Waypoint - Springtree Stormwater Report

Date: January 6, 2020

Prepared by:



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Introduction

Waypoint Residential has a contract to purchase a 13.59 acre parcel on the NW corner of US 1 and Springtree Place, in the City of Stuart, FL. The developer is proposing to build multi-family apartments consisting of 7 buildings with 270 units, associated parking and a clubhouse. This due diligence report covers preliminary calculations regarding the proposed stormwater management system for the site.

Two areas of the site have been excluded from the stormwater calculations of this report: A 1.19-acre portion of the site has been previously developed as a roadway access (Springtree Place) to an adjacent residential community to the west. Drainage for the roadway is directed to the stormwater system of the adjacent community, with an outfall to the West to the South Fork of the St. Lucie River. Furthermore, 1.60 acres will be preserved in its natural state, and will not contribute additional stormwater runoff to the site. The total development site covered under this report is 10.8 acres.

The mainly wooded, undeveloped site is relatively flat, with only about 2-3 feet variation throughout. The elevations vary from elevation 15' NAVD to 18' NAVD. The NRCS Soil Survey of the site indicates that most of the site to constitute of a Waveland-Immokalee soil, common in the area. This soil profile consists mainly of sandy soils, however the soils drain poorly due to a horizontal hardpan layer located only a few feet below the soil surface. The wet season water table is normally encountered within a couple of feet of the natural surface. Preliminary 6' deep hand augers by a geotechnical engineering firm encountered the hardpan at all locations. Three exfiltration conductivity tests confirmed the low infiltration of these soils. The hardpan must be excavated and removed from beneath the lake and retention areas. Subsequent deeper borings (30') indicated the presence of fine sands below the hardpan.

The site abuts a canal maintained by Martin County, which through a series of ditches and culverts discharges through two separate outfalls to the Manatee Pocket towards the East, with ultimate connection to the St. Lucie River near the inlet. The St. Lucie River is an impaired water body, triggering additional water quality treatment criteria. This conveyance system is known as the East Hanson Grant Drainage Basin and has been improved over the years as the area has been developed. It is the subject of a County drainage study done in 1986 and subsequent additional ERP permits for sites abutting the conveyance system. The conveyance system runs through FDOT right of way and FEC Railway property.

The undeveloped site currently drains into this canal via a 15" culvert connection. It is beyond the scope of this preliminary report, however a meeting with County engineers and further review of this conveyance system will be required to understand the operation and capacity of this system to accept drainage from our site. A pre-development TR-55 analysis indicates a high runoff rate of around 2 cfs per acre, however our experience is that the permitted discharge from the site would be limited to 1.0 cfs per acre due to conveyance issues.

The adjacent property to the west has a lake and a SFWMD permit for the site. Information from the permit and the construction plans indicate that the wet season water table for that site was established at elevation 14.9' NAVD. Due to the proximity of this site, and corroborated with the initial geotech explorations, we have assumed a conservative wet season water table on our site to be at elevation 15.0' NAVD. During a recent site visit, the adjacent canal to the north had water at an elevation of 12.0' NAVD,

but the site will experience higher water table elevations due to the hardpan and low percolating soils found on site.

The proposed stormwater system will consist of two dry retention areas totaling 0.70 acres and a 0.82-acre lake. The weir for the lake will be a 4' wide concrete sharp-crested weir set within a manhole. The weir will be set 12" above the water table, at elevation 16.0' NAVD, providing wet retention for better nutrient treatment. Runoff from the building rooftops, pavement and landscape areas will be directed via the underground drainage pipe network to the two retention areas for pre-treatment. The retention areas will then overflow into the lake, which will be connected to the canal to the north via a control structure and 15" culvert. Due to the low exfiltration conductivity and high water table, this site is not conducive to the use of exfiltration trenches or underground vaults.

