

City of Lake Forest Park, King County, Washington
Technical Information Report
And Downstream Analysis

For:

Garey Reasonable Use Exception

36xx NE 205th St, Lake Forest Park, WA

APN 4022900497



Mark X. Plog, P.E.

Revisions:

Date	Description
8/8/2022	Revised

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Section 1 – Project Overview

The proposed project is to construct one single-family residential structure on an undeveloped lot north of 3611 NE 205th Street in the City of Lake Forest Park (parcel 4022900497). The lot is uncleared with no existing buildings on site. The project site is located in the NE Quarter of Section 33, Township 24N, Range 5 E, King County, Washington and is shown on the vicinity map below.

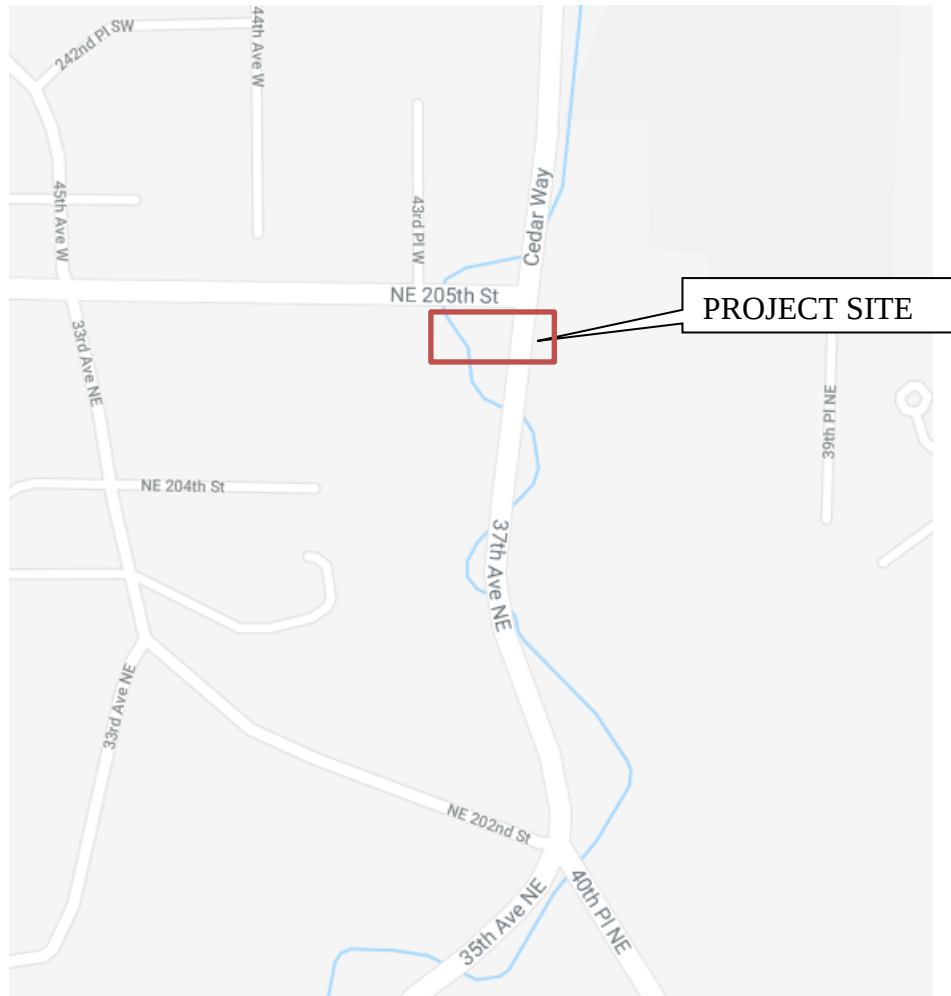


Figure 1 – Vicinity Map

A Reasonable Use Exception is being applied for in order to reduce buffer sizes to allow for a residential structure to be built on-site. There is currently a creek running through the property (see Figure 2).

The soils mapped at the site are Alderwood Complex, 5 to 35% slopes. These soils are moderately well drained and considered SCS Hydrologic Soil Group B soils. These are till soils that exhibit relatively slight surface runoff with significant interflow between the soil surface and underlying glacial till layers. See the soils map below for more information on the site soils.

