APPENDIX 8-A

FLOW CONTROL DESIGN CALCULATIONS

South Basin Detention Calculations

Western Washington Hydrology Model
PROJECT REPORT

Project Name: Eaglemont South Basin (Main Pond)
Site Address:
City : Monroe
Report Date : 10/9/2012
Gage : Everett
Data Start : 1948/10/01
Data End : 1997/09/30
Precip Scale: 1.20
WWHM3 Version:

PREDEVELOPED LAND USE

Name : Basin 1
Bypass: No

GroundWater: No

Pervious Land Use	Acres
C, Forest, Mod	36.56

Impervious Land Use	Acres

Element Flows To:

Surface	Interflow	Groundwater

Name : Basin 1
Bypass: No

GroundWater: No

Pervious Land Use	Acres
C, Lawn, Mod	18.44
C, Forest, Mod	3.04

Impervious Land Use	Acres
ROADS MOD	5.13
ROOF TOPS FLAT	6.56
DRIVEWAYS MOD	1.25
POND	1.16

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1,	Trapezoidal Pond 1,	

Name : Trapezoidal Pond 1
Bottom Length: 344ft.
Bottom Width: 55ft.
Depth : 15ft.
Volume at riser head : 11.5284ft.
Side slope 1: 3 To 1
Side slope 2: 3 To 1
Side slope 3: 2 To 1
Side slope 4: 3 To 1
Discharge Structure
Riser Height: 14 ft.
Riser Diameter: 18 in.
NotchType : Rectangular
Notch Width : 0.250 ft.
Notch Height: 1.500 ft.
Orifice 1 Diameter: 2.9375 in. **Elevation:** 0 ft.
Orifice 1 Diameter: 4.875 in. **Elevation:** 9 ft.
Orifice 1 Diameter: 3 in. **Elevation:** 10.25 ft.

Element Flows To:

Outlet 1	Outlet 2

Pond Hydraulic Table

Stage(ft)	Area(acr)	Volume(acr-ft)	Dschrg(cfs)	Infilt(cfs)
0.000	0.434	0.000	0.000	0.000
0.167	0.442	0.073	0.093	0.000
0.333	0.450	0.147	0.131	0.000
0.500	0.458	0.223	0.160	0.000
0.667	0.466	0.300	0.185	0.000
0.833	0.474	0.378	0.207	0.000
1.000	0.482	0.458	0.227	0.000
1.167	0.490	0.539	0.245	0.000
1.333	0.498	0.622	0.262	0.000
1.500	0.506	0.705	0.278	0.000
1.667	0.515	0.790	0.293	0.000
1.833	0.523	0.877	0.307	0.000
2.000	0.531	0.965	0.321	0.000
2.167	0.540	1.054	0.334	0.000
2.333	0.548	1.145	0.346	0.000
2.500	0.556	1.237	0.358	0.000
2.667	0.565	1.330	0.370	0.000
2.833	0.573	1.425	0.381	0.000
3.000	0.582	1.521	0.393	0.000
3.167	0.590	1.619	0.403	0.000
3.333	0.599	1.718	0.414	0.000
3.500	0.607	1.818	0.424	0.000
3.667	0.616	1.920	0.434	0.000
3.833	0.625	2.024	0.444	0.000