Design Criteria

Water Quality

The City of Stuart and South Florida Water Management District Criteria for Water Quality is given as:

The larger of
- 2.5" x Imperviousness (Imperviousness as defined by the SFWMD)
- 1" over the entire site

In addition, since we are discharging to an impaired water body, the following also apply:
- 50% Additional Treatment for Discharges to St Lucie River (Impaired Water Body)
- Nutrient analysis to be performed to indicate no net increase in Phosphorus and Nitrogen discharges from the site. In practice, SFWMD interprets this policy to require that the stormwater system must remove sufficient nutrients to match the pre-development rate up to a removal level of 90% of the phosphorus and nitrogen load generated by the developed site.

Stormwater Runoff Attenuation

The site has a positive outfall and therefore the allowable peak discharge rate will be determined by the existing discharge rate from the site in its undeveloped state. Though the soils are poorly draining and a large runoff rate from the site could be expected, a berm between the site and the canal restricts the discharge to 5-10 cfs (0.5-1.0 cfs per acre) through the existing 15" culvert.

The following accumulated rainfall is from the South Florida Water Management District's Data for estimation of runoff from rainfall information.

10 year 1 day Rainfall	7.0 inches	Minimum Pavement EL
25 year 3 day Rainfall	12.0 inches	Minimum Berm EL
100 year 3 day Rainfall	14.5 inches	Minimum Finished Floor

Basin Hydrology

Site	Areas (acres)	TC (mins)	CN
Southern Road Basin	1.19		
Preserve	1.60		
Project Site	10.80		
Total Property	**13.59**		
Proposed Project Site Breakdown:			
Buildings and Pool	2.01	10	98
Pavement / sidewalk	4.91	10	98
Lake (Edge of Water)	0.62	10	98
Total Impervious (70%)	**7.54**		
Dry Retention Areas	0.70	10	77
Lake Bank Above Edge of Water	0.21		
Open / Landscape	2.35	30	77
Total Pervious (30%)	**3.26**		
Project Site Total (100%)	**10.80**		

Wet Season Ground Water Elevation: estimated to be 15.0 feet NAVD.

Results

Water Quality

Water Quality Required per SFWMD and City of Stuart criteria (See appendix for detailed calculations):

1” /12 x 10.8 acres = 0.9 acre-ft x 150% = 1.35 acre-ft

2.5” x Imperviousness = 1.28 acre-ft x 150% = 1.91 acre-ft – Controlling

Water Quality Provided:

Dry Retention at El 17.5’ NAVD =	0.83 ac-ft / 50% =	1.65 ac-ft
Wet Retention at El 16.0’ NAVD =	0.65 ac-ft / 100% =	0.65 ac-ft
Total Provided	1.48 ac-ft	2.30 ac-ft

Note: For Nutrient Calculations, the retention volume = 1.48 ac-ft, or 1.80”

Nutrient Analysis

According to the BMP-Trains model, the following table describes the pre (existing) and post (developed) nutrient loads. Please note that nutrient reductions assume that a littoral zone is created within the lake.

Condition	Annual Runoff (ac-ft)	Nitrogen (N) Kg/yr	Phosphorus (P) Kg/yr
Existing load generated / discharged	6.9	9.8	0.23
Developed load generated	28.7	82.3	18.43
Developed load discharged		9.8	1.08
% Removal by Stormwater System		88%	94%
Taget Removal		88%	90%

The nutrient removal requirement is met.

ICPR Model Results (Peak Discharge / Maximum Stage):

Maximum Outfall Discharge Flow Rate (cfs):

	25-yr	100-yr
Name	3-day	3-day 0 discharge
Outfall	5.3	0

Maximum discharge rate during the 25 yr-3day event is approximately 0.5 cfs / acre

Basin Maximum Stage (NAVD):

	10-yr	25-yr	100-yr
Name	1-day	3-day	3-day 0 discharge
Lake	17.6	18.2	19.0

Minimum Elevations	Road	Berm	FFE
(NAVD)	17.8	18.5	19.5

Recovery calculations of the lake and retention area indicate that the stormwater system recovers within 12 days as required by SFWMD.

Conclusion

The existing stormwater management system has sufficient capacity to provide water quality treatment and stormwater attenuation for the proposed improvements.