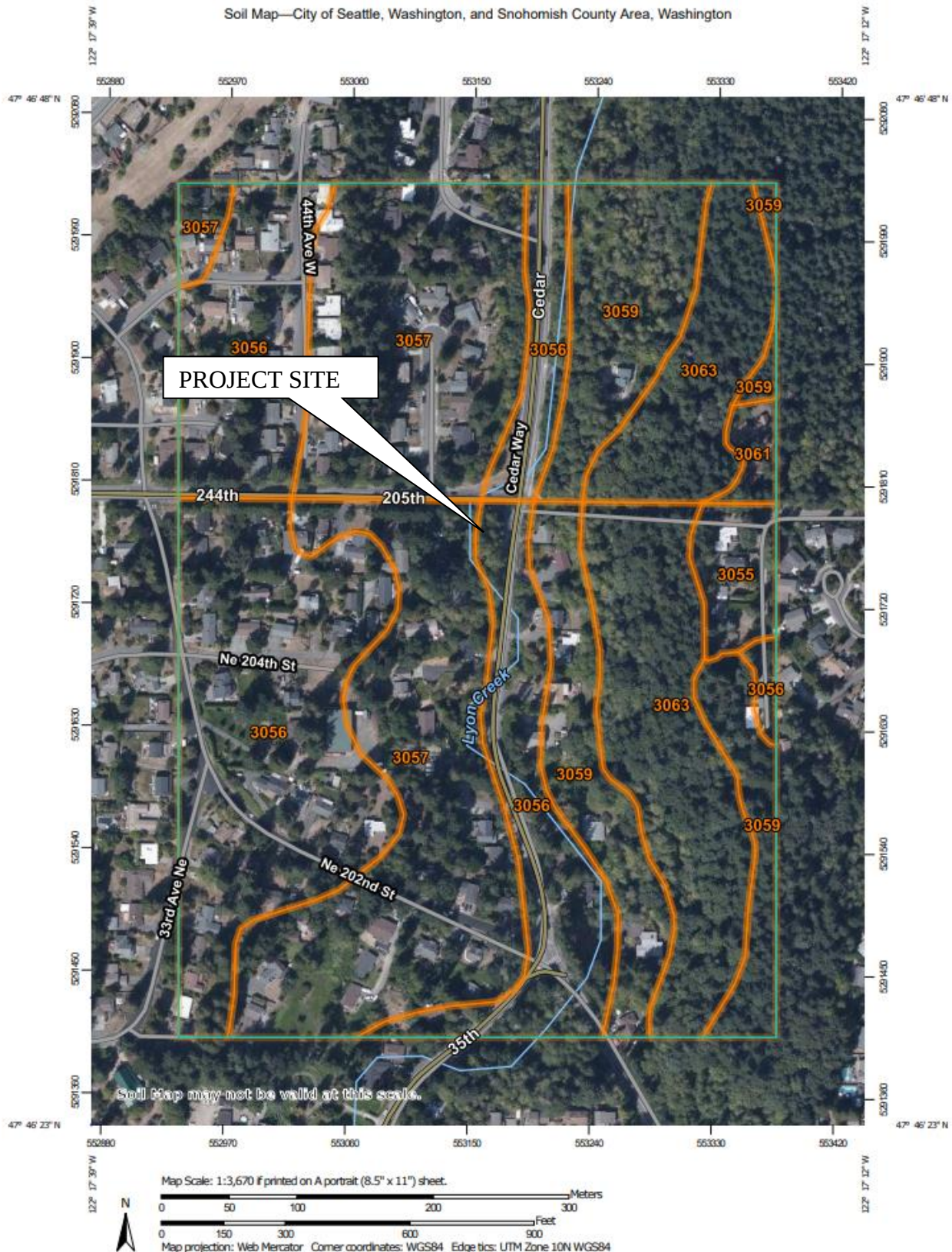


Figure 2 – USGS Soil Map

Section 2 – Conditions and Requirements Summary

The following summary describes how this project will meet the eight “Core Requirements” and the “Special Requirements” that apply:

Core Requirements

1. **Discharge at the natural location:** This site currently discharges to the creek on the property. The natural discharge location will be maintained.
2. **Off-site Analysis:** A Level 1 off-site analysis was completed for this project and is included in Section 3 of this report.
3. **Flow control:** This site is exempt from flow control based on the basic exemption in Section 1.2.3.
4. **Conveyance system:** Dispersion will be utilized; no conveyance system.
5. **Erosion and sedimentation control:** An erosion and sediment control plan has been provided with the submittal.
6. **Maintenance and Operations:** The stormwater facilities for this project shall be maintained in accordance with the requirements of Appendix A of the 2016 KCSWDM.
7. **Financial guarantees and liability:** Financial guarantees and liability will be provided as required by the City of Lake Forest Park.
8. **Water Quality:** This project is exempt from Water Quality requirements.
9. **Flow Control BMP's:** These will be implemented in accordance with KCSWDM Section 1.2.9.3. Specifically, a flat roof with unconcentrated flows to a gravel drip zone and flow dispersion

Special Requirements

1. **Other adopted area-specific requirements:** None
2. **Floodplain/Floodway delineation:** None
3. **Flood protection facilities:** None
4. **Source controls:** None
5. **Oil Control:** None

Section 3 – Off-site Analysis

This Level 1 Downstream Analysis is submitted as required by Core Requirement #2, of the 20016 KCSWDM. Core Requirement #2 requires a qualitative analysis of upstream and downstream drainage conditions with an initial project submittal.

Task 1: Study Area Definition and Maps:

See Section–1 Project Overview of this report for a detailed Study Area Definition.

Task 2: Resource Review:

The King County Sensitive Area Maps, along with the Critical Areas Report from The Watershed Company, show that there is an unclassified creek on the property.

