BASIN 3

114354-1

Pre-Development Drainage Basin Data

BASIN BREAKDOWN

HNTB

		DATE
MADE BY:	MSF	23-Apr-08
CHCK BY:	KMV	24-Apr-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION: BASIN 3 - PHASE 1

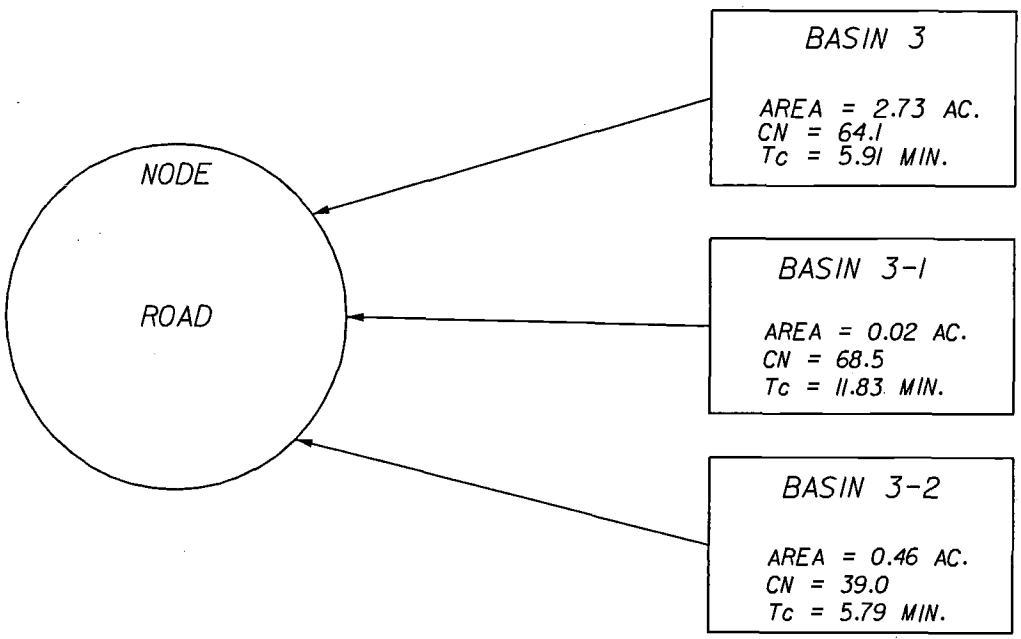
BASIN LIMITS: STA. 152+39 to STA 162+00, CL CONST. HARTWOOD MARSH RD.

EXISTING CONDITIONS:

LOCATION	STATION	To	STATION	BASIN WIDTH (Ft.)	IMP. AREA (Acres)	PERV. AREA (Acres)	TOTAL AREA (Acres)	REMARKS
ON-SITE:								
BASIN 3	152+39	-	162+00	120	0.843	1.887	2.730	
ON-SITE SUBTOTAL:					***0.843***	***1.887***	***2.73***	
OFF-SITE:								
BASIN 3-1 (OFF-SITE)	152+39	-	153+09	-	0.01	0.01	0.02	
BASIN 3-2 (OFF-SITE)	153+87	-	155+50	-	0.00	0.46	0.46	
OFF-SITE SUBTOTAL:					***0.01***	***0.47***	***0.48***	
TOTAL:					**0.85**	**2.35**	**3.21**	

PROPOSED CONDITIONS:

LOCATION	STATION	To	STATION	BASIN WIDTH (Ft.)	IMP. AREA (Acres)	PERV. AREA (Acres)	TOTAL AREA (Acres)	REMARKS
ON-SITE:								
BASIN 3	152+39	-	162+00	120	1.73	1.00	2.73	
ON-SITE SUBTOTAL:					***1.73***	***1.00***	***2.73***	
OFF-SITE:								
BASIN 3-1 (OFF-SITE)	152+39	-	153+09	-	0.01	0.01	0.02	
BASIN 3-2 (OFF-SITE)	153+87	-	155+50	-	0.00	0.46	0.46	
OFF-SITE SUBTOTAL:					***0.01***	***0.47***	***0.48***	
TOTAL:					**1.74**	**1.47**	**3.21**	



BASIN 3

LOCATION: LAKE COUNTY SEC. 9 & 10, T23S, R26E HARTWOOD MARSH ROAD RECONSTRUCTION US 27 TO 1500 FT EAST OF S. HANCOCK RD	COUNTY: LAKE STATE: FLORIDA DATE: 04-08	DATUM: NAVD 88 PURPOSE: PRE-DEVELOPMENT NODAL DIAGRAM
HNTB HNTB CORPORATION 300 PRIMERA BLVD, SUITE 200 LAKE MARY, FL 32746 (407) 805-0355 CERT. OF AUTH. NO. 6500 ENGINEER OF RECORD: KAREN M. VAN DEN AVONT, P.E. FL. REGISTRATION NO. 44794	LAKE COUNTY FLORIDA	LAKE COUNTY HARTWOOD MARSH ROAD

4/30/2008 9:27:46 AM \\LKMw00\pmwork\Jobs\41561-1\Phase 1\41561100001\drainage\NODALDIAGRAMpre.dgn

RUNOFF CURVE NUMBER

HNTB

		DATE:
MADE BY:	MSF	23-Apr-08
CHKED BY:	KMV	24-Apr-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION: BASIN 3

UNDERLINE ONE: **EXISTING** **PROPOSED**

Soil Name and Hydrologic group (Appendix A)	Cover Description (Cover type, treatment, and hydrologic condition: percent impervious: unconnected / connected impervious area ratio)	CN Tab. 2-2	CN Fig. 2-3	CN Fig. 2-4	Area acres	Product of CN x Area
-	IMPERVIOUS AREA Exist Pavement (On-Site)	98			0.84	82.62
Astatula Sand (A)	GRASS Fair Condition (On-Site)	49			1.89	92.47
			Totals =		2.73	175.09

Use CN = **64.1**

REFERENCE: *Urban Hydrology for Small Watersheds*
Technical Release 55, Soil Conservation Service
U.S. Department of Agriculture, June 1986

RUNOFF CURVE NUMBER

HNTB

		DATE:
MADE BY:	MSF	23-Apr-08
CHKED BY:	KMV	24-Apr-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION: BASIN 3-1

UNDERLINE ONE: **EXISTING** **PROPOSED**

Soil Name and Hydrologic group (Appendix A)	Cover Description (Cover type, treatment, and hydrologic condition; percent impervious; unconnected / connected impervious area ratio)	CN Tab. 2-2	CN Fig. 2-3	CN Fig. 2-4	Area acres	Product of CN x Area
-	IMPERVIOUS AREA Exist Pavement (Off-Site)	98			0.01	0.98
Astatula Sand (A)	GRASS Fair Condition (Off-Site)	39			0.01	0.39
			Totals =		0.02	1.37

Use CN = **68.5**

REFERENCE: *Urban Hydrology for Small Watersheds*
Technical Release 55, Soil Conservation Service
U.S. Department of Agriculture, June 1986

RUNOFF CURVE NUMBER

HNTB

		DATE:
MADE BY:	MSF	23-Apr-08
CHKED BY:	KMV	24-Apr-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION: BASIN 3-2

UNDERLINE ONE: **EXISTING** **PROPOSED**

Soil Name and Hydrologic group (Appendix A)	Cover Description (Cover type, treatment, and hydrologic condition: percent impervious: unconnected / connected impervious area ratio)	CN Tab. 2-2	CN Fig. 2-3	CN Fig. 2-4	Area acres	Product of CN x Area
-	IMPERVIOUS AREA Exist Pavement (Off-Site)	98			0.00	0.00
Astatula Sand (A)	GRASS Fair Condition (Off-Site)	39			0.46	17.79
			Totals =		0.46	17.79

Use CN = **39.0**

REFERENCE: *Urban Hydrology for Small Watersheds*
Technical Release 55, Soil Conservation Service
U.S. Department of Agriculture, June 1986

TIME OF CONCENTRATION CALCULATIONS

HNTB

		DATE:
MADE BY:	MSF	12-Mar-08
CHECKED BY:	KMV	13-Mar-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION : BASIN 3

UNDERLINE ONE: EXISTING PROPOSED

UNDERLINE ONE: Tc Tt Through subarea

SHEET FLOW:

1	SURFACE DESCRIPTION	SMOOTH SURFACE			
2	MANNING'S COEFFICIENT, n	0.011			
3	FLOW LENGTH, L, (< 300')	112		FT.	
4	2 YR/ 24 HR RAINFALL, P	4.70		IN.	
5	LAND SLOPE, S	0.0286			
6	Tt = (0.007 (nL)^0.8) / (P^0.5 * S^0.4)	0.0158		HR. OR	0.95 MIN.

SHALLOW CONCENTRATED FLOW:

7	SURFACE DESCRIPTION (PAVED OR UNPAVED)	UNPAVED			
8	FLOW LENGTH, L	877		L.F.	
9	WATERCOURSE SLOPE, S	0.0334		FT./ FT.	
10	AVERAGE VELOCITY, V	2.949		FT./SEC.	
11	Tt = L / (3600 * V)	0.08		HR. OR	4.96 MIN.

CHANNEL FLOW:

12	CROSS-SECTIONAL FLOW AREA, A			S.F.	
13	WETTED PERIMETER, Pw			L.F.	
14	HYDRAULIC RADIUS, R = (A / Pw)			L.F.	
15	CHANNEL SLOPE, S			FT./FT.	
16	MANNING'S ROUGHNESS COEFFICIENT, n				
17	VELOCITY, V, = (1.49 * R ^0.667 * S ^0.5) / n			FT./SEC.	
18	FLOW LENGTH, L			L.F.	
19	Tt = L / (3600 V)			HR. OR	0.00 MIN.
20	Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19)				

TOTAL Tc = 5.91 MIN.

Reference: *Urban Hydrology for Small Watersheds*
Technical Release 55, Soil Conservation Service
U.S. Department of Agriculture, June 1986

TIME OF CONCENTRATION CALCULATIONS

HNTB

		DATE:
MADE BY:	MSF	12-Mar-08
CHECKED BY:	KMV	13-Mar-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION : BASIN 3-1

UNDERLINE ONE: **EXISTING** **PROPOSED**

UNDERLINE ONE: **Tc** **Tt Through subarea**

SHEET FLOW:

1	SURFACE DESCRIPTION	SHORT GRASS			
2	MANNING'S COEFFICIENT, n	0.150			
3	FLOW LENGTH, L, (< 300')	100		FT.	
4	2 YR/ 24 HR RAINFALL, P	4.70		IN.	
5	LAND SLOPE, S	0.030			
6	Tt = (0.007 (nL)^0.8) / (P^0.5 * S^0.4)	0.115		HR. OR	6.87 MIN. (TO ROAD)

SHALLOW CONCENTRATED FLOW:

7	SURFACE DESCRIPTION (PAVED OR UNPAVED)	UNPAVED			
8	FLOW LENGTH, L	877		L.F.	
9	WATERCOURSE SLOPE, S	0.0334		FT./ FT.	
10	AVERAGE VELOCITY, V	2.949		FT./SEC.	
11	Tt = L / (3600 * V)	0.08		HR. OR	4.96 MIN.

CHANNEL FLOW:

12	CROSS-SECTIONAL FLOW AREA, A			S.F.	
13	WETTED PERIMETER, Pw			L.F.	
14	HYDRAULIC RADIUS, R = (A / Pw)			L.F.	
15	CHANNEL SLOPE, S			FT./FT.	
16	MANNING'S ROUGHNESS COEFFICIENT, n				
17	VELOCITY, V, = (1.49 * R ^0.667 * S ^0.5) / n			FT./SEC.	
18	FLOW LENGTH, L			L.F.	
19	Tt = L / (3600 V)			HR. OR	0.00 MIN.
20	Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19)				

TOTAL Tc = 11.83 MIN.

Reference: *Urban Hydrology for Small Watersheds*
Technical Release 55, Soil Conservation Service
U.S. Department of Agriculture, June 1986

TIME OF CONCENTRATION CALCULATIONS

HNTB

		DATE:
MADE BY:	MSF	12-Mar-08
CHECKED BY:	KMV	13-Mar-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION : BASIN 3-2

UNDERLINE ONE: EXISTING PROPOSED

UNDERLINE ONE: Tc Tt Through subarea

SHEET FLOW:

1	SURFACE DESCRIPTION	SHORT GRASS			
2	MANNING'S COEFFICIENT, n	0.150			
3	FLOW LENGTH, L, (< 300')	32		FT.	
4	2 YR/ 24 HR RAINFALL, P	4.70		IN.	
5	LAND SLOPE, S	0.128			
6	Tt = (0.007 (nL)^0.8) / (P^0.5 * S^0.4)	0.026		HR. OR	1.55 MIN. (TO ROAD)

SHALLOW CONCENTRATED FLOW:

7	SURFACE DESCRIPTION (PAVED OR UNPAVED)	UNPAVED			
8	FLOW LENGTH, L	755		L.F.	
9	WATERCOURSE SLOPE, S	0.0338		FT./ FT.	
10	AVERAGE VELOCITY, V	2.965		FT./SEC.	
11	Tt = L / (3600 * V)	0.07		HR. OR	4.24 MIN.

CHANNEL FLOW:

12	CROSS-SECTIONAL FLOW AREA, A			S.F.	
13	WETTED PERIMETER, Pw			L.F.	
14	HYDRAULIC RADIUS, R = (A / Pw)			L.F.	
15	CHANNEL SLOPE, S			FT./FT.	
16	MANNING'S ROUGHNESS COEFFICIENT, n				
17	VELOCITY, V, = (1.49 * R ^0.667 * S ^0.5) / n			FT./SEC.	
18	FLOW LENGTH, L			L.F.	
19	Tt = L / (3600 V)			HR. OR	0.00 MIN.
20	Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19)				

TOTAL Tc = 5.79 MIN.

Reference: *Urban Hydrology for Small Watersheds*
Technical Release 55, Soil Conservation Service
U.S. Department of Agriculture, June 1986

Hartwood Marsh Road Phase I
Pre Development
Basin 3
Input

==========
==== Basins ==========
==========

Name:	BASIN 3	Node: ROAD	Status: Onsite
Group:	BASE	Type: SCS Unit Hydrograph	
Unit Hydrograph:	Uh484	Peaking Factor:	484.0
Rainfall File:	Sjrwmd96	Storm Duration(hrs):	96.00
Rainfall Amount(in):	11.000	Time of Conc(min):	5.91
Area(ac):	2.730	Time Shift(hrs):	0.00
Curve Number:	64.10	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Existing Hartwood

Name:	BASIN 3-1	Node: ROAD	Status: Onsite
Group:	BASE	Type: SCS Unit Hydrograph	
Unit Hydrograph:	Uh484	Peaking Factor:	484.0
Rainfall File:	Sjrwmd96	Storm Duration(hrs):	96.00
Rainfall Amount(in):	11.000	Time of Conc(min):	11.83
Area(ac):	0.020	Time Shift(hrs):	0.00
Curve Number:	68.50	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

Name:	BASIN 3-2	Node: ROAD	Status: Onsite
Group:	BASE	Type: SCS Unit Hydrograph	
Unit Hydrograph:	Uh484	Peaking Factor:	484.0
Rainfall File:	Sjrwmd96	Storm Duration(hrs):	96.00
Rainfall Amount(in):	11.000	Time of Conc(min):	5.79
Area(ac):	0.460	Time Shift(hrs):	0.00
Curve Number:	39.00	Max Allowable Q(cfs):	999999.000
DCIA(%):	0.00		

==========
==== Nodes ==========
==========

Name:		Base Flow(cfs): 0.000	Init Stage(ft): 0.000
Group:	BASE		Warn Stage(ft): 0.000
Type:	Stage/Area		

Stage(ft)	Area(ac)

==========
==== Drop Structures ==========
==========

Name:		From Node:	Length(ft): 0.00
Group:	BASE	To Node:	Count: 1

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Friction Equation:	Average Conveyance
Span(in):	0.00	0.00	Solution Algorithm:	Automatic
Rise(in):	0.00	0.00	Flow:	Both
Invert(ft):	0.000	0.000	Entrance Loss Coef:	0.000
Manning's N:	0.000000	0.000000	Exit Loss Coef:	0.000
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dn
			Solution Incs:	10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

==========

Hartwood Marsh Road Phase I
Pre Development
Basin 3
Input

==== Hydrology Simulations ==========

Name: 100Y24H
Filename: W:\Jobs\41561-1\Phase 1\41561100001\drainage\ROUTINGS\PRE\100Y24H.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 10.20

Time(hrs)	Print Inc(min)
11.000	60.00
16.000	15.00
40.000	60.00

Name: 10Y24H
Filename: W:\Jobs\41561-1\Phase 1\41561100001\drainage\ROUTINGS\PRE\10Y24H.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 7.00

Time(hrs)	Print Inc(min)
11.000	60.00
16.000	15.00
40.000	60.00

Name: 2.3Y24H
Filename: W:\JOBS\41561-1\PHASE 1\41561100001\DRAINAGE\ROUTINGS\POST\2.3Y24H.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 4.90

Time(hrs)	Print Inc(min)
11.000	60.00
16.000	15.00
40.000	60.00

Name: 25Y24H
Filename: W:\JOBS\41561-1\PHASE 1\41561100001\DRAINAGE\ROUTINGS\POST\25Y24H.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 8.30

Time(hrs)	Print Inc(min)
11.000	60.00
16.000	15.00
40.000	60.00

Name: 25Y96H
Filename: W:\JOBS\41561-1\PHASE 1\41561100001\DRAINAGE\ROUTINGS\POST\25Y96H.R32

Override Defaults: No

Time(hrs)	Print Inc(min)
50.000	60.00
62.000	15.00
97.000	60.00

==== Routing Simulations ==========

Name: 2.3Y24H Hydrology Sim: 2.3Y24H
Filename: W:\JOBS\41561-1\PHASE 1\41561100001\DRAINAGE\ROUTINGS\POST\2.3Y24H.I32

Execute: No Restart: No Patch: No

Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 40.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
11.000	60.000
15.000	15.000
40.000	60.000

Group	Run
BASE	Yes

Name: 25Y24H Hydrology Sim: 25Y24H
Filename: W:\JOBS\41561-1\PHASE 1\41561100001\DRAINAGE\ROUTINGS\POST\25Y24H.I32

Execute: No Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 40.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
11.000	60.000
15.000	15.000
40.000	60.000

Group	Run
BASE	Yes

Name: 25Y96H Hydrology Sim: 25Y96H
Filename: W:\JOBS\41561-1\PHASE 1\41561100001\DRAINAGE\ROUTINGS\POST\25Y96H.I32

Execute: No Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 97.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
55.000	60.000
65.000	15.000
97.000	60.000

Group	Run
BASE	Yes

==== Boundary Conditions ====

Hartwood Marsh Road Phase I
Pre Development
Basin 3
Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess Rain in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3	BASE	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	1.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	2.00	0.027	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	3.00	0.054	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	4.00	0.081	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	5.00	0.108	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	6.00	0.134	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	7.00	0.161	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	8.00	0.188	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	9.00	0.215	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	10.00	0.242	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	11.00	0.268	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	12.00	0.295	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	13.00	0.322	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	14.00	0.349	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	15.00	0.376	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	16.00	0.403	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	17.00	0.430	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	18.00	0.457	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	19.00	0.483	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	20.00	0.510	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	21.00	0.537	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	22.00	0.564	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	23.00	0.591	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	24.00	0.618	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	25.00	0.645	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	26.00	0.708	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	27.00	0.771	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	28.00	0.834	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	29.00	0.897	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	30.00	0.963	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	31.00	1.028	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	32.00	1.093	0.065	0.000	0.000	3.807	0.000	0.002	0.000
25Y96H	BASIN 3	BASE	33.00	1.159	0.065	0.002	0.002	18.134	0.002	0.006	0.000
25Y96H	BASIN 3	BASE	34.00	1.222	0.063	0.005	0.003	45.772	0.005	0.010	0.000
25Y96H	BASIN 3	BASE	35.00	1.285	0.063	0.009	0.004	86.385	0.009	0.013	0.000
25Y96H	BASIN 3	BASE	36.00	1.348	0.063	0.014	0.005	139.557	0.014	0.016	0.000
25Y96H	BASIN 3	BASE	37.00	1.411	0.063	0.021	0.007	204.887	0.021	0.020	0.000
25Y96H	BASIN 3	BASE	38.00	1.474	0.063	0.029	0.008	281.992	0.028	0.023	0.000
25Y96H	BASIN 3	BASE	39.00	1.538	0.063	0.038	0.009	370.504	0.037	0.026	0.000
25Y96H	BASIN 3	BASE	40.00	1.601	0.063	0.048	0.010	470.071	0.047	0.029	0.000
25Y96H	BASIN 3	BASE	41.00	1.664	0.063	0.060	0.012	582.419	0.059	0.033	0.000
25Y96H	BASIN 3	BASE	42.00	1.729	0.065	0.073	0.013	707.558	0.071	0.036	0.000
25Y96H	BASIN 3	BASE	43.00	1.795	0.065	0.086	0.014	843.433	0.085	0.039	0.000
25Y96H	BASIN 3	BASE	44.00	1.860	0.065	0.101	0.015	989.704	0.100	0.042	0.000
25Y96H	BASIN 3	BASE	45.00	1.925	0.065	0.117	0.015	1143.357	0.115	0.043	0.000
25Y96H	BASIN 3	BASE	46.00	1.988	0.063	0.133	0.016	1303.803	0.132	0.046	0.000
25Y96H	BASIN 3	BASE	47.00	2.052	0.063	0.150	0.017	1473.169	0.149	0.048	0.000
25Y96H	BASIN 3	BASE	48.00	2.115	0.063	0.168	0.018	1651.237	0.167	0.051	0.000
25Y96H	BASIN 3	BASE	49.00	2.178	0.063	0.194	0.026	1872.078	0.189	0.072	0.000
25Y96H	BASIN 3	BASE	50.00	2.263	0.085	0.221	0.027	2138.647	0.216	0.076	0.000
25Y96H	BASIN 3	BASE	50.25	2.348	0.085	0.229	0.008	2213.446	0.223	0.090	0.000
25Y96H	BASIN 3	BASE	50.50	2.373	0.025	0.237	0.008	2295.191	0.232	0.092	0.000
25Y96H	BASIN 3	BASE	50.75	2.397	0.025	0.246	0.008	2378.129	0.240	0.093	0.000
25Y96H	BASIN 3	BASE	51.00	2.422	0.025	0.254	0.009	2462.234	0.248	0.094	0.000
25Y96H	BASIN 3	BASE	51.25	2.447	0.025	0.263	0.009	2547.491	0.257	0.095	0.000
25Y96H	BASIN 3	BASE	51.50	2.472	0.025	0.272	0.009	2633.890	0.266	0.097	0.000

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Hartwood Marsh Road Phase I
Pre Development
Basin 3
Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess Rain in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3	BASE	51.75	2.497	0.025	0.280	0.009	2721.417	0.275	0.098	0.000
25Y96H	BASIN 3	BASE	52.00	2.521	0.025	0.289	0.009	2810.082	0.284	0.099	0.000
25Y96H	BASIN 3	BASE	52.25	2.546	0.025	0.301	0.011	2910.667	0.294	0.124	0.000
25Y96H	BASIN 3	BASE	52.50	2.577	0.031	0.312	0.011	3023.465	0.305	0.126	0.000
25Y96H	BASIN 3	BASE	52.75	2.608	0.031	0.324	0.012	3137.952	0.317	0.128	0.000
25Y96H	BASIN 3	BASE	53.00	2.638	0.031	0.336	0.012	3254.068	0.328	0.130	0.000
25Y96H	BASIN 3	BASE	53.25	2.669	0.031	0.347	0.012	3371.794	0.340	0.132	0.000
25Y96H	BASIN 3	BASE	53.50	2.700	0.031	0.360	0.012	3491.107	0.352	0.133	0.000
25Y96H	BASIN 3	BASE	53.75	2.730	0.031	0.372	0.012	3611.989	0.364	0.135	0.000
25Y96H	BASIN 3	BASE	54.00	2.761	0.031	0.384	0.012	3734.460	0.377	0.137	0.000
25Y96H	BASIN 3	BASE	54.25	2.792	0.031	0.400	0.016	3874.235	0.391	0.174	0.000
25Y96H	BASIN 3	BASE	54.50	2.830	0.038	0.416	0.016	4031.721	0.407	0.176	0.000
25Y96H	BASIN 3	BASE	54.75	2.869	0.038	0.432	0.016	4191.575	0.423	0.179	0.000
25Y96H	BASIN 3	BASE	55.00	2.907	0.038	0.449	0.016	4353.714	0.439	0.181	0.000
25Y96H	BASIN 3	BASE	55.25	2.945	0.038	0.465	0.017	4518.102	0.456	0.184	0.000
25Y96H	BASIN 3	BASE	55.50	2.984	0.038	0.482	0.017	4684.705	0.473	0.186	0.000
25Y96H	BASIN 3	BASE	55.75	3.022	0.038	0.499	0.017	4853.489	0.490	0.189	0.000
25Y96H	BASIN 3	BASE	56.00	3.061	0.038	0.517	0.017	5024.601	0.507	0.192	0.000
25Y96H	BASIN 3	BASE	56.25	3.099	0.039	0.544	0.027	5243.518	0.529	0.295	0.000
25Y96H	BASIN 3	BASE	56.50	3.158	0.058	0.571	0.027	5511.471	0.556	0.300	0.000
25Y96H	BASIN 3	BASE	56.75	3.216	0.058	0.599	0.028	5784.213	0.584	0.306	0.000
25Y96H	BASIN 3	BASE	57.00	3.275	0.058	0.627	0.028	6061.525	0.612	0.311	0.000
25Y96H	BASIN 3	BASE	57.25	3.333	0.058	0.655	0.029	6343.307	0.640	0.316	0.000
25Y96H	BASIN 3	BASE	57.50	3.391	0.058	0.684	0.029	6629.458	0.669	0.320	0.000
25Y96H	BASIN 3	BASE	57.75	3.450	0.058	0.714	0.029	6919.884	0.698	0.325	0.000
25Y96H	BASIN 3	BASE	58.00	3.508	0.058	0.744	0.030	7214.736	0.728	0.330	0.000
25Y96H	BASIN 3	BASE	58.25	3.567	0.058	0.797	0.054	7631.455	0.770	0.596	0.000
25Y96H	BASIN 3	BASE	58.50	3.670	0.103	0.853	0.055	8174.240	0.825	0.610	0.000
25Y96H	BASIN 3	BASE	58.75	3.773	0.104	0.909	0.056	8729.419	0.881	0.623	0.000
25Y96H	BASIN 3	BASE	59.00	3.877	0.104	0.967	0.058	9296.785	0.938	0.637	0.000
25Y96H	BASIN 3	BASE	59.25	3.980	0.104	1.072	0.105	10107.624	1.020	1.164	0.000
25Y96H	BASIN 3	BASE	59.50	4.164	0.184	1.189	0.117	11184.487	1.129	1.229	0.000
25Y96H	BASIN 3	BASE	59.75	4.349	0.185	2.134	0.945	16599.842	1.675	10.806	0.000
25Y96H	BASIN 3	BASE	60.00	5.805	1.456	3.203	1.070	26890.186	2.713	12.062	0.000
25Y96H	BASIN 3	BASE	60.25	7.264	1.460	3.429	0.226	33398.816	3.370	2.402	0.000
25Y96H	BASIN 3	BASE	60.50	7.541	0.277	3.646	0.216	35558.230	3.588	2.397	0.000
25Y96H	BASIN 3	BASE	60.75	7.817	0.276	3.760	0.114	37198.113	3.754	1.247	0.000
25Y96H	BASIN 3	BASE	61.00	7.959	0.142	3.873	0.113	38321.535	3.867	1.249	0.000
25Y96H	BASIN 3	BASE	61.25	8.101	0.142	3.947	0.074	39251.285	3.961	0.817	0.000
25Y96H	BASIN 3	BASE	61.50	8.193	0.092	4.022	0.074	39987.184	4.035	0.818	0.000
25Y96H	BASIN 3	BASE	61.75	8.286	0.092	4.096	0.075	40725.090	4.110	0.821	0.000
25Y96H	BASIN 3	BASE	62.00	8.378	0.092	4.171	0.074	41464.883	4.184	0.823	0.000
25Y96H	BASIN 3	BASE	63.00	8.470	0.092	4.358	0.187	43874.371	4.427	0.516	0.000
25Y96H	BASIN 3	BASE	64.00	8.699	0.229	4.546	0.188	45738.000	4.615	0.519	0.000
25Y96H	BASIN 3	BASE	65.00	8.928	0.229	4.661	0.115	47240.059	4.767	0.315	0.000
25Y96H	BASIN 3	BASE	66.00	9.067	0.139	4.776	0.115	48376.590	4.882	0.316	0.000
25Y96H	BASIN 3	BASE	67.00	9.205	0.138	4.891	0.115	49517.762	4.997	0.318	0.000
25Y96H	BASIN 3	BASE	68.00	9.343	0.138	5.007	0.116	50662.414	5.112	0.318	0.000
25Y96H	BASIN 3	BASE	69.00	9.481	0.138	5.084	0.077	51618.648	5.209	0.213	0.000
25Y96H	BASIN 3	BASE	70.00	9.573	0.092	5.162	0.078	52386.219	5.286	0.213	0.000
25Y96H	BASIN 3	BASE	71.00	9.665	0.092	5.240	0.078	53155.199	5.364	0.214	0.000
25Y96H	BASIN 3	BASE	72.00	9.757	0.092	5.317	0.078	53924.902	5.442	0.214	0.000
25Y96H	BASIN 3	BASE	73.00	9.849	0.092	5.358	0.041	54510.555	5.501	0.111	0.000
25Y96H	BASIN 3	BASE	74.00	9.897	0.048	5.399	0.041	54912.137	5.541	0.112	0.000
25Y96H	BASIN 3	BASE	75.00	9.945	0.048	5.439	0.041	55314.191	5.582	0.112	0.000
25Y96H	BASIN 3	BASE	76.00	9.993	0.048	5.480	0.041	55716.715	5.622	0.112	0.000
25Y96H	BASIN 3	BASE	77.00	10.041	0.048	5.521	0.041	56121.352	5.663	0.113	0.000

Hartwood Marsh Road Phase I
Pre Development
Basin 3
Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess Rain in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps	
25Y96H	BASIN 3	BASE	78.00	10.089	0.048	5.562	0.041	56528.098	5.704	0.113	0.000	
25Y96H	BASIN 3	BASE	79.00	10.137	0.048	5.603	0.041	56935.305	5.745	0.113	0.000	
25Y96H	BASIN 3	BASE	80.00	10.185	0.048	5.644	0.041	57342.961	5.786	0.113	0.000	
25Y96H	BASIN 3	BASE	81.00	10.233	0.048	5.685	0.041	57749.414	5.827	0.113	0.000	
25Y96H	BASIN 3	BASE	82.00	10.281	0.048	5.726	0.041	58154.668	5.868	0.113	0.000	
25Y96H	BASIN 3	BASE	83.00	10.329	0.048	5.767	0.041	58560.359	5.909	0.113	0.000	
25Y96H	BASIN 3	BASE	84.00	10.377	0.048	5.808	0.041	58966.484	5.950	0.113	0.000	
25Y96H	BASIN 3	BASE	85.00	10.425	0.048	5.849	0.041	59373.039	5.991	0.113	0.000	
25Y96H	BASIN 3	BASE	86.00	10.473	0.048	5.891	0.041	59780.016	6.032	0.113	0.000	
25Y96H	BASIN 3	BASE	87.00	10.520	0.048	5.932	0.041	60187.414	6.073	0.113	0.000	
25Y96H	BASIN 3	BASE	88.00	10.568	0.048	5.973	0.041	60595.230	6.115	0.113	0.000	
25Y96H	BASIN 3	BASE	89.00	10.616	0.048	6.015	0.042	61005.129	6.156	0.114	0.000	
25Y96H	BASIN 3	BASE	90.00	10.664	0.048	6.056	0.042	61417.105	6.198	0.114	0.000	
25Y96H	BASIN 3	BASE	91.00	10.712	0.048	6.098	0.042	61829.496	6.239	0.115	0.000	
25Y96H	BASIN 3	BASE	92.00	10.761	0.048	6.140	0.042	62242.289	6.281	0.115	0.000	
25Y96H	BASIN 3	BASE	93.00	10.809	0.048	6.181	0.041	62653.809	6.322	0.114	0.000	
25Y96H	BASIN 3	BASE	94.00	10.857	0.048	6.222	0.041	63064.055	6.364	0.114	0.000	
25Y96H	BASIN 3	BASE	95.00	10.904	0.048	6.264	0.041	63474.691	6.405	0.114	0.000	
25Y96H	BASIN 3	BASE	96.00	10.952	0.048	6.305	0.041	63883.160	6.446	0.113	0.000	
25Y96H	BASIN 3	BASE	97.00	11.000	0.048	6.305	0.000	64086.215	6.467	0.000	0.000	← MAX
25Y96H	BASIN 3-1	BASE	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	1.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	2.00	0.027	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	3.00	0.054	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	4.00	0.081	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	5.00	0.108	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	6.00	0.134	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	7.00	0.161	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	8.00	0.188	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	9.00	0.215	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	10.00	0.242	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	11.00	0.268	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	12.00	0.295	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	13.00	0.322	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	14.00	0.349	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	15.00	0.376	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	16.00	0.403	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	17.00	0.430	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	18.00	0.457	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	19.00	0.483	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	20.00	0.510	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	21.00	0.537	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	22.00	0.564	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	23.00	0.591	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	24.00	0.618	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	25.00	0.645	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	26.00	0.708	0.063	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	27.00	0.771	0.063	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	28.00	0.834	0.063	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	29.00	0.897	0.063	0.000	0.000	0.033	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	30.00	0.963	0.065	0.002	0.002	0.165	0.002	0.000	0.000	
25Y96H	BASIN 3-1	BASE	31.00	1.028	0.065	0.006	0.004	0.422	0.006	0.000	0.000	
25Y96H	BASIN 3-1	BASE	32.00	1.093	0.065	0.012	0.005	0.800	0.011	0.000	0.000	
25Y96H	BASIN 3-1	BASE	33.00	1.159	0.065	0.019	0.007	1.285	0.018	0.000	0.000	
25Y96H	BASIN 3-1	BASE	34.00	1.222	0.063	0.027	0.008	1.867	0.026	0.000	0.000	
25Y96H	BASIN 3-1	BASE	35.00	1.285	0.063	0.037	0.010	2.550	0.035	0.000	0.000	
25Y96H	BASIN 3-1	BASE	36.00	1.348	0.063	0.047	0.011	3.330	0.046	0.000	0.000	

