36168	10393	Fail
0.2245	304	34051	11200	Fail
0.2326	277	32105	11590	Fail
0.2407	246	30222	12285	Fail
0.2488	221	28490	12891	Fail
0.2568	197	26950	13680	Fail
0.2649	172	25474	14810	Fail
0.2730	153	24127	15769	Fail
0.2811	138	22629	16397	Fail
0.2891	118	21410	18144	Fail
0.2972	110	20264	18421	Fail
0.3053	98	19167	19558	Fail
0.3134	91	18183	19981	Fail
0.3215	83	17207	20731	Fail
0.3295	80	16326	20407	Fail
0.3376	76	15490	20381	Fail
0.3457	69	14673	21265	Fail
0.3538	67	13960	20835	Fail
0.3619	65	13240	20369	Fail
0.3699	62	12596	20316	Fail
0.3780	59	11914	20193	Fail
0.3861	56	11328	20228	Fail
0.3942	52	10810	20788	Fail
0.4023	51	10318	20231	Fail
0.4103	50	9820	19640	Fail
0.4184	48	9381	19543	Fail
0.4265	44	8941	20320	Fail
0.4346	41	8547	20846	Fail
0.4426	40	8149	20372	Fail
0.4507	39	7762	19902	Fail
0.4588	36	7441	20669	Fail
0.4669	35	7125	20357	Fail
0.4750	33	6842	20733	Fail
0.4830	32	6509	20340	Fail
0.4911	31	6211	20035	Fail
0.4992	28	5940	21214	Fail
0.5073	25	5666	22664	Fail
0.5154	25	5411	21644	Fail
0.5234	23	5197	22595	Fail
0.5315	20	4979	24895	Fail
0.5396	18	4763	26461	Fail
0.5477	16	4581	28631	Fail
0.5558	16	4383	27393	Fail
0.5638	16	4188	26175	Fail

0.5719	16	4023	25143	Fail
0.5800	16	3878	24237	Fail
0.5881	16	3696	23100	Fail
0.5961	16	3544	22150	Fail
0.6042	16	3392	21200	Fail
0.6123	12	3247	27058	Fail
0.6204	12	3106	25883	Fail
0.6285	12	3020	25166	Fail
0.6365	12	2898	24150	Fail
0.6446	11	2774	25218	Fail
0.6527	11	2656	24145	Fail
0.6608	11	2560	23272	Fail
0.6689	9	2460	27333	Fail
0.6769	7	2376	33942	Fail
0.6850	7	2291	32728	Fail
0.6931	7	2209	31557	Fail
0.7012	5	2128	42560	Fail
0.7093	5	2043	40860	Fail
0.7173	5	1978	39560	Fail
0.7254	5	1911	38220	Fail
0.7335	5	1851	37020	Fail
0.7416	4	1776	44400	Fail
0.7496	4	1707	42675	Fail
0.7577	4	1651	41275	Fail
0.7658	4	1589	39725	Fail
0.7739	3	1544	51466	Fail
0.7820	3	1492	49733	Fail
0.7900	3	1440	48000	Fail
0.7981	2	1402	70100	Fail
0.8062	2	1358	67900	Fail
0.8143	2	1317	65850	Fail
0.8224	2	1285	64250	Fail
0.8304	2	1245	62250	Fail
0.8385	2	1213	60650	Fail
0.8466	2	1155	57750	Fail
0.8547	2	1124	56200	Fail
0.8628	2	1094	54700	Fail
0.8708	2	1061	53050	Fail
0.8789	2	1041	52050	Fail
0.8870	2	1005	50250	Fail
0.8951	2	972	48600	Fail
0.9032	2	942	47100	Fail
0.9112	2	911	45550	Fail
0.9193	2	882	44100	Fail
0.9274	1	858	85800	Fail
0.9355	1	828	82800	Fail

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.
The development has an increase in flow durations for more than 50% of the flows for the range of the duration analysis.

Water Quality

Water Quality BMP Flow and Volume for POC #8

On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Failed

POC 9

POC #9 was not reported because POC must exist in both scenarios and both scenarios must have been run.

POC 10

POC #10 was not reported because POC must exist in both scenarios and both scenarios must have been run.

POC 11

POC #11 was not reported because POC must exist in both scenarios and both scenarios must have been run.

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

No PERLND changes have been made.

IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic

Mitigated Schematic

Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2009 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN      1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                             ***
WDM        26   Tamarack - Durations.wdm
MESSU      25   PreTamarack - Durations.MES
           27   PreTamarack - Durations.L61
           28   PreTamarack - Durations.L62
           30   POCTamarack - Durations1.dat
           31   POCTamarack - Durations2.dat
           35   POCTamarack - Durations6.dat
           36   POCTamarack - Durations7.dat
           37   POCTamarack - Durations8.dat
           32   POCTamarack - Durations3.dat
           34   POCTamarack - Durations5.dat
           33   POCTamarack - Durations4.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND       8
      PERLND      17
      IMPLND       2
      IMPLND       4
      IMPLND       6
      PERLND       9
      IMPLND       3
      IMPLND       7
      IMPLND      16
      PERLND      40
      PERLND      41
      PERLND      42
      PERLND      43
      PERLND       3
      RCHRES       1
      RCHRES       2
      PERLND      39
      COPY       501
      COPY       502
      COPY       506
      COPY       507
      COPY       508
      COPY       503
      COPY       505
      COPY       504
      DISPLY       1
      DISPLY       2
      DISPLY       6
      DISPLY       7
      DISPLY       8
      DISPLY       3
      DISPLY       5
      DISPLY       4
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Subbasin 1                  MAX                    1    2   30    9
    2        Subbasin  2                 MAX                    1    2   31    9
```

```
    6        Subbasin  6                  MAX                     1    2   35    9
    7        Subbasin  7 - Perv Latera    MAX                     1    2   36    9
    8        Subbasin  8 - Perv Latera    MAX                     1    2   37    9
    3        Subbasin 3B                  MAX                     1    2   32    9
    5        Subbasin 5 Detention         MAX                     1    2   34    9
    4        Basin 4 - Perv Lateral Fl    MAX                     1    2   33    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  502         1    1
  506         1    1
  507         1    1
  508         1    1
  503         1    1
  505         1    1
  504         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
    8     A/B, Lawn, Mod          1    1    1    1   27    0
   17     C, Lawn, Mod            1    1    1    1   27    0
    9     A/B, Lawn, Steep        1    1    1    1   27    0
   40     A/B, Lawn, Steep        1    1    1    1   27    0
   41     C, Lawn, Steep          1    1    1    1   27    0
   42     C, Lawn, Steep          1    1    1    1   27    0
   43     A/B, Lawn, Steep        1    1    1    1   27    0
    3     A/B, Forest, Steep      1    1    1    1   27    0
   39     A/B, Forest, Mod        1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
    8         0    0    1    0    0    0    0    0    0    0    0    0
   17         0    0    1    0    0    0    0    0    0    0    0    0
    9         0    0    1    0    0    0    0    0    0    0    0    0
   40         0    0    1    0    0    0    0    0    0    0    0    0
   41         0    0    1    0    0    0    0    0    0    0    0    0
   42         0    0    1    0    0    0    0    0    0    0    0    0
   43         0    0    1    0    0    0    0    0    0    0    0    0
    3         0    0    1    0    0    0    0    0    0    0    0    0
   39         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
    8         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   17         0    0    4    0    0    0    0    0    0    0    0    0    1    9
    9         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   40         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   41         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   42         0    0    4    0    0    0    0    0    0    0    0    0    1    9
```

```
  43         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   3         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  39         0    0    4    0    0    0    0    0    0    0    0    0    1    9
END PRINT-INFO

PWAT-PARM1
  <PLS >  PWATER variable monthly parameter value flags  ***
  # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   8         0    0    0    0    0    0    0    0    0    0    0
  17         0    0    0    0    0    0    0    0    0    0    0
   9         0    0    0    0    0    0    0    0    0    0    0
  40         0    0    0    0    0    0    0    0    0    0    0
  41         0    0    0    0    0    0    0    0    0    0    0
  42         0    0    0    0    0    0    0    0    0    0    0
  43         0    0    0    0    0    0    0    0    0    0    0
   3         0    0    0    0    0    0    0    0    0    0    0
  39         0    0    0    0    0    0    0    0    0    0    0
END PWAT-PARM1

PWAT-PARM2
  <PLS >      PWATER input info: Part 2         ***
  # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   8              0         5       0.8       400       0.1       0.3     0.996
  17              0       4.5      0.03       400       0.1       0.5     0.996
   9              0         5       0.8       400      0.15       0.3     0.996
  40              0         5       0.8       400      0.15       0.3     0.996
  41              0       4.5      0.03       400      0.15       0.5     0.996
  42              0       4.5      0.03       400      0.15       0.5     0.996
  43              0         5       0.8       400      0.15       0.3     0.996
   3              0         5         2       400      0.15       0.3     0.996
  39              0         5         2       400       0.1       0.3     0.996
END PWAT-PARM2

PWAT-PARM3
  <PLS >      PWATER input info: Part 3         ***
  # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   8              0         0         2         2         0         0         0
  17              0         0         2         2         0         0         0
   9              0         0         2         2         0         0         0
  40              0         0         2         2         0         0         0
  41              0         0         2         2         0         0         0
  42              0         0         2         2         0         0         0
  43              0         0         2         2         0         0         0
   3              0         0         2         2         0         0         0
  39              0         0         2         2         0         0         0
END PWAT-PARM3
PWAT-PARM4
  <PLS >     PWATER input info: Part 4                               ***
  # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   8            0.1       0.5      0.25         0       0.7      0.25
  17            0.1      0.25      0.25         6       0.5      0.25
   9            0.1       0.5      0.25         0       0.7      0.25
  40            0.1       0.5      0.25         0       0.7      0.25
  41            0.1      0.15      0.25         6       0.3      0.25
  42            0.1      0.15      0.25         6       0.3      0.25
  43            0.1       0.5      0.25         0       0.7      0.25
   3            0.2       0.5      0.35         0       0.7       0.7
  39            0.2       0.5      0.35         0       0.7       0.7
END PWAT-PARM4

PWAT-STATE1
  <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
  # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   8              0         0         0         0         3         1         0
  17              0         0         0         0       2.5         1         0
   9              0         0         0         0         3         1         0
  40              0         0         0         0         3         1         0
  41              0         0         0         0       2.5         1         0
  42              0         0         0         0       2.5         1         0
```

```
   43              0         0         0         0         3         1         0
    3              0         0         0         0         3         1         0
   39              0         0         0         0         3         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name-------> Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                      in  out           ***
    2      ROADS/MOD              1    1    1   27    0
    4      ROOF TOPS/FLAT         1    1    1   27    0
    6      DRIVEWAYS/MOD          1    1    1   27    0
    3      ROADS/STEEP            1    1    1   27    0
    7      DRIVEWAYS/STEEP        1    1    1   27    0
   16     ROADS/MOD LAT           1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    2         0    0    1    0    0    0
    4         0    0    1    0    0    0
    6         0    0    1    0    0    0
    3         0    0    1    0    0    0
    7         0    0    1    0    0    0
   16         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   *********
    2         0    0    4    0    0    0    1    9
    4         0    0    4    0    0    0    1    9
    6         0    0    4    0    0    0    1    9
    3         0    0    4    0    0    0    1    9
    7         0    0    4    0    0    0    1    9
   16         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    2         0    0    0    0    0
    4         0    0    0    0    0
    6         0    0    0    0    0
    3         0    0    0    0    0
    7         0    0    0    0    0
   16         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    2            400      0.05       0.1      0.08
    4            400      0.01       0.1       0.1
    6            400      0.05       0.1      0.08
    3            400       0.1       0.1      0.05
    7            400       0.1       0.1      0.05
   16            400      0.05       0.1      0.08
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    2              0         0
    4              0         0
```

```
    6              0         0
    3              0         0
    7              0         0
   16              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    2              0         0
    4              0         0
    6              0         0
    3              0         0
    7              0         0
   16              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK    ***
<Name>   #                  <-factor->     <Name>   #   Tbl#    ***
Basin 4,7,8 Imperv Lateral ***
IMPLND  16                      0.6911     PERLND  39     50
Subbasin  8 - Perv Lateral Flow A/B***
PERLND  40                      0.4066     PERLND  39     30
PERLND  40                      0.4066     PERLND  39     34
PERLND  40                      0.4066     PERLND  39     38
Subbasin  3A***
PERLND   9                        5.75     RCHRES   2      2
PERLND   9                        5.75     RCHRES   2      3
IMPLND   3                        1.79     RCHRES   2      5
IMPLND   4                         2.6     RCHRES   2      5
IMPLND   7                        1.11     RCHRES   2      5
Subbasin  5***
PERLND   9                        1.39     RCHRES   1      2
PERLND   9                        1.39     RCHRES   1      3
IMPLND   3                        0.52     RCHRES   1      5
IMPLND   4                        0.55     RCHRES   1      5
IMPLND   7                        0.24     RCHRES   1      5
Subbasin  7 - Perv Lateral Flow A/B***
PERLND  43                       0.103     PERLND  39     30
PERLND  43                       0.103     PERLND  39     34
PERLND  43                       0.103     PERLND  39     38
Subbasin  7 - Perv Lateral Flow C***
PERLND  41                      0.1501     PERLND  39     30
PERLND  41                      0.1501     PERLND  39     34
PERLND  41                      0.1501     PERLND  39     38
Subbasin  8 - Perv Lateral Flow C***
PERLND  42                      0.3927     PERLND  39     30
PERLND  42                      0.3927     PERLND  39     34
PERLND  42                      0.3927     PERLND  39     38
Subbasin 1***
PERLND   8                        0.39     COPY   501     12
PERLND   8                        0.39     COPY   501     13
PERLND  17                        0.95     COPY   501     12
PERLND  17                        0.95     COPY   501     13
IMPLND   2                        0.35     COPY   501     15
IMPLND   4                        0.32     COPY   501     15
IMPLND   6                        0.14     COPY   501     15
Subbasin  2***
PERLND   8                        0.67     COPY   502     12
PERLND   8                        0.67     COPY   502     13
PERLND  17                        0.41     COPY   502     12
PERLND  17                        0.41     COPY   502     13
IMPLND   2                        0.42     COPY   502     15
IMPLND   4                        0.08     COPY   502     15
IMPLND   6                        0.04     COPY   502     15
Subbasin  6***
PERLND   8                       10.37     COPY   506     12
```

```
PERLND   8                       10.37     COPY   506     13
PERLND  17                        0.04     COPY   506     12
PERLND  17                        0.04     COPY   506     13
IMPLND   2                        1.77     COPY   506     15
IMPLND   4                        2.59     COPY   506     15
IMPLND   6                        1.11     COPY   506     15
Basin 4 - Perv Lateral Flow***
PERLND  39                        5.73     COPY   504     12
PERLND  39                        5.73     COPY   504     13
Subbasin  7 - Perv Lateral Flow C***
PERLND  41                        0.86     COPY   507     12
PERLND  41                        0.86     COPY   507     13
Subbasin  8 - Perv Lateral Flow C***
PERLND  42                        2.25     COPY   508     12
PERLND  42                        2.25     COPY   508     13
Subbasin 3B***
PERLND   3                        1.44     COPY   503     12
PERLND   3                        1.44     COPY   503     13
IMPLND   3                        0.45     COPY   503     15
IMPLND   4                        0.65     COPY   503     15
IMPLND   7                        0.28     COPY   503     15

******Routing******
RCHRES   1                           1     COPY   505     16
RCHRES   2                           1     COPY   503     16
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1
COPY   502 OUTPUT MEAN   1 1   48.4        DISPLY   2     INPUT  TIMSER 1
COPY   506 OUTPUT MEAN   1 1   48.4        DISPLY   6     INPUT  TIMSER 1
COPY   507 OUTPUT MEAN   1 1   48.4        DISPLY   7     INPUT  TIMSER 1
COPY   508 OUTPUT MEAN   1 1   48.4        DISPLY   8     INPUT  TIMSER 1
COPY   503 OUTPUT MEAN   1 1   48.4        DISPLY   3     INPUT  TIMSER 1
COPY   505 OUTPUT MEAN   1 1   48.4        DISPLY   5     INPUT  TIMSER 1
COPY   504 OUTPUT MEAN   1 1   48.4        DISPLY   4     INPUT  TIMSER 1


<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                 ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG            ***
                                         in  out                             ***
    1     Subbasin 5 Deten-049    1    1    1    1   28    0    1
    2     Subbasin 3 Deten-052    1    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
    2         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
    2         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
```

```
    RCHRES  Flags for each HYDR Section                                        ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
    1        0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
    2        0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50        ***
  <------><--------><--------><--------><--------><--------><-------->        ***
    1             1      0.01       0.0       0.0       0.5       0.0
    2             2      0.03       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                           ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit       for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1           0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    2           0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE       1
   91    4
     Depth      Area    Volume  Outflow1 Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.013223  0.000000  0.000000
  0.088889  0.013280  0.001178  0.267497
  0.177778  0.013338  0.002361  0.378297
  0.266667  0.013395  0.003549  0.463318
  0.355556  0.013453  0.004742  0.534993
  0.444444  0.013511  0.005941  0.598140
  0.533333  0.013569  0.007144  0.655230
  0.622222  0.013627  0.008353  0.707729
  0.711111  0.013685  0.009567  0.756594
  0.800000  0.013743  0.010786  0.802490
  0.888889  0.013801  0.012010  0.845898
  0.977778  0.013860  0.013239  0.887186
  1.066667  0.013918  0.014474  0.926635
  1.155556  0.013977  0.015714  0.964472
  1.244444  0.014036  0.016959  1.000880
  1.333333  0.014095  0.018209  1.036010
  1.422222  0.014154  0.019465  1.069986
  1.511111  0.014213  0.020725  1.102916
  1.600000  0.014273  0.021991  1.134892
  1.688889  0.014332  0.023263  1.165990
  1.777778  0.014392  0.024539  1.196281
  1.866667  0.014452  0.025821  1.225823
  1.955556  0.014512  0.027109  1.254670
  2.044444  0.014572  0.028401  1.282868
  2.133333  0.014632  0.029699  1.310460
  2.222222  0.014692  0.031002  1.337483
  2.311111  0.014752  0.032311  1.363970
  2.400000  0.014813  0.033625  1.389953
  2.488889  0.014873  0.034944  1.415459
  2.577778  0.014934  0.036269  1.440513
  2.666667  0.014995  0.037599  1.465139
  2.755556  0.015056  0.038935  1.489358
  2.844444  0.015117  0.040276  1.513189
  2.933333  0.015178  0.041622  1.536651
  3.022222  0.015240  0.042974  1.559759
  3.111111  0.015301  0.044332  1.582531
  3.200000  0.015363  0.045694  1.604979
  3.288889  0.015424  0.047063  1.627118
  3.377778  0.015486  0.048437  1.648959
```

```
 3.466667  0.015548  0.049816  1.670515
 3.555556  0.015610  0.051201  1.691797
 3.644444  0.015672  0.052591  1.712814
 3.733333  0.015735  0.053987  1.733576
 3.822222  0.015797  0.055388  1.754092
 3.911111  0.015860  0.056795  1.774371
 4.000000  0.015923  0.058208  1.794421
 4.088889  0.015985  0.059626  1.814250
 4.177778  0.016048  0.061050  1.833864
 4.266667  0.016111  0.062479  1.853270
 4.355556  0.016175  0.063914  1.872476
 4.444444  0.016238  0.065354  1.891486
 4.533333  0.016301  0.066801  1.910307
 4.622222  0.016365  0.068253  1.928945
 4.711111  0.016429  0.069710  1.947404
 4.800000  0.016492  0.071173  1.965690
 4.888889  0.016556  0.072642  1.983807
 4.977778  0.016620  0.074117  2.001761
 5.066667  0.016685  0.075597  2.019555
 5.155556  0.016749  0.077083  2.037193
 5.244444  0.016813  0.078574  2.054680
 5.333333  0.016878  0.080072  2.072019
 5.422222  0.016943  0.081575  2.089215
 5.511111  0.017007  0.083084  2.106270
 5.600000  0.017072  0.084598  2.123188
 5.688889  0.017137  0.086119  2.139972
 5.777778  0.017203  0.087645  2.156626
 5.866667  0.017268  0.089177  2.173152
 5.955556  0.017333  0.090715  2.189553
 6.044444  0.017399  0.092259  2.205833
 6.133333  0.017465  0.093808  2.221993
 6.222222  0.017530  0.095363  2.238037
 6.311111  0.017596  0.096925  2.253966
 6.400000  0.017662  0.098492  2.269783
 6.488889  0.017729  0.100065  2.285491
 6.577778  0.017795  0.101643  2.308660
 6.666667  0.017861  0.103228  2.327666
 6.755556  0.017928  0.104819  2.345699
 6.844444  0.017995  0.106415  2.363199
 6.933333  0.018061  0.108018  2.380329
 7.022222  0.018128  0.109626  2.467500
 7.111111  0.018195  0.111241  3.198544
 7.200000  0.018262  0.112861  4.316850
 7.288889  0.018330  0.114487  5.685745
 7.377778  0.018397  0.116120  7.207863
 7.466667  0.018465  0.117758  8.785919
 7.555556  0.018532  0.119402  10.32063
 7.644444  0.018600  0.121053  11.71823
 7.733333  0.018668  0.122709  12.90286
 7.822222  0.018736  0.124371  13.83219
 7.911111  0.018804  0.126040  14.51567
 8.000000  0.018872  0.127714  15.03487
 END FTABLE  1
 FTABLE      2
  91    4
    Depth      Area    Volume  Outflow1 Velocity  Travel Time***
     (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
 0.000000  0.000000  0.000000  0.000000
 0.066667  0.004938  0.000220  0.070410
 0.133333  0.006944  0.000620  0.099574
 0.200000  0.008456  0.001135  0.121953
 0.266667  0.009708  0.001742  0.140819
 0.333333  0.010790  0.002426  0.157441
 0.400000  0.011751  0.003178  0.172467
 0.466667  0.012616  0.003991  0.186286
 0.533333  0.013406  0.004858  0.199148
 0.600000  0.014132  0.005777  0.211229
 0.666667  0.014804  0.006741  0.222655
 0.733333  0.015430  0.007749  0.233522
 0.800000  0.016013  0.008798  0.243906
```

0.866667	0.016560	0.009884	0.253865
0.933333	0.017073	0.011005	0.263448
1.000000	0.017556	0.012160	0.272695
1.066667	0.018010	0.013345	0.281638
1.133333	0.018439	0.014560	0.290306
1.200000	0.018843	0.015803	0.298722
1.266667	0.019224	0.017072	0.306908
1.333333	0.019584	0.018366	0.314881
1.400000	0.019924	0.019683	0.322657
1.466667	0.020245	0.021022	0.330250
1.533333	0.020547	0.022382	0.337672
1.600000	0.020832	0.023761	0.344935
1.666667	0.021100	0.025159	0.352048
1.733333	0.021351	0.026574	0.359020
1.800000	0.021587	0.028006	0.365859
1.866667	0.021808	0.029452	0.372572
1.933333	0.022015	0.030913	0.379167
2.000000	0.022207	0.032387	0.385649
2.066667	0.022385	0.033874	0.392024
2.133333	0.022549	0.035372	0.398297
2.200000	0.022701	0.036880	0.404472
2.266667	0.022839	0.038398	0.410555
2.333333	0.022965	0.039925	0.416549
2.400000	0.023078	0.041460	0.422457
2.466667	0.023179	0.043002	0.428285
2.533333	0.023267	0.044550	0.434034
2.600000	0.023343	0.046104	0.439708
2.666667	0.023408	0.047662	0.445309
2.733333	0.023460	0.049224	0.450841
2.800000	0.023501	0.050790	0.456306
2.866667	0.023530	0.052358	0.461706
2.933333	0.023548	0.053927	0.467044
3.000000	0.023554	0.055497	0.472322
3.066667	0.023548	0.057067	0.477541
3.133333	0.023530	0.058637	0.482704
3.200000	0.023501	0.060204	0.487812
3.266667	0.023460	0.061770	0.492867
3.333333	0.023408	0.063332	0.497871
3.400000	0.023343	0.064891	0.502825
3.466667	0.023267	0.066444	0.507731
3.533333	0.023179	0.067993	0.512589
3.600000	0.023078	0.069535	0.517402
3.666667	0.022965	0.071069	0.522171
3.733333	0.022839	0.072596	0.526897
3.800000	0.022701	0.074114	0.531581
3.866667	0.022549	0.075623	0.536223
3.933333	0.022385	0.077121	0.540826
4.000000	0.022207	0.078607	0.545390
4.066667	0.022015	0.080081	0.549916
4.133333	0.021808	0.081542	0.554405
4.200000	0.021587	0.082989	0.558859
4.266667	0.021351	0.084420	0.563276
4.333333	0.021100	0.085835	0.567660
4.400000	0.020832	0.087233	0.572010
4.466667	0.020547	0.088612	0.576327
4.533333	0.020245	0.089972	0.580612
4.600000	0.019924	0.091311	0.584866
4.666667	0.019584	0.092628	0.589089
4.733333	0.019224	0.093922	0.593281
4.800000	0.018843	0.095191	0.597445
4.866667	0.018439	0.096434	0.601580
4.933333	0.018010	0.097649	0.605686
5.000000	0.017556	0.098835	0.609765
5.066667	0.017073	0.099989	0.978910
5.133333	0.016560	0.101111	1.648713
5.200000	0.016013	0.102196	2.508517
5.266667	0.015430	0.103245	3.508899
5.333333	0.014804	0.104253	4.608973
5.400000	0.014132	0.105218	5.768278
5.466667	0.013406	0.106136	6.945177

```
  5.533333  0.012616  0.107004  8.097647
  5.600000  0.011751  0.107816  9.185308
  5.666667  0.010790  0.108568  10.17228
  5.733333  0.009708  0.109252  11.03063
  5.800000  0.008456  0.109859  11.74437
  5.866667  0.006944  0.110374  12.31382
  5.933333  0.004938  0.110774  12.76044
  6.000000  0.000000  0.110994  13.13191
  END FTABLE  2
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.76           PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.76           IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
COPY   502 OUTPUT MEAN   1 1     48.4      WDM    502 FLOW     ENGL      REPL
COPY   506 OUTPUT MEAN   1 1     48.4      WDM    506 FLOW     ENGL      REPL
COPY   504 OUTPUT MEAN   1 1     48.4      WDM    504 FLOW     ENGL      REPL
COPY   507 OUTPUT MEAN   1 1     48.4      WDM    507 FLOW     ENGL      REPL
COPY   508 OUTPUT MEAN   1 1     48.4      WDM    508 FLOW     ENGL      REPL
RCHRES   1 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL      REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1001 STAG     ENGL      REPL
COPY   505 OUTPUT MEAN   1 1     48.4      WDM    505 FLOW     ENGL      REPL
COPY   503 OUTPUT MEAN   1 1     48.4      WDM    503 FLOW     ENGL      REPL
RCHRES   2 HYDR   RO     1 1        1      WDM   1002 FLOW     ENGL      REPL
RCHRES   2 HYDR   STAGE  1 1        1      WDM   1003 STAG     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK       3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK       5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       16
RCHRES     ROFLOW                          COPY           INPUT  MEAN
  END MASS-LINK   16

  MASS-LINK       30
```

```
PERLND      PWATER SURO                          PERLND         EXTNL  SURLI
  END MASS-LINK    30

  MASS-LINK        34
PERLND      PWATER IFWO                          PERLND         EXTNL  IFWLI
  END MASS-LINK    34

  MASS-LINK        38
PERLND      PWATER AGWO                          PERLND         EXTNL  AGWLI
  END MASS-LINK    38

  MASS-LINK        50
IMPLND      IWATER SURO                          PERLND         EXTNL  SURLI
  END MASS-LINK    50


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2009 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM        26   Tamarack - Durations.wdm
MESSU      25   MitTamarack - Durations.MES
           27   MitTamarack - Durations.L61
           28   MitTamarack - Durations.L62
           30   POCTamarack - Durations1.dat
           31   POCTamarack - Durations2.dat
           33   POCTamarack - Durations4.dat
           35   POCTamarack - Durations6.dat
           36   POCTamarack - Durations7.dat
           37   POCTamarack - Durations8.dat
           32   POCTamarack - Durations3.dat
           34   POCTamarack - Durations5.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND       8
      PERLND      17
      IMPLND       2
      IMPLND       4
      IMPLND       6
      PERLND       9
      IMPLND       3
      IMPLND       7
      PERLND       2
      PERLND      18
      RCHRES       1
      RCHRES       2
      COPY       501
      COPY       502
      COPY       504
      COPY       506
      COPY       507
      COPY       508
      COPY         3
      COPY       503
      COPY       603
      COPY         5
      COPY       505
      COPY       605
      DISPLY       1
      DISPLY       2
      DISPLY       4
      DISPLY       6
      DISPLY       7
      DISPLY       8
      DISPLY       3
      DISPLY       5
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Subbasin 1                 MAX                    1    2   30    9
    2        Subbasin  2                MAX                    1    2   31    9
    4        Subbasin  4                MAX                    1    2   33    9
```

```
    6        Subbasin  6                 MAX                      1    2   35    9
    7        Subbasin  7                 MAX                      1    2   36    9
    8        Subbasin  8                 MAX                      1    2   37    9
    3        Tank  1                     MAX                      1    2   32    9
    5        Trapezoidal Pond  1         MAX                      1    2   34    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  502         1    1
  504         1    1
  506         1    1
  507         1    1
  508         1    1
    3         1    1
  503         1    1
  603         1    1
    5         1    1
  505         1    1
  605         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                            User  t-series Engl Metr ***
                                            in  out           ***
    8     A/B, Lawn, Mod          1    1    1    1   27    0
   17     C, Lawn, Mod            1    1    1    1   27    0
    9     A/B, Lawn, Steep        1    1    1    1   27    0
    2     A/B, Forest, Mod        1    1    1    1   27    0
   18     C, Lawn, Steep          1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
    8         0    0    1    0    0    0    0    0    0    0    0    0
   17         0    0    1    0    0    0    0    0    0    0    0    0
    9         0    0    1    0    0    0    0    0    0    0    0    0
    2         0    0    1    0    0    0    0    0    0    0    0    0
   18         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
    8         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   17         0    0    4    0    0    0    0    0    0    0    0    0    1    9
    9         0    0    4    0    0    0    0    0    0    0    0    0    1    9
    2         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   18         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
    8         0    0    0    0    0    0    0    0    0    0    0
```