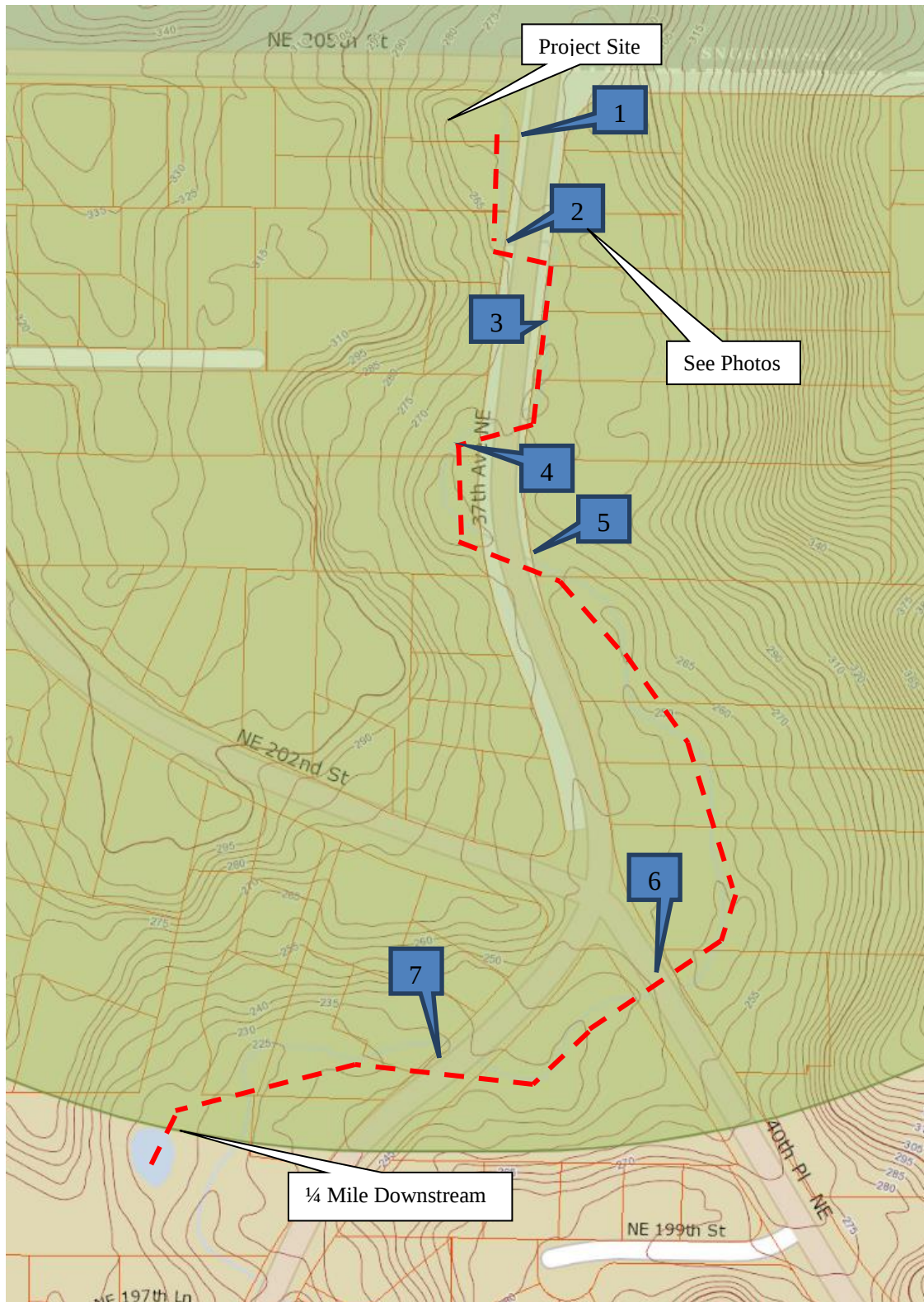
There were no recent drainage complaints on parcels within ¼ mile directly downstream of the proposed project parcel.

Task 3: Field Inspection:

A field observation of the site, upstream drainage area, and ¼ mile downstream drainage path conditions was performed in June, 2018.

Task 4: Drainage System Description and Problem Descriptions:

Upstream: There is not any significant upstream drainage area contributing to the site.



Gary RUE – Lake Forest Park		
Photo#	Description	Photo
1	Sheet flow from property into ravine/stream that exits property on SE corner Potential for erosion due to steep slopes on property	
2	Stream flows under 37th via 2' corrugated metal pipe culvert; lined with rocks and sandbags	
3	Drainage ditch/stream Flows under 2 driveways; 2 2' corrugated metal pipe culverts	

4	Stream crosses W under 37 th 2.5' corrugated metal pipe culvert	
5	Stream crosses E/SE across 37 th 2.5' corrugated metal pipe culvert	
6	Stream crosses under 40 th 2.5' corrugated metal pipe culvert Stream is joined by runoff from 40 th as well as residences uphill	

7	Stream crosses under 37 th 2.5' corrugated metal pipe culvert	
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Task 5 – Mitigation of Existing or Potential Problems:

The downstream analysis showed no signs of potential problems. Development mitigation will be outlined in the critical area mitigation plan provided by Altmann Oliver Associates.

Section 4 – Flow Control and Water Quality Facility Analysis and Design

Flow Control

Per the 2016 KCSWDM, this site is exempt from flow control based on the basic exemption in Section 1.2.3. with an increase of less than 0.15 cfs for the 100–year storm. The following calculations were performed to demonstrate the exemption.

Existing undeveloped parcel

Forested area: 0.261 Acres

Proposed parcel

Proposed Home: 1,100 SF (0.025 Acres Impervious)

Asphalt: 738 SF (.017 Acres Impervious)

Lawn: 1,437 SF (0.033 Acres Till Grass)

Forested: 0.203 Acres

Total Impervious: 0.042 Ac

Total Till Grass: 0.033 Ac

Forested: 0.186 Ac

TOTAL: 0.261 Ac

The analysis was completed and attached. The results are as follows:

Existing Condition Analysis

Flow Frequency		
Flow (cfs)	0501	15m
2 Year	=	0.0050
5 Year	=	0.0084
10 Year	=	0.0103
25 Year	=	0.0124
50 Year	=	0.0136
100 Year	=	0.0146

Proposed Condition Analysis

Flow Frequency		
Flow (cfs)	0801	15m
2 Year	=	0.0158
5 Year	=	0.0212
10 Year	=	0.0252
25 Year	=	0.0305
50 Year	=	0.0348
100 Year	=	0.0394

The resulting net increase in the 100yr flow from the historical condition to the developed condition is 0.0394 cfs – 0.0146 cfs = 0.0248 cfs <<< 0.15 cfs. Therefore, this project is exempt from the requirements for flow control.

Water Quality

This project proposes less than 5,000 SF of PGIS and is exempt from Water Quality requirements.

Section 5 – Conveyance System Analysis and Design

None

Section 6 – Special Reports and Studies

A wetland and stream report and a mitigation plan has been provided by The Watershed Company. It has been provided as part of this preliminary submittal.

Section 7 – Other Permits

Not analyzed for this preliminary TIR.

Section 8 – ESC Analysis and Design

No analysis required. A TESC plan has been provided.