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Hartwood Marsh Road Phase I
Pre Development
Basin 3
Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess Rain in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3-1	BASE	37.00	1.411	0.063	0.060	0.012	4.204	0.058	0.000	0.000
25Y96H	BASIN 3-1	BASE	38.00	1.474	0.063	0.073	0.013	5.168	0.071	0.000	0.000
25Y96H	BASIN 3-1	BASE	39.00	1.538	0.063	0.088	0.015	6.218	0.086	0.000	0.000
25Y96H	BASIN 3-1	BASE	40.00	1.601	0.063	0.104	0.016	7.353	0.101	0.000	0.000
25Y96H	BASIN 3-1	BASE	41.00	1.664	0.063	0.121	0.018	8.589	0.118	0.000	0.000
25Y96H	BASIN 3-1	BASE	42.00	1.729	0.065	0.140	0.019	9.928	0.137	0.000	0.000
25Y96H	BASIN 3-1	BASE	43.00	1.795	0.065	0.160	0.020	11.347	0.156	0.000	0.000
25Y96H	BASIN 3-1	BASE	44.00	1.860	0.065	0.180	0.021	12.844	0.177	0.000	0.000
25Y96H	BASIN 3-1	BASE	45.00	1.925	0.065	0.202	0.021	14.388	0.198	0.000	0.000
25Y96H	BASIN 3-1	BASE	46.00	1.988	0.063	0.224	0.022	15.976	0.220	0.000	0.000
25Y96H	BASIN 3-1	BASE	47.00	2.052	0.063	0.247	0.023	17.630	0.243	0.000	0.000
25Y96H	BASIN 3-1	BASE	48.00	2.115	0.063	0.270	0.024	19.347	0.266	0.000	0.000
25Y96H	BASIN 3-1	BASE	49.00	2.178	0.063	0.304	0.033	21.446	0.295	0.001	0.000
25Y96H	BASIN 3-1	BASE	50.00	2.263	0.085	0.338	0.035	23.948	0.330	0.001	0.000
25Y96H	BASIN 3-1	BASE	50.25	2.348	0.085	0.349	0.010	24.638	0.339	0.001	0.000
25Y96H	BASIN 3-1	BASE	50.50	2.373	0.025	0.359	0.011	25.390	0.350	0.001	0.000
25Y96H	BASIN 3-1	BASE	50.75	2.397	0.025	0.370	0.011	26.158	0.360	0.001	0.000
25Y96H	BASIN 3-1	BASE	51.00	2.422	0.025	0.381	0.011	26.933	0.371	0.001	0.000
25Y96H	BASIN 3-1	BASE	51.25	2.447	0.025	0.392	0.011	27.717	0.382	0.001	0.000
25Y96H	BASIN 3-1	BASE	51.50	2.472	0.025	0.403	0.011	28.510	0.393	0.001	0.000
25Y96H	BASIN 3-1	BASE	51.75	2.497	0.025	0.414	0.011	29.310	0.404	0.001	0.000
25Y96H	BASIN 3-1	BASE	52.00	2.521	0.025	0.425	0.011	30.118	0.415	0.001	0.000
25Y96H	BASIN 3-1	BASE	52.25	2.546	0.025	0.439	0.014	31.019	0.427	0.001	0.000
25Y96H	BASIN 3-1	BASE	52.50	2.577	0.031	0.453	0.014	32.028	0.441	0.001	0.000
25Y96H	BASIN 3-1	BASE	52.75	2.608	0.031	0.468	0.014	33.061	0.455	0.001	0.000
25Y96H	BASIN 3-1	BASE	53.00	2.638	0.031	0.482	0.015	34.107	0.470	0.001	0.000
25Y96H	BASIN 3-1	BASE	53.25	2.669	0.031	0.497	0.015	35.163	0.484	0.001	0.000
25Y96H	BASIN 3-1	BASE	53.50	2.700	0.031	0.512	0.015	36.231	0.499	0.001	0.000
25Y96H	BASIN 3-1	BASE	53.75	2.730	0.031	0.527	0.015	37.310	0.514	0.001	0.000
25Y96H	BASIN 3-1	BASE	54.00	2.761	0.031	0.542	0.015	38.401	0.529	0.001	0.000
25Y96H	BASIN 3-1	BASE	54.25	2.792	0.031	0.561	0.019	39.623	0.546	0.001	0.000
25Y96H	BASIN 3-1	BASE	54.50	2.830	0.038	0.580	0.019	40.998	0.565	0.002	0.000
25Y96H	BASIN 3-1	BASE	54.75	2.869	0.038	0.600	0.020	42.408	0.584	0.002	0.000
25Y96H	BASIN 3-1	BASE	55.00	2.907	0.038	0.620	0.020	43.833	0.604	0.002	0.000
25Y96H	BASIN 3-1	BASE	55.25	2.945	0.038	0.640	0.020	45.275	0.624	0.002	0.000
25Y96H	BASIN 3-1	BASE	55.50	2.984	0.038	0.660	0.020	46.732	0.644	0.002	0.000
25Y96H	BASIN 3-1	BASE	55.75	3.022	0.038	0.680	0.020	48.204	0.664	0.002	0.000
25Y96H	BASIN 3-1	BASE	56.00	3.061	0.038	0.701	0.021	49.692	0.684	0.002	0.000
25Y96H	BASIN 3-1	BASE	56.25	3.099	0.039	0.733	0.032	51.541	0.710	0.002	0.000
25Y96H	BASIN 3-1	BASE	56.50	3.158	0.058	0.765	0.032	53.806	0.741	0.003	0.000
25Y96H	BASIN 3-1	BASE	56.75	3.216	0.058	0.798	0.033	56.151	0.773	0.003	0.000
25Y96H	BASIN 3-1	BASE	57.00	3.275	0.058	0.831	0.033	58.529	0.806	0.003	0.000
25Y96H	BASIN 3-1	BASE	57.25	3.333	0.058	0.864	0.033	60.938	0.839	0.003	0.000
25Y96H	BASIN 3-1	BASE	57.50	3.391	0.058	0.898	0.034	63.376	0.873	0.003	0.000
25Y96H	BASIN 3-1	BASE	57.75	3.450	0.058	0.932	0.034	65.844	0.907	0.003	0.000
25Y96H	BASIN 3-1	BASE	58.00	3.508	0.058	0.967	0.035	68.343	0.941	0.003	0.000
25Y96H	BASIN 3-1	BASE	58.25	3.567	0.058	1.029	0.062	71.729	0.988	0.005	0.000
25Y96H	BASIN 3-1	BASE	58.50	3.670	0.103	1.093	0.064	76.152	1.049	0.005	0.000
25Y96H	BASIN 3-1	BASE	58.75	3.773	0.104	1.157	0.065	80.788	1.113	0.005	0.000
25Y96H	BASIN 3-1	BASE	59.00	3.877	0.104	1.224	0.067	85.511	1.178	0.005	0.000
25Y96H	BASIN 3-1	BASE	59.25	3.980	0.104	1.342	0.118	91.971	1.267	0.009	0.000
25Y96H	BASIN 3-1	BASE	59.50	4.164	0.184	1.485	0.143	100.575	1.385	0.010	0.000
25Y96H	BASIN 3-1	BASE	59.75	4.349	0.185	2.516	1.031	138.850	1.913	0.075	0.000
25Y96H	BASIN 3-1	BASE	60.00	5.805	1.456	3.654	1.138	214.087	2.949	0.092	0.000
25Y96H	BASIN 3-1	BASE	60.25	7.264	1.460	3.907	0.253	268.321	3.696	0.028	0.000
25Y96H	BASIN 3-1	BASE	60.50	7.541	0.277	4.136	0.228	289.530	3.988	0.019	0.000
25Y96H	BASIN 3-1	BASE	60.75	7.817	0.276	4.258	0.122	302.849	4.171	0.011	0.000

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Hartwood Marsh Road Phase I
Pre Development
Basin 3
Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess Rain in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps	
25Y96H	BASIN 3-1	BASE	61.00	7.959	0.142	4.377	0.119	312.066	4.298	0.010	0.000	
25Y96H	BASIN 3-1	BASE	61.25	8.101	0.142	4.456	0.079	319.459	4.400	0.007	0.000	
25Y96H	BASIN 3-1	BASE	61.50	8.193	0.092	4.535	0.079	325.341	4.481	0.006	0.000	
25Y96H	BASIN 3-1	BASE	61.75	8.286	0.092	4.613	0.079	331.045	4.560	0.006	0.000	
25Y96H	BASIN 3-1	BASE	62.00	8.378	0.092	4.691	0.078	336.755	4.639	0.006	0.000	
25Y96H	BASIN 3-1	BASE	63.00	8.470	0.092	4.889	0.198	355.334	4.894	0.004	0.000	
25Y96H	BASIN 3-1	BASE	64.00	8.699	0.229	5.087	0.198	369.677	5.092	0.004	0.000	
25Y96H	BASIN 3-1	BASE	65.00	8.928	0.229	5.207	0.121	381.223	5.251	0.002	0.000	
25Y96H	BASIN 3-1	BASE	66.00	9.067	0.139	5.328	0.120	389.953	5.371	0.002	0.000	
25Y96H	BASIN 3-1	BASE	67.00	9.205	0.138	5.449	0.121	398.710	5.492	0.002	0.000	
25Y96H	BASIN 3-1	BASE	68.00	9.343	0.138	5.570	0.121	407.488	5.613	0.002	0.000	
25Y96H	BASIN 3-1	BASE	69.00	9.481	0.138	5.651	0.081	414.816	5.714	0.002	0.000	
25Y96H	BASIN 3-1	BASE	70.00	9.573	0.092	5.732	0.081	420.693	5.795	0.002	0.000	
25Y96H	BASIN 3-1	BASE	71.00	9.665	0.092	5.813	0.081	426.579	5.876	0.002	0.000	
25Y96H	BASIN 3-1	BASE	72.00	9.757	0.092	5.894	0.081	432.469	5.957	0.002	0.000	
25Y96H	BASIN 3-1	BASE	73.00	9.849	0.092	5.937	0.042	436.949	6.019	0.001	0.000	
25Y96H	BASIN 3-1	BASE	74.00	9.897	0.048	5.979	0.042	440.019	6.061	0.001	0.000	
25Y96H	BASIN 3-1	BASE	75.00	9.945	0.048	6.021	0.042	443.091	6.103	0.001	0.000	
25Y96H	BASIN 3-1	BASE	76.00	9.993	0.048	6.064	0.042	446.167	6.146	0.001	0.000	
25Y96H	BASIN 3-1	BASE	77.00	10.041	0.048	6.107	0.043	449.257	6.188	0.001	0.000	
25Y96H	BASIN 3-1	BASE	78.00	10.089	0.048	6.149	0.043	452.363	6.231	0.001	0.000	
25Y96H	BASIN 3-1	BASE	79.00	10.137	0.048	6.192	0.043	455.472	6.274	0.001	0.000	
25Y96H	BASIN 3-1	BASE	80.00	10.185	0.048	6.235	0.043	458.583	6.317	0.001	0.000	
25Y96H	BASIN 3-1	BASE	81.00	10.233	0.048	6.278	0.043	461.684	6.359	0.001	0.000	
25Y96H	BASIN 3-1	BASE	82.00	10.281	0.048	6.320	0.043	464.775	6.402	0.001	0.000	
25Y96H	BASIN 3-1	BASE	83.00	10.329	0.048	6.363	0.043	467.869	6.444	0.001	0.000	
25Y96H	BASIN 3-1	BASE	84.00	10.377	0.048	6.406	0.043	470.966	6.487	0.001	0.000	
25Y96H	BASIN 3-1	BASE	85.00	10.425	0.048	6.449	0.043	474.064	6.530	0.001	0.000	
25Y96H	BASIN 3-1	BASE	86.00	10.473	0.048	6.491	0.043	477.166	6.573	0.001	0.000	
25Y96H	BASIN 3-1	BASE	87.00	10.520	0.048	6.534	0.043	480.270	6.615	0.001	0.000	
25Y96H	BASIN 3-1	BASE	88.00	10.568	0.048	6.577	0.043	483.376	6.658	0.001	0.000	
25Y96H	BASIN 3-1	BASE	89.00	10.616	0.048	6.620	0.043	486.497	6.701	0.001	0.000	
25Y96H	BASIN 3-1	BASE	90.00	10.664	0.048	6.664	0.043	489.634	6.744	0.001	0.000	
25Y96H	BASIN 3-1	BASE	91.00	10.712	0.048	6.707	0.043	492.772	6.787	0.001	0.000	
25Y96H	BASIN 3-1	BASE	92.00	10.761	0.048	6.750	0.043	495.913	6.831	0.001	0.000	
25Y96H	BASIN 3-1	BASE	93.00	10.809	0.048	6.793	0.043	499.044	6.874	0.001	0.000	
25Y96H	BASIN 3-1	BASE	94.00	10.857	0.048	6.836	0.043	502.164	6.917	0.001	0.000	
25Y96H	BASIN 3-1	BASE	95.00	10.904	0.048	6.879	0.043	505.287	6.960	0.001	0.000	
25Y96H	BASIN 3-1	BASE	96.00	10.952	0.048	6.921	0.042	508.393	7.003	0.001	0.000	
25Y96H	BASIN 3-1	BASE	97.00	11.000	0.048	6.921	0.000	509.936	7.024	0.000	0.000	← max
25Y96H	BASIN 3-2	BASE	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	1.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	2.00	0.027	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	3.00	0.054	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	4.00	0.081	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	5.00	0.108	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	6.00	0.134	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	7.00	0.161	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	8.00	0.188	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	9.00	0.215	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	10.00	0.242	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	11.00	0.268	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	12.00	0.295	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	13.00	0.322	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	14.00	0.349	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	15.00	0.376	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	16.00	0.403	0.027	0.000	0.000	0.000	0.000	0.000	0.000	

Hartwood Marsh Road Phase I
Pre Development
Basin 3
Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess Rain in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3-2	BASE	17.00	0.430	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	18.00	0.457	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	19.00	0.483	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	20.00	0.510	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	21.00	0.537	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	22.00	0.564	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	23.00	0.591	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	24.00	0.618	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	25.00	0.645	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	26.00	0.708	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	27.00	0.771	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	28.00	0.834	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	29.00	0.897	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	30.00	0.963	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	31.00	1.028	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	32.00	1.093	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	33.00	1.159	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	34.00	1.222	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	35.00	1.285	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	36.00	1.348	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	37.00	1.411	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	38.00	1.474	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	39.00	1.538	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	40.00	1.601	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	41.00	1.664	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	42.00	1.729	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	43.00	1.795	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	44.00	1.860	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	45.00	1.925	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	46.00	1.988	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	47.00	2.052	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	48.00	2.115	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	49.00	2.178	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	50.00	2.263	0.085	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	50.25	2.348	0.085	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	50.50	2.373	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	50.75	2.397	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	51.00	2.422	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	51.25	2.447	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	51.50	2.472	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	51.75	2.497	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	52.00	2.521	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	52.25	2.546	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	52.50	2.577	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	52.75	2.608	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	53.00	2.638	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	53.25	2.669	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	53.50	2.700	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	53.75	2.730	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	54.00	2.761	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	54.25	2.792	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	54.50	2.830	0.038	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	54.75	2.869	0.038	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	55.00	2.907	0.038	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	55.25	2.945	0.038	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	55.50	2.984	0.038	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	55.75	3.022	0.038	0.000	0.000	0.000	0.000	0.000	0.000

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Hartwood Marsh Road Phase I
Pre Development
Basin 3
Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess Rain in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3-2	BASE	56.00	3.061	0.038	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	56.25	3.099	0.039	0.000	0.000	0.079	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	56.50	3.158	0.058	0.000	0.000	0.593	0.000	0.001	0.000
25Y96H	BASIN 3-2	BASE	56.75	3.216	0.058	0.001	0.001	1.818	0.001	0.002	0.000
25Y96H	BASIN 3-2	BASE	57.00	3.275	0.058	0.003	0.001	3.752	0.002	0.003	0.000
25Y96H	BASIN 3-2	BASE	57.25	3.333	0.058	0.004	0.002	6.387	0.004	0.003	0.000
25Y96H	BASIN 3-2	BASE	57.50	3.391	0.058	0.006	0.002	9.717	0.006	0.004	0.000
25Y96H	BASIN 3-2	BASE	57.75	3.450	0.058	0.009	0.003	13.732	0.008	0.005	0.000
25Y96H	BASIN 3-2	BASE	58.00	3.508	0.058	0.012	0.003	18.427	0.011	0.006	0.000
25Y96H	BASIN 3-2	BASE	58.25	3.567	0.058	0.018	0.006	26.302	0.016	0.012	0.000
25Y96H	BASIN 3-2	BASE	58.50	3.670	0.103	0.026	0.007	38.054	0.023	0.014	0.000
25Y96H	BASIN 3-2	BASE	58.75	3.773	0.104	0.034	0.009	51.850	0.031	0.016	0.000
25Y96H	BASIN 3-2	BASE	59.00	3.877	0.104	0.044	0.010	67.662	0.041	0.019	0.000
25Y96H	BASIN 3-2	BASE	59.25	3.980	0.104	0.064	0.020	93.660	0.056	0.039	0.000
25Y96H	BASIN 3-2	BASE	59.50	4.164	0.184	0.090	0.026	132.327	0.079	0.047	0.000
25Y96H	BASIN 3-2	BASE	59.75	4.349	0.185	0.391	0.301	437.457	0.262	0.631	0.000
25Y96H	BASIN 3-2	BASE	60.00	5.805	1.456	0.860	0.469	1140.289	0.683	0.931	0.000
25Y96H	BASIN 3-2	BASE	60.25	7.264	1.460	0.971	0.111	1649.032	0.988	0.200	0.000
25Y96H	BASIN 3-2	BASE	60.50	7.541	0.277	1.081	0.110	1831.840	1.097	0.206	0.000
25Y96H	BASIN 3-2	BASE	60.75	7.817	0.276	1.140	0.059	1973.821	1.182	0.109	0.000
25Y96H	BASIN 3-2	BASE	61.00	7.959	0.142	1.200	0.060	2072.915	1.241	0.111	0.000
25Y96H	BASIN 3-2	BASE	61.25	8.101	0.142	1.239	0.039	2155.825	1.291	0.073	0.000
25Y96H	BASIN 3-2	BASE	61.50	8.193	0.092	1.279	0.040	2222.085	1.331	0.074	0.000
25Y96H	BASIN 3-2	BASE	61.75	8.286	0.092	1.319	0.040	2289.083	1.371	0.075	0.000
25Y96H	BASIN 3-2	BASE	62.00	8.378	0.092	1.360	0.040	2356.775	1.411	0.076	0.000
25Y96H	BASIN 3-2	BASE	63.00	8.470	0.092	1.463	0.103	2579.787	1.545	0.048	0.000
25Y96H	BASIN 3-2	BASE	64.00	8.699	0.229	1.569	0.106	2755.963	1.650	0.050	0.000
25Y96H	BASIN 3-2	BASE	65.00	8.928	0.229	1.634	0.065	2899.789	1.737	0.030	0.000
25Y96H	BASIN 3-2	BASE	66.00	9.067	0.139	1.700	0.066	3009.883	1.803	0.031	0.000
25Y96H	BASIN 3-2	BASE	67.00	9.205	0.138	1.767	0.067	3121.502	1.869	0.031	0.000
25Y96H	BASIN 3-2	BASE	68.00	9.343	0.138	1.835	0.068	3234.538	1.937	0.032	0.000
25Y96H	BASIN 3-2	BASE	69.00	9.481	0.138	1.881	0.046	3329.643	1.994	0.021	0.000
25Y96H	BASIN 3-2	BASE	70.00	9.573	0.092	1.927	0.046	3406.476	2.040	0.021	0.000
25Y96H	BASIN 3-2	BASE	71.00	9.665	0.092	1.973	0.046	3483.898	2.086	0.022	0.000
25Y96H	BASIN 3-2	BASE	72.00	9.757	0.092	2.020	0.047	3561.899	2.133	0.022	0.000
25Y96H	BASIN 3-2	BASE	73.00	9.849	0.092	2.045	0.024	3621.494	2.169	0.011	0.000
25Y96H	BASIN 3-2	BASE	74.00	9.897	0.048	2.069	0.025	3662.455	2.193	0.011	0.000
25Y96H	BASIN 3-2	BASE	75.00	9.945	0.048	2.094	0.025	3703.581	2.218	0.011	0.000
25Y96H	BASIN 3-2	BASE	76.00	9.993	0.048	2.119	0.025	3744.871	2.243	0.011	0.000
25Y96H	BASIN 3-2	BASE	77.00	10.041	0.048	2.144	0.025	3786.493	2.268	0.012	0.000
25Y96H	BASIN 3-2	BASE	78.00	10.089	0.048	2.169	0.025	3828.448	2.293	0.012	0.000
25Y96H	BASIN 3-2	BASE	79.00	10.137	0.048	2.194	0.025	3870.567	2.318	0.012	0.000
25Y96H	BASIN 3-2	BASE	80.00	10.185	0.048	2.219	0.025	3912.847	2.343	0.012	0.000
25Y96H	BASIN 3-2	BASE	81.00	10.233	0.048	2.245	0.025	3955.115	2.369	0.012	0.000
25Y96H	BASIN 3-2	BASE	82.00	10.281	0.048	2.270	0.025	3997.371	2.394	0.012	0.000
25Y96H	BASIN 3-2	BASE	83.00	10.329	0.048	2.296	0.025	4039.783	2.419	0.012	0.000
25Y96H	BASIN 3-2	BASE	84.00	10.377	0.048	2.321	0.026	4082.350	2.445	0.012	0.000
25Y96H	BASIN 3-2	BASE	85.00	10.425	0.048	2.347	0.026	4125.072	2.470	0.012	0.000
25Y96H	BASIN 3-2	BASE	86.00	10.473	0.048	2.372	0.026	4167.948	2.496	0.012	0.000
25Y96H	BASIN 3-2	BASE	87.00	10.520	0.048	2.398	0.026	4210.977	2.522	0.012	0.000
25Y96H	BASIN 3-2	BASE	88.00	10.568	0.048	2.424	0.026	4254.157	2.548	0.012	0.000
25Y96H	BASIN 3-2	BASE	89.00	10.616	0.048	2.450	0.026	4297.667	2.574	0.012	0.000
25Y96H	BASIN 3-2	BASE	90.00	10.664	0.048	2.477	0.026	4341.504	2.600	0.012	0.000
25Y96H	BASIN 3-2	BASE	91.00	10.712	0.048	2.503	0.026	4385.494	2.626	0.012	0.000
25Y96H	BASIN 3-2	BASE	92.00	10.761	0.048	2.529	0.026	4429.632	2.653	0.012	0.000
25Y96H	BASIN 3-2	BASE	93.00	10.809	0.048	2.556	0.026	4473.740	2.679	0.012	0.000
25Y96H	BASIN 3-2	BASE	94.00	10.857	0.048	2.582	0.026	4517.816	2.706	0.012	0.000

Hartwood Marsh Road Phase I
Pre Development
Basin 3
Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess Rain in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3-2	BASE	95.00	10.904	0.048	2.609	0.027	4562.038	2.732	0.012	0.000
25Y96H	BASIN 3-2	BASE	96.00	10.952	0.048	2.635	0.026	4606.295	2.759	0.012	0.000
25Y96H	BASIN 3-2	BASE	97.00	11.000	0.048	2.635	0.000	4628.405	2.772	0.000	0.000 ← MAX

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Post Development Drainage Basin Data

BASIN BREAKDOWN

HNTB

		DATE
MADE BY:	MSF	23-Apr-08
CHCK BY:	KMV	24-Apr-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION: BASIN 3 - PHASE 1

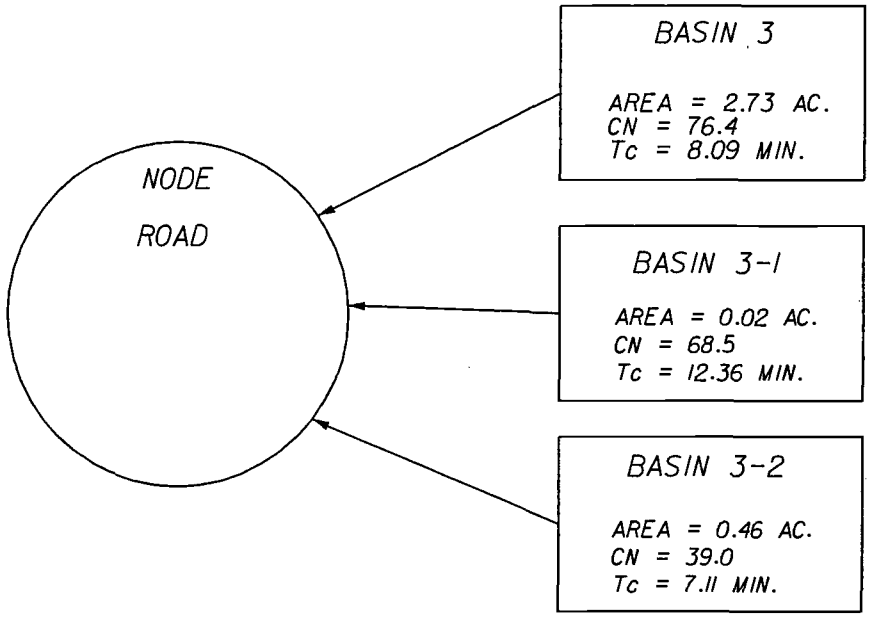
BASIN LIMITS: STA. 152+39 to STA 162+00, CL CONST. HARTWOOD MARSH RD.

EXISTING CONDITIONS:

LOCATION	STATION	To	STATION	BASIN WIDTH (Ft.)	IMP. AREA (Acres)	PERV. AREA (Acres)	TOTAL AREA (Acres)	REMARKS
ON-SITE:								
BASIN 3	152+39	-	162+00	120	0.843	1.887	2.730	
ON-SITE SUBTOTAL:					*0.843*	*1.887*	*2.73*	
OFF-SITE:								
BASIN 3-1 (OFF-SITE)	152+39	-	153+09	-	0.01	0.01	0.02	
BASIN 3-2 (OFF-SITE)	153+87	-	155+50	-	0.00	0.46	0.46	
OFF-SITE SUBTOTAL:					*0.01*	*0.47*	*0.48*	
TOTAL:					0.85	2.35	3.21	

PROPOSED CONDITIONS:

LOCATION	STATION	To	STATION	BASIN WIDTH (Ft.)	IMP. AREA (Acres)	PERV. AREA (Acres)	TOTAL AREA (Acres)	REMARKS
ON-SITE:								
BASIN 3	152+39	-	162+00	120	1.73	1.00	2.73	
ON-SITE SUBTOTAL:					*1.73*	*1.00*	*2.73*	
OFF-SITE:								
BASIN 3-1 (OFF-SITE)	152+39	-	153+09	-	0.01	0.01	0.02	
BASIN 3-2 (OFF-SITE)	153+87	-	155+50	-	0.00	0.46	0.46	
OFF-SITE SUBTOTAL:					*0.01*	*0.47*	*0.48*	
TOTAL:					1.74	1.47	3.21	



BASIN 3

LOCATION: LAKE COUNTY SEC. 9 & 10, T23S, R26E HARTWOOD MARSH ROAD RECONSTRUCTION US 27 TO 1500 FT EAST OF S. HANCOCK RD	COUNTY: LAKE STATE: FLORIDA DATE: 04-08	DATUM: NAVD 88 PURPOSE: POST-DEVELOPMENT NODAL DIAGRAM
HNTB HNTB CORPORATION 300 PRIMERA BLVD, SUITE 200 LAKE MARY, FL 32746 (407) 805-0355 CERT. OF AUTH. NO. 6500 ENGINEER OF RECORD: KAREN M. VAN DEN AVONT, P.E. FL. REGISTRATION NO. 44794	LAKE COUNTY FLORIDA	LAKE COUNTY HARTWOOD MARSH ROAD

4/30/2008 5:04:25 PM \\LKMW00\pmwork\Jobs\41561-1\Phase 1\41561I0000I\drainage\NODALDIAGRAMpost.dgn

RUNOFF CURVE NUMBER

HNTB

		DATE:
MADE BY:	MSF	23-Apr-08
CHKED BY:	KMV	24-Apr-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION: BASIN 3

UNDERLINE ONE: EXISTING **PROPOSED**

Soil Name and Hydrologic group (Appendix A)	Cover Description (Cover type, treatment, and hydrologic condition: percent impervious: unconnected / connected impervious area ratio)	CN Tab. 2-2	CN Fig. 2-3	CN Fig. 2-4	Area acres	Product of CN x Area
-	IMPERVIOUS AREA Exist Pavement (Off-Site)	98			1.73	169.59
Astatula Sand (A)	GRASS Fair Condition (Off-Site)	39			1.00	38.99
			Totals =		2.73	208.58

Use CN = **76.4**

REFERENCE: *Urban Hydrology for Small Watersheds*
Technical Release 55, Soil Conservation Service
U.S. Department of Agriculture, June 1986

RUNOFF CURVE NUMBER

HNTB

		DATE:
MADE BY:	MSF	23-Apr-08
CHKED BY:	KMV	24-Apr-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION: BASIN 3-1

UNDERLINE ONE: **EXISTING** **PROPOSED**

Soil Name and Hydrologic group (Appendix A)	Cover Description (Cover type, treatment, and hydrologic condition: percent impervious: unconnected / connected impervious area ratio)	CN Tab. 2-2	CN Fig. 2-3	CN Fig. 2-4	Area acres	Product of CN x Area
-	IMPERVIOUS AREA Exist Pavement (Off-Site)	98			0.01	0.98
Astatula Sand (A)	GRASS Fair Condition (Off-Site)	39			0.01	0.39
			Totals =		0.02	1.37

Use CN = **68.5**

REFERENCE: *Urban Hydrology for Small Watersheds*
Technical Release 55, Soil Conservation Service
U.S. Department of Agriculture, June 1986

RUNOFF CURVE NUMBER

HNTB

		DATE:
MADE BY:	MSF	23-Apr-08
CHKED BY:	KMV	24-Apr-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION: BASIN 3-2

UNDERLINE ONE: **EXISTING** **PROPOSED**

Soil Name and Hydrologic group (Appendix A)	Cover Description (Cover type, treatment, and hydrologic condition: percent impervious: unconnected / connected impervious area ratio)	CN Tab. 2-2	CN Fig. 2-3	CN Fig. 2-4	Area acres	Product of CN x Area
-	IMPERVIOUS AREA Exist Pavement (Off-Site)	98			0.00	0.00
Astatula Sand (A)	GRASS Fair Condition (Off-Site)	39			0.46	17.79
			Totals =		0.46	17.79

Use CN = **39.0**

REFERENCE: *Urban Hydrology for Small Watersheds*
Technical Release 55, Soil Conservation Service
U.S. Department of Agriculture, June 1986

TIME OF CONCENTRATION CALCULATIONS

HNTB

		DATE:
MADE BY:	MSF	12-Mar-08
CHECKED BY:	KMV	13-Mar-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION : BASIN 3

UNDERLINE ONE: EXISTING **PROPOSED**

UNDERLINE ONE: **Tc** **Tt** **Through subarea**

SHEET FLOW:

1	SURFACE DESCRIPTION	SMOOTH SURFACE			
2	MANNING'S COEFFICIENT, n	0.011			
3	FLOW LENGTH, L, (< 300')	300		FT.	
4	2 YR/ 24 HR RAINFALL, P	4.70		IN.	
5	LAND SLOPE, S	0.011			
6	Tt = (0.007 (nL)^0.8) / (P^0.5 * S^0.4)	0.052		HR. OR	3.11 MIN.

SHALLOW CONCENTRATED FLOW:

7	SURFACE DESCRIPTION (PAVED OR UNPAVED)	UNPAVED			
8	FLOW LENGTH, L	806		L.F.	
9	WATERCOURSE SLOPE, S	0.0280		FT./ FT.	
10	AVERAGE VELOCITY, V	2.699		FT./SEC.	
11	Tt = L / (3600 * V)	0.08		HR. OR	4.98 MIN.

CHANNEL FLOW:

12	CROSS-SECTIONAL FLOW AREA, A			S.F.	
13	WETTED PERIMETER, Pw			L.F.	
14	HYDRAULIC RADIUS, R = (A / Pw)			L.F.	
15	CHANNEL SLOPE, S			FT./FT.	
16	MANNING'S ROUGHNESS COEFFICIENT, n				
17	VELOCITY, V, = (1.49 * R ^0.667 * S ^0.5) / n			FT./SEC.	
18	FLOW LENGTH, L			L.F.	
19	Tt = L / (3600 V)			HR. OR	0.00 MIN.
20	Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19)				

TOTAL Tc = 8.09 MIN.

Reference: *Urban Hydrology for Small Watersheds*
Technical Release 55, Soil Conservation Service
U.S. Department of Agriculture, June 1986

TIME OF CONCENTRATION CALCULATIONS

HNTB

		DATE:
MADE BY:	MSF	12-Mar-08
CHECKED BY:	KMV	13-Mar-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION : BASIN 3-1

UNDERLINE ONE: EXISTING **PROPOSED**

UNDERLINE ONE: **Tc** **Tt** **Through subarea**

SHEET FLOW:

1	SURFACE DESCRIPTION	SHORT GRASS		
2	MANNING'S COEFFICIENT, n	0.150		
3	FLOW LENGTH, L, (< 300')	100	FT.	
4	2 YR/ 24 HR RAINFALL, P	4.70	IN.	
5	LAND SLOPE, S	0.030		
6	Tt = (0.007 (nL)^0.8) / (P^0.5 * S^0.4)	0.115	HR. OR	6.87 MIN. (TO ROAD)

SHALLOW CONCENTRATED FLOW:

7	SURFACE DESCRIPTION (PAVED OR UNPAVED)	UNPAVED		
8	FLOW LENGTH, L	860	L.F.	
9	WATERCOURSE SLOPE, S	0.0262	FT./ FT.	
10	AVERAGE VELOCITY, V	2.613	FT./SEC.	
11	Tt = L / (3600 * V)	0.09	HR. OR	5.49 MIN.