```
  17          0    0    0    0    0    0    0    0    0    0    0
   9          0    0    0    0    0    0    0    0    0    0    0
   2          0    0    0    0    0    0    0    0    0    0    0
  18          0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -   # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
    8               0         5       0.8       400       0.1       0.3     0.996
   17               0       4.5      0.03       400       0.1       0.5     0.996
    9               0         5       0.8       400      0.15       0.3     0.996
    2               0         5         2       400       0.1       0.3     0.996
   18               0       4.5      0.03       400      0.15       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -   # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
    8               0         0         2         2         0         0         0
   17               0         0         2         2         0         0         0
    9               0         0         2         2         0         0         0
    2               0         0         2         2         0         0         0
   18               0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                                     ***
    # -   #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
    8             0.1       0.5      0.25         0       0.7      0.25
   17             0.1      0.25      0.25         6       0.5      0.25
    9             0.1       0.5      0.25         0       0.7      0.25
    2             0.2       0.5      0.35         0       0.7       0.7
   18             0.1      0.15      0.25         6       0.3      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
              ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -   # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
    8               0         0         0         0         3         1         0
   17               0         0         0         0       2.5         1         0
    9               0         0         0         0         3         1         0
    2               0         0         0         0         3         1         0
   18               0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -   #                    User  t-series Engl Metr ***
                                     in  out            ***
    2      ROADS/MOD              1    1    1   27    0
    4      ROOF TOPS/FLAT         1    1    1   27    0
    6      DRIVEWAYS/MOD          1    1    1   27    0
    3      ROADS/STEEP            1    1    1   27    0
    7      DRIVEWAYS/STEEP        1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -   # ATMP SNOW IWAT  SLD  IWG IQAL    ***
    2         0    0    1    0    0    0
    4         0    0    1    0    0    0
    6         0    0    1    0    0    0
    3         0    0    1    0    0    0
    7         0    0    1    0    0    0
  END ACTIVITY
```

```
  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    2         0    0    4    0    0    0    1    9
    4         0    0    4    0    0    0    1    9
    6         0    0    4    0    0    0    1    9
    3         0    0    4    0    0    0    1    9
    7         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    2         0    0    0    0    0
    4         0    0    0    0    0
    6         0    0    0    0    0
    3         0    0    0    0    0
    7         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    2            400      0.05       0.1      0.08
    4            400      0.01       0.1       0.1
    6            400      0.05       0.1      0.08
    3            400       0.1       0.1      0.05
    7            400       0.1       0.1      0.05
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    2              0         0
    4              0         0
    6              0         0
    3              0         0
    7              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    2              0         0
    4              0         0
    6              0         0
    3              0         0
    7              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Subbasin  3A***
PERLND   9                        5.54     RCHRES   1      2
PERLND   9                        5.54     RCHRES   1      3
IMPLND   3                        1.79     RCHRES   1      5
IMPLND   4                        2.74     RCHRES   1      5
IMPLND   7                        1.18     RCHRES   1      5
Subbasin  5***
PERLND   9                        1.15     RCHRES   2      2
PERLND   9                        1.15     RCHRES   2      3
IMPLND   3                        0.52     RCHRES   2      5
IMPLND   4                        0.73     RCHRES   2      5
IMPLND   7                        0.31     RCHRES   2      5
Subbasin 1***
PERLND   8                        0.38     COPY   501     12
```

```
PERLND   8                         0.38     COPY   501     13
PERLND  17                         0.94     COPY   501     12
PERLND  17                         0.94     COPY   501     13
IMPLND   2                         0.35     COPY   501     15
IMPLND   4                         0.33     COPY   501     15
IMPLND   6                         0.14     COPY   501     15
Subbasin  2***
PERLND   8                         0.52     COPY   502     12
PERLND   8                         0.52     COPY   502     13
PERLND  17                         0.32     COPY   502     12
PERLND  17                         0.32     COPY   502     13
IMPLND   2                         0.42     COPY   502     15
IMPLND   4                         0.25     COPY   502     15
IMPLND   6                         0.11     COPY   502     15
Subbasin  4***
PERLND   2                         5.82     COPY   504     12
PERLND   2                         5.82     COPY   504     13
Subbasin  6***
PERLND   8                         9.37     COPY   506     12
PERLND   8                         9.37     COPY   506     13
PERLND  17                         0.03     COPY   506     12
PERLND  17                         0.03     COPY   506     13
IMPLND   2                         1.77     COPY   506     15
IMPLND   4                          3.3     COPY   506     15
IMPLND   6                         1.41     COPY   506     15
Subbasin  7***
PERLND   9                         0.52     COPY   507     12
PERLND   9                         0.52     COPY   507     13
PERLND  18                         0.77     COPY   507     12
PERLND  18                         0.77     COPY   507     13
IMPLND   4                         0.72     COPY   507     15
IMPLND   7                         0.31     COPY   507     15
Subbasin  8***
PERLND   9                          2.2     COPY   508     12
PERLND   9                          2.2     COPY   508     13
PERLND  18                         2.13     COPY   508     12
PERLND  18                         2.13     COPY   508     13
IMPLND   3                         1.78     COPY   508     15
IMPLND   4                         1.02     COPY   508     15
IMPLND   7                         0.44     COPY   508     15
Basin  3B***
PERLND   9                         1.39     COPY   503     12
PERLND   9                         1.39     COPY   603     12
PERLND   9                         1.39     COPY   503     13
PERLND   9                         1.39     COPY   603     13
IMPLND   3                         0.45     COPY   503     15
IMPLND   3                         0.45     COPY   603     15
IMPLND   4                         0.69     COPY   503     15
IMPLND   4                         0.69     COPY   603     15
IMPLND   7                         0.29     COPY   503     15
IMPLND   7                         0.29     COPY   603     15

******Routing******
PERLND   9                         5.54     COPY     3     12
IMPLND   3                         1.79     COPY     3     15
IMPLND   4                         2.74     COPY     3     15
IMPLND   7                         1.18     COPY     3     15
PERLND   9                         5.54     COPY     3     13
PERLND   9                         1.15     COPY     5     12
IMPLND   3                         0.52     COPY     5     15
IMPLND   4                         0.73     COPY     5     15
IMPLND   7                         0.31     COPY     5     15
PERLND   9                         1.15     COPY     5     13
RCHRES   1                            1     COPY   503     16
RCHRES   2                            1     COPY   505     16
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
```

```
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1
COPY   502 OUTPUT MEAN   1 1   48.4        DISPLY   2     INPUT  TIMSER 1
COPY   504 OUTPUT MEAN   1 1   48.4        DISPLY   4     INPUT  TIMSER 1
COPY   506 OUTPUT MEAN   1 1   48.4        DISPLY   6     INPUT  TIMSER 1
COPY   507 OUTPUT MEAN   1 1   48.4        DISPLY   7     INPUT  TIMSER 1
COPY   508 OUTPUT MEAN   1 1   48.4        DISPLY   8     INPUT  TIMSER 1
COPY   503 OUTPUT MEAN   1 1   48.4        DISPLY   3     INPUT  TIMSER 1
COPY   505 OUTPUT MEAN   1 1   48.4        DISPLY   5     INPUT  TIMSER 1


<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                 ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG            ***
                                           in  out                           ***
    1     Tank  1                 1    1    1    1   28    0    1
    2     Trapezoidal Pond-056    1    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
    2         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ****************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
    2         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                      ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *     *  *  *  *  *       *  *  *  *  *        ***
    1        0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
    2        0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
    1             1      0.03       0.0       0.0       0.5       0.0
    2             2      0.01       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                         ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
         *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1           0          4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    2           0          4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   91    4
     Depth      Area    Volume  Outflow1 Velocity  Travel Time***
```

(ft)	(acres)	(acre-ft)	(cfs)	(ft/sec)	(Minutes)***
0.000000	0.000000	0.000000	0.000000		
0.066667	0.004938	0.000220	0.070410		
0.133333	0.006944	0.000620	0.099574		
0.200000	0.008456	0.001135	0.121953		
0.266667	0.009708	0.001742	0.140819		
0.333333	0.010790	0.002426	0.157441		
0.400000	0.011751	0.003178	0.172467		
0.466667	0.012616	0.003991	0.186286		
0.533333	0.013406	0.004858	0.199148		
0.600000	0.014132	0.005777	0.211229		
0.666667	0.014804	0.006741	0.222655		
0.733333	0.015430	0.007749	0.233522		
0.800000	0.016013	0.008798	0.243906		
0.866667	0.016560	0.009884	0.253865		
0.933333	0.017073	0.011005	0.263448		
1.000000	0.017556	0.012160	0.272695		
1.066667	0.018010	0.013345	0.281638		
1.133333	0.018439	0.014560	0.290306		
1.200000	0.018843	0.015803	0.298722		
1.266667	0.019224	0.017072	0.306908		
1.333333	0.019584	0.018366	0.314881		
1.400000	0.019924	0.019683	0.322657		
1.466667	0.020245	0.021022	0.330250		
1.533333	0.020547	0.022382	0.337672		
1.600000	0.020832	0.023761	0.344935		
1.666667	0.021100	0.025159	0.352048		
1.733333	0.021351	0.026574	0.359020		
1.800000	0.021587	0.028006	0.365859		
1.866667	0.021808	0.029452	0.372572		
1.933333	0.022015	0.030913	0.379167		
2.000000	0.022207	0.032387	0.385649		
2.066667	0.022385	0.033874	0.392024		
2.133333	0.022549	0.035372	0.398297		
2.200000	0.022701	0.036880	0.404472		
2.266667	0.022839	0.038398	0.410555		
2.333333	0.022965	0.039925	0.416549		
2.400000	0.023078	0.041460	0.422457		
2.466667	0.023179	0.043002	0.428285		
2.533333	0.023267	0.044550	0.434034		
2.600000	0.023343	0.046104	0.439708		
2.666667	0.023408	0.047662	0.445309		
2.733333	0.023460	0.049224	0.450841		
2.800000	0.023501	0.050790	0.456306		
2.866667	0.023530	0.052358	0.461706		
2.933333	0.023548	0.053927	0.467044		
3.000000	0.023554	0.055497	0.472322		
3.066667	0.023548	0.057067	0.477541		
3.133333	0.023530	0.058637	0.482704		
3.200000	0.023501	0.060204	0.487812		
3.266667	0.023460	0.061770	0.492867		
3.333333	0.023408	0.063332	0.497871		
3.400000	0.023343	0.064891	0.502825		
3.466667	0.023267	0.066444	0.507731		
3.533333	0.023179	0.067993	0.512589		
3.600000	0.023078	0.069535	0.517402		
3.666667	0.022965	0.071069	0.522171		
3.733333	0.022839	0.072596	0.526897		
3.800000	0.022701	0.074114	0.531581		
3.866667	0.022549	0.075623	0.536223		
3.933333	0.022385	0.077121	0.540826		
4.000000	0.022207	0.078607	0.545390		
4.066667	0.022015	0.080081	0.549916		
4.133333	0.021808	0.081542	0.554405		
4.200000	0.021587	0.082989	0.558859		
4.266667	0.021351	0.084420	0.563276		
4.333333	0.021100	0.085835	0.567660		
4.400000	0.020832	0.087233	0.572010		
4.466667	0.020547	0.088612	0.576327		
4.533333	0.020245	0.089972	0.580612		

```
4.600000  0.019924  0.091311  0.584866
4.666667  0.019584  0.092628  0.589089
4.733333  0.019224  0.093922  0.593281
4.800000  0.018843  0.095191  0.597445
4.866667  0.018439  0.096434  0.601580
4.933333  0.018010  0.097649  0.605686
5.000000  0.017556  0.098835  0.609765
5.066667  0.017073  0.099989  0.978910
5.133333  0.016560  0.101111  1.648713
5.200000  0.016013  0.102196  2.508517
5.266667  0.015430  0.103245  3.508899
5.333333  0.014804  0.104253  4.608973
5.400000  0.014132  0.105218  5.768278
5.466667  0.013406  0.106136  6.945177
5.533333  0.012616  0.107004  8.097647
5.600000  0.011751  0.107816  9.185308
5.666667  0.010790  0.108568  10.17228
5.733333  0.009708  0.109252  11.03063
5.800000  0.008456  0.109859  11.74437
5.866667  0.006944  0.110374  12.31382
5.933333  0.004938  0.110774  12.76044
6.000000  0.000000  0.110994  13.13191
END FTABLE  1
FTABLE      2
 91    4
   Depth      Area    Volume  Outflow1 Velocity  Travel Time***
    (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
0.000000  0.013223  0.000000  0.000000
0.088889  0.013280  0.001178  0.267497
0.177778  0.013338  0.002361  0.378297
0.266667  0.013395  0.003549  0.463318
0.355556  0.013453  0.004742  0.534993
0.444444  0.013511  0.005941  0.598140
0.533333  0.013569  0.007144  0.655230
0.622222  0.013627  0.008353  0.707729
0.711111  0.013685  0.009567  0.756594
0.800000  0.013743  0.010786  0.802490
0.888889  0.013801  0.012010  0.845898
0.977778  0.013860  0.013239  0.887186
1.066667  0.013918  0.014474  0.926635
1.155556  0.013977  0.015714  0.964472
1.244444  0.014036  0.016959  1.000880
1.333333  0.014095  0.018209  1.036010
1.422222  0.014154  0.019465  1.069986
1.511111  0.014213  0.020725  1.102916
1.600000  0.014273  0.021991  1.134892
1.688889  0.014332  0.023263  1.165990
1.777778  0.014392  0.024539  1.196281
1.866667  0.014452  0.025821  1.225823
1.955556  0.014512  0.027109  1.254670
2.044444  0.014572  0.028401  1.282868
2.133333  0.014632  0.029699  1.310460
2.222222  0.014692  0.031002  1.337483
2.311111  0.014752  0.032311  1.363970
2.400000  0.014813  0.033625  1.389953
2.488889  0.014873  0.034944  1.415459
2.577778  0.014934  0.036269  1.440513
2.666667  0.014995  0.037599  1.465139
2.755556  0.015056  0.038935  1.489358
2.844444  0.015117  0.040276  1.513189
2.933333  0.015178  0.041622  1.536651
3.022222  0.015240  0.042974  1.559759
3.111111  0.015301  0.044332  1.582531
3.200000  0.015363  0.045694  1.604979
3.288889  0.015424  0.047063  1.627118
3.377778  0.015486  0.048437  1.648959
3.466667  0.015548  0.049816  1.670515
3.555556  0.015610  0.051201  1.691797
3.644444  0.015672  0.052591  1.712814
3.733333  0.015735  0.053987  1.733576
```

```
  3.822222  0.015797  0.055388  1.754092
  3.911111  0.015860  0.056795  1.774371
  4.000000  0.015923  0.058208  1.794421
  4.088889  0.015985  0.059626  1.814250
  4.177778  0.016048  0.061050  1.833864
  4.266667  0.016111  0.062479  1.853270
  4.355556  0.016175  0.063914  1.872476
  4.444444  0.016238  0.065354  1.891486
  4.533333  0.016301  0.066801  1.910307
  4.622222  0.016365  0.068253  1.928945
  4.711111  0.016429  0.069710  1.947404
  4.800000  0.016492  0.071173  1.965690
  4.888889  0.016556  0.072642  1.983807
  4.977778  0.016620  0.074117  2.001761
  5.066667  0.016685  0.075597  2.019555
  5.155556  0.016749  0.077083  2.037193
  5.244444  0.016813  0.078574  2.054680
  5.333333  0.016878  0.080072  2.072019
  5.422222  0.016943  0.081575  2.089215
  5.511111  0.017007  0.083084  2.106270
  5.600000  0.017072  0.084598  2.123188
  5.688889  0.017137  0.086119  2.139972
  5.777778  0.017203  0.087645  2.156626
  5.866667  0.017268  0.089177  2.173152
  5.955556  0.017333  0.090715  2.189553
  6.044444  0.017399  0.092259  2.205833
  6.133333  0.017465  0.093808  2.221993
  6.222222  0.017530  0.095363  2.238037
  6.311111  0.017596  0.096925  2.253966
  6.400000  0.017662  0.098492  2.269783
  6.488889  0.017729  0.100065  2.285491
  6.577778  0.017795  0.101643  2.308660
  6.666667  0.017861  0.103228  2.327666
  6.755556  0.017928  0.104819  2.345699
  6.844444  0.017995  0.106415  2.363199
  6.933333  0.018061  0.108018  2.380329
  7.022222  0.018128  0.109626  2.467500
  7.111111  0.018195  0.111241  3.198544
  7.200000  0.018262  0.112861  4.316850
  7.288889  0.018330  0.114487  5.685745
  7.377778  0.018397  0.116120  7.207863
  7.466667  0.018465  0.117758  8.785919
  7.555556  0.018532  0.119402  10.32063
  7.644444  0.018600  0.121053  11.71823
  7.733333  0.018668  0.122709  12.90286
  7.822222  0.018736  0.124371  13.83219
  7.911111  0.018804  0.126040  14.51567
  8.000000  0.018872  0.127714  15.03487
  END FTABLE  2
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.76           PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.76           IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
COPY   601 OUTPUT MEAN   1 1     48.4      WDM    901 FLOW     ENGL      REPL
COPY     2 OUTPUT MEAN   1 1     48.4      WDM    702 FLOW     ENGL      REPL
COPY   502 OUTPUT MEAN   1 1     48.4      WDM    802 FLOW     ENGL      REPL
COPY   602 OUTPUT MEAN   1 1     48.4      WDM    902 FLOW     ENGL      REPL
```

```
COPY      4 OUTPUT MEAN   1 1     48.4       WDM     704 FLOW     ENGL      REPL
COPY    504 OUTPUT MEAN   1 1     48.4       WDM     804 FLOW     ENGL      REPL
COPY    604 OUTPUT MEAN   1 1     48.4       WDM     904 FLOW     ENGL      REPL
COPY      6 OUTPUT MEAN   1 1     48.4       WDM     706 FLOW     ENGL      REPL
COPY    506 OUTPUT MEAN   1 1     48.4       WDM     806 FLOW     ENGL      REPL
COPY    606 OUTPUT MEAN   1 1     48.4       WDM     906 FLOW     ENGL      REPL
COPY      7 OUTPUT MEAN   1 1     48.4       WDM     707 FLOW     ENGL      REPL
COPY    507 OUTPUT MEAN   1 1     48.4       WDM     807 FLOW     ENGL      REPL
COPY    607 OUTPUT MEAN   1 1     48.4       WDM     907 FLOW     ENGL      REPL
COPY      8 OUTPUT MEAN   1 1     48.4       WDM     708 FLOW     ENGL      REPL
COPY    508 OUTPUT MEAN   1 1     48.4       WDM     808 FLOW     ENGL      REPL
COPY    608 OUTPUT MEAN   1 1     48.4       WDM     908 FLOW     ENGL      REPL
COPY      3 OUTPUT MEAN   1 1     48.4       WDM     703 FLOW     ENGL      REPL
COPY    503 OUTPUT MEAN   1 1     48.4       WDM     803 FLOW     ENGL      REPL
COPY    603 OUTPUT MEAN   1 1     48.4       WDM     903 FLOW     ENGL      REPL
RCHRES    1 HYDR   RO     1 1        1       WDM    1004 FLOW     ENGL      REPL
RCHRES    1 HYDR   STAGE  1 1        1       WDM    1005 STAG     ENGL      REPL
RCHRES    2 HYDR   RO     1 1        1       WDM    1006 FLOW     ENGL      REPL
RCHRES    2 HYDR   STAGE  1 1        1       WDM    1007 STAG     ENGL      REPL
COPY      5 OUTPUT MEAN   1 1     48.4       WDM     705 FLOW     ENGL      REPL
COPY    505 OUTPUT MEAN   1 1     48.4       WDM     805 FLOW     ENGL      REPL
COPY    605 OUTPUT MEAN   1 1     48.4       WDM     905 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       16
RCHRES     ROFLOW                          COPY           INPUT  MEAN
  END MASS-LINK   16


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

Disclaimer

Legal Notice

Clear Creek Solutions, Inc.
6200 Capitol Blvd. Ste F
Olympia, WA. 98501
Toll Free 1(866)943-0304
Local (360)943-0304

www.clearcreeksolutions.com

APPENDIX C

COOPERS BEACH – MITIGATION AS BUILT

Altmann Oliver Associates, LLC

PO Box 578 Carnation, WA 98014 Office (425) 333-4535 Fax (425) 333-4509

AOA

Environmental
Planning &
Landscape
Architecture

May 5, 2011

AOA-3985

Kathy Curry
City of Sammamish
801 228th Avenue SE
Sammamish, WA 98075

REFERENCE: **Cooper's Beach – 42x E. Lake Sammamish Shore Lane NE, Sammamish, WA (Corps # NWS-2009-476 Heen/Leseberg)**

SUBJECT: Revised Mitigation As-built - Baseline Assessment Report

Dear Kathy:

This report has been prepared to document baseline conditions following installation of the wetland and shoreline mitigation area at the Cooper's Beach project site, and has been revised to address the comments presented in your March 3, 2011 e-mail to Evan Maxim (see Section 1.0 below). Also included in this report are the vegetation sample plots and photo-points that will be reviewed as part of the five year monitoring program.

1.0 PROJECT SUMMARY

Installation of the wetland mitigation area at the Cooper's Beach project site was generally completed in January 2011 according to the *Shoreline Restoration, Wetland Restoration, Clearing and Grading Permit* Plan (revised June 15, 2010), prepared by The Watershed Company. Site visits for the initial baseline assessment were conducted by AOA and occurred on January 13, and February 3, 2011. Following the initial baseline review, the mitigation area was slightly revised to ensure compliance with SMC 21A.50.351(3)(b). Under this code section, no more than 25% of the total lake frontage may be used for shoreline access.

As depicted on the current as-built plan, the mitigation area has been revised such that the existing bulkhead to remain is now 60 feet in total length (i.e., 25% of the total 240 feet of lake frontage). The remaining 180 feet of shoreline has been planted and will remain in a natural condition. In addition, the northern edge of the mitigation area has been revised slightly to ensure a minimum 45-foot buffer (Photos 1 and 2).

Photo 1: Revised maximum 60-foot long bulkhead to remain.

Photo 2: Revised log along northern edge of mitigation area (note darker bark coloration depicting revised location).

The large logs that have been placed along the 45-foot buffer boundary in lieu of fencing have been staked into the ground with re-bar to ensure that they will remain in place (Photo 3). In addition, the required critical areas sign on the 45-foot buffer boundary has also been installed (Photo 4).


Photo 3: Rebar stake through log along buffer boundary.

Photo 4: Installed critical area sign.

It is our understanding that the origin of the one remaining pipe in the northern portion of the site that discharges into the lake is likely from a rockery drain (Comment 1.e). The origin of this pipe will be confirmed during construction of the house and a plan will be designed to divert all water currently carried in this feature into the mitigation area during house construction.

The existing standpipe and drain line located along the northern edge of the mitigation area will be left in place for perpetuity or until such time as the upstream sediment problems are fixed (Comment 1.f). Since sediment from an off-site upstream ditch continues to erode and enter the on-site mitigation area, periodic maintenance may be required. It is our understanding that it is the subject property owner's intention to attempt to rectify this off-site condition. If the erosion is stabilized and the sediment source is eliminated or significantly reduced, then the standpipe and drain line could be removed.

The only plant substitution approved by The Watershed Company was that deer fern was substituted for lady fern. The revised as-built drawing for the site (**Figure 1**) depicts the actual location of the graded ponds and large woody debris placement. Grading was generally conducted per the approved plan, with some minor modifications in the southwest corner of the mitigation area to preserve two existing red alder trees. In addition, at our recommendation several of the conifers located within ponded areas were moved into drier portions of the mitigation site.

This as-built figure also includes the final total plant quantities and the location of the vegetation sample plots and photo-points. Dimensions were added to the as-built figure that reflect the approved mitigation boundaries and minor changes made in the field to ensure code compliance.

2.0 PERFORMANCE MONITORING

This report summarizes the baseline conditions encountered during our January 13, 2011 site review. The data collected during future site visits will be compared to the data collected during the baseline assessment.

Monitoring field reviews followed by preparation and submittal of annual summary reports will continue for a period of at least five years. This report, as well as future reports, will include: a) photo-documentation, b) estimates of percent vegetative cover, plant survival and undesirable species, c) wildlife usage, d) water quality, hydrology, and site stability, and e) an overall qualitative assessment of project success.

2.1 VEGETATION SAMPLE PLOTS AND PHOTO-POINT LOCATIONS

During the baseline assessment, three vegetation sample plots and three photo-point locations were established. These locations will continue to be monitored throughout the five-year performance monitoring period. Within the vegetation sample plot locations, all plant species will be recorded as well as relative percent cover of the dominant species within the vegetative strata. Photos will be taken throughout the monitoring period to document the general appearance and progress in plant community establishment. Review of the photos over time will provide a visual representation of success of the planting plan.

Attachment 1 contains photographs from the established photo-point locations.

2.2 VEGETATION DATA FROM SAMPLE PLOTS

VEGETATION SAMPLE PLOT 1 (Wetland Buffer)

Plant Species	Baseline
Western red cedar (*Thuja plicata*)	1
Douglas fir (*Pseudotsuga menziesii*)	1
Red flowering currant (*Ribes sanguineum*)	9
Tall Oregongrape (*Mahonia aquifolium*)	24
Red-osier dogwood (*Cornus sericea*)	3
Deer fern (*Blechnum spicant*)	5

SUMMARY OF PLOT 1 CONDITIONS

- Woody areal coverage of installed woody plants~20%
- Survival rate of installed plants: 100%
- No herbaceous vegetation coverage – plot entirely mulched.
- No invasive coverage.
- MAINTENANCE: Continue on-going routine maintenance.
- SUCCESS CRITERIA: This plot is currently meeting the approved success criteria for woody plant survival (see Section 2.5 below).

VEGETATION SAMPLE PLOT 2 (Southwest Wetland).

Plant Species	Baseline
Western red cedar (*Thuja plicata)*	1
Sitka willow (*Salix sitchensis*)	1
Sitka spruce (*Picea sitchensis*)	1
Nootka rose (*Rosa nutkana*)	4
Salmonberry (*Rubus spectabilis*)	5
Small-fruited bulrush (*Scirpus microcarpus*)	~20%
Watercress (*Rorippa nasturtium-aquaticum*)	~5%
Velvet grass (*Holcus lanatus*)	~5%

SUMMARY OF PLOT 2 CONDITIONS

- Woody areal coverage ~15%.
- Survival rate of installed plants: 100%
- Herbaceous coverage is ~30%.
- No significant invasive coverage (no control of velvet grass necessary).
- MAINTENANCE: Continue on-going routine maintenance.

- SUCCESS CRITERIA: This plot is currently meeting the approved success criteria for woody plant survival.

VEGETATION SAMPLE PLOT 3 (Southeast Wetland)

Plant Species	Baseline
Nootka rose (*Rosa nutkana*)	4
Red-osier dogwood (*Cornus sericea*)	11
Deer fern (*Blechnum spicant*)	4
Watercress (*Rorippa nasturtium-aquaticum*)	~25%
Dagger-leaf rush (*Juncus ensifolius*)	~25%
Mannagrass (*Glyceria* sp.)	~5%

SUMMARY OF PLOT 3 CONDITIONS

- Woody areal coverage ~15%.
- Survival rate of installed plants: 100%.
- Herbaceous coverage ~55%.
- No invasive coverage.
- MAINTENANCE: Continue on-going routine maintenance.
- SUCCESS CRITERIA: This plot is currently meeting the approved success criteria for woody plant survival.

2.3 WATER QUALITY AND HYDROLOGY

During each monitoring event, an assessment will be made of the water regime within the mitigation area to ensure that hydrological conditions within the wetland and buffer are suitable to support the desired native plant communities. General observations will also be made of the extent and depth of soil saturation or inundation.

Water quality will be assessed qualitatively; unless it is evident there is a serious problem. In such an event, water samples will be taken and analyzed in a laboratory for suspected pollutants. Results will be reported quantitatively. Qualitative assessments of water quality include:

- oil sheen or other surface films,
- abnormal color or odor,
- stressed or dead vegetation or aquatic fauna,
- turbidity.

Observations and evaluations will be made of slope and soil stability in the mitigation area. Any erosion or slumping of soils will be recorded and reported so that corrective measures may be taken.

At the time of the baseline field investigation, soils throughout the created wetland were generally saturated to the surface with shallow ponding observed within the graded depressions. Water quality appeared good and no significant erosion or other soil stability problems were observed within the mitigation area.

2.4 WILDLIFE

Wildlife species observed in the wetland and buffer areas (either by direct or direct means) will be identified and recorded during the monitoring events. Direct observations include actual sightings, while indirect observations include tracks, scat, nests, burrows, song, or other indicative signs.

Wildlife signs or observations at the Cooper's Beach site during the baseline review included the following: black-tailed deer (browse and scat), mallard, mole (uplift mounds), and American coot.

3.0 SUCCESS CRITERIA & CURRENT STATUS

The approved performance standards for the project as developed by The Watershed Company included:

- *100 percent survival of all planting during the first year of monitoring, 100 percent survival of trees during years 2-5, and an 80 percent survival of shrubs during years 2-5 of monitoring.*

- *80 percent survival of groundcover and emergent vegetation in year 2*

- *75 cover standard of groundcover and emergent vegetation by year 5*

It is assumed based on the approved maintenance requirements that invasive species will be controlled at levels below 15% coverage. At the time of the January 2011 baseline monitoring there was 100% survival of all planted species and invasive species coverage was well below the 15% coverage threshold. Therefore all of success criteria are currently being met.

