

STAGE / STORAGE CALCULATIONS



DATE

MADE BY:	msf	15-Jul-09
CHCK BY:	BJS	16-Jul-09

PROJECT: HARTWOOD MARSH ROAD PHASE II

POND: 10 YR FLOOD PLAIN COMPENSATION POND

Boring	Approx. Existing Ground Elevation	Depth to Encountered Water Surface	Estimated Depth to Encountered Water Surface	Average Estimated Depth to Encountered Water Surface	Depth to Seasonal High Water Surface	Estimated Seasonal High Water Elevation	Average Estimated Seasonal High Water Elevation
AB-114	102.31	20.0	82.31	83.17	15	87.31	88.17
AB-116	104.02	20.0	84.02		15	89.02	
-	-	-	-		-	-	
-	-	-	-		-	-	

Note: Above information per pond boring profiles: Ardaman & Associates, June 2008
Per Ardaman report groundwater not encountered.

AVG. SHWT ELEVATION: 88.2 Ft. (NAVD)

AVG. GROUND WATER TABLE ELEVATION: 83.2 Ft. (NAVD)

AVG. EXIST. GROUND ELEVATION AT BORING LOCATIONS: 103.2 Ft. (NAVD)

STAGE FL. (NAVD)	AREA AC.	AVERAGE AREA AC.	INCREMENTAL VOL. AF	CUMULATIVE VOL. AF
90.0	0.25		0.00	0.00
		0.26		
91.0	0.28		0.26	0.26
		0.29		
92.0	0.30		0.29	0.55
TOTAL:			0.55	

TOP EL. OF STORAGE VOLUME: 90.23 Ft.

AVE. PERCOLATION RATE: 21 Ft./Day or 10.5 Inches/Hr.

FACTOR OF SAFTEY: 2 = 10.5 Ft./Day

Melinda Deahl
9-1-09

Project Data

Project Name: Hartwood Marsh Road Phase II
Simulation Description: Pond 7 Water Quality Recovery
Project Number: 41561-1
Engineer : MSF
Supervising Engineer:
Date: 09-01-2009

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum): 144.39
Water Table Elevation, [WT] (ft datum): 145.39
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
Fillable Porosity, [n] (%): 25.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 13.33
Maximum Area For Unsaturated Infiltration, [Av] (ft²): 40946.4

Geometry Data

Equivalent Pond Length, [L] (ft): 265.0
Equivalent Pond Width, [W] (ft): 155.0
Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

<u>Stage (ft datum)</u>	<u>Area (ft²)</u>
153.00	36154.8
154.00	39639.6
155.00	42688.8
156.00	46173.6
157.00	50094.0
158.00	53578.8
159.00	57499.2
160.00	61419.6
161.00	65775.6

Melvin S. Seereeram
9-1-09

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 57063.6

Initial ground water level (ft datum) default, 145.39

Time After Storm Event (days)	Time After Storm Event (days)
0.100	2.000
0.250	2.500
0.500	3.000
1.000	3.500
1.500	4.000

Melinda Deak
9-1-09

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Detailed Results :: Scenario 1 :: Water Quality

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	9510.6000	0.0000	145.390	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	9510.6000	0.0000	154.474	5.57856	0.00000	57063.6	33.5	0.0	U/P
2.400	0.0000	0.0000	153.069	3.79144	0.00000	57063.6	54577.1	0.0	U/P
6.000	0.0000	0.0000	----	----	----	57063.6	57063.6	0.0	dry
12.000	0.0000	0.0000	----	----	----	57063.6	57063.6	0.0	dry
24.000	0.0000	0.0000	----	----	----	57063.6	57063.6	0.0	dry
36.000	0.0000	0.0000	----	----	----	57063.6	57063.6	0.0	dry
48.000	0.0000	0.0000	----	----	----	57063.6	57063.6	0.0	dry
60.000	0.0000	0.0000	----	----	----	57063.6	57063.6	0.0	dry
72.000	0.0000	0.0000	----	----	----	57063.6	57063.6	0.0	dry
84.000	0.0000	0.0000	----	----	----	57063.6	57063.6	0.0	dry
96.000	0.0000	0.0000	----	----	----	57063.6	57063.6	0.0	dry

← Recovery < 6hrs

Melinda Storch
 9-1-09

Project Data

Project Name: Hartwood Marsh Road Phase II
 Simulation Description: Pond 7 25 year/96 hour Recovery
 Project Number: 41561-1
 Engineer : MSF
 Supervising Engineer:
 Date: 09-01-2009