CHANNEL FLOW:

12	CROSS-SECTIONAL FLOW AREA, A		S.F.	
13	WETTED PERIMETER, Pw		L.F.	
14	HYDRAULIC RADIUS, R = (A / Pw)		L.F.	
15	CHANNEL SLOPE, S		FT./FT.	
16	MANNING'S ROUGHNESS COEFFICIENT, n			
17	VELOCITY, V, = (1.49 * R ^0.667 * S ^0.5) / n		FT./SEC.	
18	FLOW LENGTH, L		L.F.	
19	Tt = L / (3600 V)		HR. OR	0.00 MIN.
20	Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19)			

TOTAL Tc = 12.36 MIN.

Reference: *Urban Hydrology for Small Watersheds*
Technical Release 55, Soil Conservation Service
U.S. Department of Agriculture, June 1986

TIME OF CONCENTRATION CALCULATIONS

HNTB

		DATE:
MADE BY:	MSF	12-Mar-08
CHECKED BY:	KMV	13-Mar-08

PROJECT: HARTWOOD MARSH ROAD

LOCATION : BASIN 3-2

UNDERLINE ONE: EXISTING **PROPOSED**

UNDERLINE ONE: **Tc** **Tt Through subarea**

SHEET FLOW:

1	SURFACE DESCRIPTION	SHORT GRASS			
2	MANNING'S COEFFICIENT, n	0.150			
3	FLOW LENGTH, L, (< 300')	32		FT.	
4	2 YR/ 24 HR RAINFALL, P	4.70		IN.	
5	LAND SLOPE, S	0.128			
6	Tt = (0.007 (nL)^0.8) / (P^0.5 * S^0.4)	0.026		HR. OR	1.55 MIN. (TO ROAD)

SHALLOW CONCENTRATED FLOW:

7	SURFACE DESCRIPTION (PAVED OR UNPAVED)	UNPAVED			
8	FLOW LENGTH, L	745		L.F.	
9	WATERCOURSE SLOPE, S	0.0368		FT./ FT.	
10	AVERAGE VELOCITY, V	3.094		FT./SEC.	
11	Tt = L / (3600 * V)	0.07		HR. OR	4.01 MIN.

CHANNEL FLOW:

12	CROSS-SECTIONAL FLOW AREA, A			S.F.	Pipe flow
13	WETTED PERIMETER, Pw			L.F.	
14	HYDRAULIC RADIUS, R = (A / Pw)			L.F.	
15	CHANNEL SLOPE, S			FT./FT.	
16	MANNING'S ROUGHNESS COEFFICIENT, n				
17	VELOCITY, V, = (1.49 * R ^0.667 * S ^0.5) / n	2.500		FT./SEC.	
18	FLOW LENGTH, L	233		L.F.	
19	Tt = L / (3600 V)	0.03		HR. OR	1.55 MIN.
20	Watershed or subarea Tc or Tt (add Tt in steps 6, 11, and 19)				

TOTAL Tc = 7.11 MIN.

Reference: *Urban Hydrology for Small Watersheds*
Technical Release 55, Soil Conservation Service
U.S. Department of Agriculture, June 1986

Hartwood Marsh Road Phase I
Post Development
Basin 3
Input

==========
==== Basins ====
==========

Name: BASIN 3 Node: ROAD Status: Onsite
Group: BASE Type: SCS Unit Hydrograph

Unit Hydrograph: Uh484 Peaking Factor: 484.0
Rainfall File: Sjrwmd96 Storm Duration(hrs): 96.00
Rainfall Amount(in): 11.000 Time of Conc(min): 8.09
Area(ac): 2.730 Time Shift(hrs): 0.00
Curve Number: 76.40 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Existing Hartwood

Name: BASIN 3-1 Node: ROAD Status: Onsite
Group: BASE Type: SCS Unit Hydrograph

Unit Hydrograph: Uh484 Peaking Factor: 484.0
Rainfall File: Sjrwmd96 Storm Duration(hrs): 96.00
Rainfall Amount(in): 11.000 Time of Conc(min): 12.36
Area(ac): 0.020 Time Shift(hrs): 0.00
Curve Number: 68.50 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: BASIN 3-2 Node: ROAD Status: Onsite
Group: BASE Type: SCS Unit Hydrograph

Unit Hydrograph: Uh484 Peaking Factor: 484.0
Rainfall File: Sjrwmd96 Storm Duration(hrs): 96.00
Rainfall Amount(in): 11.000 Time of Conc(min): 7.11
Area(ac): 0.460 Time Shift(hrs): 0.00
Curve Number: 39.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

==========
==== Hydrology Simulations ====
==========

Name: 100Y24H
Filename: W:\Jobs\41561-1\Phase 1\41561100001\drainage\ROUTINGS\POST\100Y24H.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 10.20

Time(hrs)	Print Inc(min)
11.000	60.00
16.000	15.00
40.000	60.00

Name: 10Y24H
Filename: W:\Jobs\41561-1\Phase 1\41561100001\drainage\ROUTINGS\PRE\10Y24H.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 7.00

Time(hrs)	Print Inc(min)
11.000	60.00
16.000	15.00
40.000	60.00

Name: 2.3Y24H
Filename: W:\JOBS\41561-1\PHASE 1\41561100001\DRAINAGE\ROUTINGS\POST\2.3Y24H.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00

Rainfall File: Flmod
Rainfall Amount(in): 4.90

Time(hrs)	Print Inc(min)
11.000	60.00
16.000	15.00
40.000	60.00

Name: 25Y24H
Filename: W:\JOBS\41561-1\PHASE 1\41561100001\DRAINAGE\ROUTINGS\POST\25Y24H.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: Flmod
Rainfall Amount(in): 8.30

Time(hrs)	Print Inc(min)
11.000	60.00
16.000	15.00
40.000	60.00

Name: 25Y96H
Filename: W:\JOBS\41561-1\PHASE 1\41561100001\DRAINAGE\ROUTINGS\POST\25Y96H.R32

Override Defaults: No

Time(hrs)	Print Inc(min)
50.000	60.00
62.000	15.00
97.000	60.00

==========

==== Routing Simulations ==========

==========

Name: 10Y24H Hydrology Sim: 10Y24H
Filename: W:\Jobs\41561-1\Phase 1\41561100001\drainage\ROUTINGS\POST\10Y24H.I32

Execute: No Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 40.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
11.000	60.000
15.000	15.000
40.000	60.000

Group	Run
BASE	Yes

Name: 2.3Y24H Hydrology Sim: 2.3Y24H
Filename: W:\JOBS\41561-1\PHASE 1\41561100001\DRAINAGE\ROUTINGS\POST\2.3Y24H.I32

Execute: No Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 40.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)

11.000	60.000
15.000	15.000
40.000	60.000

Group	Run
BASE	Yes

Name: 25Y24H Hydrology Sim: 25Y24H
Filename: W:\JOBS\41561-1\PHASE 1\41561100001\DRAINAGE\ROUTINGS\POST\25Y24H.I32

Execute: No Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 40.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
11.000	60.000
15.000	15.000
40.000	60.000

Group	Run
BASE	Yes

Name: 25Y96H Hydrology Sim: 25Y96H
Filename: W:\JOBS\41561-1\PHASE 1\41561100001\DRAINAGE\ROUTINGS\POST\25Y96H.I32

Execute: No Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 97.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
55.000	60.000
65.000	15.000
97.000	60.000

Group	Run
BASE	Yes

==== Boundary Conditions ====

Hartwood Marsh Road Phase I
Post Development
Basin 3
Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess Rain in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3	BASE	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	1.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	2.00	0.027	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	3.00	0.054	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	4.00	0.081	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	5.00	0.108	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	6.00	0.134	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	7.00	0.161	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	8.00	0.188	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	9.00	0.215	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	10.00	0.242	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	11.00	0.268	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	12.00	0.295	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	13.00	0.322	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	14.00	0.349	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	15.00	0.376	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	16.00	0.403	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	17.00	0.430	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	18.00	0.457	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	19.00	0.483	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	20.00	0.510	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	21.00	0.537	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	22.00	0.564	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	23.00	0.591	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3	BASE	24.00	0.618	0.027	0.000	0.000	2.041	0.000	0.001	0.000
25Y96H	BASIN 3	BASE	25.00	0.645	0.027	0.003	0.002	20.283	0.002	0.009	0.000
25Y96H	BASIN 3	BASE	26.00	0.708	0.063	0.007	0.005	64.155	0.006	0.015	0.000
25Y96H	BASIN 3	BASE	27.00	0.771	0.063	0.014	0.007	130.317	0.013	0.021	0.000
25Y96H	BASIN 3	BASE	28.00	0.834	0.063	0.023	0.009	217.516	0.022	0.027	0.000
25Y96H	BASIN 3	BASE	29.00	0.897	0.063	0.035	0.011	326.787	0.033	0.034	0.000
25Y96H	BASIN 3	BASE	30.00	0.963	0.065	0.048	0.013	457.633	0.046	0.039	0.000
25Y96H	BASIN 3	BASE	31.00	1.028	0.065	0.063	0.015	607.391	0.061	0.044	0.000
25Y96H	BASIN 3	BASE	32.00	1.093	0.065	0.081	0.017	775.029	0.078	0.049	0.000
25Y96H	BASIN 3	BASE	33.00	1.159	0.065	0.099	0.018	956.313	0.097	0.052	0.000
25Y96H	BASIN 3	BASE	34.00	1.222	0.063	0.118	0.020	1149.891	0.116	0.056	0.000
25Y96H	BASIN 3	BASE	35.00	1.285	0.063	0.140	0.021	1357.791	0.137	0.060	0.000
25Y96H	BASIN 3	BASE	36.00	1.348	0.063	0.162	0.023	1579.310	0.159	0.063	0.000
25Y96H	BASIN 3	BASE	37.00	1.411	0.063	0.186	0.024	1813.793	0.183	0.067	0.000
25Y96H	BASIN 3	BASE	38.00	1.474	0.063	0.211	0.025	2060.626	0.208	0.070	0.000
25Y96H	BASIN 3	BASE	39.00	1.538	0.063	0.237	0.026	2319.233	0.234	0.073	0.000
25Y96H	BASIN 3	BASE	40.00	1.601	0.063	0.265	0.027	2589.075	0.261	0.076	0.000
25Y96H	BASIN 3	BASE	41.00	1.664	0.063	0.294	0.029	2874.500	0.290	0.082	0.000
25Y96H	BASIN 3	BASE	42.00	1.729	0.065	0.325	0.031	3175.352	0.320	0.085	0.000
25Y96H	BASIN 3	BASE	43.00	1.795	0.065	0.356	0.032	3486.627	0.352	0.088	0.000
25Y96H	BASIN 3	BASE	44.00	1.860	0.065	0.389	0.033	3807.835	0.384	0.091	0.000
25Y96H	BASIN 3	BASE	45.00	1.925	0.065	0.421	0.032	4133.094	0.417	0.090	0.000
25Y96H	BASIN 3	BASE	46.00	1.988	0.063	0.455	0.033	4461.748	0.450	0.092	0.000
25Y96H	BASIN 3	BASE	47.00	2.052	0.063	0.489	0.034	4798.595	0.484	0.095	0.000
25Y96H	BASIN 3	BASE	48.00	2.115	0.063	0.524	0.035	5143.327	0.519	0.097	0.000
25Y96H	BASIN 3	BASE	49.00	2.178	0.063	0.572	0.048	5558.006	0.561	0.134	0.000
25Y96H	BASIN 3	BASE	50.00	2.263	0.085	0.621	0.049	6045.191	0.610	0.137	0.000
25Y96H	BASIN 3	BASE	50.25	2.348	0.085	0.636	0.015	6179.229	0.624	0.161	0.000
25Y96H	BASIN 3	BASE	50.50	2.373	0.025	0.650	0.015	6324.689	0.638	0.162	0.000
25Y96H	BASIN 3	BASE	50.75	2.397	0.025	0.665	0.015	6471.442	0.653	0.164	0.000
25Y96H	BASIN 3	BASE	51.00	2.422	0.025	0.680	0.015	6619.194	0.668	0.165	0.000
25Y96H	BASIN 3	BASE	51.25	2.447	0.025	0.695	0.015	6767.929	0.683	0.166	0.000
25Y96H	BASIN 3	BASE	51.50	2.472	0.025	0.711	0.015	6917.632	0.698	0.167	0.000

Hartwood Marsh Road Phase I
Post Development
Basin 3
Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess Rain in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3	BASE	51.75	2.497	0.025	0.726	0.015	7068.290	0.713	0.168	0.000
25Y96H	BASIN 3	BASE	52.00	2.521	0.025	0.741	0.015	7219.930	0.729	0.169	0.000
25Y96H	BASIN 3	BASE	52.25	2.546	0.025	0.760	0.019	7390.221	0.746	0.209	0.000
25Y96H	BASIN 3	BASE	52.50	2.577	0.031	0.780	0.019	7579.898	0.765	0.212	0.000
25Y96H	BASIN 3	BASE	52.75	2.608	0.031	0.799	0.019	7771.500	0.784	0.214	0.000
25Y96H	BASIN 3	BASE	53.00	2.638	0.031	0.819	0.020	7964.447	0.804	0.215	0.000
25Y96H	BASIN 3	BASE	53.25	2.669	0.031	0.838	0.020	8158.716	0.823	0.217	0.000
25Y96H	BASIN 3	BASE	53.50	2.700	0.031	0.858	0.020	8354.283	0.843	0.218	0.000
25Y96H	BASIN 3	BASE	53.75	2.730	0.031	0.878	0.020	8551.126	0.863	0.219	0.000
25Y96H	BASIN 3	BASE	54.00	2.761	0.031	0.898	0.020	8749.286	0.883	0.221	0.000
25Y96H	BASIN 3	BASE	54.25	2.792	0.031	0.923	0.025	8973.177	0.905	0.277	0.000
25Y96H	BASIN 3	BASE	54.50	2.830	0.038	0.949	0.025	9223.761	0.931	0.280	0.000
25Y96H	BASIN 3	BASE	54.75	2.869	0.038	0.974	0.026	9476.907	0.956	0.282	0.000
25Y96H	BASIN 3	BASE	55.00	2.907	0.038	1.000	0.026	9731.862	0.982	0.284	0.000
25Y96H	BASIN 3	BASE	55.25	2.945	0.038	1.026	0.026	9988.589	1.008	0.286	0.000
25Y96H	BASIN 3	BASE	55.50	2.984	0.038	1.052	0.026	10247.049	1.034	0.288	0.000
25Y96H	BASIN 3	BASE	55.75	3.022	0.038	1.079	0.026	10507.206	1.060	0.290	0.000
25Y96H	BASIN 3	BASE	56.00	3.061	0.038	1.106	0.027	10769.219	1.087	0.292	0.000
25Y96H	BASIN 3	BASE	56.25	3.099	0.039	1.146	0.041	11100.069	1.120	0.443	0.000
25Y96H	BASIN 3	BASE	56.50	3.158	0.058	1.187	0.041	11502.350	1.161	0.451	0.000
25Y96H	BASIN 3	BASE	56.75	3.216	0.058	1.228	0.041	11909.983	1.202	0.455	0.000
25Y96H	BASIN 3	BASE	57.00	3.275	0.058	1.270	0.042	12321.057	1.243	0.459	0.000
25Y96H	BASIN 3	BASE	57.25	3.333	0.058	1.312	0.042	12735.467	1.285	0.462	0.000
25Y96H	BASIN 3	BASE	57.50	3.391	0.058	1.355	0.042	13153.114	1.327	0.466	0.000
25Y96H	BASIN 3	BASE	57.75	3.450	0.058	1.397	0.043	13573.903	1.370	0.469	0.000
25Y96H	BASIN 3	BASE	58.00	3.508	0.058	1.440	0.043	13998.123	1.413	0.473	0.000
25Y96H	BASIN 3	BASE	58.25	3.567	0.058	1.517	0.076	14587.068	1.472	0.835	0.000
25Y96H	BASIN 3	BASE	58.50	3.670	0.103	1.594	0.078	15348.230	1.549	0.856	0.000
25Y96H	BASIN 3	BASE	58.75	3.773	0.104	1.673	0.079	16122.914	1.627	0.865	0.000
25Y96H	BASIN 3	BASE	59.00	3.877	0.104	1.752	0.079	16905.689	1.706	0.874	0.000
25Y96H	BASIN 3	BASE	59.25	3.980	0.104	1.895	0.143	18000.586	1.816	1.559	0.000
25Y96H	BASIN 3	BASE	59.50	4.164	0.184	2.053	0.158	19436.186	1.961	1.631	0.000
25Y96H	BASIN 3	BASE	59.75	4.349	0.185	3.251	1.197	26066.941	2.630	13.104	0.000
25Y96H	BASIN 3	BASE	60.00	5.805	1.456	4.519	1.268	38333.980	3.868	14.156	0.000
25Y96H	BASIN 3	BASE	60.25	7.264	1.460	4.787	0.268	46089.785	4.651	3.079	0.000
25Y96H	BASIN 3	BASE	60.50	7.541	0.277	5.036	0.249	48715.223	4.916	2.756	0.000
25Y96H	BASIN 3	BASE	60.75	7.817	0.276	5.167	0.131	50613.117	5.107	1.462	0.000
25Y96H	BASIN 3	BASE	61.00	7.959	0.142	5.297	0.129	51913.082	5.239	1.427	0.000
25Y96H	BASIN 3	BASE	61.25	8.101	0.142	5.381	0.085	52979.293	5.346	0.943	0.000
25Y96H	BASIN 3	BASE	61.50	8.193	0.092	5.466	0.085	53822.117	5.431	0.930	0.000
25Y96H	BASIN 3	BASE	61.75	8.286	0.092	5.551	0.085	54660.098	5.516	0.932	0.000
25Y96H	BASIN 3	BASE	62.00	8.378	0.092	5.635	0.084	55498.617	5.600	0.932	0.000
25Y96H	BASIN 3	BASE	63.00	8.470	0.092	5.846	0.212	58222.336	5.875	0.582	0.000
25Y96H	BASIN 3	BASE	64.00	8.699	0.229	6.058	0.212	60319.406	6.087	0.583	0.000
25Y96H	BASIN 3	BASE	65.00	8.928	0.229	6.187	0.129	62004.629	6.257	0.353	0.000
25Y96H	BASIN 3	BASE	66.00	9.067	0.139	6.315	0.128	63275.883	6.385	0.353	0.000
25Y96H	BASIN 3	BASE	67.00	9.205	0.138	6.444	0.129	64549.414	6.514	0.354	0.000
25Y96H	BASIN 3	BASE	68.00	9.343	0.138	6.573	0.129	65824.039	6.642	0.354	0.000
25Y96H	BASIN 3	BASE	69.00	9.481	0.138	6.659	0.086	66887.086	6.750	0.237	0.000
25Y96H	BASIN 3	BASE	70.00	9.573	0.092	6.745	0.086	67739.023	6.835	0.237	0.000
25Y96H	BASIN 3	BASE	71.00	9.665	0.092	6.831	0.086	68591.359	6.921	0.237	0.000
25Y96H	BASIN 3	BASE	72.00	9.757	0.092	6.917	0.086	69443.945	7.008	0.237	0.000
25Y96H	BASIN 3	BASE	73.00	9.849	0.092	6.962	0.045	70092.211	7.073	0.123	0.000
25Y96H	BASIN 3	BASE	74.00	9.897	0.048	7.007	0.045	70535.969	7.118	0.123	0.000
25Y96H	BASIN 3	BASE	75.00	9.945	0.048	7.052	0.045	70979.953	7.163	0.123	0.000
25Y96H	BASIN 3	BASE	76.00	9.993	0.048	7.096	0.045	71424.164	7.207	0.123	0.000
25Y96H	BASIN 3	BASE	77.00	10.041	0.048	7.142	0.045	71870.406	7.252	0.124	0.000

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Hartwood Marsh Road Phase I
Post Development
Basin 3
Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess Rain in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps	
25Y96H	BASIN 3	BASE	78.00	10.089	0.048	7.187	0.045	72318.680	7.298	0.125	0.000	
25Y96H	BASIN 3	BASE	79.00	10.137	0.048	7.232	0.045	72767.172	7.343	0.125	0.000	
25Y96H	BASIN 3	BASE	80.00	10.185	0.048	7.278	0.045	73215.875	7.388	0.125	0.000	
25Y96H	BASIN 3	BASE	81.00	10.233	0.048	7.323	0.045	73662.977	7.433	0.124	0.000	
25Y96H	BASIN 3	BASE	82.00	10.281	0.048	7.368	0.045	74108.477	7.478	0.124	0.000	
25Y96H	BASIN 3	BASE	83.00	10.329	0.048	7.413	0.045	74554.180	7.523	0.124	0.000	
25Y96H	BASIN 3	BASE	84.00	10.377	0.048	7.458	0.045	75000.086	7.568	0.124	0.000	
25Y96H	BASIN 3	BASE	85.00	10.425	0.048	7.503	0.045	75446.195	7.613	0.124	0.000	
25Y96H	BASIN 3	BASE	86.00	10.473	0.048	7.548	0.045	75892.508	7.658	0.124	0.000	
25Y96H	BASIN 3	BASE	87.00	10.520	0.048	7.593	0.045	76339.016	7.703	0.124	0.000	
25Y96H	BASIN 3	BASE	88.00	10.568	0.048	7.638	0.045	76785.719	7.748	0.124	0.000	
25Y96H	BASIN 3	BASE	89.00	10.616	0.048	7.684	0.046	77234.438	7.794	0.125	0.000	
25Y96H	BASIN 3	BASE	90.00	10.664	0.048	7.729	0.046	77685.172	7.839	0.125	0.000	
25Y96H	BASIN 3	BASE	91.00	10.712	0.048	7.775	0.046	78136.102	7.885	0.125	0.000	
25Y96H	BASIN 3	BASE	92.00	10.761	0.048	7.820	0.046	78587.211	7.930	0.125	0.000	
25Y96H	BASIN 3	BASE	93.00	10.809	0.048	7.866	0.045	79036.680	7.976	0.124	0.000	
25Y96H	BASIN 3	BASE	94.00	10.857	0.048	7.911	0.045	79484.516	8.021	0.124	0.000	
25Y96H	BASIN 3	BASE	95.00	10.904	0.048	7.956	0.045	79932.531	8.066	0.124	0.000	
25Y96H	BASIN 3	BASE	96.00	10.952	0.048	8.001	0.045	80380.523	8.111	0.124	0.000	
25Y96H	BASIN 3	BASE	97.00	11.000	0.048	8.001	0.000	80604.461	8.134	0.000	0.000	← MAX
25Y96H	BASIN 3-1	BASE	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	1.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	2.00	0.027	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	3.00	0.054	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	4.00	0.081	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	5.00	0.108	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	6.00	0.134	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	7.00	0.161	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	8.00	0.188	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	9.00	0.215	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	10.00	0.242	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	11.00	0.268	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	12.00	0.295	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	13.00	0.322	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	14.00	0.349	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	15.00	0.376	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	16.00	0.403	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	17.00	0.430	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	18.00	0.457	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	19.00	0.483	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	20.00	0.510	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	21.00	0.537	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	22.00	0.564	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	23.00	0.591	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	24.00	0.618	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	25.00	0.645	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	26.00	0.708	0.063	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	27.00	0.771	0.063	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	28.00	0.834	0.063	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	29.00	0.897	0.063	0.000	0.000	0.033	0.000	0.000	0.000	
25Y96H	BASIN 3-1	BASE	30.00	0.963	0.065	0.002	0.002	0.163	0.002	0.000	0.000	
25Y96H	BASIN 3-1	BASE	31.00	1.028	0.065	0.006	0.004	0.420	0.006	0.000	0.000	
25Y96H	BASIN 3-1	BASE	32.00	1.093	0.065	0.012	0.005	0.797	0.011	0.000	0.000	
25Y96H	BASIN 3-1	BASE	33.00	1.159	0.065	0.019	0.007	1.281	0.018	0.000	0.000	
25Y96H	BASIN 3-1	BASE	34.00	1.222	0.063	0.027	0.008	1.863	0.026	0.000	0.000	
25Y96H	BASIN 3-1	BASE	35.00	1.285	0.063	0.037	0.010	2.545	0.035	0.000	0.000	
25Y96H	BASIN 3-1	BASE	36.00	1.348	0.063	0.047	0.011	3.325	0.046	0.000	0.000	

Hartwood Marsh Road Phase I
Post Development
Basin 3
Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess Rain in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3-1	BASE	37.00	1.411	0.063	0.060	0.012	4.198	0.058	0.000	0.000
25Y96H	BASIN 3-1	BASE	38.00	1.474	0.063	0.073	0.013	5.161	0.071	0.000	0.000
25Y96H	BASIN 3-1	BASE	39.00	1.538	0.063	0.088	0.015	6.211	0.086	0.000	0.000
25Y96H	BASIN 3-1	BASE	40.00	1.601	0.063	0.104	0.016	7.344	0.101	0.000	0.000
25Y96H	BASIN 3-1	BASE	41.00	1.664	0.063	0.121	0.018	8.580	0.118	0.000	0.000
25Y96H	BASIN 3-1	BASE	42.00	1.729	0.065	0.140	0.019	9.919	0.137	0.000	0.000
25Y96H	BASIN 3-1	BASE	43.00	1.795	0.065	0.160	0.020	11.337	0.156	0.000	0.000
25Y96H	BASIN 3-1	BASE	44.00	1.860	0.065	0.180	0.021	12.833	0.177	0.000	0.000
25Y96H	BASIN 3-1	BASE	45.00	1.925	0.065	0.202	0.021	14.377	0.198	0.000	0.000
25Y96H	BASIN 3-1	BASE	46.00	1.988	0.063	0.224	0.022	15.965	0.220	0.000	0.000
25Y96H	BASIN 3-1	BASE	47.00	2.052	0.063	0.247	0.023	17.618	0.243	0.000	0.000
25Y96H	BASIN 3-1	BASE	48.00	2.115	0.063	0.270	0.024	19.335	0.266	0.000	0.000
25Y96H	BASIN 3-1	BASE	49.00	2.178	0.063	0.304	0.033	21.435	0.295	0.001	0.000
25Y96H	BASIN 3-1	BASE	50.00	2.263	0.085	0.338	0.035	23.937	0.330	0.001	0.000
25Y96H	BASIN 3-1	BASE	50.25	2.348	0.085	0.349	0.010	24.626	0.339	0.001	0.000
25Y96H	BASIN 3-1	BASE	50.50	2.373	0.025	0.359	0.011	25.376	0.350	0.001	0.000
25Y96H	BASIN 3-1	BASE	50.75	2.397	0.025	0.370	0.011	26.143	0.360	0.001	0.000
25Y96H	BASIN 3-1	BASE	51.00	2.422	0.025	0.381	0.011	26.919	0.371	0.001	0.000
25Y96H	BASIN 3-1	BASE	51.25	2.447	0.025	0.392	0.011	27.702	0.382	0.001	0.000
25Y96H	BASIN 3-1	BASE	51.50	2.472	0.025	0.403	0.011	28.494	0.392	0.001	0.000
25Y96H	BASIN 3-1	BASE	51.75	2.497	0.025	0.414	0.011	29.295	0.404	0.001	0.000
25Y96H	BASIN 3-1	BASE	52.00	2.521	0.025	0.425	0.011	30.103	0.415	0.001	0.000
25Y96H	BASIN 3-1	BASE	52.25	2.546	0.025	0.439	0.014	31.002	0.427	0.001	0.000
25Y96H	BASIN 3-1	BASE	52.50	2.577	0.031	0.453	0.014	32.008	0.441	0.001	0.000
25Y96H	BASIN 3-1	BASE	52.75	2.608	0.031	0.468	0.014	33.041	0.455	0.001	0.000
25Y96H	BASIN 3-1	BASE	53.00	2.638	0.031	0.482	0.015	34.086	0.470	0.001	0.000
25Y96H	BASIN 3-1	BASE	53.25	2.669	0.031	0.497	0.015	35.142	0.484	0.001	0.000
25Y96H	BASIN 3-1	BASE	53.50	2.700	0.031	0.512	0.015	36.210	0.499	0.001	0.000
25Y96H	BASIN 3-1	BASE	53.75	2.730	0.031	0.527	0.015	37.289	0.514	0.001	0.000
25Y96H	BASIN 3-1	BASE	54.00	2.761	0.031	0.542	0.015	38.379	0.529	0.001	0.000
25Y96H	BASIN 3-1	BASE	54.25	2.792	0.031	0.561	0.019	39.598	0.545	0.001	0.000
25Y96H	BASIN 3-1	BASE	54.50	2.830	0.038	0.580	0.019	40.970	0.564	0.002	0.000
25Y96H	BASIN 3-1	BASE	54.75	2.869	0.038	0.600	0.020	42.379	0.584	0.002	0.000
25Y96H	BASIN 3-1	BASE	55.00	2.907	0.038	0.620	0.020	43.804	0.603	0.002	0.000
25Y96H	BASIN 3-1	BASE	55.25	2.945	0.038	0.640	0.020	45.245	0.623	0.002	0.000
25Y96H	BASIN 3-1	BASE	55.50	2.984	0.038	0.660	0.020	46.702	0.643	0.002	0.000
25Y96H	BASIN 3-1	BASE	55.75	3.022	0.038	0.680	0.020	48.173	0.664	0.002	0.000
25Y96H	BASIN 3-1	BASE	56.00	3.061	0.038	0.701	0.021	49.661	0.684	0.002	0.000
25Y96H	BASIN 3-1	BASE	56.25	3.099	0.039	0.733	0.032	51.503	0.709	0.002	0.000
25Y96H	BASIN 3-1	BASE	56.50	3.158	0.058	0.765	0.032	53.759	0.740	0.003	0.000
25Y96H	BASIN 3-1	BASE	56.75	3.216	0.058	0.798	0.033	56.103	0.773	0.003	0.000
25Y96H	BASIN 3-1	BASE	57.00	3.275	0.058	0.831	0.033	58.480	0.806	0.003	0.000
25Y96H	BASIN 3-1	BASE	57.25	3.333	0.058	0.864	0.033	60.888	0.839	0.003	0.000
25Y96H	BASIN 3-1	BASE	57.50	3.391	0.058	0.898	0.034	63.326	0.872	0.003	0.000
25Y96H	BASIN 3-1	BASE	57.75	3.450	0.058	0.932	0.034	65.793	0.906	0.003	0.000
25Y96H	BASIN 3-1	BASE	58.00	3.508	0.058	0.967	0.035	68.291	0.941	0.003	0.000
25Y96H	BASIN 3-1	BASE	58.25	3.567	0.058	1.029	0.062	71.656	0.987	0.005	0.000
25Y96H	BASIN 3-1	BASE	58.50	3.670	0.103	1.093	0.064	76.058	1.048	0.005	0.000
25Y96H	BASIN 3-1	BASE	58.75	3.773	0.104	1.157	0.065	80.689	1.111	0.005	0.000
25Y96H	BASIN 3-1	BASE	59.00	3.877	0.104	1.224	0.066	85.407	1.176	0.005	0.000
25Y96H	BASIN 3-1	BASE	59.25	3.980	0.104	1.342	0.119	91.826	1.265	0.009	0.000
25Y96H	BASIN 3-1	BASE	59.50	4.164	0.184	1.484	0.142	100.380	1.383	0.010	0.000
25Y96H	BASIN 3-1	BASE	59.75	4.349	0.185	2.516	1.032	137.927	1.900	0.073	0.000
25Y96H	BASIN 3-1	BASE	60.00	5.805	1.456	3.652	1.136	212.287	2.924	0.092	0.000
25Y96H	BASIN 3-1	BASE	60.25	7.264	1.460	3.907	0.256	267.030	3.678	0.030	0.000
25Y96H	BASIN 3-1	BASE	60.50	7.541	0.277	4.136	0.228	288.974	3.980	0.019	0.000
25Y96H	BASIN 3-1	BASE	60.75	7.817	0.276	4.258	0.122	302.432	4.166	0.011	0.000