0.6000	3378	2897	85	Pass
0.6300	2946	1815	61	Pass
0.6600	2579	975	37	Pass
0.6900	2250	492	21	Pass
0.7200	1943	476	24	Pass
0.7500	1701	447	26	Pass
0.7800	1481	419	28	Pass
0.8100	1278	398	31	Pass
0.8400	1121	380	33	Pass
0.8700	990	359	36	Pass
0.9000	858	343	39	Pass
0.9300	747	329	44	Pass
0.9599	640	309	48	Pass
0.9899	558	278	49	Pass
1.0199	491	260	52	Pass
1.0499	429	243	56	Pass
1.0799	385	223	57	Pass
1.1099	347	205	59	Pass
1.1399	311	187	60	Pass
1.1699	278	179	64	Pass
1.1999	251	171	68	Pass
1.2299	233	163	69	Pass
1.2599	216	153	70	Pass
1.2899	202	147	72	Pass
1.3199	185	141	76	Pass
1.3498	174	135	77	Pass
1.3798	161	130	80	Pass
1.4098	154	125	81	Pass
1.4398	142	122	85	Pass
1.4698	135	119	88	Pass
1.4998	130	115	88	Pass
1.5298	123	112	91	Pass
1.5598	119	108	90	Pass
1.5898	114	102	89	Pass
1.6198	112	99	88	Pass
1.6498	109	97	88	Pass
1.6798	103	95	92	Pass
1.7098	97	91	93	Pass
1.7397	95	89	93	Pass
1.7697	94	86	91	Pass
1.7997	91	85	93	Pass
1.8297	89	83	93	Pass
1.8597	85	79	92	Pass
1.8897	81	76	93	Pass
1.9197	76	73	96	Pass
1.9497	74	69	93	Pass
1.9797	72	62	86	Pass
2.0097	69	59	85	Pass
2.0397	67	55	82	Pass
2.0697	66	48	72	Pass
2.0997	63	45	71	Pass
2.1296	61	44	72	Pass
2.1596	60	43	71	Pass
2.1896	58	42	72	Pass
2.2196	57	40	70	Pass
2.2496	55	37	67	Pass
2.2796	52	32	61	Pass

2.3096	51	27	52	Pass
2.3396	48	25	52	Pass
2.3696	45	24	53	Pass
2.3996	44	23	52	Pass
2.4296	42	22	52	Pass
2.4596	39	22	56	Pass
2.4896	38	20	52	Pass
2.5195	36	20	55	Pass
2.5495	35	19	54	Pass
2.5795	34	18	52	Pass
2.6095	34	18	52	Pass
2.6395	32	17	53	Pass
2.6695	31	17	54	Pass
2.6995	30	15	50	Pass
2.7295	29	15	51	Pass
2.7595	28	14	50	Pass
2.7895	24	14	58	Pass
2.8195	24	13	54	Pass
2.8495	23	13	56	Pass
2.8795	20	12	60	Pass
2.9094	20	12	60	Pass
2.9394	18	11	61	Pass
2.9694	16	10	62	Pass
2.9994	16	10	62	Pass
3.0294	13	9	69	Pass
3.0594	13	9	69	Pass
3.0894	13	8	61	Pass
3.1194	11	7	63	Pass
3.1494	11	6	54	Pass
3.1794	11	5	45	Pass
3.2094	8	5	62	Pass
3.2394	7	4	57	Pass
3.2694	6	4	66	Pass
3.2993	6	1	16	Pass
3.3293	5	0	0	Pass
3.3593	3	0	0	Pass
3.3893	3	0	0	Pass
3.4193	3	0	0	Pass
3.4493	3	0	0	Pass
3.4793	2	0	0	Pass
3.5093	2	0	0	Pass
3.5393	2	0	0	Pass
3.5693	2	0	0	Pass

Water Quality BMP Flow and Volume for POC 1.
On-line facility volume: 1.0579 acre-feet
On-line facility target flow: 0.01 **cfs.**
Adjusted for 15 min: 0.5631 **cfs.**
Off-line facility target flow: 0.3536 **cfs.**
Adjusted for 15 min: 0.3718 **cfs.**

Perlnd and Implnd Changes

No changes have been made.

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North Basin Detention Calculations:

Actually, this is to show that the bypassed area has a passing flow rate for the criteris of wwhm3 for the north basin, based on the existing basin size to the north, and the developed basin size with the correct amount diverted south. Thus the north basin of the pond, plus the existing basin area upstream of the POC is within the allowable release rates of WWHM3.