Site Data

Springtree

Area Calculations

Springtree

Post Development

Description	Square Feet	Acres
Impervious		
Building (Total Footprint)	87749	2.01
Pavement/Conc	214043	4.91
Pond 2 EOW	26846	0.62
Total Impervious	328,638	7.54
Pervious		
Retention Areas	30,569	0.70
Lake Bank	8,775	0.20
Open Space	102,716	2.36
Total Pervious	142,060	**3.26**
Total	**470,698**	**10.80**
Percent Impervious		70%
Percent Pervious		30%

Stage storage

Springtree

Stage / Storage Computations

Post-Development

	Pavement Linear	Open Linear	Dry Retention Bottom	Dry Retention Bank	Lake Bottom	Lake Bank	
Area (ac)	4.91	2.36	0.46	0.24	0.62	0.20	
	L	L	V	L	V	L	
Starting Elev (ft)	17.50	18.00	16.00	16.00	15.00	15.00	
Ending Elev (ft)	18.00	19.00	21.00	18.00	21.00	18.00	
Stage NAVD	Linear Storage ac-ft	Linear Storage ac-ft	Vertical Storage ac-ft	Linear Storage ac-ft	Vertical Storage ac-ft	Linear Storage ac-ft	Total Storage ac-ft
13.50	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14.50	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15.50	0.000	0.000	0.000	0.000	0.310	0.008	0.318
16.00	0.000	0.000	0.000	0.000	0.620	0.033	0.653
16.50	0.000	0.000	0.230	0.015	0.930	0.075	1.250
17.00	0.000	0.000	0.460	0.060	1.240	0.133	1.893
17.50	0.000	0.000	0.690	0.135	1.550	0.208	2.583
18.00	1.228	0.000	0.920	0.240	1.860	0.300	4.548
18.50	3.683	0.295	1.150	0.360	2.170	0.400	8.058
19.00	6.138	1.180	1.380	0.480	2.480	0.500	12.158
19.50	8.593	2.360	1.610	0.600	2.790	0.600	16.553
20.00	11.048	3.540	1.840	0.720	3.100	0.700	20.948
20.50	13.503	4.720	2.070	0.840	3.410	0.800	25.343
21.00	15.958	5.900	2.300	0.960	3.720	0.900	29.738

Curve Number

Springtree

Curve Number and Time of Concentration

Name	Total Area	Pervious Area	Pervious CN	Impervious Area	Impervious Cn	Weighted CN
Site	10.80	3.26	77	7.54	98	91.7
Total	**10.80**					

Name	Total Area	Pervious Area	Pervious CN	Impervious Area	Impervious Cn	Weighted CN
Lake	0.82	0.20	77	0.62	98	92.9
Total	**0.82**					

Name	Total Area	Pervious Area	Pervious CN	Impervious Area	Impervious Cn	Weighted CN
Dry Retention Area	0.70	0.70	77	0.00	98	77.0
Total	**0.70**					

Water quality required

Springtree

Water Quality Requirements

Post Development

a) Per SFWMD and City of Stuart, water quality volume shall provide for the greater of:

Criteria 1: 1 inch of runoff x total drainage area

Calculated Runoff Volume => (1.0/12) * (10.80) = **0.90** ac-ft

Criteria 2: 2.5 inches times imperviousness

Site area, for water quality pervious/impervious calculation only
Total Project - (Roof + Lake) = site area for water quality

= 10.80 - (2.01 + 0.62) = **8.17** ac

Impervious area for water quality pervious/impervious calculations
(Site area for water quality pervious/impervious) - pervious =
= 8.17 - 3.26 = **4.91** ac

Percentage of impervious area for water quality
(Imp. Area for WQ / Site area for WQ) * 100%
= (4.91 / 8.17) * 100% = **60.10%**

For 2.5 in times the percentage impervious
2.5 * 0.6010 = **1.50** in

Calculated Runoff Volume:
Inches to be Treated x (Total Site - Lake - Roof)
= 1.50 * (10.80 - 0.62) * (1/12) **1.27** ac-ft