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Hartwood Marsh Road Phase I
Post Development
Basin 3
Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess Rain in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps	
25Y96H	BASIN 3-1	BASE	61.00	7.959	0.142	4.378	0.120	311.734	4.294	0.010	0.000	
25Y96H	BASIN 3-1	BASE	61.25	8.101	0.142	4.456	0.079	319.163	4.396	0.007	0.000	
25Y96H	BASIN 3-1	BASE	61.50	8.193	0.092	4.535	0.079	325.072	4.478	0.006	0.000	
25Y96H	BASIN 3-1	BASE	61.75	8.286	0.092	4.613	0.079	330.779	4.556	0.006	0.000	
25Y96H	BASIN 3-1	BASE	62.00	8.378	0.092	4.692	0.078	336.489	4.635	0.006	0.000	
25Y96H	BASIN 3-1	BASE	63.00	8.470	0.092	4.889	0.197	355.070	4.891	0.004	0.000	
25Y96H	BASIN 3-1	BASE	64.00	8.699	0.229	5.087	0.198	369.415	5.088	0.004	0.000	
25Y96H	BASIN 3-1	BASE	65.00	8.928	0.229	5.207	0.121	380.964	5.247	0.002	0.000	
25Y96H	BASIN 3-1	BASE	66.00	9.067	0.139	5.328	0.120	389.693	5.368	0.002	0.000	
25Y96H	BASIN 3-1	BASE	67.00	9.205	0.138	5.449	0.121	398.450	5.488	0.002	0.000	
25Y96H	BASIN 3-1	BASE	68.00	9.343	0.138	5.570	0.121	407.228	5.609	0.002	0.000	
25Y96H	BASIN 3-1	BASE	69.00	9.481	0.138	5.651	0.081	414.557	5.710	0.002	0.000	
25Y96H	BASIN 3-1	BASE	70.00	9.573	0.092	5.732	0.081	420.435	5.791	0.002	0.000	
25Y96H	BASIN 3-1	BASE	71.00	9.665	0.092	5.813	0.081	426.320	5.872	0.002	0.000	
25Y96H	BASIN 3-1	BASE	72.00	9.757	0.092	5.894	0.081	432.207	5.953	0.002	0.000	
25Y96H	BASIN 3-1	BASE	73.00	9.849	0.092	5.937	0.043	436.685	6.015	0.001	0.000	
25Y96H	BASIN 3-1	BASE	74.00	9.897	0.048	5.979	0.042	439.754	6.057	0.001	0.000	
25Y96H	BASIN 3-1	BASE	75.00	9.945	0.048	6.021	0.042	442.827	6.100	0.001	0.000	
25Y96H	BASIN 3-1	BASE	76.00	9.993	0.048	6.064	0.042	445.902	6.142	0.001	0.000	
25Y96H	BASIN 3-1	BASE	77.00	10.041	0.048	6.107	0.043	448.993	6.184	0.001	0.000	
25Y96H	BASIN 3-1	BASE	78.00	10.089	0.048	6.149	0.043	452.099	6.227	0.001	0.000	
25Y96H	BASIN 3-1	BASE	79.00	10.137	0.048	6.192	0.043	455.207	6.270	0.001	0.000	
25Y96H	BASIN 3-1	BASE	80.00	10.185	0.048	6.235	0.043	458.318	6.313	0.001	0.000	
25Y96H	BASIN 3-1	BASE	81.00	10.233	0.048	6.278	0.043	461.420	6.356	0.001	0.000	
25Y96H	BASIN 3-1	BASE	82.00	10.281	0.048	6.320	0.043	464.511	6.398	0.001	0.000	
25Y96H	BASIN 3-1	BASE	83.00	10.329	0.048	6.363	0.043	467.605	6.441	0.001	0.000	
25Y96H	BASIN 3-1	BASE	84.00	10.377	0.048	6.406	0.043	470.701	6.483	0.001	0.000	
25Y96H	BASIN 3-1	BASE	85.00	10.425	0.048	6.449	0.043	473.800	6.526	0.001	0.000	
25Y96H	BASIN 3-1	BASE	86.00	10.473	0.048	6.491	0.043	476.901	6.569	0.001	0.000	
25Y96H	BASIN 3-1	BASE	87.00	10.520	0.048	6.534	0.043	480.005	6.612	0.001	0.000	
25Y96H	BASIN 3-1	BASE	88.00	10.568	0.048	6.577	0.043	483.111	6.654	0.001	0.000	
25Y96H	BASIN 3-1	BASE	89.00	10.616	0.048	6.620	0.043	486.232	6.697	0.001	0.000	
25Y96H	BASIN 3-1	BASE	90.00	10.664	0.048	6.664	0.043	489.369	6.741	0.001	0.000	
25Y96H	BASIN 3-1	BASE	91.00	10.712	0.048	6.707	0.043	492.507	6.784	0.001	0.000	
25Y96H	BASIN 3-1	BASE	92.00	10.761	0.048	6.750	0.043	495.648	6.827	0.001	0.000	
25Y96H	BASIN 3-1	BASE	93.00	10.809	0.048	6.793	0.043	498.779	6.870	0.001	0.000	
25Y96H	BASIN 3-1	BASE	94.00	10.857	0.048	6.836	0.043	501.900	6.913	0.001	0.000	
25Y96H	BASIN 3-1	BASE	95.00	10.904	0.048	6.879	0.043	505.022	6.956	0.001	0.000	
25Y96H	BASIN 3-1	BASE	96.00	10.952	0.048	6.922	0.043	508.141	6.999	0.001	0.000	
25Y96H	BASIN 3-1	BASE	97.00	11.000	0.048	6.922	0.000	509.699	7.021	0.000	0.000	← MAX
25Y96H	BASIN 3-2	BASE	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	1.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	2.00	0.027	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	3.00	0.054	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	4.00	0.081	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	5.00	0.108	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	6.00	0.134	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	7.00	0.161	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	8.00	0.188	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	9.00	0.215	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	10.00	0.242	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	11.00	0.268	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	12.00	0.295	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	13.00	0.322	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	14.00	0.349	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	15.00	0.376	0.027	0.000	0.000	0.000	0.000	0.000	0.000	
25Y96H	BASIN 3-2	BASE	16.00	0.403	0.027	0.000	0.000	0.000	0.000	0.000	0.000	

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Hartwood Marsh Road Phase I
Post Development
Basin 3
Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess Rain in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3-2	BASE	17.00	0.430	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	18.00	0.457	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	19.00	0.483	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	20.00	0.510	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	21.00	0.537	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	22.00	0.564	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	23.00	0.591	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	24.00	0.618	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	25.00	0.645	0.027	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	26.00	0.708	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	27.00	0.771	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	28.00	0.834	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	29.00	0.897	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	30.00	0.963	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	31.00	1.028	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	32.00	1.093	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	33.00	1.159	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	34.00	1.222	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	35.00	1.285	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	36.00	1.348	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	37.00	1.411	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	38.00	1.474	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	39.00	1.538	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	40.00	1.601	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	41.00	1.664	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	42.00	1.729	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	43.00	1.795	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	44.00	1.860	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	45.00	1.925	0.065	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	46.00	1.988	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	47.00	2.052	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	48.00	2.115	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	49.00	2.178	0.063	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	50.00	2.263	0.085	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	50.25	2.348	0.085	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	50.50	2.373	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	50.75	2.397	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	51.00	2.422	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	51.25	2.447	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	51.50	2.472	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	51.75	2.497	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	52.00	2.521	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	52.25	2.546	0.025	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	52.50	2.577	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	52.75	2.608	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	53.00	2.638	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	53.25	2.669	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	53.50	2.700	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	53.75	2.730	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	54.00	2.761	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	54.25	2.792	0.031	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	54.50	2.830	0.038	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	54.75	2.869	0.038	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	55.00	2.907	0.038	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	55.25	2.945	0.038	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	55.50	2.984	0.038	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	55.75	3.022	0.038	0.000	0.000	0.000	0.000	0.000	0.000

Hartwood Marsh Road Phase I
Post Development
Basin 3
Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess Rain in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps
25Y96H	BASIN 3-2	BASE	56.00	3.061	0.038	0.000	0.000	0.000	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	56.25	3.099	0.039	0.000	0.000	0.062	0.000	0.000	0.000
25Y96H	BASIN 3-2	BASE	56.50	3.158	0.058	0.000	0.000	0.533	0.000	0.001	0.000
25Y96H	BASIN 3-2	BASE	56.75	3.216	0.058	0.001	0.001	1.709	0.001	0.002	0.000
25Y96H	BASIN 3-2	BASE	57.00	3.275	0.058	0.003	0.001	3.594	0.002	0.002	0.000
25Y96H	BASIN 3-2	BASE	57.25	3.333	0.058	0.004	0.002	6.181	0.004	0.003	0.000
25Y96H	BASIN 3-2	BASE	57.50	3.391	0.058	0.006	0.002	9.462	0.006	0.004	0.000
25Y96H	BASIN 3-2	BASE	57.75	3.450	0.058	0.009	0.003	13.430	0.008	0.005	0.000
25Y96H	BASIN 3-2	BASE	58.00	3.508	0.058	0.012	0.003	18.077	0.011	0.006	0.000
25Y96H	BASIN 3-2	BASE	58.25	3.567	0.058	0.018	0.006	25.833	0.015	0.012	0.000
25Y96H	BASIN 3-2	BASE	58.50	3.670	0.103	0.026	0.007	37.418	0.022	0.014	0.000
25Y96H	BASIN 3-2	BASE	58.75	3.773	0.104	0.034	0.009	51.073	0.031	0.016	0.000
25Y96H	BASIN 3-2	BASE	59.00	3.877	0.104	0.044	0.010	66.748	0.040	0.019	0.000
25Y96H	BASIN 3-2	BASE	59.25	3.980	0.104	0.064	0.020	92.388	0.055	0.038	0.000
25Y96H	BASIN 3-2	BASE	59.50	4.164	0.184	0.089	0.024	130.130	0.078	0.045	0.000
25Y96H	BASIN 3-2	BASE	59.75	4.349	0.185	0.391	0.302	422.198	0.253	0.604	0.000
25Y96H	BASIN 3-2	BASE	60.00	5.805	1.456	0.858	0.467	1103.809	0.661	0.911	0.000
25Y96H	BASIN 3-2	BASE	60.25	7.264	1.460	0.971	0.113	1607.652	0.963	0.209	0.000
25Y96H	BASIN 3-2	BASE	60.50	7.541	0.277	1.081	0.110	1794.083	1.074	0.206	0.000
25Y96H	BASIN 3-2	BASE	60.75	7.817	0.276	1.140	0.059	1936.241	1.160	0.110	0.000
25Y96H	BASIN 3-2	BASE	61.00	7.959	0.142	1.199	0.059	2035.696	1.219	0.111	0.000
25Y96H	BASIN 3-2	BASE	61.25	8.101	0.142	1.239	0.040	2118.693	1.269	0.074	0.000
25Y96H	BASIN 3-2	BASE	61.50	8.193	0.092	1.279	0.040	2185.098	1.309	0.074	0.000
25Y96H	BASIN 3-2	BASE	61.75	8.286	0.092	1.319	0.040	2252.043	1.349	0.075	0.000
25Y96H	BASIN 3-2	BASE	62.00	8.378	0.092	1.360	0.041	2319.710	1.389	0.076	0.000
25Y96H	BASIN 3-2	BASE	63.00	8.470	0.092	1.463	0.103	2542.694	1.523	0.048	0.000
25Y96H	BASIN 3-2	BASE	64.00	8.699	0.229	1.569	0.106	2718.829	1.628	0.050	0.000
25Y96H	BASIN 3-2	BASE	65.00	8.928	0.229	1.634	0.065	2862.641	1.714	0.030	0.000
25Y96H	BASIN 3-2	BASE	66.00	9.067	0.139	1.700	0.066	2972.708	1.780	0.031	0.000
25Y96H	BASIN 3-2	BASE	67.00	9.205	0.138	1.767	0.067	3084.301	1.847	0.031	0.000
25Y96H	BASIN 3-2	BASE	68.00	9.343	0.138	1.835	0.068	3197.314	1.915	0.032	0.000
25Y96H	BASIN 3-2	BASE	69.00	9.481	0.138	1.881	0.046	3292.404	1.972	0.021	0.000
25Y96H	BASIN 3-2	BASE	70.00	9.573	0.092	1.927	0.046	3369.226	2.018	0.021	0.000
25Y96H	BASIN 3-2	BASE	71.00	9.665	0.092	1.973	0.046	3446.637	2.064	0.022	0.000
25Y96H	BASIN 3-2	BASE	72.00	9.757	0.092	2.020	0.047	3524.609	2.111	0.022	0.000
25Y96H	BASIN 3-2	BASE	73.00	9.849	0.092	2.045	0.024	3584.179	2.146	0.011	0.000
25Y96H	BASIN 3-2	BASE	74.00	9.897	0.048	2.069	0.025	3625.137	2.171	0.011	0.000
25Y96H	BASIN 3-2	BASE	75.00	9.945	0.048	2.094	0.025	3666.260	2.196	0.011	0.000
25Y96H	BASIN 3-2	BASE	76.00	9.993	0.048	2.119	0.025	3707.547	2.220	0.011	0.000
25Y96H	BASIN 3-2	BASE	77.00	10.041	0.048	2.144	0.025	3749.167	2.245	0.012	0.000
25Y96H	BASIN 3-2	BASE	78.00	10.089	0.048	2.169	0.025	3791.120	2.270	0.012	0.000
25Y96H	BASIN 3-2	BASE	79.00	10.137	0.048	2.194	0.025	3833.236	2.296	0.012	0.000
25Y96H	BASIN 3-2	BASE	80.00	10.185	0.048	2.219	0.025	3875.513	2.321	0.012	0.000
25Y96H	BASIN 3-2	BASE	81.00	10.233	0.048	2.245	0.025	3917.779	2.346	0.012	0.000
25Y96H	BASIN 3-2	BASE	82.00	10.281	0.048	2.270	0.025	3960.031	2.372	0.012	0.000
25Y96H	BASIN 3-2	BASE	83.00	10.329	0.048	2.296	0.025	4002.440	2.397	0.012	0.000
25Y96H	BASIN 3-2	BASE	84.00	10.377	0.048	2.321	0.026	4045.005	2.422	0.012	0.000
25Y96H	BASIN 3-2	BASE	85.00	10.425	0.048	2.347	0.026	4087.725	2.448	0.012	0.000
25Y96H	BASIN 3-2	BASE	86.00	10.473	0.048	2.372	0.026	4130.598	2.474	0.012	0.000
25Y96H	BASIN 3-2	BASE	87.00	10.520	0.048	2.398	0.026	4173.624	2.499	0.012	0.000
25Y96H	BASIN 3-2	BASE	88.00	10.568	0.048	2.424	0.026	4216.802	2.525	0.012	0.000
25Y96H	BASIN 3-2	BASE	89.00	10.616	0.048	2.450	0.026	4260.308	2.551	0.012	0.000
25Y96H	BASIN 3-2	BASE	90.00	10.664	0.048	2.477	0.026	4304.143	2.578	0.012	0.000
25Y96H	BASIN 3-2	BASE	91.00	10.712	0.048	2.503	0.026	4348.129	2.604	0.012	0.000
25Y96H	BASIN 3-2	BASE	92.00	10.761	0.048	2.529	0.026	4392.266	2.630	0.012	0.000
25Y96H	BASIN 3-2	BASE	93.00	10.809	0.048	2.556	0.026	4436.371	2.657	0.012	0.000
25Y96H	BASIN 3-2	BASE	94.00	10.857	0.048	2.582	0.026	4480.445	2.683	0.012	0.000

Hartwood Marsh Road Phase I
Post Development
Basin 3
Basin Time Series 25yr/96hr

Simulation	Basin	Group	Time hrs	Sum Rain in	Inc Rain in	SumExcess Rain in	IncExcess Rain in	Volume ft3	Volume in	Rate cfs	Velocity fps	
25Y96H	BASIN 3-2	BASE	95.00	10.904	0.048	2.609	0.027	4524.664	2.710	0.012	0.000	
25Y96H	BASIN 3-2	BASE	96.00	10.952	0.048	2.635	0.027	4568.993	2.736	0.012	0.000	
25Y96H	BASIN 3-2	BASE	97.00	11.000	0.048	2.635	0.000	4591.177	2.750	0.000	0.000	←MAX

9/8/

Water Quality Treatment and Recovery Calculations

POLLUTION ABATEMENT VOLUME

HNTB

		DATE
MADE BY:	MSF	18-Sep-07
CHCK BY:	KMV	20-Sep-07

PROJECT: **HARTWOOD MARSH ROAD**

LOCATION: **BASIN 3 - PHASE 1**

BASIN LIMITS: STA. 152+39.00 to STA 162+00.00, CL CONST. HARTWOOD MARSH RD.

TOTAL TREATMENT AREA: 3.21 AC.

IMPERVIOUS AREA: 1.74 AC.

UNDERINE ONE: RETENTION DETENTION

UNDERINE ONE: DRY WET

UNDERINE ONE: ONLINE OFFLINE

REQUIRED TREATMENT VOLUME:

1) COMPUTE FIRST 0.5 INCH OF RUNOFF FROM PROJECT:

(0.5"/12) x 3.21 AC. = **0.134** AF

2) COMPUTE 1.25 INCHES TIMES IMPERVIOUS AREA:

(1.25"/12) x 1.74 AC. = **0.181** AF

CONTROLLING CRITERIA: 2

REQUIRED TREATMENT VOLUME: **0.181** AF

3) ADDITIONAL 0.5" INCH FOR ON-LINE RETENTION:

0.13 AF + 0.18 AF = **0.315** AF

TOTAL REQUIRED TREATMENT VOLUME: **0.315** AF

TOTAL PROVIDED TREATMENT VOLUME: **0.316** AF

STAGE / STORAGE CALCULATIONS

HNTB

		DATE
MADE BY:	MSF	23-Apr-08
CHCK BY:	KMV	24-Apr-08

PROJECT: HARTWOOD MARSH ROAD

SWALES: 3

Borings below are within region of swales between Sta. 156+00 and Sta. 161+00
Ground water was not encounter at a boring depth of 15 feet.
Boring station in report are based on baseline of survey

Boring	CL Station	Offset	Existing Ground Elevation	Depth to Encountered Water Surface	Estimated Encountered Water Elevation	Depth to Seasonal High Water	Estimated Seasonal High Water	Estimated Normal High Water	Assumed Depth to Confining Layer	Confining Layer Elevation
AB-53	155+97	50.87' lt	153.89	20.0	133.9	15	138.89	136.39	30	123.89
AB-54	157+02	7.99' rt	149.57	20.0	129.6	15	134.57	132.07	30	119.57
AB-55	157+97	38.52' lt	146.6	20.0	126.6	15	131.6	129.1	30	116.6
AB-56	159+04	16.28' lt	140.3	20.0	120.3	15	125.3	122.8	30	110.3
AB-57	159+94	33.05' lt	135.42	20.0	115.4	15	120.42	117.92	30	105.42
AB-58	160+98	15.25' rt	131.53	20.0	111.5	15	116.53	114.03	30	101.53
AB-59	161+93	26.33' rt	127.66	20.0	107.7	15	112.66	110.16	30	97.66

PERCOLATION RATE: Use percolation rate for Stratum 1 soils as found in ponds 40 Ft./Day or 20 Inches/Hr. Boring AB-P2

FACTOR OF SAFETY: 2 = 10 Inches/Hr. = 20 Ft./Day

PROJECT: HARTWOOD MARSH ROAD

POND: 3

Attenuation Volume For 25 Year/96 Hour Storm Event

Volumes from AdICPR

Basin	Pre-development CF	Post Development CF
3	64,086	80,604
3-1	510	510
3-2	4,628	4,591
TOTAL	**69,224**	**85,705**

REQUIRED ATTENUATION VOLUME: 16,481 CF
PROVIDED ATTENUATION VOLUME 17,963 CF

HARTWOOD MARSH ROAD
BASIN 3
INTERIM CONDITION
SWALE STORAGE CALCULATIONS - Water Quality

HNTB

Ditch Parameters-Left Side

Station	Ditch Bottom (ft)	Max. Depth (ft)	Max. Elevation (ft)	Est. Elev. Of Base (ft)	Slope	Ditch Back Slope (F) (1:F)	Ditch Bottom Width (ft)	Ditch Fore Slope (B) (1:B)
156+00	151.4	1.21	152.61	151.84		2	4.76	4
					0.022			
156+25	150.85	1.37	152.22	151.50		2	4.83	4
					0.022			
156+50	150.3	1.53	151.83	151.16		2	4.9	4
					0.032			
156+75	149.5	1.59	151.09	150.46		2	5.79	4
					0.032			
157+00	148.7	1.64	150.34	149.75		2	6.68	4
					0.042			
157+25	147.65	1.74	149.39	149.10		2	7.205	4
					0.042			
157+50	146.6	1.84	148.44	148.44		2	7.73	4
					0.056			
157+75	145.2	2.13	147.33	147.33		2	7.665	4
					0.056			
158+00	143.8	2.41	146.21	146.21		2	7.6	4
					0.078			
158+25	141.85	2.04	143.90	143.90		2	7.19	4
					0.078			
158+50	139.9	1.68	141.58	141.58		2	6.78	4
					0.060			
158+75	138.4	2.10	140.50	140.50		2	7.01	4
					0.060			
159+00	136.9	2.51	139.41	139.41		2	7.24	4
					0.062			
159+25	135.35	2.66	138.01	138.01		2	7.52	4
					0.062			
159+50	133.8	2.81	136.61	136.61		2	7.8	4
					0.050			
159+75	132.55	2.87	135.42	135.42		2	7.98	4
					0.050			
160+00	131.3	2.93	134.23	134.23		2	8.16	4
					0.012			
160+25	131	2.38	133.38	133.38		2	10.56	4
					0.012			
160+50	130.7	1.82	132.52	132.52		2	12.96	4
					0.044			
160+75	129.6	1.94	131.54	131.64		2	14.485	4
					0.044			
161+00	128.5	2.06	130.56	130.75		2	16.01	4
					0.030			
161+25	127.8	1.79	129.54	129.75		2	16.545	4
					0.030			
161+50	127.0	1.52	128.52	128.74		2	17.08	4
					0.040			
161+75	126.0	1.51	127.51	127.72		2	14.08	4
					0.080			
162+00	124.0	2.50	126.50	126.7		2	14.54	4

Water Quality Storage Between Ditch Blocks - Left

Ditch Station	Ditch Block Height (ft)	Elevation of Ditch Block (ft)	Ditch Back Slope (F) (ft)	Ditch Bottom Width (ft)	Ditch Fore Slope (B) (1:B)	Ditch Area at Ditch Block (sf)	Distance to Upstream Ditch Block or Zero Area (1:B)	Area at Upstream Ditch Block on Downstream Side (sf)	Volume (cf)
156+50	0.85	151.15	2	4.9	4	6.715	25.00	2.37	113.56
156+75	0.95	150.45	2	5.79	4	8.3505	25.00	1.32	120.88
157+00	1.05	149.75	2	6.68	4	10.164	25.00	2.42	157.30
157+25	1.43	149.08	2	7.205	4	14.59315	25.00	3.87	230.79
157+50	1.82	148.42	2	7.73	4	19.5286	25.00	8.26	347.36
157+75	2.12	147.32	2	7.665	4	22.6098	25.00	7.68	378.62
158+00	2.4	146.2	2	7.6	4	25.44	25.00	10.6	450.50
158+25	2.04	143.89	2	7.19	4	20.7876	25.00	0.92	271.35
158+50	1.68	141.58	2	6.78	4	16.4304	21.54	0	176.96
158+75	2.09	140.49	2	7.01	4	20.9209	25.00	5.9	335.26
159+00	2.5	139.4	2	7.24	4	25.6	25.00	10.24	448.00
159+25	2.65	138	2	7.52	4	27.878	25.00	11.57	493.10
159+50	2.8	136.6	2	7.8	4	30.24	25.00	13.5	546.75
159+75	2.85	135.4	2	7.98	4	31.293	25.00	17.57	610.79
160+00	2.92	134.22	2	8.16	4	32.5872	25.00	18.64	640.34
160+25	2.35	133.35	2	10.56	4	31.866	25.00	27.8	745.83
160+50	1.8	132.5	2	12.96	4	28.728	25.00	23.94	658.35
160+75	2	131.6	2	14.485	4	34.97	25.00	16.09	638.25
161+00	2.05	130.55	2	16.01	4	38.9705	25.00	18.06	712.88
161+25	1.8	129.55	2	16.545	4	35.181	25.00	20.52	696.26
161+50	1.55	128.55	2	17.08	4	31.124	25.00	16.06	589.80
161+75	1.5	127.5	2	14.08	4	25.62	25.00	8.54	427.00
162+00	2.5	126.5	2	14.54	4	43.85	25.00	8.77	657.75
								Total	10447.67
									0.240 af

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HARTWOOD MARSH ROAD
BASIN 3
INTERIM CONDITION
MAXIMUM SWALE STORAGE CALCULATIONS

HNTB

Ditch Parameters-Left Side

Station	Ditch Bottom (ft)	Max. Depth (ft)	Max. Elevation (ft)	Est. Elev. Of Base (ft)	Slope	Ditch Back Slope (F) (1:F)	Ditch Bottom Width (ft)	Ditch Fore Slope (B) (1:B)
156+00	151.4	1.21	152.61	151.84		2	4.76	4
					0.022			
156+25	150.85	1.37	152.22	151.5		2	4.83	4
					0.022			
156+50	150.3	1.53	151.83	151.16		2	4.9	4
					0.032			
156+75	149.5	1.59	151.09	150.455		2	5.79	4
					0.032			
157+00	148.7	1.64	150.34	149.75		2	6.68	4
					0.042			
157+25	147.65	1.74	149.39	149.095		2	7.205	4
					0.042			
157+50	146.6	1.84	148.44	148.44		2	7.73	4
					0.056			
157+75	145.2	2.13	147.33	147.325		2	7.665	4
					0.056			
158+00	143.8	2.41	146.21	146.21		2	7.6	4
					0.078			
158+25	141.85	2.04	143.90	143.895		2	7.19	4
					0.078			
158+50	139.9	1.68	141.58	141.58		2	6.78	4
					0.060			
158+75	138.4	2.10	140.50	140.495		2	7.01	4
					0.060			
159+00	136.9	2.51	139.41	139.41		2	7.24	4
					0.062			
159+25	135.35	2.66	138.01	138.01		2	7.52	4
					0.062			
159+50	133.8	2.81	136.61	136.61		2	7.8	4
					0.050			
159+75	132.55	2.87	135.42	135.42		2	7.98	4
					0.050			
160+00	131.3	2.93	134.23	134.23		2	8.16	4
					0.012			
160+25	131	2.38	133.38	133.375		2	10.56	4
					0.012			
160+50	130.7	1.82	132.52	132.52		2	12.96	4
					0.044			
160+75	129.6	1.94	131.54	131.635		2	14.485	4
					0.044			
161+00	128.5	2.06	130.56	130.75		2	16.01	4
					0.030			
161+25	127.75	1.79	129.54	129.745		2	16.545	4
					0.030			
161+50	127	1.52	128.52	128.74		2	17.08	4
					0.040			
161+75	126	1.51	127.51	127.72		2	14.08	4
					0.080			
162+00	124	2.50	126.50	126.7		2	14.54	4

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Maximum Storage Between Ditch Blocks - Left

Ditch Station	Max Depth (ft)	Top Bank at Ditch Block (ft)	Ditch Back Slope (F) (ft)	Ditch Bottom Width (ft)	Ditch Fore Slope (B) (1:B)	Ditch Area at Ditch Block (sf)	Distance to Upstream Ditch Block or Zero Area (1:B)	Area at Upstream Ditch Block on Downstream Side (sf)	Volume (cf)
156+50	1.53	151.83	2	4.9	4	12.087	25.00	7.74	247.84
156+75	1.59	151.085	2	5.79	4	13.93215	25.00	6.9	260.40
157+00	1.64	150.34	2	6.68	4	15.8752	25.00	8.13	300.07
157+25	1.74	149.39	2	7.205	4	17.7567	25.00	7.04	309.96
157+50	1.84	148.44	2	7.73	4	19.7432	25.00	8.48	352.79
157+75	2.13	147.325	2	7.665	4	22.663125	25.00	7.73	379.91
158+00	2.41	146.21	2	7.6	4	25.546	25.00	10.71	453.20
158+25	2.04	143.895	2	7.19	4	20.83855	25.00	0.97	272.61
158+50	1.68	141.58	2	6.78	4	16.4304	21.54	0	176.96
158+75	2.10	140.495	2	7.01	4	20.97095	25.00	5.96	336.64
159+00	2.51	139.41	2	7.24	4	25.7024	25.00	10.34	450.53
159+25	2.66	138.01	2	7.52	4	27.9832	25.00	11.68	495.79
159+50	2.81	136.61	2	7.8	4	30.348	25.00	13.61	549.48
159+75	2.87	135.42	2	7.98	4	31.5126	25.00	17.79	616.28
160+00	2.93	134.23	2	8.16	4	32.6988	25.00	18.75	643.11
160+25	2.38	133.375	2	10.56	4	32.205	25.00	28.14	754.31
160+50	1.82	132.52	2	12.96	4	29.0472	25.00	24.26	666.34
160+75	1.94	131.54	2	14.485	4	33.9209	25.00	14.69	607.64
161+00	2.06	130.56	2	16.01	4	39.1606	25.00	18.25	717.63
161+25	1.79	129.54	2	16.545	4	34.98555	25.00	20.32	691.32
161+50	1.52	128.52	2	17.08	4	30.5216	25.00	15.46	574.77
161+75	1.51	127.51	2	14.08	4	25.7908	25.00	8.71	431.26
162+00	2.50	126.5	2	14.54	4	43.85	25.00	8.77	657.75
								Total	10946.57

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HNTB

Parameters for Recovery Analysis - Left Ditch

Ditch Block	Estimated SHGW (ft)	Confining Layer Elevation (ft)	Width at Ditch Block (ft)	Width at upper end of swale basin (ft)	Equivalent Pond Width (ft)	Equivalent Pond Length (ft)	Stage 1 (ft)	Area 1 (sf)	Stage 2 (ft)	Area 2 (sf)
156+50	136.73	121.73	10.00	4.90	7.45	25.00	150.30	0.00	151.83	309.87
156+75	135.65	120.65	11.49	5.79	8.64	25.00	149.50	0.00	151.09	311.38
157+00	134.57	119.57	12.98	6.68	9.83	25.00	148.70	0.00	150.34	341.88
157+25	133.83	118.83	15.79	7.21	11.50	25.00	147.65	0.00	149.39	355.81
157+50	133.09	118.09	18.65	7.73	13.19	25.00	146.60	0.00	148.44	383.94
157+75	132.34	117.34	20.39	7.67	14.03	25.00	145.20	0.00	147.33	406.19
158+00	131.60	116.60	22.00	7.60	14.80	25.00	143.80	0.00	146.21	447.31
158+25	130.03	115.03	19.43	7.19	13.31	25.00	141.85	0.00	143.90	345.37
158+50	128.45	113.45	16.86	6.78	11.82	21.54	139.90	0.00	141.58	259.02
158+75	126.88	111.88	19.55	7.01	13.28	25.00	138.40	0.00	140.50	374.13
159+00	125.30	110.30	22.24	7.24	14.74	25.00	136.90	0.00	139.41	442.12
159+25	124.08	109.08	23.42	7.52	15.47	25.00	135.35	0.00	138.01	467.25
159+50	122.86	107.86	24.60	7.80	16.20	25.00	133.80	0.00	136.61	496.75
159+75	121.64	106.64	25.08	7.98	16.53	25.00	132.55	0.00	135.42	534.00
160+00	120.42	105.42	25.68	8.16	16.92	25.00	131.30	0.00	134.23	547.50
160+25	119.45	104.45	24.66	10.56	17.61	25.00	131.00	0.00	133.38	567.75
160+50	118.48	103.48	23.76	12.96	18.36	25.00	130.70	0.00	132.52	544.50
160+75	117.50	102.50	26.49	14.49	20.49	25.00	129.60	0.00	131.54	551.56
161+00	116.53	101.53	28.31	16.01	22.16	25.00	128.50	0.00	130.56	607.69
161+25	115.56	100.56	27.35	16.55	21.95	25.00	127.75	0.00	129.54	619.19
161+50	114.60	99.60	26.38	17.08	21.73	25.00	127.00	0.00	128.52	592.06
161+75	113.63	98.63	23.08	14.08	18.58	25.00	126.00	0.00	127.51	541.00
162+00	112.66	97.66	29.54	14.54	22.04	25.00	124.00	0.00	126.50	582.75

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 156+25 to 156+50 lt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-04-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	121.73
Water Table Elevation, [WT] (ft datum):	136.73
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	186.0

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	7.5

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
150.30	0.0
151.83	309.9

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 113.56

Initial ground water level (ft datum) default, 136.73

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)
0.001	0.010	0.100	0.450	3.000
0.002	0.015	0.150	0.500	3.500
0.003	0.020	0.250	1.000	4.000
0.005	0.030	0.300	1.500	
0.008	0.050	0.350	2.000	
0.009	0.080	0.400	2.500	

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	18.9267	0.0000	136.730	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	18.9267	0.0000	151.358	0.04306	0.00000	113.6	0.3	0.0	U/P
0.024	0.0000	0.0000	151.342	0.04306	0.00000	113.6	3.7	0.0	U/P
0.048	0.0000	0.0000	151.324	0.04306	0.00000	113.6	7.4	0.0	U/P
0.072	0.0000	0.0000	151.306	0.04306	0.00000	113.6	11.2	0.0	U/P
0.120	0.0000	0.0000	151.268	0.04306	0.00000	113.6	18.6	0.0	U/P
0.192	0.0000	0.0000	151.210	0.04275	0.00000	113.6	29.8	0.0	U/P
0.216	0.0000	0.0000	151.190	0.04217	0.00000	113.6	33.4	0.0	U/P
0.240	0.0000	0.0000	151.169	0.04134	0.00000	113.6	37.0	0.0	U/P
0.360	0.0000	0.0000	151.066	0.03712	0.00000	113.6	54.1	0.0	U/P
0.480	0.0000	0.0000	150.962	0.03238	0.00000	113.6	69.1	0.0	U/P
0.720	0.0000	0.0000	150.750	0.01850	0.00000	113.6	93.1	0.0	U/P
1.200	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
1.920	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
2.400	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
3.600	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
6.000	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
7.200	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
8.400	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
9.600	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
10.800	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
12.000	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
24.000	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
36.000	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
48.000	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
60.000	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
72.000	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
84.000	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry
96.000	0.0000	0.0000	---	---	---	113.6	113.6	0.0	dry

~1 hr

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 156+50 to 156+75 lt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-04-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	120.65
Water Table Elevation, [WT] (ft datum):	135.65
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	216.0

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	8.6

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
149.50	0.0
151.09	311.4

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 120.88

Initial ground water level (ft datum) default, 135.65

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)
0.001	0.010	0.100	0.450	3.000
0.002	0.015	0.150	0.500	3.500
0.003	0.020	0.250	1.000	4.000
0.005	0.030	0.300	1.500	
0.008	0.050	0.350	2.000	
0.009	0.080	0.400	2.500	

Detailed Results :: *Scenario 1* :: *Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	20.1467	0.0000	135.650	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	20.1467	0.0000	150.610	0.05000	0.00000	120.9	0.3	0.0	U/P
0.024	0.0000	0.0000	150.591	0.04974	0.00000	120.9	4.3	0.0	U/P
0.048	0.0000	0.0000	150.571	0.04900	0.00000	120.9	8.6	0.0	U/P
0.072	0.0000	0.0000	150.551	0.04824	0.00000	120.9	12.8	0.0	U/P
0.120	0.0000	0.0000	150.510	0.04689	0.00000	120.9	21.0	0.0	U/P
0.192	0.0000	0.0000	150.448	0.04368	0.00000	120.9	32.9	0.0	U/P
0.216	0.0000	0.0000	150.428	0.04252	0.00000	120.9	36.6	0.0	U/P
0.240	0.0000	0.0000	150.408	0.04171	0.00000	120.9	40.2	0.0	U/P
0.360	0.0000	0.0000	150.305	0.03764	0.00000	120.9	57.5	0.0	U/P
0.480	0.0000	0.0000	150.201	0.03307	0.00000	120.9	72.8	0.0	U/P
0.720	0.0000	0.0000	149.989	0.01906	0.00000	120.9	97.5	0.0	U/P ~1 hr
1.200	0.0000	0.0000	----	----	----	120.9	120.9	0.0	dry
1.920	0.0000	0.0000	----	----	----	120.9	120.9	0.0	dry
2.400	0.0000	0.0000	----	----	----	120.9	120.9	0.0	dry
3.600	0.0000	0.0000	----	----	----	120.9	120.9	0.0	dry
6.000	0.0000	0.0000	----	----	----	120.9	120.9	0.0	dry
7.200	0.0000	0.0000	----	----	----	120.9	120.9	0.0	dry
8.400	0.0000	0.0000	----	----	----	120.9	120.9	0.0	dry
9.600	0.0000	0.0000	----	----	----	120.9	120.9	0.0	dry
10.800	0.0000	0.0000	----	----	----	120.9	120.9	0.0	dry
12.000	0.0000	0.0000	----	----	----	120.9	120.9	0.0	dry
24.000	0.0000	0.0000	----	----	----	120.9	120.9	0.0	dry
36.000	0.0000	0.0000	----	----	----	120.9	120.9	0.0	dry
48.000	0.0000	0.0000	----	----	----	120.9	120.9	0.0	dry
60.000	0.0000	0.0000	----	----	----	120.9	120.9	0.0	dry
72.000	0.0000	0.0000	----	----	----	120.9	120.9	0.0	dry
84.000	0.0000	0.0000	----	----	----	120.9	120.9	0.0	dry
96.000	0.0000	0.0000	----	----	----	120.9	120.9	0.0	dry