4.0 SUMMARY & MONITORING SCHEDULE

Overall, the site is performing well and is currently meeting the defined success criteria for the project. With proper on-going maintenance, the site should continue to establish successfully.

Assuming approval by the City, the next long-term monitoring event is scheduled for the late spring of 2011. The next report will then be prepared following the fall 2011 site visit. Monitoring will continue twice yearly, with the submittal of annual reports.

Should you have any questions or would like to schedule a site review, please call Simone Oliver or me at (425) 333-4535.

Sincerely,

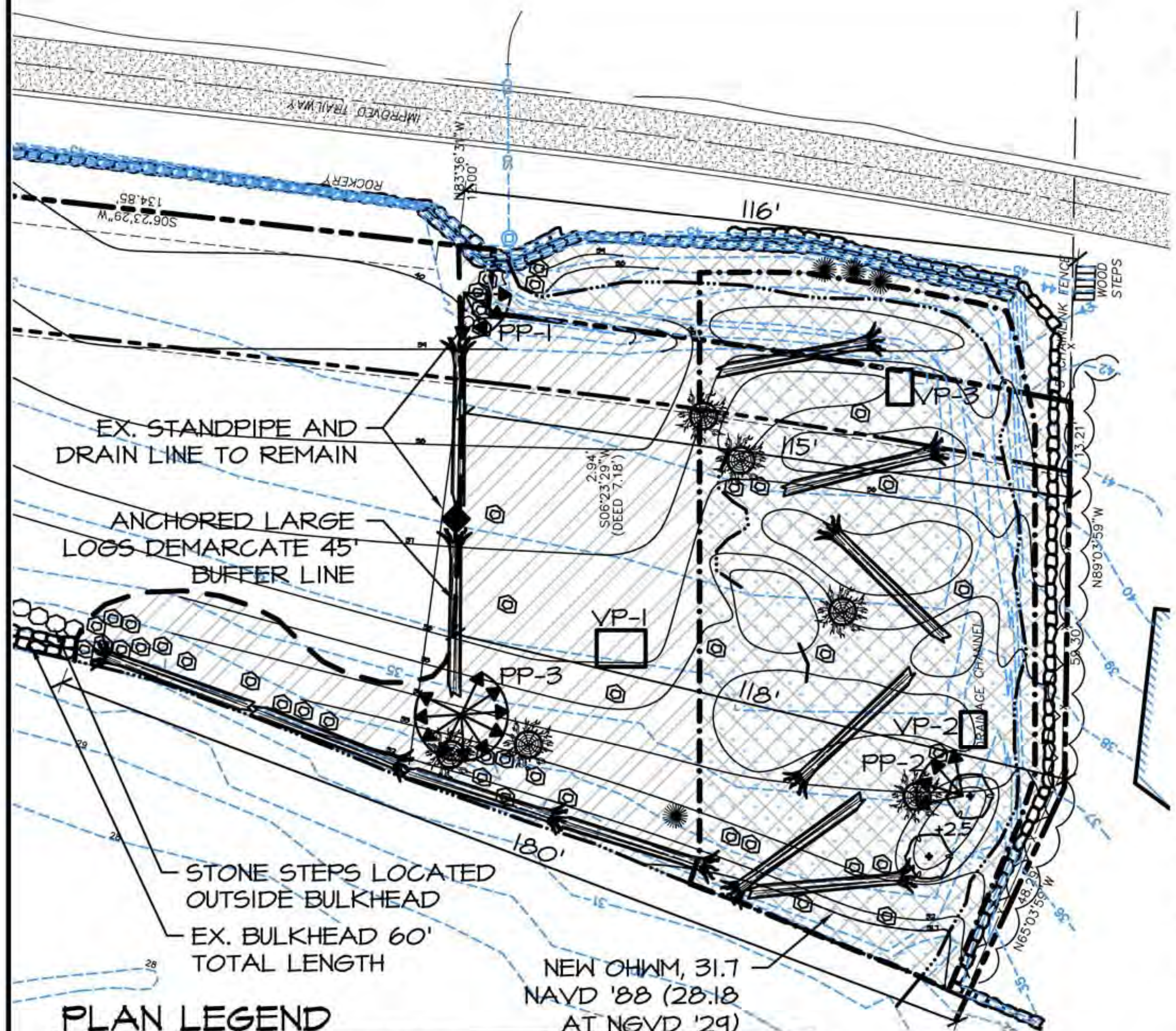
ALTMANN OLIVER ASSOCIATES, LLC

John Altmann

John Altmann
Ecologist

Attachments
1. Photographs
2. Figure 1 - As-built

cc: Roger MacPherson



PLAN LEGEND

- PROPERTY LINE
- CREATED WETLAND
- APPROX. CENTERLINE OF STREAM
- BUFFER BOUNDARY
- ENHANCED STREAM/WETLAND (8,467 SF)
- ENHANCED BUFFER (5,783 SF)
- WOODY DEBRIS
- EXISTING STUMP
- EXISTING WILLOW
- EXISTING RED ALDER
- EXISTING BOULDER
- PP-# APPROX. LOCATION OF PHOTO-POINTS
- VP-# APPROX. LOCATION OF VEGETATION SAMPLING PLOTS
- CRITICAL AREA SIGN

PLANT LIST

TREES

SCIENTIFIC NAME	COMMON NAME	TOTAL PROJECT QTY.	SIZE/SPACING
BETULA PAPYRIFERA	PAPER BIRCH	3	2 GAL.
PICEA SITCHESIS	SITKA SPRUCE	2	2 GAL.
PSEUDOTSUGA MENSIEZII	DOUGLAS FIR	3	5 GAL.
THUJA PLICATA	WESTERN RED CEDAR	14	5 GAL.

SHRUBS

SCIENTIFIC NAME	COMMON NAME	TOTAL PROJECT QTY.	SIZE/SPACING
ACER CIRCINATUM	VINE MAPLE	23	2 GAL.
CORNUS SERICEA	RED-OSIER DOGWOOD	88	1 GAL.
CORYLUS CORNUTA	BEAKED HAZELNUT	5	2 GAL.
HOLODISCUS DISCOLOR	OCEAN SPRAY	7	1 GAL.
MAHONIA AQUIFOLLIUM	TALL OREGON GRAPE	35	2 GAL.
PHYSOCARPUS CAPITATUS	NINEBARK	29	1 GAL.
PRUNUS EMARGINATA	BITTER CHERRY	12	2 GAL.
RIBES SANGUINEUM	RED FLOWERING CURRENT	34	1 GAL.
ROSA NUTKANA	NOOTKA ROSE	34	1 GAL.
RUBUS SPECTABILIS	SALMONBERRY	25	1 GAL.
SALIX LASIANDRA	PACIFIC WILLOW	8	1 GAL.
SALIX SITCHENSIS	SITKA WILLOW	19	1 GAL.
SAMBUCUS RACEMOSA	RED ELDERBERRY	10	1 GAL.
VACCINIUM OVATUM	EVERGREEN HUCKLEBERRY	11	1 GAL.

PERENNIALS/GROUNDCOVER

SCIENTIFIC NAME	COMMON NAME	TOTAL PROJECT QTY.	SIZE/SPACING
BLECHUM SPICANT	DEER FERN	98	4" POTS
GAULTHERIA SHALLON	SALAL	30	1 GAL.
MAHONIA NERVOSA	LOW OREGON GRAPE	60	1 GAL.
POLYSTICHUM MUNITUM	SWORD FERN	53	4" POTS

EMERGENTS

SCIENTIFIC NAME	COMMON NAME	TOTAL PROJECT QTY.	SIZE/SPACING
ELEOCHARIS PALUSTRIS	SPIKERUSH	800	10 CU. IN POTS @ 18" O.C.
JUNCUS ENSIFOLIUS	DAGGER-LEAVED RUSH	240	10 CU. IN POTS @ 18" O.C.
SCIRPUS MICROCARPUS	SMALL-FRUITED BULRUSH	220	10 CU. IN POTS @ 18" O.C.
SCIRPUS LACUSTRIS	HARD-STEM BULRUSH	315	10 CU. IN POTS @ 24" O.C.

GRAPHIC SCALE
(IN FEET)

0 15 30 45 60 90

SCALE: 1:30

N

NOTES

1. BASE INFORMATION PROVIDED BY MACPHERSON CONSTRUCTION & DESIGN, (425) 391-3333.
2. SITE PLAN AND ORIGINAL DESIGN PREPARED BY THE WATERSHED COMPANY, KIRKLAND, WA, (425) 822-5242.
3. BASED ON APPROVED DRAWING 'SHORELINE RESTORATION, WETLAND RESTORATION, CLEARING AND GRADING PERMIT' DATED 6/15/2010, DRAWINGS 1-7 BY THE WATERSHED COMPANY.

PROJECT 3985
DRAWN SO
SCALE AS NOTED
DATE 02-08-11
REVISED 05-05-11
1/1

FIGURE 1: AS-BUILT MITIGATION PLAN
COOPER'S BEACH
42X EAST LAKE SAMMAMISH SHORE LANE NE
SAMMAMISH, WA 98074

AOA
Environmental Planning & Landscape Architecture
Altmann Oliver Associates, LLC

3985-AB-05-05-11.dwg

SB-265

Photo-point 1: View looking south.

Photo-point 1: View looking southwest.

Photo-point 1: View looking west.

Photo-point 2: View looking east.

Photo-point 2: View looking northeast.

Photo-point 2: View looking north.

Photo-point 3: View looking south.

Photo-point 3: View looking southwest.

Photo-point 3: View looking north.

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 10:58 AM
To: 'stocklimann67@gmail.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Michelle,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Michael Mann [mailto:stocklimann67@gmail.com]
Sent: Thursday, January 26, 2017 3:59 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the permit, as submitted.

Approval of the permit will advance completion of the 44 mile regional trail system between Seattle and the foothills of the Cascades. The trail, as proposed in the permit, will provide a safe walking and biking route through Sammamish. Please support the proposed trail widths, which reflect industry standards (AASHTO).

A 12ft trail with 2ft shoulders will create a safe trail with space for the various different uses… from people running to people riding a bike. Please approve the permit, including the proposed width of the trail.

Ensuring crossing priority for the trail is an important safety issue. Giving priority to the trail when roads and driveways cross the path will be intuitive for all users. The trail alignment, as proposed in the permit, provides sight lines for good visibility for people on the trail and people crossing the trail at trail intersections.

Please approve the permit, as proposed, with expediency.

Sincerely,

Micheal Mann

Michael Mann
1826 FRANKLIN AVE E
SEATTLE, WA 98102
2069307501

Lindsey Ozbolt

From:	Lindsey Ozbolt
Sent:	Friday, January 27, 2017 10:58 AM
To:	'm_w_r7@hotmail.com'
Subject:	RE: Please Approve the Permit for Segment 2B of the ELST

Dear Melissa,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Melissa Lail [mailto:m_w_r7@hotmail.com]
Sent: Thursday, January 26, 2017 3:48 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the permit, as submitted.

I love riding my bike and this will give me a new place to explore. Also, I'm hoping to get my dad hooked on biking too and having a nice trail close by is key to my master plan. I know when I got into riding a few years ago that riding on a nice, safe trail was what really got me to enjoy getting some exercise. I hadn't ridden much since I was a kid but when I bought a bike and tired riding around my neighborhood it was a pretty disappointing experience. Riding around the neighborhood wasn't very fun when I got started because, I was pretty wobbly and there isn't much flat ground near my house and on top of that I had to worry about cars. When I started riding on bike paths, I was able to relax and enjoy. This allowed me to improve my bike handling and helped me to improve my confidence. I really want my dad to also have that same type of positive experience. I think having this trail completed and so close by will be very helpful.

Sincerely,

Melissa Lail

Melissa Lail
2524 97th PL SE
Everett, WA 98208
253-468-6517

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 10:58 AM
To: 'Shannon Holman Ramirez'
Subject: RE: Subject: Comments on ELST South Segment B (STA 375 - 380)

Dear Shannon,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

From: Shannon Holman Ramirez [mailto:auntieshannon1@gmail.com]
Sent: Thursday, January 26, 2017 3:25 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Subject: Comments on ELST South Segment B (STA 375 - 380)

To Lindsey Ozbolt and other interested parties,

I am submitting comments on the proposed trail and fish passage changes included in the South Sammamish Segment B 60% plan. As part of researching and producing this commentary and feedback I reviewed the plan documents, discussed the various plan details and concerns with our neighbors, and also visited the City of Sammamish City Hall to discuss some of these issues with King County representatives in person. The neighbors in this discussion have expressed similar concerns and include the 10 homeowners of Whileaway Court who share ownership of the common private driveway that would be effected by this proposal.

I would also like to point out that in addition to living in the area for the past 20 years where the proposed changes would effect, I have also been very active in contributing to research and preservation of Kokanee salmon both in Pine Lake Creek but also in other capacities in the Sammamish water basin. I am also a volunteer member of the Kokanee Work Group lead by David St. John.

Given the quantity of feedback I have gathered I think it best to present the information in bullet form, after which I will comment further on a few of the key points.

New culvert under Whileaway court (reference pages AL39, FP1, and WP9):

- Good for the fish!
- Good for improved water flow, drainage, and creek flooding mitigation
- Property rights concerns
  - Most proposed construction is within private road (519710TRCT) that is not part of the trail ROW. All home owners have a shared ownership in this tract, so owner consent is required.
  - Why does the proposed construction extend into privately owned Gill Trust lots 5197100135 and 5197100130 instead of remaining within the shared driveway 519710TRCT?
- It is very important to preserve the two massive ancient redwood trees at the west exit of the culvert, near 11+00 on the p-line and adjacent to rock walls #1 & #2. Does the "M" designation on the tree removal plan for these two trees reflect concern?
- Earth walls #42 and #43
  - Chain link fencing is not visually acceptable, would need a more aesthetically pleasing and natural fence choice that fits the style of the neighborhood and the beautiful natural surroundings of the creek passing there.
  - Length of "earth walls" is concerning, why are they so long?
  - In particular the south starting point of wall #43. That starting point should be moved at least 5 feet farther north. As it is located now it is likely to be a back-up hazard for cars backing out of the driveway from the 903 residence and turning to back up to the north.
  - Why does wall #42 run so far to the north, seems this could be substantially reduced?
- What is the relationship of culvert replacement plans to trail plans (tied together, different projects, timelines?)
- How does funding work, all paid for by King County?
- How will all the utilities be routed and what will the effect on utilities be during construction?
  - Gas, water, sewer are all underground in the road where culvert resides (as are cable and power in other road areas in the construction zone)
  - Current plan would require removal/replacement of power pole near south edge culvert. Could power on these poles be moved underground as part of this work?
  - FYI: There is a separate proposal for a fire hydrant to be added north of the proposed fish passage culvert work on 519710TRCT. This work should be coordinated.
- How will people have access to their homes during culvert/road construction?
- Road grading and drainage is an important concern. We already have issues with water on the road flowing towards residence driveways, in particular the driveways of 903, 909, or 915, so we would appreciate any grading changes improve upon the drainage conditions.
- Concern about current design reducing parking availability.
- What are landscape plans for this area after culvert replacement?

New trail plan (reference pages AL20 and LA12):

- Is it necessary for the trail around 378+00 to meander into and destroy existing delightful landscaping adjacent to 929?
  - Plan will destroy numerous large very mature Rhododendrons, Oregon Grape, Aspen, and Fir trees
  - Can the meander be avoided here or moved somewhere else along the trail?
  - At minimum can the meander be reduced to preserve more of the mature trees and bushes?
  - If infringement on wetlands is a concern, the designation of the area east of the trail here as wetland 23C is questionable. Can this be reevaluated and the plans changed to avoid destruction of the Rhododendron, Oregon Grape, Aspen and Fir trees?
- Where grass area is replaced just south of Driveway #10 access, please ensure only very low growing plants are added to the enhancement area to replace the grass. This is required for good visibility onto trail and parkway from the driveway.

To expand on some of the key points I will first focus on the new culvert plans under Whileaway court. One concern here is it is important to preserve the two large, majestic, redwood trees that are planted here just to the west of the culvert. I am pleased to see that, to my understanding, feedback given to folks planning the culvert changes during an onsite meeting in April of 2016 (Kelly Donahue from King County and several representatives from Parametrix) was incorporated. It appears the plans have offset the new proposed culvert further away from the two redwoods in order to reduce the disturbance to the tree roots during required excavation. The trees were planted in the 40's and are a keystone of the landscape in our neighborhood, they must be seen in person to be fully appreciated and cannot be sacrificed!

We are also very interested in the improved fish passage that the new culvert will provide, and in particular the increased capacity the new culvert will have in allowing storm water to pass through. The old/current culvert there is much smaller and has been a concern of ours for plugging and overflowing.

We have additional concerns about several other details of the proposed plan outlined above, in particular the chain link fencing and earth walls. It's important to us that the new culvert aesthetically look very pleasing and fit into the neighborhood landscaping and natural look and feel. Chain link fencing does not meet that requirement, we would like this to be changed to some other suitable more natural material. It appears the earth walls will be constructed of precast concrete blocks which will mostly be buried down to the road surface level, and only exposed where the cut of the creek bed slopes down. If so, we believe this would be suitable if they did not have chain link fence attached.

My final point for the culvert plans is that I want to emphasize that in this section, unlike the trail ROW, the proposed changes to the culvert occur on private property. There are important property rights and consent that need to be adhered to here.

Secondly I would like to comment further on the trail deviation outlined in AL20. We are dismayed to see that the current plan has the trail diverting to the west such that a significant and very beautiful naturally landscaped area will be destroyed by the trail. The area has been maintained for nearly 20 years in its current state, and contains many native plants and trees including other much older vegetation including mature Rhododendrons, Oregon Grape, Aspen, and Fir trees. We would ask that as much of that landscaping be preserved as is possible. Are there changes that can be made to the trail path in this section that can avoid or minimize that destruction? Can it be moved more towards the existing trail path or shifted in some other way? If the reason for the diversion is due to the designated wetland 23C east of the trail in this section, then we would respectfully request that this designation be reevaluated. It really does not look like a wetland, it is a hill sloping down with a ditch carrying water away north and south. It would also be very illustrative for folks in charge of planning the trail in this section to come down and see the current state and landscaping in person if that hasn't been done already. The landscaped area is well worth preserving and it would be a terrible waste to destroy it.

Overall, we are happy to see the trail plans progress, and we see several benefits to the fish passage culvert work as well. We welcome and encourage a dialog between the county trail planners and our neighborhood to discuss the concerns, adjust the plans, and make some beneficial changes.

Can you please provide more information in your response to this email regarding how the feedback will be processed, how it will be communicated to king county, how we will hear about incorporation of the feedback, and if there is additional opportunity for feedback after any changes are considered and made? Also, sharing the timeline of the entire review process leading up to eventual approval and construction would also be helpful.

Thanks for your attention and consideration, and please let us know if you have any questions. We appreciate your follow-up on this matter.

Shannon and Chris Ramirez

909 E LK Sammamish Sh LN SE

Sammamish, WA

425.836.5384

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 10:57 AM
To: 'mark.bike.anderson@gmail.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Mark,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Mark Anderson [mailto:mark.bike.anderson@gmail.com]
Sent: Thursday, January 26, 2017 3:04 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I've ridden this trail many times and hate the fact that I have to jump to the road in the middle. I support the completion and support for completing the ELST and approving permit SSDP2016-00415.

Please approve the trail permit, as submitted, so that users of all ages and abilities can safely use the trail. It will accommodate walkers, runners and bikers.

As proposed in the permit, priority at trail crossings should be given to the trail and trail users. Consistent crossing priority is intuitive and safe for users of both the trail and the driveways and roads that cross the trail.

This will be a great community amenity when completed. Please complete the trail and keep me off the road.

Sincerely,

Mark Anderson

Mark Anderson
3242 56th Ave. SW
Seattle, WA 98116
2069383244

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 10:55 AM
To: 'Thomas Leach'
Subject: RE: 821 E. Lake Sammamish Pkwy NE (Trail #'s 447 - 448)

Dear Thomas,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

From: Thomas Leach [mailto:tom_leach@me.com]
Sent: Thursday, January 26, 2017 2:46 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: 821 E. Lake Sammamish Pkwy NE (Trail #'s 447 - 448)

Hi Lindsey:

I just met with Kelly today and she was a tremendous help in reviewing the trail and construction plan. We came up with the following comments / concerns:

- We have a substantial tree located on our property. The tag number is 8173. We noticed that the tree location differed between the tree preservation plan and the 60% plan. It is unclear as to whether this tree will be removed or not. The tree preservation plan shows removal but it is not located properly on the tree preservation plan.
- Staircase number 68 has a structural landing within the C&G area. I will need to know the following:
    - Will this be cleared out, If so, who is responsible for the reconstruction of the staircase?
    - Will there be access to the staircase during construction as this is the only way into the property.
    - Will there be any permanent security gate made to the staircase when the trail is complete? If there is a gate who is responsible for the cost?
- There is a significant bluff between the trail and my residence. There is currently a line of arborvitae that is approximately 20 feet tall that is right on the CG line. It is not clear if those will be removed or not. I am not clear if they do get removed if a fence will replace them.
- The trail currently bisects my parking area and my house. I have been using the public space between the trail and East Lake Sammamish Parkway for parking. I had the Special Use Permit but I just found out it has expired and I need to reapply. I will reapply within the coming weeks. There is currently no other access or parking available. My questions are the following:
    - Can I expect no net loss of parking available to me during and after construction?
    - During the construction phase will crews be using the public land for staging equipment and crew vehicles?
    - Will there be a way to build some sort of car port for vehicle protection in the public area when the construction phase is complete?

- Alternatively I might be able to construct a garage and access it through the same alley that my neighbor to the south uses (trail number 446-447). I believe the street name is E. Lake Sammamish Shore Lane NE. Thus you would not have any additional access point across the trail to worry about.

Take care,

Tom Leach

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 10:54 AM
To: 'Michelle Eden'
Subject: RE: Comments RE: Trail construction

Dear Michelle,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

From: Michelle Eden [mailto:mmeden@hotmail.com]
Sent: Thursday, January 26, 2017 2:47 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Comments RE: Trail construction

Dear Ms. Ozbolt,

Four neighbors met on Wednesday, January 25, 2017 with Kelly Donahue from King County. Kelly reviewed the trail plans and our specific feedback, and said that our final comments need to be sent to you. Kelly suggested we amend our earlier document to you to address concerns as they are related to the formal county plans. In that regard we are looking for solutions to our issues in area 353 to 355. My specific property is nearest to 353.50.
Our concerns are as follows:

1. During construction the CG line for fencing on the west side of these sections will keep us from entering any of our properties. Even assuming we could get past area 355 we could not get past the tree nor could the Roberts family turn into their garage.

2. Post construction the 60% plans, as drawn, will not allow access for emergency vehicles, delivery trucks (FedEx, UPS, DHL etc.) and perhaps larger residential vehicles.

3. Post construction the 60% plans, as drawn, will not allow the Roberts family (area 353) to safely pass parked vehicles parked at our location, the Eden residence (area 353 + 50). It is currently a tight fit as built now.

We are asking that prior to construction the following changes are made to the 60% plans.

1. The CG fence line be adjusted to allow access for emergency, residential and commercial vehicles to our properties. Practically speaking the CG fence should not be further west than the current fence/bollards are now.

2. The trail center line be moved east at least another two to three feet in sections 353 to 355 to allow for access to our properties. In essence move the trail east such that our final fence/bollards are no further west than they are currently on the temporary trail.

3. The north end of the proposed wooden barrier be moved south to its current endpoint (or further south) to allow for safe vehicle access.

The good news is that the county already is proposing to develop the permanent trail east of its current temporary location. We are only asking that it be moved a few feet further east allowing us to have the access as we currently have now. Given the nature of the existing terrain in our areas (353 - 355) and the proposed work in the 60% plan this request would not significantly change the construction details and would allow our neighborhood safe access during and after construction.

I would like to track the progress and process of my requests. Please let me know how I can do that.

Sincerely,

Michelle Eden
1633 E Lk Samm Place SE
Sammamish, WA 98075
206-650-6804

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 10:53 AM
To: 'ny nuon'
Subject: RE: South Sammamish Trail section 2b design, markers 470-473 Comments

Dear Ny,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

From: ny nuon [mailto:nynuon@hotmail.com]
Sent: Thursday, January 26, 2017 2:44 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: South Sammamish Trail section 2b design, markers 470-473 Comments

Dear Ms. Ozbolt,

Please see attached.

Thank you,

Ny Nuon

To whom it may concern,

The proposed trail plans on East Lake Sammamish Parkway NE, Sammamish, WA 98074 are concerning to me. The area of concern uses trail markers 470-473. There is a pickle ball court that I have been playing on for the last 10 years. We have played multiple tournaments there and it has been a source of great fun for my friends and I. I have even coached some of my friends there on how to be a better tennis and pickle ball player. The proposed new plans, destroys the pickle ball court. It makes the space unusable for pickle ball. I would really like it if you changed the plans.

Thank you,

Ny Nuon,
4583 N Ainsley Way
Prescott Valley, AZ 86314

nynuon@hotmail.com

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 10:39 AM
To: 'charlesdavidwilliams@gmail.com'
Subject: RE: Approval needed for Segment 2B of the ELST

Dear Charles,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Charles Williams [mailto:charlesdavidwilliams@gmail.com]
Sent: Thursday, January 26, 2017 2:20 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Approval needed for Segment 2B of the ELST

Dear

Dear city of Sammamish,

The form part so you know what this is about:

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

The part that I'm writing with a story:

The East Lake Sammamish trial is in a pretty great location. It is a great commuting pathway and wonderful for summertime recreation along the lake. However, the weak point is that the narrow sections and dirt sections make the trail harder to access for all ages and abilities. I rode it several times with less experienced cyclists this summer and saw two of them crash despite exercising caution. They didn't get more than a scrape or two but we know that every crash carries with it a risk of a more substantial injury. We can prevent these by completing the proposed trail improvements.

Please approve the permit, as submitted.

Sincerely,

Charles Williams
2203 MINOR AVE E
SEATTLE, WA 98102
2067925827

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 10:38 AM
To: 'smith.madison.m@gmail.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Maddie,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Madison Smith [mailto:smith.madison.m@gmail.com]
Sent: Thursday, January 26, 2017 2:20 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the permit, as submitted.

Approval of the permit will advance completion of the 44 mile regional trail system between Seattle and the foothills of the Cascades. The trail, as proposed in the permit, will provide a safe walking and biking route through Sammamish. Please support the proposed trail widths, which reflect industry standards (AASHTO).

A 12ft trail with 2ft shoulders will create a safe trail with space for the various different uses… from people running to people riding a bike. Please approve the permit, including the proposed width of the trail.

Ensuring crossing priority for the trail is an important safety issue. Giving priority to the trail when roads and driveways cross the path will be intuitive for all users. The trail alignment, as proposed in the permit, provides sight lines for good visibility for people on the trail and people crossing the trail at trail intersections.

As a daily bike commuter in the area, I have experienced first hand how important trails are for commuting. With trails that are safe and accessible, many more feel comfortable commuting by bike or foot.

Please approve the permit, as proposed, with expediency.

Sincerely,
Maddie Smith

Madison Smith
7501 Greenwood Ave N #101
Seattle, WA 98103
3609270263

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 10:38 AM
To: 'sita24@gmail.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Sita,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Sita Bhaskaran [mailto:sita24@gmail.com]
Sent: Thursday, January 26, 2017 2:11 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

I am 67 years old and have recently moved to Washington state to be closer to my daughter. I love to ride the Burke Gilman to Sammamish river trail to Marymoor park. Would be great if I could ride on a paved East Lake Sammamish trail onto Sammamish and Issaquah.

Please approve the permit, as submitted.

Approval of the permit will advance completion of the 44 mile regional trail system between Seattle and the foothills of the Cascades. The trail, as proposed in the permit, will provide a safe walking and biking route through Sammamish. Please support the proposed trail widths, which reflect industry standards (AASHTO).

A 12ft trail with 2ft shoulders will create a safe trail with space for the various different uses… from people running to people riding a bike. Please approve the permit, including the proposed width of the trail.

Ensuring crossing priority for the trail is an important safety issue. Giving priority to the trail when roads and driveways cross the path will be intuitive for all users. The trail alignment, as proposed in the permit, provides sight lines for good visibility for people on the trail and people crossing the trail at trail intersections.

Please approve the permit, as proposed, with expediency.

Sincerely,
Sita Bhaskaran
sita24@gmail.com
18501 69th Lane NE, Apt 109
Kenmore, WA 98028

Sita Bhaskaran
18501 69th Lane NE, Apt 109
Kenmore, WA 98028
2486471984

Lindsey Ozbolt

From:	Lindsey Ozbolt
Sent:	Friday, January 27, 2017 10:38 AM
To:	'frankmckulka@comcast.net'
Subject:	RE: Notes regarding the trail

Dear Frank,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

From: frankmckulka@comcast.net [mailto:frankmckulka@comcast.net]
Sent: Thursday, January 26, 2017 2:10 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Cc: rissberger, william <williamrissberger@comcast.net>; roberts, steve <steve@roberts.org>; Jerry <jerryj27@msn.com>
Subject: Fwd: Notes regarding the trail

Dear Lindsey,

We met on Wednesday with Kelly Donahue from King County. Kelly reviewed the plans and our comments and said that comments need to be sent to you for sending on to King County. My name is Frank McKulka and our home is in section 354 with our group of four neighbors in sections 353 to 355. The neighbors are myself, William Rissberger, Michelle Eden and Steve Roberts. The properties are shown in exhibit 1.

Our concerns are as follows:

-1. During construction the CG line for fencing on the west side of these sections will keep us from entering our properties. Refer to attachment re.
property accessibility. Realizing that this is a 60% plan one would expect some errors, this is one of them. We also noted with Kelly that the culvert in this section does not run continuously as would be expected.

-2. Post construction the 60% plans as drawn will not allow access for emergency equipment, trucks (FedEx, UPS, DHL etc.) and perhaps larger residential vehicles. Photos that show this issue and are also included in Bill Rissberger's letter.