Controlling SFWMD Required Water Quality Volume	**1.27 ac-ft**
x150% for Discharge into Impaired Water Body	**1.91 ac-ft**

Water Quality Provided

Springtree

Water Quality Treatment Provided

	Dry Ret Bottom	Dry Ret Bank	Lake Bottom	Lake Bank	
Area (ac)	0.46	0.24	0.62	0.20	
	V	L	V	L	
Starting Elev (ft)	16.00	16.00	15.00	15.00	
Ending Elev (ft)	21.00	18.00	21.00	18.00	
Stage NAVD	Vertical Storage ac-ft	Linear Storage ac-ft	Vertical Storage ac-ft	Linear Storage ac-ft	Total Storage ac-ft
15.00	0.000	0.000	0.000	0.000	0.000
15.50	0.000	0.000	0.310	0.008	0.318
16.00	0.000	0.000	0.620	0.033	0.653
16.50	0.230	0.015	0.930	0.075	1.250
17.00	0.460	0.060	1.240	0.133	1.893
17.50	0.690	0.135	1.550	0.208	2.583
18.00	0.920	0.240	1.860	0.300	3.320
18.50	1.150	0.360	2.170	0.400	4.080
19.00	1.380	0.480	2.480	0.500	4.840
19.50	1.610	0.600	2.790	0.600	5.600
20.00	1.840	0.720	3.100	0.700	6.360
20.50	2.070	0.840	3.410	0.800	7.120

Onsite WQ Required 1.91 Ac-ft

	Ac-Ft	Credit	Ac-Ft	
WQ Provided (Dry Retention) / 50%	0.83	50%	1.65	Provided at elev 17.5
WQ Provided Wet Retention (Lake)	0.65	100%	0.65	Provided at elev 16.0
	1.48		2.30	

Finished Floor Elevation

Springtree

Runoff (Zero Discharge) Calculations

Post Development

Soil Storage

Average Depth to Water Table = 2.50 feet
Using Depressional Compacted (SFWMD Permit Manual):

Depth to W.T. (ft)	Coastal Storage (in)	Flatwoods Storage (in)	Depression Storage - Compacted (in)
1.0	0.6	0.6	0.45
1.5	1.6	1.6	1.02
2.0	2.5	2.5	1.58
2.5	4.6	4.0	2.44
3.0	6.6	5.4	3.30
3.5	8.8	7.2	4.20
4.0	10.9	9.0	5.10

Developed Pervious Area = 3.26 acres
Soil Storage = 2.44 inches
Soil Moisture Storage (S) = 0.74 inches

Total Developed Area = 10.80 acres
= (3.26/10.80)*2.44

For the 100 year - 3 day storm event, with zero discharge:

P = = 14.50 inches

$$Vol = \frac{(14.5 - (0.2 \times 0.74))^2}{(14.5 + (0.8 \times 0.74))} \text{ in}^2 \times \frac{10.80 \text{ acres}}{1} \times \frac{1 \text{ foot}}{12 \text{ inches}}$$

= 12.29 ac-ft

From Total Stage - Storage Table, elevation = 19.01 ft, NAVD

Interpolation Table

Storage	Stage
12.16	19.00
12.29	**19.01**
16.55	19.50

Nutrient Analysis

Complete Report (not including cost) Ver 2.1.0

Project: Springtree
Date: 11/25/2019 5:18:55 PM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	Site
Rainfall Zone	Florida Zone 5
Annual Mean Rainfall	57.00

Pre-Condition Landuse Information

Landuse	Undeveloped - Scrubby Flatwoods: TN=1.155 TP=0.027
Area (acres)	10.80
Rational Coefficient (0-1)	0.13
Non DCIA Curve Number	77.00
DCIA Percent (0-100)	0.00
Nitrogen EMC (mg/l)	1.155
Phosphorus EMC (mg/l)	0.027
Runoff Volume (ac-ft/yr)	6.915
Nitrogen Loading (kg/yr)	9.848
Phosphorus Loading (kg/yr)	0.230