Western Washington Hydrology Model
PROJECT REPORT

Project Name: Eaglemont
Site Address: North Basin
City : Monroe
Report Date : 9/26/2012
Gage : Everett
Data Start : 1948/10/01
Data End : 1997/09/30
Precip Scale: 1.20
WWHM3 Version:

PREDEVELOPED LAND USE

Name : North Basin
Bypass: No

GroundWater: No

Pervious Land Use	Acres
C, Forest, Mod	6.11
C, Pasture, Mod	.17

Impervious Land Use	Acres
DRIVEWAYS MOD	0.034

Element Flows To:

Surface	Interflow	Groundwater

Name : Basin 1
Bypass: No

GroundWater: No

Pervious Land Use	Acres
C, Forest, Mod	1.91
C, Pasture, Mod	.105
C, Lawn, Mod	.32

Impervious Land Use	Acres

ROADS MOD	0.34
ROOF TOPS FLAT	0.22

Element Flows To:

Surface	Interflow	Groundwater

MITIGATED LAND USE

ANALYSIS RESULTS

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	0.217557
5 year	0.325868
10 year	0.411517
25 year	0.537
50 year	0.643936
100 year	0.763209

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0.295045
5 year	0.41956
10 year	0.510242
25 year	0.634313
50 year	0.733733
100 year	0.83924

Yearly Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1950	0.153	0.266
1951	0.413	0.504
1952	0.146	0.261
1953	0.177	0.252
1954	0.238	0.350
1955	0.381	0.437
1956	0.351	0.404
1957	0.234	0.194
1958	0.380	0.383
1959	0.380	0.568
1960	0.206	0.230
1961	0.183	0.266
1962	0.267	0.704
1963	0.334	0.377
1964	0.529	0.583
1965	0.185	0.217
1966	0.176	0.178
1967	0.113	0.193
1968	0.234	0.537

1969	0.263	0.322
1970	0.424	0.607
1971	0.140	0.210
1972	0.230	0.353
1973	0.202	0.561
1974	0.149	0.305
1975	0.197	0.316
1976	0.169	0.312
1977	0.136	0.228
1978	0.129	0.176
1979	0.159	0.196
1980	0.558	0.540
1981	0.158	0.198
1982	0.202	0.243
1983	0.172	0.214
1984	0.209	0.294
1985	0.192	0.267
1986	0.278	0.325
1987	0.561	0.477
1988	0.270	0.328
1989	0.141	0.248
1990	0.277	0.363
1991	0.182	0.176
1992	0.190	0.184
1993	0.186	0.251
1994	0.109	0.229
1995	0.122	0.153
1996	0.184	0.180
1997	0.332	0.294
1998	0.761	0.565

Ranked Yearly Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.7609	0.7037
2	0.5606	0.6074
3	0.5577	0.5833
4	0.5286	0.5682
5	0.4237	0.5649
6	0.4126	0.5607
7	0.3813	0.5397
8	0.3804	0.5365
9	0.3800	0.5043
10	0.3509	0.4771
11	0.3340	0.4368
12	0.3321	0.4044
13	0.2775	0.3825
14	0.2768	0.3773
15	0.2704	0.3627
16	0.2674	0.3534
17	0.2632	0.3497
18	0.2385	0.3278
19	0.2344	0.3250
20	0.2339	0.3223
21	0.2303	0.3158
22	0.2085	0.3121
23	0.2060	0.3055

24	0.2025	0.2943
25	0.2025	0.2939
26	0.1973	0.2673
27	0.1919	0.2663
28	0.1903	0.2655
29	0.1864	0.2611
30	0.1849	0.2525
31	0.1840	0.2505
32	0.1834	0.2485
33	0.1825	0.2430
34	0.1769	0.2305
35	0.1757	0.2286
36	0.1716	0.2276
37	0.1691	0.2172
38	0.1591	0.2141
39	0.1576	0.2097
40	0.1527	0.1975
41	0.1491	0.1957
42	0.1462	0.1938
43	0.1406	0.1927
44	0.1404	0.1841
45	0.1360	0.1797
46	0.1294	0.1777
47	0.1219	0.1762
48	0.1133	0.1759
49	0.1090	0.1533

POC #1
The Facility PASSED

The Facility PASSED.