We are asking that during construction the following changes are made to the 60% plans.

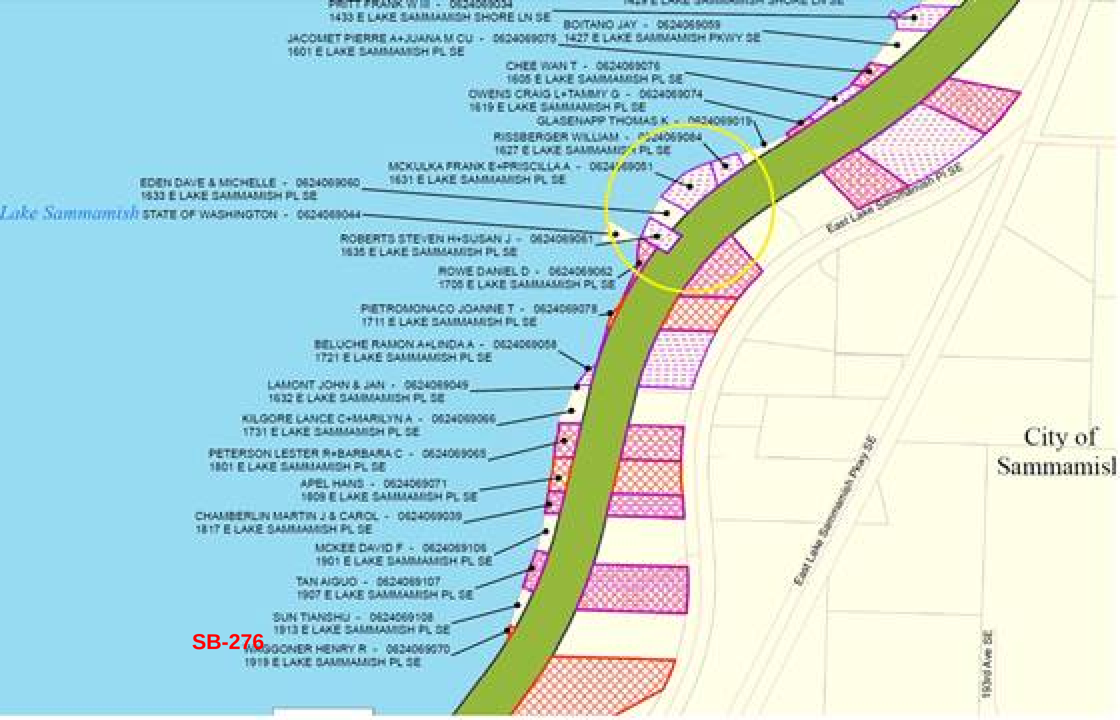
-1. The CG fence line be adjusted to allow access for emergency, residential and commercial vehicles to our properties.

-2. The trail center line be moved east approximately two+ feet in sections 353 to 355 to allow for access to our properties.

-3. The wooden barrier be moved south to its current endpoint to allow for vehicle access.

In addition we would like to know how this review will work and when our concerns will be addressed with a response to us. We would also like to know how reasonable requests like these have been dealt with in Segment A.

Thank you for your efforts to construct a trail that is workable for all, Frank and Pam McKulka, 425 557 0725



1430 E LAKE SAMMAMISH SHORE LN SE
BOITANO JAY - 0624069059
1427 E LAKE SAMMAMISH PKWY SE
JACOMET PIERRE A+JUANA M CU - 0624069075
1601 E LAKE SAMMAMISH PL SE
CHEE WAN T - 0624069076
1605 E LAKE SAMMAMISH PL SE
OWENS CRAIG L+TAMMY G - 0624069074
1619 E LAKE SAMMAMISH PL SE
GLASENAPP THOMAS K - 0624069019
RISSBERGER WILLIAM - 0624069084
1627 E LAKE SAMMAMISH PL SE
MCKULKA FRANK E+PRISCILLA A - 0624069051
1631 E LAKE SAMMAMISH PL SE
EDEN DAVE & MICHELLE - 0624069060
1633 E LAKE SAMMAMISH PL SE
Lake Sammamish
STATE OF WASHINGTON - 0624069044
ROBERTS STEVEN H+SUSAN J - 0624069061
1635 E LAKE SAMMAMISH PL SE
ROWE DANIEL D - 0624069062
1705 E LAKE SAMMAMISH PL SE
PIETROMONACO JOANNE T - 0624069078
1711 E LAKE SAMMAMISH PL SE
BELUCHE RAMON A+LINDA A - 0624069058
1721 E LAKE SAMMAMISH PL SE
LAMONT JOHN & JAN - 0624069049
1632 E LAKE SAMMAMISH PL SE
KILGORE LANCE C+MARILYN A - 0624069066
1731 E LAKE SAMMAMISH PL SE
PETERSON LESTER R+BARBARA C - 0624069065
1801 E LAKE SAMMAMISH PL SE
APEL HANS - 0624069071
1809 E LAKE SAMMAMISH PL SE
CHAMBERLIN MARTIN J & CAROL - 0624069039
1817 E LAKE SAMMAMISH PL SE
MCKEE DAVID F - 0624069106
1901 E LAKE SAMMAMISH PL SE
TAN AIGUO - 0624069107
1907 E LAKE SAMMAMISH PL SE
SUN TIANSHU - 0624069108
1913 E LAKE SAMMAMISH PL SE
WAGGONER HENRY R - 0624069070
1919 E LAKE SAMMAMISH PL SE
East Lake Sammamish Pl SE
East Lake Sammamish Pkwy SE
City of Sammamish

SB-276

Proposed CG line

Proposed Wood Barrier

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 10:37 AM
To: 'Ted Davis'
Subject: RE: Comments on the Shoreline Substantial Development Plan

Dear Ted,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

From: Ted Davis [mailto:ted.Davis@comcast.net]
Sent: Thursday, January 26, 2017 2:04 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Comments on the Shoreline Substantial Development Plan

Date: January 26, 2017

Lindsey Osbolt lozbolt@sammamish.us
Associate Planner
City of Sammamish
801 228th Avenue SE
Sammamish, Washington 98075

Request to Rescind the "Permit Application Complete" for the Shoreline Substantial Development Trail Segment 2B-SSDP2016-00415 of the Lake Sammamish Trail is based on comments to the Sammamish City Council and our review of the 60% plans.

Ted and Elaine Davis Ted.Davis@Comcast.net
3137 East Lake Sammamish Shore Lane SE
Sammamish, WA98075
See LANDSCAPE PLAN LA3 296+50

Our Property is located on PLAN AND PROFILE AL3 adjoining marker number 296.50 and on EXISTING CONDITIONS AND PLANS EX3. We have questions regarding the open and unresolved land ownership issue and the 60% REVIEW SUBMITTAL recently published and ask the Shoreline Substantial Development Permit no. 2016-00415 be rescinded until these questions are addressed and answered.

Comments to the Sammamish City Council Meeting on January 10, 2017

In the process of coming to decisions, on issues before you, much of the research and investigation is not performed by you individually, but by staff, consultants and other types of contractors working for the city.
That is why I believe, regarding the decision on December 13 that deemed the Sammamish "Trail Application Complete" you may not have all the information needed/required to make that decision regarding Corridor Parcel 292506-9007 of the East Lake Sammamish Trail Segment 2B.

If you have lived in your home for over 18 years the same structure prior owners lived in since 1968 and you recently discovered your house had a ROW line drawn, on the proposed 60% trail parcel maps, through the front entry of your home, through the upstairs bedroom walk in closet and through most your carport…. **you would be concerned,** and I believe you would want to resolve the issue. **(See Images # 1 and # 2)**

This is especially important to us when the City Attorney's letter dated 14 December, 2016, references comments such as: "That real property included within the legal description of for the Corridor Parcel is under King County Control and use," "Free and clear of all claims by the Plaintiffs." This opinion also indicates that King County "is entitled to the exclusive use and possession of the area on, above, and below the surface for railroad purposes and incidental uses permitted under Washington law".

I believe you would agree, if you were us, you would want clarification as prescribed under SMC 20.05.040 *Application Requirements (1) (r) Verification of that property is in the exclusive ownership of the applicant.*

I mentioned earlier you may not have had all the information needed to make your decision. The information you are missing *is ….* Several Lake Sammamish home owners have ongoing litigation with King County, challenging the original ownership of portions of the ROW and the width of the easement used by the railroad. That was not mentioned, perhaps his office did not know, in the letter from the City Attorney to the City Council. The case is 15-2-20483-1 SEA

We are not part of the Pechman case or that litigation. Our purpose before you today is to request the Sammamish City Council rescind the Permit Application Complete until the litigation at the state court level, regarding who has clear title to the land in the "Corridor" has been resolved or we meet with representatives of King County to solve the land ownership and easement issues for the good of all.

Comments regarding questions to be answered in the 60% plans

We have reviewed the 60% plans and see in several areas close to us, the needs of the trail have been balanced while trying to minimizing the impact on the adjoining property owners.

1 Will the Concrete block wall remain after the trail construction has been completed?

As we review the CG (Clearing and Grading) we cannot determine if the concrete block wall plans simply have not been addressed, if there was an omission of the plans or what is the planned future for the wall. The concrete block wall is between 12 and 14 feet from the trail center line. The CG touches and splits a portion of the concrete block wall, but not the entire wall. The single vehicle lane where our house is located, is inside the ROW and has one way in and the same way out. The lane provides very limited parking for residents, delivery trucks, maintenance personnel and guests. Daily, our neighbors and our family use the area between the asphalt lane in front of our houses and the concrete block wall for parking. Most importantly, this area provides a wide spot on the lane for emergency vehicles and regularly aids other vehicles in turning around instead of having to back all the way up the lane. (**See image # 3 Wall)**

2 Will the CG (Clearing and Grading) remove the cedar fence and the plants that are currently between the concrete wall and the gravel trail during construction and what type of fence will replace the current fence?

Currently, as indicated on the 60% plans a permitted 6-foot tall cedar fence separates the gravel trail from the top of the wall. What is not noted on the plans is the 4-foot height from the top of the wall to the gravel parking area below. **(See image # 3 Wall)**

3 Will parking, continue along the concrete block wall, by marker 296.50 during construction?

Parking spaces along our lane are scarce under normal conditions. Any reduction in available parking will be burden on the home owners and or anyone wanting to park in along the lane. How does the King County plan to accommodate parking along East Lake Sammamish Shore Lane SE during the construction?

5. Stairs/steps (#5 at marker 296.60?) to the trail are shown, on the 60% plans as existing. How will the county accommodate a gate to the trail, currently accessed by stairs (#5 at marker 296.60)? Part of the stairs (#5) are outside of the ROW how will they be incorporated into the final plan? **(See Image #4 Steps)**

6. We do not see there are no plans for replacement steps on the east side of the trail close to marker 295.20 that lead to East Lake Sammamish Parkway SE. Was this an omission or simply the plans for steps have not been completed?

The current steps are used daily by residents on the entire lane homeowners to access their mailboxes and areas along the East Lake Sammamish SE Parkway for parking. If the steps are not replaced individuals must walk approximately ½ mile round trip on East Lake Sammamish Shore Lane SE and along a dangerous curved section of the Parkway to access their mail and overflow parking. At least 4 home owners are retired and the absence of a stairway for access to their mailboxes and parking will be burden to them. What can the county do to address this issue and accommodate these concerns? **(See image # 5)**

7 During construction how does the county plan to replace our access to the mailboxes and the parking areas, currently accessed by the stairs, along East Lake Sammamish Parkway SE?

Until these concerns, along with the land ownership issues, are addressed the City of Sammamish will not have enough information on which to determine if the application is complete and should not move forward with their final decision on the permit.

Images referenced above on next page

Image # 1 Photo of homes with ROW imposed;

Image #2 Davis home (3137) with ROW marker next to north side of home.

Image # 3 Concrete Block Wall with 6 ft. Cedar Fence

Image # 4 Steps to Trail

Image # 5 Steps from Trail to East Lake Sammamish Parkway SE

End of Images/End of Comments

Respectfully submitted,

Ted & Elaine Davis

RE: Trail concerns

Lindsey Ozbolt

Mon 1/23/2017 8:45 AM

To:adam anderson <emailadama@yahoo.com>;

Dear Adam,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner I City of Sammamish I Department of Community Development
425.295.0527

From: adam anderson [mailto:emailadama@yahoo.com]
Sent: Sunday, January 22, 2017 11:22 AM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Trail concerns

Hello Ms. Ozbolt,
Please find the attached letter, which I'm also mailing, requesting the City's comment on three ares of concern I have with respect to the trail improvement project.
Please feel free to contact me at this email, via my address in the letter, or by phone at 206-225-4570.
Regards,
Adam J. Anderson

January 22, 2017

Adam J. Anderson
19108 SE 26th St.
Sammamish, WA 98075

Lindsey Ozbolt, Assoc. Planner
Sammamish City Hall
801 228th Ave SE
Sammamish, WA 98075

Dear Ms. Ozbolt and Sammamish City Council Trail Leaders,

Thank you for inviting feedback on the trail development plans. I have three main concerns about the plans for the construction portion (Segment 2B) that is adjacent to our lot on SE 26th St. (Lot # 0724069119).

1. Construction and/or design of the trail work causing increased risk of erosion on our property. The current West bank on our property is a slope that leads to the trail site. I'd like to understand the geological/engineering analysis that was done to ensure that there is no significant risk of slide or property erosion as a result of the trail construction. Please send me a copy of report that shows the necessary due diligence was undertaken.
2. Please confirm that no construction vehicles will be using Se 26th St., which is a private road, to access the job site. I am concerned about damage to the road and property.
3. I am concerned about a significant increase of trespassers on our street attracted by the improved trail. Currently, we get a decent volume on trespassers who use our private road to access the trail, and based on reports from neighbors in parts of the trail that have already been completed, the volume of trespassers has increased significantly. Currently there is signage at the top of the street indicating “No trail access” and that this is a private road, but trespassing happens regularly nonetheless. What will the city do to further dissuade trespassers in light of the expected increased trespassing volume?

Thank you for your consideration. I look forward to your response.

Regards,

Adam J. Anderson

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Wednesday, January 25, 2017 10:25 AM
To: 'astrbear@comcast.net'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Astrid,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Astrid Bear [mailto:astrbear@comcast.net]
Sent: Tuesday, January 24, 2017 5:01 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the permit, as submitted.

Approval of the permit will advance completion of the 44 mile regional trail system between Seattle and the foothills of the Cascades. The trail, as proposed in the permit, will provide a safe walking and biking route through Sammamish. Please support the proposed trail widths, which reflect industry standards (AASHTO).

A 12ft trail with 2ft shoulders will create a safe trail with space for the various different uses of the trail… from running to riding a bike. Please approve the permit with the trail widths as proposed.

Ensuring crossing priority for the trail is an important safety issue. Giving priority to the trail when roads and driveways cross the path will be intuitive for all users, whether in a vehicle, on foot, or on a bike. The trail alignment, as proposed in the permit, provides sight lines for good approach visibility for people on the trail and people crossing the trail.

Please approve the permit, as proposed, with expediency.

As a bicyclist who has ridden the Lake Sammamish Trail, I want it to be a safe and usable space for all users.

Astrid Bear
506 Lakeview Road
LYNNWOOD, WA 98087
425-238-4045

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 10:28 AM
To: 'adam.k.carlton@gmail.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Adam,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Adam Carlton [mailto:adam.k.carlton@gmail.com]
Sent: Thursday, January 26, 2017 11:47 AM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the permit, as submitted.

Approval of the permit will advance completion of the 44 mile regional trail system between Seattle and the foothills of the Cascades. The trail, as proposed in the permit, will provide a safe walking and biking route through Sammamish. Please support the proposed trail widths, which reflect industry standards (AASHTO).

A 12ft trail with 2ft shoulders will create a safe trail with space for the various different uses of the trail… from running to riding a bike. Please approve the permit with the trail widths as proposed.

Ensuring crossing priority for the trail is an important safety issue. Giving priority to the trail when roads and driveways cross the path will be intuitive for all users, whether in a vehicle, on foot, or on a bike. The trail alignment, as proposed in the permit, provides sight lines for good approach visibility for people on the trail and people crossing the trail.

Please approve the permit, as proposed, with expediency.

Adam Carlton
4040 NE 204 ST
Lake Forest Park, WA 98155
2067698584

RE: Please Approve the Permit for Segment 2B of the ELST

Lindsey Ozbolt

Mon 1/23/2017 9:02 AM

To:anne-gigi.chan@outlook.com <anne-gigi.chan@outlook.com>;

Dear Anne-Gigi Chan,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Anne-Gigi Chan [mailto:anne-gigi.chan@outlook.com]
Sent: Saturday, January 21, 2017 8:25 AM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear City of Sammamish,

I'm writing as a resident of the City of Sammamish to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the trail permit, as submitted, so that users of all ages and abilities can safely use the trail. A trail built to national standards (AASHTO), that is 12 ft, plus 2 ft gravel shoulders, will allow for safe use by a variety of different users, including people who walk and bike.

As proposed in the permit, priority at trail crossings should be given to the trail and trail users. Consistent crossing priority is intuitive and safe for users of both the trail and the driveways and roads that cross the trail.

When complete, the trail will be an even greater community amenity, and provide a safe option for people who bike to travel to and through Sammamish. Please complete the trail and make my city an even a better place to live in.

Sincerely,

Anne-Gigi Chan
2904 222nd Pl SE
Sammamish, WA 98075
425-281-2663

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Wednesday, January 25, 2017 10:29 AM
To: 'apquach@gmail.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Anh,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Anh Quach Crandall [mailto:apquach@gmail.com]
Sent: Tuesday, January 24, 2017 6:27 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear City of Sammamish,

I'm writing to express my support for completing the East Lake Sammamish Trail and approving permit SSDP2016-00415.

I live in the English Cove Condominiums just off Redmond Way, and I use the ELST frequently. For the past 3 years I've trained for a half marathon and a couple of triathlons on this trail. I recently gave birth to my first baby, and I was looking forward to taking her on family bike rides on the trail once she was old enough to ride in a bike trailer.

Please approve the permit, as submitted.

Approval of the permit will advance completion of the 44 mile regional trail system between Seattle and the foothills of the Cascades. The trail, as proposed in the permit, will provide a safe walking and biking route through Sammamish. Please support the proposed trail widths, which reflect industry standards (AASHTO).

A 12 ft trail with 2 ft shoulders will create a safe trail with space for the various uses of the trail - from running to cycling to new mothers walking together with their strollers. Please approve the permit with the trail widths as proposed.

Ensuring crossing priority for the trail is an important safety issue given how many children use the trail. Giving priority to the trail when roads and driveways cross the path will be intuitive for all users, whether in a vehicle, on foot, or on a bike. The trail alignment, as proposed in the permit, provides sight lines for good approach visibility for people on the trail and people crossing the trail.

Please approve the permit, as proposed, with expediency.

Thanks,

Anh Quach Crandall

Anh Quach Crandall
18622 NE 57th Way
Redmond, WA 98052
520-979-0187

Lindsey Ozbolt

From:	Lindsey Ozbolt
Sent:	Friday, January 27, 2017 9:09 AM
To:	'purplepumpkins@hotmail.com'
Subject:	RE: Please approve the East Lake Sammamish Trail permit

Dear Adam,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Adam Dodge [mailto:purplepumpkins@hotmail.com]
Sent: Wednesday, January 25, 2017 2:01 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please approve the East Lake Sammamish Trail permit

Dear

To the relevant authorities,

Please approve the permit for an East Lake Sammamish Trail that is built to proper standards and that will be safe and comfortable for people of all ages and abilities to ride on.

My whole family would like a safe and comfortable route to bike on, and building the trail to the proper specifications and with safety the utmost concern is absolutely needed for the trail.

Thanks!

Adam Dodge
3001 S Genesee St
Seattle, WA 98108
5555555555

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 9:22 AM
To: 'adrian.down@gmail.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Adrian,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Adrian Down [mailto:adrian.down@gmail.com]
Sent: Wednesday, January 25, 2017 4:03 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the trail permit, as submitted, so that users of all ages and abilities can safely use the trail. A trail built to national standards (AASHTO), that is 12 ft, plus gravel shoulders, will allow for safe use by a variety of different users, including people who walk and bike.

I bike on the regional trail system in King County every day to commute to work. Every day, my safety is put at risk because King County did not complete the "missing link" of the Burke-Gillman trail in Seattle. Instead, a shortsighted, selfish group of local businesses fought the development of the trail and won. As a result, the safety of hundreds of people like me who bike on the trail has been unnecessarily at risk every day for nearly two decades. Do not repeat the same mistakes with the the East Lake Sammamish Trail. Please do not sacrifice the opportunity to create a fantastic regional amenity. Please do not sacrifice the benefits for all the people who will use this trail for years to come.

When complete, the trail will be an even greater community amenity than in it's interim state, and will provide a safe option for people who bike to travel to and through Sammamish. I can't wait to bike on the continuous paved trail system between Sammamish and Seattle with my family. Without a continuous paved trail that is safe for people of all ages and abilities, we will not be able to. The trail will make Sammamish a more attractive place to visit and could bring money to local businesses. Please, please complete the trail and do not repeat the mistakes of the past. Thank you for your consideration.

Sincerely,
Adrian Down

Adrian Down
2041 NW 57th St
Seattle, WA 98107
9192653997

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Wednesday, January 25, 2017 3:53 PM
To: 'drewdwight@msn.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Andrew,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Andrew Dwight [mailto:drewdwight@msn.com]
Sent: Wednesday, January 25, 2017 12:48 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I ride the trail with my daughter for recreation, and to commute to work between Redmond and Issaquah. The missing section requires me to ride on the road, and while the shoulder is OK, it's not nearly as safe and isolated from car traffic as the trail.

Thousands of people use the trail, and even more will when the missing segment is completed.

And while I understand the perspective of the property owners to a degree, as far as I know, the railway way easement has been there for years and TRAINS used to run. A nice asphalt trail will IMPROVE the property values of the homeowners. I think the fears they have are unfounded.

This is a huge capital investment into the fitness, health and enjoyment of the City of Sammamish, and entire Seattle area. The trail will be used extensively, and will inject many dollars into the community by having visiting cyclists spend at local business.

It's a win for the whole community.

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the permit, as submitted.

Approval of the permit will advance completion of the 44 mile regional trail system between Seattle and the foothills of the Cascades. The trail, as proposed in the permit, will provide a safe walking and biking route through Sammamish. Please support the proposed trail widths, which reflect industry standards (AASHTO).

A 12ft trail with 2ft shoulders will create a safe trail with space for the various different uses… from people running to people riding a bike. Please approve the permit, including the proposed width of the trail.

Ensuring crossing priority for the trail is an important safety issue. Giving priority to the trail when roads and driveways cross the path will be intuitive for all users. The trail alignment, as proposed in the permit, provides sight lines for good visibility for people on the trail and people crossing the trail at trail intersections.

Please approve the permit, as proposed, with expediency.

Sincerely,

Andrew Dwight
9200 Redmond Woodinville Rd NE, C208
Redmond, WA 98052
4255916296

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Wednesday, January 25, 2017 9:50 AM
To: 'anne_gwynnerobson@hotmail.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Anne,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Anne Gwynne-Robson [mailto:anne_gwynnerobson@hotmail.com]
Sent: Tuesday, January 24, 2017 8:11 AM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the permit, as proposed, with expediency.

The ELST was my favorite bike ride when I lived in Redmond. Even though it was close to a suburban area, it had a wild feel with wonderful views of the lake and mountains. I don't think there's an MUT in King County that can top the ELST for beauty, and I'd love to see it completed so that everyone can safely enjoy it.

Sincerely,
Anne Gwynne-Robson

Anne Gwynne-Robson
25th Ave E
Seattle, WA 98112
2063495809

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 9:17 AM
To: 'ariahkidder@gmail.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Ariah,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Ariah Kidder [mailto:ariahkidder@gmail.com]
Sent: Wednesday, January 25, 2017 3:09 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the permit, as submitted.

Approval of the permit will advance completion of the 44 mile regional trail system between Seattle and the foothills of the Cascades. The trail, as proposed in the permit, will provide a safe walking and biking route through Sammamish. Please support the proposed trail widths, which reflect industry standards (AASHTO).

A 12ft trail with 2ft shoulders will create a safe trail with space for the various different uses of the trail… from running to riding a bike. Please approve the permit with the trail widths as proposed.

Ensuring crossing priority for the trail is an important safety issue. Giving priority to the trail when roads and driveways cross the path will be intuitive for all users, whether in a vehicle, on foot, or on a bike. The trail alignment, as proposed in the permit, provides sight lines for good approach visibility for people on the trail and people crossing the trail.

Please approve the permit, as proposed, with expediency.

Ariah Kidder
2203 Minor Ave E
Seattle, WA 98102
(206) 792-5839

RE: Please Approve the Permit for Segment 2B of the ELST

Lindsey Ozbolt

Mon 1/23/2017 9:05 AM

To:Andy.loats@gmail.com <Andy.loats@gmail.com>;

Dear Andrew,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Andrew Loats [mailto:Andy.loats@gmail.com]
Sent: Saturday, January 21, 2017 6:23 AM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

This trail provides a crucial link between Redmond and issaquah creating the backbone for our growing community. There's nothing else like it.

Please approve the permit, as submitted.

Approval of the permit will advance completion of the 44 mile regional trail system between Seattle and the foothills of the Cascades. The trail, as proposed in the permit, will provide a safe walking and biking route through Sammamish. Please support the proposed trail widths, which reflect industry standards (AASHTO).

A 12ft trail with 2ft shoulders will create a safe trail with space for the various different uses of the trail... from running to riding a bike. Please approve the permit with the trail widths as proposed.

Ensuring crossing priority for the trail is an important safety issue. Giving priority to the trail when roads and driveways cross the path will be intuitive for all users, whether in a vehicle, on foot, or on a bike. The trail alignment, as proposed in the permit, provides sight lines for good approach visibility for people on the trail and people crossing the trail.

Please approve the permit, as proposed, with expediency.

Andrew Loats
1008 244th Court SE
Sammamish, WA 98075
4252815845

Re: 3143 E Lk Samm Comments

Bill and Annette <mcnabbvan@msn.com>

Tue 1/17/2017 11:32 AM

To:Lindsey Ozbolt <LOzbolt@sammamish.us>;

Thank you!

> On Jan 17, 2017, at 10:38 AM, Lindsey Ozbolt <LOzbolt@sammamish.us> wrote:
>
> Dear Bill and Annette,
>
> Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).
>
> Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.
>
> Regards,
>
> Lindsey Ozbolt
> Associate Planner | City of Sammamish | Department of Community Development
> 425.295.0527
>
>
> -----Original Message-----
> From: Bill and Annette [mailto:mcnabbvan@msn.com]
> Sent: Monday, January 16, 2017 5:37 PM
> To: Lindsey Ozbolt <LOzbolt@sammamish.us>
> Subject: 3143 E Lk Samm Comments
>
> Please find attached the comments requesting that the KC permit for development of section 2b not be granted and our comments regarding the 60% plan.
>

3143 E Lk Sammamish Sh Ln SE
Sammamish, WA 98075
mcnabbvan@msn.com

January 14, 2016

Lindsey Osbolt
Associate Planner
City of Sammamish
801 228th Avenue SE
Sammamish, Washington 98075

Dear Ms. Lindsey Osbolt:

My husband and I live at 3143 E Lake Sammamish Shore Lane SE. This piece of property has been in our family since the early 1930s. A two-room cottage was originally built on the property (great grandmother) and registered with King County (KC) in 1932. In 1944 it was added onto to create the footprint that we live in today. We are writing a letter to you to comment about our concerns regarding a Shoreline Development permit allowing King County to move forward with the development of the King County Trail Section 2B.

We request that the City of Sammamish rescind any permit that may have been granted to proceed until KC can provide clear title to the property._As it stands, we do not believe King County met the criteria establishing clear ownership required by SMC 20.05.040. KC did not present a title report but submitted four exhibits (Kenyon Disend, December 14, 2016) instead of a title report:

1. The 1997 deed from Burlington Northern Santa Fe RR Co. to the Land Conservancy of Seattle and KC
2. The 1998 deed from the Seattle Land Conservancy and KC to KC
3. Summary judgment by Judge Pechman (appealed to 9th Circuit Court)
4. Judgment quieting title to KC based on Judge Pechman's ruling (appealed to 9th Circuit Court)

These exhibits do not meet the burden of proof that KC owns the property they claim to own and wish to develop. We are currently in litigation due to KC's claim to "own" some sections of our property. The 1997 and 1998 deeds are not proof that KC has ownership. We are involved in a federal lawsuit that has not been settled yet. The Pechman ruling also does not establish clear title to a 100 ROW through our particular parcel. The Pechman decision only involved four parcels, all of which are dissimilar to ours. We are part of a current lawsuit with the state in order to establish ownership. Additionally, the Pechman case has been appealed to the ninth Circuit Court and does not follow an earlier ruling by Judge Horn, another federal judge. Until these cases are settled and ownership of the rail corridor is clearly established, development of section 2B should not proceed.

I will try to briefly convey our concern regarding ownership of our land. King County claims to have **fee title** to 50 feet on either side of the centerline of the corridor running through our property at 3143. This 100 foot ROW **runs through the middle of our house!** (photo attached)

- Our deed (attached) indicates that we own to the county road (E Lake Sammamish Parkway) with the exception of the Burlington Northern Santa Fe ROW and an 8-foot access road for transportation on the **southerly side** of the RR ROW. **Our deed does not indicate how wide the RR ROW is**. Although there are a number of quit -claim deeds from private property owners on record for different parcels along the corridor for varying widths, **there is none on record for our parcel**. The railroad only used 12-feet of the corridor during the entire time it operated from the late 1800s until it relinquished its run in 1997; yet, KC is claiming to "own" 100 feet of land **including the land underneath half of our house**.