Section 9 – Bond Quantities, Facility Summaries, and Declaration of Covenant

None required

Section 10 – Operations and Maintenance Manual

None required

TECHNICAL INFORMATION REPORT (TIR) WORKSHEET

Part 1 PROJECT OWNER AND PROJECT ENGINEER

Project Owner Mark Govey
 Phone 206 446 9090
 Address _____

Project Engineer Mark X. Plog, PE, PLS
 Company Plog Engineering
 Phone 206 420 7130

Part 2 PROJECT LOCATION AND DESCRIPTION

Project Name Govey RUE
 DLS-Permitting
 Permit # 2021-RUE-0001
 Location Township 24
 Range 5
 Section 33
 Site Address 36XX NE 205th St
Lake Forest Park, WA

Part 3 TYPE OF PERMIT APPLICATION

- ☒ Land use (e.g., Subdivision / Short Subd. / UPD)
☐ Building (e.g., M/F / Commercial / SFR)
☐ Clearing and Grading
☐ Right-of-Way Use
☒ Other RUE

Part 4 OTHER REVIEWS AND PERMITS¹

- ☐ DFW HPA ☐ Shoreline Management
☐ COE CWA 404 ☐ Structural Rockery/Vault/_____
☐ ECY Dam Safety ☐ ESA Section 7
☐ FEMA Floodplain
☐ COE Wetlands
☐ Other _____

Part 5 PLAN AND REPORT INFORMATION

Technical Information Report

Type of Drainage Review (check one):
☒ Full
☐ Targeted
☐ Simplified
☐ Large Project
☐ Directed
 Date (include revision dates): 3/16/22
 Date of Final: _____

Site Improvement Plan (Engr. Plans)

Plan Type (check one):
☒ Full
☐ Modified
☐ Simplified
 Date (include revision dates): 3/16/22
 Date of Final: _____

Part 6 SWDM ADJUSTMENT APPROVALS

Type (circle one): Standard / Experimental / Blanket

Description: (include conditions in TIR Section 2)

Approved Adjustment No. _____ Date of Approval: _____

¹ DFW: WA State Dept. of Fish and Wildlife. HPA: hydraulic project approval. COE: (Army) Corps of Engineers. CWA: Clean Water Act. ECY: WA State Dept. of Ecology. FEMA: Federal Emergency Management Agency. ESA: Endangered Species Act.

TECHNICAL INFORMATION REPORT (TIR) WORKSHEET

Part 7 MONITORING REQUIREMENTS

Monitoring Required: Yes ☒ No

Start Date: _____

Completion Date: _____

Describe: _____

Re: KCSWDM Adjustment No. _____

Part 8 SITE COMMUNITY AND DRAINAGE BASIN

Community Plan: _____

Special District Overlays: _____

Drainage Basin: Lynn Creek

Stormwater Requirements: _____

Part 9 ONSITE AND ADJACENT SENSITIVE AREAS

☒ River/Stream _____☐ Lake _____☐ Wetlands _____☐ Closed Depression _____☐ Floodplain _____☐ Other _____☒ Steep Slope _____☐ Erosion Hazard _____☐ Landslide Hazard _____☐ Coal Mine Hazard _____☐ Seismic Hazard _____☐ Habitat Protection _____☐ _____

Part 10 SOILS

Soil Type

Alderwood

Slopes

5-35%

Erosion Potential

moderate☒ High Groundwater Table (within 5 feet)☐ Other _____☐ Sole Source Aquifer☐ Seeps/Springs☐ Additional Sheets Attached

TECHNICAL INFORMATION REPORT (TIR) WORKSHEET

Part 11 DRAINAGE DESIGN LIMITATIONS

REFERENCE

LIMITATION / SITE CONSTRAINT

☐ Core 2 – Offsite Analysis _____☒ Sensitive/Critical Areas _____☐ SEPA _____☐ LID Infeasibility _____☐ Other _____☐ _____stream + buffer☐ Additional Sheets Attached

Part 12 TIR SUMMARY SHEET

(provide one TIR Summary Sheet per Threshold Discharge Area)

Threshold Discharge Area:
(name or description)Area east of stream

Core Requirements (all 8 apply):

Discharge at Natural Location

Number of Natural Discharge Locations: 1

Offsite Analysis

Level: 1 / 2 / 3

dated: 10/2020Flow Control (include facility
summary sheet)

Level: 1 / 2 / 3

or Exemption Number 1.2.3.Flow Control BMPs Rain Garden

Conveyance System

Spill containment located at: N/AErosion and Sediment Control /
Construction Stormwater
Pollution PreventionCSWPP/CESCL/ESC Site Supervisor: Mark GarryContact Phone: 206-446-9090After Hours Phone: same

Maintenance and Operation

Responsibility (circle one): Private / PublicIf Private, Maintenance Log Required: Yes (No)Financial Guarantees and
LiabilityProvided: Yes (No)Water Quality (include facility
summary sheet)Type (circle one): Basic / Sens. Lake / Enhanced Basic / Bog
or Exemption No. 1.2.3 - 1Landscape Management Plan: Yes (No)

For Entire Project:

% of Target Impervious that had a
feasible FCBMP
implemented 100%Total Replaced Impervious surfaces on the site 0Total New Pervious Surfaces on the site 1,838 SFRepl. Imp. on site mitigated w/flow control facility 0Repl. Imp. on site mitigated w/water quality facility 0Repl. Imp. on site mitigated with FCBMP 0

TECHNICAL INFORMATION REPORT (TIR) WORKSHEET

Part 12 TIR SUMMARY SHEET (provide one TIR Summary Sheet per Threshold Discharge Area)

Special Requirements (as applicable):

Area Specific Drainage Requirements Type: CDA / SDO / MDP / BP / LMP / Shared Fac. / None
Name: _____

Floodplain/Floodway Delineation Type (circle one): Major / Minor / Exemption / None
100-year Base Flood Elevation (or range): _____
Datum: _____

Flood Protection Facilities Describe: _____

Source Control Describe land use:
(commercial / industrial land use) Describe any structural controls: _____

Oil Control High-use Site: Yes / No
Treatment BMP: _____
Maintenance Agreement: Yes / No
with whom? _____