Post-Condition Landuse Information

Landuse	Multi-Family: TN=2.320 TP=0.520
Area (acres)	10.80
Rational Coefficient (0-1)	0.61
Non DCIA Curve Number	77.00
DCIA Percent (0-100)	70.00
Wet Pond Area (ac)	0.82
Nitrogen EMC (mg/l)	2.320
Phosphorus EMC (mg/l)	0.520
Runoff Volume (ac-ft/yr)	28.746
Nitrogen Loading (kg/yr)	82.231
Phosphorus Loading (kg/yr)	18.431

Catchment Number: 1 Name: Site

Project: Springtree
Date: 11/25/2019

Multiple BMP in Series Design Parameters

BMP in Series Number: 1
BMP Type: Retention

Retention Depth (in)	1.800
Retention Volume (ac-ft)	1.497

BMP in Series Number: 2
BMP Type: Wet Detention

Permanent Pool Volume (ac-ft)	5.500
Permanent Pool Volume (ac-ft) for 31 days residence	2.441
Annual Residence Time (days)	70
Littoral Zone Efficiency Credit	10
Wetland Efficiency Credit	

BMP in Series Number: 3
BMP Type: None

BMP in Series Number: 4
BMP Type: None

Watershed Characteristics

Catchment Area (acres)	10.80
Contributing Area (acres)	9.980
Non-DCIA Curve Number	77.00
DCIA Percent	70.00
Rainfall Zone	Florida Zone 5
Rainfall (in)	57.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	88
Provided TN Treatment Efficiency (%)	88
Required TP Treatment Efficiency (%)	99
Provided TP Treatment Efficiency (%)	94

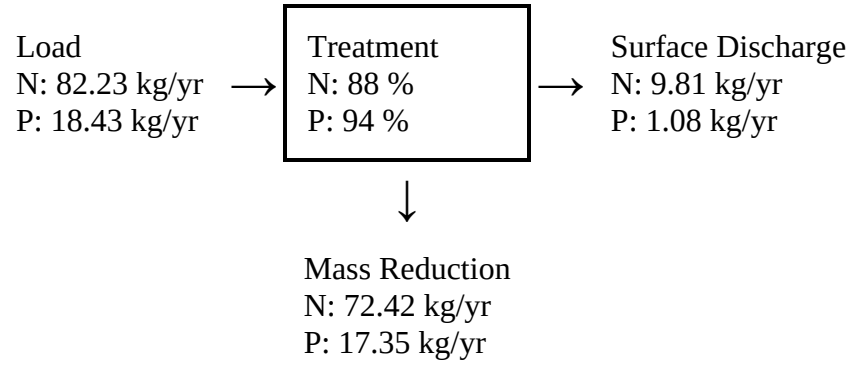
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

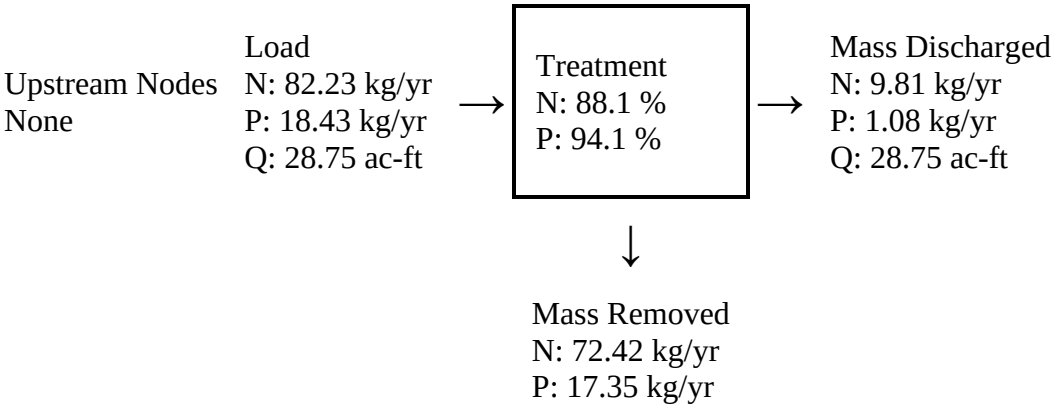
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	69.080
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	15.484
TP Concentration (mg/L)	0.000