Aquifer Data

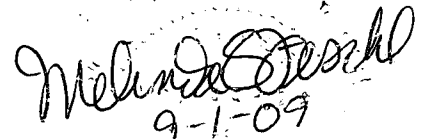
Base Of Aquifer Elevation, [B] (ft datum): 144.39
 Water Table Elevation, [WT] (ft datum): 145.39
 Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day): 20.00
 Fillable Porosity, [n] (%): 25.00
 Unsaturated Vertical Infiltration Rate, [Iv] (ft/day): 13.33
 Maximum Area For Unsaturated Infiltration, [Av] (ft²): 60984.0

Geometry Data

Equivalent Pond Length, [L] (ft): 309.0
 Equivalent Pond Width, [W] (ft): 199.0
 Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft ²)
153.00	36154.8
154.00	39639.6
155.00	42688.8
156.00	46173.6
157.00	50094.0
158.00	53578.8
159.00	57499.2
160.00	61419.6
161.00	65775.6


 9-1-09

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Scenario Input Data

Scenario 1 :: 25 year - 96 hour

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 331229.2

Initial ground water level (ft datum) default, 145.39

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.100	2.700	3.500	7.500	11.500
0.250	2.800	4.000	8.000	12.000
0.500	2.900	4.500	8.500	12.500
1.000	3.000	5.000	9.000	13.000
1.500	3.100	5.500	9.500	13.500
2.000	3.200	6.000	10.000	14.000
2.500	3.300	6.500	10.500	14.500
2.600	3.400	7.000	11.000	

Melinda Seereeram
9-1-09

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Detailed Results :: Scenario 1 :: 25 year - 96 hour