Other Drainage Structures

Describe: _____

Part 13 EROSION AND SEDIMENT CONTROL REQUIREMENTS

MINIMUM ESC REQUIREMENTS DURING CONSTRUCTION

- ☒ Clearing Limits
- ☒ Cover Measures
- ☒ Perimeter Protection
- ☐ Traffic Area Stabilization
- ☐ Sediment Retention
- ☐ Surface Water Collection
- ☐ Dewatering Control
- ☐ Dust Control
- ☐ Flow Control
- ☒ Protection of Flow Control BMP Facilities (existing and proposed)
- ☒ Maintain BMPs / Manage Project

MINIMUM ESC REQUIREMENTS AFTER CONSTRUCTION

- ☒ Stabilize exposed surfaces
- ☒ Remove and restore Temporary ESC Facilities
- ☐ Clean and remove all silt and debris, ensure operation of Permanent Facilities, restore operation of Flow Control BMP Facilities as necessary
- ☒ Flag limits of SAO and open space preservation areas
- ☐ Other _____

TECHNICAL INFORMATION REPORT (TIR) WORKSHEET

Part 14 STORMWATER FACILITY DESCRIPTIONS (Note: Include Facility Summary and Sketch)			
Flow Control	Type/Description	Water Quality	Type/Description
☐ Detention	_____	☐ Vegetated Flowpath	_____
☐ Infiltration	_____	☐ Wetpool	_____
☐ Regional Facility	_____	☐ Filtration	_____
☐ Shared Facility	_____	☐ Oil Control	_____
☐ Flow Control BMPs	_____	☐ Spill Control	_____
☐ Other	_____	☐ Flow Control BMPs	_____
		☐ Other	_____

Part 15 EASEMENTS/TRACTS	Part 16 STRUCTURAL ANALYSIS
☐ Drainage Easement	☐ Cast in Place Vault
☐ Covenant	☐ Retaining Wall
☐ Native Growth Protection Covenant	☐ Rockery > 4' High
☐ Tract	☐ Structural on Steep Slope
☐ Other _____	☐ Other _____

Part 17 SIGNATURE OF PROFESSIONAL ENGINEER
I, or a civil engineer under my supervision, have visited the site. Actual site conditions as observed were incorporated into this worksheet and the attached Technical Information Report. To the best of my knowledge the information provided here is accurate. 3/17/22 Signed/Date

WWHM2012
PROJECT REPORT

General Model Information

Project Name: default[0]
Site Name:
Site Address:
City:
Report Date: 3/16/2022
Gage: Seatac
Data Start: 1948/10/01
Data End: 2009/09/30
Timestep: 15 Minute
Precip Scale: 0.833
Version Date: 2019/09/13
Version: 4.2.17

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass: No

GroundWater: No

Pervious Land Use acre
C, Forest, Mod 0.261

Pervious Total 0.261

Impervious Land Use acre

Impervious Total 0

Basin Total 0.261

Element Flows To:		
Surface	Interflow	Groundwater

*Mitigated Land Use***Basin 1**

Bypass:	No
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GroundWater:	No
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Pervious Land Use	acre
C, Lawn, Flat	0.033
C, Forest, Mod	0.186

Pervious Total	0.219
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Impervious Land Use	acre
ROOF TOPS FLAT	0.025
DRIVEWAYS FLAT	0.017

Impervious Total	0.042
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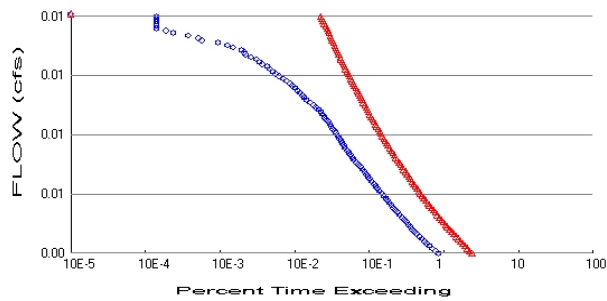
Basin Total	0.261
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Element Flows To:		
Surface	Interflow	Groundwater

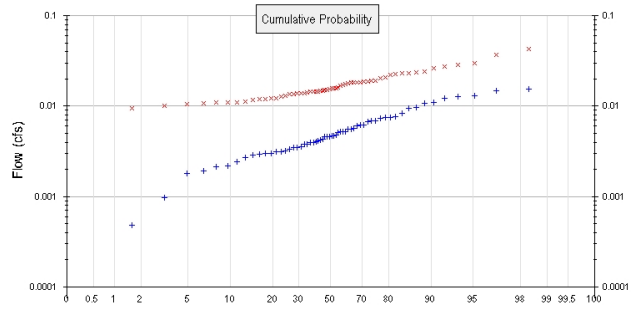
Routing Elements
Predeveloped Routing

Analysis Results

POC 1



+ Predeveloped x Mitigated



Predeveloped Landuse Totals for POC #1

Total Pervious Area: 0.261
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1

Total Pervious Area: 0.219
Total Impervious Area: 0.042

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	0.005008
5 year	0.008397
10 year	0.010333
25 year	0.012359
50 year	0.013586
100 year	0.014609

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0.01584
5 year	0.021235
10 year	0.025153
25 year	0.03051
50 year	0.034806
100 year	0.039372

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1949	0.006	0.023
1950	0.007	0.022
1951	0.013	0.018
1952	0.004	0.011
1953	0.003	0.010
1954	0.005	0.014
1955	0.008	0.015
1956	0.006	0.015
1957	0.004	0.018
1958	0.005	0.012