Load for Multiple BMP in Series



Load Diagram for Multiple BMP (As Used In Routing)



Summary Treatment Report Version: 2.1.0

Project: Springtree

Date:11/25/2019

Analysis Type: Net Improvement

BMP Types:

Catchment 1 - Multiple BMP

Routing Summary
Catchment 1 Routed to Outlet

Total nitrogen target removal met? YES
Total phosphorus target removal met? NO

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	9.85 kg/yr	
Total N post load	82.23 kg/yr	
Target N load reduction	88 %	
Target N discharge load	9.85 kg/yr	
Percent N load reduction	88 %	
Provided N discharge load	9.81 kg/yr	21.63 lb/yr
Provided N load removed	72.42 kg/yr	159.69 lb/yr

Phosphorus

Surface Water Discharge

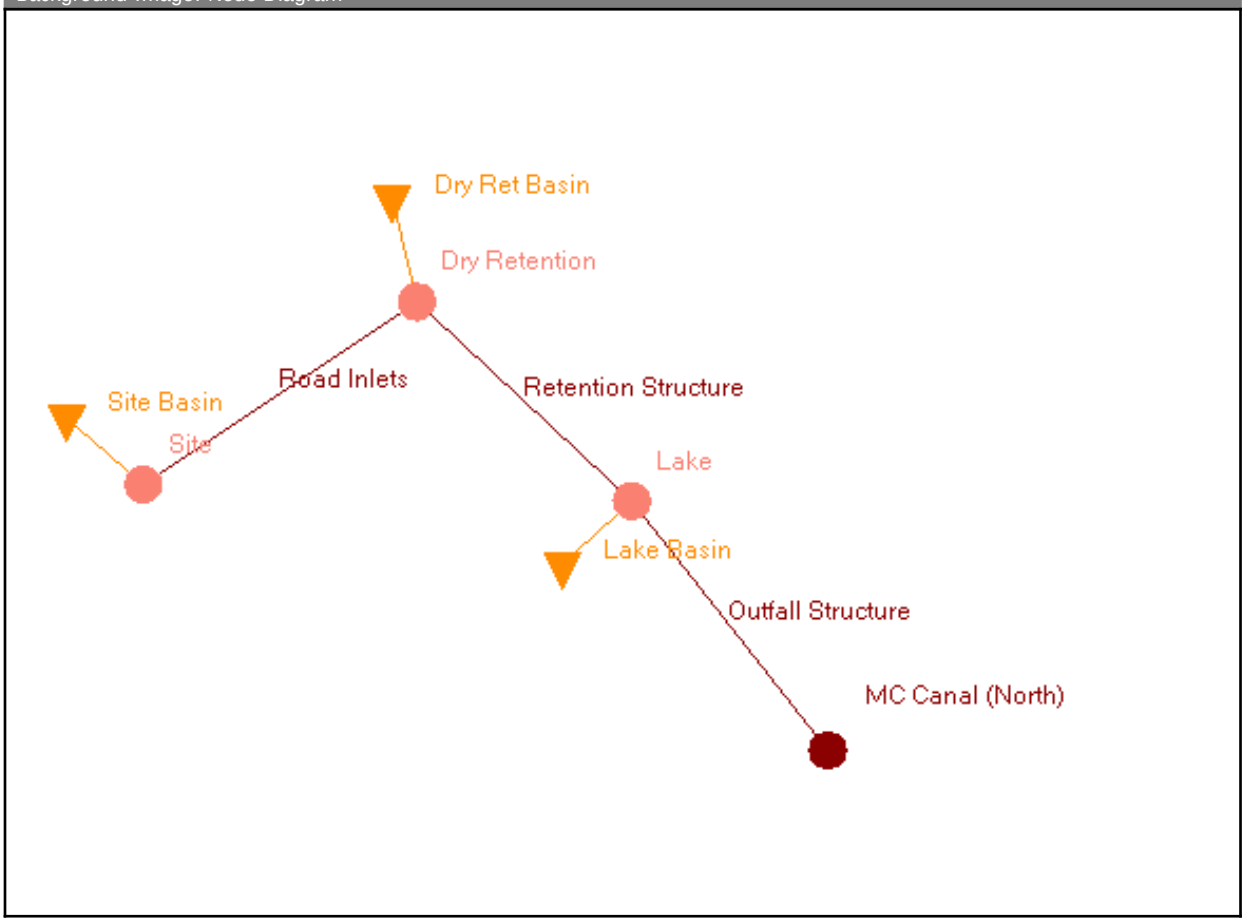
Total P pre load	.23 kg/yr	
Total P post load	18.431 kg/yr	
Target P load reduction	99 %	
Target P discharge load	.23 kg/yr	
Percent P load reduction	94 %	
Provided P discharge load	1.084 kg/yr	2.39 lb/yr
Provided P load removed	17.347 kg/yr	38.25 lb/yr