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method
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Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 156+75 to 157+00 lt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	119.57
Water Table Elevation, [WT] (ft datum):	134.57
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	246.0

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	9.8

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
148.70	0.0
150.34	341.9

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 157.3

Initial ground water level (ft datum) default, 134.57

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)
0.001	0.013	0.090	0.460	1.500
0.002	0.015	0.100	0.470	2.000
0.003	0.020	0.150	0.500	2.500
0.005	0.030	0.250	0.600	3.000
0.008	0.050	0.300	0.700	3.500
0.009	0.060	0.350	0.800	4.000
0.010	0.070	0.400	0.900	
0.012	0.080	0.450	1.000	

Detailed Results :: *Scenario 1* :: *Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	26.2167	0.0000	134.570	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	26.2167	0.0000	149.927	0.05694	0.00000	157.3	0.3	0.0	U/P
0.024	0.0000	0.0000	149.909	0.05694	0.00000	157.3	4.9	0.0	U/P
0.048	0.0000	0.0000	149.889	0.05694	0.00000	157.3	9.8	0.0	U/P
0.072	0.0000	0.0000	149.869	0.05677	0.00000	157.3	14.8	0.0	U/P
0.120	0.0000	0.0000	149.829	0.05564	0.00000	157.3	24.5	0.0	U/P
0.192	0.0000	0.0000	149.767	0.05223	0.00000	157.3	38.6	0.0	U/P
0.216	0.0000	0.0000	149.747	0.05100	0.00000	157.3	43.1	0.0	U/P
0.240	0.0000	0.0000	149.727	0.05019	0.00000	157.3	47.4	0.0	U/P
0.288	0.0000	0.0000	149.686	0.04823	0.00000	157.3	56.0	0.0	U/P
0.312	0.0000	0.0000	149.666	0.04725	0.00000	157.3	60.1	0.0	U/P
0.360	0.0000	0.0000	149.625	0.04568	0.00000	157.3	68.2	0.0	U/P
0.480	0.0000	0.0000	149.522	0.04102	0.00000	157.3	86.9	0.0	U/P
0.720	0.0000	0.0000	149.312	0.03122	0.00000	157.3	118.3	0.0	U/P
1.200	0.0000	0.0000	148.859	0.00703	0.00000	157.3	154.7	0.0	U/P ~1 hr
1.440	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry
1.680	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry
1.920	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry
2.160	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry
2.400	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry
3.600	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry
6.000	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry
7.200	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry
8.400	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry
9.600	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry
10.800	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry
11.040	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry
11.280	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry
12.000	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry
14.400	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry
16.800	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry
19.200	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry
21.600	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry
24.000	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry
36.000	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry
48.000	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry
60.000	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry
72.000	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry
84.000	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry
96.000	0.0000	0.0000	----	----	----	157.3	157.3	0.0	dry

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 157+00 to 157+25 lt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	118.83
Water Table Elevation, [WT] (ft datum):	133.83
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	288.0

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	11.5

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
147.65	0.0
149.39	355.8

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 230.79

Initial ground water level (ft datum) default, 133.83

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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	38.4650	0.0000	133.830	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	38.4650	0.0000	149.151	0.06667	0.00000	230.8	0.4	0.0	U/P
0.024	0.0000	0.0000	149.134	0.06667	0.00000	230.8	5.8	0.0	U/P
0.048	0.0000	0.0000	149.114	0.06667	0.00000	230.8	11.5	0.0	U/P
0.072	0.0000	0.0000	149.095	0.06667	0.00000	230.8	17.3	0.0	U/P
0.120	0.0000	0.0000	149.056	0.06661	0.00000	230.8	28.8	0.0	U/P
0.192	0.0000	0.0000	148.994	0.06435	0.00000	230.8	46.0	0.0	U/P
0.216	0.0000	0.0000	148.974	0.06315	0.00000	230.8	51.5	0.0	U/P
0.240	0.0000	0.0000	148.954	0.06236	0.00000	230.8	57.0	0.0	U/P
0.288	0.0000	0.0000	148.913	0.06044	0.00000	230.8	67.6	0.0	U/P
0.312	0.0000	0.0000	148.893	0.05948	0.00000	230.8	72.8	0.0	U/P
0.360	0.0000	0.0000	148.852	0.05795	0.00000	230.8	83.0	0.0	U/P
0.480	0.0000	0.0000	148.750	0.05341	0.00000	230.8	107.0	0.0	U/P
0.720	0.0000	0.0000	148.543	0.04398	0.00000	230.8	149.2	0.0	U/P
1.200	0.0000	0.0000	148.117	0.02389	0.00000	230.8	208.5	0.0	U/P
1.440	0.0000	0.0000	147.896	0.00934	0.00000	230.8	224.6	0.0	U/P ~1.5 hrs
1.680	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
1.920	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
2.160	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
2.400	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
3.600	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
6.000	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
7.200	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
8.400	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
9.600	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
10.800	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
11.040	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
11.280	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
11.520	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
11.760	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
12.000	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
14.400	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
16.800	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
19.200	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
21.600	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
24.000	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
36.000	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
48.000	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
60.000	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
72.000	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
84.000	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry
96.000	0.0000	0.0000	----	----	----	230.8	230.8	0.0	dry

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 157+25 to 157+50 lt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	118.09
Water Table Elevation, [WT] (ft datum):	133.09
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft²):	329.8

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	13.2

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft²)
146.60	0.0
148.44	383.9

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 347.36

Initial ground water level (ft datum) default, 133.09

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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	57.8933	0.0000	133.090	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	57.8933	0.0000	148.424	0.07633	0.00000	347.4	0.5	0.0	U/P
0.024	0.0000	0.0000	148.407	0.07633	0.00000	347.4	6.6	0.0	U/P
0.048	0.0000	0.0000	148.390	0.07633	0.00000	347.4	13.2	0.0	U/P
0.072	0.0000	0.0000	148.372	0.07633	0.00000	347.4	19.8	0.0	U/P
0.120	0.0000	0.0000	148.336	0.07633	0.00000	347.4	33.0	0.0	U/P
0.192	0.0000	0.0000	148.280	0.07633	0.00000	347.4	52.8	0.0	U/P
0.216	0.0000	0.0000	148.262	0.07633	0.00000	347.4	59.4	0.0	U/P
0.240	0.0000	0.0000	148.242	0.07633	0.00000	347.4	66.0	0.0	U/P
0.288	0.0000	0.0000	148.203	0.07633	0.00000	347.4	79.1	0.0	U/P
0.312	0.0000	0.0000	148.184	0.07633	0.00000	347.4	85.7	0.0	U/P
0.360	0.0000	0.0000	148.143	0.07547	0.00000	347.4	98.9	0.0	U/P
0.480	0.0000	0.0000	148.041	0.07098	0.00000	347.4	130.6	0.0	U/P
0.720	0.0000	0.0000	147.836	0.06145	0.00000	347.4	187.9	0.0	U/P
1.200	0.0000	0.0000	147.420	0.04139	0.00000	347.4	277.2	0.0	U/P
1.440	0.0000	0.0000	147.210	0.03114	0.00000	347.4	308.5	0.0	U/P
1.680	0.0000	0.0000	146.996	0.02078	0.00000	347.4	331.0	0.0	U/P
1.920	0.0000	0.0000	146.767	0.00776	0.00000	347.4	344.4	0.0	U/P ~2 hrs
2.160	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
2.400	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
3.600	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
6.000	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
7.200	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
8.400	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
9.600	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
10.800	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
11.040	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
11.280	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
11.520	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
11.760	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
12.000	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
14.400	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
16.800	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
19.200	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
21.600	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
24.000	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
36.000	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
48.000	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
60.000	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
72.000	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
84.000	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry
96.000	0.0000	0.0000	---	---	---	347.4	347.4	0.0	dry

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 157+50 to 157+75 lt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	117.34
Water Table Elevation, [WT] (ft datum):	132.34
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	350.8

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	14.0

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
145.20	0.0
147.33	406.2

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 378.62

Initial ground water level (ft datum) default, 132.34

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

Detailed Results :: *Scenario 1* :: *Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type	
0.000	63.1033	0.0000	132.340	0.00000	0.00000	0.0	0.0	0.0	N.A.	
0.002	63.1033	0.0000	147.191	0.08119	0.00000	378.6	0.5	0.0	U/P	
0.024	0.0000	0.0000	147.174	0.08119	0.00000	378.6	7.0	0.0	U/P	
0.048	0.0000	0.0000	147.155	0.08119	0.00000	378.6	14.0	0.0	U/P	
0.072	0.0000	0.0000	147.137	0.08119	0.00000	378.6	21.0	0.0	U/P	
0.120	0.0000	0.0000	147.098	0.08119	0.00000	378.6	35.1	0.0	U/P	
0.192	0.0000	0.0000	147.039	0.08119	0.00000	378.6	56.1	0.0	U/P	
0.216	0.0000	0.0000	147.019	0.08074	0.00000	378.6	63.1	0.0	U/P	
0.240	0.0000	0.0000	146.999	0.08000	0.00000	378.6	70.1	0.0	U/P	
0.288	0.0000	0.0000	146.958	0.07822	0.00000	378.6	83.8	0.0	U/P	
0.312	0.0000	0.0000	146.938	0.07733	0.00000	378.6	90.5	0.0	U/P	
0.360	0.0000	0.0000	146.898	0.07590	0.00000	378.6	103.8	0.0	U/P	
0.480	0.0000	0.0000	146.796	0.07170	0.00000	378.6	135.7	0.0	U/P	
0.720	0.0000	0.0000	146.592	0.06302	0.00000	378.6	193.9	0.0	U/P	
1.200	0.0000	0.0000	146.178	0.04478	0.00000	378.6	287.5	0.0	U/P	
1.440	0.0000	0.0000	145.970	0.03549	0.00000	378.6	322.1	0.0	U/P	
1.680	0.0000	0.0000	145.759	0.02620	0.00000	378.6	348.8	0.0	U/P	
1.920	0.0000	0.0000	145.543	0.01665	0.00000	378.6	367.4	0.0	U/P	
2.160	0.0000	0.0000	145.304	0.00589	0.00000	378.6	377.6	0.0	U/P	~2.25 hrs
2.400	0.0000	0.0000	----	----	----	378.6	378.6	0.0	dry	
3.600	0.0000	0.0000	----	----	----	378.6	378.6	0.0	dry	
6.000	0.0000	0.0000	----	----	----	378.6	378.6	0.0	dry	
7.200	0.0000	0.0000	----	----	----	378.6	378.6	0.0	dry	
8.400	0.0000	0.0000	----	----	----	378.6	378.6	0.0	dry	
9.600	0.0000	0.0000	----	----	----	378.6	378.6	0.0	dry	
10.800	0.0000	0.0000	----	----	----	378.6	378.6	0.0	dry	
11.040	0.0000	0.0000	----	----	----	378.6	378.6	0.0	dry	
11.280	0.0000	0.0000	----	----	----	378.6	378.6	0.0	dry	
11.520	0.0000	0.0000	----	----	----	378.6	378.6	0.0	dry	
11.760	0.0000	0.0000	----	----	----	378.6	378.6	0.0	dry	
12.000	0.0000	0.0000	----	----	----	378.6	378.6	0.0	dry	
14.400	0.0000	0.0000	----	----	----	378.6	378.6	0.0	dry	
16.800	0.0000	0.0000	----	----	----	378.6	378.6	0.0	dry	
19.200	0.0000	0.0000	----	----	----	378.6	378.6	0.0	dry	
21.600	0.0000	0.0000	----	----	----	378.6	378.6	0.0	dry	
24.000	0.0000	0.0000	----	----	----	378.6	378.6	0.0	dry	
36.000	0.0000	0.0000	----	----	----	378.6	378.6	0.0	dry	
48.000	0.0000	0.0000	----	----	----	378.6	378.6	0.0	dry	
60.000	0.0000	0.0000	----	----	----	378.6	378.6	0.0	dry	
72.000	0.0000	0.0000	----	----	----	378.6	378.6	0.0	dry	
84.000	0.0000	0.0000	----	----	----	378.6	378.6	0.0	dry	
96.000	0.0000	0.0000	----	----	----	378.6	378.6	0.0	dry	

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 157+75 to 158+00 lt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	116.60
Water Table Elevation, [WT] (ft datum):	131.60
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	370.0

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	14.8

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
143.80	0.0
146.21	447.3

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 450.5

Initial ground water level (ft datum) default, 131.60

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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	75.0833	0.0000	131.600	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	75.0833	0.0000	146.002	0.08565	0.00000	450.5	0.5	0.0	U/P
0.024	0.0000	0.0000	145.985	0.08565	0.00000	450.5	7.4	0.0	U/P
0.048	0.0000	0.0000	145.967	0.08565	0.00000	450.5	14.8	0.0	U/P
0.072	0.0000	0.0000	145.948	0.08565	0.00000	450.5	22.2	0.0	U/P
0.120	0.0000	0.0000	145.911	0.08565	0.00000	450.5	37.0	0.0	U/P
0.192	0.0000	0.0000	145.853	0.08565	0.00000	450.5	59.2	0.0	U/P
0.216	0.0000	0.0000	145.834	0.08565	0.00000	450.5	66.6	0.0	U/P
0.240	0.0000	0.0000	145.814	0.08565	0.00000	450.5	74.0	0.0	U/P
0.288	0.0000	0.0000	145.774	0.08510	0.00000	450.5	88.8	0.0	U/P
0.312	0.0000	0.0000	145.754	0.08453	0.00000	450.5	96.1	0.0	U/P
0.360	0.0000	0.0000	145.714	0.08315	0.00000	450.5	110.6	0.0	U/P
0.480	0.0000	0.0000	145.612	0.07907	0.00000	450.5	145.7	0.0	U/P
0.720	0.0000	0.0000	145.408	0.07064	0.00000	450.5	210.4	0.0	U/P
1.200	0.0000	0.0000	144.997	0.05298	0.00000	450.5	317.6	0.0	U/P
1.440	0.0000	0.0000	144.790	0.04402	0.00000	450.5	359.5	0.0	U/P
1.680	0.0000	0.0000	144.582	0.03509	0.00000	450.5	393.7	0.0	U/P
1.920	0.0000	0.0000	144.372	0.02606	0.00000	450.5	420.1	0.0	U/P
2.160	0.0000	0.0000	144.156	0.01679	0.00000	450.5	438.7	0.0	U/P
2.400	0.0000	0.0000	143.921	0.01005	0.00000	450.5	449.2	0.0	U/P ~3 hrs
3.600	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
6.000	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
7.200	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
8.400	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
9.600	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
10.800	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
11.040	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
11.280	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
11.520	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
11.760	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
12.000	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
14.400	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
16.800	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
19.200	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
21.600	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
24.000	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
36.000	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
48.000	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
60.000	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
72.000	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
84.000	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry
96.000	0.0000	0.0000	---	---	---	450.5	450.5	0.0	dry

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method
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Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 158+00 to 158+25 lt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	115.03
Water Table Elevation, [WT] (ft datum):	130.03
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	332.8

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	13.3

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
141.85	0.0
143.90	345.4

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 271.35

Initial ground water level (ft datum) default, 130.03

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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	45.2250	0.0000	130.030	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	45.2250	0.0000	143.643	0.06999	0.00000	271.4	0.4	0.0	U/P
0.024	0.0000	0.0000	143.625	0.06959	0.00000	271.4	6.0	0.0	U/P
0.048	0.0000	0.0000	143.605	0.06882	0.00000	271.4	12.0	0.0	U/P
0.072	0.0000	0.0000	143.585	0.06816	0.00000	271.4	17.9	0.0	U/P
0.120	0.0000	0.0000	143.544	0.06701	0.00000	271.4	29.6	0.0	U/P
0.192	0.0000	0.0000	143.483	0.06428	0.00000	271.4	46.7	0.0	U/P
0.216	0.0000	0.0000	143.463	0.06329	0.00000	271.4	52.2	0.0	U/P
0.240	0.0000	0.0000	143.443	0.06263	0.00000	271.4	57.7	0.0	U/P
0.288	0.0000	0.0000	143.402	0.06106	0.00000	271.4	68.4	0.0	U/P
0.312	0.0000	0.0000	143.382	0.06027	0.00000	271.4	73.6	0.0	U/P
0.360	0.0000	0.0000	143.342	0.05901	0.00000	271.4	84.0	0.0	U/P
0.480	0.0000	0.0000	143.240	0.05529	0.00000	271.4	108.7	0.0	U/P
0.720	0.0000	0.0000	143.034	0.04759	0.00000	271.4	153.2	0.0	U/P
1.200	0.0000	0.0000	142.617	0.03136	0.00000	271.4	221.8	0.0	U/P
1.440	0.0000	0.0000	142.406	0.02305	0.00000	271.4	245.3	0.0	U/P
1.680	0.0000	0.0000	142.190	0.01460	0.00000	271.4	261.6	0.0	U/P
1.920	0.0000	0.0000	141.950	0.00515	0.00000	271.4	270.5	0.0	U/P ~2 hrs
2.160	0.0000	0.0000	----	----	----	271.4	271.4	0.0	dry
2.400	0.0000	0.0000	----	----	----	271.4	271.4	0.0	dry
3.600	0.0000	0.0000	----	----	----	271.4	271.4	0.0	dry
6.000	0.0000	0.0000	----	----	----	271.4	271.4	0.0	dry
7.200	0.0000	0.0000	----	----	----	271.4	271.4	0.0	dry
8.400	0.0000	0.0000	----	----	----	271.4	271.4	0.0	dry
9.600	0.0000	0.0000	----	----	----	271.4	271.4	0.0	dry
10.800	0.0000	0.0000	----	----	----	271.4	271.4	0.0	dry
11.040	0.0000	0.0000	----	----	----	271.4	271.4	0.0	dry
11.280	0.0000	0.0000	----	----	----	271.4	271.4	0.0	dry
11.520	0.0000	0.0000	----	----	----	271.4	271.4	0.0	dry
11.760	0.0000	0.0000	----	----	----	271.4	271.4	0.0	dry
12.000	0.0000	0.0000	----	----	----	271.4	271.4	0.0	dry
14.400	0.0000	0.0000	----	----	----	271.4	271.4	0.0	dry
16.800	0.0000	0.0000	----	----	----	271.4	271.4	0.0	dry
19.200	0.0000	0.0000	----	----	----	271.4	271.4	0.0	dry
21.600	0.0000	0.0000	----	----	----	271.4	271.4	0.0	dry
24.000	0.0000	0.0000	----	----	----	271.4	271.4	0.0	dry
36.000	0.0000	0.0000	----	----	----	271.4	271.4	0.0	dry
48.000	0.0000	0.0000	----	----	----	271.4	271.4	0.0	dry
60.000	0.0000	0.0000	----	----	----	271.4	271.4	0.0	dry
72.000	0.0000	0.0000	----	----	----	271.4	271.4	0.0	dry
84.000	0.0000	0.0000	----	----	----	271.4	271.4	0.0	dry
96.000	0.0000	0.0000	----	----	----	271.4	271.4	0.0	dry

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 158+25 to 158+50 lt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	113.45
Water Table Elevation, [WT] (ft datum):	128.45
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	254.6

Geometry Data

Equivalent Pond Length, [L] (ft):	21.5
Equivalent Pond Width, [W] (ft):	11.8

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
139.90	0.0
141.58	259.0

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 176.96

Initial ground water level (ft datum) default, 128.45

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

Detailed Results :: *Scenario 1* :: *Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	29.4933	0.0000	128.450	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	29.4933	0.0000	141.414	0.05407	0.00000	177.0	0.3	0.0	U/P
0.024	0.0000	0.0000	141.395	0.05370	0.00000	177.0	4.7	0.0	U/P
0.048	0.0000	0.0000	141.375	0.05300	0.00000	177.0	9.3	0.0	U/P
0.072	0.0000	0.0000	141.355	0.05240	0.00000	177.0	13.8	0.0	U/P
0.120	0.0000	0.0000	141.314	0.05134	0.00000	177.0	22.8	0.0	U/P
0.192	0.0000	0.0000	141.253	0.04883	0.00000	177.0	35.9	0.0	U/P
0.216	0.0000	0.0000	141.233	0.04792	0.00000	177.0	40.1	0.0	U/P
0.240	0.0000	0.0000	141.213	0.04732	0.00000	177.0	44.2	0.0	U/P
0.288	0.0000	0.0000	141.172	0.04588	0.00000	177.0	52.3	0.0	U/P
0.312	0.0000	0.0000	141.152	0.04515	0.00000	177.0	56.2	0.0	U/P
0.360	0.0000	0.0000	141.111	0.04400	0.00000	177.0	63.9	0.0	U/P
0.480	0.0000	0.0000	141.009	0.04058	0.00000	177.0	82.2	0.0	U/P
0.720	0.0000	0.0000	140.802	0.03347	0.00000	177.0	114.2	0.0	U/P
1.200	0.0000	0.0000	140.377	0.01833	0.00000	177.0	159.5	0.0	U/P
1.440	0.0000	0.0000	140.156	0.00721	0.00000	177.0	171.9	0.0	U/P
1.680	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
1.920	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
2.160	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
2.400	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
3.600	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
6.000	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
7.200	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
8.400	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
9.600	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
10.800	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
11.040	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
11.280	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
11.520	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
11.760	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
12.000	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
14.400	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
16.800	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
19.200	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
21.600	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
24.000	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
36.000	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
48.000	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
60.000	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
72.000	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
84.000	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry
96.000	0.0000	0.0000	---	---	---	177.0	177.0	0.0	dry

1.5 hrs

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 158+50 to 158+75 lt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	111.88
Water Table Elevation, [WT] (ft datum):	126.88
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	332.0

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	13.3

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
138.40	0.0
140.50	374.1

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 335.26

Initial ground water level (ft datum) default, 126.88

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

Detailed Results :: *Scenario 1 :: Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	55.8767	0.0000	126.880	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	55.8767	0.0000	140.339	0.07685	0.00000	335.3	0.5	0.0	U/P
0.024	0.0000	0.0000	140.321	0.07685	0.00000	335.3	6.6	0.0	U/P
0.048	0.0000	0.0000	140.301	0.07685	0.00000	335.3	13.3	0.0	U/P
0.072	0.0000	0.0000	140.282	0.07685	0.00000	335.3	19.9	0.0	U/P
0.120	0.0000	0.0000	140.242	0.07649	0.00000	335.3	33.2	0.0	U/P
0.192	0.0000	0.0000	140.180	0.07405	0.00000	335.3	52.9	0.0	U/P
0.216	0.0000	0.0000	140.160	0.07301	0.00000	335.3	59.2	0.0	U/P
0.240	0.0000	0.0000	140.140	0.07232	0.00000	335.3	65.5	0.0	U/P
0.288	0.0000	0.0000	140.100	0.07065	0.00000	335.3	77.9	0.0	U/P
0.312	0.0000	0.0000	140.080	0.06982	0.00000	335.3	84.0	0.0	U/P
0.360	0.0000	0.0000	140.039	0.06849	0.00000	335.3	95.9	0.0	U/P
0.480	0.0000	0.0000	139.938	0.06457	0.00000	335.3	124.7	0.0	U/P
0.720	0.0000	0.0000	139.733	0.05644	0.00000	335.3	177.0	0.0	U/P
1.200	0.0000	0.0000	139.318	0.03937	0.00000	335.3	260.2	0.0	U/P
1.440	0.0000	0.0000	139.109	0.03067	0.00000	335.3	290.4	0.0	U/P
1.680	0.0000	0.0000	138.898	0.02194	0.00000	335.3	313.2	0.0	U/P
1.920	0.0000	0.0000	138.678	0.00877	0.00000	335.3	328.4	0.0	U/P ~2hrs
2.160	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
2.400	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
3.600	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
6.000	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
7.200	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
8.400	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
9.600	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
10.800	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
11.040	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
11.280	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
11.520	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
11.760	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
12.000	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
14.400	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
16.800	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
19.200	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
21.600	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
24.000	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
36.000	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
48.000	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
60.000	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
72.000	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
84.000	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry
96.000	0.0000	0.0000	---	---	---	335.3	335.3	0.0	dry

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 158+75 to 159+00 lt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	110.30
Water Table Elevation, [WT] (ft datum):	125.30
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	368.5

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	14.7

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
136.90	0.0
139.41	442.1

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 448

Initial ground water level (ft datum) default, 125.30

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

Detailed Results :: *Scenario 1 :: Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	74.6667	0.0000	125.300	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	74.6667	0.0000	139.154	0.08530	0.00000	448.0	0.5	0.0	U/P
0.024	0.0000	0.0000	139.137	0.08530	0.00000	448.0	7.4	0.0	U/P
0.048	0.0000	0.0000	139.118	0.08530	0.00000	448.0	14.7	0.0	U/P
0.072	0.0000	0.0000	139.099	0.08530	0.00000	448.0	22.1	0.0	U/P
0.120	0.0000	0.0000	139.061	0.08530	0.00000	448.0	36.9	0.0	U/P
0.192	0.0000	0.0000	139.002	0.08530	0.00000	448.0	59.0	0.0	U/P
0.216	0.0000	0.0000	138.982	0.08509	0.00000	448.0	66.3	0.0	U/P
0.240	0.0000	0.0000	138.962	0.08461	0.00000	448.0	73.7	0.0	U/P
0.288	0.0000	0.0000	138.921	0.08296	0.00000	448.0	88.2	0.0	U/P
0.312	0.0000	0.0000	138.901	0.08214	0.00000	448.0	95.3	0.0	U/P
0.360	0.0000	0.0000	138.861	0.08083	0.00000	448.0	109.4	0.0	U/P
0.480	0.0000	0.0000	138.759	0.07696	0.00000	448.0	143.5	0.0	U/P
0.720	0.0000	0.0000	138.556	0.06897	0.00000	448.0	206.6	0.0	U/P
1.200	0.0000	0.0000	138.144	0.05222	0.00000	448.0	311.7	0.0	U/P
1.440	0.0000	0.0000	137.938	0.04372	0.00000	448.0	353.1	0.0	U/P
1.680	0.0000	0.0000	137.731	0.03527	0.00000	448.0	387.2	0.0	U/P
1.920	0.0000	0.0000	137.521	0.02673	0.00000	448.0	414.0	0.0	U/P
2.160	0.0000	0.0000	137.307	0.01800	0.00000	448.0	433.4	0.0	U/P
2.400	0.0000	0.0000	137.080	0.01132	0.00000	448.0	445.2	0.0	U/P
3.600	0.0000	0.0000	----	----	----	448.0	448.0	0.0	dry
6.000	0.0000	0.0000	----	----	----	448.0	448.0	0.0	dry
7.200	0.0000	0.0000	----	----	----	448.0	448.0	0.0	dry
8.400	0.0000	0.0000	----	----	----	448.0	448.0	0.0	dry
9.600	0.0000	0.0000	----	----	----	448.0	448.0	0.0	dry
10.800	0.0000	0.0000	----	----	----	448.0	448.0	0.0	dry
11.040	0.0000	0.0000	----	----	----	448.0	448.0	0.0	dry
11.280	0.0000	0.0000	----	----	----	448.0	448.0	0.0	dry
11.520	0.0000	0.0000	----	----	----	448.0	448.0	0.0	dry
11.760	0.0000	0.0000	----	----	----	448.0	448.0	0.0	dry
12.000	0.0000	0.0000	----	----	----	448.0	448.0	0.0	dry
14.400	0.0000	0.0000	----	----	----	448.0	448.0	0.0	dry
16.800	0.0000	0.0000	----	----	----	448.0	448.0	0.0	dry
19.200	0.0000	0.0000	----	----	----	448.0	448.0	0.0	dry
21.600	0.0000	0.0000	----	----	----	448.0	448.0	0.0	dry
24.000	0.0000	0.0000	----	----	----	448.0	448.0	0.0	dry
36.000	0.0000	0.0000	----	----	----	448.0	448.0	0.0	dry
48.000	0.0000	0.0000	----	----	----	448.0	448.0	0.0	dry
60.000	0.0000	0.0000	----	----	----	448.0	448.0	0.0	dry
72.000	0.0000	0.0000	----	----	----	448.0	448.0	0.0	dry
84.000	0.0000	0.0000	----	----	----	448.0	448.0	0.0	dry
96.000	0.0000	0.0000	----	----	----	448.0	448.0	0.0	dry

~3 hrs

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 159+00 to 159+25 lt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	109.08
Water Table Elevation, [WT] (ft datum):	124.08
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	386.8

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	15.5

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
135.35	0.0
138.01	467.3

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 493.1

Initial ground water level (ft datum) default, 124.08

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

Detailed Results :: *Scenario 1* :: *Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	82.1833	0.0000	124.080	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	82.1833	0.0000	137.718	0.08953	0.00000	493.1	0.5	0.0	U/P
0.024	0.0000	0.0000	137.701	0.08953	0.00000	493.1	7.7	0.0	U/P
0.048	0.0000	0.0000	137.682	0.08953	0.00000	493.1	15.5	0.0	U/P
0.072	0.0000	0.0000	137.663	0.08953	0.00000	493.1	23.2	0.0	U/P
0.120	0.0000	0.0000	137.625	0.08953	0.00000	493.1	38.7	0.0	U/P
0.192	0.0000	0.0000	137.566	0.08953	0.00000	493.1	61.9	0.0	U/P
0.216	0.0000	0.0000	137.546	0.08941	0.00000	493.1	69.6	0.0	U/P
0.240	0.0000	0.0000	137.526	0.08901	0.00000	493.1	77.3	0.0	U/P
0.288	0.0000	0.0000	137.485	0.08737	0.00000	493.1	92.6	0.0	U/P
0.312	0.0000	0.0000	137.465	0.08656	0.00000	493.1	100.1	0.0	U/P
0.360	0.0000	0.0000	137.425	0.08525	0.00000	493.1	115.0	0.0	U/P
0.480	0.0000	0.0000	137.324	0.08139	0.00000	493.1	151.0	0.0	U/P
0.720	0.0000	0.0000	137.120	0.07343	0.00000	493.1	217.9	0.0	U/P
1.200	0.0000	0.0000	136.710	0.05676	0.00000	493.1	330.8	0.0	U/P
1.440	0.0000	0.0000	136.504	0.04831	0.00000	493.1	376.1	0.0	U/P
1.680	0.0000	0.0000	136.297	0.03992	0.00000	493.1	414.3	0.0	U/P
1.920	0.0000	0.0000	136.089	0.03146	0.00000	493.1	445.1	0.0	U/P
2.160	0.0000	0.0000	135.878	0.02288	0.00000	493.1	468.6	0.0	U/P
2.400	0.0000	0.0000	135.660	0.01546	0.00000	493.1	484.6	0.0	U/P
3.600	0.0000	0.0000	----	----	----	493.1	493.1	0.0	dry
6.000	0.0000	0.0000	----	----	----	493.1	493.1	0.0	dry
7.200	0.0000	0.0000	----	----	----	493.1	493.1	0.0	dry
8.400	0.0000	0.0000	----	----	----	493.1	493.1	0.0	dry
9.600	0.0000	0.0000	----	----	----	493.1	493.1	0.0	dry
10.800	0.0000	0.0000	----	----	----	493.1	493.1	0.0	dry
11.040	0.0000	0.0000	----	----	----	493.1	493.1	0.0	dry
11.280	0.0000	0.0000	----	----	----	493.1	493.1	0.0	dry
11.520	0.0000	0.0000	----	----	----	493.1	493.1	0.0	dry
11.760	0.0000	0.0000	----	----	----	493.1	493.1	0.0	dry
12.000	0.0000	0.0000	----	----	----	493.1	493.1	0.0	dry
14.400	0.0000	0.0000	----	----	----	493.1	493.1	0.0	dry
16.800	0.0000	0.0000	----	----	----	493.1	493.1	0.0	dry
19.200	0.0000	0.0000	----	----	----	493.1	493.1	0.0	dry
21.600	0.0000	0.0000	----	----	----	493.1	493.1	0.0	dry
24.000	0.0000	0.0000	----	----	----	493.1	493.1	0.0	dry
36.000	0.0000	0.0000	----	----	----	493.1	493.1	0.0	dry
48.000	0.0000	0.0000	----	----	----	493.1	493.1	0.0	dry
60.000	0.0000	0.0000	----	----	----	493.1	493.1	0.0	dry
72.000	0.0000	0.0000	----	----	----	493.1	493.1	0.0	dry
84.000	0.0000	0.0000	----	----	----	493.1	493.1	0.0	dry
96.000	0.0000	0.0000	----	----	----	493.1	493.1	0.0	dry

~3hrs

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 159+25 to 159+50 lt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	107.86
Water Table Elevation, [WT] (ft datum):	122.86
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	405.0

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	16.2

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
133.80	0.0
136.61	496.8

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 546.75

Initial ground water level (ft datum) default, 122.86

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

Detailed Results :: *Scenario 1* :: *Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	91.1250	0.0000	122.860	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	91.1250	0.0000	136.286	0.09375	0.00000	546.8	0.6	0.0	U/P
0.024	0.0000	0.0000	136.269	0.09375	0.00000	546.8	8.1	0.0	U/P
0.048	0.0000	0.0000	136.250	0.09375	0.00000	546.8	16.2	0.0	U/P
0.072	0.0000	0.0000	136.231	0.09375	0.00000	546.8	24.3	0.0	U/P
0.120	0.0000	0.0000	136.193	0.09375	0.00000	546.8	40.5	0.0	U/P
0.192	0.0000	0.0000	136.135	0.09375	0.00000	546.8	64.8	0.0	U/P
0.216	0.0000	0.0000	136.115	0.09375	0.00000	546.8	72.9	0.0	U/P
0.240	0.0000	0.0000	136.096	0.09375	0.00000	546.8	81.0	0.0	U/P
0.288	0.0000	0.0000	136.055	0.09277	0.00000	546.8	97.2	0.0	U/P
0.312	0.0000	0.0000	136.035	0.09201	0.00000	546.8	105.2	0.0	U/P
0.360	0.0000	0.0000	135.995	0.09070	0.00000	546.8	121.0	0.0	U/P
0.480	0.0000	0.0000	135.894	0.08682	0.00000	546.8	159.3	0.0	U/P
0.720	0.0000	0.0000	135.690	0.07882	0.00000	546.8	231.0	0.0	U/P
1.200	0.0000	0.0000	135.280	0.06207	0.00000	546.8	353.0	0.0	U/P
1.440	0.0000	0.0000	135.075	0.05359	0.00000	546.8	403.0	0.0	U/P
1.680	0.0000	0.0000	134.870	0.04517	0.00000	546.8	445.6	0.0	U/P
1.920	0.0000	0.0000	134.662	0.03670	0.00000	546.8	481.0	0.0	U/P
2.160	0.0000	0.0000	134.453	0.02814	0.00000	546.8	509.0	0.0	U/P
2.400	0.0000	0.0000	134.240	0.01986	0.00000	546.8	529.6	0.0	U/P
3.600	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
6.000	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
7.200	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
8.400	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
9.600	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
10.800	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
11.040	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
11.280	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
11.520	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
11.760	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
12.000	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
14.400	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
16.800	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
19.200	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
21.600	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
24.000	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
36.000	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
48.000	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
60.000	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
72.000	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
84.000	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry
96.000	0.0000	0.0000	---	---	---	546.8	546.8	0.0	dry

~3 hrs

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 159+50 to 159+75 lt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	106.64
Water Table Elevation, [WT] (ft datum):	121.64
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	413.3

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	16.5

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
132.55	0.0
135.42	534.0

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 610.79

Initial ground water level (ft datum) default, 121.64

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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	101.7983	0.0000	121.640	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	101.7983	0.0000	135.111	0.09566	0.00000	610.8	0.6	0.0	U/P
0.024	0.0000	0.0000	135.095	0.09566	0.00000	610.8	8.3	0.0	U/P
0.048	0.0000	0.0000	135.077	0.09566	0.00000	610.8	16.5	0.0	U/P
0.072	0.0000	0.0000	135.060	0.09566	0.00000	610.8	24.8	0.0	U/P
0.120	0.0000	0.0000	135.024	0.09566	0.00000	610.8	41.3	0.0	U/P
0.192	0.0000	0.0000	134.970	0.09566	0.00000	610.8	66.1	0.0	U/P
0.216	0.0000	0.0000	134.951	0.09566	0.00000	610.8	74.4	0.0	U/P
0.240	0.0000	0.0000	134.933	0.09566	0.00000	610.8	82.7	0.0	U/P
0.288	0.0000	0.0000	134.895	0.09566	0.00000	610.8	99.2	0.0	U/P
0.312	0.0000	0.0000	134.876	0.09566	0.00000	610.8	107.4	0.0	U/P
0.360	0.0000	0.0000	134.838	0.09566	0.00000	610.8	124.0	0.0	U/P
0.480	0.0000	0.0000	134.738	0.09422	0.00000	610.8	165.3	0.0	U/P
0.720	0.0000	0.0000	134.535	0.08704	0.00000	610.8	244.2	0.0	U/P
1.200	0.0000	0.0000	134.126	0.06944	0.00000	610.8	379.8	0.0	U/P
1.440	0.0000	0.0000	133.921	0.06052	0.00000	610.8	435.9	0.0	U/P
1.680	0.0000	0.0000	133.716	0.05168	0.00000	610.8	484.4	0.0	U/P
1.920	0.0000	0.0000	133.509	0.04279	0.00000	610.8	525.2	0.0	U/P
2.160	0.0000	0.0000	133.301	0.03383	0.00000	610.8	558.3	0.0	U/P
2.400	0.0000	0.0000	133.090	0.02444	0.00000	610.8	583.6	0.0	U/P
3.600	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
6.000	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
7.200	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
8.400	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
9.600	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
10.800	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
11.040	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
11.280	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
11.520	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
11.760	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
12.000	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
14.400	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
16.800	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
19.200	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
21.600	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
24.000	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
36.000	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
48.000	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
60.000	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
72.000	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
84.000	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry
96.000	0.0000	0.0000	---	---	---	610.8	610.8	0.0	dry

~3hrs

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method
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Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 159+75 to 160+00 lt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	105.42
Water Table Elevation, [WT] (ft datum):	120.42
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	423.0

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	16.9

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
131.30	0.0
134.23	547.5

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 640.34

Initial ground water level (ft datum) default, 120.42

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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	106.7233	0.0000	120.420	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	106.7233	0.0000	133.917	0.09792	0.00000	640.3	0.6	0.0	U/P
0.024	0.0000	0.0000	133.901	0.09792	0.00000	640.3	8.5	0.0	U/P
0.048	0.0000	0.0000	133.883	0.09792	0.00000	640.3	16.9	0.0	U/P
0.072	0.0000	0.0000	133.866	0.09792	0.00000	640.3	25.4	0.0	U/P
0.120	0.0000	0.0000	133.830	0.09792	0.00000	640.3	42.3	0.0	U/P
0.192	0.0000	0.0000	133.776	0.09792	0.00000	640.3	67.7	0.0	U/P
0.216	0.0000	0.0000	133.757	0.09792	0.00000	640.3	76.1	0.0	U/P
0.240	0.0000	0.0000	133.739	0.09792	0.00000	640.3	84.6	0.0	U/P
0.288	0.0000	0.0000	133.702	0.09792	0.00000	640.3	101.5	0.0	U/P
0.312	0.0000	0.0000	133.683	0.09792	0.00000	640.3	110.0	0.0	U/P
0.360	0.0000	0.0000	133.644	0.09792	0.00000	640.3	126.9	0.0	U/P
0.480	0.0000	0.0000	133.546	0.09668	0.00000	640.3	169.2	0.0	U/P
0.720	0.0000	0.0000	133.342	0.08990	0.00000	640.3	250.6	0.0	U/P
1.200	0.0000	0.0000	132.934	0.07223	0.00000	640.3	391.0	0.0	U/P
1.440	0.0000	0.0000	132.729	0.06328	0.00000	640.3	449.5	0.0	U/P
1.680	0.0000	0.0000	132.524	0.05441	0.00000	640.3	500.4	0.0	U/P
1.920	0.0000	0.0000	132.318	0.04550	0.00000	640.3	543.6	0.0	U/P
2.160	0.0000	0.0000	132.110	0.03653	0.00000	640.3	579.0	0.0	U/P
2.400	0.0000	0.0000	131.900	0.02669	0.00000	640.3	606.7	0.0	U/P ~3hrs
3.600	0.0000	0.0000	----	----	----	640.3	640.3	0.0	dry
6.000	0.0000	0.0000	----	----	----	640.3	640.3	0.0	dry
7.200	0.0000	0.0000	----	----	----	640.3	640.3	0.0	dry
8.400	0.0000	0.0000	----	----	----	640.3	640.3	0.0	dry
9.600	0.0000	0.0000	----	----	----	640.3	640.3	0.0	dry
10.800	0.0000	0.0000	----	----	----	640.3	640.3	0.0	dry
11.040	0.0000	0.0000	----	----	----	640.3	640.3	0.0	dry
11.280	0.0000	0.0000	----	----	----	640.3	640.3	0.0	dry
11.520	0.0000	0.0000	----	----	----	640.3	640.3	0.0	dry
11.760	0.0000	0.0000	----	----	----	640.3	640.3	0.0	dry
12.000	0.0000	0.0000	----	----	----	640.3	640.3	0.0	dry
14.400	0.0000	0.0000	----	----	----	640.3	640.3	0.0	dry
16.800	0.0000	0.0000	----	----	----	640.3	640.3	0.0	dry
19.200	0.0000	0.0000	----	----	----	640.3	640.3	0.0	dry
21.600	0.0000	0.0000	----	----	----	640.3	640.3	0.0	dry
24.000	0.0000	0.0000	----	----	----	640.3	640.3	0.0	dry
36.000	0.0000	0.0000	----	----	----	640.3	640.3	0.0	dry
48.000	0.0000	0.0000	----	----	----	640.3	640.3	0.0	dry
60.000	0.0000	0.0000	----	----	----	640.3	640.3	0.0	dry
72.000	0.0000	0.0000	----	----	----	640.3	640.3	0.0	dry
84.000	0.0000	0.0000	----	----	----	640.3	640.3	0.0	dry
96.000	0.0000	0.0000	----	----	----	640.3	640.3	0.0	dry

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 160+00 to 160+25 lt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	104.45
Water Table Elevation, [WT] (ft datum):	119.45
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	440.3

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	17.6

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
131.00	0.0
133.38	567.8

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 745.83

Initial ground water level (ft datum) default, 119.45

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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	124.3050	0.0000	119.450	0.00000	0.00000	0.0	0.0	0.0	N.A.	
0.002	124.3050	0.0000	133.503	0.10191	0.00000	745.8	0.6	0.0	U/P	
0.024	0.0000	0.0000	133.488	0.10191	0.00000	745.8	8.8	0.0	U/P	
0.048	0.0000	0.0000	133.473	0.10191	0.00000	745.8	17.6	0.0	U/P	
0.072	0.0000	0.0000	133.457	0.10191	0.00000	745.8	26.4	0.0	U/P	
0.120	0.0000	0.0000	133.426	0.10191	0.00000	745.8	44.0	0.0	U/P	
0.192	0.0000	0.0000	133.380	0.10191	0.00000	745.8	70.4	0.0	U/P	
0.216	0.0000	0.0000	133.364	0.10191	0.00000	745.8	79.2	0.0	U/P	
0.240	0.0000	0.0000	133.348	0.10191	0.00000	745.8	88.1	0.0	U/P	
0.288	0.0000	0.0000	133.317	0.10191	0.00000	745.8	105.7	0.0	U/P	
0.312	0.0000	0.0000	133.301	0.10191	0.00000	745.8	114.5	0.0	U/P	
0.360	0.0000	0.0000	133.268	0.10191	0.00000	745.8	132.1	0.0	U/P	
0.480	0.0000	0.0000	133.186	0.10191	0.00000	745.8	176.1	0.0	U/P	
0.720	0.0000	0.0000	133.010	0.10109	0.00000	745.8	264.2	0.0	U/P	
1.200	0.0000	0.0000	132.612	0.08998	0.00000	745.8	436.0	0.0	U/P	
1.440	0.0000	0.0000	132.407	0.07958	0.00000	745.8	509.7	0.0	U/P	
1.680	0.0000	0.0000	132.202	0.06825	0.00000	745.8	573.5	0.0	U/P	
1.920	0.0000	0.0000	131.996	0.05687	0.00000	745.8	627.6	0.0	U/P	
2.160	0.0000	0.0000	131.788	0.04540	0.00000	745.8	671.8	0.0	U/P	
2.400	0.0000	0.0000	131.578	0.03304	0.00000	745.8	706.1	0.0	U/P	~3hrs
3.600	0.0000	0.0000	----	----	----	745.8	745.8	0.0	dry	
6.000	0.0000	0.0000	----	----	----	745.8	745.8	0.0	dry	
7.200	0.0000	0.0000	----	----	----	745.8	745.8	0.0	dry	
8.400	0.0000	0.0000	----	----	----	745.8	745.8	0.0	dry	
9.600	0.0000	0.0000	----	----	----	745.8	745.8	0.0	dry	
10.800	0.0000	0.0000	----	----	----	745.8	745.8	0.0	dry	
11.040	0.0000	0.0000	----	----	----	745.8	745.8	0.0	dry	
11.280	0.0000	0.0000	----	----	----	745.8	745.8	0.0	dry	
11.520	0.0000	0.0000	----	----	----	745.8	745.8	0.0	dry	
11.760	0.0000	0.0000	----	----	----	745.8	745.8	0.0	dry	
12.000	0.0000	0.0000	----	----	----	745.8	745.8	0.0	dry	
14.400	0.0000	0.0000	----	----	----	745.8	745.8	0.0	dry	
16.800	0.0000	0.0000	----	----	----	745.8	745.8	0.0	dry	
19.200	0.0000	0.0000	----	----	----	745.8	745.8	0.0	dry	
21.600	0.0000	0.0000	----	----	----	745.8	745.8	0.0	dry	
24.000	0.0000	0.0000	----	----	----	745.8	745.8	0.0	dry	
36.000	0.0000	0.0000	----	----	----	745.8	745.8	0.0	dry	
48.000	0.0000	0.0000	----	----	----	745.8	745.8	0.0	dry	
60.000	0.0000	0.0000	----	----	----	745.8	745.8	0.0	dry	
72.000	0.0000	0.0000	----	----	----	745.8	745.8	0.0	dry	
84.000	0.0000	0.0000	----	----	----	745.8	745.8	0.0	dry	
96.000	0.0000	0.0000	----	----	----	745.8	745.8	0.0	dry	

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Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 160+25 to 160+50 lt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	103.48
Water Table Elevation, [WT] (ft datum):	118.48
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	459.0

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	18.4

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
130.70	0.0
132.52	544.5

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 658.35

Initial ground water level (ft datum) default, 118.48

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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	109.7250	0.0000	118.480	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	109.7250	0.0000	132.818	0.10625	0.00000	658.4	0.6	0.0	U/P
0.024	0.0000	0.0000	132.802	0.10625	0.00000	658.4	9.2	0.0	U/P
0.048	0.0000	0.0000	132.785	0.10625	0.00000	658.4	18.4	0.0	U/P
0.072	0.0000	0.0000	132.769	0.10625	0.00000	658.4	27.5	0.0	U/P
0.120	0.0000	0.0000	132.735	0.10625	0.00000	658.4	45.9	0.0	U/P
0.192	0.0000	0.0000	132.684	0.10625	0.00000	658.4	73.4	0.0	U/P
0.216	0.0000	0.0000	132.667	0.10625	0.00000	658.4	82.6	0.0	U/P
0.240	0.0000	0.0000	132.651	0.10625	0.00000	658.4	91.8	0.0	U/P
0.288	0.0000	0.0000	132.617	0.10625	0.00000	658.4	110.2	0.0	U/P
0.312	0.0000	0.0000	132.600	0.10625	0.00000	658.4	119.3	0.0	U/P
0.360	0.0000	0.0000	132.566	0.10625	0.00000	658.4	137.7	0.0	U/P
0.480	0.0000	0.0000	132.482	0.10625	0.00000	658.4	183.6	0.0	U/P
0.720	0.0000	0.0000	132.300	0.10373	0.00000	658.4	275.4	0.0	U/P
1.200	0.0000	0.0000	131.892	0.08474	0.00000	658.4	445.9	0.0	U/P
1.440	0.0000	0.0000	131.685	0.07060	0.00000	658.4	513.1	0.0	U/P
1.680	0.0000	0.0000	131.477	0.05622	0.00000	658.4	568.0	0.0	U/P
1.920	0.0000	0.0000	131.267	0.04165	0.00000	658.4	610.3	0.0	U/P
2.160	0.0000	0.0000	131.051	0.02669	0.00000	658.4	639.9	0.0	U/P
2.400	0.0000	0.0000	130.814	0.01589	0.00000	658.4	656.4	0.0	U/P
3.600	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
6.000	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
7.200	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
8.400	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
9.600	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
10.800	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
11.040	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
11.280	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
11.520	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
11.760	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
12.000	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
14.400	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
16.800	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
19.200	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
21.600	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
24.000	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
36.000	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
48.000	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
60.000	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
72.000	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
84.000	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry
96.000	0.0000	0.0000	---	---	---	658.4	658.4	0.0	dry

~3 hrs

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 160+50 to 160+75 lt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	102.50
Water Table Elevation, [WT] (ft datum):	117.50
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	512.3

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	20.5

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
129.60	0.0
131.54	551.6

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 638.25

Initial ground water level (ft datum) default, 117.50

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

Detailed Results :: *Scenario 1 :: Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	106.3750	0.0000	117.500	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	106.3750	0.0000	131.726	0.11858	0.00000	638.3	0.7	0.0	U/P
0.024	0.0000	0.0000	131.709	0.11858	0.00000	638.3	10.2	0.0	U/P
0.048	0.0000	0.0000	131.690	0.11858	0.00000	638.3	20.5	0.0	U/P
0.072	0.0000	0.0000	131.671	0.11858	0.00000	638.3	30.7	0.0	U/P
0.120	0.0000	0.0000	131.634	0.11858	0.00000	638.3	51.2	0.0	U/P
0.192	0.0000	0.0000	131.579	0.11858	0.00000	638.3	82.0	0.0	U/P
0.216	0.0000	0.0000	131.560	0.11858	0.00000	638.3	92.2	0.0	U/P
0.240	0.0000	0.0000	131.541	0.11858	0.00000	638.3	102.5	0.0	U/P
0.288	0.0000	0.0000	131.504	0.11858	0.00000	638.3	122.9	0.0	U/P
0.312	0.0000	0.0000	131.485	0.11858	0.00000	638.3	133.2	0.0	U/P
0.360	0.0000	0.0000	131.446	0.11853	0.00000	638.3	153.7	0.0	U/P
0.480	0.0000	0.0000	131.346	0.11576	0.00000	638.3	204.8	0.0	U/P
0.720	0.0000	0.0000	131.142	0.10384	0.00000	638.3	300.3	0.0	U/P
1.200	0.0000	0.0000	130.730	0.07675	0.00000	638.3	456.9	0.0	U/P
1.440	0.0000	0.0000	130.523	0.06299	0.00000	638.3	517.2	0.0	U/P
1.680	0.0000	0.0000	130.314	0.04928	0.00000	638.3	565.7	0.0	U/P
1.920	0.0000	0.0000	130.103	0.03536	0.00000	638.3	602.3	0.0	U/P
2.160	0.0000	0.0000	129.884	0.01416	0.00000	638.3	626.8	0.0	U/P ~2.3hrs
2.400	0.0000	0.0000	----	----	----	638.3	638.3	0.0	dry
3.600	0.0000	0.0000	----	----	----	638.3	638.3	0.0	dry
6.000	0.0000	0.0000	----	----	----	638.3	638.3	0.0	dry
7.200	0.0000	0.0000	----	----	----	638.3	638.3	0.0	dry
8.400	0.0000	0.0000	----	----	----	638.3	638.3	0.0	dry
9.600	0.0000	0.0000	----	----	----	638.3	638.3	0.0	dry
10.800	0.0000	0.0000	----	----	----	638.3	638.3	0.0	dry
11.040	0.0000	0.0000	----	----	----	638.3	638.3	0.0	dry
11.280	0.0000	0.0000	----	----	----	638.3	638.3	0.0	dry
11.520	0.0000	0.0000	----	----	----	638.3	638.3	0.0	dry
11.760	0.0000	0.0000	----	----	----	638.3	638.3	0.0	dry
12.000	0.0000	0.0000	----	----	----	638.3	638.3	0.0	dry
14.400	0.0000	0.0000	----	----	----	638.3	638.3	0.0	dry
16.800	0.0000	0.0000	----	----	----	638.3	638.3	0.0	dry
19.200	0.0000	0.0000	----	----	----	638.3	638.3	0.0	dry
21.600	0.0000	0.0000	----	----	----	638.3	638.3	0.0	dry
24.000	0.0000	0.0000	----	----	----	638.3	638.3	0.0	dry
36.000	0.0000	0.0000	----	----	----	638.3	638.3	0.0	dry
48.000	0.0000	0.0000	----	----	----	638.3	638.3	0.0	dry
60.000	0.0000	0.0000	----	----	----	638.3	638.3	0.0	dry
72.000	0.0000	0.0000	----	----	----	638.3	638.3	0.0	dry
84.000	0.0000	0.0000	----	----	----	638.3	638.3	0.0	dry
96.000	0.0000	0.0000	----	----	----	638.3	638.3	0.0	dry

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Retention Pond Recovery - Refined Method
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Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 160+75 to 161+00 lt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	101.53
Water Table Elevation, [WT] (ft datum):	116.53
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	554.0

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	22.2

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
128.50	0.0
130.56	607.7

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 712.88

Initial ground water level (ft datum) default, 116.53

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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	118.8133	0.0000	116.530	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	118.8133	0.0000	130.702	0.12824	0.00000	712.9	0.8	0.0	U/P
0.024	0.0000	0.0000	130.685	0.12824	0.00000	712.9	11.1	0.0	U/P
0.048	0.0000	0.0000	130.667	0.12824	0.00000	712.9	22.2	0.0	U/P
0.072	0.0000	0.0000	130.648	0.12824	0.00000	712.9	33.2	0.0	U/P
0.120	0.0000	0.0000	130.612	0.12824	0.00000	712.9	55.4	0.0	U/P
0.192	0.0000	0.0000	130.557	0.12824	0.00000	712.9	88.6	0.0	U/P
0.216	0.0000	0.0000	130.539	0.12824	0.00000	712.9	99.7	0.0	U/P
0.240	0.0000	0.0000	130.520	0.12824	0.00000	712.9	110.8	0.0	U/P
0.288	0.0000	0.0000	130.483	0.12824	0.00000	712.9	133.0	0.0	U/P
0.312	0.0000	0.0000	130.464	0.12824	0.00000	712.9	144.0	0.0	U/P
0.360	0.0000	0.0000	130.425	0.12822	0.00000	712.9	166.2	0.0	U/P
0.480	0.0000	0.0000	130.325	0.12544	0.00000	712.9	221.6	0.0	U/P
0.720	0.0000	0.0000	130.121	0.11315	0.00000	712.9	325.2	0.0	U/P
1.200	0.0000	0.0000	129.709	0.08509	0.00000	712.9	497.1	0.0	U/P
1.440	0.0000	0.0000	129.503	0.07084	0.00000	712.9	564.4	0.0	U/P
1.680	0.0000	0.0000	129.296	0.05667	0.00000	712.9	619.5	0.0	U/P
1.920	0.0000	0.0000	129.085	0.04233	0.00000	712.9	662.4	0.0	U/P
2.160	0.0000	0.0000	128.870	0.02763	0.00000	712.9	692.7	0.0	U/P
2.400	0.0000	0.0000	128.637	0.01679	0.00000	712.9	710.1	0.0	U/P ~3 hrs
3.600	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
6.000	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
7.200	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
8.400	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
9.600	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
10.800	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
11.040	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
11.280	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
11.520	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
11.760	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
12.000	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
14.400	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
16.800	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
19.200	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
21.600	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
24.000	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
36.000	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
48.000	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
60.000	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
72.000	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
84.000	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry
96.000	0.0000	0.0000	---	---	---	712.9	712.9	0.0	dry

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Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 161+00 to 161+25 lt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	100.56
Water Table Elevation, [WT] (ft datum):	115.56
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	548.8

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	22.0

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
127.75	0.0
129.54	619.2

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 696.25

Initial ground water level (ft datum) default, 115.56

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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	116.0417	0.0000	115.560	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	116.0417	0.0000	129.768	0.12703	0.00000	696.3	0.8	0.0	U/P
0.024	0.0000	0.0000	129.752	0.12703	0.00000	696.3	11.0	0.0	U/P
0.048	0.0000	0.0000	129.734	0.12703	0.00000	696.3	22.0	0.0	U/P
0.072	0.0000	0.0000	129.716	0.12703	0.00000	696.3	32.9	0.0	U/P
0.120	0.0000	0.0000	129.681	0.12703	0.00000	696.3	54.9	0.0	U/P
0.192	0.0000	0.0000	129.628	0.12703	0.00000	696.3	87.8	0.0	U/P
0.216	0.0000	0.0000	129.610	0.12703	0.00000	696.3	98.8	0.0	U/P
0.240	0.0000	0.0000	129.592	0.12703	0.00000	696.3	109.8	0.0	U/P
0.288	0.0000	0.0000	129.557	0.12703	0.00000	696.3	131.7	0.0	U/P
0.312	0.0000	0.0000	129.539	0.12703	0.00000	696.3	142.7	0.0	U/P
0.360	0.0000	0.0000	129.503	0.12703	0.00000	696.3	164.6	0.0	U/P
0.480	0.0000	0.0000	129.410	0.12650	0.00000	696.3	219.5	0.0	U/P
0.720	0.0000	0.0000	129.209	0.11819	0.00000	696.3	327.9	0.0	U/P
1.200	0.0000	0.0000	128.796	0.08671	0.00000	696.3	507.0	0.0	U/P
1.440	0.0000	0.0000	128.589	0.06991	0.00000	696.3	574.6	0.0	U/P
1.680	0.0000	0.0000	128.379	0.05314	0.00000	696.3	627.8	0.0	U/P
1.920	0.0000	0.0000	128.165	0.03603	0.00000	696.3	666.4	0.0	U/P
2.160	0.0000	0.0000	127.939	0.01368	0.00000	696.3	690.1	0.0	U/P ~2.3 hrs
2.400	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
3.600	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
6.000	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
7.200	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
8.400	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
9.600	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
10.800	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
11.040	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
11.280	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
11.520	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
11.760	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
12.000	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
14.400	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
16.800	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
19.200	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
21.600	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
24.000	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
36.000	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
48.000	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
60.000	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
72.000	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
84.000	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry
96.000	0.0000	0.0000	---	---	---	696.3	696.3	0.0	dry

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 161+25 to 161+50 lt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	99.60
Water Table Elevation, [WT] (ft datum):	114.60
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	543.3

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	21.7

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
127.00	0.0
128.52	592.1

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 589.8

Initial ground water level (ft datum) default, 114.60

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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	98.3000	0.0000	114.600	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	98.3000	0.0000	128.755	0.12575	0.00000	589.8	0.8	0.0	U/P
0.024	0.0000	0.0000	128.738	0.12575	0.00000	589.8	10.9	0.0	U/P
0.048	0.0000	0.0000	128.720	0.12575	0.00000	589.8	21.7	0.0	U/P
0.072	0.0000	0.0000	128.701	0.12575	0.00000	589.8	32.6	0.0	U/P
0.120	0.0000	0.0000	128.664	0.12575	0.00000	589.8	54.3	0.0	U/P
0.192	0.0000	0.0000	128.609	0.12575	0.00000	589.8	86.9	0.0	U/P
0.216	0.0000	0.0000	128.591	0.12575	0.00000	589.8	97.8	0.0	U/P
0.240	0.0000	0.0000	128.573	0.12575	0.00000	589.8	108.7	0.0	U/P
0.288	0.0000	0.0000	128.536	0.12575	0.00000	589.8	130.4	0.0	U/P
0.312	0.0000	0.0000	128.518	0.12575	0.00000	589.8	141.2	0.0	U/P
0.360	0.0000	0.0000	128.480	0.12575	0.00000	589.8	163.0	0.0	U/P
0.480	0.0000	0.0000	128.383	0.12335	0.00000	589.8	217.3	0.0	U/P
0.720	0.0000	0.0000	128.178	0.10941	0.00000	589.8	319.7	0.0	U/P
1.200	0.0000	0.0000	127.760	0.07188	0.00000	589.8	477.3	0.0	U/P
1.440	0.0000	0.0000	127.549	0.05265	0.00000	589.8	531.0	0.0	U/P
1.680	0.0000	0.0000	127.333	0.03309	0.00000	589.8	568.3	0.0	U/P
1.920	0.0000	0.0000	127.090	0.01155	0.00000	589.8	588.2	0.0	U/P
2.160	0.0000	0.0000	----	----	----	589.8	589.8	0.0	dry
2.400	0.0000	0.0000	----	----	----	589.8	589.8	0.0	dry
3.600	0.0000	0.0000	----	----	----	589.8	589.8	0.0	dry
6.000	0.0000	0.0000	----	----	----	589.8	589.8	0.0	dry
7.200	0.0000	0.0000	----	----	----	589.8	589.8	0.0	dry
8.400	0.0000	0.0000	----	----	----	589.8	589.8	0.0	dry
9.600	0.0000	0.0000	----	----	----	589.8	589.8	0.0	dry
10.800	0.0000	0.0000	----	----	----	589.8	589.8	0.0	dry
11.040	0.0000	0.0000	----	----	----	589.8	589.8	0.0	dry
11.280	0.0000	0.0000	----	----	----	589.8	589.8	0.0	dry
11.520	0.0000	0.0000	----	----	----	589.8	589.8	0.0	dry
11.760	0.0000	0.0000	----	----	----	589.8	589.8	0.0	dry
12.000	0.0000	0.0000	----	----	----	589.8	589.8	0.0	dry
14.400	0.0000	0.0000	----	----	----	589.8	589.8	0.0	dry
16.800	0.0000	0.0000	----	----	----	589.8	589.8	0.0	dry
19.200	0.0000	0.0000	----	----	----	589.8	589.8	0.0	dry
21.600	0.0000	0.0000	----	----	----	589.8	589.8	0.0	dry
24.000	0.0000	0.0000	----	----	----	589.8	589.8	0.0	dry
36.000	0.0000	0.0000	----	----	----	589.8	589.8	0.0	dry
48.000	0.0000	0.0000	----	----	----	589.8	589.8	0.0	dry
60.000	0.0000	0.0000	----	----	----	589.8	589.8	0.0	dry
72.000	0.0000	0.0000	----	----	----	589.8	589.8	0.0	dry
84.000	0.0000	0.0000	----	----	----	589.8	589.8	0.0	dry
96.000	0.0000	0.0000	----	----	----	589.8	589.8	0.0	dry

~2hrs

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 161+50 to 161+75 lt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	98.63
Water Table Elevation, [WT] (ft datum):	113.63
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	464.5

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	18.6

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
126.00	0.0
127.51	541.0

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 427

Initial ground water level (ft datum) default, 113.63

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

Detailed Results :: *Scenario 1* :: *Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	71.1667	0.0000	113.630	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	71.1667	0.0000	127.543	0.10752	0.00000	427.0	0.6	0.0	U/P
0.024	0.0000	0.0000	127.527	0.10752	0.00000	427.0	9.3	0.0	U/P
0.048	0.0000	0.0000	127.510	0.10752	0.00000	427.0	18.6	0.0	U/P
0.072	0.0000	0.0000	127.493	0.10752	0.00000	427.0	27.9	0.0	U/P
0.120	0.0000	0.0000	127.458	0.10752	0.00000	427.0	46.5	0.0	U/P
0.192	0.0000	0.0000	127.403	0.10752	0.00000	427.0	74.3	0.0	U/P
0.216	0.0000	0.0000	127.385	0.10752	0.00000	427.0	83.6	0.0	U/P
0.240	0.0000	0.0000	127.366	0.10752	0.00000	427.0	92.9	0.0	U/P
0.288	0.0000	0.0000	127.327	0.10752	0.00000	427.0	111.5	0.0	U/P
0.312	0.0000	0.0000	127.308	0.10752	0.00000	427.0	120.8	0.0	U/P
0.360	0.0000	0.0000	127.267	0.10622	0.00000	427.0	139.4	0.0	U/P
0.480	0.0000	0.0000	127.165	0.09896	0.00000	427.0	183.8	0.0	U/P
0.720	0.0000	0.0000	126.959	0.08247	0.00000	427.0	262.4	0.0	U/P
1.200	0.0000	0.0000	126.535	0.04748	0.00000	427.0	375.7	0.0	U/P
1.440	0.0000	0.0000	126.318	0.02921	0.00000	427.0	408.9	0.0	U/P
1.680	0.0000	0.0000	126.069	0.00999	0.00000	427.0	426.2	0.0	U/P ~1.7hrs
1.920	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
2.160	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
2.400	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
3.600	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
6.000	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
7.200	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
8.400	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
9.600	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
10.800	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
11.040	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
11.280	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
11.520	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
11.760	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
12.000	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
14.400	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
16.800	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
19.200	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
21.600	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
24.000	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
36.000	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
48.000	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
60.000	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
72.000	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
84.000	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry
96.000	0.0000	0.0000	---	---	---	427.0	427.0	0.0	dry

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 161+75 to 162+00 lt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	97.66
Water Table Elevation, [WT] (ft datum):	112.66
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	551.0

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	22.0

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
124.00	0.0
126.50	582.8

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 657.75

Initial ground water level (ft datum) default, 112.66

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

Detailed Results :: *Scenario 1 :: Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	109.6250	0.0000	112.660	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	109.6250	0.0000	126.374	0.12755	0.00000	657.8	0.8	0.0	U/P
0.024	0.0000	0.0000	126.356	0.12733	0.00000	657.8	11.0	0.0	U/P
0.048	0.0000	0.0000	126.336	0.12656	0.00000	657.8	22.0	0.0	U/P
0.072	0.0000	0.0000	126.315	0.12566	0.00000	657.8	32.9	0.0	U/P
0.120	0.0000	0.0000	126.275	0.12407	0.00000	657.8	54.5	0.0	U/P
0.192	0.0000	0.0000	126.214	0.12030	0.00000	657.8	86.3	0.0	U/P
0.216	0.0000	0.0000	126.194	0.11894	0.00000	657.8	96.6	0.0	U/P
0.240	0.0000	0.0000	126.174	0.11803	0.00000	657.8	106.9	0.0	U/P
0.288	0.0000	0.0000	126.134	0.11586	0.00000	657.8	127.1	0.0	U/P
0.312	0.0000	0.0000	126.114	0.11477	0.00000	657.8	137.1	0.0	U/P
0.360	0.0000	0.0000	126.073	0.11304	0.00000	657.8	156.8	0.0	U/P
0.480	0.0000	0.0000	125.972	0.10792	0.00000	657.8	204.5	0.0	U/P
0.720	0.0000	0.0000	125.768	0.09735	0.00000	657.8	293.3	0.0	U/P
1.200	0.0000	0.0000	125.358	0.07524	0.00000	657.8	442.9	0.0	U/P
1.440	0.0000	0.0000	125.152	0.06402	0.00000	657.8	503.0	0.0	U/P
1.680	0.0000	0.0000	124.946	0.05288	0.00000	657.8	553.5	0.0	U/P
1.920	0.0000	0.0000	124.738	0.04165	0.00000	657.8	594.4	0.0	U/P
2.160	0.0000	0.0000	124.526	0.03026	0.00000	657.8	625.5	0.0	U/P
2.400	0.0000	0.0000	124.309	0.02043	0.00000	657.8	646.7	0.0	U/P
3.600	0.0000	0.0000	----	----	----	657.8	657.8	0.0	dry
6.000	0.0000	0.0000	----	----	----	657.8	657.8	0.0	dry
7.200	0.0000	0.0000	----	----	----	657.8	657.8	0.0	dry
8.400	0.0000	0.0000	----	----	----	657.8	657.8	0.0	dry
9.600	0.0000	0.0000	----	----	----	657.8	657.8	0.0	dry
10.800	0.0000	0.0000	----	----	----	657.8	657.8	0.0	dry
11.040	0.0000	0.0000	----	----	----	657.8	657.8	0.0	dry
11.280	0.0000	0.0000	----	----	----	657.8	657.8	0.0	dry
11.520	0.0000	0.0000	----	----	----	657.8	657.8	0.0	dry
11.760	0.0000	0.0000	----	----	----	657.8	657.8	0.0	dry
12.000	0.0000	0.0000	----	----	----	657.8	657.8	0.0	dry
14.400	0.0000	0.0000	----	----	----	657.8	657.8	0.0	dry
16.800	0.0000	0.0000	----	----	----	657.8	657.8	0.0	dry
19.200	0.0000	0.0000	----	----	----	657.8	657.8	0.0	dry
21.600	0.0000	0.0000	----	----	----	657.8	657.8	0.0	dry
24.000	0.0000	0.0000	----	----	----	657.8	657.8	0.0	dry
36.000	0.0000	0.0000	----	----	----	657.8	657.8	0.0	dry
48.000	0.0000	0.0000	----	----	----	657.8	657.8	0.0	dry
60.000	0.0000	0.0000	----	----	----	657.8	657.8	0.0	dry
72.000	0.0000	0.0000	----	----	----	657.8	657.8	0.0	dry
84.000	0.0000	0.0000	----	----	----	657.8	657.8	0.0	dry
96.000	0.0000	0.0000	----	----	----	657.8	657.8	0.0	dry

~23h~5

Water Quality Storage Between Ditch Blocks - Right

Ditch Station	Ditch Block Height (ft)	Elevation of Ditch Block (ft)	Ditch Back Slope (F) (ft)	Ditch Bottom Width (ft)	Ditch Fore Slope (B) (1:B)	Ditch Area at Ditch Block (sf)	Distance to Upstream Ditch Block or Zero Area (1:B)	Area at Upstream Ditch Block on Downstream Side (sf)	Volume (cf)
156+25	1	149.875	2	3.67	4	6.67	25.00	4.17	135.50
156+50	1.4	149.9	2	3.52	4	9.128	25.00	6.68	197.60
156+75	1.2	148.95	2	4.405	4	8.886	25.00	3.33	152.70
157+00	1	148	2	5.29	4	8.29	25.00	2.07	129.50
157+25	1.2	147.2	2	5.09	4	9.708	25.00	1.62	141.60
157+50	1.5	146.5	2	4.89	4	11.835	25.00	3.95	197.31
157+75	1.6	145.85	2	6.635	4	15.416	25.00	8.19	295.08
158+00	1.6	145.1	2	8.38	4	18.208	25.00	9.67	348.48
158+25	1.1	143.35	2	9.035	4	13.2385	22.00	0	145.62
158+50	0.57	141.57	2	9.69	4	7.2333	11.40	0	41.23
158+75	0.55	140.55	2	12.845	4	8.71475	13.75	0	59.91
159+00	0.55	139.55	2	16	4	10.45	13.75	0	71.84
159+25	0.55	138.05	2	16.405	4	10.67275	9.17	0	48.93
159+50	0.6	136.6	2	16.81	4	11.886	10.00	0	59.43
159+75	0.6	135.35	2	14.985	4	10.791	12.00	0	64.75
160+00	0.55	134.05	2	13.16	4	8.888	11.00	0	48.88
160+25	0.7	133.2	2	13.18	4	11.326	17.50	0	99.10
160+50	0.75	132.25	2	13.2	4	12.15	18.75	0	113.91
160+75	0.9	131.4	2	12.355	4	13.8195	22.50	0	155.47
161+00	0.8	130.3	2	11.51	4	11.608	20.00	0	116.08
161+25	0.95	129.6	2	11.35	4	13.6325	25.00	1.44	188.41
161+50	0.92	128.72	2	11.19	4	13.0548	25.00	0.99	175.56
161+95	1	127.74	2	12.5	4	15.5	42.45	0	328.99
								Total	3315.88
									0.076 af

HARTWOOD MARSH ROAD
BASIN 3
INTERIM CONDITION
MAXIMUM SWALE STORAGE CALCULATIONS

HNTB

Ditch Parameters-Right Side

Station	Ditch Bottom (ft)	Max. Depth (ft)	Max. Elevation (ft)	Est. Elev. Of Base (ft)	Slope	Ditch Back Slope (F) (1:F)	Ditch Bottom Width (ft)	Ditch Fore Slope (B) (1:B)
156+00	149.25	0.74	149.99	150.88		2	3.82	4
					0.015			
156+25	148.875	1.05	149.93	150.585		2	3.67	4
					0.015			
156+50	148.5	1.36	149.86	150.29		2	3.52	4
					0.030			
156+75	147.75	1.18	148.93	149.625		2	4.405	4
					0.030			
157+00	147	1.00	148.00	148.96		2	5.29	4
					0.040			
157+25	146	1.29	147.29	148.05		2	5.09	4
					0.040			
157+50	145	1.57	146.57	147.14		2	4.89	4
					0.030			
157+75	144.25	1.60	145.85	146.14		2	6.635	4
					0.030			
158+00	143.5	1.62	145.12	145.14		2	8.38	4
					0.050			
158+25	142.25	1.76	144.01	143.36		2	9.035	4
					0.050			
158+50	141	1.89	142.89	141.58		2	9.69	4
					0.040			
158+75	140	1.51	141.52	140.565		2	12.845	4
					0.040			
159+00	139	1.14	140.14	139.55		2	16	4
					0.060			
159+25	137.5	1.13	138.63	138.08		2	16.405	4
					0.060			
159+50	136	1.11	137.11	136.61		2	16.81	4
					0.050			
159+75	134.75	0.97	135.72	135.35		2	14.985	4
					0.050			
160+00	133.5	0.83	134.33	134.09		2	13.16	4
					0.040			
160+25	132.5	1.13	133.64	133.195		2	13.18	4
					0.040			
160+50	131.5	1.44	132.94	132.3		2	13.2	4
					0.040			
160+75	130.5	1.55	132.05	131.405		2	12.355	4
					0.040			
161+00	129.5	1.65	131.15	130.51		2	11.51	4
					0.034			
161+25	128.65	1.63	130.29	129.627		2	11.35	4
					0.034			
161+50	127.8	1.62	129.42	128.744		2	11.19	4
					0.024			
161+95	126.74	1.87	128.61	127.74		2	12.5	4

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Maximum Storage Between Ditch Blocks - Right

Ditch Station	Max Depth (ft)	Top Bank at Ditch Block (ft)	Ditch Back Slope (F) (ft)	Ditch Bottom Width (ft)	Ditch Fore Slope (B) (1:B)	Ditch Area at Ditch Block (sf)	Distance to Upstream Ditch Block or Zero Area (1:B)	Area at Upstream Ditch Block on Downstream Side (sf)	Volume (cf)
156+25	1.05	149.925	2	3.67	4	7.0035	25.00	4.5	143.79
156+50	1.36	149.86	2	3.52	4	8.8672	25.00	6.42	191.09
156+75	1.18	148.93	2	4.405	4	8.7379	25.00	3.18	148.97
157+00	1.00	148	2	5.29	4	8.29	25.00	2.07	129.50
157+25	1.29	147.285	2	5.09	4	10.39565	25.00	2.31	158.82
157+50	1.57	146.57	2	4.89	4	12.3873	25.00	4.5	211.09
157+75	1.60	145.845	2	6.635	4	15.367825	25.00	8.14	293.85
158+00	1.62	145.12	2	8.38	4	18.4356	25.00	9.9	354.20
158+25	1.76	144.005	2	9.035	4	21.121425	25.00	6.08	340.02
158+50	1.89	142.89	2	9.69	4	23.9841	25.00	8.13	401.43
158+75	1.51	141.515	2	12.845	4	24.005175	25.00	8.16	402.06
159+00	1.14	140.14	2	16	4	21.66	25.00	2.66	304.00
159+25	1.13	138.625	2	16.405	4	21.830625	18.75	0	204.66
159+50	1.11	137.11	2	16.81	4	21.9891	18.50	0	203.40
159+75	0.97	135.72	2	14.985	4	17.44545	19.40	0	169.22
160+00	0.83	134.33	2	13.16	4	13.4128	16.60	0	111.33
160+25	1.13	133.635	2	13.18	4	18.3643	25.00	2.18	256.80
160+50	1.44	132.94	2	13.2	4	23.328	25.00	7.13	380.73
160+75	1.55	132.045	2	12.355	4	23.723475	25.00	8.37	401.17
161+00	1.65	131.15	2	11.51	4	23.9415	25.00	9.43	417.14
161+25	1.63	130.285	2	11.35	4	23.46225	25.00	11.27	434.15
161+50	1.62	129.42	2	11.19	4	22.9878	25.00	10.93	423.97
161+95	1.87	128.61	2	12.5	4	28.985	45.00	12.56	934.76
								Total	7016.16

Total North and South **17962.73** CF

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HNTB

Parameters for Recovery Analysis - Right Ditch

Ditch Block	Estimated SHGW (ft)	Confining Layer Elevation (ft)	Width at Ditch Block (ft)	Width at upper end of swale basin (ft)	Equivalent Pond Width (ft)	Equivalent Pond Length (ft)	Stage 1 (ft)	Area 1 (sf)	Stage 2 (ft)	Area 2 (sf)
156+25	137.81	122.81	9.67	3.82	6.75	25.00	148.88	0.00	149.93	223.00
156+50	136.73	121.73	11.92	3.67	7.80	25.00	148.50	0.00	149.86	265.75
156+75	135.65	120.65	11.61	3.52	7.56	25.00	147.75	0.00	148.93	219.81
157+00	134.57	119.57	11.29	4.41	7.85	25.00	147.00	0.00	148.00	214.94
157+25	133.83	118.83	12.29	5.29	8.79	25.00	146.00	0.00	147.29	247.50
157+50	133.09	118.09	13.89	5.09	9.49	25.00	145.00	0.00	146.57	285.25
157+75	132.34	117.34	16.24	4.89	10.56	25.00	144.25	0.00	145.85	327.06
158+00	131.60	116.60	17.98	6.64	12.31	25.00	143.50	0.00	145.12	374.44
158+25	130.03	115.03	15.64	8.38	12.01	22.00	142.25	0.00	144.01	387.19
158+50	128.45	113.45	13.11	9.04	11.07	11.40	141.00	0.00	142.89	423.81
158+75	126.88	111.88	16.15	9.69	12.92	13.75	140.00	0.00	141.52	433.94
159+00	125.30	110.30	19.30	12.85	16.07	13.75	139.00	0.00	140.14	456.56
159+25	124.08	109.08	19.71	16.00	17.85	9.17	137.50	0.00	138.63	367.08
159+50	122.86	107.86	20.41	16.41	18.41	10.00	136.00	0.00	137.11	368.84
159+75	121.64	106.64	18.59	16.81	17.70	12.00	134.75	0.00	135.72	364.87
160+00	120.42	105.42	16.46	14.97	15.72	11.00	133.50	0.00	134.33	274.94
160+25	119.45	104.45	17.38	13.16	15.27	17.50	132.50	0.00	133.64	424.50
160+50	118.48	103.48	17.70	13.18	15.44	18.75	131.50	0.00	132.94	470.75
160+75	117.50	102.50	17.76	13.20	15.48	25.00	130.50	0.00	132.05	476.19
161+00	116.53	101.53	16.31	12.35	14.33	25.00	129.50	0.00	131.15	470.81
161+25	115.56	100.56	17.05	11.51	14.28	25.00	128.65	0.00	130.29	467.25
161+50	114.60	99.60	16.71	11.35	14.03	25.00	127.80	0.00	129.42	461.00
161+95	113.63	98.63	18.50	11.19	14.85	42.45	126.74	0.00	128.61	894.82

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PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 156+00 to 156+25 rt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	122.81
Water Table Elevation, [WT] (ft datum):	137.81
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	168.8

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	6.8

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
148.88	0.0
149.93	223.0

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 135.5

Initial ground water level (ft datum) default, 137.81

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)
0.001	0.010	0.100	0.450	3.000
0.002	0.015	0.150	0.500	3.500
0.003	0.020	0.250	1.000	4.000
0.005	0.030	0.300	1.500	
0.008	0.050	0.350	2.000	
0.009	0.080	0.400	2.500	

Detailed Results :: *Scenario 1* :: *Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	22.5833	0.0000	137.810	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	22.5833	0.0000	150.012	0.03906	0.00000	135.5	0.2	0.0	U/P
0.024	0.0000	0.0000	149.998	0.03906	0.00000	135.5	3.4	0.0	U/P
0.048	0.0000	0.0000	149.982	0.03906	0.00000	135.5	6.8	0.0	U/P
0.072	0.0000	0.0000	149.967	0.03906	0.00000	135.5	10.1	0.0	U/P
0.120	0.0000	0.0000	149.937	0.03906	0.00000	135.5	16.9	0.0	U/P
0.192	0.0000	0.0000	149.891	0.03906	0.00000	135.5	27.0	0.0	U/P
0.216	0.0000	0.0000	149.875	0.03906	0.00000	135.5	30.4	0.0	U/P
0.240	0.0000	0.0000	149.859	0.03906	0.00000	135.5	33.8	0.0	U/P
0.360	0.0000	0.0000	149.774	0.03906	0.00000	135.5	50.6	0.0	U/P
0.480	0.0000	0.0000	149.680	0.03799	0.00000	135.5	67.5	0.0	U/P
0.720	0.0000	0.0000	149.471	0.03068	0.00000	135.5	98.5	0.0	U/P
1.200	0.0000	0.0000	149.011	0.01223	0.00000	135.5	133.7	0.0	U/P ~1.5 hrs
1.920	0.0000	0.0000	----	----	----	135.5	135.5	0.0	dry
2.400	0.0000	0.0000	----	----	----	135.5	135.5	0.0	dry
3.600	0.0000	0.0000	----	----	----	135.5	135.5	0.0	dry
6.000	0.0000	0.0000	----	----	----	135.5	135.5	0.0	dry
7.200	0.0000	0.0000	----	----	----	135.5	135.5	0.0	dry
8.400	0.0000	0.0000	----	----	----	135.5	135.5	0.0	dry
9.600	0.0000	0.0000	----	----	----	135.5	135.5	0.0	dry
10.800	0.0000	0.0000	----	----	----	135.5	135.5	0.0	dry
12.000	0.0000	0.0000	----	----	----	135.5	135.5	0.0	dry
24.000	0.0000	0.0000	----	----	----	135.5	135.5	0.0	dry
36.000	0.0000	0.0000	----	----	----	135.5	135.5	0.0	dry
48.000	0.0000	0.0000	----	----	----	135.5	135.5	0.0	dry
60.000	0.0000	0.0000	----	----	----	135.5	135.5	0.0	dry
72.000	0.0000	0.0000	----	----	----	135.5	135.5	0.0	dry
84.000	0.0000	0.0000	----	----	----	135.5	135.5	0.0	dry
96.000	0.0000	0.0000	----	----	----	135.5	135.5	0.0	dry

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Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 156+25 to 156+50 rt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	121.73
Water Table Elevation, [WT] (ft datum):	136.73
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	195.0

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	7.8

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
148.50	0.0
149.86	265.8

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 197.6

Initial ground water level (ft datum) default, 136.73

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)
0.001	0.010	0.100	0.450	3.000
0.002	0.015	0.150	0.500	3.500
0.003	0.020	0.250	1.000	4.000
0.005	0.030	0.300	1.500	
0.008	0.050	0.350	2.000	
0.009	0.080	0.400	2.500	

Detailed Results :: *Scenario 1* :: *Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	32.9333	0.0000	136.730	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	32.9333	0.0000	149.923	0.04514	0.00000	197.6	0.3	0.0	U/P
0.024	0.0000	0.0000	149.909	0.04514	0.00000	197.6	3.9	0.0	U/P
0.048	0.0000	0.0000	149.894	0.04514	0.00000	197.6	7.8	0.0	U/P
0.072	0.0000	0.0000	149.880	0.04514	0.00000	197.6	11.7	0.0	U/P
0.120	0.0000	0.0000	149.850	0.04514	0.00000	197.6	19.5	0.0	U/P
0.192	0.0000	0.0000	149.805	0.04514	0.00000	197.6	31.2	0.0	U/P
0.216	0.0000	0.0000	149.790	0.04514	0.00000	197.6	35.1	0.0	U/P
0.240	0.0000	0.0000	149.774	0.04514	0.00000	197.6	39.0	0.0	U/P
0.360	0.0000	0.0000	149.693	0.04514	0.00000	197.6	58.5	0.0	U/P
0.480	0.0000	0.0000	149.606	0.04504	0.00000	197.6	78.0	0.0	U/P
0.720	0.0000	0.0000	149.410	0.04107	0.00000	197.6	116.8	0.0	U/P
1.200	0.0000	0.0000	148.985	0.02011	0.00000	197.6	174.7	0.0	U/P
1.920	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
2.400	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
3.600	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
6.000	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
7.200	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
8.400	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
9.600	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
10.800	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
12.000	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
24.000	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
36.000	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
48.000	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
60.000	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
72.000	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
84.000	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry
96.000	0.0000	0.0000	---	---	---	197.6	197.6	0.0	dry

~1.5 hrs

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Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 156+50 to 156+75 rt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-04-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	120.65
Water Table Elevation, [WT] (ft datum):	135.65
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	189.0

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	7.6

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
147.75	0.0
148.93	219.8

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 152.7

Initial ground water level (ft datum) default, 135.65

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)
0.001	0.010	0.100	0.450	3.000
0.002	0.015	0.150	0.500	3.500
0.003	0.020	0.250	1.000	4.000
0.005	0.030	0.300	1.500	
0.008	0.050	0.350	2.000	
0.009	0.080	0.400	2.500	

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	25.4500	0.0000	135.650	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	25.4500	0.0000	149.034	0.04375	0.00000	152.7	0.3	0.0	U/P
0.024	0.0000	0.0000	149.018	0.04375	0.00000	152.7	3.8	0.0	U/P
0.048	0.0000	0.0000	149.000	0.04375	0.00000	152.7	7.6	0.0	U/P
0.072	0.0000	0.0000	148.983	0.04375	0.00000	152.7	11.3	0.0	U/P
0.120	0.0000	0.0000	148.949	0.04375	0.00000	152.7	18.9	0.0	U/P
0.192	0.0000	0.0000	148.897	0.04375	0.00000	152.7	30.2	0.0	U/P
0.216	0.0000	0.0000	148.879	0.04375	0.00000	152.7	34.0	0.0	U/P
0.240	0.0000	0.0000	148.861	0.04375	0.00000	152.7	37.8	0.0	U/P
0.360	0.0000	0.0000	148.765	0.04320	0.00000	152.7	56.7	0.0	U/P
0.480	0.0000	0.0000	148.663	0.04056	0.00000	152.7	75.1	0.0	U/P
0.720	0.0000	0.0000	148.454	0.03188	0.00000	152.7	106.5	0.0	U/P
1.200	0.0000	0.0000	148.015	0.01375	0.00000	152.7	146.2	0.0	U/P ~1.5 hrs
1.920	0.0000	0.0000	----	----	----	152.7	152.7	0.0	dry
2.400	0.0000	0.0000	----	----	----	152.7	152.7	0.0	dry
3.600	0.0000	0.0000	----	----	----	152.7	152.7	0.0	dry
6.000	0.0000	0.0000	----	----	----	152.7	152.7	0.0	dry
7.200	0.0000	0.0000	----	----	----	152.7	152.7	0.0	dry
8.400	0.0000	0.0000	----	----	----	152.7	152.7	0.0	dry
9.600	0.0000	0.0000	----	----	----	152.7	152.7	0.0	dry
10.800	0.0000	0.0000	----	----	----	152.7	152.7	0.0	dry
12.000	0.0000	0.0000	----	----	----	152.7	152.7	0.0	dry
24.000	0.0000	0.0000	----	----	----	152.7	152.7	0.0	dry
36.000	0.0000	0.0000	----	----	----	152.7	152.7	0.0	dry
48.000	0.0000	0.0000	----	----	----	152.7	152.7	0.0	dry
60.000	0.0000	0.0000	----	----	----	152.7	152.7	0.0	dry
72.000	0.0000	0.0000	----	----	----	152.7	152.7	0.0	dry
84.000	0.0000	0.0000	----	----	----	152.7	152.7	0.0	dry
96.000	0.0000	0.0000	----	----	----	152.7	152.7	0.0	dry

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 156+75 to 157+00 rt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	119.57
Water Table Elevation, [WT] (ft datum):	134.57
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	196.3

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	7.9

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
147.00	0.0
148.00	214.9

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 129.5

Initial ground water level (ft datum) default, 134.57

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)
0.001	0.013	0.090	0.460	1.500
0.002	0.015	0.100	0.470	2.000
0.003	0.020	0.150	0.500	2.500
0.005	0.030	0.250	0.600	3.000
0.008	0.050	0.300	0.700	3.500
0.009	0.060	0.350	0.800	4.000
0.010	0.070	0.400	0.900	
0.012	0.080	0.450	1.000	

Detailed Results :: *Scenario 1* :: *Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	21.5833	0.0000	134.570	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	21.5833	0.0000	148.101	0.04543	0.00000	129.5	0.3	0.0	U/P
0.024	0.0000	0.0000	148.084	0.04543	0.00000	129.5	3.9	0.0	U/P
0.048	0.0000	0.0000	148.066	0.04543	0.00000	129.5	7.9	0.0	U/P
0.072	0.0000	0.0000	148.048	0.04543	0.00000	129.5	11.8	0.0	U/P
0.120	0.0000	0.0000	148.011	0.04543	0.00000	129.5	19.6	0.0	U/P
0.192	0.0000	0.0000	147.955	0.04543	0.00000	129.5	31.4	0.0	U/P
0.216	0.0000	0.0000	147.936	0.04543	0.00000	129.5	35.3	0.0	U/P
0.240	0.0000	0.0000	147.916	0.04543	0.00000	129.5	39.3	0.0	U/P
0.288	0.0000	0.0000	147.876	0.04419	0.00000	129.5	47.1	0.0	U/P
0.312	0.0000	0.0000	147.855	0.04323	0.00000	129.5	50.9	0.0	U/P
0.360	0.0000	0.0000	147.814	0.04161	0.00000	129.5	58.2	0.0	U/P
0.480	0.0000	0.0000	147.711	0.03678	0.00000	129.5	75.2	0.0	U/P
0.720	0.0000	0.0000	147.499	0.02125	0.00000	129.5	102.7	0.0	U/P ~ 1hr
1.200	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
1.440	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
1.680	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
1.920	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
2.160	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
2.400	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
3.600	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
6.000	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
7.200	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
8.400	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
9.600	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
10.800	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
11.040	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
11.280	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
12.000	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
14.400	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
16.800	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
19.200	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
21.600	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
24.000	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
36.000	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
48.000	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
60.000	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
72.000	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
84.000	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry
96.000	0.0000	0.0000	----	----	----	129.5	129.5	0.0	dry

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 157+00 to 157+25 rt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	118.83
Water Table Elevation, [WT] (ft datum):	133.83
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	219.8

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	8.8

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
146.00	0.0
147.29	247.5

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 141.6

Initial ground water level (ft datum) default, 133.83

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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	23.6000	0.0000	133.830	0.00000	0.00000	0.0	0.0	0.0	N.A.	
0.002	23.6000	0.0000	147.214	0.05087	0.00000	141.6	0.3	0.0	U/P	
0.024	0.0000	0.0000	147.196	0.05087	0.00000	141.6	4.4	0.0	U/P	
0.048	0.0000	0.0000	147.177	0.05087	0.00000	141.6	8.8	0.0	U/P	
0.072	0.0000	0.0000	147.157	0.05087	0.00000	141.6	13.2	0.0	U/P	
0.120	0.0000	0.0000	147.117	0.05036	0.00000	141.6	22.0	0.0	U/P	
0.192	0.0000	0.0000	147.055	0.04754	0.00000	141.6	34.8	0.0	U/P	
0.216	0.0000	0.0000	147.035	0.04641	0.00000	141.6	38.9	0.0	U/P	
0.240	0.0000	0.0000	147.015	0.04566	0.00000	141.6	42.8	0.0	U/P	
0.288	0.0000	0.0000	146.974	0.04385	0.00000	141.6	50.6	0.0	U/P	
0.312	0.0000	0.0000	146.954	0.04295	0.00000	141.6	54.4	0.0	U/P	
0.360	0.0000	0.0000	146.913	0.04150	0.00000	141.6	61.7	0.0	U/P	
0.480	0.0000	0.0000	146.810	0.03722	0.00000	141.6	78.7	0.0	U/P	
0.720	0.0000	0.0000	146.600	0.02818	0.00000	141.6	107.1	0.0	U/P	
1.200	0.0000	0.0000	146.143	0.00628	0.00000	141.6	139.6	0.0	U/P	~1.3 hrs
1.440	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
1.680	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
1.920	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
2.160	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
2.400	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
3.600	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
6.000	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
7.200	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
8.400	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
9.600	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
10.800	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
11.040	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
11.280	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
11.520	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
11.760	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
12.000	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
14.400	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
16.800	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
19.200	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
21.600	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
24.000	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
36.000	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
48.000	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
60.000	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
72.000	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
84.000	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	
96.000	0.0000	0.0000	---	---	---	141.6	141.6	0.0	dry	

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 157+25 to 157+50 rt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	118.09
Water Table Elevation, [WT] (ft datum):	133.09
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	237.3

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	9.5

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
145.00	0.0
146.57	285.3

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 197.31

Initial ground water level (ft datum) default, 133.09

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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	32.8850	0.0000	133.090	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	32.8850	0.0000	146.473	0.05492	0.00000	197.3	0.3	0.0	U/P
0.024	0.0000	0.0000	146.456	0.05492	0.00000	197.3	4.7	0.0	U/P
0.048	0.0000	0.0000	146.438	0.05492	0.00000	197.3	9.5	0.0	U/P
0.072	0.0000	0.0000	146.420	0.05492	0.00000	197.3	14.2	0.0	U/P
0.120	0.0000	0.0000	146.382	0.05492	0.00000	197.3	23.7	0.0	U/P
0.192	0.0000	0.0000	146.324	0.05492	0.00000	197.3	38.0	0.0	U/P
0.216	0.0000	0.0000	146.305	0.05489	0.00000	197.3	42.7	0.0	U/P
0.240	0.0000	0.0000	146.284	0.05458	0.00000	197.3	47.4	0.0	U/P
0.288	0.0000	0.0000	146.244	0.05288	0.00000	197.3	56.8	0.0	U/P
0.312	0.0000	0.0000	146.224	0.05203	0.00000	197.3	61.3	0.0	U/P
0.360	0.0000	0.0000	146.183	0.05067	0.00000	197.3	70.2	0.0	U/P
0.480	0.0000	0.0000	146.081	0.04663	0.00000	197.3	91.2	0.0	U/P
0.720	0.0000	0.0000	145.874	0.03824	0.00000	197.3	128.0	0.0	U/P
1.200	0.0000	0.0000	145.447	0.02035	0.00000	197.3	179.2	0.0	U/P
1.440	0.0000	0.0000	145.224	0.00786	0.00000	197.3	192.8	0.0	U/P ~1.5hs
1.680	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
1.920	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
2.160	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
2.400	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
3.600	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
6.000	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
7.200	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
8.400	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
9.600	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
10.800	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
11.040	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
11.280	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
11.520	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
11.760	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
12.000	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
14.400	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
16.800	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
19.200	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
21.600	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
24.000	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
36.000	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
48.000	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
60.000	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
72.000	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
84.000	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry
96.000	0.0000	0.0000	---	---	---	197.3	197.3	0.0	dry

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 157+50 to 157+75 rt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	117.34
Water Table Elevation, [WT] (ft datum):	132.34
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	264.0

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	10.6

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
144.25	0.0
145.85	327.1

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 295.08

Initial ground water level (ft datum) default, 132.34

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

Detailed Results :: *Scenario 1* :: *Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	49.1800	0.0000	132.340	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	49.1800	0.0000	145.951	0.06111	0.00000	295.1	0.4	0.0	U/P
0.024	0.0000	0.0000	145.936	0.06111	0.00000	295.1	5.3	0.0	U/P
0.048	0.0000	0.0000	145.920	0.06111	0.00000	295.1	10.6	0.0	U/P
0.072	0.0000	0.0000	145.904	0.06111	0.00000	295.1	15.8	0.0	U/P
0.120	0.0000	0.0000	145.872	0.06111	0.00000	295.1	26.4	0.0	U/P
0.192	0.0000	0.0000	145.823	0.06111	0.00000	295.1	42.2	0.0	U/P
0.216	0.0000	0.0000	145.806	0.06111	0.00000	295.1	47.5	0.0	U/P
0.240	0.0000	0.0000	145.790	0.06111	0.00000	295.1	52.8	0.0	U/P
0.288	0.0000	0.0000	145.756	0.06111	0.00000	295.1	63.4	0.0	U/P
0.312	0.0000	0.0000	145.739	0.06111	0.00000	295.1	68.6	0.0	U/P
0.360	0.0000	0.0000	145.703	0.06111	0.00000	295.1	79.2	0.0	U/P
0.480	0.0000	0.0000	145.612	0.06078	0.00000	295.1	105.6	0.0	U/P
0.720	0.0000	0.0000	145.410	0.05575	0.00000	295.1	157.5	0.0	U/P
1.200	0.0000	0.0000	144.992	0.03687	0.00000	295.1	238.8	0.0	U/P
1.440	0.0000	0.0000	144.781	0.02677	0.00000	295.1	266.3	0.0	U/P
1.680	0.0000	0.0000	144.564	0.01645	0.00000	295.1	285.0	0.0	U/P
1.920	0.0000	0.0000	144.312	0.00559	0.00000	295.1	294.7	0.0	U/P ~2hrs
2.160	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
2.400	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
3.600	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
6.000	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
7.200	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
8.400	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
9.600	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
10.800	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
11.040	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
11.280	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
11.520	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
11.760	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
12.000	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
14.400	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
16.800	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
19.200	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
21.600	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
24.000	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
36.000	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
48.000	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
60.000	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
72.000	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
84.000	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry
96.000	0.0000	0.0000	---	---	---	295.1	295.1	0.0	dry

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 157+75 to 158+00 rt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	116.60
Water Table Elevation, [WT] (ft datum):	131.60
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	307.8

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	12.3

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
143.50	0.0
145.12	374.4

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 348.48

Initial ground water level (ft datum) default, 131.60

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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	58.0800	0.0000	131.600	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	58.0800	0.0000	145.240	0.07124	0.00000	348.5	0.4	0.0	U/P
0.024	0.0000	0.0000	145.224	0.07124	0.00000	348.5	6.2	0.0	U/P
0.048	0.0000	0.0000	145.208	0.07124	0.00000	348.5	12.3	0.0	U/P
0.072	0.0000	0.0000	145.191	0.07124	0.00000	348.5	18.5	0.0	U/P
0.120	0.0000	0.0000	145.159	0.07124	0.00000	348.5	30.8	0.0	U/P
0.192	0.0000	0.0000	145.109	0.07124	0.00000	348.5	49.2	0.0	U/P
0.216	0.0000	0.0000	145.093	0.07124	0.00000	348.5	55.4	0.0	U/P
0.240	0.0000	0.0000	145.076	0.07124	0.00000	348.5	61.6	0.0	U/P
0.288	0.0000	0.0000	145.042	0.07124	0.00000	348.5	73.9	0.0	U/P
0.312	0.0000	0.0000	145.024	0.07124	0.00000	348.5	80.0	0.0	U/P
0.360	0.0000	0.0000	144.989	0.07124	0.00000	348.5	92.3	0.0	U/P
0.480	0.0000	0.0000	144.897	0.07083	0.00000	348.5	123.1	0.0	U/P
0.720	0.0000	0.0000	144.695	0.06502	0.00000	348.5	183.6	0.0	U/P
1.200	0.0000	0.0000	144.277	0.04357	0.00000	348.5	278.7	0.0	U/P
1.440	0.0000	0.0000	144.067	0.03218	0.00000	348.5	311.4	0.0	U/P
1.680	0.0000	0.0000	143.851	0.02062	0.00000	348.5	334.3	0.0	U/P
1.920	0.0000	0.0000	143.614	0.00736	0.00000	348.5	347.0	0.0	U/P ~2hrs
2.160	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
2.400	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
3.600	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
6.000	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
7.200	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
8.400	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
9.600	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
10.800	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
11.040	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
11.280	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
11.520	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
11.760	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
12.000	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
14.400	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
16.800	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
19.200	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
21.600	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
24.000	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
36.000	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
48.000	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
60.000	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
72.000	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
84.000	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry
96.000	0.0000	0.0000	---	---	---	348.5	348.5	0.0	dry

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 158+00 to 158+25 rt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	115.03
Water Table Elevation, [WT] (ft datum):	130.03
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	264.2

Geometry Data

Equivalent Pond Length, [L] (ft):	22.0
Equivalent Pond Width, [W] (ft):	12.0

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
142.25	0.0
144.01	387.2

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 145.62

Initial ground water level (ft datum) default, 130.03

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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	24.2700	0.0000	130.030	0.00000	0.00000	0.0	0.0	0.0	N.A.	
0.002	24.2700	0.0000	143.399	0.05859	0.00000	145.6	0.4	0.0	U/P	
0.024	0.0000	0.0000	143.380	0.05806	0.00000	145.6	5.1	0.0	U/P	
0.048	0.0000	0.0000	143.360	0.05705	0.00000	145.6	10.0	0.0	U/P	
0.072	0.0000	0.0000	143.340	0.05620	0.00000	145.6	14.9	0.0	U/P	
0.120	0.0000	0.0000	143.299	0.05468	0.00000	145.6	24.5	0.0	U/P	
0.192	0.0000	0.0000	143.238	0.05107	0.00000	145.6	38.4	0.0	U/P	
0.216	0.0000	0.0000	143.217	0.04977	0.00000	145.6	42.7	0.0	U/P	
0.240	0.0000	0.0000	143.197	0.04892	0.00000	145.6	47.0	0.0	U/P	
0.288	0.0000	0.0000	143.156	0.04684	0.00000	145.6	55.3	0.0	U/P	
0.312	0.0000	0.0000	143.136	0.04580	0.00000	145.6	59.3	0.0	U/P	
0.360	0.0000	0.0000	143.095	0.04415	0.00000	145.6	67.1	0.0	U/P	
0.480	0.0000	0.0000	142.992	0.03921	0.00000	145.6	85.1	0.0	U/P	
0.720	0.0000	0.0000	142.781	0.02876	0.00000	145.6	114.7	0.0	U/P	
1.200	0.0000	0.0000	142.276	0.00596	0.00000	145.6	145.5	0.0	U/P	~1.2hrs
1.440	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
1.680	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
1.920	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
2.160	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
2.400	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
3.600	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
6.000	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
7.200	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
8.400	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
9.600	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
10.800	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
11.040	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
11.280	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
11.520	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
11.760	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
12.000	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
14.400	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
16.800	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
19.200	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
21.600	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
24.000	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
36.000	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
48.000	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
60.000	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
72.000	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
84.000	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	
96.000	0.0000	0.0000	----	----	----	145.6	145.6	0.0	dry	

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 158+25 to 158+50 rt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	113.45
Water Table Elevation, [WT] (ft datum):	128.45
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	126.2

Geometry Data

Equivalent Pond Length, [L] (ft):	11.4
Equivalent Pond Width, [W] (ft):	11.1

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
141.00	0.0
142.89	423.8

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 41.23

Initial ground water level (ft datum) default, 128.45

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

Detailed Results :: *Scenario 1* :: *Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	6.8717	0.0000	128.450	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	6.8717	0.0000	141.605	0.02921	0.00000	41.2	0.2	0.0	U/P
0.024	0.0000	0.0000	141.588	0.02921	0.00000	41.2	2.5	0.0	U/P
0.048	0.0000	0.0000	141.568	0.02921	0.00000	41.2	5.0	0.0	U/P
0.072	0.0000	0.0000	141.548	0.02896	0.00000	41.2	7.6	0.0	U/P
0.120	0.0000	0.0000	141.506	0.02758	0.00000	41.2	12.5	0.0	U/P
0.192	0.0000	0.0000	141.442	0.02379	0.00000	41.2	19.3	0.0	U/P
0.216	0.0000	0.0000	141.422	0.02243	0.00000	41.2	21.3	0.0	U/P
0.240	0.0000	0.0000	141.401	0.02154	0.00000	41.2	23.2	0.0	U/P
0.288	0.0000	0.0000	141.359	0.01937	0.00000	41.2	26.8	0.0	U/P
0.312	0.0000	0.0000	141.339	0.01828	0.00000	41.2	28.4	0.0	U/P
0.360	0.0000	0.0000	141.296	0.01653	0.00000	41.2	31.4	0.0	U/P
0.480	0.0000	0.0000	141.184	0.00928	0.00000	41.2	37.4	0.0	U/P ~0.6hrs
0.720	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
1.200	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
1.440	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
1.680	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
1.920	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
2.160	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
2.400	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
3.600	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
6.000	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
7.200	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
8.400	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
9.600	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
10.800	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
11.040	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
11.280	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
11.520	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
11.760	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
12.000	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
14.400	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
16.800	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
19.200	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
21.600	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
24.000	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
36.000	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
48.000	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
60.000	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
72.000	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
84.000	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry
96.000	0.0000	0.0000	---	---	---	41.2	41.2	0.0	dry

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 158+50 to 158+75 rt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	111.88
Water Table Elevation, [WT] (ft datum):	126.88
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	177.7

Geometry Data

Equivalent Pond Length, [L] (ft):	13.8
Equivalent Pond Width, [W] (ft):	12.9

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
140.00	0.0
141.52	433.9

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 59.91

Initial ground water level (ft datum) default, 126.88

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

Detailed Results :: *Scenario 1* :: *Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	9.9850	0.0000	126.880	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	9.9850	0.0000	140.647	0.04112	0.00000	59.9	0.2	0.0	U/P
0.024	0.0000	0.0000	140.628	0.04112	0.00000	59.9	3.6	0.0	U/P
0.048	0.0000	0.0000	140.608	0.04066	0.00000	59.9	7.1	0.0	U/P
0.072	0.0000	0.0000	140.588	0.03975	0.00000	59.9	10.6	0.0	U/P
0.120	0.0000	0.0000	140.546	0.03775	0.00000	59.9	17.3	0.0	U/P
0.192	0.0000	0.0000	140.483	0.03295	0.00000	59.9	26.7	0.0	U/P
0.216	0.0000	0.0000	140.462	0.03122	0.00000	59.9	29.4	0.0	U/P
0.240	0.0000	0.0000	140.442	0.03010	0.00000	59.9	32.0	0.0	U/P
0.288	0.0000	0.0000	140.400	0.02735	0.00000	59.9	37.1	0.0	U/P
0.312	0.0000	0.0000	140.379	0.02597	0.00000	59.9	39.4	0.0	U/P
0.360	0.0000	0.0000	140.337	0.02375	0.00000	59.9	43.7	0.0	U/P
0.480	0.0000	0.0000	140.227	0.01365	0.00000	59.9	52.5	0.0	U/P ~20.6 hrs
0.720	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
1.200	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
1.440	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
1.680	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
1.920	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
2.160	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
2.400	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
3.600	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry.
6.000	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
7.200	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
8.400	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
9.600	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
10.800	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
11.040	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
11.280	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
11.520	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
11.760	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
12.000	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
14.400	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
16.800	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
19.200	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
21.600	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
24.000	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
36.000	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
48.000	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
60.000	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
72.000	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
84.000	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry
96.000	0.0000	0.0000	---	---	---	59.9	59.9	0.0	dry

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 158+75 to 159+00 rt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	110.30
Water Table Elevation, [WT] (ft datum):	125.30
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	206.5

Geometry Data

Equivalent Pond Length, [L] (ft):	16.1
Equivalent Pond Width, [W] (ft):	13.8

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
139.00	0.0
140.14	456.6

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 71.84

Initial ground water level (ft datum) default, 125.30

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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	11.9733	0.0000	125.300	0.00000	0.00000	0.0	0.0	0.0	N.A.	
0.002	11.9733	0.0000	139.598	0.04780	0.00000	71.8	0.3	0.0	U/P	
0.024	0.0000	0.0000	139.582	0.04780	0.00000	71.8	4.1	0.0	U/P	
0.048	0.0000	0.0000	139.564	0.04780	0.00000	71.8	8.3	0.0	U/P	
0.072	0.0000	0.0000	139.545	0.04780	0.00000	71.8	12.4	0.0	U/P	
0.120	0.0000	0.0000	139.506	0.04743	0.00000	71.8	20.7	0.0	U/P	
0.192	0.0000	0.0000	139.442	0.04242	0.00000	71.8	32.8	0.0	U/P	
0.216	0.0000	0.0000	139.421	0.03999	0.00000	71.8	36.3	0.0	U/P	
0.240	0.0000	0.0000	139.401	0.03840	0.00000	71.8	39.7	0.0	U/P	
0.288	0.0000	0.0000	139.358	0.03453	0.00000	71.8	46.1	0.0	U/P	
0.312	0.0000	0.0000	139.338	0.03258	0.00000	71.8	49.0	0.0	U/P	
0.360	0.0000	0.0000	139.295	0.02945	0.00000	71.8	54.4	0.0	U/P	
0.480	0.0000	0.0000	139.183	0.01653	0.00000	71.8	65.1	0.0	U/P	~0.6hrs
0.720	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
1.200	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
1.440	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
1.680	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
1.920	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
2.160	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
2.400	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
3.600	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
6.000	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
7.200	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
8.400	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
9.600	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
10.800	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
11.040	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
11.280	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
11.520	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
11.760	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
12.000	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
14.400	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
16.800	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
19.200	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
21.600	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
24.000	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
36.000	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
48.000	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
60.000	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
72.000	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
84.000	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	
96.000	0.0000	0.0000	---	---	---	71.8	71.8	0.0	dry	

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 159+00 to 159+25 rt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	109.08
Water Table Elevation, [WT] (ft datum):	124.08
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	163.6

Geometry Data

Equivalent Pond Length, [L] (ft):	17.9
Equivalent Pond Width, [W] (ft):	9.2

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
137.50	0.0
138.63	367.1

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 48.93

Initial ground water level (ft datum) default, 124.08

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

Detailed Results :: *Scenario 1 :: Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	8.1550	0.0000	124.080	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	8.1550	0.0000	138.048	0.03787	0.00000	48.9	0.2	0.0	U/P
0.024	0.0000	0.0000	138.030	0.03787	0.00000	48.9	3.3	0.0	U/P
0.048	0.0000	0.0000	138.011	0.03787	0.00000	48.9	6.5	0.0	U/P
0.072	0.0000	0.0000	137.991	0.03755	0.00000	48.9	9.8	0.0	U/P
0.120	0.0000	0.0000	137.949	0.03564	0.00000	48.9	16.2	0.0	U/P
0.192	0.0000	0.0000	137.884	0.03011	0.00000	48.9	24.9	0.0	U/P
0.216	0.0000	0.0000	137.864	0.02812	0.00000	48.9	27.4	0.0	U/P
0.240	0.0000	0.0000	137.843	0.02684	0.00000	48.9	29.8	0.0	U/P
0.288	0.0000	0.0000	137.801	0.02367	0.00000	48.9	34.3	0.0	U/P
0.312	0.0000	0.0000	137.780	0.02208	0.00000	48.9	36.2	0.0	U/P
0.360	0.0000	0.0000	137.736	0.01950	0.00000	48.9	39.9	0.0	U/P
0.480	0.0000	0.0000	137.620	0.01043	0.00000	48.9	46.6	0.0	U/P ~0.6hrs
0.720	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
1.200	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
1.440	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
1.680	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
1.920	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
2.160	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
2.400	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
3.600	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
6.000	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
7.200	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
8.400	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
9.600	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
10.800	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
11.040	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
11.280	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
11.520	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
11.760	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
12.000	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
14.400	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
16.800	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
19.200	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
21.600	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
24.000	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
36.000	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
48.000	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
60.000	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
72.000	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
84.000	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
96.000	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 159+25 to 159+50 rt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	107.86
Water Table Elevation, [WT] (ft datum):	122.86
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	184.1

Geometry Data

Equivalent Pond Length, [L] (ft):	18.4
Equivalent Pond Width, [W] (ft):	10.0

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
136.00	0.0
137.11	368.8

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 59.43

Initial ground water level (ft datum) default, 122.86

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

Detailed Results :: *Scenario 1* :: *Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	9.9050	0.0000	122.860	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	9.9050	0.0000	136.597	0.04262	0.00000	59.4	0.3	0.0	U/P
0.024	0.0000	0.0000	136.579	0.04262	0.00000	59.4	3.7	0.0	U/P
0.048	0.0000	0.0000	136.560	0.04262	0.00000	59.4	7.4	0.0	U/P
0.072	0.0000	0.0000	136.540	0.04225	0.00000	59.4	11.0	0.0	U/P
0.120	0.0000	0.0000	136.498	0.04023	0.00000	59.4	18.2	0.0	U/P
0.192	0.0000	0.0000	136.434	0.03461	0.00000	59.4	28.1	0.0	U/P
0.216	0.0000	0.0000	136.413	0.03259	0.00000	59.4	31.0	0.0	U/P
0.240	0.0000	0.0000	136.393	0.03127	0.00000	59.4	33.8	0.0	U/P
0.288	0.0000	0.0000	136.351	0.02806	0.00000	59.4	39.0	0.0	U/P
0.312	0.0000	0.0000	136.330	0.02644	0.00000	59.4	41.3	0.0	U/P
0.360	0.0000	0.0000	136.287	0.02384	0.00000	59.4	45.7	0.0	U/P
0.480	0.0000	0.0000	136.175	0.01331	0.00000	59.4	54.3	0.0	U/P ~0.6hrs
0.720	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
1.200	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
1.440	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
1.680	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
1.920	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
2.160	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
2.400	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
3.600	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
6.000	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
7.200	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
8.400	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
9.600	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
10.800	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
11.040	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
11.280	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
11.520	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
11.760	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
12.000	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
14.400	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
16.800	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
19.200	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
21.600	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
24.000	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
36.000	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
48.000	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
60.000	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
72.000	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
84.000	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry
96.000	0.0000	0.0000	---	---	---	59.4	59.4	0.0	dry

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 159+50 to 159+75 rt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	106.64
Water Table Elevation, [WT] (ft datum):	121.64
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	212.4

Geometry Data

Equivalent Pond Length, [L] (ft):	17.7
Equivalent Pond Width, [W] (ft):	12.0

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
134.75	0.0
135.72	364.9

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 64.75

Initial ground water level (ft datum) default, 121.64

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

Detailed Results :: *Scenario 1* :: *Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	10.7917	0.0000	121.640	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	10.7917	0.0000	135.335	0.04917	0.00000	64.8	0.3	0.0	U/P
0.024	0.0000	0.0000	135.317	0.04917	0.00000	64.8	4.2	0.0	U/P
0.048	0.0000	0.0000	135.297	0.04839	0.00000	64.8	8.5	0.0	U/P
0.072	0.0000	0.0000	135.277	0.04703	0.00000	64.8	12.6	0.0	U/P
0.120	0.0000	0.0000	135.235	0.04440	0.00000	64.8	20.5	0.0	U/P
0.192	0.0000	0.0000	135.171	0.03802	0.00000	64.8	31.5	0.0	U/P
0.216	0.0000	0.0000	135.150	0.03573	0.00000	64.8	34.6	0.0	U/P
0.240	0.0000	0.0000	135.130	0.03424	0.00000	64.8	37.7	0.0	U/P
0.288	0.0000	0.0000	135.087	0.03059	0.00000	64.8	43.4	0.0	U/P
0.312	0.0000	0.0000	135.067	0.02876	0.00000	64.8	45.9	0.0	U/P
0.360	0.0000	0.0000	135.024	0.02581	0.00000	64.8	50.7	0.0	U/P
0.480	0.0000	0.0000	134.910	0.01427	0.00000	64.8	59.9	0.0	U/P ~0-6 hrs
0.720	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
1.200	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
1.440	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
1.680	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
1.920	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
2.160	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
2.400	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
3.600	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
6.000	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
7.200	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
8.400	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
9.600	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
10.800	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
11.040	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
11.280	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
11.520	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
11.760	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
12.000	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
14.400	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
16.800	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
19.200	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
21.600	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
24.000	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
36.000	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
48.000	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
60.000	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
72.000	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
84.000	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry
96.000	0.0000	0.0000	---	---	---	64.8	64.8	0.0	dry

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method
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Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 159+75 to 160+00 rt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	105.42
Water Table Elevation, [WT] (ft datum):	120.42
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	172.9

Geometry Data

Equivalent Pond Length, [L] (ft):	15.7
Equivalent Pond Width, [W] (ft):	11.0

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
133.50	0.0
134.33	274.9

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 48.88

Initial ground water level (ft datum) default, 120.42

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

Detailed Results :: *Scenario 1* :: *Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	8.1467	0.0000	120.420	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	8.1467	0.0000	134.042	0.04003	0.00000	48.9	0.2	0.0	U/P
0.024	0.0000	0.0000	134.024	0.04003	0.00000	48.9	3.5	0.0	U/P
0.048	0.0000	0.0000	134.003	0.03931	0.00000	48.9	6.9	0.0	U/P
0.072	0.0000	0.0000	133.983	0.03807	0.00000	48.9	10.3	0.0	U/P
0.120	0.0000	0.0000	133.941	0.03575	0.00000	48.9	16.7	0.0	U/P
0.192	0.0000	0.0000	133.876	0.03010	0.00000	48.9	25.4	0.0	U/P
0.216	0.0000	0.0000	133.856	0.02807	0.00000	48.9	27.9	0.0	U/P
0.240	0.0000	0.0000	133.835	0.02676	0.00000	48.9	30.3	0.0	U/P
0.288	0.0000	0.0000	133.793	0.02352	0.00000	48.9	34.7	0.0	U/P
0.312	0.0000	0.0000	133.772	0.02190	0.00000	48.9	36.6	0.0	U/P
0.360	0.0000	0.0000	133.728	0.01926	0.00000	48.9	40.2	0.0	U/P
0.480	0.0000	0.0000	133.610	0.01021	0.00000	48.9	46.9	0.0	U/P
0.720	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
1.200	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
1.440	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
1.680	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
1.920	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
2.160	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
2.400	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
3.600	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
6.000	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
7.200	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
8.400	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
9.600	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
10.800	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
11.040	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
11.280	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
11.520	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
11.760	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
12.000	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
14.400	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
16.800	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
19.200	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
21.600	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
24.000	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
36.000	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
48.000	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
60.000	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
72.000	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
84.000	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry
96.000	0.0000	0.0000	----	----	----	48.9	48.9	0.0	dry

10.6 hrs

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 160+00 to 160+25 rt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	104.45
Water Table Elevation, [WT] (ft datum):	119.45
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	267.2

Geometry Data

Equivalent Pond Length, [L] (ft):	17.5
Equivalent Pond Width, [W] (ft):	15.3

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
132.50	0.0
133.64	424.5

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 99.1

Initial ground water level (ft datum) default, 119.45

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

Detailed Results :: *Scenario 1* :: *Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	16.5167	0.0000	119.450	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	16.5167	0.0000	133.228	0.06186	0.00000	99.1	0.4	0.0	U/P
0.024	0.0000	0.0000	133.210	0.06153	0.00000	99.1	5.3	0.0	U/P
0.048	0.0000	0.0000	133.189	0.06029	0.00000	99.1	10.6	0.0	U/P
0.072	0.0000	0.0000	133.169	0.05883	0.00000	99.1	15.8	0.0	U/P
0.120	0.0000	0.0000	133.128	0.05625	0.00000	99.1	25.7	0.0	U/P
0.192	0.0000	0.0000	133.065	0.05003	0.00000	99.1	39.8	0.0	U/P
0.216	0.0000	0.0000	133.044	0.04779	0.00000	99.1	44.0	0.0	U/P
0.240	0.0000	0.0000	133.024	0.04632	0.00000	99.1	48.0	0.0	U/P
0.288	0.0000	0.0000	132.982	0.04276	0.00000	99.1	55.8	0.0	U/P
0.312	0.0000	0.0000	132.962	0.04097	0.00000	99.1	59.4	0.0	U/P
0.360	0.0000	0.0000	132.920	0.03811	0.00000	99.1	66.3	0.0	U/P
0.480	0.0000	0.0000	132.813	0.02935	0.00000	99.1	80.9	0.0	U/P
0.720	0.0000	0.0000	132.560	0.01351	0.00000	99.1	98.4	0.0	U/P
1.200	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
1.440	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
1.680	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
1.920	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
2.160	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
2.400	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
3.600	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
6.000	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
7.200	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
8.400	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
9.600	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
10.800	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
11.040	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
11.280	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
11.520	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
11.760	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
12.000	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
14.400	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
16.800	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
19.200	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
21.600	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
24.000	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
36.000	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
48.000	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
60.000	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
72.000	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
84.000	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry
96.000	0.0000	0.0000	---	---	---	99.1	99.1	0.0	dry

~072hrs

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 160+25 to 160+50 rt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	103.48
Water Table Elevation, [WT] (ft datum):	118.48
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	203.5

Geometry Data

Equivalent Pond Length, [L] (ft):	18.8
Equivalent Pond Width, [W] (ft):	15.4

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
131.50	0.0
132.94	470.8

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 113.91

Initial ground water level (ft datum) default, 118.48

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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	18.9850	0.0000	118.480	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	18.9850	0.0000	132.334	0.04711	0.00000	113.9	0.3	0.0	U/P
0.024	0.0000	0.0000	132.320	0.04711	0.00000	113.9	4.1	0.0	U/P
0.048	0.0000	0.0000	132.304	0.04711	0.00000	113.9	8.1	0.0	U/P
0.072	0.0000	0.0000	132.289	0.04711	0.00000	113.9	12.2	0.0	U/P
0.120	0.0000	0.0000	132.257	0.04711	0.00000	113.9	20.4	0.0	U/P
0.192	0.0000	0.0000	132.206	0.04711	0.00000	113.9	32.6	0.0	U/P
0.216	0.0000	0.0000	132.188	0.04711	0.00000	113.9	36.6	0.0	U/P
0.240	0.0000	0.0000	132.169	0.04711	0.00000	113.9	40.7	0.0	U/P
0.288	0.0000	0.0000	132.131	0.04711	0.00000	113.9	48.8	0.0	U/P
0.312	0.0000	0.0000	132.111	0.04681	0.00000	113.9	52.9	0.0	U/P
0.360	0.0000	0.0000	132.070	0.04477	0.00000	113.9	60.9	0.0	U/P
0.480	0.0000	0.0000	131.964	0.03729	0.00000	113.9	78.7	0.0	U/P
0.720	0.0000	0.0000	131.743	0.01976	0.00000	113.9	104.3	0.0	U/P ~1 hr
1.200	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
1.440	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
1.680	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
1.920	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
2.160	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
2.400	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
3.600	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
6.000	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
7.200	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
8.400	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
9.600	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
10.800	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
11.040	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
11.280	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
11.520	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
11.760	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
12.000	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
14.400	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
16.800	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
19.200	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
21.600	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
24.000	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
36.000	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
48.000	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
60.000	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
72.000	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
84.000	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry
96.000	0.0000	0.0000	---	---	---	113.9	113.9	0.0	dry

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 160+50 to 160+75 rt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	102.50
Water Table Elevation, [WT] (ft datum):	117.50
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	348.3

Geometry Data

Equivalent Pond Length, [L] (ft):	22.5
Equivalent Pond Width, [W] (ft):	15.5

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
130.50	0.0
132.05	476.2

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 155.47

Initial ground water level (ft datum) default, 117.50

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

Detailed Results :: *Scenario 1* :: *Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type	
0.000	25.9117	0.0000	117.500	0.00000	0.00000	0.0	0.0	0.0	N.A.	
0.002	25.9117	0.0000	131.505	0.07154	0.00000	155.5	0.4	0.0	U/P	
0.024	0.0000	0.0000	131.486	0.07080	0.00000	155.5	6.2	0.0	U/P	
0.048	0.0000	0.0000	131.466	0.06939	0.00000	155.5	12.2	0.0	U/P	
0.072	0.0000	0.0000	131.445	0.06819	0.00000	155.5	18.2	0.0	U/P	
0.120	0.0000	0.0000	131.405	0.06607	0.00000	155.5	29.8	0.0	U/P	
0.192	0.0000	0.0000	131.342	0.06101	0.00000	155.5	46.5	0.0	U/P	
0.216	0.0000	0.0000	131.322	0.05919	0.00000	155.5	51.6	0.0	U/P	
0.240	0.0000	0.0000	131.302	0.05799	0.00000	155.5	56.7	0.0	U/P	
0.288	0.0000	0.0000	131.261	0.05508	0.00000	155.5	66.5	0.0	U/P	
0.312	0.0000	0.0000	131.241	0.05363	0.00000	155.5	71.2	0.0	U/P	
0.360	0.0000	0.0000	131.200	0.05131	0.00000	155.5	80.3	0.0	U/P	
0.480	0.0000	0.0000	131.095	0.04436	0.00000	155.5	101.0	0.0	U/P	
0.720	0.0000	0.0000	130.881	0.02486	0.00000	155.5	133.2	0.0	U/P	~1 hr
1.200	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
1.440	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
1.680	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
1.920	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
2.160	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
2.400	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
3.600	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
6.000	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
7.200	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
8.400	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
9.600	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
10.800	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
11.040	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
11.280	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
11.520	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
11.760	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
12.000	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
14.400	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
16.800	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
19.200	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
21.600	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
24.000	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
36.000	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
48.000	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
60.000	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
72.000	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
84.000	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	
96.000	0.0000	0.0000	---	---	---	155.5	155.5	0.0	dry	

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 160+75 to 161+00 rt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	101.53
Water Table Elevation, [WT] (ft datum):	116.53
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	286.6

Geometry Data

Equivalent Pond Length, [L] (ft):	20.0
Equivalent Pond Width, [W] (ft):	14.3

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
129.50	0.0
131.15	470.8

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 116.08

Initial ground water level (ft datum) default, 116.53

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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	19.3467	0.0000	116.530	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	19.3467	0.0000	130.401	0.05957	0.00000	116.1	0.4	0.0	U/P
0.024	0.0000	0.0000	130.382	0.05889	0.00000	116.1	5.1	0.0	U/P
0.048	0.0000	0.0000	130.362	0.05758	0.00000	116.1	10.2	0.0	U/P
0.072	0.0000	0.0000	130.341	0.05646	0.00000	116.1	15.1	0.0	U/P
0.120	0.0000	0.0000	130.300	0.05449	0.00000	116.1	24.7	0.0	U/P
0.192	0.0000	0.0000	130.238	0.04977	0.00000	116.1	38.4	0.0	U/P
0.216	0.0000	0.0000	130.218	0.04807	0.00000	116.1	42.6	0.0	U/P
0.240	0.0000	0.0000	130.197	0.04695	0.00000	116.1	46.7	0.0	U/P
0.288	0.0000	0.0000	130.156	0.04425	0.00000	116.1	54.7	0.0	U/P
0.312	0.0000	0.0000	130.136	0.04289	0.00000	116.1	58.4	0.0	U/P
0.360	0.0000	0.0000	130.095	0.04072	0.00000	116.1	65.7	0.0	U/P
0.480	0.0000	0.0000	129.990	0.03421	0.00000	116.1	81.9	0.0	U/P
0.720	0.0000	0.0000	129.770	0.01838	0.00000	116.1	105.7	0.0	U/P ~1 hr
1.200	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
1.440	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
1.680	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
1.920	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
2.160	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
2.400	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
3.600	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
6.000	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
7.200	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
8.400	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
9.600	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
10.800	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
11.040	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
11.280	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
11.520	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
11.760	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
12.000	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
14.400	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
16.800	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
19.200	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
21.600	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
24.000	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
36.000	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
48.000	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
60.000	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
72.000	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
84.000	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry
96.000	0.0000	0.0000	---	---	---	116.1	116.1	0.0	dry

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 161+00 to 161+25 rt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	100.56
Water Table Elevation, [WT] (ft datum):	115.56
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	357.0

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	14.3

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
128.65	0.0
130.29	467.3

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 188.41

Initial ground water level (ft datum) default, 115.56

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

Detailed Results :: *Scenario 1* :: *Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	31.4017	0.0000	115.560	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	31.4017	0.0000	129.799	0.07584	0.00000	188.4	0.5	0.0	U/P
0.024	0.0000	0.0000	129.780	0.07516	0.00000	188.4	6.5	0.0	U/P
0.048	0.0000	0.0000	129.760	0.07385	0.00000	188.4	13.0	0.0	U/P
0.072	0.0000	0.0000	129.740	0.07274	0.00000	188.4	19.3	0.0	U/P
0.120	0.0000	0.0000	129.699	0.07078	0.00000	188.4	31.7	0.0	U/P
0.192	0.0000	0.0000	129.637	0.06611	0.00000	188.4	49.7	0.0	U/P
0.216	0.0000	0.0000	129.617	0.06442	0.00000	188.4	55.3	0.0	U/P
0.240	0.0000	0.0000	129.597	0.06331	0.00000	188.4	60.8	0.0	U/P
0.288	0.0000	0.0000	129.556	0.06063	0.00000	188.4	71.6	0.0	U/P
0.312	0.0000	0.0000	129.535	0.05928	0.00000	188.4	76.7	0.0	U/P
0.360	0.0000	0.0000	129.495	0.05714	0.00000	188.4	86.8	0.0	U/P
0.480	0.0000	0.0000	129.391	0.05075	0.00000	188.4	110.1	0.0	U/P
0.720	0.0000	0.0000	129.180	0.03721	0.00000	188.4	148.4	0.0	U/P
1.200	0.0000	0.0000	128.674	0.00770	0.00000	188.4	188.3	0.0	U/P
1.440	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
1.680	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
1.920	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
2.160	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
2.400	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
3.600	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
6.000	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
7.200	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
8.400	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
9.600	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
10.800	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
11.040	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
11.280	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
11.520	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
11.760	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
12.000	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
14.400	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
16.800	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
19.200	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
21.600	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
24.000	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
36.000	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
48.000	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
60.000	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
72.000	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
84.000	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry
96.000	0.0000	0.0000	----	----	----	188.4	188.4	0.0	dry

~1.2 hrs

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 161+25 to 161+50 r
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	99.60
Water Table Elevation, [WT] (ft datum):	114.60
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	350.8

Geometry Data

Equivalent Pond Length, [L] (ft):	25.0
Equivalent Pond Width, [W] (ft):	14.0

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
127.80	0.0
129.42	461.0

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 175.56

Initial ground water level (ft datum) default, 114.60

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

Detailed Results :: *Scenario 1* :: *Water Quality*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	29.2600	0.0000	114.600	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	29.2600	0.0000	128.909	0.07316	0.00000	175.6	0.4	0.0	U/P
0.024	0.0000	0.0000	128.891	0.07248	0.00000	175.6	6.3	0.0	U/P
0.048	0.0000	0.0000	128.871	0.07118	0.00000	175.6	12.5	0.0	U/P
0.072	0.0000	0.0000	128.850	0.07007	0.00000	175.6	18.6	0.0	U/P
0.120	0.0000	0.0000	128.810	0.06811	0.00000	175.6	30.6	0.0	U/P
0.192	0.0000	0.0000	128.748	0.06344	0.00000	175.6	47.8	0.0	U/P
0.216	0.0000	0.0000	128.727	0.06175	0.00000	175.6	53.2	0.0	U/P
0.240	0.0000	0.0000	128.707	0.06064	0.00000	175.6	58.5	0.0	U/P
0.288	0.0000	0.0000	128.666	0.05796	0.00000	175.6	68.8	0.0	U/P
0.312	0.0000	0.0000	128.646	0.05661	0.00000	175.6	73.7	0.0	U/P
0.360	0.0000	0.0000	128.605	0.05447	0.00000	175.6	83.4	0.0	U/P
0.480	0.0000	0.0000	128.502	0.04808	0.00000	175.6	105.5	0.0	U/P
0.720	0.0000	0.0000	128.290	0.02772	0.00000	175.6	141.5	0.0	U/P
1.200	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
1.440	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
1.680	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
1.920	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
2.160	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
2.400	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
3.600	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
6.000	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
7.200	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
8.400	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
9.600	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
10.800	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
11.040	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
11.280	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
11.520	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
11.760	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
12.000	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
14.400	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
16.800	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
19.200	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
21.600	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
24.000	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
36.000	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
48.000	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
60.000	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
72.000	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
84.000	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry
96.000	0.0000	0.0000	---	---	---	175.6	175.6	0.0	dry

~1 hr

PONDS Version 3.3.0223
Retention Pond Recovery - Refined Method

Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	Hartwood Marsh Road
Simulation Description:	Swale Recovery Water Quality Sta. 161+50 to 161+95 rt
Project Number:	41561
Engineer :	kmv
Supervising Engineer:	
Date:	05-05-2008

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	98.63
Water Table Elevation, [WT] (ft datum):	113.63
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	20.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	20.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	636.3

Geometry Data

Equivalent Pond Length, [L] (ft):	42.5
Equivalent Pond Width, [W] (ft):	14.9

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
126.74	0.0
128.61	894.8

Scenario Input Data

Scenario 1 :: Water Quality

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft^3) 328.99

Initial ground water level (ft datum) default, 113.63

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)
0.001	0.013	0.090	0.460	0.900
0.002	0.015	0.100	0.470	1.000
0.003	0.020	0.150	0.480	1.500
0.005	0.030	0.250	0.490	2.000
0.008	0.050	0.300	0.500	2.500
0.009	0.060	0.350	0.600	3.000
0.010	0.070	0.400	0.700	3.500
0.012	0.080	0.450	0.800	4.000

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	54.8317	0.0000	113.630	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	54.8317	0.0000	127.911	0.12988	0.00000	329.0	0.8	0.0	U/P
0.024	0.0000	0.0000	127.893	0.12873	0.00000	329.0	11.2	0.0	U/P
0.048	0.0000	0.0000	127.872	0.12654	0.00000	329.0	22.2	0.0	U/P
0.072	0.0000	0.0000	127.852	0.12467	0.00000	329.0	33.1	0.0	U/P
0.120	0.0000	0.0000	127.811	0.12138	0.00000	329.0	54.4	0.0	U/P
0.192	0.0000	0.0000	127.750	0.11354	0.00000	329.0	85.1	0.0	U/P
0.216	0.0000	0.0000	127.729	0.11071	0.00000	329.0	94.8	0.0	U/P
0.240	0.0000	0.0000	127.709	0.10884	0.00000	329.0	104.3	0.0	U/P
0.288	0.0000	0.0000	127.668	0.10434	0.00000	329.0	122.8	0.0	U/P
0.312	0.0000	0.0000	127.648	0.10208	0.00000	329.0	131.7	0.0	U/P
0.360	0.0000	0.0000	127.607	0.09848	0.00000	329.0	149.1	0.0	U/P
0.480	0.0000	0.0000	127.504	0.08776	0.00000	329.0	189.3	0.0	U/P
0.720	0.0000	0.0000	127.293	0.06510	0.00000	329.0	255.8	0.0	U/P
1.200	0.0000	0.0000	126.817	0.01385	0.00000	329.0	327.6	0.0	U/P
1.440	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
1.680	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
1.920	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
2.160	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
2.400	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
3.600	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
6.000	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
7.200	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
8.400	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
9.600	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
10.800	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
11.040	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
11.280	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
11.520	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
11.760	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
12.000	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
14.400	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
16.800	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
19.200	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
21.600	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
24.000	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
36.000	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
48.000	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
60.000	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
72.000	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
84.000	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry
96.000	0.0000	0.0000	---	---	---	329.0	329.0	0.0	dry

~1.3 hrs

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