- The deed we have indicates that the access road is on the **southerly** edge of the RR ROW; yet the access road is on the **northerly** side of our house. It runs between our house and the proposed trail. The access road has been located where it is since the late 1920s. An attorney advised my family many years ago that the access road clearly overruled any claim that the railway may make for additional property beyond it to the south. The 100-foot ROW claimed by KC should be ruled null and void based on the access road that has been used by us and all our neighbors for over 80 years.

- King County claims they have been paying taxes on this section of our property since they acquired the rights to the corridor through the Rails to Trails legislation and that we did not object within seven years. Well this is just not true. We have consistently been taxed on a 1,150 square foot house since the 1940s. Since we are paying those taxes, it would be hard for KC to claim that they are paying them also. And we did object to KC's claim to own the ROW when we filed a lawsuit with the federal government in 1998.

- There are easements on top of easements! There is the road easement on top of the ROW easement and then several easements run through the 8-foot access road, one for electricity and another for gas. Alice Fuller, property owner in the 1920s, granted the easement for electricity. The property owners on the lane granted the easement for gas in 1996. Now KC is claiming they "own" this road; yet BNSE was never involved in signing either of these easements because they didn't own the property.

We would be delighted to have the trail so close to us if KC wasn't claiming half our house in the process. While we are pro trail and want what is best for the community, giving up clear title to our house and property without just compensation is too much of a sacrifice. We were hoping to sit down with King County **to work out a mutually agreeable exchange of property** so that they could have what they need for the trail and we could get clear title to the property where our house sits, but they have been unwilling to talk to us about it. We were told they "*own the property and that we could fill out a special use permit to have our house encroach on their ownership*." We are unwilling to do this. Our belief is that BNSF RR did not have fee title but rather a prescriptive easement to operate a railroad through our property (there is no deed saying otherwise) and that KC's right to build a trail is also based on a prescriptive easement that they acquired through Rails to Trails legislation. KC claims they cannot change boundary lines within the easement according to Rails to Trails laws; however, KC has changed property lines with others on the corridor in numerous cases since 1998 (Bucks and Pickerings are two close neighbors who did so). We don't understand why KC is not willing to meet with us in what seems to us to be a win-win case.

The second purpose of this letter is to make comments about the 60% plan for the trail. As indicated earlier, we support a trail and have few concerns regarding KC's desire to build a nice trail through our property as long as they don't claim to "own" the land under our house. We met with KC on January 11, 2016 to review the plan for our property. However, the 60% plan included very little useful information, as the drawings were woefully incomplete. What comments could a reasonable person make when the drawing does not show accurate design detail for which a person could constructively comment? The drawings had old and inaccurate existing conditions. The proposed plan lacked any detail for the south side of the trail that would give us anything to comment about. For example, there was no fence and no finished grade lines. Our current rockery and our dogwood tree were not represented on the plan, so the representatives could not tell us what would happen to these features. A great deal more detail is needed in order for us to make any kind of constructive comments. However, I want to say that we don't expect to have any major issues with the trail development as long as we can get our ownership issues resolved before it is allowed to proceed.

If you wish additional information or clarification, please do not hesitate to contact us.

Sincerely,

Annette McNabb, 425-503-3861
Bill Van De Bogert, 425-495-5312
mcnabbvan@msn.com


Line defined by BNSF
Quit Claim to KC Parks
3133
3137
3139
3141
3143

VOL. 1642 PAGE 582

2860720

53—WARRANTY DEED, (Statutory Form)

Miller & Sutherlen Printing Co., Bellingham, Wash.

The Grantor Alice M. Fuller, a widow,

for and in consideration of ten

Dollars in hand paid, conveys and warrants to Annie Costello

The grantee the following described real estate:

That certain portion of Government Lot 3, section 7, township 24, north, of range 6 east W.M. described as follows:

Beginning at the quarter section corner bewteen sections 7 and 8 of said township and range, thence along the section line south 10 minutes east 74.4 feet; thence north 79 degrees and 51 minutes west 387.1 feet to the true place of beginning: thence north 79 degrees and 51 minutes west 50 feet; thence north 10 degrees and 35 minutes east 120 feet, more or less, to the Redmond-Issaquah county road; thence southeasterly along said road 53 feet, more or less, to a point which is north 10 degrees and 35 minutes east from the said true place of beginning; thence south 10 degrees and 35 minutes west to the true place of beginning, together with all upland and second class shore land adjoining, lying between the lines of said tract extended southwesterly; except the right of way of the Northern Pacific Railway Company, and except an 8 foot strip on the south side of said railway right of way, reserved for road purposes, subject to taxes.

(It is agreed between the parties hereto, their heirs and assigns, that no roadhouse shall be built or operated on said property, nor shall it or any part thereof be sold or rented to any colored person, nor shall any part thereof be rented to any person by day or night, nor shall any part thereof be used for chicken housing for commercial purposes),

situated in the County of King, State of Washington.

Dated March 15 A. D. 19 35.

~~Signed in Presence of~~

Alice M. Fuller (Seal)

STATE OF WASHINGTON,
County of Whatcom. } ss.

THIS IS TO CERTIFY, That on this 15th day of March A. D. 19 35, before me Charles H. Hurlbut a Notary Public in and for the State of Washington, duly commissioned and sworn personally, came Alice M. Fuller to me known to be the individual described in and who executed the within instrument, and acknowledged to me that she signed and sealed the same as her free and voluntary act and deed for the uses and purposes therein mentioned.

WITNESS my hand and official seal the day and year in this certificate first above written.

Charles H. Hurlbut
Notary Public in and for the State of Washington,
residing at Bellingham.

Filed for Record July 17, 1935, 1 24 P.M.
EARL MILLIKIN, County Auditor.
A. Leijar

SB-289

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Wednesday, January 25, 2017 11:00 AM
To: 'Alisa.oliver36@gmail.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Alisa,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Alisa Oliver [mailto:Alisa.oliver36@gmail.com]
Sent: Wednesday, January 25, 2017 5:28 AM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the trail permit, as submitted, so that users of all ages and abilities can safely use the trail. A trail built to national standards (AASHTO), that is 12 ft, plus gravel shoulders, will allow for safe use by a variety of different users, including people who walk and bike.

As proposed in the permit, priority at trail crossings should be given to the trail and trail users. Consistent crossing priority is intuitive and safe for users of both the trail and the driveways and roads that cross the trail.

When complete, the trail will be an even greater community amenity than in it's interim state, and will provide a safe option for people who bike to travel to and through Sammamish. As we continue to look for alternative means for commuting and continuing to introduce biking to our younger generation, it's important to have a safe place for both commuters and families. Please complete the trail so we have more safe cycling and walking options.

Sincerely,

Alisa Oliver
9719 49th Ave NE
Seattle, WA 98115
2063842812

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 10:21 AM
To: 'apailthorp@msn.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Aaron,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Aaron Pailthorp [mailto:apailthorp@msn.com]
Sent: Thursday, January 26, 2017 9:45 AM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Trails like this provide a welcome recreational outlet as well as an inexpensive transportation alternative. I like to leave the city to ride in the hills and spend money along the way.

Please approve the trail permit, as submitted, so that users of all ages and abilities can safely use the trail. A trail built to national standards (AASHTO), that is 12 ft, plus 2 ft gravel shoulders, will allow for safe use by a variety of different users, including people who walk and bike.

As proposed in the permit, priority at trail crossings should be given to the trail and trail users. Consistent crossing priority is intuitive and safe for users of both the trail and the driveways and roads that cross the trail.

When complete, the trail will be an even greater community amenity, and provide a safe option for people who bike to travel to and through Sammamish. Please complete the trail.

I'm looking forward to coming to the area to use the trail and leaving my spending money behind.

Sincerely,

Aaron Pailthorp
1806 30th Ave S
Seattle, WA 98144
206-310-6113

RE: SSDP Comment for 109 East Lake Sammamish Pkwy SE, Peck Residence

Lindsey Ozbolt

Mon 1/23/2017 11:33 AM

To: April Zangl Peck <aprilzangl@hotmail.com>; Steve Peck <stevejpeck@live.com>;

Good morning April,

That is a correct summary, the City will review and consider all comments.

Best,

Lindsey Ozbolt
Associate Planner I City of Sammamish I Department of Community Development
425.295.0527

From: April Zangl Peck [mailto:aprilzangl@hotmail.com]
Sent: Monday, January 23, 2017 9:52 AM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>; Steve Peck <stevejpeck@live.com>
Subject: Re: SSDP Comment for 109 East Lake Sammamish Pkwy SE, Peck Residence

Hi Lindsey,
Thank you for your prompt response. Besides compiling our comments, what else is the City of Sammamish doing with these comments? My understanding was the City of Sammamish was also reviewing and taking the comments into consideration when approving the plans. Am I misunderstanding what the comments are being used for?

April (Zangl) Peck
425.829.4917

From: Lindsey Ozbolt <LOzbolt@sammamish.us>
Sent: Monday, January 23, 2017 8:40 AM
To: April Zangl Peck
Subject: RE: SSDP Comment for 109 East Lake Sammamish Pkwy SE, Peck Residence

Dear Peck Family,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner I City of Sammamish I Department of Community Development
425.295.0527

From: April Zangl Peck [mailto:aprilzangl@hotmail.com]
Sent: Sunday, January 22, 2017 6:19 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Cc: Steve Peck <stevejpeck@live.com>
Subject: SSDP Comment for 109 East Lake Sammamish Pkwy SE, Peck Residence

Liz Ozbolt and To Whom Else It May Concern:

My husband, Steve Peck, my children and I are writing with serious concerns, fear and disappointment with King County's plans (and the unknown plans) to expand the development of the East Lake Sammamish Trail. In early 2015, through exhaustive dedication to our labors, we finally realized our dream to own a home on Lake Sammamish. We felt excited and extremely fortunate to finally own something we worked so hard for and excited to find something with so many opportunities. My husband loved the lake, outbuildings and shop, my children loved the 27 – 75-year-old blueberry bushes and I loved the space which gave my children more room to roam and learn the value of work. After King County's plans, we are overwhelmed with feelings of disappointment and sadness. Further, we are uneasy knowing there is still plans we are unaware of. What other plans does King County have for our land? The City of Sammamish has no legal authority to approve the Shoreline Substantial Development Permit until issues like ours, along with countless others, are addressed and the public has had a chance to review the complete (90%) plans to assess the county's response. We urge the City of Sammamish for help in modifying King County's plans for the East Lake Sammamish trail. We love the trail and believe it is a community asset but we believe the expansion is severely encroaching on our property and must be modified.

Through a detailed Ownership Research Report conducted by Graddon Consulting and Research (findings affirmed by the Federal Court of Claims through Judge Horne's extensive ruling) who has studied the historic ownership and title of our land, we have confidence that the Right of Way Deed of May 6, 1887 does not chain to either the Land Conservancy of Seattle and King County nor King County because the legal description of the Quit Claim Deeds under which King County claims it alleged fee simple ownership purports to convey only the right of way as now located and constructed. Therefore, King County not only does not own fee simple absolute title to the land upon which it purports to desire to expand the East Lake Sammamish Trail, it factually has no chain of title claims whatsoever to our land. There is strong factual evidence both from the language of the Right of Way Deed of May 6, 1887 and the historical time, place and manner context of the use of conveyance document executed by Bill Sbedzue and Lucinda Sbedzue that the parties of the Right of

Way Deed of May 6, 1887 intended only the conveyance of a mere easement for the sole purpose of locating, constructing and operating a railroad and never intended to convey a fee simple absolute interest in the property described by the Right of Way Deed of May 6, 1887. In addition, at the time of the purported acquisition of the property by way of Quit Claim Deed from the Land Conservancy of Seattle and King County to King County, the title insurance company had significant concerns about what interests, if any King County actually obtained from the Quit Claim Deed. First American Title Insurance Company has further corroborated Graddon Consulting's analyses and conclusions indicating that the property claimed now by King County was owned feed simple absolute to the previous owners whom we purchased our home, Raab and Matrinez, and upon our purchase of the property we've obtained Quit Claim Deed for fee simple ownership of the Right of Way. We are not arguing against having a public trail, we are asking for a trail allowing for Right of Way Deed for a surface easement with a similar size to the current trail. The proposed trail is far overreaching to what currently exists and compared to what other Rails to Trails development exists.

The proposed development plans give us cause for serious concern. Especially since they are only 60% of what is to come. Here is a list of our specific concerns:

- The proposed 60% plans show three lines that significantly impact our property beyond where the current trail resides and are costly, unnecessary and invasive. The Clearing and Grubbing, Fill and Dispersion lines (AL27-AL28/LA16) significantly impact our property, going beyond the proposed expanded 18' trail and adding an additional 10-12' (see CS2) more to the west side of the trail for clearing, development, etc. This proposed plan would remove much of the features, appeal and sentiment our property has for us. In this area lies 27 75-year-old blueberry bushes and once botanical gardens historically known on the Eastside before roads even existed. I cannot begin to understand why this would be okay for someone to remove from our property. Plant retention is significant to all trail residence. In our short period of time owning our property, it has become an opportunity for my children to learn the value of work and provide service to those around us. In addition to the blueberry bushes being removed, a long-since (over 30 years old) pre-established workshop structures and chain-link fence providing security look as if they are to be removed and not replaced. The structures, fence and the blueberry bushes have existed for several decades and in no way impede the current trail nor the planned initial 18' trail expansion. The 60% proposed plans have added Clearing and Grubbing areas that are excessive and unnecessary that remove our preexisting structures and plants. This area of land is flat, has several plants that absorb moisture and has not historically been known for an area needing run off. With the expansion of a trail with a nonpermeable surface, other less invasive (and less costly) drain off options exist that we'd be willing to explore and help develop with King County, such as a French drain, dry well, or swale (in addition to the plant life that already exists). A fence also must be replaced to provide security to my family. From the trail, our home does not provide a view to the lake, only directly to the window and access points of our home. Replacing the existing security fence for my young children's safety is absolutely and irrevocably necessary. Finally, the plans which only indicate 60% being shown and yet are requesting your approval, do not show what plants they wish to replace our plants, structure and fence with. I've never heard of plans being approved with only 60% communication. Developing other drainage options other than the proposed C&G and dispersion plans would allow our structures, plants and fence to exist with an 18' trail as already developed in other areas of the trail.
- The county's existing plans (EX16) are not accurately displaying our property which borders the eastside of the trail. The county correctly notes a compost bin but does not display a fence

along the trail line enclosing a garden and wrapping around by East Lake Sammamish Pkwy SE with tall bordering pine trees. The existing irrigation which currently runs under the trail for the gardens is shown but does not look to be replaced in the proposed plans. Measuring from the centerline of the trail for a width of 18' (9' each side of center line), the gardens do not impose on the county's plan and are consistent to the fruitful beauty of the area. We would also like the plans to show our irrigation being maintained running to the eastside of the trail. We disagree that the county would remove this from our property since it does not conflict with an 18' trail as developed in other areas of the trail.

- On a separate Tree Preservation Plan (TP16), we've noticed that the county plans to save a tree on our property beyond the Clearing and Grubbing line and boarding the R/W line that is currently growing into a powerline. Frankly, it is makes no sense that the County would be clearing much of the benefits and appeal of our property yet deeming a tree that is potentially hazardous to remain.

We thank you for your time in seriously considering and acknowledging our comments and concerns. In my profession, I've been fortunate to travel and learn about many other areas around the world. I'm always thankful and happy to return home. I feel blessed to live in America, live in a democracy with the constitution and knowledge that I live in a land of opportunity. I've personally been blessed to experience how hard work can transform someone's life. I feel shocked that the intent of a Right of Way Deed easement and ownership of many properties on Lake Sammamish including my own have been convoluted and transformed into something which it is not. We urge the City of Sammamish for help in modifying King County's plans for the East Lake Sammamish trail. King County is being unfair in their pursuit to develop the trail. They claim they are trying to work with the homeowners to be fair but their actions do not match their accommodating words. The City of Sammamish has no legal authority to approve the Shoreline Substantial Development Permit until issues like ours, along with countless others, are addressed and the public has had a chance to review the complete (90%) plans to assess the county's response. I hope these issues can be resolved and the community can enjoy the benefits the East Lake Sammamish Trail has to offer. My husband and I would greatly appreciate the opportunity to speak with someone further about alternative drainage and development options to maintain both our interests and the interests of the trail. Please feel free to contact us with the details below.

Sincerely,

The Peck Family

April Peck I AprilZangl@Hotmail.com I 425.829.4917
Steve Peck I SteveJPeck@Live.com I 425.829.0838

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 9:43 AM
To: 'rak@giro.org'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Adam,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Adam Rakunas [mailto:rak@giro.org]
Sent: Wednesday, January 25, 2017 7:33 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear City of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

I am the co-leader of a Girl Scout troop in Seattle. As the Scouts grow older, they want to go on bicycle trips. By approving approving this trail permit, as submitted, the Scouts will have more trails to explore. A trail built to national standards (AASHTO), that is 12 ft, plus 2 ft gravel shoulders, will allow for safe use by a variety of different users, thus making the Scouts' parents feel more secure about their children riding afar.

As proposed in the permit, priority at trail crossings should be given to the trail and trail users. Consistent crossing priority is intuitive and safe for users of both the trail and the driveways and roads that cross the trail.

Please complete the trail. The Girl Scouts can't wait to ride to your city.

Sincerely,

Adam Rakunas
1431 26th Ave

Seattle, WA 98122
310.907.6141

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 10:27 AM
To: 'aschearer@gmail.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Alex,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Alex Schearer [mailto:aschearer@gmail.com]
Sent: Thursday, January 26, 2017 11:11 AM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing in support of completing the ELST and approving permit SSDP2016-00415.

I'm an avid cyclist in the area and have been looking forward to riding on the completed trial for some time. Once complete, this trial will be a jewel in the area for people who want to enjoy the lake and surrounding area.

Thanks, Alex

Alex Schearer
902 18th ave
Seattle, WA 98122
2069925737

RE: Please Approve the Permit for Segment 2B of the ELST

Lindsey Ozbolt

Mon 1/23/2017 8:39 AM

To:andy.steinmetz@comcast.net <andy.steinmetz@comcast.net>;

Dear Andy,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Andy Steinmetz [mailto:andy.steinmetz@comcast.net]
Sent: Sunday, January 22, 2017 6:42 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the permit, as submitted.

My family of four is using the trail for bike rides and even for commuting in the summer.   The completion of the trail to meet standards would greatly improve our experience and safety.

Please approve the permit, as proposed, with expediency.

Sincerely,

Andy Steinmetzz

Andy Steinmetz
2239 224th Place NE
Sammamish, WA 98074
425-898-8652

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Wednesday, January 25, 2017 10:24 AM
To: 'artak.sukhudyan@gmail.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Artak,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Artak Sukhudyan [mailto:artak.sukhudyan@gmail.com]
Sent: Tuesday, January 24, 2017 4:58 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the trail permit, as submitted, so that users of all ages and abilities can safely use the trail. A trail built to national standards (AASHTO), that is 12 ft, plus gravel shoulders, will allow for safe use by a variety of different users, including people who walk and bike.

As proposed in the permit, priority at trail crossings should be given to the trail and trail users. Consistent crossing priority is intuitive and safe for users of both the trail and the driveways and roads that cross the trail.

When complete, the trail will be an even greater community amenity than in it's interim state, and will provide a safe option for people who bike to travel to and through Sammamish. Please complete the trail.

Sincerely,

Artak Sukhudyan
18026 40TH DR SE
Bothell, WA 98012
4252236006

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Wednesday, January 25, 2017 10:59 AM
To: 'Lexie.tigre@gmail.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Alexa,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Alexa Tigre [mailto:Lexie.tigre@gmail.com]
Sent: Wednesday, January 25, 2017 1:08 AM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the permit, as submitted.

Approval of the permit will advance completion of the 44 mile regional trail system between Seattle and the foothills of the Cascades. The trail, as proposed in the permit, will provide a safe walking and biking route through Sammamish. Please support the proposed trail widths, which reflect industry standards (AASHTO).

A 12ft trail with 2ft shoulders will create a safe trail with space for the various different uses of the trail… from running to riding a bike. Please approve the permit with the trail widths as proposed.

Ensuring crossing priority for the trail is an important safety issue. Giving priority to the trail when roads and driveways cross the path will be intuitive for all users, whether in a vehicle, on foot, or on a bike. The trail alignment, as proposed in the permit, provides sight lines for good approach visibility for people on the trail and people crossing the trail.

Please approve the permit, as proposed, with expediency.

Thank you!

Alexa Tigre
16028 NE 28th St
Bellevue, WA 98008
425-861-8290

Lindsey Ozbolt

From:	Lindsey Ozbolt
Sent:	Wednesday, January 25, 2017 11:02 AM
To:	'andreva@outlook.com'
Subject:	RE: Please Approve the Permit for Segment 2B of the ELST

Dear Andre,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Andre Vachon [mailto:andreva@outlook.com]
Sent: Wednesday, January 25, 2017 7:54 AM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

My daughter just turned 3 years old and loves her strider bike. I hope this summer we get her onto a pedal bike and by the following year to have an avid rider. I've been riding around lake sam for 2 decades now. Where the trail is completed, it's been wonderful. I hope we can complete all of it.
I look forward to riding the trail with my daughter.

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the permit, as submitted.

Approval of the permit will advance completion of the 44 mile regional trail system between Seattle and the foothills of the Cascades. The trail, as proposed in the permit, will provide a safe walking and biking route through Sammamish. Please support the proposed trail widths, which reflect industry standards (AASHTO).

A 12ft trail with 2ft shoulders will create a safe trail with space for the various different uses… from people running to people riding a bike. Please approve the permit, including the proposed width of the trail.

Ensuring crossing priority for the trail is an important safety issue. Giving priority to the trail when roads and driveways cross the path will be intuitive for all users. The trail alignment, as proposed in the permit, provides sight lines for good visibility for people on the trail and people crossing the trail at trail intersections.

Please approve the permit, as proposed, with expediency.

Sincerely,

Andre Vachon
133rd ave ne
BELLEVUE, WA 98005
425-444-9183

RE: Please Approve the Permit for Segment 2B of the ELST

Lindsey Ozbolt

Mon 1/23/2017 9:00 AM

To:Alexa.volwiler@gmail.com <Alexa.volwiler@gmail.com>;

Dear Alexa,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Alexa Volwiler [mailto:Alexa.volwiler@gmail.com]
Sent: Saturday, January 21, 2017 9:56 AM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the permit, as submitted.

Approval of the permit will advance completion of the 44 mile regional trail system between Seattle and the foothills of the Cascades. The trail, as proposed in the permit, will provide a safe walking and biking route through Sammamish. Please support the proposed trail widths, which reflect industry standards (AASHTO).

A 12ft trail with 2ft shoulders will create a safe trail with space for the various different uses of the trail… from running to riding a bike. Please approve the permit with the trail widths as proposed.

Ensuring crossing priority for the trail is an important safety issue. Giving priority to the trail when roads and driveways cross the path will be intuitive for all users, whether in a vehicle, on foot, or on a bike. The trail alignment, as proposed in the permit, provides sight lines for good approach visibility for people on the trail and people crossing the trail.

Please approve the permit, as proposed, with expediency.

Alexa Volwiler
11434 176th PL NE
Redmond, WA 98052
3603030526

RE: Please Approve the Permit for Segment 2B of the ELST

Lindsey Ozbolt

Mon 1/23/2017 9:06 AM

To:Anne_a_ward@yahoo.com <Anne_a_ward@yahoo.com>;

Dear Anne,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Anne Ward [mailto:Anne_a_ward@yahoo.com]
Sent: Saturday, January 21, 2017 5:56 AM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the permit, as submitted. The East Lake Sammamish Trail is a huge public benefit promoting healthy outdooor recreation for our community and also providing a safe pathway for those interested in commuting by bicycle, thus easing traffic on our over used roadways. It adds huge enjoyment for those of us who are not wealthy enough to live on the lake by allowing us to walk or bike along the beautiful waterfront and access the new waterfront park.

Approval of the permit will advance completion of the 44 mile regional trail system between Seattle and the foothills of the Cascades. The trail, as proposed in the permit, will provide a safe walking and biking route through Sammamish. Please support the proposed trail widths, which reflect industry standards (AASHTO).

A 12ft trail with 2ft shoulders will create a safe trail with space for the various different uses... from people running to people riding a bike. Please approve the permit, including the proposed width of the trail.

Ensuring crossing priority for the trail is an important safety issue. Giving priority to the trail when roads and driveways cross the path will be intuitive for all users. The trail alignment, as proposed in the permit, provides sight lines for good visibility for people on the trail and people crossing the trail at trail intersections.

Please approve the permit, as proposed, with expediency.

Sincerely,

Anne Ward
SE 64th
Issaquah, WA 98027
9086254508

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Wednesday, January 25, 2017 10:33 AM
To: 'adam.warfield@ymail.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Adam,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: adam warfield [mailto:adam.warfield@ymail.com]
Sent: Tuesday, January 24, 2017 8:36 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the permit, as submitted.

Approval of the permit will advance completion of the 44 mile regional trail system between Seattle and the foothills of the Cascades. The trail, as proposed in the permit, will provide a safe walking and biking route through Sammamish. Please support the proposed trail widths, which reflect industry standards (AASHTO).

A 12ft trail with 2ft shoulders will create a safe trail with space for the various different uses… from people running to people riding a bike. Please approve the permit, including the proposed width of the trail.

Ensuring crossing priority for the trail is an important safety issue. Giving priority to the trail when roads and driveways cross the path will be intuitive for all users. The trail alignment, as proposed in the permit, provides sight lines for good visibility for people on the trail and people crossing the trail at trail intersections.

I frequently use the area for multiple activities. Running, walking (with my elderly mom) and a significant amount of cycling (about three days a week) Having access to the trail vs. the road for cycling would be awesome, and much much safer. Even though there is a significant shoulder/bike lane, drivers are absent minded and text while driving. Ive had multiple "near misses" and "close calls" Which is crazy, because I am well visible with reflective clothing and blinking lights.
Please approve the permit, as proposed, with expediency.

Sincerely,

adam warfield
po box 394
maple valley, WA 98038
4257666986

RE: Please Approve the Permit for Segment 2B of the ELST

Lindsey Ozbolt

Mon 1/23/2017 9:04 AM

To:stevenglasgow@yahoo.com <stevenglasgow@yahoo.com>;

Dear Steven,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Steven Glasgow [mailto:stevenglasgow@yahoo.com]
Sent: Saturday, January 21, 2017 7:21 AM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm a Sammamish resident and am writing to express my support for completing the ELST and approving permit SSDP2016-00415. We need a safe, paved trail along East Lake Sammamish and completion of the trail is the only way to fully realize the investment we've made North and South on the same trail. This is our missing link. Please look out for the interests of the community at large and approve the permit, as submitted, with the proposed trail widths. We've been waiting for years!

Sincerely,

Steven Glasgow
4433 229th Place SE
Sammamish, WA 98075

Steven Glasgow

4433 229th Place SE
Sammamish, WA 98075
4253699203

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Wednesday, January 25, 2017 10:34 AM
To: 'bikelicker@gmail.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Alexander,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Alexander Wilson [mailto:bikelicker@gmail.com]
Sent: Tuesday, January 24, 2017 9:03 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to convey my strong support for completion of the East Lake Sammamish multi-use Trail, and approving permit SSDP2016-00415.

Enabling alternative transportation consistently boosts property values, the local economy and quality of life. Creating a recreational trail will not serve to increase crime, property damage, or block up residents parking, as all previous regional trail infrastructure has shown. As a regular user of the trail, I can testify first hand that this trail provides the opportunity for users to experience magnificent scenery, exercise, and experiencing the outdoors in a convenient manner, and away from the dangers of automotive traffic.

Please approve the trail permit, as submitted, so that users of all ages and abilities can safely use the trail. A trail built to national standards (AASHTO), that is 12 ft, plus 2 ft gravel shoulders, will allow for safe use by a variety of different users, including people who walk and bike.

As proposed in the permit, priority at trail crossings should be given to the trail and trail users. Consistent crossing priority is intuitive and safe for users of both the trail and the driveways and roads that cross the trail.

When complete, the trail will be an even greater community amenity, and provide a safe option for people who bike to travel to and through Sammamish. Please complete the trail.

Thank you for your time.

-Alexander J Wilson

Alexander Wilson
7532 11TH AVE NW
SEATTLE, WA 98117
2067692091

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 9:10 AM
To: 'bk_benson@yahoo.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Brian,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Brian Benson [mailto:bk_benson@yahoo.com]
Sent: Wednesday, January 25, 2017 2:11 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the trail permit, as submitted, so that users of all ages and abilities can safely use the trail. A trail built to national standards (AASHTO), that is 12 ft, plus 2 ft gravel shoulders, will allow for safe use by a variety of different users, including people who walk and bike.

As proposed in the permit, priority at trail crossings should be given to the trail and trail users. Consistent crossing priority is intuitive and safe for users of both the trail and the driveways and roads that cross the trail.

When complete, the trail will be an even greater community amenity, and provide a safe option for people who bike to travel to and through Sammamish.

I've ridden sections of the trail, and look forward to riding the new part (and bringing business to nearby businesses!). Please complete the trail.

Sincerely,

Brian Benson
8307 Dibble Ave. N.W.
Seattle, WA 98117
2065551212

Re: E. lake Sammamish Trail improvement

Lindsey Ozbolt

Thu 1/19/2017 8:10 AM

To:Brad Del Matto <braddmt@hotmail.com>;

Cc:'Lorelle Del Matto' <lorelledm@outlook.com>;

Dear Brad,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner I City of Sammamish I Department of Community Development
425.295.0527

From: Brad Del Matto <braddmt@hotmail.com>
Sent: Tuesday, January 17, 2017 7:42 PM
To: Lindsey Ozbolt
Cc: 'Lorelle Del Matto'
Subject: E. lake Sammamish Trail improvement

Dear Lindsey,
We understand that residents along the lake are to provide comments to you regarding the recent trail improvement plans for section 2B (the 60% improvement plans/maps) released by King County.