1959	0.005	0.011
1960	0.007	0.017
1961	0.005	0.015
1962	0.002	0.010
1963	0.003	0.014
1964	0.005	0.013
1965	0.003	0.017
1966	0.003	0.012
1967	0.007	0.023
1968	0.005	0.019
1969	0.004	0.014
1970	0.003	0.015
1971	0.003	0.016
1972	0.010	0.021
1973	0.004	0.011
1974	0.004	0.015
1975	0.005	0.019
1976	0.004	0.014
1977	0.000	0.011
1978	0.003	0.014
1979	0.002	0.018
1980	0.006	0.023
1981	0.003	0.015
1982	0.004	0.024
1983	0.006	0.016
1984	0.003	0.012
1985	0.002	0.015
1986	0.010	0.018
1987	0.007	0.018
1988	0.003	0.011
1989	0.002	0.012
1990	0.015	0.043
1991	0.011	0.029
1992	0.004	0.012
1993	0.004	0.009
1994	0.001	0.009
1995	0.006	0.014
1996	0.013	0.024
1997	0.011	0.019
1998	0.002	0.013
1999	0.007	0.028
2000	0.004	0.016
2001	0.000	0.014
2002	0.005	0.019
2003	0.005	0.018
2004	0.006	0.026
2005	0.005	0.016
2006	0.007	0.015
2007	0.012	0.037
2008	0.016	0.030
2009	0.008	0.021

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.0156	0.0425
2	0.0149	0.0370
3	0.0129	0.0296

4	0.0128	0.0289
5	0.0123	0.0277
6	0.0109	0.0263
7	0.0107	0.0242
8	0.0096	0.0238
9	0.0095	0.0234
10	0.0083	0.0229
11	0.0077	0.0228
12	0.0075	0.0223
13	0.0074	0.0206
14	0.0073	0.0206
15	0.0069	0.0191
16	0.0068	0.0190
17	0.0068	0.0188
18	0.0063	0.0187
19	0.0062	0.0184
20	0.0061	0.0183
21	0.0057	0.0182
22	0.0056	0.0182
23	0.0056	0.0179
24	0.0052	0.0175
25	0.0052	0.0174
26	0.0052	0.0169
27	0.0051	0.0162
28	0.0047	0.0159
29	0.0047	0.0159
30	0.0046	0.0158
31	0.0046	0.0155
32	0.0046	0.0151
33	0.0046	0.0151
34	0.0043	0.0149
35	0.0042	0.0148
36	0.0041	0.0146
37	0.0040	0.0145
38	0.0040	0.0145
39	0.0039	0.0144
40	0.0038	0.0142
41	0.0038	0.0139
42	0.0036	0.0139
43	0.0035	0.0138
44	0.0035	0.0135
45	0.0034	0.0135
46	0.0032	0.0131
47	0.0031	0.0128
48	0.0031	0.0122
49	0.0030	0.0121
50	0.0030	0.0120
51	0.0029	0.0119
52	0.0029	0.0117
53	0.0027	0.0113
54	0.0024	0.0111
55	0.0022	0.0110
56	0.0022	0.0109
57	0.0019	0.0107
58	0.0018	0.0104
59	0.0010	0.0102
60	0.0005	0.0094
61	0.0002	0.0091

Duration Flows

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0025	17909	50670	282	Fail
0.0026	16335	47055	288	Fail
0.0027	14972	43761	292	Fail
0.0028	13719	40724	296	Fail
0.0030	12637	37922	300	Fail
0.0031	11668	35334	302	Fail
0.0032	10818	33110	306	Fail
0.0033	10014	30928	308	Fail
0.0034	9274	28960	312	Fail
0.0035	8639	27121	313	Fail
0.0036	8061	25410	315	Fail
0.0037	7569	23784	314	Fail
0.0038	7099	22309	314	Fail
0.0040	6665	20929	314	Fail
0.0041	6254	19667	314	Fail
0.0042	5861	18478	315	Fail
0.0043	5491	17404	316	Fail
0.0044	5116	16386	320	Fail
0.0045	4770	15443	323	Fail
0.0046	4487	14489	322	Fail
0.0047	4216	13650	323	Fail
0.0049	3995	12902	322	Fail
0.0050	3749	12179	324	Fail
0.0051	3531	11544	326	Fail
0.0052	3324	10878	327	Fail
0.0053	3140	10333	329	Fail
0.0054	2939	9781	332	Fail
0.0055	2766	9300	336	Fail
0.0056	2607	8823	338	Fail
0.0058	2464	8374	339	Fail
0.0059	2316	7967	343	Fail
0.0060	2171	7595	349	Fail
0.0061	2050	7217	352	Fail
0.0062	1942	6862	353	Fail
0.0063	1836	6521	355	Fail
0.0064	1751	6194	353	Fail
0.0065	1642	5888	358	Fail
0.0066	1525	5600	367	Fail
0.0068	1422	5345	375	Fail
0.0069	1333	5084	381	Fail
0.0070	1267	4830	381	Fail
0.0071	1197	4616	385	Fail
0.0072	1131	4406	389	Fail
0.0073	1068	4192	392	Fail
0.0074	1014	3980	392	Fail
0.0075	964	3797	393	Fail
0.0077	927	3636	392	Fail
0.0078	889	3478	391	Fail
0.0079	853	3354	393	Fail
0.0080	809	3213	397	Fail
0.0081	770	3071	398	Fail
0.0082	730	2945	403	Fail
0.0083	693	2815	406	Fail
0.0084	655	2697	411	Fail

0.0085	633	2579	407	Fail
0.0087	606	2464	406	Fail
0.0088	558	2361	423	Fail
0.0089	529	2250	425	Fail
0.0090	506	2156	426	Fail
0.0091	480	2090	435	Fail
0.0092	446	2022	453	Fail
0.0093	409	1948	476	Fail
0.0094	379	1861	491	Fail
0.0096	341	1782	522	Fail
0.0097	305	1714	561	Fail
0.0098	285	1656	581	Fail
0.0099	268	1597	595	Fail
0.0100	250	1532	612	Fail
0.0101	231	1462	632	Fail
0.0102	217	1413	651	Fail
0.0103	200	1356	678	Fail
0.0105	185	1302	703	Fail
0.0106	167	1247	746	Fail
0.0107	151	1197	792	Fail
0.0108	131	1159	884	Fail
0.0109	118	1120	949	Fail
0.0110	109	1073	984	Fail
0.0111	100	1028	1028	Fail
0.0112	91	995	1093	Fail
0.0113	78	964	1235	Fail
0.0115	72	932	1294	Fail
0.0116	65	895	1376	Fail
0.0117	55	867	1576	Fail
0.0118	47	836	1778	Fail
0.0119	45	812	1804	Fail
0.0120	41	785	1914	Fail
0.0121	32	761	2378	Fail
0.0122	27	731	2707	Fail
0.0124	20	707	3534	Fail
0.0125	12	677	5641	Fail
0.0126	11	662	6018	Fail
0.0127	8	640	8000	Fail
0.0128	5	616	12320	Fail
0.0129	4	600	15000	Fail
0.0130	3	584	19466	Fail
0.0131	3	555	18500	Fail
0.0133	3	534	17800	Fail
0.0134	3	511	17033	Fail
0.0135	3	489	16300	Fail
0.0136	3	472	15733	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 #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 = Failed

Model Default Modifications

Total of 0 changes have been made.

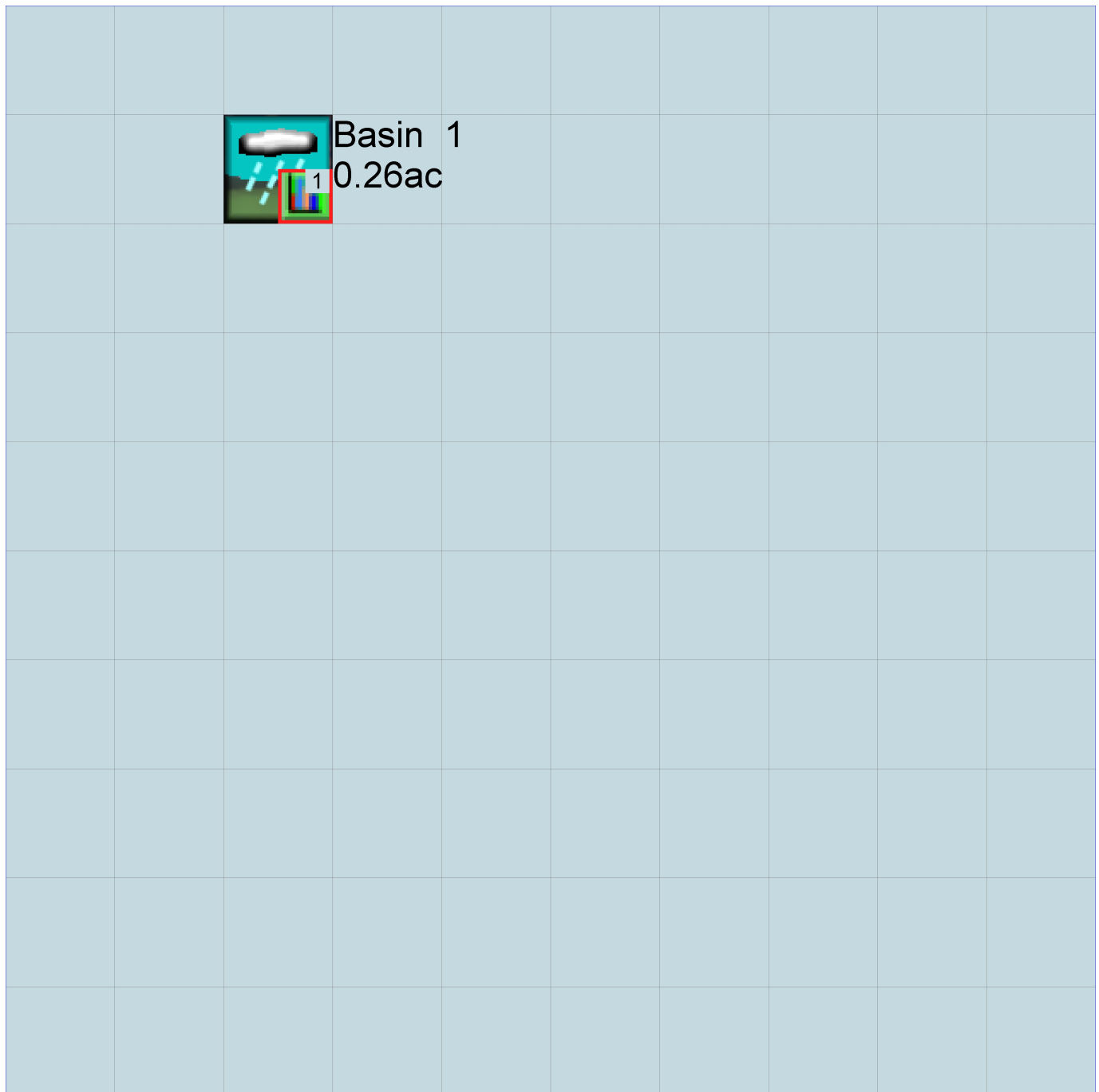
PERLND Changes

No PERLND changes have been made.

IMPLND Changes

No IMPLND changes have been made.





Predeveloped UCI File

RUN

GLOBAL

```

WWM4 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     default[0].wdm
MESSU    25     Predefault[0].MES
          27     Predefault[0].L61
          28     Predefault[0].L62
          30     POCdefault[0]1.dat

```

END FILES

OPN SEQUENCE

```

INGRP                      INDELT 00:15
  PERLND      11
  COPY        501
  DISPLY      1

```

END INGRP

END OPN SEQUENCE

DISPLY

```

DISPLY-INF01
# - #<-----Title----->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
1      Basin 1                      MAX          1    2    30    9

```

END DISPLY-INF01

END DISPLY

COPY

```

TIMESERIES
# - # NPT NMN ***
1      1    1
501    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
11      C, 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 ***
11      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 *****
11      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 ***
11      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
11      0      4.5      0.08      400      0.1      0.5      0.996
END PWAT-PARM2

PWAT-PARM3
<PLS > PWATER input info: Part 3 ***
# - # ***PETMAX PETMIN INFEXP INFILD DEEPFR BASETP AGWETP
11      0      0      2      2      0      0      0
END PWAT-PARM3

PWAT-PARM4
<PLS > PWATER input info: Part 4 ***
# - # CEPSC UZSN NSUR INTFW IRC LZETP ***
11      0.2      0.5      0.35      6      0.5      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
11      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 ***

END GEN-INFO
*** Section IWATER***

ACTIVITY
<PLS > ***** Active Sections *****
# - # ATMP SNOW IWAT SLD IWG IQAL ***
END ACTIVITY

PRINT-INFO
<ILS > ***** Print-flags ***** PIVL PYR
# - # ATMP SNOW IWAT SLD IWG IQAL *****
END PRINT-INFO

IWAT-PARM1
<PLS > IWATER variable monthly parameter value flags ***
# - # CSNO RTOP VRS VNN RTLI ***
END IWAT-PARM1

IWAT-PARM2
<PLS > IWATER input info: Part 2 ***
# - # *** LSUR SLSUR NSUR RETSC
END IWAT-PARM2

IWAT-PARM3
<PLS > IWATER input info: Part 3 ***
# - # ***PETMAX PETMIN
END IWAT-PARM3

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

```

END IMPLND

SCHEMATIC

<-Source->	<--Area-->	<-Target->	MBLK	***
<Name> #	<-factor->	<Name> #	Tbl#	***
Basin 1***				
PERLND 11	0.261	COPY 501	12	
PERLND 11	0.261	COPY 501	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

<-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	***	ODGTFG for each	FUNCT for each	***
# - #	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	0.833			PERLND 1	999	EXTNL PREC	
WDM 2	PREC ENGL	0.833			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
COPY	501	OUTPUT	MEAN	1	1	48.4	WDM	501	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	IFW0		0.083333	COPY	INPUT	MEAN
END MASS-LINK		13					

END MASS-LINK

END RUN

Mitigated UCI File

RUN

GLOBAL

```

WWM4 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     default[0].wdm
MESSU    25     Mitdefault[0].MES
          27     Mitdefault[0].L61
          28     Mitdefault[0].L62
          30     POCdefault[0]1.dat

```

END FILES

OPN SEQUENCE

INGRP INDELT 00:15

```

PERLND    16
PERLND    11
IMPLND     4
IMPLND     5
COPY      501
DISPLY     1

```

END INGRP

END OPN SEQUENCE

DISPLY

DISPLY-INF01

```

# - #<-----Title----->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
1   -   Basin 1      MAX      1   2   30   9

```

END DISPLY-INF01

END DISPLY

COPY

TIMESERIES

```

# - # NPT NMN ***
1   -   1   1
501 -   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

```

```

16      C, Lawn, Flat      1   1   1   1   27   0
11      C, 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 ***

```

```

16      0      0      1      0      0      0      0      0      0      0      0      0
11      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 *****
16      0      0      4      0      0      0      0      0      0      0      0      0      1      9
11      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 ***
16      0      0      0      0      0      0      0      0      0      0      0
11      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 KVARV AGWRC
16      0      4.5      0.03      400      0.05      0.5      0.996
11      0      4.5      0.08      400      0.1      0.5      0.996
END PWAT-PARM2

```

PWAT-PARM3

```

<PLS > PWATER input info: Part 3 ***
# - # ***PETMAX PETMIN INFEXP INFILD DEEPFR BASETP AGWETP
16      0      0      2      2      0      0      0
11      0      0      2      2      0      0      0
END PWAT-PARM3

```

PWAT-PARM4

```

<PLS > PWATER input info: Part 4 ***
# - # CEPSC UZSN NSUR INTFW IRC LZETP ***
16      0.1      0.25      0.25      6      0.5      0.25
11      0.2      0.5      0.35      6      0.5      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
16      0      0      0      0      2.5      1      0
11      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
4 ROOF TOPS/FLAT 1 1 1 27 0
5 DRIVEWAYS/FLAT 1 1 1 27 0
END GEN-INFO

```

*** Section IWATER***

ACTIVITY

```

<PLS > ***** Active Sections *****
# - # ATMP SNOW IWAT SLD IWG IQAL ***
4      0      0      1      0      0      0
5      0      0      1      0      0      0
END ACTIVITY

```

PRINT-INFO

```

<ILS > ***** Print-flags ***** PIVL  PYR
# - # ATMP SNOW IWAT SLD IWG IQAL *****
4      0      0      4      0      0      0      1      9
5      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 ***

```

```

4      0      0      0      0      0
5      0      0      0      0      0
END IWAT-PARM1

IWAT-PARM2
<PLS >      IWATER input info: Part 2      ***
# - # ***   LSUR      SLSUR      NSUR      RETSC
4      400      0.01      0.1      0.1
5      400      0.01      0.1      0.1
END IWAT-PARM2

IWAT-PARM3
<PLS >      IWATER input info: Part 3      ***
# - # ***   PETMAX      PETMIN
4      0      0
5      0      0
END IWAT-PARM3

IWAT-STATE1
<PLS > *** Initial conditions at start of simulation
# - # ***   RETS      SURS
4      0      0
5      0      0
END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->      <--Area-->      <-Target->      MBLK      ***
<Name> #      <-factor->      <Name> #      Tbl#      ***
Basin 1***
PERLND 16      0.033      COPY 501      12
PERLND 16      0.033      COPY 501      13
PERLND 11      0.186      COPY 501      12
PERLND 11      0.186      COPY 501      13
IMPLND 4      0.025      COPY 501      15
IMPLND 5      0.017      COPY 501      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

<-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      0.833      PERLND  1 999 EXTNL PREC
WDM      2 PREC      ENGL      0.833      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
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 IFW0 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

Disclaimer

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