Elapsed Time (hours)	Inflow Rate (ft ³ /s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft ³ /s)	Overflow Discharge (ft ³ /s)	Cumulative Inflow Volume (ft ³)	Cumulative Infiltration Volume (ft ³)	Cumulative Discharge Volume (ft ³)	Flow Type
0.000	55204.8700	0.0000	145.390	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	55204.8700	0.0000	159.881	5.58071	0.00000	331229.2	33.5	0.0	U/P
2.400	0.0000	0.0000	158.487	8.31902	0.00000	331229.2	81228.8	0.0	U/P
6.000	0.0000	0.0000	156.833	4.52853	0.00000	331229.2	167933.9	0.0	U/S
12.000	0.0000	0.0000	156.421	0.79513	0.00000	331229.2	187930.1	0.0	S
24.000	0.0000	0.0000	155.929	0.45925	0.00000	331229.2	210994.2	0.0	S
36.000	0.0000	0.0000	155.562	0.34473	0.00000	331229.2	227609.5	0.0	S
48.000	0.0000	0.0000	155.264	0.27965	0.00000	331229.2	240778.8	0.0	S
60.000	0.0000	0.0000	155.009	0.24682	0.00000	331229.2	251771.3	0.0	S
62.400	0.0000	0.0000	154.960	0.24112	0.00000	331229.2	253890.6	0.0	S
64.800	0.0000	0.0000	154.911	0.23311	0.00000	331229.2	255937.8	0.0	S
67.200	0.0000	0.0000	154.865	0.22573	0.00000	331229.2	257918.8	0.0	S
69.600	0.0000	0.0000	154.819	0.21891	0.00000	331229.2	259838.5	0.0	S
72.000	0.0000	0.0000	154.775	0.21256	0.00000	331229.2	261701.5	0.0	S
74.400	0.0000	0.0000	154.732	0.20663	0.00000	331229.2	263511.5	0.0	S
76.800	0.0000	0.0000	154.690	0.20109	0.00000	331229.2	265272.1	0.0	S
79.200	0.0000	0.0000	154.649	0.19588	0.00000	331229.2	266986.3	0.0	S
81.600	0.0000	0.0000	154.608	0.19098	0.00000	331229.2	268656.9	0.0	S
84.000	0.0000	0.0000	154.569	0.18546	0.00000	331229.2	270286.4	0.0	S
86.000	0.0000	0.0000	154.531	0.18211	0.00000	331229.2	271872.9	0.0	S
88.000	0.0000	0.0000	154.494	0.17881	0.00000	331229.2	273416.1	0.0	S
90.000	0.0000	0.0000	154.458	0.17556	0.00000	331229.2	274915.5	0.0	S
92.000	0.0000	0.0000	154.423	0.17235	0.00000	331229.2	276370.5	0.0	S
94.000	0.0000	0.0000	154.389	0.16918	0.00000	331229.2	277781.6	0.0	S
96.000	0.0000	0.0000	154.356	0.16605	0.00000	331229.2	279148.4	0.0	S
98.000	0.0000	0.0000	154.324	0.16296	0.00000	331229.2	280471.4	0.0	S
100.000	0.0000	0.0000	154.293	0.15991	0.00000	331229.2	281750.1	0.0	S
102.000	0.0000	0.0000	154.263	0.15690	0.00000	331229.2	282985.1	0.0	S
104.000	0.0000	0.0000	154.234	0.15393	0.00000	331229.2	284176.0	0.0	S
106.000	0.0000	0.0000	154.206	0.15100	0.00000	331229.2	285322.5	0.0	S
108.000	0.0000	0.0000	154.179	0.14811	0.00000	331229.2	286424.2	0.0	S
110.000	0.0000	0.0000	154.153	0.14526	0.00000	331229.2	287481.7	0.0	S
112.000	0.0000	0.0000	154.128	0.14245	0.00000	331229.2	288494.7	0.0	S
114.000	0.0000	0.0000	154.104	0.13968	0.00000	331229.2	289462.8	0.0	S
116.000	0.0000	0.0000	154.081	0.13695	0.00000	331229.2	290385.5	0.0	S
118.000	0.0000	0.0000	154.059	0.13426	0.00000	331229.2	291262.5	0.0	S
120.000	0.0000	0.0000	154.038	0.13161	0.00000	331229.2	292093.4	0.0	S
122.000	0.0000	0.0000	154.018	0.12900	0.00000	331229.2	292877.9	0.0	S
124.000	0.0000	0.0000	153.999	0.12643	0.00000	331229.2	293615.6	0.0	S
126.000	0.0000	0.0000	153.981	0.12391	0.00000	331229.2	294305.9	0.0	S
128.000	0.0000	0.0000	153.964	0.12143	0.00000	331229.2	294948.4	0.0	S
130.000	0.0000	0.0000	153.948	0.11900	0.00000	331229.2	295542.6	0.0	S
132.000	0.0000	0.0000	153.933	0.11661	0.00000	331229.2	296088.1	0.0	S
134.000	0.0000	0.0000	153.919	0.11427	0.00000	331229.2	296684.5	0.0	S
136.000	0.0000	0.0000	153.906	0.11197	0.00000	331229.2	297231.4	0.0	S
138.000	0.0000	0.0000	153.894	0.10971	0.00000	331229.2	297728.4	0.0	S
140.000	0.0000	0.0000	153.883	0.10750	0.00000	331229.2	298175.1	0.0	S
142.000	0.0000	0.0000	153.873	0.10533	0.00000	331229.2	298571.1	0.0	S
144.000	0.0000	0.0000	153.864	0.10321	0.00000	331229.2	298916.0	0.0	S
146.000	0.0000	0.0000	153.856	0.10113	0.00000	331229.2	299209.4	0.0	S
148.000	0.0000	0.0000	153.849	0.09910	0.00000	331229.2	299451.0	0.0	S