The address of our residence is 161 E. Lake Sammamish Shore Lane NE. the trail is between our residence and E. Lake Sammamish parkway. Our comments are as follows:

First, the County intends to extend its current trail border (i.e., the fence along the trail separating our property from the trail) into an area that we use for parking and storage. The county indicates that it will use this extended area for drainage. It seems that the county could easily drain the trail to the east where it currently drains and where there are wetlands. Further, it is uncertain how drainage to the west will affect our property in terms of increasing saturation nearer to our residence. I am concerned it could cause flooding problems.

Second, the plans fail to indicate how the County intends to improve this drainage area in terms of materials and vegetation. It seems the county should provide specifics so that we have sufficient information to comment about impact before the plans are approved.

Third, the county wants to install a chain link fence along the extended border. The problem is we have deer (often with fawns in the spring) and other wildlife accessing the lake through the trail. This would disrupt wildlife and would likely cause some of them to be trapped if they make it to the lake. Trapped deer are dangerous and being trapped could impact their health. The county should at least provide many gaps in the fence to allow animals to pass more freely.

Fourth, according to the Tree Preservation Plans, 16 trees are to be removed (sheet TP16 of the plans) that are outside the planned trail footprint. It appears this is intended only to allow construction of the dispersion area. Trees absorb moisture and contribute significantly to dispersion of runoff. These trees should not be removed.

Thanks for considering our comments.

Brad & Lorelle Del Matto
161 E. Lake Sammamish Shore Lane NE
Sammamish, WA 98074

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Wednesday, January 25, 2017 11:15 AM
To: 'bdillaway@hotmail.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Blair,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Blair Dillaway [mailto:bdillaway@hotmail.com]
Sent: Wednesday, January 25, 2017 11:12 AM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the permit, as submitted.

Approval of the permit will advance completion of the 44 mile regional trail system between Seattle and the foothills of the Cascades. It will also provide a critical north-south corridor connecting with existing east-west trails along I-90 and Hwy 520. This is important to commuters and recreational users such as myself.

The trail, as proposed in the permit, will provide a safe, multi-use, route through Sammamish. Please support the proposed trail widths, which reflect industry standards (AASHTO). Please also ensure that trail users are given priority when to the trail crosses roads and driveways. This is an important safety issue.

Please approve the permit, as proposed, with expediency.

Blair Dillaway
2635 90th Ave NE

Clyde Hill, WA 98004
4257363599

RE: Please Approve the Permit for Segment 2B of the ELST

Lindsey Ozbolt

Mon 1/23/2017 9:03 AM

To:bill@fhaus5.net <bill@fhaus5.net>;

Dear Bill,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Bill Fuerstenberg [mailto:bill@fhaus5.net]
Sent: Saturday, January 21, 2017 7:45 AM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415. Please support the proposed trail widths, which reflect industry standards (AASHTO).

I have lived in Sammamish since 1995 with my wife raising our 3 kids. I wish this would have been finished sooner but better late than never! I bike commute to work full time to Microsoft using the trail and run the trail on weekends.

Please approve the permit, as submitted. The completed portions are the safest and most enjoyable trails I've ever ridden on -- and I've ridden almost every possibly trail around here including Sammamish River and Burke Gilman (since UW days).

I believe the home owners on the trail are being selfish and the fact is this is a Right of Way. That was clear in any property documents. Homeowners claim concerns of environmental impact or disturbing their RoW encroaching/non-permitted modifications; these do not seem genuine to me seeing first hand the lawns and chemicals, all the trees cut down for the buildings, firepits, docks, etc. This will only IMPROVE the situation in every way.

In my opinion, this would be an EPIC FAIL of any urban planning or government planning to compromise on this little section of trail for a few special interests. This is a LONG TERM investment for everyone to enjoy for generations to come.

A 12ft trail with 2ft shoulders will create a safe trail with space for the various different uses... from people running to people riding a bike. Please approve the permit, including the proposed width of the trail.

Ensuring crossing priority for the trail is an important safety issue. Giving priority to the trail when roads and driveways cross the path will be intuitive for all users. The trail alignment, as proposed in the permit, provides sight lines for good visibility for people on the trail and people crossing the trail at trail intersections.

Please approve the permit, as proposed, with expediency.

Sincerely,

Bill Fuerstenberg
Sammamish Resident since '95 and Trail User since it opened - Let's get this done so everyone can enjoy safely!
bill@fhaus5.net

Bill Fuerstenberg
1819 203rd Ave SE
Sammamish, WA 98075
4255031358

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 9:15 AM
To: 'gobie.bill@gmail.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Bill,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Bill Gobie [mailto:gobie.bill@gmail.com]
Sent: Wednesday, January 25, 2017 2:43 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the trail permit, as submitted, so that users of all ages and abilities can safely use the trail. A trail built to national standards (AASHTO), that is 12 ft, plus 2 ft gravel shoulders, will allow for safe use by a variety of different users, including people who walk and bike.

As proposed in the permit, priority at trail crossings should be given to the trail and trail users. Consistent crossing priority is intuitive and safe for users of both the trail and the driveways and roads that cross the trail.

When complete, the trail will be an even greater community amenity, and provide a safe option for people who bike to travel to and through Sammamish. Please complete the trail.

The completed segments are excellent. Finish the trail!

Sincerely,

Bill Gobie
4836 38th Avenue SW
Seattle, WA 98126
2069352689

Greve - Gottschalk - East Lake Sammamish Trail Segment 2B Comments to the City Council

b.greve@comcast.net

Sat 1/28/2017 1:39 PM

To:City Council <citycouncil@sammamish.us>;

Cc:Jeffrey Thomas <JThomas@sammamish.us>; Lyman Howard <lhoward@sammamish.us>; Jessi Bon <JBon@sammamish.us>; David Pyle <DPyle@sammamish.us>; Kim Adams Pratt <kim@kenyondisend.com>; Lindsey Ozbolt <LOzbolt@sammamish.us>; Christie Malchow <CMalchow@sammamish.us>; Tom Hornish <THornish@sammamish.us>; Ramiro Valderrama-Aramayo <RValderrama-Aramayo@sammamish.us>; Gus Gottschalk <ggottschalk@lydig.com>;

1 attachment

Letter to City (1-27-17).pdf;

Good morning City Council Members -

In a dialog (shown below) with council member Christie Malchow earlier this month seeking guidance on how best to ensure the city council had the opportunity to understand "each individual homeowner's impacts and concerns", and to help the council when the council meeting or "study session" takes place in reference to the East Lake Sammamish Trail - Segment 2B, we were told to forward comments to the city council as well as Ms. Ozbolt.

Our neighbors (William (Gus) and Debra Gottschalk) and us (William and Kathryn Greve) worked jointly with our attorney to develop our comments as we share a private drive leading into our properties. Our properties are part the Waterside Home Owners Association.

Please find our joint comments and associated exhibits attached in pdf form.

Note that together and with Gus' 35 years of commercial construction experience as President of Lydig Construction, we have identified clear and specific alternatives to each of our concerns relating to the 60% design plan. Our proposals do NOT impact the design intent of the trail, but instead creates a far safer, more cost effective, and rational design. In fact, our proposal works to acknowledge and adhere to two specific design objectives outlined in King County's communications which are being unmistakably averted with the current 60% plan. The two objectives referenced include:

(1) “[m]inimizing costs where possible without impacting trail standards,” and
(2) “[m]inimizing impacts to adjacent homeowners.”

We view many of the design elements in the 60% plan as unnecessarily impactful; especially in light of the alternatives. They also significantly elevate the risk to trail users as it relates to the sight lines associated with the trail crossing both exiting and entering our properties. It's for these reasons that we worked so diligently to not just object to the impactful elements of the plan but to instead use common sense and best practice design considerations to create and share clear and specific alternatives that satisfy each concern and work to what we feel can be a mutually agreeable solution.

Ultimately we want to see this project succeed and become the wonderful shared resource that it can be, but not at the cost or with the unnecessary impact designed into the current 60% plan.

Please inquire should you have any questions, need any additional information, or best case if you would like to set time for us to discuss, demonstrate, and/or explain not just our concerns, but our rationale.

With Best Regards and Intentions,

William (Bill) and Kathryn (Katy)Greve
William (Gus) and Debra (Debbie) Gottschalk

From: "Christie Malchow" <CMalchow@sammamish.us>
To: "Jeffrey Thomas" <JThomas@sammamish.us>, "b greve" <b.greve@comcast.net>, "City Council" <citycouncil@sammamish.us>
Cc: "Lyman Howard" <lhoward@sammamish.us>, "Jessi Bon" <JBon@sammamish.us>, "David Pyle" <DPyle@sammamish.us>, "Kim Adams Pratt" <kim@kenyondisend.com>, "Lindsey Ozbolt" <LOzbolt@sammamish.us>
Sent: Monday, January 16, 2017 9:40:46 PM
Subject: RE: Seeking Guidance - East Lake Sammamish Trail Segment 2B

Thank you, Jeff, for clarifying.

Christie Malchow
Sammamish City Council
cmalchow@sammamish.us
(425-301-6667 l **www.Sammamish.us**
801 228th Ave SE l Sammamish, WA 98075

From: Jeffrey Thomas
Sent: Monday, January 16, 2017 6:46 PM
To: Christie Malchow <CMalchow@sammamish.us>; b.greve@comcast.net; City Council <citycouncil@sammamish.us>
Cc: Lyman Howard <lhoward@sammamish.us>; Jessi Bon <JBon@sammamish.us>; David Pyle

<DPyle@sammamish.us>; Kim Adams Pratt <kim@kenyondisend.com>; Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Re: Seeking Guidance - East Lake Sammamish Trail Segment 2B

Hi Christie,

One clarification and one correction from your email earlier today to Mr. & Mrs. Greve:

1. Clarification - City staff is reviewing and compiling public comments as they are submitted through next week. The public comments will help City staff complete its comprehensive first review of the shoreline permit application. In addition to requesting the County to respond to the public comments, the City will also determine requested revisions and send to the County concurrently.

2. Correction - As currently set up, the shoreline permit application is being processed as a Type II permit - the Community Development Director issued the decision on behalf of the City. As we learned from the State Shorelines Hearings Board with south segment 2a, the Hearing Examiner does not have jurisdiction to hold an administrative appeal hearing on a shoreline permit decision issued by the Director. Therefore the appeal of a shoreline permit decision will go directly to the State Shorelines Hearings Board.

Thanks, Jeff

From: Christie Malchow
Sent: Monday, January 16, 2017 1:18 PM
To: b.greve@comcast.net; City Council
Cc: Lyman Howard; Jessi Bon; Jeffrey Thomas
Subject: RE: Seeking Guidance - East Lake Sammamish Trail Segment 2B

Mr. & Mrs. Greve,

I've cc'd a few staff members here to elaborate or correct any misinformation/omitted information in my response below (in red). My answers below are based on the best of my knowledge and are process based to help you on the questions you've asked below.

Christie Malchow
Sammamish City Council
cmalchow@sammamish.us
(425-301-6667 | **www.Sammamish.us**
801 228th Ave SE | Sammamish, WA 98075

From: b.greve@comcast.net [mailto:b.greve@comcast.net]
Sent: Monday, January 16, 2017 9:55 AM
To: City Council <citycouncil@sammamish.us>
Subject: Seeking Guidance - East Lake Sammamish Trail Segment 2B

Good morning

This e-mail is specifically created to ask for clarification and direction about the city's role and the processes in reference to the on-going and vitally important issues involving the East Lake Sammamish Trail - Segment 2B project.

We (Bill and Katy Greve) residing at 2417 E Lake Sammamish PL SE respectfully request information and answers to each of the following questions outlined below.

- Correspondence coming from both the City of Sammamish and King County provided direction for property owners to submit comments to the staff project planner (Lindsey Ozbolt). Upon doing that an automated response was received stating "Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response". This response seems to elude to the fact that the City of Sammamish is merely a "pass through" for the process by simply collecting the comments and sending them off to King County without working to understand, building a case, offering opinion, or advocating for its citizens..
    - Will the City Council actively review the comments provided, seek to understand them in detail, and ultimately advocate for the citizens of Sammamish? We certainly can read them, but they are not given to Council specifically. You can email your comments to the Council at citycouncil@sammamish.us, this will help us to better understand each individual homeowner's impacts and concerns. This will then help us when we have the County in for a Council meeting or study session.
    - Will the City Council actively participate and help to mediate discussions between King County and the citizens of Sammamish to resolve issues to citizen satisfaction? We are certainly advocating for a study session or the like where King County is present, to answer our questions & citizens alike, so yes, we will be actively participating in discussions between the County, citizens, and City staff processing the applications.
    - Who specifically makes the decision to issue both the shoreline substantial development permit and the clearing and grading permit; and what influence does the city council have in that process? City of Sammamish's staff. The Council does not have influence in reality there, aside from encourage legal & staff to scrutinize the application for meeting our City's codes and regulations.
    - Does the City Council have the ability to prevent either permit (SSDP and Clearing & Grading) from being issued? No, not to my knowledge.
    - What specifically is the procedure to surface issues and seek adjustment to the proposed 60% plan; aside from simply submitting comments? Submitting your comments is the primary means, and certainly engaging Council in those comments (via public comment or simply by emailing them to us). The more we know, the better we can advocate for alterations to the design plan that allows the trail to proceed, but also takes into account affected trail-side owners' issues.
    - Will the City Council actively be involved in and support citizens in discussions involving

proposed adjustments to the 60% plan? I think the entire Council has an interest in the trail. I certainly do. As far as alterations to the plan, staff will ultimately make those decisions. The Council is certainly going to weigh in on the trail, and as of last Tuesday has asked for a joint meeting that would have King County officials in for a meeting that would likely be a study session. There was an urgency on this request, & I know our City Manager has already reached out to the County on this meeting, I would anticipate that meeting sooner than later.

- In the event that King County does not work to address the proposed adjustments to citizen satisfaction, what is the specific process to appeal, mediate, and mitigate the situation too ensure satisfactory results, and what role with the City play in this process? The appeal can be done if the City approves the plans (after the final submission based on 100% design plan is reached). At that point any group or individual may appeal the decision to the Hearing Examiner.

Citizens have spent literally hundreds of hours trying to understand how to be heard and how to ensure the slightest bit of comment sense and rational thought is applied to the issues being forced upon us or suggested changes. We've worked to submit comments in multiple forms and forums as directed, but no impacted party feels good about how the process has unfolded thus far. Most feel completely unsupported by the city and certainly stonewalled by the county.
I understand your frustrations. My responses above are intended to shed a bit of light on process for you. However, if you feel you have more questions, please don't hesitate to email Council or call me. My cell phone number is listed below in my email signature.

Satisfactory and complete answers to the above questions will at minimum help to ensure we know what to do and how to do it.

Please advise.

Sincerely,

Bill Greve

Re: Seeking Guidance - East Lake Sammamish Trail Segment 2B

b.greve@comcast.net

Tue 1/17/2017 10:01 AM

To:Jeffrey Thomas <JThomas@sammamish.us>;

Cc:Christie Malchow <CMalchow@sammamish.us>; City Council <citycouncil@sammamish.us>; Lyman Howard <lhoward@sammamish.us>; Jessi Bon <JBon@sammamish.us>; David Pyle <DPyle@sammamish.us>; Kim Adams Pratt <kim@kenyondisend.com>; Lindsey Ozbolt <LOzbolt@sammamish.us>;

Christie, Jeff -

Because we've never done anything close to what we're embarking on in relation to trying to have our concerns related to the trail design considered and adjustments made, I'd like to summarize the information you provided to ensure complete understanding. Please advise should I have misinterpreted any part of our correspondence.

Thank you!

Bill Greve

Summary:

- The City is actively working to arrange a "study session" or "council meeting" to include representatives from King County, City Staff, and Sammamish Citizens with the intent to ensure comments, concerns, proposals are heard, understood, and decisions can be made in order to ensure satisfactory solutions to concerns with the 60% plan occur.
- Although citizen comments will not be given to the City Council specifically, there is a desire by Council Members to better understand each individual homeowners impacts and concerns in order to prepare for the above mentioned meeting(s) with King County. Comments can be sent to citycouncil@sammamish.us for this purpose.
- The City council intends to actively participate in discussions between King County, Sammamish Citizens, and City Staff responsible for processing the necessary applications.
- City Staff is both compiling and reviewing public comments provided by Citizens. The intent is to help city staff complete its comprehensive first review of the shoreline permit application. In addition to requesting the county's response to comments, the City will also "determine requested revisions" which will be sent to the county concurrently.

Question - Will the revisions requested by the City include requests for revisions to both the 60% plan and the permit application; or just the application?

- Both Permits (SSDP and Clearing & Grading) are approved and issued by the City of Sammamish Staff. The City council does NOT have influence, aside from encouraging legal and staff to scrutinize the application in relation to city codes and regulations.The City council does NOT have the ability to prevent either permit from being issued.
- The procedure to seek adjustments to the current 60% plan is as follows:
    - Citizens to submit official comments to be included as part of the project file
    - Engaging City Council in relation to the comments (public comment or email)
    - Participate in the above mentioned study and/or council session with King County
    - Alterations to the 60% plan will be decided upon and requested by City Staff
    - The City council intends to weigh in on and advocate for requested adjustments to the trail design
- Any appeal of a Shoreline Permit Decision must go through to the State Shoreline Hearings Board

Note: Per my previous e-mail please provide insight into the protocol related to raising appeals to the State Shoreline Hearings Board

---

From: "Jeffrey Thomas" <JThomas@sammamish.us>
To: "Christie Malchow" <CMalchow@sammamish.us>, "b greve" <b.greve@comcast.net>, "City Council" <citycouncil@sammamish.us>
Cc: "Lyman Howard" <lhoward@sammamish.us>, "Jessi Bon" <JBon@sammamish.us>, "David Pyle" <DPyle@sammamish.us>, "Kim Adams Pratt" <kim@kenyondisend.com>, "Lindsey Ozbolt" <LOzbolt@sammamish.us>
Sent: Monday, January 16, 2017 6:45:53 PM
Subject: Re: Seeking Guidance - East Lake Sammamish Trail Segment 2B

Hi Christie,

One clarification and one correction from your email earlier today to Mr. & Mrs. Greve:

1. Clarification - City staff is reviewing and compiling public comments as they are submitted through next week. The public comments will help City staff complete its comprehensive first review of the shoreline permit application. In addition to requesting the County to respond to the public comments, the City will also determine requested revisions and send to the County concurrently.

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Thanks, Jeff

From: Christie Malchow
Sent: Monday, January 16, 2017 1:18 PM
To: b.greve@comcast.net; City Council
Cc: Lyman Howard; Jessi Bon; Jeffrey Thomas
Subject: RE: Seeking Guidance - East Lake Sammamish Trail Segment 2B

Mr. & Mrs. Greve,

I've cc'd a few staff members here to elaborate or correct any misinformation/omitted information in my response below (in red). My answers below are based on the best of my knowledge and are process based to help you on the questions you've asked below.

Christie Malchow
Sammamish City Council
cmalchow@sammamish.us<mailto:cmalchow@sammamish.us>
• 425-301-6667 | www.Sammamish.us<http://www.sammamish.us/>
801 228th Ave SE | Sammamish, WA 98075

[sammamish logo]

From: b.greve@comcast.net [mailto:b.greve@comcast.net]
Sent: Monday, January 16, 2017 9:55 AM
To: City Council <citycouncil@sammamish.us>
Subject: Seeking Guidance - East Lake Sammamish Trail Segment 2B

Good morning

This e-mail is specifically created to ask for clarification and direction about the city's role and the processes in reference to the on-going and vitally important issues involving the East Lake Sammamish Trail - Segment 2B project.

We (Bill and Katy Greve) residing at 2417 E Lake Sammamish PL SE respectfully request information and answers to each of the following questions outlined below.

* Correspondence coming from both the City of Sammamish and King County provided direction for property owners to submit comments to the staff project planner (Lindsey Ozbolt). Upon doing that an automated response was received stating "Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response". This response seems to elude to the fact that the City of Sammamish is merely a "pass through" for the process by simply collecting the comments and

SB-309

sending them off to King County without working to understand, building a case, offering opinion, or advocating for its citizens..

* Will the City Council actively review the comments provided, seek to understand them in detail, and ultimately advocate for the citizens of Sammamish? We certainly can read them, but they are not given to Council specifically. You can email your comments to the Council at citycouncil@sammamish.us<mailto:citycouncil@sammamish.us>, this will help us to better understand each individual homeowner's impacts and concerns. This will then help us when we have the County in for a Council meeting or study session.
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I understand your frustrations. My responses above are intended to shed a bit of light on process for you. However, if you feel you have more questions, please don't hesitate to email Council or call me. My cell phone number is listed below in my email signature.

Satisfactory and complete answers to the above questions will at minimum help to ensure we know what to do and how to do it.

Please advise.

Sincerely,

Bill Greve

LAW OFFICE OF
SAMUEL A. RODABOUGH PLLC

SAMUEL A. RODABOUGH
ATTORNEY AT LAW
11820 NORTHUP WAY, STE. E200
BELLEVUE, WA 98004
(425) 440-2593
(425) 284-3051 (FAX)

January 27, 2017

Via Email & U.S. Mail

City of Sammamish
Department of Community Development
Attn: Lindsey Ozbolt, Associate Planner
801 228th Ave. SE
Sammamish WA, 98075
lozbolt@sammamish.us

King County
Department of Natural Resources and Parks
Attn: Gina Auld, Capital Project Manager IV
201 S. Jackson St., Ste. 700
Seattle, WA 98104-3855
gina.auld@kingcounty.gov

Re: Shoreline Substantial Development Permit 2016-00415
East Lake Sammamish Trail, South Sammamish B Segment

Dear Ms. Ozbolt and Ms. Auld:

This Firm represents William & Debra Gottschalk (collectively "Gottschalk") and William & Kathryn Greve (collectively "Greve"), the owners of residential properties located within the City of Sammamish ("City"). My clients' properties will be adversely affected by the proposed modifications to the East Lake Sammamish Trail, South Sammamish B Segment ("Trail") that have been proposed by King County ("County") in the above shoreline substantial development permit ("SSDP"). My clients are in receipt of the City's Notice of Application for the above SSDP and they have reviewed the 60% design plans for the Trail, dated on or about September 2016 ("Preliminary Plans"). Please accept the following as (1) a response on behalf of my clients to the SSDP application, including the Preliminary Plans, and (2) a request for my clients to be included as parties of record for this SSDP and to receive future notifications and status updates regarding the SSDP application.

A. The Properties

Gottschalk owns and resides in the residence located at 2419 E. Lk. Sammamish Pl. SE, Sammamish, WA 98075, also known as King County Tax Parcel No. 0724069055 ("Gottschalk Property"). Greve owns and resides in the adjoining residence located at 2417 E. Lk. Sammamish Pl. SE, Sammamish, WA 98075, also known as King County Tax Parcel No. 0724069059 ("Greve Property"). The Greve Property is located immediately north of the Gottschalk Property. As with many waterfront properties in this area, the Gottschalk Property and the Greve Property are physically constrained by Lake Sammamish to the west and the Trail to the east. Although these properties enjoy significant waterfront amenities, they are also characterized by significant access constraints and privacy concerns stemming from their proximity to the Trail.

By way of background, and for purposes of this letter, with the limited time available for public comment, my clients have been unable to undertake a comprehensive review of the titles to their respective properties to determine the origin of the County's right-of-way for the Trail. However, per maps available through the County's Department of Natural Resources and Parks, it appears that the origin of the right-of-way in this section of the Trail is the "Tibbetts Deed."[1] The map does not explain if the County believes it owns a fee simple interest in this section of the Trail, or a mere easement. In this limited time available for public comment, however, my clients have been unable to verify if the property interest conveyed by the Tibbetts Deed has previously been adjudicated by any state or federal court. Nonetheless, until demonstrated otherwise, similar to other sections of the Trail, my clients' necessarily take the position that the County's interest constitutes an easement and that my clients own the underlying fee simple interest.

B. Deficiencies in Preliminary Plans

As indicated, my clients have reviewed the Preliminary Plans for the Trail. In this regard, it is worth noting that Mr. Gottschalk has over 35 years of complex construction experience. He is currently the President of Lydig Construction, Inc., a regional commercial construction company whose project portfolios include federal, state, and local government buildings (*e.g.*, secondary and higher education buildings, courthouses, administration buildings, correction centers, civic halls, etc.) and private commercial buildings (*e.g.*, offices, hospitals, hotels, casinos, etc.). In short, Mr. Gottschalk is well-versed and highly qualified in reviewing construction drawings. Accordingly, my clients offer the following comments regarding the Preliminary Plans:

1. Unnecessary Waterward Realignment of Trail Centerline

Per the Preliminary Plans, it appears that the County is unnecessarily realigning the centerline of the Trail waterward (*i.e.*, closer to my clients' residences).[2] Notably, the County has previously published the criteria that it employs to determine if the existing centerline of the Trail should be realigned, which include the following: (1) "[m]inimizing costs where possible without impacting trail standards," and (2) "[m]inimizing impacts to adjacent homeowners."[3] As explained in greater detail below, it does not appear that the County's proposed realignment complies with either of these criteria.

---

[1] *See* East Lake Sammamish Trail Railroad Right of Way Historical Acquisitions, King County Department of Natural Resources and Parks, Parks Division (July 29, 2014), at pg. 15.

[2] *Compare* Preliminary Plans, Existing Conditions Plan, at pg. EX6 (attached hereto as Exhibit 2) *with* Plan and Profile, at pg. AL10 (attached hereto as Exhibit 1).

[3] East Lake Sammamish Trail Project, King County Parks (Spring 2014), at pg. 5.

Specifically, the proposed realignment occurs between stations 327+31.99 and 326+71.62.[4] The realignment results in the following significant, adverse impacts, among others:

- **Reduced Utility of Shared and Separate Driveways** – The realignment shortens the approach to the shared portion of my clients' driveway and severely limits vehicle maneuverability and ingress and egress from the easternmost portions of their separate driveways. In particular, the turning radius of their driveways are significantly compromised and may require the owners to trespass onto each other's property for future, rudimentary driveway navigation.
- **Reduced Safety/Visibility** – The proposed Trail realignment creates an increased safety hazard for both vehicles and Trail users at this crossing. Specifically, the rather abrupt realignment near the north property line of the Greve Property appears to reduce sight distance for vehicles exiting the shared portion of my clients' driveway, which decreases safety for both my clients and Trail users.
- **Proximity, Loss of Privacy and Safety –** The proposed Trail realignment will undoubtedly negatively affect the values of my clients' residences, both of which are multi-million dollar residences. The proposed Trail realignment and accompanying widening will require the loss of most, if not all, of the existing privacy screening for these residences, including mature arborvitae hedges. In short, Trail users will not only be much closer to these residences, but will be staring through windows into their homes. Additionally, the increased proximity of the Trail to my clients' residences may encourage Trail users to engage in unauthorized use of the highly visible boat launch located on the Greve Property.

2. Inadequate Drainage Infrastructure

The existing elevated Trail corridor currently acts as a berm that collects surface water behind it during extreme weather conditions. This problem is exacerbated by excess hydraulic water pressure from Jurisdictional Ditch #11B and runoff from nearby impervious surfaces, including the existing semi-permeable gravel Trail.[5] Although the Preliminary Plans depict the existence of four, 6-inch culverts located near the north end of Jurisdictional Ditch #11B,[6] these culverts do not currently provide an outlet for the ponding water. Instead, because the ponding water currently has no outlet, it builds hydraulic pressure that adversely affects the foundations and sewer systems of both the Gottschalk and Greve residences. This hydraulic pressure has led to water infiltration through the foundations and into their respective residences.

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[4] *See* Preliminary Plans, Plan and Profile, at pg. AL10 (attached hereto as Exhibit 1).

[5] *See* Preliminary Plans, Existing Conditions Plan, at pg. EX6 (attached hereto as Exhibit 2) with Plan and Profile, pg. AL10 (attached hereto as Exhibit 3).

[6] *See* Preliminary Plans, Existing Conditions Plan, at pg. EX6 (attached hereto as Exhibit 2).

The following photos depicts the water that ponds behind the Trail corridor in front of my clients' residences and the damage to these residences as a result of this ponding and associated hydraulic pressure:

*Note – The above photo was taken at approximately 3:00 p.m. on January 18, 2017. The ditch collects and retains water during extreme weather conditions. The ditch was water free 18 hours prior to the time that this photo was taken. As explained in greater detail herein, adopting my clients' recommended drainage improvements, will resolve the existing drainage issues and better protect any Trail improvements from unnecessary erosion and damage.

*Note – The above photo depicts the source of water forced up through the foundation of the residence as a result of hydraulic pressure.

*Note – The above photo depicts the pathway by which water, forced up through the foundation from hydraulic pressure, runs along the interior walls of the residence.

The proposed drainage improvements in the Preliminary Plans do not appear to adequately address these drainage concerns. In particular, changing the Trail from a semi-permeable gravel surface to an impervious paved surface, while simultaneously widening the Trail, will increase surface water runoff. Moreover, the Preliminary Plans do not depict any underdrain in the vicinity of my clients' properties that will allow for surface water collecting on the east side of the Trail to drain to the west side and ultimately be discharged into the Lake. In other words, it is likely that the existing ponding conditions will continue unless and until the Preliminary Plans are revised with respect to drainage.

3. Design

My clients, including Mr. Gottschalk with his extensive design and construction experience, believe that the Proposed Plans depict a Trail with poor design and a general lack of consideration to architectural exterior design. Specifically, the Preliminary Plans include a masonry retaining wall with a coated chain link for only a portion of affected property, and leaving the remainder with no protection at all. This total lack of architectural perspective by the County fails to follow any reasonable architectural standards for the proposed improvements. The County should have designed something more consistent with the existing improvements that takes into consideration that the two residents share one common entrance and the architectural barrier should be consistent along the affected property.