Flow(CFS)	Predev	Dev	Percentage	Pass/Fail
0.1088	3102	1484	47	Pass
0.1142	2657	1284	48	Pass
0.1196	2340	1128	48	Pass
0.1250	2038	992	48	Pass
0.1304	1735	839	48	Pass
0.1358	1521	755	49	Pass
0.1412	1281	645	50	Pass
0.1466	1125	585	52	Pass
0.1520	985	511	51	Pass
0.1574	867	461	53	Pass
0.1628	756	412	54	Pass
0.1682	641	364	56	Pass
0.1736	554	328	59	Pass
0.1791	484	280	57	Pass
0.1845	421	258	61	Pass
0.1899	380	237	62	Pass
0.1953	339	212	62	Pass
0.2007	313	194	61	Pass
0.2061	270	183	67	Pass
0.2115	246	164	66	Pass
0.2169	226	151	66	Pass
0.2223	207	131	63	Pass
0.2277	196	120	61	Pass

0.2331	181	108	59	Pass
0.2385	169	105	62	Pass
0.2439	158	102	64	Pass
0.2493	150	96	64	Pass
0.2547	137	87	63	Pass
0.2601	132	81	61	Pass
0.2655	126	78	61	Pass
0.2709	122	73	59	Pass
0.2764	119	67	56	Pass
0.2818	113	62	54	Pass
0.2872	109	60	55	Pass
0.2926	103	56	54	Pass
0.2980	98	52	53	Pass
0.3034	95	51	53	Pass
0.3088	93	49	52	Pass
0.3142	90	45	50	Pass
0.3196	88	42	47	Pass
0.3250	86	41	47	Pass
0.3304	84	39	46	Pass
0.3358	79	37	46	Pass
0.3412	74	36	48	Pass
0.3466	72	35	48	Pass
0.3520	68	29	42	Pass
0.3574	67	28	41	Pass
0.3628	66	27	40	Pass
0.3682	64	23	35	Pass
0.3737	64	22	34	Pass
0.3791	62	20	32	Pass
0.3845	57	19	33	Pass
0.3899	56	18	32	Pass
0.3953	55	17	30	Pass
0.4007	53	17	32	Pass
0.4061	52	15	28	Pass
0.4115	48	15	31	Pass
0.4169	44	15	34	Pass
0.4223	43	15	34	Pass
0.4277	40	15	37	Pass
0.4331	38	15	39	Pass
0.4385	36	13	36	Pass
0.4439	34	12	35	Pass
0.4493	34	12	35	Pass
0.4547	32	12	37	Pass
0.4601	32	12	37	Pass
0.4656	30	12	40	Pass
0.4710	29	12	41	Pass
0.4764	29	12	41	Pass
0.4818	24	10	41	Pass
0.4872	24	10	41	Pass
0.4926	23	10	43	Pass
0.4980	20	10	50	Pass
0.5034	20	10	50	Pass
0.5088	18	9	50	Pass
0.5142	18	9	50	Pass
0.5196	16	9	56	Pass
0.5250	15	9	60	Pass
0.5304	13	9	69	Pass
0.5358	12	9	75	Pass

0.5412	12	6	50	Pass
0.5466	12	6	50	Pass
0.5520	11	6	54	Pass
0.5574	11	6	54	Pass
0.5629	7	5	71	Pass
0.5683	6	4	66	Pass
0.5737	6	3	50	Pass
0.5791	5	3	60	Pass
0.5845	5	2	40	Pass
0.5899	3	2	66	Pass
0.5953	3	2	66	Pass
0.6007	3	2	66	Pass
0.6061	2	2	100	Pass
0.6115	2	1	50	Pass
0.6169	2	1	50	Pass
0.6223	2	1	50	Pass
0.6277	1	1	100	Pass
0.6331	1	1	100	Pass
0.6385	1	1	100	Pass
0.6439	1	1	100	Pass

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.**

Perlnd and Implnd Changes

No changes have been made.

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