150.000	0.0000	0.0000	153.843	0.09711	0.00000	331229.2	299640.5	0.0	S
152.000	0.0000	0.0000	153.838	0.09516	0.00000	331229.2	299777.5	0.0	S
154.000	0.0000	0.0000	153.834	0.09325	0.00000	331229.2	299862.6	0.0	S
156.000	0.0000	0.0000	153.831	0.09138	0.00000	331229.2	299895.4	0.0	S
158.000	0.0000	0.0000	153.829	0.08955	0.00000	331229.2	299875.6	0.0	S
160.000	0.0000	0.0000	153.827	0.08776	0.00000	331229.2	299802.9	0.0	S
162.000	0.0000	0.0000	153.826	0.08600	0.00000	331229.2	299777.1	0.0	S
164.000	0.0000	0.0000	153.826	0.08428	0.00000	331229.2	299700.0	0.0	S
166.000	0.0000	0.0000	153.826	0.08260	0.00000	331229.2	299661.4	0.0	S
168.000	0.0000	0.0000	153.826	0.08096	0.00000	331229.2	299611.1	0.0	S
170.000	0.0000	0.0000	153.826	0.07936	0.00000	331229.2	299549.0	0.0	S
172.000	0.0000	0.0000	153.826	0.07780	0.00000	331229.2	299475.0	0.0	S
174.000	0.0000	0.0000	153.826	0.07628	0.00000	331229.2	299389.0	0.0	S
176.000	0.0000	0.0000	153.826	0.07480	0.00000	331229.2	299291.0	0.0	S
178.000	0.0000	0.0000	153.826	0.07336	0.00000	331229.2	299181.0	0.0	S
180.000	0.0000	0.0000	153.826	0.07196	0.00000	331229.2	299059.0	0.0	S
182.000	0.0000	0.0000	153.826	0.07060	0.00000	331229.2	298925.0	0.0	S
184.000	0.0000	0.0000	153.826	0.06928	0.00000	331229.2	298779.0	0.0	S
186.000	0.0000	0.0000	153.826	0.06800	0.00000	331229.2	298621.0	0.0	S
188.000	0.0000	0.0000	153.826	0.06676	0.00000	331229.2	298451.0	0.0	S
190.000	0.0000	0.0000	153.826	0.06556	0.00000	331229.2	298269.0	0.0	S
192.000	0.0000	0.0000	153.826	0.06440	0.00000	331229.2	298075.0	0.0	S
194.000	0.0000	0.0000	153.826	0.06328	0.00000	331229.2	297869.0	0.0	S
196.000	0.0000	0.0000	153.826	0.06220	0.00000	331229.2	297651.0	0.0	S
198.000	0.0000	0.0000	153.826	0.06116	0.00000	331229.2	297421.0	0.0	S
200.000	0.0000	0.0000	153.826	0.06016	0.00000	331229.2	297179.0	0.0	S
202.000	0.0000	0.0000	153.826	0.05920	0.00000	331229.2	296925.0	0.0	S
204.000	0.0000	0.0000	153.826	0.05828	0.00000	331229.2	296659.0	0.0	S
206.000	0.0000	0.0000	153.826	0.05740	0.00000	331229.2	296381.0	0.0	S
208.000	0.0000	0.0000	153.826	0.05656	0.00000	331229.2	296091.0	0.0	S
210.000	0.0000	0.0000	153.826	0.05576	0.00000	331229.2	295789.0	0.0	S
212.000	0.0000	0.0000	153.826	0.05500	0.00000	331229.2	295475.0	0.0	S
214.000	0.0000	0.0000	153.826	0.05428	0.00000	331229.2	295149.0	0.0	S
216.000	0.0000	0.0000	153.826	0.05360	0.00000	331229.2	294811.0	0.0	S
218.000	0.0000	0.0000	153.826	0.05296	0.00000	331229.2	294461.0	0.0	S
220.000	0.0000	0.0000	153.826	0.05236	0.00000	331229.2	294099.0	0.0	S
222.000	0.0000	0.0000	153.826	0.05180	0.00000	331229.2	293725.0	0.0	S
224.000	0.0000	0.0000	153.826	0.05128	0.00000	331229.2	293339.0	0.0	S
226.000	0.0000	0.0000	153.826	0.05080	0.00000	331229.2	292941.0	0.0	S
228.000	0.0000	0.0000	153.826	0.05036	0.00000	331229.2	292531.0	0.0	S
230.000	0.0000	0.0000	153.826	0.05000	0.00000	331229.2	292109.0	0.0	S
232.000	0.0000	0.0000	153.826	0.04968	0.00000	331229.2	291675.0	0.0	S
234.000	0.0000	0.0000	153.826	0.04940	0.00000	331229.2	291229.0	0.0	S
236.000	0.0000	0.0000	153.826	0.04916	0.00000	331229.2	290771.0	0.0	S
238.000	0.0000	0.0000	153.826	0.04896	0.00000	331229.2	290301.0	0.0	S
240.000	0.0000	0.0000	153.826	0.04880	0.00000	331229.2	289819.0	0.0	S
242.000	0.0000	0.0000	153.826	0.04868	0.00000	331229.2	289325.0	0.0	S
244.000	0.0000	0.0000	153.826	0.04860	0.00000	331229.2	288819.0	0.0	S
246.000	0.0000	0.0000	153.826	0.04856	0.00000	331229.2	288301.0	0.0	S
248.000	0.0000	0.0000	153.826	0.04856	0.00000	331229.2	287771.0	0.0	S
250.000	0.0000	0.0000	153.826	0.04860	0.00000	331229.2	287229.0	0.0	S
252.000	0.0000	0.0000	153.826	0.04868	0.00000	331229.2	286675.0	0.0	S
254.000	0.0000	0.0000	153.826	0.04880	0.00000	331229.2	286109.0	0.0	S
256.000	0.0000	0.0000	153.826	0.04896	0.00000	331229.2	285531.0	0.0	S
258.000	0.0000	0.0000	153.826	0.04916					