From Pre-Condition Loads

Existing N Discharge	9.85 (kg/yr)
Existing P Discharge	.23 (kg/yr)

ICPR Model

Background Image: Node Diagram



Scenario	Sim	Node Name	Maximum Stage [ft]
Scenario 2	10Y-1D	Dry Retention	17.82
Scenario 2	10Y-1D	Lake	17.59
Scenario 2	10Y-1D	MC Canal (North)	16.20
Scenario 2	10Y-1D	Site	18.07
Scenario 2	25Y-3D	Dry Retention	18.19
Scenario 2	25Y-3D	Lake	18.17
Scenario 2	25Y-3D	MC Canal (North)	17.00
Scenario 2	25Y-3D	Site	18.25

Sim	Link Name	Maximum Flow Rate [cfs]
25Y-3D	Outfall Structure	5.30
25Y-3D	Retention Structure	11.12
25Y-3D	Road Inlets	11.32

Simple Basin: Dry Ret Basin

Scenario:	Scenario 2
Node:	Dry Retention
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	10.0000 min
Max Allowable Q:	9999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	0.7000 ac
Curve Number:	77.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: Lake Basin

Scenario:	Scenario 2
Node:	Lake
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	10.0000 min
Max Allowable Q:	9999.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	0.8200 ac
Curve Number:	93.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: Site Basin

Scenario:	Scenario 2
Node:	Site
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	10.0000 min
Max Allowable Q:	9999.00 cfs

Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	9.2800 ac
Curve Number:	92.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Node: Dry Retention

Scenario:	Scenario 2
Type:	Stage/Volume
Base Flow:	0.00 cfs
Initial Stage:	16.00 ft
Warning Stage:	18.50 ft

Stage [ft]	Volume [ac-ft]	Volume [ft3]
16.00	0.00	0
16.50	0.25	10672
17.00	0.52	22651
17.50	0.83	35937
18.00	1.16	50530
18.50	1.51	65776
19.00	1.86	81022
19.50	2.21	96268

Comment:

Node: Lake

Scenario:	Scenario 2
Type:	Stage/Volume
Base Flow:	0.00 cfs
Initial Stage:	15.00 ft
Warning Stage:	18.50 ft

Stage [ft]	Volume [ac-ft]	Volume [ft3]
15.00	0.00	0
15.50	0.32	13939
16.00	0.65	28314
16.50	1.00	43560
17.00	1.37	59677
17.50	1.76	76666

Stage [ft]	Volume [ac-ft]	Volume [ft3]
18.00	2.16	94090
18.50	2.57	111949
19.00	2.98	129809
19.50	3.39	147668

Comment:

Node: MC Canal (North)

Scenario: Scenario 2
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 15.00 ft
Warning Stage: 17.50 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	12.00
0	0	0	12.0000	15.00
0	0	0	72.0000	17.00
0	0	0	96.0000	17.00
0	0	0	120.0000	15.00
0	0	0	160.0000	15.00
0	0	0	288.0000	12.00