B. Proposed Resolutions for Deficiencies in Preliminary Plans

My clients believe that there are simple and cost-effective design solutions that would largely alleviate the above concerns that are both (1) consistent with the County's design objectives for the Trail, and (2) avoid negative impacts to adjacent property owners. These solutions are as follows:

1. Shift Proposed Realignment of Trail Centerline to the South

My clients propose that the abrupt transition for the Trail centerline realignment currently depicted as occurring between stations 327+31.99 and 326+71.62 be shifted to the south between stations 324+50 and 324+00.[7] It does not appear that shifting the transition to that location would impact any adjacent properties, as that location does not involve constraints that are similar to those in the immediate vicinity of my clients' property. For example, unlike the County's proposed location, my clients' proposed location is not in the vicinity of a Trail crossing, such as a driveway. Moreover, my client's proposed location for the transition would alleviate concerns regarding impaired sight lines at my clients' Trail crossing, as the Trail alignment could be straightened in the absence of the proposed transition. My clients' proposal would also accommodate the following:

- **Retaining Wall #10 –** My clients' preferred alignment would allow for Retaining Wall #10 to be moved east, closer to the alignment of the Trail, which could then be reengineered to be either a smaller retaining wall, or be eliminated altogether as a result of existing elevations. This common sense change would result in considerable savings to taxpayers.[8]
- **Clearing and Grubbing Limits** – My clients also propose that the clearing and grubbing lines be modified to correspond to my clients' preferred Trail realignment. My clients' proposed modifications are depicted on the attached Exhibit 3. Further, the clearing limits should be adjusted to follow the course of the Trail in order to prevent and/or limit, any adverse impacts to my clients' existing stamped concrete driveway, irrigation, drainage, and landscape lighting.

- **Drainage Revisions** – My clients also request that certain changes be made to the Preliminary Design with respect to drainage, as depicted in the attached Exhibit 4. These proposed changes are summarized as follows:

---

[7] *See* Preliminary Plans, Existing Conditions Plan, pg. EX6 (attached hereto as Exhibit 2).

[8] *See* Preliminary Plans, Existing Conditions Plan, Plan and Profile, pg. AL10 (attached hereto as Exhibit 3).

(1) Continue the underdrain depicted for installation south of station 326+00 on the east side of the Trail through to station 327+31.99. Tie the underdrain to Catch Basin #9 located at station 327+34.

(2) To address the additional ponding that will be expected from increasing the impervious surface from the Trail due to widening, my clients request the installation of a CMP slotted trench drain in the existing driveway, such as the product available from Contech Engineering Solutions depicted in Exhibit 6.

- **Fencing –** My clients also request that they be allowed to maintain the existing level of safety and security that exists for their properties, which will be significantly compromised by the removal of their vegetative privacy screening, existing fence, and electric gate. Maintaining the same level of security will also eliminate the potential for unauthorized use of the highly visible boat launch located on the Greve Property. My clients recommend realigning the chain link fence depicted in the Proposed Plans consistent with their preferred Trail realignment and extending said fence across both properties as depicted in Exhibit 5. Further, they request permission to install an electric rolling security gate similar to existing one serving the properties. Doing so will also maintain a reasonable resemblance of the exterior architecture of these multi-million dollar homes.

CONCLUSION

The Trail constitutes a regional asset that is beneficial to the greater public. As such, my clients do not oppose improvements to the Trail and sincerely desire that the project will be successful and completed in a timely manner. However, my clients justifiably believe that the proposed Trail improvements should consider the adverse impacts to adjoining properties (as expressly set forth in the County's own criteria), including the Gottschalk Property and Greve Property. My clients respectively request that the County give their proposed improvements serious and thoughtful consideration, as the adoption of those proposals would remedy their concerns.

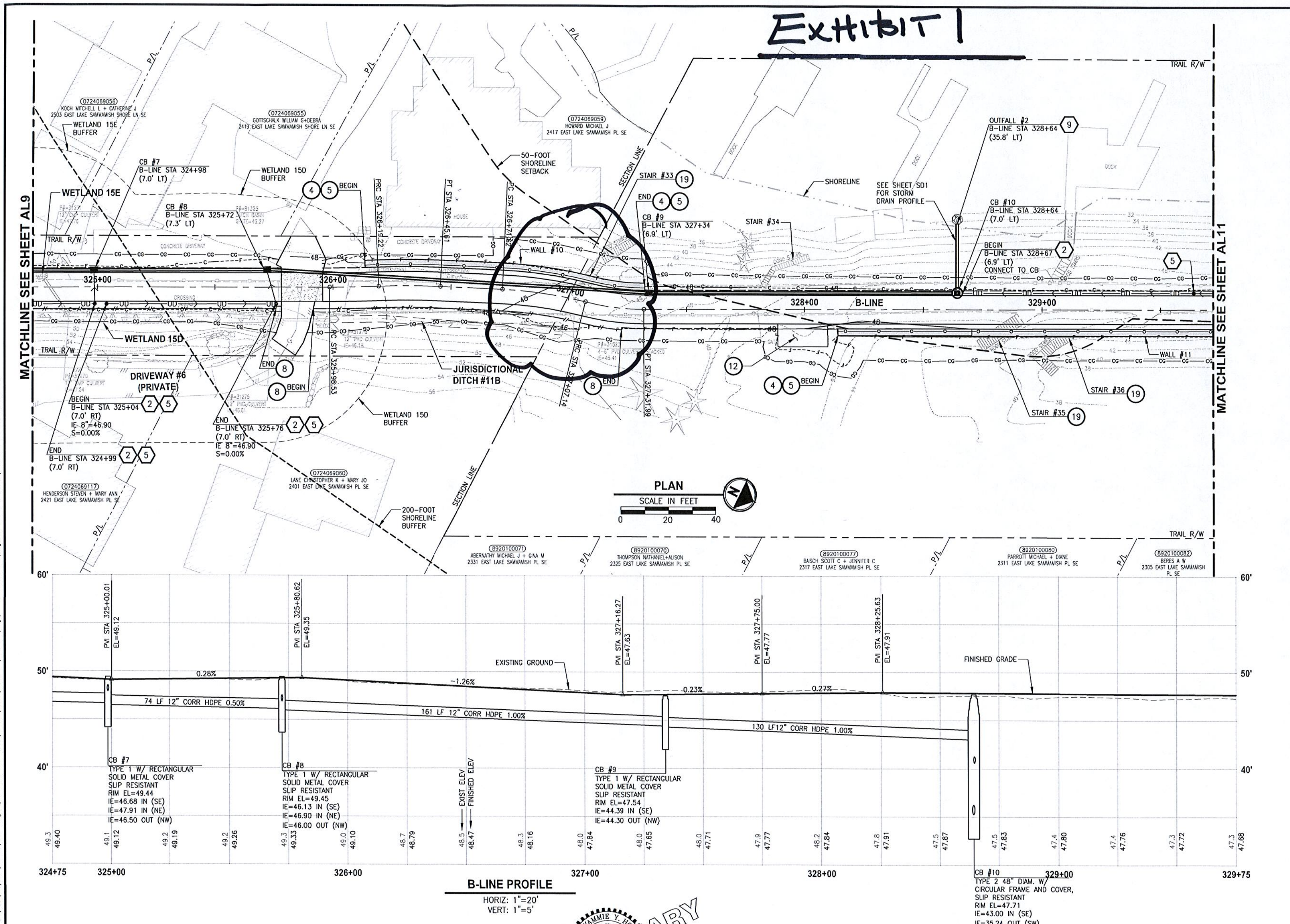
Sincerely,

LAW OFFICE OF SAMUEL A. RODABOUGH PLLC

Samuel A. Rodabough
sam@rodaboughlaw.com

cc: Barbara Flemming, Senior Deputy Prosecuting Attorney

Exhibit 1



CIVIL CONSTRUCTION NOTES:

1. RESTORE AND INSTALL STAIR. TYPE TO BE DETERMINED.
2. RECONSTRUCT PEDESTRIAN BRIDGE.
3. INSTALL PRECAST REINF CONC SPLIT BOX CULVERT. SEE FP SHEETS FOR DETAILS.
4. INSTALL STRUCTURAL EARTH WALL. SEE WALL DETAILS ON SHEET X. SEE WALL PROFILES ON WP SHEETS.
5. INSTALL COATED CHAIN LINK FENCE TYPE 6. FOR GROUND POST INSTALLATION SEE APPENDIX B IN THE SPECIFICATIONS. SEE SHEET X FOR MOUNTING ON TOP OF WALL.
6. NEW DRIVEWAY.
7. INSTALL WOOD GUARDRAIL, SEE DETAILS ON SHEET XX.
8. INSTALL SPLIT RAIL FENCE, SEE DETAILS ON SHEET XX.
9. INSTALL GRAVITY BLOCK WALL. SEE WALL DETAILS ON SHEET WD1. SEE WALL PROFILES ON WP SHEETS.
10. DRIVEWAY REMOVAL. SEE MP SHEETS FOR PLANTING PLAN.
11. INSTALL PATTERNED CONCRETE DRIVEWAY. SEE DETAILS ON SHEET XX.
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15. INSTALL GRAVITY BLOCK WALL.
16. INSTALL WING WALL, SEE FP SHEETS.
17. INSTALL EXTRUDED CURB PER WSDOT STD PLAN F-10.42-00.
18. REST STOP PULL-OUT.
19. STAIRS WILL BE ELIMINATED DURING CONSTRUCTION.
20. BRIDGES WILL BE REMOVED TO R/W LINE DURING CONSTRUCTION.
21. INSTALL ROCK WALL.

STORMWATER CONSTRUCTION NOTES:

1. INFILTRATION TRENCH, SEE DETAIL 4 ON SHEET DD1.
2. UNDERDRAIN TRENCH, SEE DETAIL 5 ON SHEET DD1.
3. ROCK PAD, SEE DETAIL 2 ON SHEET DD1 AND WP SHEETS.
4. CONNECTION TO DRAINAGE STRUCTURE AND CLEANING EXISTING DRAINAGE STRUCTURE.
5. INSTALL UNDERDRAIN TRENCH CLEANOUT, SEE DETAIL 6 ON SHEET DD1.
6. INSTALL RECTANGULAR SLIP RESISTANT SOLID METAL COVER PER WSDOT STD DETAIL B-30.20-02.
7. CONCRETE HEADWALL, SEE DETAIL 1 ON SHEET DD1.
8. BASIC DISPERSION, SEE SHEET CS3.
9. QUARRY SPALL OUTFALL PROTECTION. SEE DETAIL 3 ON SHEET DD1.
10. ADJUST CATCH BASIN.

LEGEND:

RETAINING WALL
SOLDIER PILE WALL
WOOD GUARDRAIL
DISPERSION AREA
DRIVEWAY REMOVAL

CITY OF SAMMAMISH APPROVAL

City Engineer	Date
Community Development	Date

60 % REVIEW SUBMITTAL
NOT FOR CONSTRUCTION

REVISIONS	DATE	BY	DESIGNED M. TSUN
			DRAWN B. PURGANAN
			CHECKED P. JOHANNESSEN
			APPROVED Y. HO

ONE INCH AT FULL SCALE. IF NOT, SCALE ACCORDINGLY
FILE NAME BL1521075P19T03AL-01
JOB No. 554-1521-075 P19 T03
DATE SEPTEMBER 2016

PRELIMINARY — TAMMIE Y. HO, STATE OF WASHINGTON, 40829, REGISTERED PROFESSIONAL ENGINEER

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WWW.PARAMETRIX.COM

PROJECT NAME
EAST LAKE SAMMAMISH MASTER PLAN TRAIL SOUTH SAMMAMISH SEGMENT B
SAMMAMISH, WA

PLAN AND PROFILE

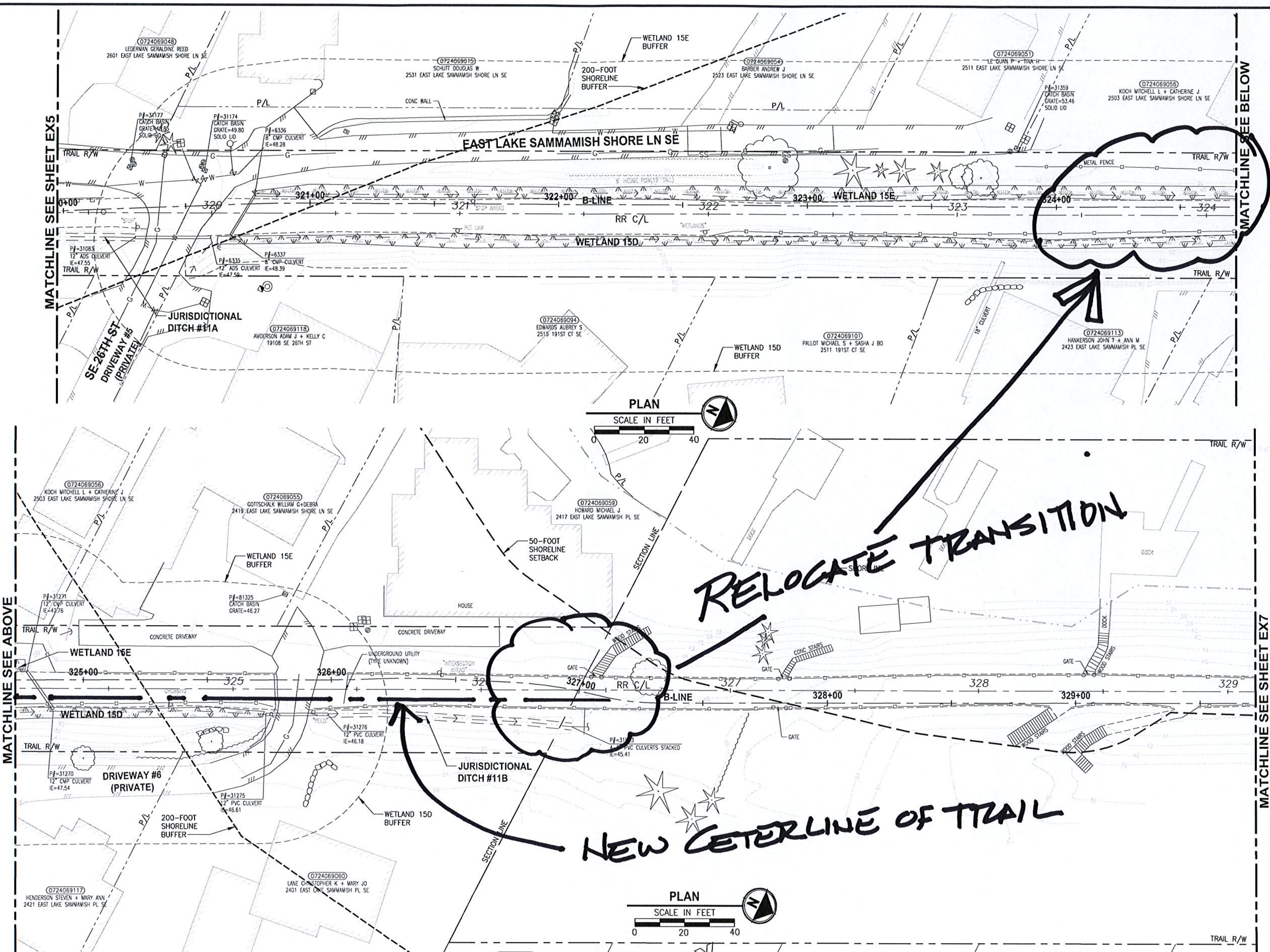
SHEET NO. 42 OF 135
AL10

LAYOUT: AL10 PATH: U:\PSO\Projects\Clients\1521-KingCo\554-1521-075-ELST\99Svcs\CADD\Phase 19\T03 Civil\Dwg\ PLOTTED BY: purgobut DATE: Wednesday, October 12, 2016 8:54:10 PM

SB-309

SB-309

Exhibit 2



GENERAL NOTES:

1. SEE SHEET G4 FOR SYMBOL AND LINE LEGEND.
2. THE RAIL ROAD CENTERLINE (RR CL) & R/W LINES SHOWN IS BASED ON THE RIGHT OF WAY DRAWINGS PROVIDED BY KING COUNTY, DATED 1998, UNLESS OTHERWISE NOTED.
3. OUTLINES FOR BUILDING STRUCTURES SHOWN ARE BASED ON GIS AND AERIAL PHOTOS, DATED 2012.
4. NOT ALL HEDGES AND ARBORVITAES ARE INCLUDED IN THE SURVEY.
5. UTILITY ASBUILT AND POTHOLING RESEARCH HAVE NOT BEEN INCORPORATED.
6. MODIFICATIONS WERE DONE TO THE RIGHT OF WAY LIMITS PER SUPPLEMENTAL RECORD DOCUMENTATION AS PROVIDED BY KC.
7. PARCEL LINES WERE UPDTED PER GIS INFORMATION PROVIDED BY COUNTY, DATED 2016.

LEGEND:

FORMER RAILROAD CENTERLINE	220 RR C/L
CONSTRUCTION CENTERLINE	220+00 B-LINE

CITY OF SAMMAMISH APPROVAL	
City Engineer	Date
Community Development	Date

60 % REVIEW SUBMITTAL
NOT FOR CONSTRUCTION

PRELIMINARY

TAMMIE Y. HO, STATE OF WASHINGTON, 40829, REGISTERED PROFESSIONAL ENGINEER

REVISIONS	DATE	BY	DESIGNED M. TSUN DRAWN B. PURGANAN CHECKED P. JOHANNESSEN APPROVED Y. HO

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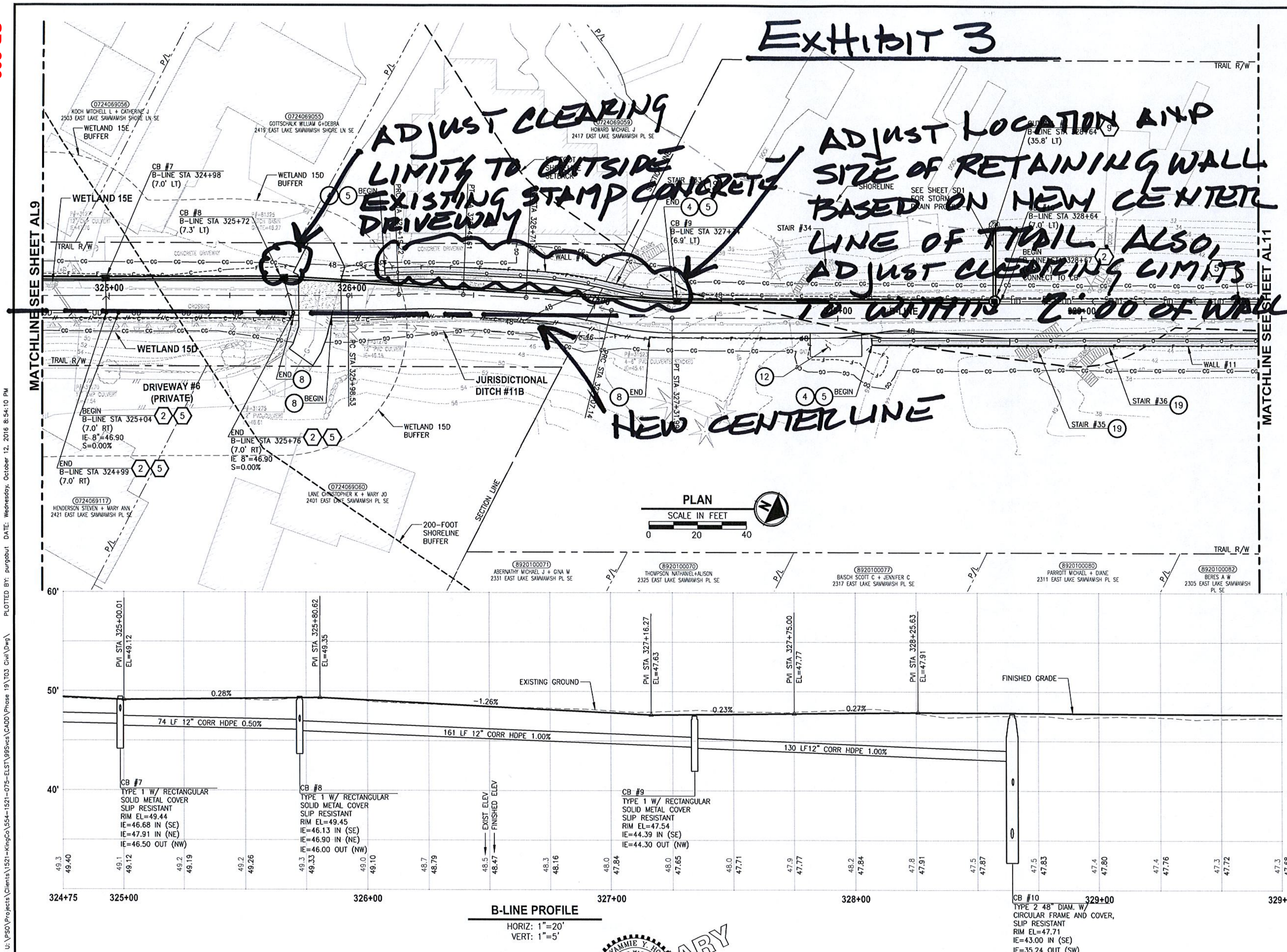
PROJECT NAME
EAST LAKE SAMMAMISH MASTER PLAN TRAIL
SOUTH SAMMAMISH SEGMENT B
SAMMAMISH, WA

EXISTING CONDITIONS PLAN

SHEET NO. 14 OF 135
EX6

LAYOUT: EX6 PATH: U:\PSO\Projects\Clients\1521-KingCo\554-1521-075-ELST\99Svcs\CADD\Phase 19\T03 Civil\Dwg\ PLOTTED BY: purgabut DATE: Wednesday, October 12, 2016 8:31:29 PM

Exhibit 3



CIVIL CONSTRUCTION NOTES:

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10. ADJUST CATCH BASIN.

LEGEND:

- RETAINING WALL
- SOLDIER PILE WALL
- WOOD GUARDRAIL
- DISPERSION AREA
- DRIVEWAY REMOVAL

CITY OF SAMMAMISH APPROVAL	
City Engineer	Date
Community Development	Date

60 % REVIEW SUBMITTAL
NOT FOR CONSTRUCTION

REVISIONS	DATE	BY	
			DESIGNED M. TSUN
			DRAWN B. PURGANAN
			CHECKED P. JOHANNESSEN
			APPROVED Y. HO

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JOB No. 554-1521-075 P19 T03
DATE SEPTEMBER 2016

PRELIMINARY
YAMMIE Y. HO, STATE OF WASHINGTON, 40829, REGISTERED PROFESSIONAL ENGINEER

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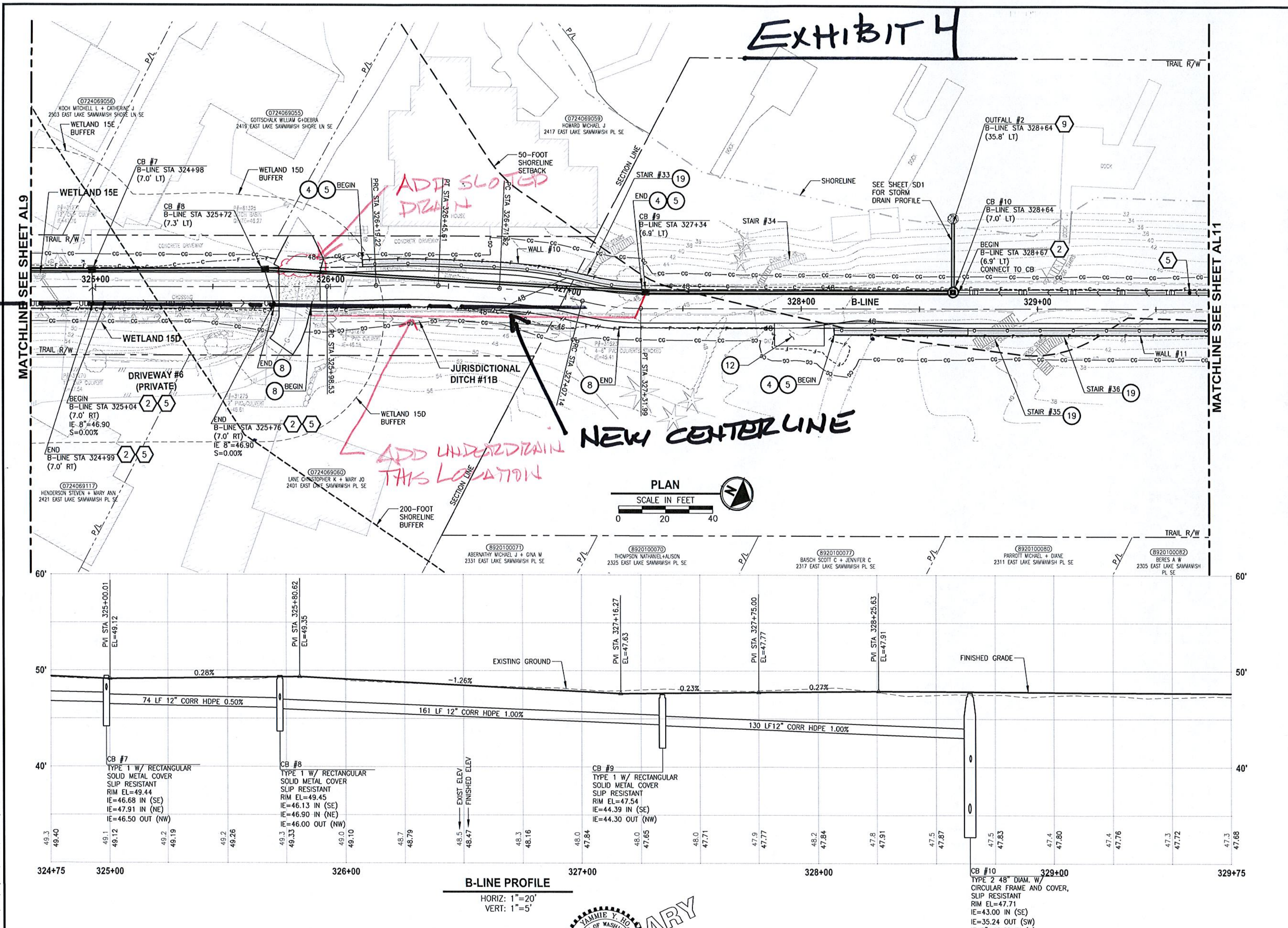
PROJECT NAME
EAST LAKE SAMMAMISH MASTER PLAN TRAIL
SOUTH SAMMAMISH SEGMENT B
SAMMAMISH, WA

PLAN AND PROFILE

SHEET NO. 42 OF 135
AL10

LAYOUT: AL10 PATH: U:\PSO\Projects\Clients\1521-KingCo\554-1521-075-ELST\99Svcs\CADD\Phase 19\T03 Civil\Dwg\ PLOTTED BY: purgabut DATE: Wednesday, October 12, 2016 8:54:10 PM

SB-309



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10. ADJUST CATCH BASIN.

LEGEND:

RETAINING WALL
SOLDIER PILE WALL
WOOD GUARDRAIL
DISPERSION AREA
DRIVEWAY REMOVAL

CITY OF SAMMAMISH APPROVAL	
City Engineer	Date
Community Development	Date

60 % REVIEW SUBMITTAL
NOT FOR CONSTRUCTION

REVISIONS	DATE	BY	DESIGNED M. TSUN; DRAWN B. PURGANAN; CHECKED P. JOHANNESSEN; APPROVED Y. HO

ONE INCH AT FULL SCALE, IF NOT, SCALE ACCORDINGLY
FILE NAME BL1521075P19T03AL-01
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DATE SEPTEMBER 2016

PRELIMINARY — YAMMIE Y. HO, STATE OF WASHINGTON, 40629, REGISTERED PROFESSIONAL ENGINEER

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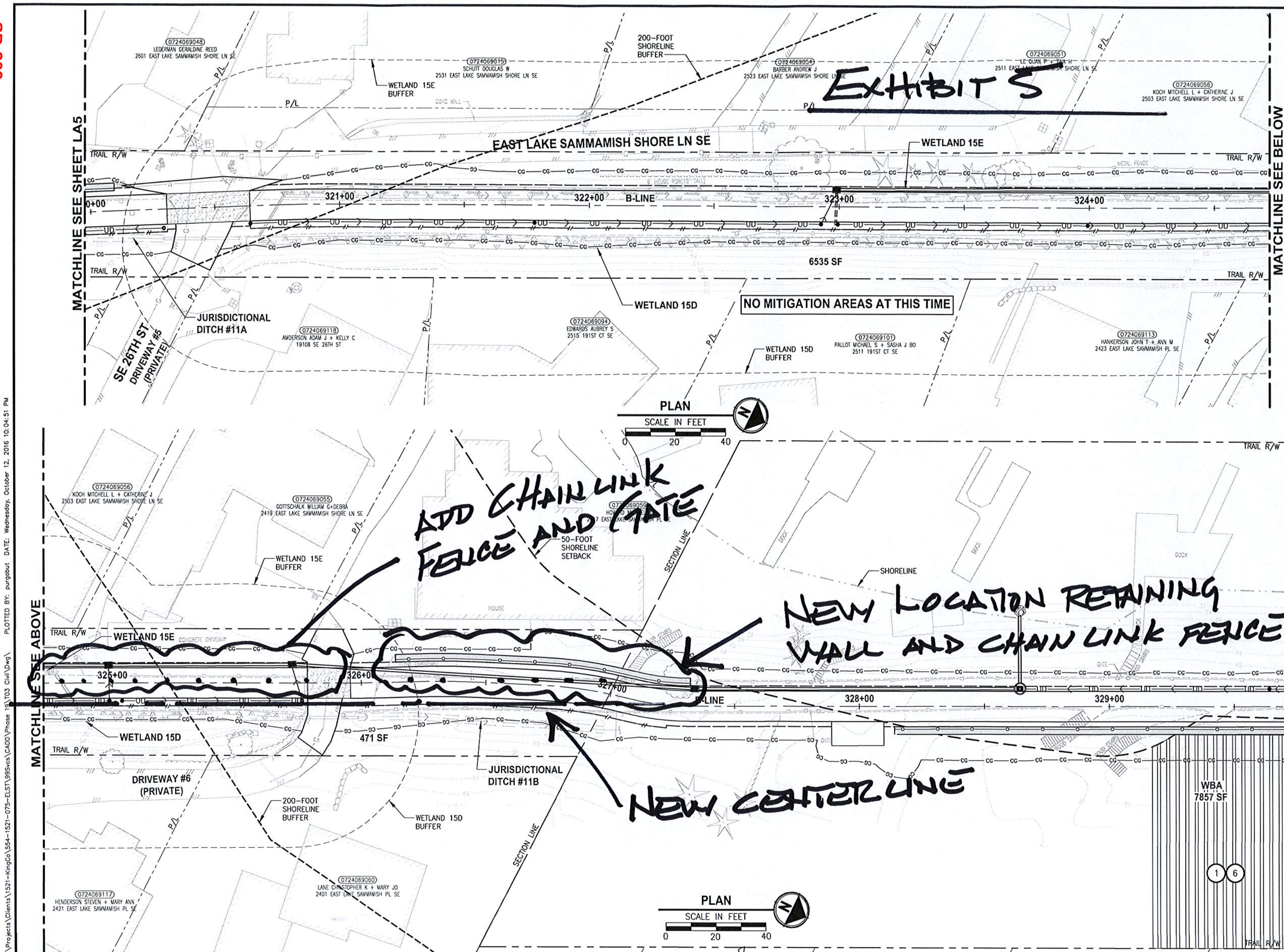
PROJECT NAME
EAST LAKE SAMMAMISH MASTER PLAN TRAIL SOUTH SAMMAMISH SEGMENT B
SAMMAMISH, WA

PLAN AND PROFILE

SHEET NO. 42 OF 135
AL10

LAYOUT: AL10 PATH: U:\PSO\Projects\Clients\1521-KingCo\554-1521-075-ELST\99Svcs\CADD\Phase 19\T03 Civil\Dwg\ PLOTTED BY: purgobut DATE: Wednesday, October 12, 2016 8:54:10 PM

Exhibit 5



CONSTRUCTION NOTES:

1. REMOVE LAWN IN THIS AREA.
2. REMOVE CONCRETE PAD.
3. REMOVE GRAVEL PAVING.
4. REMOVE STRUCTURE IN THIS AREA.
5. PROTECT EXISTING NATIVE TREES AND SHRUBS; REMOVE BLACKBERRY AND OTHER UNWANTED INVASIVE PLANTS; AMEND SOIL WITH COMPOST; PLANT WITH NATIVE WETLAND PLANTS AND PLACE WOOD CHIP MULCH OVER ENTIRE AREA.
6. PROTECT EXISTING NATIVE TREES AND SHRUBS; REMOVE BLACKBERRY AND OTHER UNWANTED INVASIVE PLANTS; AMEND SOIL WITH COMPOST; PLANT WITH NATIVE BUFFER PLANTS AND PLACE WOOD CHIP MULCH OVER ENTIRE AREA.
7. GRADE AREA TO CREATE WETLAND CONDITIONS AND AMEND SOIL WITH COMPOST, PLANT WITH NATIVE WETLAND PLANTS.

GENERAL NOTE:

1. SEE SHEET LA23 FOR DETAILS AND PLANT LISTS.
2. SEEDING FOR REMOVED DRIVEWAYS IS NOT PART OF THE MITIGATION PLAN.

LEGEND:

WBE	WETLAND BUFFER ENHANCEMENT (6)
WBA	WETLAND BUFFER ADDITION AREA (6)
SSE	SHORELINE SETBACK ENHANCEMENT AREA (6)
WC/WR	WETLAND CREATION OR RESTORATION AREA (7)
WE	WETLAND ENHANCEMENT AREA (5)
SBE	STREAM BUFFER ENHANCEMENT AREA (6)
	SEEDING FOR REMOVED DRIVEWAYS. NOTE 2.

CITY OF SAMMAMISH APPROVAL	
City Engineer	Date
Community Development	Date

60 % REVIEW SUBMITTAL
NOT FOR CONSTRUCTION

REVISIONS	DATE	BY	
			DESIGNED J. SWENSON
			DRAWN B. PURGANAN
			CHECKED P. JOHANNESSEN
			APPROVED Y. HO

ONE INCH AT FULL SCALE. IF NOT, SCALE ACCORDINGLY
FILE NAME BL1521075P19T03LA-01
JOB No. 554-1521-075 P19 T03
DATE SEPTEMBER 2016

PRELIMINARY
STATE OF WASHINGTON LICENSED LANDSCAPE ARCHITECT
JENS SWENSON
LICENSE NO. 656
EXPIRES ON

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PROJECT NAME
EAST LAKE SAMMAMISH MASTER PLAN TRAIL SOUTH SAMMAMISH SEGMENT B
SAMMAMISH, WA

LANDSCAPE PLAN

SHEET NO. 118 OF 135
LA6

Exhibit 6

CONTECH®
ENGINEERED SOLUTIONS

PRODUCTS | MARKETS | START A PROJECT | KNOWLEDGE CENTER | COMPANY

Products > Pipe > Corrugated Metal (CMP) > Slotted Drain

Slotted Drain™

Slotted Drain pipe removes sheet flow from streets, highways, and parking lots without multiple grades or water channeling devices. The result is an aesthetically pleasing inlet that is safer and easier to install and maintain.

Lindsey Ozbolt

From:	Lindsey Ozbolt
Sent:	Wednesday, January 25, 2017 10:52 AM
To:	'benwhughey@gmail.com'
Subject:	RE: Please Approve the Permit: Segment 2B of the ELST

Dear Ben,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Ben Hughey [mailto:benwhughey@gmail.com]
Sent: Tuesday, January 24, 2017 10:48 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit: Segment 2B of the ELST

Dear

Dear city of Sammamish,

I would like to register my support for completing the ELST and approving permit SSDP2016-00415.

King County has the skeleton of an amazing regional trail system, but many missing gaps hold us back. If we can pave the East Lake Sammamish Trail, we can create a safe transportation corridor for people to move around our region. This would also aid the future Emerald Necklace Trail that could make Sammamish a destination for all kinds of trail users.

Please don't let a few selfish neighbors stand in the way of a greater and long-term benefit to the community, please approve this submitted permit.

Sincerely,

Ben Hughey
1713 Dexter Ave N, Apt 201
Seattle, WA 98109
9077381252

RE: Comments on Section 2B 60% Design Plans

Lindsey Ozbolt

Tue 1/17/2017 10:21 AM

To:John and Barbara <drjnbarb@comcast.net>;

Dear Ms. Johnson,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner I City of Sammamish I Department of Community Development
425.295.0527

From: John and Barbara [mailto:drjnbarb@comcast.net]
Sent: Saturday, January 14, 2017 12:50 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Comments on Section 2B 60% Design Plans

Linsey-
Attached are my comments.
Thank you for giving them serious consideration and response.

Barbara Johnson

Comments regarding Section 2B of East Lake Sammamish Trail Design

Thank you in advance for giving serious consideration and responding to our input.

The comments are regarding the Pine Lake Creek area, named on pages 20, 52, 71, and 124; or as Wetland 23C, 24A, 24B, LA12 or Station 380 (see snip of page 124 at end).

1. On page 71 of the plan documents there appears to be a proposed earth wall and 4' high cyclone fence to be placed on PRIVATE PROPERTY. The subject property is called Whileaway Court (519710TRCT), and is "jointly owned" by the adjacent property owners. The wall and fencing is being proposed for about 40' over the creek on the west side of Whileaway Court; and a ~15' portion of of the wall and fencing on the east side appear to be in the Whileaway Court tract. Since this is private property, **any construction activity requires the consent of all owners.** This fact was made evident to the City during the recent construction / development activity on the Gill Trust Lots (5197100135, 5197100130, 597100120), resulting in a relocation of drainage onto his property and off of Whileaway Court. **And as one of the parties owning Whileaway, we insist you comply with getting written permission from all owners.**

2. As residents near Pine Lake Creek for 22 years, we have witnessed wetland conditions, excess standing water, and soggy & muddy soil much of the year in Wetlands 24A, 24B, AND to the south of Wetland 24B area designation, extending to Pine Lake Creek. **It confounds us that the area between 24B and Pine Lake Creek is not displayed as wetland presently - because it absolutely IS.**

3. Furthermore, on page 124 of the plans a Wetland buffer is notated for WE23C, but no buffer is noted for Wetland 24B or WC 1428 SF. **We request that it be shown on the plans.**

4. The general area north of Pine Lake Creek is classified as wetlands and is also habitat of deer, raccoons, water fowl, beavers, otters, and the occasion bobcat. The concern we have is that the westerly edge of the new trail will extend about 15' west of its current location into wetland regions. Furthermore, the Clearing and Grubbing line appears to extend between 10' – 20' beyond the current trail west edge. **The plan depicts a loss of natural habitat / wetland preservation, which we request be left untouched.**

Please make a smaller Clearing and Grubbing strip, and expand the Wetland area larger than the WC 1428 SF designation. This will help to maintain wetland and wildlife habitat conditions, without interruption or wildlife displacement.

5. A couple years ago the 3 Lots owned by the Gill Trust (5197100135, 5197100130, 597100120) were cleared, graded and prepared for development. We understand the permitting process required a “no touch” zone on the eastern portion of the subject lots – ranging from 50’ – 75’ of setback buffer from the east property line of the Gill lots. It seems from the site design that the County / City are not being held to the same standard with respect to the development of the trail as the Clearing and Grubbing line indicates only about 30’ “no touch” zone setback from the trail Corridor’s westerly property line. **Why the inconsistent application of “no touch” setbacks in wetland zones?**

6. In the present Trail Corridor, to the west of the existing trail (Wetland 24B and adjacent WC to the south), is a mixture of large aged and rotten deciduous trees, plus younger evergreen trees. There have been consistent problems with the older trees – cottonwoods, willows – as whole trees have fallen or large portions have broken off due to wind, rain, and soft wetland conditions, often blocking the trail. **We request that for safety and ease of maintenance, the construction preparation activity remove the large ailing deciduous trees, while preserving the younger evergreen trees, even if they have established themselves in the Clearing and Grubbing area.**

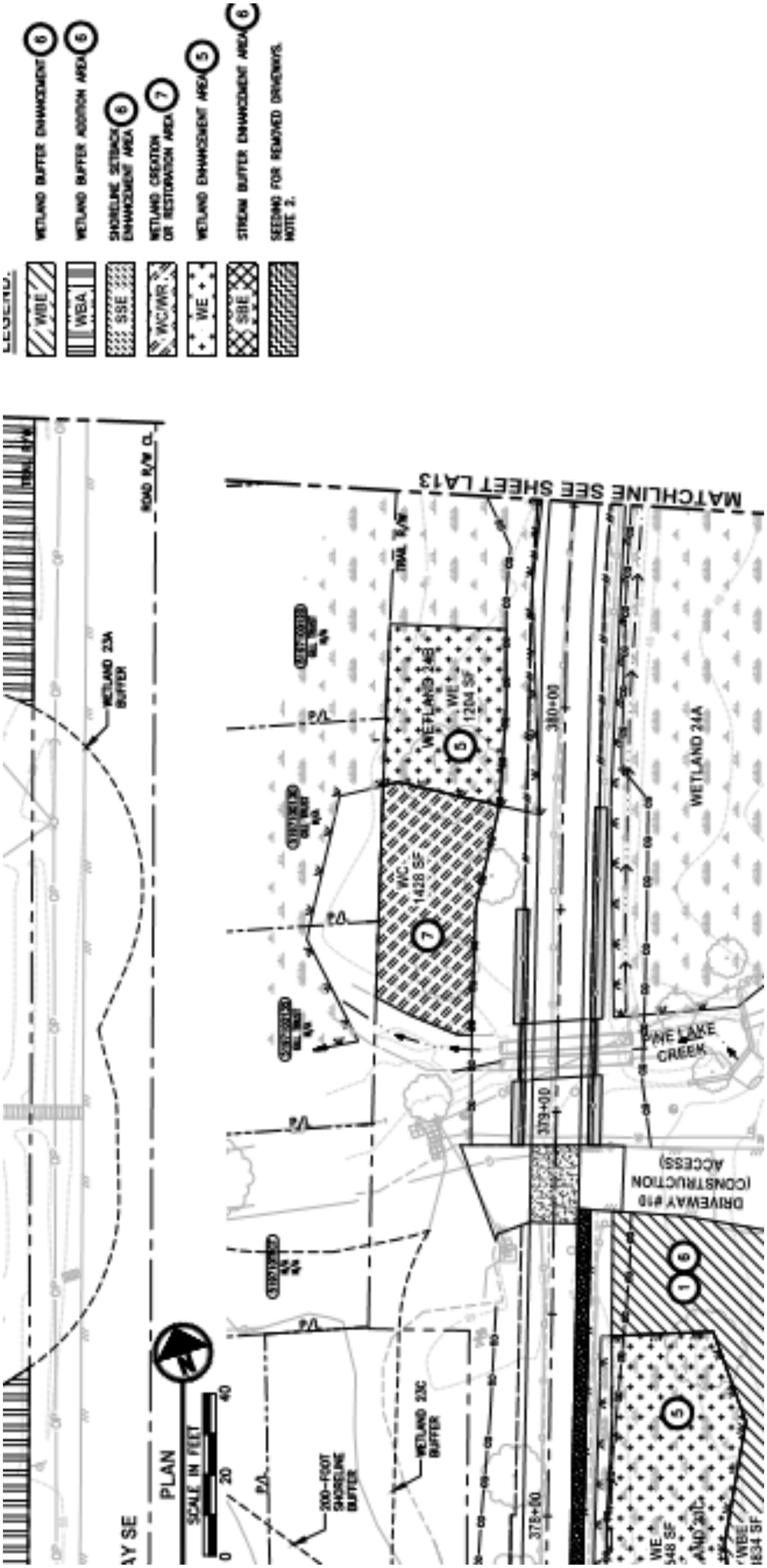
In addition to our comments, we have a question to the City regarding trail maintenance. Here are our observations and resulting question.

As mentioned above, there have been trees and large portions of trees, primarily deciduous, that have fallen over the trail in the vicinity of Pine Lake Creek. In the past the trees / trunks / large limbs were bucked up into bolts or lengths, and just left in an unsightly pile along the trail. What is the City’s maintenance plan and criteria for leaving all the fallen tree debris alongside the trail vs. hauling away the larger portions for better trail appearance and aesthetics? **The courtesy of a reply would be appreciated.**

Respectfully submitted,

Barbara Schulz Johnson

Barbara S Johnson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WBA WETLAND BUFFER ADDITION AREA 6
SSE SHORELINE SETBACK ENHANCEMENT AREA 6
WC/WR WETLAND CREATION OR RESTORATION AREA 7
WE WETLAND ENHANCEMENT AREA 5
SBE STREAM BUFFER ENHANCEMENT AREA 6
SEEDING FOR REMOVED DRIVEWAYS. NOTE 2.
MATCHLINE SEE SHEET LA13
TRAIL R/W
ROAD R/W CL
WETLAND 23A BUFFER
WETLAND 24B
WE
1204 SF
5
WC
1428 SF
7
380+00
379+00
378+00
WETLAND 24A
PINE LAKE CREEK
DRIVEWAY #10 (CONSTRUCTION ACCESS)
1
6
5
PLAN
SCALE IN FEET
0
20
40
200-FOOT SHORELINE BUFFER
WETLAND 23C BUFFER

Lindsey Ozbolt

From:	Lindsey Ozbolt
Sent:	Friday, January 27, 2017 10:32 AM
To:	'paperjam@serv.net'
Subject:	RE: Please Approve the Permit for Segment 2B of the ELST

Dear Sue,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: B.Sue Johnson [mailto:paperjam@serv.net]
Sent: Thursday, January 26, 2017 12:39 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear City of Sammamish,

I have lived on Bainbridge Island since 1985, but grew up in the region and have been a recreational and commuting cyclist for over 45 years. I cannot adequately express my appreciation for the regional trail systems that have developed in those decades, not just for the increased safety they provide for non-motorized transportation, but also the sheer pleasure of connectivity without auto traffic that they provide me. One of my favorite training rides is what I call my "Lakes and Trails Loop", using the Myrtle Edwards, Interbay, South Canal, Burke-Gilman, Sammamish, 520, Mercer Slough, and I-90 trails. When I'm feeling ambitious, I expand this loop to include the East Lake Sammamish, and I have used the Issaquah-Preston and Snoqualmie Valley trails as well. Because the system has such great connectivity now, missing links really stand out as barriers to safe cycling.

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the trail permit, as submitted, so that users of all ages and abilities can safely use the trail. A trail built to national standards (AASHTO), that is 12 ft, plus gravel shoulders, will allow for safe use by a variety of different users, including people who walk and bike.

As proposed in the permit, priority at trail crossings should be given to the trail and trail users. Consistent crossing priority is intuitive and safe for users of both the trail and the driveways and roads that cross the trail.

When complete, the trail will be an even greater community amenity than in it's interim state, and will provide a safe option for people who bike to travel to and through Sammamish. Please complete the trail.

Sincerely,

B.Sue Johnson
Bainbridge Island, WA

B.Sue Johnson
5419 Lynwood Center Rd NE
Bainbridge Island, WA 98110
2068428242

RE: Please Approve the Permit for Segment 2B of the ELST

Lindsey Ozbolt

Mon 1/23/2017 8:51 AM

To:Betsymacinnes@comcast.net <Betsymacinnes@comcast.net>;

Dear Betsy,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Betsy MacInnes [mailto:Betsymacinnes@comcast.net]
Sent: Saturday, January 21, 2017 6:21 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the permit, as submitted.

I rode the trail (from Issaquah to Bothell) several times this fall. It is a beautiful asset for our community and should be completed as quickly as possible. As it becomes more known, I believe this trail can bring $$ to our communities. I look forward to the day I can make safe loops around our Seattle and eastside area on my bike. It is time to stop all the delays and complete the trail.

Approval of the permit will advance completion of the 44 mile regional trail system between Seattle and the foothills of the Cascades. The trail, as proposed in the permit, will provide a safe walking and biking route through Sammamish. Please support the proposed trail widths, which reflect industry standards (AASHTO).

A 12ft trail with 2ft shoulders will create a safe trail with space for the various different uses of the trail... from running to riding a bike. Please approve the permit with the trail widths as proposed.

Ensuring crossing priority for the trail is an important safety issue. Giving priority to the trail when roads and driveways cross the path will be intuitive for all users, whether in a vehicle, on foot, or on a bike. The trail alignment, as proposed in the permit, provides sight lines for good approach visibility for people on the trail and people crossing the trail.

Please approve the permit, as proposed, with expediency.

Betsy MacInnes
4220 - 243rd Place SE
Issaquah, WA 98029
4253912363

Lindsey Ozbolt

From:	Lindsey Ozbolt
Sent:	Friday, January 27, 2017 10:09 AM
To:	'Bmaryman@gmail.com'
Subject:	RE: Please Approve the Permit for Segment 2B of the ELST

Dear Brice,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Brice Maryman [mailto:Bmaryman@gmail.com]
Sent: Wednesday, January 25, 2017 10:44 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the permit, as submitted.

Approval of the permit will advance completion of the 44 mile regional trail system between Seattle and the foothills of the Cascades. The trail, as proposed in the permit, will provide a safe walking and biking route through Sammamish. Please support the proposed trail widths, which reflect industry standards (AASHTO).

A 12ft trail with 2ft shoulders will create a safe trail with space for the various different uses… from people running to people riding a bike. Please approve the permit, including the proposed width of the trail.

Ensuring crossing priority for the trail is an important safety issue. Giving priority to the trail when roads and driveways cross the path will be intuitive for all users. The trail alignment, as proposed in the permit, provides sight lines for good visibility for people on the trail and people crossing the trail at trail intersections.

Please approve the permit, as proposed, with expediency.

Sincerely,

Brice Maryman
6705 35th Pl S
Seattle, WA 98118
2063107254

Lindsey Ozbolt

From: Brad Moore <bgmoore77@gmail.com>
Sent: Thursday, January 26, 2017 9:12 AM
To: Lindsey Ozbolt
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the trail permit, as submitted, so that users of all ages and abilities can safely use the trail. A trail built to national standards (AASHTO), that is 12 ft, plus gravel shoulders, will allow for safe use by a variety of different users, including people who walk and bike.

I work in Bellevue; my family and I all bike both for recreation and transportation/commuting. Completing this trail makes both of these activities better.

As proposed in the permit, priority at trail crossings should be given to the trail and trail users. Consistent crossing priority is intuitive and safe for users of both the trail and the driveways and roads that cross the trail.

When complete, the trail will be an even greater community amenity than in it's interim state, and will provide a safe option for people who bike to travel to and through Sammamish. Please complete the trail.

Sincerely,

Brad Moore
1408 - 140th Place NE, Suite 150
Bellevue, WA 98007
2069206247

RE: East Lake Sammamish Trail Segment 2B

Lindsey Ozbolt

Tue 1/17/2017 9:03 AM

To:Bruce Morehead <brucemorehead@gmail.com>;

Cc:Gordon Torrey <gordontorrey@hotmail.com>; edward mcrae <diaex06@hotmail.com>;

Dear Mr. Morehead,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner I City of Sammamish I Department of Community Development
425.295.0527

From: Bruce Morehead [mailto:brucemorehead@gmail.com]
Sent: Friday, January 13, 2017 9:09 AM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Cc: Gordon Torrey <gordontorrey@hotmail.com>; edward mcrae <diaex06@hotmail.com>
Subject: East Lake Sammamish Trail Segment 2B

Hello Lindsey,

I am the president of the HOA for the Ashton Woods development on SE 8th Street in Sammamish. There are approximately 70 homes in this immediate area which include Ashton Woods, Pulte Lake Vista and about 12 other homes located in this area off SE 8th Street. We would like to propose the following:

- The work effort for the 3.5 mile improvement of the East Lake Sammamish Trail, extending from SE 33rd Street to Inglewood Hill Road be split into two phases; one from SE 33rd Street to SE 8th Street and the other from Inglewood Hill Road to SE 8th Street.

This would allow for use of the trail during the improvements. SE 8th is also used as a parking area for people walking or biking the trail. Closing the entire 3.5 mile stretch would essential prohibit any use of this corridor by the people in our neighborhood as well as the many others who use SE 8th Street to access the trail.

Please take this under consideration and let me know if there are any other information we can provide.

Thank you,

Bruce

--
Bruce Morehead
President - Ashton Woods Homeowners Association
425.681.5114
brucemorehead@gmail.com

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Wednesday, January 25, 2017 11:01 AM
To: 'mbnyland@yahoo.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Bill,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Bill Nyland [mailto:mbnyland@yahoo.com]
Sent: Wednesday, January 25, 2017 5:50 AM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the permit, as submitted.

I don't live in the area but I will ride my bike on the trail as soon as the paving is complete. It is an excellent location for a trail and is a great segment in our growing network. I rode it once last summer but the gravel was too loose for my tires.

It needs to be wide enough so we don't have issues between walkers and bikers

Bill Nyland

Bill Nyland
298th pl
Auburn, WA 98001
253-315-4393

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 9:22 AM
To: 'Benpeterson21@yahoo.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Ben,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Ben Peterson [mailto:Benpeterson21@yahoo.com]
Sent: Wednesday, January 25, 2017 4:19 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear folks who administer permits at the city of Sammamish,

I'm writing to voice my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the permit, as submitted. A lot of thought and planning has gone into the proposed project. A paved trail 12' wide with 2' shoulders is the safest and most useful design for everyone.
I have ridden on narrower trails and it is not as safe.

Please approve the permit, as proposed, with expediency.

Ben Peterson
8722 14th Ave NW
Seattle, WA 98117
206-197-0754

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Wednesday, January 25, 2017 10:09 AM
To: 'billybob713@msn.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Bill,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Bill Prescott [mailto:billybob713@msn.com]
Sent: Tuesday, January 24, 2017 12:28 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear City of Sammamish,

I want to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the permit, as submitted.

I have been a trail user for the past 16 years, and have endured the constant stonewalling of some lakefront residents. Essentially, they regard any land between East Lake Sammamish road and the actual lake as their divine property. There are those who have put up every objection in order to hoard this valuable resource for themselves, even going so far as to cite "environmental concerns" as a reason why the trail should not be built. Please. It's all about preserving their private access and position and neglecting the rest of the population.

A 12ft trail with 2ft shoulders will create a safe trail with space for the various different uses of the trail… from running to riding a bike. Please approve the permit with the trail widths as proposed ASAP.

Completion of this corridor will provide an extremely valuable commuting route as compared to the dangerous route along ELS Drive, with cars going 50mph on one side of you, and a jersey barrier on the other.

Ensuring crossing priority for the trail is an important safety issue. Giving priority to the trail when roads and driveways cross the path will be intuitive for all users, whether in a vehicle, on foot, or on a bike. The trail alignment, as proposed in the permit, provides sight lines for good approach visibility for people on the trail and people crossing the trail.

Please approve the permit, as proposed, immediately.

Thanks, Bp

Bill Prescott
19651 SE 29th St
Sammamish, WA 98075
425-830-0592

RE: Please Approve the Permit for Segment 2B of the ELST

Lindsey Ozbolt

Mon 1/23/2017 8:50 AM

To:brianreed528@gmail.com <brianreed528@gmail.com>;

Dear Brian,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: BRIAN REED [mailto:brianreed528@gmail.com]
Sent: Saturday, January 21, 2017 7:15 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

As for the dissenters along the former railway, how about instead of a trail for families and other non-threatening fitness enthusiasts, we get the former freight trains running again. Show some perspective and get over yourselves, promote community and not selfishness. Lake Sammamish and its perimeter is not owned by you, you only own the land to the end of your driveway.

Sincerely, Brian from Redmond.

BRIAN REED
5501 161ST PL NE
REDMOND, WA 98052

4258833134

RE: Please Approve the Permit for Segment 2B of the ELST

Lindsey Ozbolt

Mon 1/23/2017 8:43 AM

To:Britinizer@comcast.net <Britinizer@comcast.net>;

Dear Brita,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Brita Rood [mailto:Britinizer@comcast.net]
Sent: Sunday, January 22, 2017 3:14 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the trail permit, as submitted, so that users of all ages and abilities can safely use the trail. A trail built to national standards (AASHTO), that is 12 ft, plus 2 ft gravel shoulders, will allow for safe use by a variety of different users, including people who walk and bike.

As proposed in the permit, priority at trail crossings should be given to the trail and trail users. Consistent crossing priority is intuitive and safe for users of both the trail and the driveways and roads that cross the trail.

When complete, the trail will be an even greater community amenity, and provide a safe option for people who bike to travel to and through Sammamish. Please complete the trail.

This is a wonderful trail for riding. It would be so nice to have the option of using this trail all the way around the lake. I have used parts of the trail for s few years riding with the cascade bicycle club. It would be an added benefit for folks that live in the area as well.

Sincerely,

Brita Rood
18209 se 246th st
Covington, WA 98042
2067197309

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Wednesday, January 25, 2017 10:40 AM
To: 'bsteiner@efn.org'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Brad,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Brad Steiner [mailto:bsteiner@efn.org]
Sent: Tuesday, January 24, 2017 9:31 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

As an avid cyclist and regular trail user I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

Please approve the permit, as submitted.

Approval of the permit will advance completion of the 44 mile regional trail system between Seattle and the foothills of the Cascades. The trail, as proposed in the permit, will provide a safe walking and biking route through Sammamish. Please support the proposed trail widths, which reflect industry standards (AASHTO).

A 12ft trail with 2ft shoulders will create a safe trail with space for the various different uses of the trail… from running to riding a bike. Please approve the permit with the trail widths as proposed.

Ensuring crossing priority for the trail is an important safety issue. Giving priority to the trail when roads and driveways cross the path will be intuitive for all users, whether in a vehicle, on foot, or on a bike. The trail alignment, as proposed in the permit, provides sight lines for good approach visibility for people on the trail and people crossing the trail.

Please approve the permit, as proposed, with expediency.

Brad Steiner
12th Ave NE
Seattle, WA 98115
2069859520

Lindsey Ozbolt

From: Lindsey Ozbolt
Sent: Friday, January 27, 2017 9:37 AM
To: 'brian@tosch.com'
Subject: RE: Please Approve the Permit for Segment 2B of the ELST

Dear Brian,

Thank you for contacting the City of Sammamish regarding the current Shoreline Substantial Development Permit Application for East Lake Sammamish Trail Segment 2B (SSDP2016-00415).

Your comments have been received and will be included in the project record. At the close of the comment period, all comments will be compiled and provided to King County for review and response. You will be included in future notices the City issues for this proposal.

Regards,

Lindsey Ozbolt
Associate Planner | City of Sammamish | Department of Community Development
425.295.0527

-----Original Message-----
From: Brian Tosch [mailto:brian@tosch.com]
Sent: Wednesday, January 25, 2017 6:38 PM
To: Lindsey Ozbolt <LOzbolt@sammamish.us>
Subject: Please Approve the Permit for Segment 2B of the ELST

Dear

Dear city of Sammamish,

I'm writing to express my support for completing the ELST and approving permit SSDP2016-00415.

I am so excited to finally see this project finished. This is a hugely important piece of the trail system I use several days a week as a neighbor to Marymoor Park.

Please approve the permit, as submitted.

Approval of the permit will advance completion of the 44 mile regional trail system between Seattle and the foothills of the Cascades. The trail, as proposed in the permit, will provide a safe walking and biking route through Sammamish. Please support the proposed trail widths, which reflect industry standards (AASHTO).

A 12ft trail with 2ft shoulders will create a safe trail with space for the various different uses… from people running to people riding a bike. Please approve the permit, including the proposed width of the trail.

Ensuring crossing priority for the trail is an important safety issue. Giving priority to the trail when roads and driveways cross the path will be intuitive for all users. The trail alignment, as proposed in the permit, provides sight lines for good visibility for people on the trail and people crossing the trail at trail intersections.

Please approve the permit, as proposed, with expediency.

Sincerely,

Brian Tosch
16253 NE 51st St.
Redmond, WA 98052
206-683-6788