Comment:

Node: Site

Scenario: Scenario 2
Type: Stage/Volume
Base Flow: 0.00 cfs
Initial Stage: 17.50 ft
Warning Stage: 19.00 ft

Stage [ft]	Volume [ac-ft]	Volume [ft3]
17.50	0.00	0
18.00	1.23	53492
18.50	3.98	173282
19.00	7.32	318772
19.50	10.95	477113

External Hydrograph

Comment:

Drop Structure Link: Outfall Structure		Upstream Pipe		Downstream Pipe	
Scenario:	Scenario 2	Invert:	15.00 ft	Invert:	14.50 ft
From Node:	Lake	Manning's N:	0.0130	Manning's N:	0.0130
To Node:	MC Canal (North)	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.25 ft	Max Depth:	1.25 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	10	Op Table:		Op Table:	
Pipe Count:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	325.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 ft				
Energy Switch:	Energy				

Pipe Comment:

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	16.00 ft	Ref Node:	
Control Elevation:	16.00 ft	Discharge Coefficients	
Max Depth:	3.25 ft	Weir Default:	3.200
Max Width:	4.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment:

Drop Structure Link: Retention Structure		Upstream Pipe		Downstream Pipe	
Scenario:	Scenario 2	Invert:	12.00 ft	Invert:	12.00 ft
From Node:	Dry Retention	Manning's N:	0.0110	Manning's N:	0.0110
To Node:	Lake	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	2	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000

Length:	500.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 ft				
Energy Switch:	Energy				

Pipe Comment:

Weir Component			
Weir:	1	Bottom Clip	
Weir Count:	2	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Horizontal	Top Clip	
Geometry Type:	Rectangular	Default:	0.00 ft
Invert:	17.50 ft	Op Table:	
Control Elevation:	17.50 ft	Ref Node:	
Max Depth:	2.00 ft	Discharge Coefficients	
Max Width:	3.00 ft	Weir Default:	3.200
Fillet:	0.00 ft	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment:

Drop Structure Link: Road Inlets		Upstream Pipe		Downstream Pipe	
Scenario:	Scenario 2	Invert:	16.00 ft	Invert:	16.00 ft
From Node:	Site	Manning's N:	0.0110	Manning's N:	0.0110
To Node:	Dry Retention	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	4	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	500.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 ft				
Energy Switch:	Energy				

Pipe Comment:

Weir Component

Weir:	1
Weir Count:	4
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Horizontal
Geometry Type:	Rectangular
Invert:	17.50 ft
Control Elevation:	17.50 ft
Max Depth:	2.00 ft
Max Width:	3.00 ft
Fillet:	0.00 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients

Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Drop Structure Comment:

Simulation: 10Y-1D

Scenario:	Scenario 2
Run Date/Time:	1/6/2020 4:35:27 PM
Program Version:	ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	48.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set: CN
Green-Ampt Set:
Vertical Layers Set:
Impervious Set: Impervious
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic
Dflt Damping (2D): 0.0050 ft
Min Node Srf Area (2D): 100 ft2
Energy Switch (2D): Energy

IA Recovery Time: 24.0000 hr
ET for Manual Basins: False
Smp/Man Basin Rain Opt: Global
OF Region Rain Opt: Global
Rainfall Name: ~FLMOD
Rainfall Amount: 7.00 in
Storm Duration: 24.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 25Y-3D

Scenario: Scenario 2
Run Date/Time: 1/6/2020 4:36:12 PM

Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	288.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set: CN
Green-Ampt Set:
Vertical Layers Set:
Impervious Set: Impervious
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	72.0000 hr
Max Iterations:	6	ET for Manual Basins:	False
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~SFWMD-72
		Rainfall Amount:	12.00 in
Edge Length Option:	Automatic	Storm Duration:	72.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (2D):	100 ft2	Min Node Srf Area (1D):	100 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment: