DONALD W. McINTOSH
ASSOCIATES, INC.

FONTANA
(NAVD 88)
OSCEOLA COUNTY, FLORIDA

ENGINEERING REPORT

Application for:
CONCEPTUAL ENVIRONMENTAL RESOURCE PERMIT MODIFICATION

CIVIL ENGINEERS

LAND PLANNERS

SURVEYORS

Submitted to:
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

FEBRUARY, 2021
JUNE, 2021
Revisions in Italics

PREPARED BY:

DONALD W. McINTOSH ASSOCIATES, INC.
Certification of Authorization No. 68
Dated March 7, 2001

James C. Nugent, PE, State of Florida, Professional Engineer, License No. 57553

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FONTANA
ENGINEERING REPORT

A. PROJECT OVERVIEW

1. Project Description

Fontana is a proposed mixed use development consisting primarily of residential uses. The development will include approximately 3,020 single family and multi-family residential units, with interspersed neighborhood and commercial centers, a centrally located school site and a future commercial marina with related facilities, to be permitted separately, at the southwest corner of the property. A copy of the current conceptual plan for the project is included with this application separately for reference. Water quantity and quality requirements will be met using 16 wet detention pond systems.

2. Project Area

The total property area is 677 acres, including approximately 624 acres of development.

3. Project Location

The property is located in unincorporated Osceola County in Sections 27, 28, 33, and 34, Township 26 South, and Range 30 East. The property is west of the Florida Turnpike (S.R. 91) and north of Friar's Cove Road. The property abuts Friar's Cove on the eastern side of Lake Tohopekaliga. Please refer to the Vicinity Map, Appendix B.1

4. Project Datum

All datum references contained within this report, the supporting calculations, and the conceptual stormwater management plans reference NAVD88 Datum.

5. Project Results

See the Critical Data Summary provided in Appendix A for tabulated results which meet the requirements of Osceola County and the South Florida Water Management District (SFWMD).

B. EXISTING CONDITIONS AND GENERAL SITE INFORMATION

1. Existing Drainage and Topography

The site topography slopes primarily to the east and the west, with the highest areas being located near to the center of the site. This results in easterly and westerly flow patterns. The easterly flow drains into the Gator Bay Slough via ditches and wetlands. The Gator Bay Slough flows into the WPA Canal, which

discharges at Friar's Cove and ultimately to Lake Tohopekaliga. The westerly flow drains into the WPA Canal and Lake Tohopekaliga via wetlands, ditches, and existing drainage pipes. Review of the elevation contours depicted on the LIDAR topographic data obtained from Osceola County indicates the site elevations range between 54 feet NAVD near Friar's Cove, to 68 feet NAVD at the high areas in the center of the site. General topographic information for the project area is depicted on the U.S.G.S. Quad Map, Appendix B.2. Site specific topographic information is presented on the Pre-Development Basin Map included in Appendix C and on the mass grading plans.

The project site is contained within the Lake Tohopekaliga drainage basin. The ultimate discharge point receiving runoff from the site is Lake Tohopekaliga, via ditches, wetlands, and canals. A small offsite area south of Friar's Cove Road drains onto the property.

2. Existing Land Use

The property is primarily pasture, wetlands, woods, and former orange groves. There is also extensive ditching from past agricultural use, as shown in the FLUCCS Map, Appendix B.6. The land use utilized in the analyses is a combination of off-site land coverage provided by SFWMD, as well as on-site land coverage as determined by the environmental consultant, Bio-Tech Consulting, Inc.

3. Soils and Groundwater

Please refer to the NRCS Soil Map, Appendix B.4, for a graphical representation of the soil types described in the Natural Resources Conservation Service (NRCS) Soil Survey of Osceola County. For further information, please refer to the Geotechnical Report for Fontana Property and related supporting documentation prepared by Devo Engineering and submitted for the original permit, Application No. 180510-569, a copy of which is included with this application submittal for completeness.

4. Lake Tohopekaliga

The ultimate discharge point of the site is Lake Tohopekaliga. Lake Tohopekaliga is a regulated lake with controlled elevations ranging between 51 and 54 feet NAVD. See Osceola County Lakes Management Plan Excerpt for more information, Appendix C.3.

5. 100-Year Floodplain

The western portion of the property abutting the WPA Canal lies within a Zone AE 100-year floodplain with a base flood elevation of 57.1 NAVD, as determined by FEMA, FIRM Maps 12097C0255G and 12097C0265G, and LOMR Case No. 16-04-3250P. The northeastern portion of the property lies within a Zone A 100-

year floodplain. Please refer to the FEMA Food Zone Map, Appendix B.5, for further information.

C. WATER QUANTITY ANALYSIS

1. Proposed Drainage Overview

The Fontana property is designed with *16* wet detention ponds for managing runoff generated from the development. The proposed ponds will discharge into on- and off-site wetlands and the WPA Canal. The ponds along the southern portion of the property will treat, attenuate, and cascade until discharging into the WPA Canal and nearby wetlands. The ponds located in the northern half of the property will treat, attenuate, and discharge into nearby wetlands and the Gator Bay Slough.

2. Design Criteria

Water quantity design and performance criteria are in accordance with SFWMD and Osceola County stormwater management system requirements as summarized below.

Discharge Rate Control (SFWMD):

Limit the post development peak discharge rate to that of pre-development for the 10-year, 72-hour design storm event or the design storm criteria specified by the local government, whichever is more stringent.

More specifically, the project lies within the Lake Tohopekaliga Basin (84,130 acres) as depicted on Figure 10 included in Appendix R (formerly Appendix 2) of the SFWMD SWERP Manual, "Allowable Discharge Values for Projects within the South Florida Water Management District". Appendix R prescribes the allowable discharge rate for Osceola County within the Lake Tohopekaliga Basin to be 17.5 CSM for the 10-year design event (10-year, 72-hour). Included in this appendix is a section titled "Use of Appendix 2 to Determine Allowable Discharge Values", which states: "It is also likely that the smaller basins should have higher unit area discharges." As indicated in Case 1 described in the Appendix, the immediate receiving waters comprise a) overland sheet flow directly to Friars Cove/Lake Tohopekaliga and b) secondary or tertiary man-made ditch (the WPA Canal and Gator Bay Slough, respectively), therefore the post development instantaneous peak discharge rate should be equal to (or no greater than) the pre-development rate for the appropriate design storm event so that new adverse water quantity impacts are not created. The proposed design is based on the latter criterion.

Discharge Rate Control (Osceola County):

Limit the post-development peak rate of discharge to that of the pre-development for the 10-year frequency, 72-hour duration design storm.

Freeboard (Osceola County):

All ponds are required to provide a minimum of twelve (12) inches freeboard between the design high water level for the 10-year, 72-hour design storm event and the minimum berm elevation.

3. Design Methodology

i. Runoff Hydrographs

Curve Number:

Hydrologic simulations of the design storm events were performed using the SCS Unit Hydrograph Method. Curve numbers were obtained from the SCS TR55 Manual, Second Edition, June 1986. Curve numbers were based on hydrologic soil group (per the NRCS Soils Survey of Osceola County) and land cover.

Rainfall Distribution(s):

Mean Annual (1-year/24-hour frequency) and the SFMWD 72-hr distribution (10-year/72-hour and 100-year/72-hour frequency storms)

Total Rainfall:

4.0 inches (1-year/24-hour)
7.5 inches (10-year/72-hour)
11.4 inches (100-year/72-hour)

Unit Hydrograph Shape Factor:

A shape factor of 256 was used in pre-development and post development hydrograph generations.

Time of Concentration:

The simplified form of the Kinematic Wave Equation was utilized in the time of concentration calculations, as outlined in the National Engineering Handbook Part 630, Chapter 15 (2010).

ii. Routing Analysis

Routing calculations were performed by Interconnected Pond Routing (v4.03.02) by Streamline Technologies, Inc.

iii. Boundary Conditions

Five (5) boundary nodes are used in the routing model. These include one node at Friar's Cove, representing Lake Tohopekaliga, two nodes in the

WPA Canal, and two nodes in the Gator Bay Slough. Lake Tohopekaliga is modeled as a fixed tailwater at elevation 54 feet NAVD, the highest regulated stage. The Gator Bay Slough and WPA Canal nodes are named and located based upon the Gator Bay Slough Study (2001) of Osceola County. The stages for all nodes are fixed at 54 feet NAVD, except for the node in the Gator Bay Slough at the northeast corner of site, adjacent to the Florida Turnpike, which is fixed at 57 feet NAVD, based upon the difference between initial stages provided in the Slough study. See Appendix C.2 for supporting documentation.

The total drainage area modeled includes both the on-site basins and related off-site basins contributing to the boundary nodes modeled. The total drainage area includes the areas of the water courses within the Gator Bay Slough and the WPA Canal; however, no modifications or alterations are proposed to these existing facilities.

D. WATER QUALITY ANALYSIS

1. Design Criteria

Water quality design and performance criteria are in accordance with SFWMD and Osceola County stormwater management system requirements, summarized as follows:

Wet Detention (SFWMD):

Treatment volume shall be the greater of the first inch of runoff from the basin or 2.5 inches of runoff times the percentage of imperviousness. An additional 50% of the volume required will be treated due to the project discharge to an impaired water body.

The outfall structure should be designed to drawdown no more than one-half inch of the required treatment volume within 24 hours following the design storm event.

Dry pretreatment for commercial projects within the proposed mixed-use development, as required by SFWMD rule, will be addressed at the time of final design on a project-specific basis.

Impaired Water Body (SFWMD and Osceola County):

Systems discharging to a waterbody that has been identified as impaired by FDEP are subject to additional criteria. An additional 50% water quality treatment volume must be provided and a site-specific pollutant analysis must be performed for the pollutant of concern.

2. Design Methodology

The project is within the Lake Tohopekaliga basin, which eventually contributes to Lake Okeechobee. Thus, it is subject to the impaired water body criteria. As a result, an additional 50% water quality treatment volume has been provided and a site-specific pollutant analysis has been performed for the pollutant of concern (phosphorous). The site-specific pollutant loading analysis was done for the site using BMPTRAINS (v8.6).

Land use maps are provided in Appendix D.2 which include land coverage categories used in BMPTRAINS, based upon FLUCCS codes and corresponding categories developed by BMPTRAINS. These land use categories with correlated FLUCCS codes are included in Appendix D.2.

E. WETLAND HYDROLOGY

1. Design Criteria

Preserve wetland hydrologic patterns based upon the Mean Annual design storm to limit adverse effects.

Lake-Wetland Separation Requirements (SFWMD):

Hydraulic gradients between 0.005 ft/ft and 0.015 ft/ft include calculations for drawdown that does not exceed 12 vertical inches in a 90-day period.

2. Design Methodology

Post development flows to the preserved wetlands are designed to match pre-development flows and stages, as practicable. Thus, treated discharge from the adjacent stormwater management areas is routed to the preserved wetlands to maintain hydration and control structures are placed within the perimeter buffers of the preserved wetlands to regulate stage and flow. Flows to the wetlands for both the pre-development and post-development conditions were evaluated using the Mean Annual storm event and comparative time-stage hydrographs for the pre-development and post development conditions are included in Appendix E, demonstrating adequate hydration flows and comparable wetland stages.

The Lake-Wetland Separation Table provided in Appendix E provides the calculated hydraulic gradient between the preserved wetlands and the adjacent wet detention ponds.

F. 100-YEAR FLOOD PLAIN COMPENSATING STORAGE

1. Design Criteria

Flood Plain Encroachment (SFWMD and Osceola County):

No net encroachment into the floodplain, between the average wet season water table and that encompassed by the 100-year event.

2. Methodology

Compensating storage is provided within the wet detention ponds to offset the fill of the proposed development. Two additional compensating storage areas are provided to address the flood plain encroachment associated with the proposed boat ramps, access road/parking area and future development pad. These compensating storage areas include a) the boat trailer access road and parking area which is graded to the 10-year storm peak stage elevation (55.8) and provide storage above that elevation for the FEMA 100-year event at elevation 57.1, and b) an upland excavation area between the boat ramps and the retaining wall around the future development pad. Flood plain impact and compensating storage exhibits and calculations are included in appendix F.

For the portion of the site within Zone AE, the limits of the floodplain were established by re-mapping the 57.1 foot NAVD base flood elevation onto the Osceola County LIDAR contours from 2016. The re-mapped 57.1 foot NAVD elevation is used as the limits of the flood, for comparing existing and proposed storage for the 100-year storm event. Similarly, the Zone A limits when projected onto the LIDAR contours correspond to an average elevation of 62.9 feet NAVD. The 62.9 foot NAVD contour was mapped onto the LIDAR contours, and used as the limits for existing and proposed storage in the 100-year storm event.

Fontana

Revisions to the Post-Development Model – June 2021

Basins

SMA-1	Revised basin area from 106.28 acres to 99.09 acres
MARINA	Revised basin from 7.14 acres to 6.91 acres
W-14	Revised basin from 13.06 acres to 12.92 acres
W-16	Revised basin from 15.88 acres to 16.41 acres

Links

CS-15	Revised orifice in control structure from SMA-15 to SMA-13

Water Quality

SMA-1	Revised water quality calculations to include MARINA area revision
MARINA	Revised water quality calculations
SMA-15-16	Revised orifice in water quality calculations

Spreader Swale Sizing

MARINA	Added spreader swale and bubble-up structure to LK TOHO/W-16 outfall

APPENDIX A

CRITICAL DATA SUMMARY

Critical Data Summary

Project Name:	**Fontana**
District Permit No:	**Existing Conceptual ERP: 49-100503-P/App. No. 190110-1099**
Location:	**Osceola County, S27,28,33,34/T26S/R30E**
Project Area:	**Proposed permit modification area is 7.3± acres. Overall project area previously permitted is ± 677.4 acres.**
Project Datum:	**NAVD88**
Project Land Use:	**Commercial, Residential**
Prepared By:	**Donald W. McIntosh Associates, Inc.**
Prepared For:	**Fontana Lakes, LLC**

New Projects or Previously Permitted Projects (Modifications)

Is this a new project or a modification to an existing project?

- ☐ New (The District will provide a permit number upon issuance).
- ☒ Modification

Application Types

- ☒ ERP (All new projects and most others)
- ☐ SWM (Grandfathered projects only)
- ☐ D & F (Grandfathered projects only)

Location

County

- ☐ Orange
- ☒ Osceola
- ☐ Polk

General Location:

Section	**27, 28, 33 & 34**
Township	**26 South**
Range	**30 East**

Owner and Permittee: **Fontana Lakes, LLC**
(Note: These entities should be the same unless the applicant has a Contract for Sale for the site. If so, the Contract for Sale should be submitted. In all cases the Warranty Deed should be submitted. If they are co-applicants, list both.)

Operating Entity: **Fontana Lakes Master Homeowners Association, Inc. (draft documents on file with the District)**

Project/Phase Area**: Proposed permit modification area is 7.3± acres. Overall project area previously permitted is ± 677.4 acres**

Project Land Use:

- ☒ Commercial
- ☒ Residential
- ☐ Industrial

☐ Other *(Specify type: _____)*

Drainage Basin (pick one): **Lake Tohopekaliga**

Receiving Water Body: **Lake Tohopekaliga**

Total Acres of Wetlands Onsite: **See Environmental Report**

Total Acres of Wetlands Impacts: **See Environmental Report**

Total Acres Preserved Wetlands: **See Environmental Report**

2.0 Project Site Description

The proposed Fontana development is a planned mixed use development, primarily residential. This site is located west of the Florida Turnpike (S.R. 91), and north of Friar's Cove Road, abutting Friar's Cove in Lake Tohopekaliga.

This development shall be divided into phases in the Preliminary Subdivision Plan (PSP).

3.0 Proposed Project

The proposed Fontana project is a 677.4 acres mixed use development, primarily residential, but also includes a school, community and commercial centers. The site is topographically divided approximately in the center, with slopes to the east and west. The westerly flow goes into Lake Tohopekaliga, and easterly flow makes its way into the Gator Bay Slough, through wetlands and ditches on-site and along the Florida Turnpike. The proposed development will contain 15 ponds for stormwater management. These stormwater management areas will provide water quality treatment and attenuation in accordance with the South Florida Water Management District and Osceola County design criteria. The post development peak discharge rates will be limited by the pre-development peak rates and the pre-development drainage patterns will be preserved, where possible. The western portion of the site adjacent to the WPA Canal is located within the 100-year floodplain Zone AE with a base flood elevation of 57.1 NAVD, as determined by FEMA, FIRM Maps 12097C0255G and 12097C0265G, LOMR Case No. 16-04-3250P. There is also a 100-year floodplain Zone A crossing through the northeast corner of the site, connecting the Gator Bay Slough with an existing wetland, as determined by FEMA, FIRM Maps 12097C0260G and 12097C0270G. Compensating storage for the floodplains will be provided in the proposed stormwater management areas.

This application is for a modification to the existing Conceptual Permit No. 49-100503-P/Application No. 190110-1099 for the Fontana project. As discussed with District Staff during the September 2, 2020 preapplication meeting and in subsequent telephone discussions, this modification includes changes to the previously permitted surface water management system for the project to add boat ramps with finger piers, an access road and parking area, and building pad grading for a future commercial facility at the southwest corner of the project site.

Modifications to the previously approved conceptual mass grading plans include the reconfiguration of stormwater management area SMA-1 and the addition of SMA-Marina with related changes to their respective drainage basins. The area of the proposed permit modification is 7.5± *acres*. Revised and updated stormwater management system calculations are provided demonstrating that the project remains

consistent with the previously permitted water quality, discharge rate and floodplain compensating storage volume requirements.

4.0 Conceptual Land Use Drainage Basins

Conceptual Land Use – Basin Level Breakdown[1]

Basin ID	Buildings[2] (acres)	Pavement (acres)	Water Mgmt (acres)	Pervious (acres)	Preservation (acres)	Total (acres)
SMA-1[3,3A]	*11.08*	*31.98*	*29.78*	*26.25*	*0.00*	*99.09*
SMA-2	1.47	7.9	2.36	6.09	0.00	17.81
SMA-3	2.34	9.18	6.44	6.98	0.00	24.94
SMA-4A	0.44	3.04	1.24	2.37	0.00	7.10
SMA-4B	0.44	3.06	1.31	2.91	0.00	7.72
SMA-5	4.65	25.82	4.64	15.15	0.00	50.26
SMA-6	2.03	13.63	3.97	16.74	0.00	36.37
POND-7	0.00	0.00	0.50	0.66	0.00	1.16
SMA-8	3.17	17.25	2.80	10.53	0.00	33.75
SMA-9	1.23	5.16	0.99	3.67	0.00	11.05
SMA-10	5.50	22.64	5.34	14.30	0.00	47.78
SMA-12[3]	9.49	36.15	9.40	22.72	0.00	77.76
SMA-13[3]	8.59	36.12	8.13	22.18	0.00	75.02
SMA-14	4.46	19.89	4.85	14.13	0.00	43.33
SMA-15[3]	5.64	29.62	7.91	18.07	0.00	61.24
SMA-16	1.52	6.66	2.16	5.05	0.00	15.39
W-11	0.00	0.00	0.00	4.48	6.44	10.92
W-14	*0.00*	*0.00*	*0.00*	*0.42*	*12.50*	*12.92*
W-15	0.00	0.00	0.00	5.55	4.52	10.07
W-16	*0.00*	*0.06*	*0.00*	*1.15*	*15.20*	*16.41*
W-4[4]	0.00	0.00	0.00	25.09	23.19	48.28
OFF-1[5]	0.00	0.00	0.00	5.16	0.00	5.16
OFF-2[6]	0.00	0.00	0.00	7.48	0.00	7.48
CANAL[7]	0.00	0.00	0.00	0.00	12.19	12.19
MARINA[3A]	*0.19*	*4.30*	*1.35*	*1.07*	*0.00*	*6.91*
Total	62.24	272.46	93.17	238.20	74.04	740.11[8]

[1]See "Wet Detention Water Quality Calculations" (Appendix D.2) for land use breakdown per basin
[2]Includes proposed buildings for residential, civic, and commercial land uses
[3]Basins include off-site drainage area from anticipated future development of Friar's Cove Road (9.24 acres)
[3A] Water quality treatment volume for Marina basin provided in SMA-1 – SMA-3 treatment volume
[4]Basin W-4 includes on- and off-site drainage areas; the off-site drainage area is 47.57 acres
[5]Basin OFF-1 includes only off-site drainage area south of Friar's Cove Road
[6]Basin OFF-2 includes on- and off-site drainage areas; the off-site drainage area is 0.80 acres located within the Turnpike R/W
[7]CANAL encompasses the area of the WPA Canal and Gator Bay Slough within property limits
[8]Total Area less the off-site drainage area is 677.34 acres (740.11 ac – 9.24 ac – 47.57 ac – 5.16 ac – 0.80 ac = 677.34 ac)

5.0 Surface Water Management Design Parameters

SMA ID	WQ Volume Required (ac-ft)	WQ Volume Provided (ac-ft)	Overflow Elevation (ft)	Maximum Discharge[1] 10-year/72-hour (cfs)	Receiving Node(s)[2,3]
SMA-1	*19.27*	25.40	54.90	*106.27*	WPA-006, WPA001, LK TOHO
SMA-2				*15.71*	
SMA-3				*7.14*	
SMA-4A	11.03	11.25	59.50	9.12	SMA-6
SMA-4B				4.61	
SMA-5				35.82	
SMA-6	4.55	5.34	58.80	57.02	W-11, GBS-001
SMA-8	15.97	16.09	62.20	23.37	W-4, GBS-004
SMA-9				7.30	
SMA-10				76.67	
SMA-12	13.12	13.47	59.40	*189.93*	SMA-1
SMA-13	12.95	13.37	62.60	*135.48*	SMA-12
SMA-14	7.03	7.51	63.50	*27.22*	SMA-13
SMA-15	12.70	*16.68*	64.10	*41.11*	SMA-13
SMA-16				*6.49*	
MARINA[4]	*0.86*	1.03	55.00	*7.91*	W-16

Note: All elevations are given in NAVD

[1]See Post-Development ICPR Nodal Maximum Conditions (Appendix C.2)

[2]W = Wetland, WPA = WPA Canal, GBS = Gator Bay Slough, LK TOHO = Lake Tohopekaliga

[3]WPA Canal and Gator Bay Slough ultimately discharge into Lake Tohopekaliga

[4]*Based on 1" over basin area, additional water quality treatment volume for impervious area provided in SMA-1*

Design Storm Event	**10-year/72-hour**	**10-year/72-hour**
Tailwater Node	**Pre-Development Max Inflow**	**Post Development Max Inflow**
GBS-004	173.94 cfs	62.16 cfs
GBS-001	80.34 cfs	56.55 cfs
WPA-006	12.20 cfs	*12.20 cfs*
WPA-001	87.57 cfs	*86.09 cfs*
LK TOHO	109.40 cfs	*94.03 cfs*
Total	**463.45 cfs**	***311.03 cfs***
Total Drainage Area[1]	**740.11 ac**	**740.11 ac**
Pro Rata Discharge	**0.63 cfs/ac**	**0.42 cfs/ac**

[1]Total Drainage Area includes all modeled basin areas, including on-site and related off-site basin areas (See Narrative C.3.iii.)

Design Storm Stages

SMA ID	Control Elevation (ft)	10yr/72hr Stage (ft)	Proposed Min. Rd. Crown[1] (ft)	100yr/72hr Stage (ft)	Proposed Min. FFE[2] (ft)
SMA-1	54.25	*56.76*	*56.76*	*57.65*	58.76
SMA-2	54.25	*56.78*	*56.78*	*57.69*	58.78
SMA-3	54.25	*56.77*	*56.77*	*57.69*	58.77
SMA-4A	58.00	60.86	60.86	61.89	62.86
SMA-4B	58.00	60.90	60.90	61.95	62.90
SMA-5	58.00	60.82	60.82	61.85	62.82
SMA-6	57.50	60.12	60.12	60.73	62.12
POND-7[3]	58.00	59.13	60.00	59.77	62.00
SMA-8	60.50	63.70	63.70	65.02	65.70
SMA-9	60.50	63.49	63.49	64.46	65.49
SMA-10	60.50	63.16	63.16	63.73	65.16
SMA-12	58.00	*60.98*	*60.98*	*61.78*	*62.98*
SMA-13	61.00	*63.68*	*63.68*	*64.68*	*65.68*
SMA-14	62.00	64.71	64.71	65.89	66.71
SMA-15	62.50	*65.05*	*65.05*	*66.35*	*67.05*
SMA-16	62.50	*65.21*	*65.21*	*66.53*	*67.21*
MARINA[1A]	*54.25*	*55.62*	*55.62*	*56.04*	*57.62*

Note: All elevations are given in NAVD

[1]Proposed minimum road crown elevations are set at the greater of 2' above the Control Elevation or the 10yr/72hr maximum flood stage (per SFMWD criteria).

[1A]Marina crown elevation set at 10yr/72hr stage according to SFWMD criteria

[2]Proposed minimum finished floor elevations have been set at the greater of 2' above the proposed road crown (per Osceola County criteria) or the 100yr/72hr maximum flood stage (per SFWMD criteria).

[3]No treatment or attenuation proposed in POND-7

Control Structures

	Orifice/Weir			Drop Inlet			Pipe		
Control Structure	**Type**	**Invert El. (ft)**	**Dimension**	**Type**	**Grate El. (ft)**	**Dimension**	**Type**	**Dia.**	**Length (ft)**
CS-1A	R	54.25	3”x2’-7”	R	56.25	3’x8’-9”	C	60”	49
	R	54.90	(2) 2’x1’ (1) 6’x1’						
CS-1B	R	54.90	2’x6”	R	56.25	3’-1”x4’-1”	C	36”	83
CS-5	C	58.00	6”	R	60.50	3’x8’-9”	C	48”	552
	R	59.50	(2) *2’x10”* (1) *7’x10”*						
CS-6A	C	57.50	5”	R	60.00	3’x6’-7”	C	48”	267
	R	58.80	(2) 2’x1’ (1) 6’x1’						
CS-6B				R	58.80	2’x3’-1”	C	18”	230
CS-W11				R	55.70	3’x4’-6”	C	24”	87
CS-8				R	62.20	2’x3’-1”	C	24”	1734
CS-10A	C	60.50	(2) 5”	R	63.5	3’x8’-9”	C	42”	575
	R	62.20	(2) 3’x1’-2” (1) 8’x1’-2”						
CS-10B				R	62.50	3’x6’-7”	C	42”	581
CS-12A	C	58.00	(2) 5”	R	60.50	3’x8’-9”	C	48”	272
	R	59.40	(2) 2’x9” (1) 6’x9”						
CS-12B				R	59.50	3’x8’-9”	C	48”	274
CS-13A	C	61.00	(2) 4.5”	R	62.60	3’x6’-7”	C	42”	160
CS-13B				R	62.60	3’x6’-7”	C	42”	160
CS-14	C	62.00	5”	R	64.50	3’x8’-9”	C	42”	618
	R	63.50	(2) 2’x10” (1) 5’x10”						
CS-15	C	62.50	*(2) 5”*	R	64.10	3’x8’-9”	C	48”	1552
CS-Marina	*C*	*54.25*	*2.75”*	*R*	*55.00*	*2’x3’-1”*	*C*	*18”*	*198*

Note: All elevations are given in NAVD

Types:
C = Circular, R = Rectangular

6.0 Water Use Sources – Potable, Wastewater, Dewatering, Irrigation

☐ Potable water supplier: **Potable water service to be supplied by the City of St. Cloud.**

☐ Wastewater supplier **Wastewater service to be supplied by the City of St. Cloud.**

Irrigation source:

☐ Public Utility supplier **Reclaimed water service to be supplied by the City of St. Cloud.**
☐ Irrigation Wells _____ Water Use Permit required
☐ Reuse water supplier _____
☐ Surface Water _____ Water Use Permit required

Dewatering:

A dewatering permit application will be submitted at the time of construction ERP permitting if required.

7.0 Water Resources

N/A

8.0 Wetland Impacts

See Environmental Report.

9.0 Mitigation

See Environmental Report.

10.0 Cumulative Impacts

See Environmental Report.

11.0 Wetland Inventory

See Environmental Report.

12.0 Threatened and Endangered Species

See Environmental Report.

APPENDIX B

MAPS

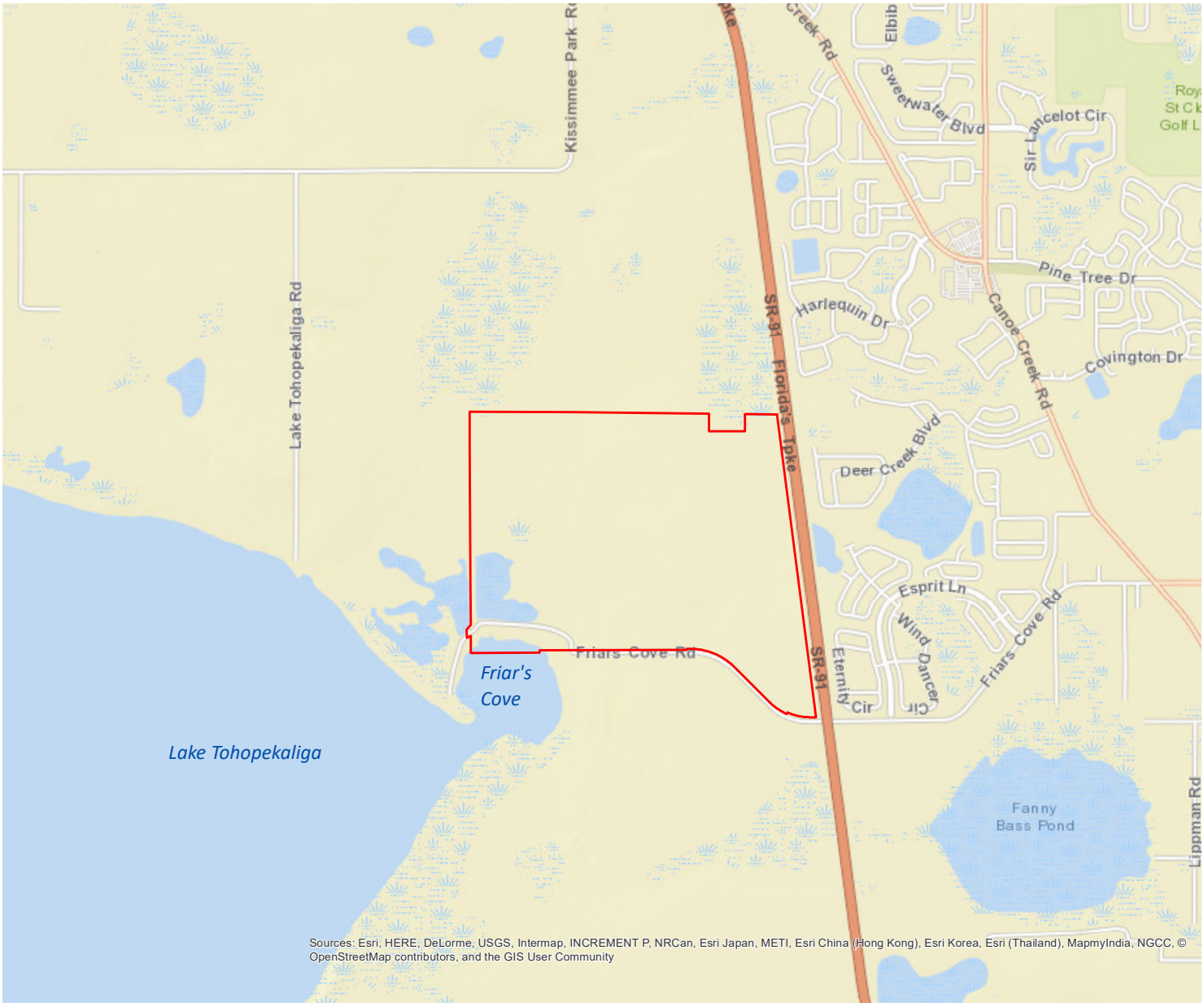
N

1"=3,000'

Fontana

Section 27, 28, 33 & 34, Township 26 S, Range 30 E

Osceola County, FL



Legend

Project Boundary

NOTES

1) This is not a survey.
2) This map is for planning and permitting activity for the above named project and should be used for those purposes only.
3) The base map shown hereon was obtained in digital format from ESRI ArcGIS online, based on the sources listed above.

Map B.1
Vicinity Map

DONALD W. McINTOSH ASSOCIATES, INC.
CIVIL ENGINEERS - LAND PLANNERS - SURVEYORS
2200 PARK AVENUE NORTH, WINTER PARK, FL 32789
PHONE 407.644.4068 FAX 407.644.8318

F:\Proj2013\13189\Gis\Exhibits\B.1 Vicinity Map.mxd

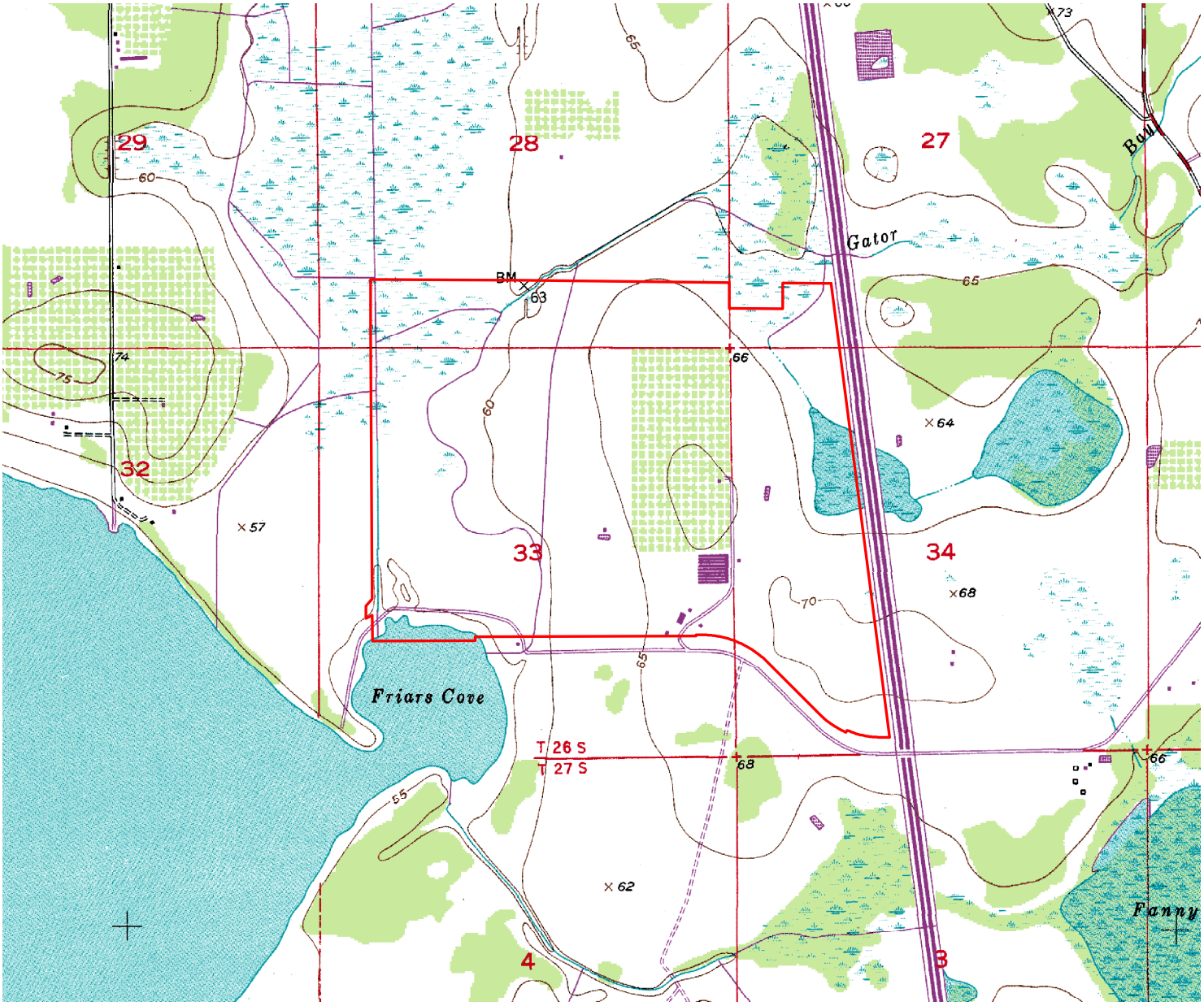
N

1"=2,000'

Fontana

Section 27, 28, 33 & 34, Township 26 S, Range 30 E

Osceola County, FL



Legend

Project Boundary

NOTES

1) This is not a survey.
2) This map is for planning and permitting activity for the above named project and should be used for those purposes only.
3) The Quad Map shown hereon was obtained in digital format from USGS, St. Cloud S panel.
4) This Quad Map is in NGVD29.

Map B.2
Quad Map

DONALD W. McINTOSH ASSOCIATES, INC.
CIVIL ENGINEERS - LAND PLANNERS - SURVEYORS
2200 PARK AVENUE NORTH, WINTER PARK, FL 32789
PHONE 407.644.4068 FAX 407.644.8318

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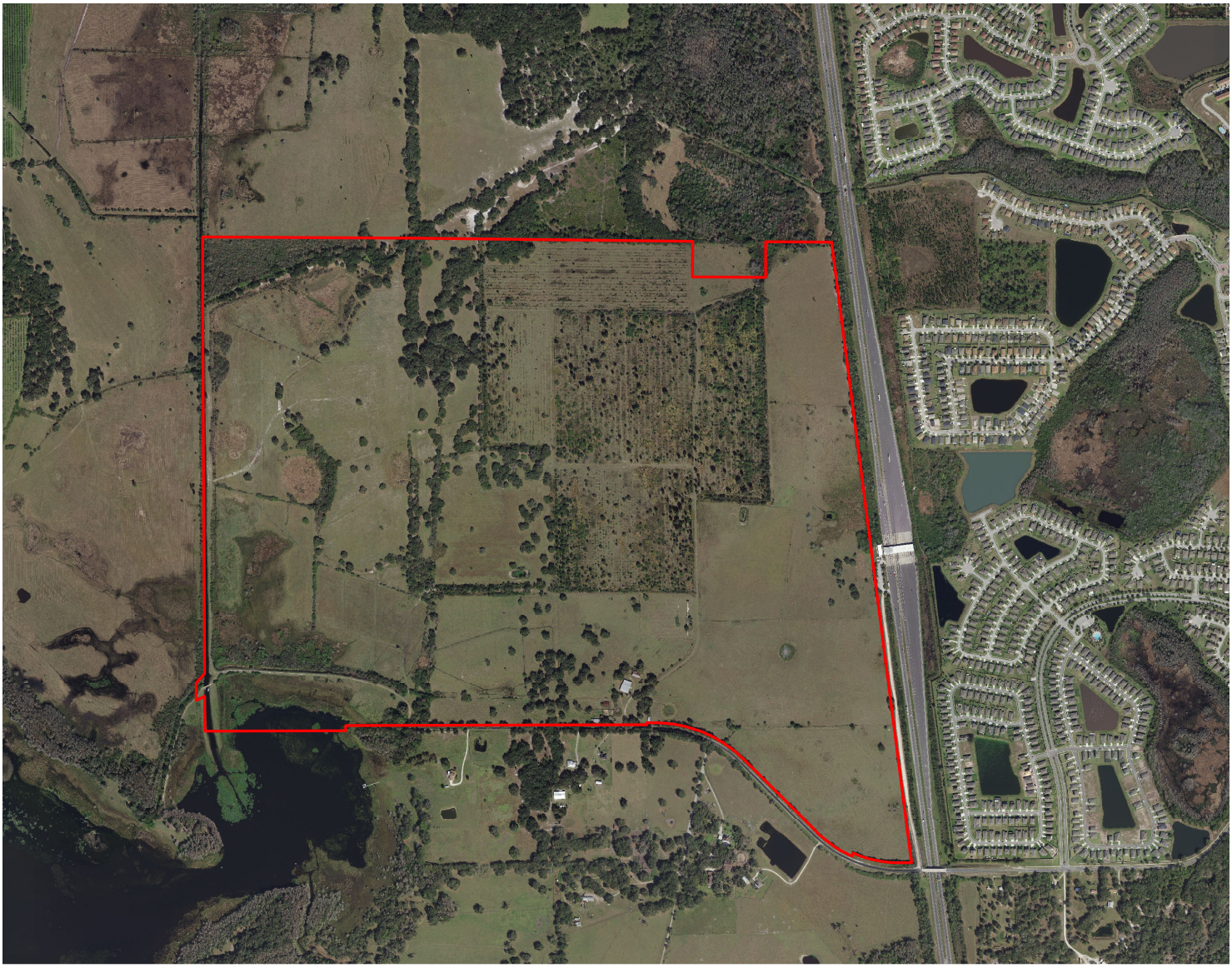
N

1"=1,500'

Fontana

Section 27, 28, 33 & 34, Township 26 S, Range 30 E

Osceola County, FL



Legend

Project Boundary

NOTES

1) This is not a survey.
2) This map is for planning and permitting activity for the above named project and should be used for those purposes only.
3) The Aerial map shown hereon was obtained in digital format from Osceola County (2017).

Map B.3
Site Aerial Map

DONALD W. McINTOSH ASSOCIATES, INC.
CIVIL ENGINEERS - LAND PLANNERS - SURVEYORS
2200 PARK AVENUE NORTH, WINTER PARK, FL 32789
PHONE 407.644.4068 FAX 407.644.8318

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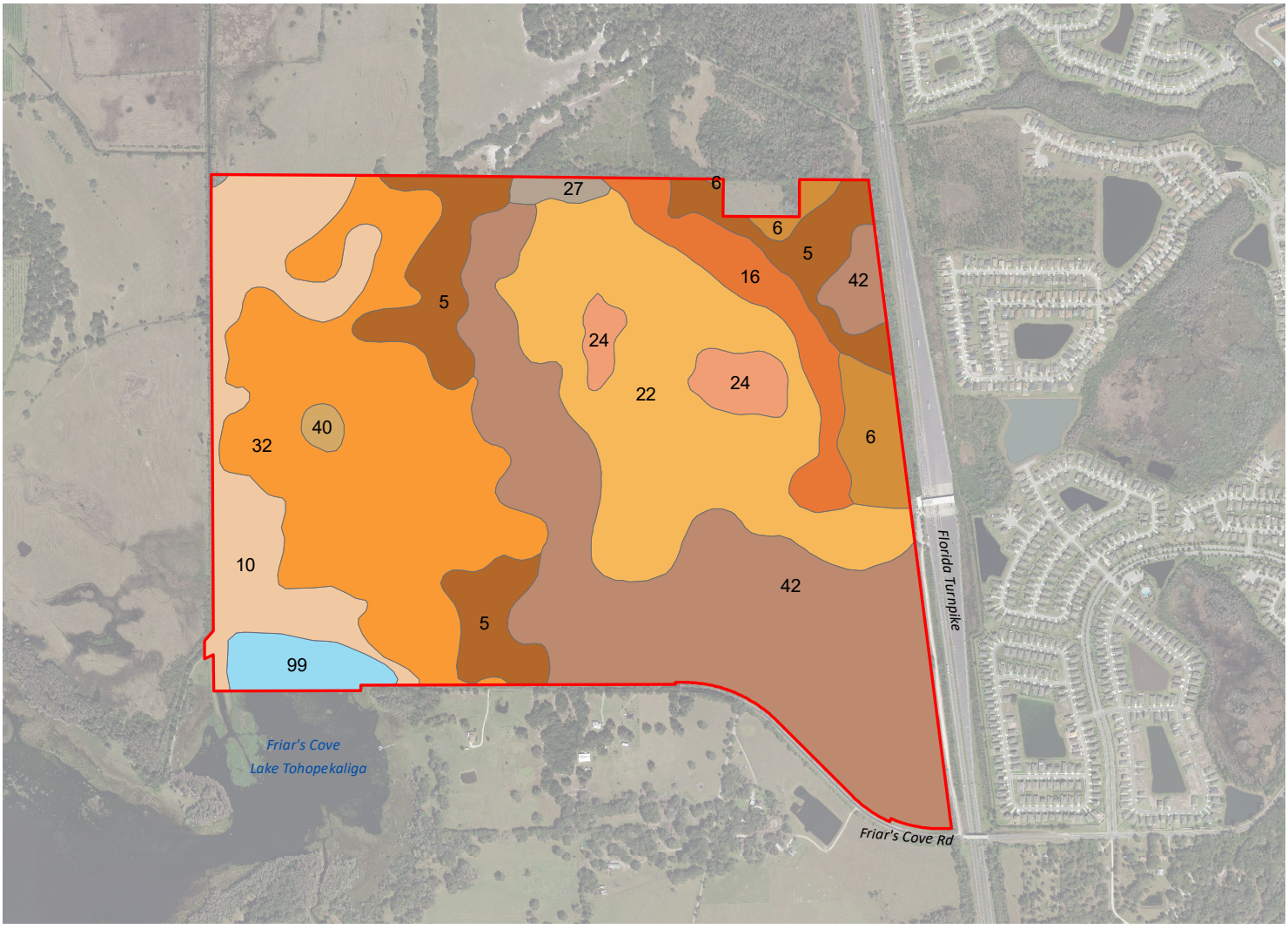
N

1"=1,500'

Fontana

Section 27, 28, 33 & 34, Township 26 S, Range 30 E

Osceola County, FL



Legend

Project Boundary

NRCS Soils

- 10 - Delray loamy fine sand, depressional
- 16 - Immokalee fine sand
- 22 - Myakka fine sand, 0 to 2 percent slopes
- 24 - Narcoossee fine sand, 0 to 2 percent slopes
- 27 - Ona fine sand
- 32 - Placid fine sand, depressional
- 40 - Samsula muck
- 42 - Smyrna fine sand, 0 to 2 percent slopes
- 5 - Basinger fine sand, 0 to 2 percent slopes
- 6 - Basinger fine sand, depressional, 0 to 1 percent slopes
- 99 - Water

NOTES

1) This is not a survey.
2) This map is for planning and permitting activity for the above named project and should be used for those purposes only.
3) The soils data shown hereon was obtained in digital format from the USDA Natural Resources Conservation Service Soil Survey map of Osceola County.

F:\Proj2013\13189\Gis\Exhibits\B.4 NRCS Soils Map.mxd

Map B.4
NRCS Soils Map

DONALD W. McINTOSH ASSOCIATES, INC.
CIVIL ENGINEERS - LAND PLANNERS - SURVEYORS
2200 PARK AVENUE NORTH, WINTER PARK, FL 32789
PHONE 407.644.4068 FAX 407.644.8318

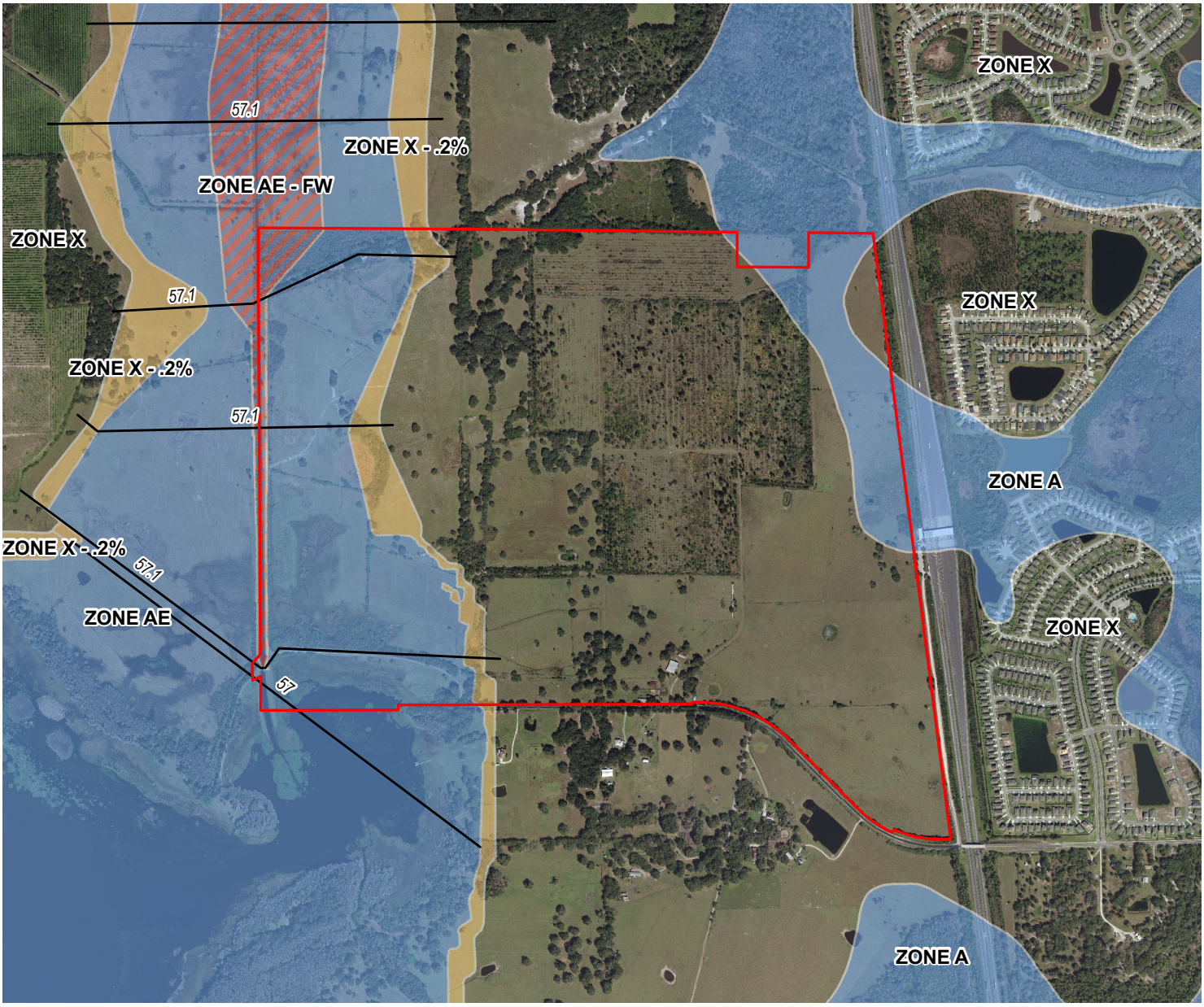
N

1"=1,500'

Fontana

Section 27, 28, 33 & 34, Township 26 S, Range 30 E

Osceola County, FL



Legend

Project Boundary

NOTES

1) This is not a survey.
2) This map is for planning and permitting activity for the above named project and should be used for those purposes only.
3) The flood zones shown hereon were obtained in digital format from FEMA and correspond to LOMR Case No. 16-04-3250P (eff. 3/31/2017) and Osceola County FIRM Maps: 12097C0255G (eff. 03/31/17), 12097C0260G (eff. 05/03/17), 12097C0265G (eff. 03/31/17), and 12097C0270G (eff. 6/18/13).

Map B.5
FEMA Flood Zone Map

DONALD W. McINTOSH ASSOCIATES, INC.
CIVIL ENGINEERS - LAND PLANNERS - SURVEYORS
2200 PARK AVENUE NORTH, WINTER PARK, FL 32789
PHONE 407.644.4068 FAX 407.644.8318

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Fontana

Section 27, 28, 33 & 34, Township 26 S, Range 30 E
Osceola County, FL

N

1"=1,250'

Legend

Project Boundary

FLUCCS

- 2110 - Improved Pastures
- 2130 - Woodland Pastures
- 2240 - Abandoned Citrus Groves
- 3100 - Herbaceous (Dry Prairie)
- 3210 - Palmetto Prairies
- 4270 - Live Oak
- 4380 - Mixed Hardwoods
- 5100 - Streams and Waterways
- 5200 - Lakes
- 5210 - Lakes larger than 500 acres
- 5340 - Reservoirs less than 10 acres
- 6170 - Mixed Wetland Hardwoods
- 6190 - Exotic Wetland Hardwoods
- 6210 - Cypress
- 6300 - Wetland Forested Mixed
- 6400 - Vegetated Non-Forested Wetlands
- 6410 - Freshwater Marshes
- 6430 - Wet Prairies
- 8140 - Roads and Highways

NOTES

1) This is not a survey.
2) This map is for planning and permitting activity for the above named project and should be used for those purposes only.
3) The land use data shown hereon was obtained in digital format from the South Florida Water Management District (2010) for all areas outside of the project boundary. Areas within the project boundary are based upon land use determined by Bio-Tech Consultants, Inc.

Map B.6
FLUCCS Map

DONALD W. McINTOSH ASSOCIATES, INC.
CIVIL ENGINEERS - LAND PLANNERS - SURVEYORS
2200 PARK AVENUE NORTH, WINTER PARK, FL 32789
PHONE 407.644.4068 FAX 407.644.8318

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APPENDIX C

WATER QUANTITY ANALYSIS

APPENDIX C.1

PRE-DEVELOPMENT
WATER QUANTITY ANALYSIS

LEGEND

Property Boundary

Basins

TC PATH

W-14 DNW 54.0 — NODE I.D. INITIAL STAGE ELEVATION

PRE-1 19.76 AC — BASIN I.D. BASIN ACREAGE

OUTFALL LK TOHO DNW 54.0 — OUTFALL I.D. INITIAL STAGE ELEVATION

GENERAL NOTES:

1. THE SCALE OF THIS DRAWING MAY HAVE CHANGED DUE TO REPRODUCTION.
2. LIDAR TOPO FROM OSCEOLA COUNTY (2016)
3. ELEVATIONS ARE IN NAVD88 DATUM

NO.	DATE	REVISIONS	CHK.

JAMES C. NUGENT
FLORIDA P.E. No. 57553
DATE:

DONALD W. McINTOSH ASSOCIATES, INC.
PLANNERS ENGINEERS SURVEYORS
2200 PARK AVENUE NORTH, WINTER PARK, FL 32789 407.644.4068
CERTIFICATE OF AUTHORIZATION NO. 68

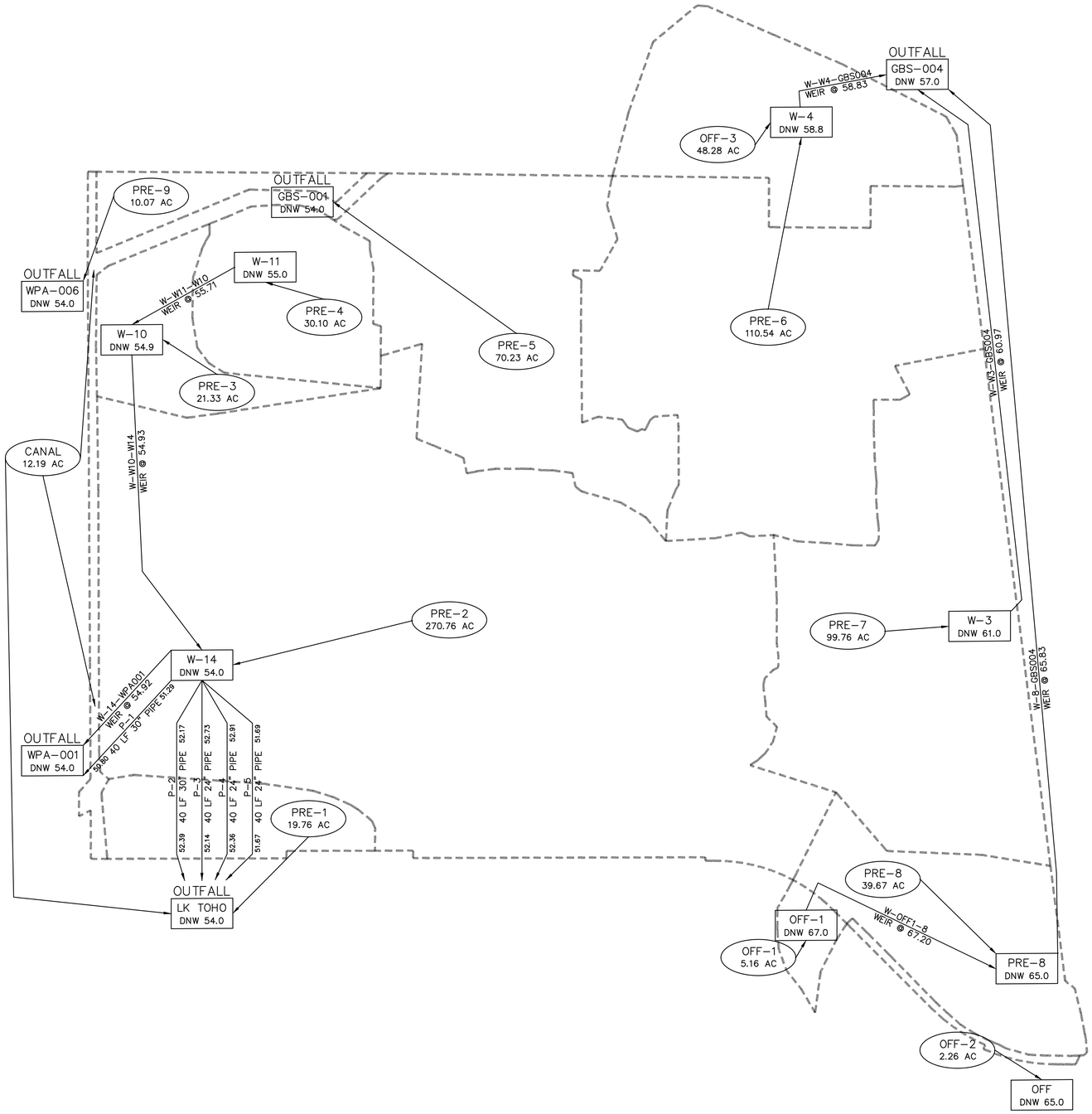
DRAWN BY	DESIGNED BY	CHECKED BY	DATE	SCALE	JOB NUMBER
ACC	ACC	JCN	4/24/2018	1"=400'	13189

FONTANA
OSCEOLA COUNTY, FL
PRE-DEVELOPMENT BASIN MAP

DRAWING 13189-XPREMAP

SHEET 1 OF 1

F:\Proj2013\13189\EDWG\Exhibits\13189-XPREMAP.dwg



LEGEND

W-14
DNW 54.0
NODE I.D.
INITIAL STAGE
ELEVATION

PRE-1
19.76 AC
BASIN I.D.
BASIN
ACREAGE

OUTFALL
LK TOHO
DNW 54.0
OUTFALL
OUTFALL I.D.
INITIAL STAGE
ELEVATION

W-14-WPA001
WEIR @ 54.92
LINK I.D.
LINK
DESCRIPTION

GENERAL NOTES:

1. ELEVATIONS ARE IN NAVD88 DATUM

NO.	DATE	REVISIONS	CHK.

JAMES C. NUGENT
FLORIDA P.E. No. 57553
DATE:

DONALD W. McINTOSH ASSOCIATES, INC.
ENGINEERS PLANNERS SURVEYORS
2200 PARK AVENUE NORTH, WINTER PARK, FL 32789 407.644.4068
CERTIFICATE OF AUTHORIZATION NO. 68

DRAWN BY ACC | DESIGNED BY ACC | CHECKED BY JCN | DATE 4/24/2018 | SCALE NTS | JOB NUMBER 13189

FONTANA
OSCEOLA COUNTY, FL
PRE-DEVELOPMENT NODAL DIAGRAM

DRAWING 13189-XPRENODE
SHEET 1 OF 1

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Fontana
Pre-Development Basin Hydrology Calculations

Date: 4/27/2018
By: ACC
Chk: JCN

Basin Name:	**CANAL**
Receiving Node:	**LK TOHO**
Basin Area:	**12.19 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
5	Basinger fine sand	A/D
10	Delray loamy fine sand, depressional	A/D
17	Kaliga muck	C/D
32	Placid fine sand, depressional	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Pasture (Good)	D	80	1.86		1.86	149
Woods (Good)	D	77	1.55		1.55	119
Wetlands	D	98		0.62	0.62	0
Water Surface	D	98		8.15	8.15	0
Totals:			3.41	8.78	12.19	268

Composite CN (exc. DCIA) =	**79**
Composite DCIA =	**72%**

Time of Concentration (T_c) Calculations

Equations

Sheet Flow: $T_t = \frac{0.007(nL)^{0.8}}{(4.8)^{0.5}(S^{0.4}/100)}$ where: $L \leq 100$ ft., S = slope (%), n = Manning's "n"

Shallow Concentrated Flow: $T_t = \frac{L}{60V}$ where:

	Description:
$V = 2.516(S)^{0.5}$	Forest & Meadow (F&M)
$V = 5.032(S)^{0.5}$	Fallow & Woodland (F&W)
$V = 6.962(S)^{0.5}$	Short Grass Pasture (Pasture)
$V = 8.762(S)^{0.5}$	Nearly Bare Ground (Bare)
$V = 9.965(S)^{0.5}$	Cultivated Straight Row Crops (Cultivated)
$V = 16.135(S)^{0.5}$	Grassed Waterway (GW)
$V = 20.328(S)^{0.5}$	Pavement & Small Upland Gullies (Paved)

Note: Shallow Concentrated Flow Velocity equations obtained from the National Engineering Handbook, Part 630 Hydrology, Chapter 15, Table 15-3

Channel Flow: $T_t = \frac{L}{60V}$ where: V = 2.5 fps (assumed)

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	65	0.24	6.2	-	5.3

Note: 10-minute Time of Concentration is used when calculated value is less.

Time of Conc. =	**5 Minutes**

Fontana
Pre-Development Basin Hydrology Calculations

Date: 4/27/2018
By: ACC
Chk: JCN

Basin Name:	**OFF-1**
Receiving Node:	**OFF-1**
Basin Area:	**5.16 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
24	Narcoossee fine sand	A
42	Smyrna fine sand	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Pasture (Good)	A	39	0.21		0.21	8
Pasture (Good)	D	80	4.26		4.26	341
Woods-Grass Comb. (Good)	A	32	0.68		0.68	22
Woods-Grass Comb. (Good)	D	79	0.01		0.01	1
Totals:			5.16	-	5.16	372

Composite CN (exc. DCIA) =	**72**
Composite DCIA =	**-**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.24	1.9	-	11.9
Shallow Conc. (Pasture)	495		0.4	0.44	18.7

Time of Conc. =	**31 Minutes**

Basin Name:	**OFF-2**
Receiving Node:	**OFF**
Basin Area:	**2.26 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
42	Smyrna fine sand	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Pasture (Good)	D	80	2.26		2.26	181
Totals:			2.26	-	2.26	181

Composite CN (exc. DCIA) =	**80**
Composite DCIA =	**-**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.24	4.4	-	8.5
Shallow Conc. (Pasture)	10		1.9	0.96	0.2

Note: 10-minute Time of Concentration is used when calculated value is less.

Time of Conc. =	**9 Minutes**

Fontana
Pre-Development Basin Hydrology Calculations

Date: 4/27/2018
By: ACC
Chk: JCN

Basin Name:	**OFF-3**
Receiving Node:	**W-4**
Basin Area:	**48.28 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
5	Basinger fine sand	A/D
6	Basinger fine sand, depressional	A/D
16	Immokalee fine sand	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Brush (Good)	D	73	11.83		11.83	864
Pasture (Good)	D	80	5.66		5.66	453
Woods-Grass Comb. (Good)	D	79	7.15		7.15	565
Wetlands	D	98		23.64	23.64	0
Totals:			24.64	23.64	48.28	1881

Composite CN (exc. DCIA) =	**76**
Composite DCIA =	**49%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.24	0.8	-	16.8
Shallow Conc. (Pasture)	820		0.7	0.58	23.5

Time of Conc. =	**40 Minutes**

Basin Name:	**PRE-1**
Receiving Node:	**LK TOHO**
Basin Area:	**19.76 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
10	Delray loamy fine sand, depressional	A/D
32	Placid fine sand, depressional	A/D
99	Water	N/A

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Pasture (Good)	D	80	4.21		4.21	337
Water Surface	D	98		15.55	15.55	0
Totals:			4.21	15.55	19.76	337

Composite CN (exc. DCIA) =	**80**
Composite DCIA =	**79%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.24	0.7	-	17.7
Shallow Conc. (Pasture)	185		0.8	0.62	5.0

Time of Conc. =	**23 Minutes**

Fontana
Pre-Development Basin Hydrology Calculations

Date: 4/27/2018
By: ACC
Chk: JCN

Basin Name:	**PRE-2**
Receiving Node:	**W-14**
Basin Area:	**270.76 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
5	Basinger fine sand	A/D
10	Delray loamy fine sand, depressional	A/D
22	Myakka fine sand	A/D
32	Placid fine sand, depressional	A/D
40	Samsula muck	A/D
42	Smyrna fine sand	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Pasture (Good)	D	80	175.04		175.04	14003
Woods (Good)	D	77	17.53		17.53	1350
Woods-Grass Comb. (Good)	D	79	28.15		28.15	2224
Wetlands	D	98		37.64	37.64	0
Water Surface	D	98		12.40	12.40	0
Totals:			220.72	50.04	270.76	17577

Composite CN (exc. DCIA) =	**80**
Composite DCIA =	**18%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.24	0.2	-	29.3
Shallow Conc. (Pasture)	2200		0.3	0.38	96.2
Channel Flow	1975			2.50	13.2

Time of Conc. =	**139 Minutes**

Basin Name:	**PRE-3**
Receiving Node:	**W-10**
Basin Area:	**21.33 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
5	Basinger fine sand	A/D
10	Delray loamy fine sand, depressional	A/D
32	Placid fine sand, depressional	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Pasture (Good)	D	80	18.62		18.62	1490
Wetlands	D	98		0.84	0.84	0
Water Surface	D	98		1.87	1.87	0
Totals:			18.62	2.71	21.33	1490

Composite CN (exc. DCIA) =	**80**
Composite DCIA =	**13%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.24	0.4	-	22.2
Shallow Conc. (Pasture)	1485		0.4	0.44	56.2

Time of Conc. =	**78 Minutes**

Fontana
Pre-Development Basin Hydrology Calculations

Date: 4/27/2018
By: ACC
Chk: JCN

Basin Name:	**PRE-4**
Receiving Node:	**W-11**
Basin Area:	**30.10 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
5	Basinger fine sand	A/D
10	Delray loamy fine sand, depressional	A/D
32	Placid fine sand, depressional	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Pasture (Good)	D	80	21.28		21.28	1702
Woods (Good)	D	77	1.26		1.26	97
Wetlands	D	98		6.47	6.47	0
Water Surface	D	98		1.09	1.09	0
Totals:			22.54	7.56	30.10	1799

Composite CN (exc. DCIA) =	**80**
Composite DCIA =	**25%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.24	0.5	-	20.3
Shallow Conc. (Pasture)	1080		0.5	0.49	36.6

Time of Conc. =	**57 Minutes**

Basin Name:	**PRE-5**
Receiving Node:	**GBS-001**
Basin Area:	**70.23 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
5	Basinger fine sand	A/D
16	Immokalee fine sand	A/D
22	Myakka fine sand	A/D
24	Narcoossee fine sand	A
27	Ona fine sand	B/D
32	Placid fine sand, depressional	A/D
42	Smyrna fine sand	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Pasture (Good)	D	80	0.22		0.22	18
Woods (Good)	D	77	23.22		23.22	1788
Woods-Grass Comb. (Good)	A	32	1.20		1.20	38
Woods-Grass Comb. (Good)	D	79	39.05		39.05	3085
Water Surface	D	98		6.54	6.54	0
Totals:			63.69	6.54	70.23	4929

Composite CN (exc. DCIA) =	**77**
Composite DCIA =	**9%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.24	0.2	-	29.3
Shallow Conc. (Pasture)	440		0.7	0.58	12.6
Channel Flow	2465			2.50	16.4

Time of Conc. =	**58 Minutes**

Fontana
Pre-Development Basin Hydrology Calculations

Date: 4/27/2018
By: ACC
Chk: JCN

Basin Name:	**PRE-6**
Receiving Node:	**W-4**
Basin Area:	**110.54 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
5	Basinger fine sand	A/D
6	Basinger fine sand, depressional	A/D
16	Immokalee fine sand	A/D
22	Myakka fine sand	A/D
24	Narcoossee fine sand	A
27	Ona fine sand	B/D
42	Smyrna fine sand	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Pasture (Good)	D	80	22.14		22.14	1771
Woods-Grass Comb. (Good)	A	32	13.58		13.58	435
Woods-Grass Comb. (Good)	D	79	68.61		68.61	5420
Wetlands	D	98		1.30	1.30	0
Water Surface	D	98		4.91	4.91	0
Totals:			104.33	6.21	110.54	7626

Composite CN (exc. DCIA) =	**73**
Composite DCIA =	**6%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.24	0.2	-	29.3
Shallow Conc. (Pasture)	1540		0.4	0.44	58.3
Channel Flow	195			2.50	1.3

Time of Conc. =	**89 Minutes**

Basin Name:	**PRE-7**
Receiving Node:	**W-3**
Basin Area:	**99.76 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
5	Basinger fine sand	A/D
6	Basinger fine sand, depressional	A/D
16	Immokalee fine sand	A/D
22	Myakka fine sand	A/D
42	Smyrna fine sand	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Pasture (Good)	D	80	86.81		86.81	6945
Woods-Grass Comb. (Good)	D	79	0.01		0.01	1
Wetlands	D	98		12.29	12.29	0
Water Surface	D	98		0.65	0.65	0
Totals:			86.82	12.94	99.76	6946

Composite CN (exc. DCIA) =	**80**
Composite DCIA =	**13%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.24	1.1	-	14.8
Shallow Conc. (Pasture)	1475		0.5	0.49	49.9

Time of Conc. =	**65 Minutes**

Fontana
Pre-Development Basin Hydrology Calculations

Date: 4/27/2018
By: ACC
Chk: JCN

Basin Name:	**PRE-8**
Receiving Node:	**PRE-8**
Basin Area:	**39.67 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
42	Smyrna fine sand	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Pasture (Good)	D	80	39.11		39.11	3129
R.O.W. (Paved, Open Ditch)	D	93		0.56	0.56	0
Totals:			39.11	0.56	39.67	3129

Composite CN (exc. DCIA) =	**80**
Composite DCIA =	**1%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.24	0.2	-	29.3
Shallow Conc. (Pasture)	2195		0.2	0.31	117.5

Time of Conc. =	**147 Minutes**

Basin Name:	**PRE-9**
Receiving Node:	**WPA-006**
Basin Area:	**10.07 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
5	Basinger fine sand	A/D
10	Delray loamy fine sand, depressional	A/D
17	Kaliga muck	C/D
32	Placid fine sand, depressional	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Woods (Good)	D	77	5.55		5.55	427
Wetlands	D	98		4.52	4.52	0
Totals:			5.55	4.52	10.07	427

Composite CN (exc. DCIA) =	**77**
Composite DCIA =	**45%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.24	1.6	-	12.7
Shallow Conc. (Pasture)	1070		0.3	0.38	46.8

Time of Conc. =	**60 Minutes**

Manual Basin: CANAL

Scenario: Pre
Node: LK TOHO
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 10.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
12.19	CANAL	D	

Comment:

Manual Basin: OFF-1

Scenario: Pre
Node: OFF-1
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 31.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
5.16	OFF-1	D	

Comment:

Manual Basin: OFF-2

Scenario: Pre
Node: OFF
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 10.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
2.26	OFF-2	D	

Comment:

Manual Basin: OFF-3

Scenario: Pre
Node: W-4
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 40.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
48.28	OFF-3	D	

Comment:

Manual Basin: PRE-1

Scenario: Pre
Node: LK TOHO
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 23.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
19.76	PRE-1	D	

Comment:

Manual Basin: PRE-2

Scenario: Pre
Node: W-14
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 139.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
270.76	PRE-2	D	

Comment:

Manual Basin: PRE-3

Scenario: Pre
Node: W-10
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 78.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
21.33	PRE-3	D	

Comment:

Manual Basin: PRE-4

Scenario: Pre
Node: W-11
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 57.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
30.10	PRE-4	D	

Comment:

Manual Basin: PRE-5

Scenario: Pre
Node: GBS-001
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 58.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
70.23	PRE-5	D	

Comment:

Manual Basin: PRE-6

Scenario: Pre
Node: W-4
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 89.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
110.54	PRE-6	D	

Comment:

Manual Basin: PRE-7

Scenario: Pre
Node: W-3
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 65.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
99.76	PRE-7	D	

Comment:

Manual Basin: PRE-8

Scenario: Pre
Node: PRE-8
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 147.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
39.67	PRE-8	D	

Comment:

Manual Basin: PRE-9

Scenario: Pre
Node: WPA-006
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 60.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
10.07	PRE-9	D	

Comment:

Curve Number: Basin Composite CN [Set]

Land Cover Zone	Soil Zone	Curve Number [dec]
CANAL	D	79.0
OFF-1	D	72.0
OFF-2	D	80.0
OFF-3	D	76.0
PRE-1	D	80.0
PRE-2	D	80.0
PRE-3	D	80.0
PRE-4	D	80.0
PRE-5	D	77.0
PRE-6	D	73.0
PRE-7	D	80.0
PRE-8	D	80.0
PRE-9	D	77.0

Impervious: Basin Composite DCIA [Set]

Land Cover Zone	% Impervious	% DCIA	% Direct	Ia Impervious [in]	Ia Pervious [in]
CANAL	72.00	72.00	0.00	0.000	0.000
OFF-1	0.00	0.00	0.00	0.000	0.000
OFF-2	0.00	0.00	0.00	0.000	0.000
OFF-3	49.00	49.00	0.00	0.000	0.000
PRE-1	79.00	79.00	0.00	0.000	0.000
PRE-2	18.00	18.00	0.00	0.000	0.000
PRE-3	13.00	13.00	0.00	0.000	0.000
PRE-4	25.00	25.00	0.00	0.000	0.000
PRE-5	9.00	9.00	0.00	0.000	0.000
PRE-6	6.00	6.00	0.00	0.000	0.000

Land Cover Zone	% Impervious	% DCIA	% Direct	Ia Impervious [in]	Ia Pervious [in]
PRE-7	13.00	13.00	0.00	0.000	0.000
PRE-8	1.00	1.00	0.00	0.000	0.000
PRE-9	45.00	45.00	0.00	0.000	0.000

Node: GBS-001

Scenario: Pre
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 54.00 ft
Warning Stage: 54.50 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.00	54.00
0	0	0	100.00	54.00

Comment:

Node: GBS-004

Scenario: Pre
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 57.00 ft
Warning Stage: 57.50 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.00	57.00
0	0	0	100.00	57.00

Comment:

Node: LK TOHO

Scenario: Pre
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 54.00 ft
Warning Stage: 54.50 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.00	54.00
0	0	0	100.00	54.00

Comment:

Node: OFF

Scenario: Pre
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 65.00 ft
Warning Stage: 65.50 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.00	65.00
0	0	0	100.00	65.00

Comment:

Node: OFF-1

Scenario: Pre
Type: Stage/Volume
Base Flow: 0.00 cfs
Initial Stage: 67.00 ft
Warning Stage: 68.00 ft

Stage [ft]	Volume [ac-ft]	Volume [ft3]
67.00	0.00	0
67.50	0.23	10019
68.00	0.61	26572

Comment:

Node: PRE-8

Scenario: Pre
Type: Stage/Volume
Base Flow: 0.00 cfs
Initial Stage: 65.00 ft
Warning Stage: 67.00 ft

Stage [ft]	Volume [ac-ft]	Volume [ft3]
65.00	0.00	0
65.50	0.05	2178
66.00	0.24	10454
66.50	2.33	101495
67.00	5.98	260489

Comment:

Node: W-10

Scenario: Pre
Type: Stage/Volume
Base Flow: 0.00 cfs
Initial Stage: 54.93 ft
Warning Stage: 57.00 ft

Stage [ft]	Volume [ac-ft]	Volume [ft3]
54.90	0.00	0
55.00	0.03	1307
55.50	1.27	55321
56.00	3.80	165528
56.50	9.27	403801
57.00	15.75	686070

Comment:

Node: W-11

Scenario: Pre
Type: Stage/Volume
Base Flow: 0.00 cfs
Initial Stage: 55.00 ft
Warning Stage: 57.00 ft

Stage [ft]	Volume [ac-ft]	Volume [ft3]
55.00	0.00	0
55.50	2.40	104544
56.00	6.07	264409
56.50	11.24	489614
57.00	17.02	741391

Comment:

Node: W-14

Scenario: Pre
Type: Stage/Volume
Base Flow: 0.00 cfs
Initial Stage: 54.00 ft
Warning Stage: 56.00 ft

Stage [ft]	Volume [ac-ft]	Volume [ft3]
54.00	0.29	12632
54.50	11.40	496584
55.00	24.68	1075061
55.50	43.02	1873951
56.00	65.31	2844904

Comment:

Node: W-3

Scenario: Pre
Type: Stage/Volume
Base Flow: 0.00 cfs
Initial Stage: 61.00 ft
Warning Stage: 63.00 ft

Stage [ft]	Volume [ac-ft]	Volume [ft3]
61.00	0.02	871
61.50	3.60	156816
62.00	8.79	382892
62.50	15.75	686070
63.00	23.78	1035857

Comment:

Node: W-4

Scenario: Pre
Type: Stage/Volume
Base Flow: 0.00 cfs
Initial Stage: 58.83 ft
Warning Stage: 61.00 ft

Stage [ft]	Volume [ac-ft]	Volume [ft3]
58.00	0.01	436
59.00	6.30	274428
59.50	16.75	729630
60.00	29.37	1279357
60.50	44.18	1924481

Stage [ft]	Volume [ac-ft]	Volume [ft3]
61.00	59.89	2608808

Comment:

Node: WPA-001

Scenario: Pre
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 54.00 ft
Warning Stage: 54.50 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.00	54.00
0	0	0	100.00	54.00

Comment:

Node: WPA-006

Scenario: Pre
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 54.00 ft
Warning Stage: 54.50 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.00	54.00
0	0	0	999.00	54.00

Comment:

Pipe Link: P-1

Scenario: Pre
From Node: W-14
To Node: WPA-001
Link Count: 1
Flow Direction: Both
Damping: 0.0000 ft
Length: 40.00 ft
FHWA Code: 6

Upstream		Downstream	
Invert:	51.29 ft	Invert:	50.80 ft
Manning's N:	0.012	Manning's N:	0.012
Geometry: Circular		Geometry: Circular	
Max Depth:	2.50 ft	Max Depth:	2.50 ft
Bottom Clip			
Default:	0.00 ft	Default:	0.00 ft
Op Table:		Op Table:	
Ref Node:		Ref Node:	

Entr Loss Coef:	0.90	Manning's N:	0.000	Manning's N:	0.000
Exit Loss Coef:	1.00		Top Clip		
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 ft	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.000	Manning's N:	0.000

Comment:

Pipe Link: P-2		Upstream		Downstream	
Scenario:	Pre	Invert:	52.17 ft	Invert:	52.39 ft
From Node:	W-14	Manning's N:	0.012	Manning's N:	0.012
To Node:	LK TOHO	Geometry:	Circular	Geometry:	Circular
Link Count:	1	Max Depth:	2.50 ft	Max Depth:	2.50 ft
Flow Direction:	Both		Bottom Clip		
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	40.00 ft	Op Table:		Op Table:	
FHWA Code:	6	Ref Node:		Ref Node:	
Entr Loss Coef:	0.90	Manning's N:	0.000	Manning's N:	0.000
Exit Loss Coef:	1.00		Top Clip		
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 ft	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.000	Manning's N:	0.000

Comment:

Pipe Link: P-3		Upstream		Downstream	
Scenario:	Pre	Invert:	52.73 ft	Invert:	52.14 ft
From Node:	W-14	Manning's N:	0.012	Manning's N:	0.012
To Node:	LK TOHO	Geometry:	Circular	Geometry:	Circular
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both		Bottom Clip		
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	40.00 ft	Op Table:		Op Table:	
FHWA Code:	6	Ref Node:		Ref Node:	
Entr Loss Coef:	0.90	Manning's N:	0.000	Manning's N:	0.000
Exit Loss Coef:	1.00		Top Clip		
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 ft	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.000	Manning's N:	0.000

Comment:

Pipe Link: P-4		Upstream		Downstream	
Scenario:	Pre	Invert:	52.91 ft	Invert:	52.36 ft
From Node:	W-14	Manning's N:	0.012	Manning's N:	0.012
To Node:	LK TOHO	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	40.00 ft	Op Table:		Op Table:	
FHWA Code:	6	Ref Node:		Ref Node:	
Entr Loss Coef:	0.90	Manning's N:	0.000	Manning's N:	0.000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 ft	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.000	Manning's N:	0.000

Comment:

Pipe Link: P-5		Upstream		Downstream	
Scenario:	Pre	Invert:	51.69 ft	Invert:	51.67 ft
From Node:	W-14	Manning's N:	0.012	Manning's N:	0.012
To Node:	LK TOHO	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	40.00 ft	Op Table:		Op Table:	
FHWA Code:	6	Ref Node:		Ref Node:	
Entr Loss Coef:	0.90	Manning's N:	0.000	Manning's N:	0.000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 ft	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.000	Manning's N:	0.000

Comment:

Weir Link: W-8-GBS004			
Scenario:	Pre	Bottom Clip	
From Node:	PRE-8	Default:	0.00 ft
To Node:	GBS-004	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Irregular	Ref Node:	
Invert:	65.83 ft	Discharge Coefficients	
Control Elevation:	65.83 ft	Weir Default:	2.800

Cross Section:	X-8-GBS004		
		Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Comment:

Weir Link: W-OFF1-8

Scenario:	Pre	**Bottom Clip**	
From Node:	OFF-1	Default:	0.00 ft
To Node:	PRE-8	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Irregular	Ref Node:	
Invert:	67.20 ft	**Discharge Coefficients**	
Control Elevation:	67.20 ft	Weir Default:	2.800
Cross Section:	X-OFF1-8	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Comment:

Weir Link: W-W10-W14

Scenario:	Pre	**Bottom Clip**	
From Node:	W-10	Default:	0.00 ft
To Node:	W-14	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Irregular	Ref Node:	
Invert:	54.93 ft	**Discharge Coefficients**	
Control Elevation:	54.93 ft	Weir Default:	2.800
Cross Section:	X-10-14	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Comment:

Weir Link: W-W11-W10

Scenario:	Pre	**Bottom Clip**	
From Node:	W-11	Default:	0.00 ft
To Node:	W-10	Op Table:	

Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Broad Crested Vertical
Geometry Type:	Irregular
Invert:	55.71 ft
Control Elevation:	55.71 ft
Cross Section:	X-11-10

Ref Node:	
Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Weir Link: W-W14-WPA001

Scenario:	Pre
From Node:	W-14
To Node:	WPA-001
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Broad Crested Vertical
Geometry Type:	Irregular
Invert:	54.92 ft
Control Elevation:	54.92 ft
Cross Section:	X-W14-WPA001

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Weir Link: W-W3-GBS004

Scenario:	Pre
From Node:	W-3
To Node:	GBS-004
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Broad Crested Vertical
Geometry Type:	Irregular
Invert:	60.97 ft
Control Elevation:	60.97 ft
Cross Section:	X-W3-GBS004

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Weir Link: W-W4-GBS004

Scenario:	Pre
From Node:	W-4
To Node:	GBS-004
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Broad Crested Vertical
Geometry Type:	Irregular
Invert:	58.83 ft
Control Elevation:	58.83 ft
Cross Section:	X-4-GBS004

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip

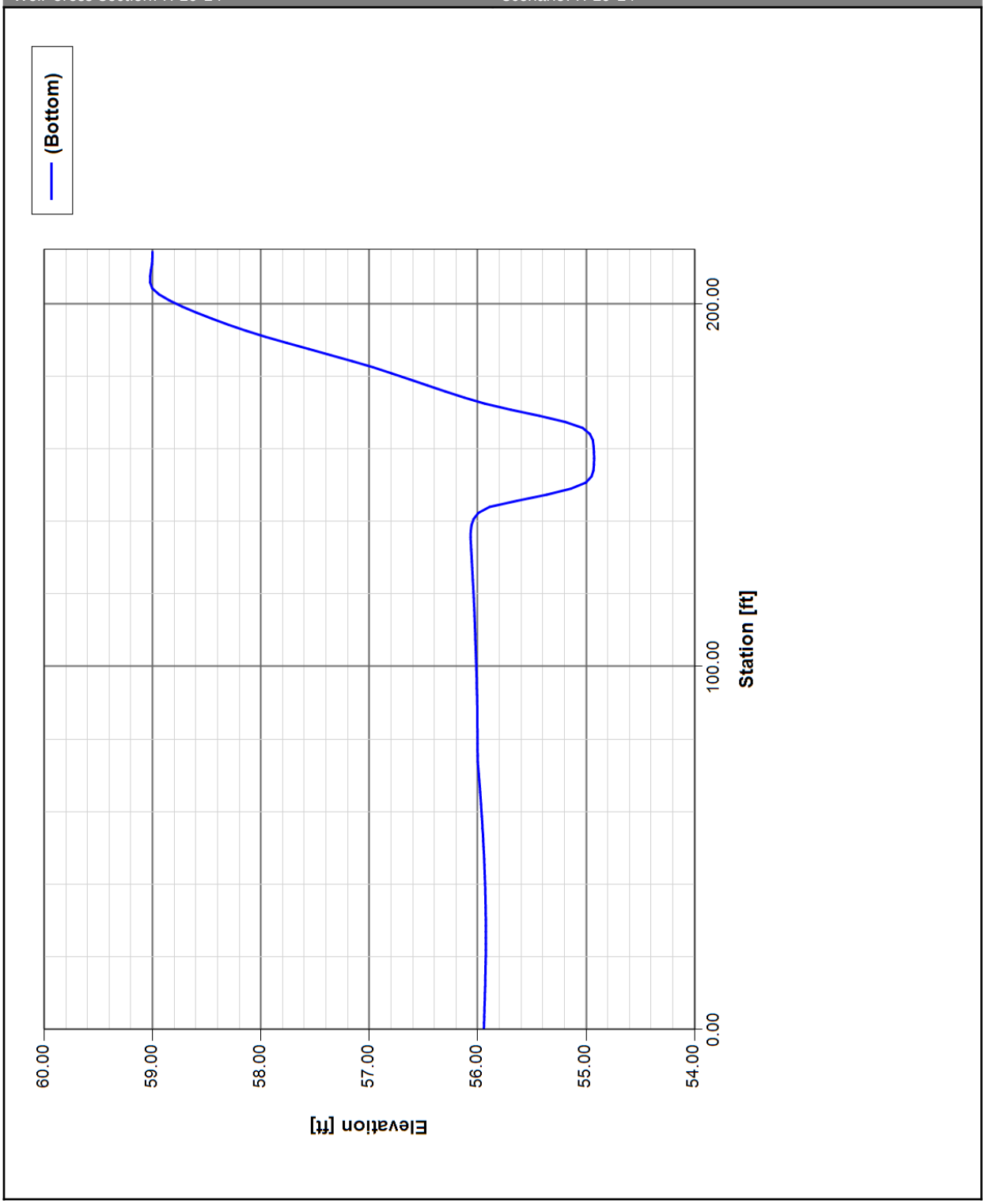
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients

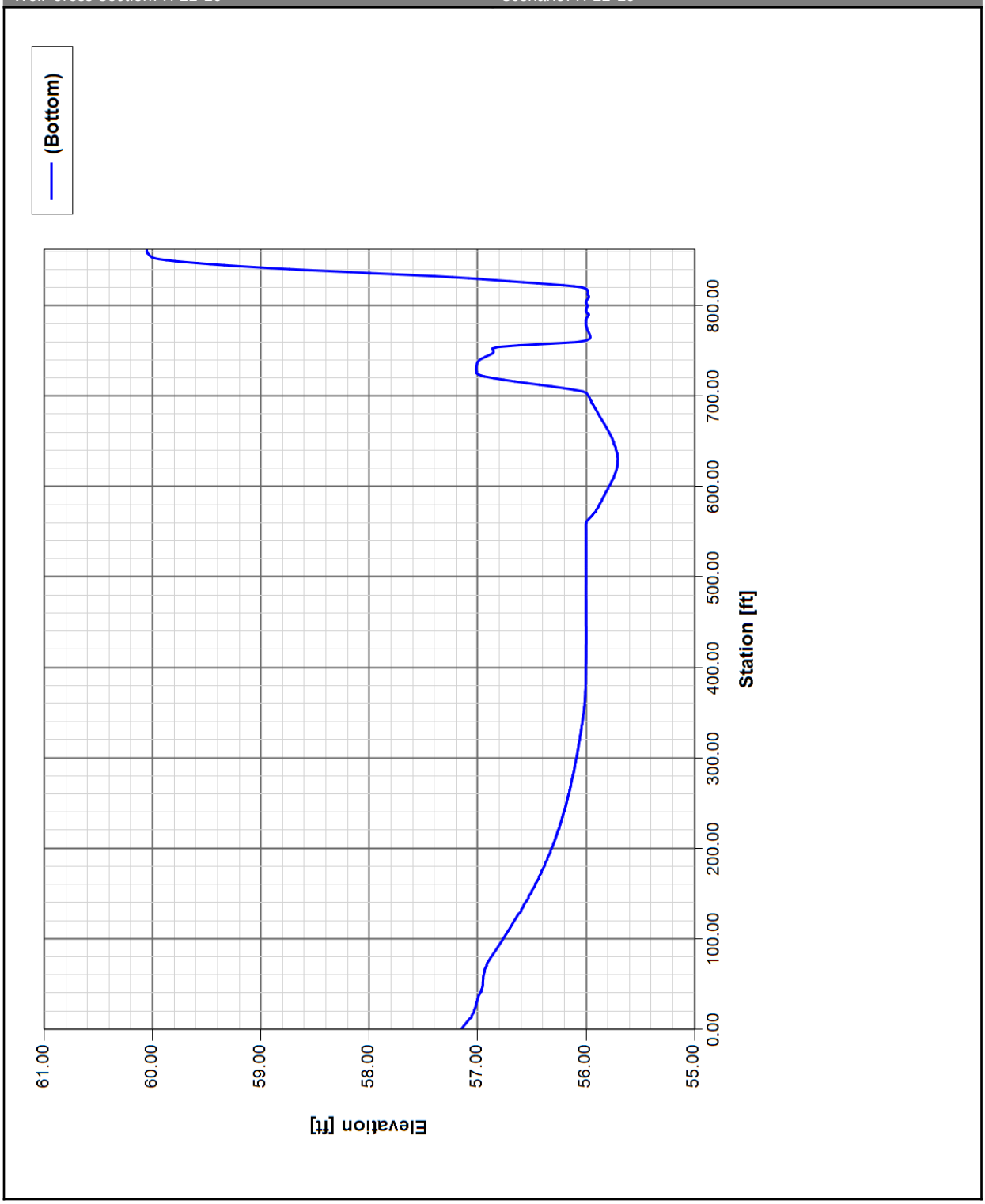
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

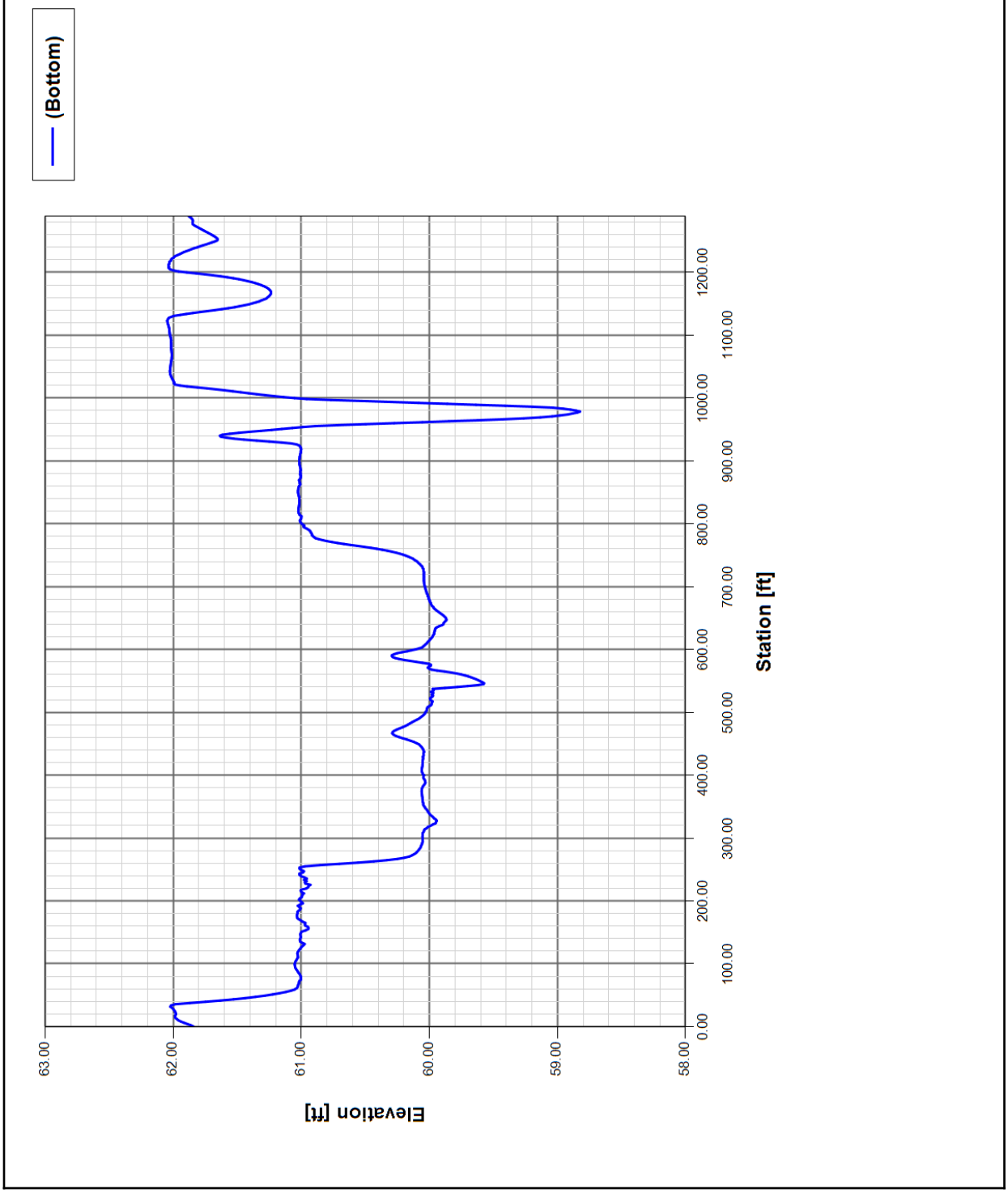
Weir Cross Section: X-10-14 Scenario: X-10-14



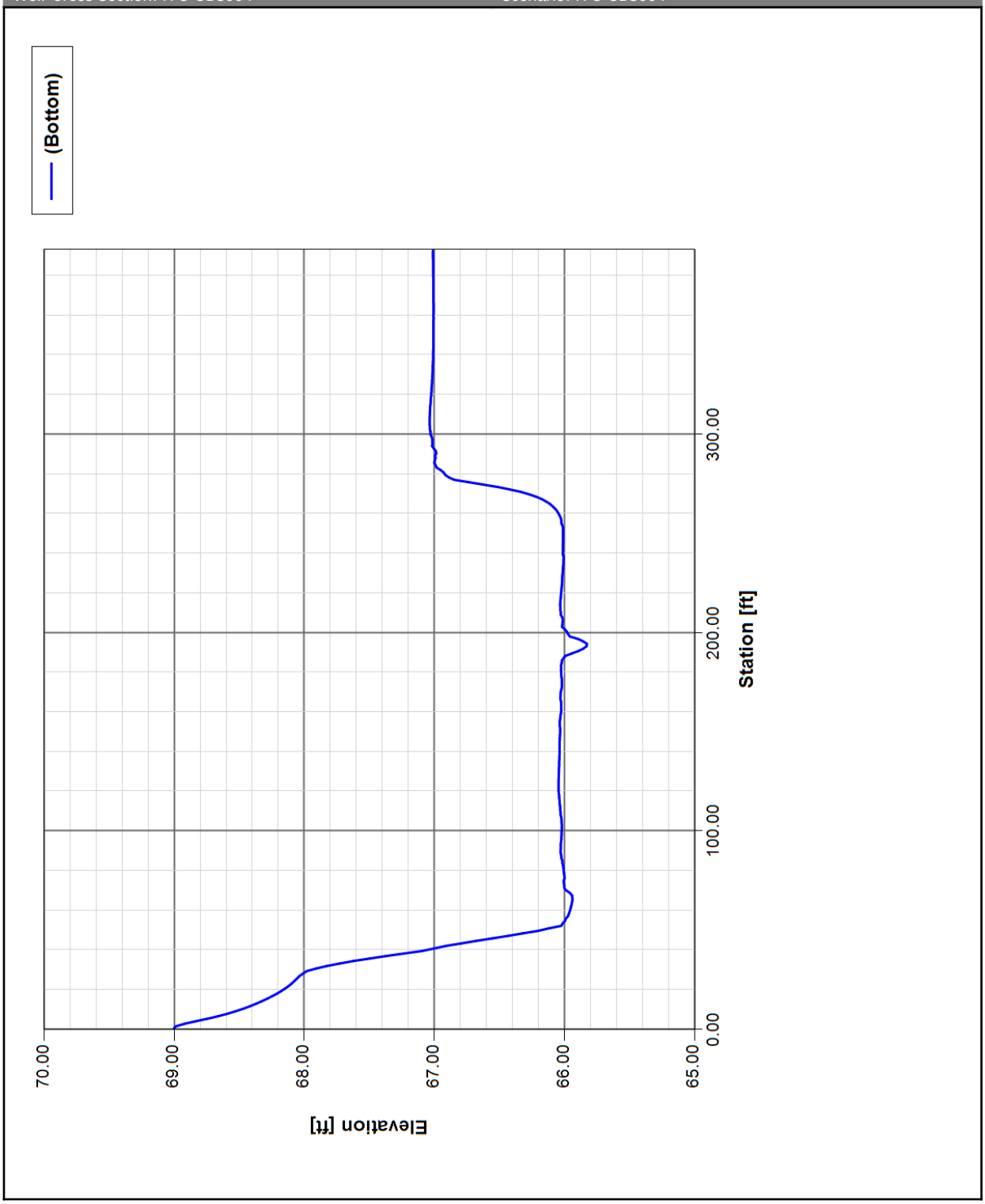
Weir Cross Section: X-11-10 Scenario: X-11-10



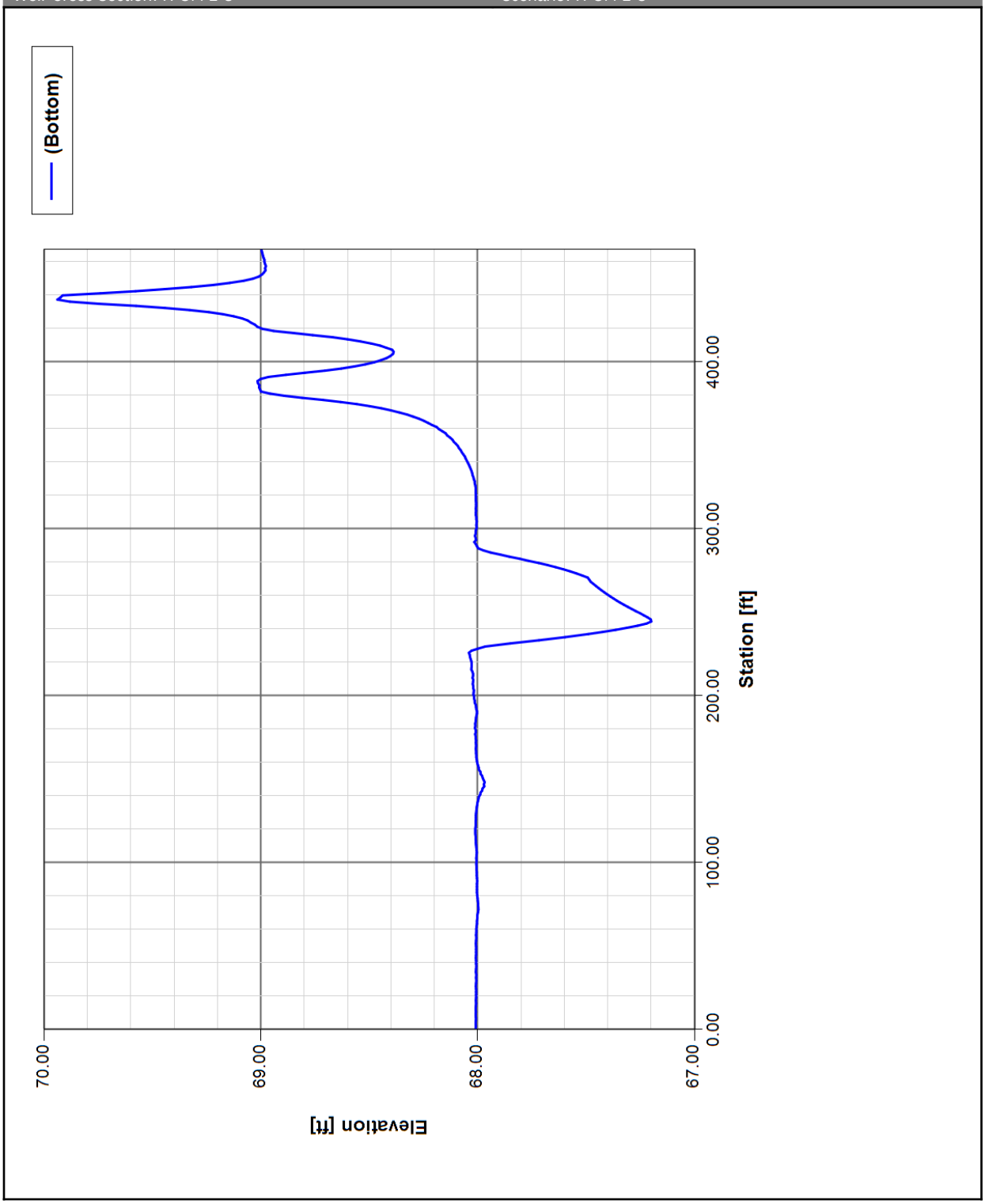
Weir Cross Section: X-4-GBS004 Scenario: X-4-GBS004



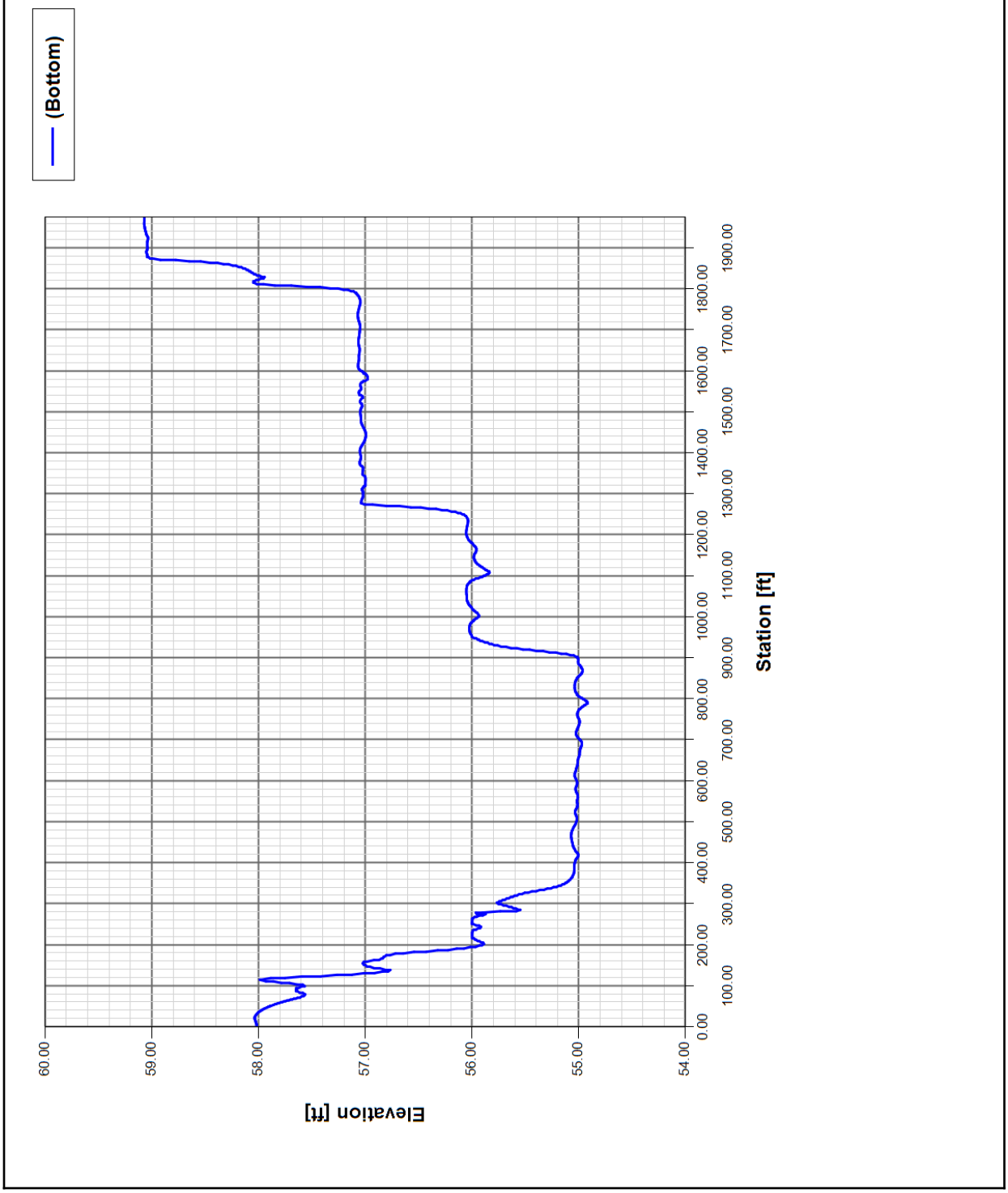
Weir Cross Section: X-8-GBS004 Scenario: X-8-GBS004



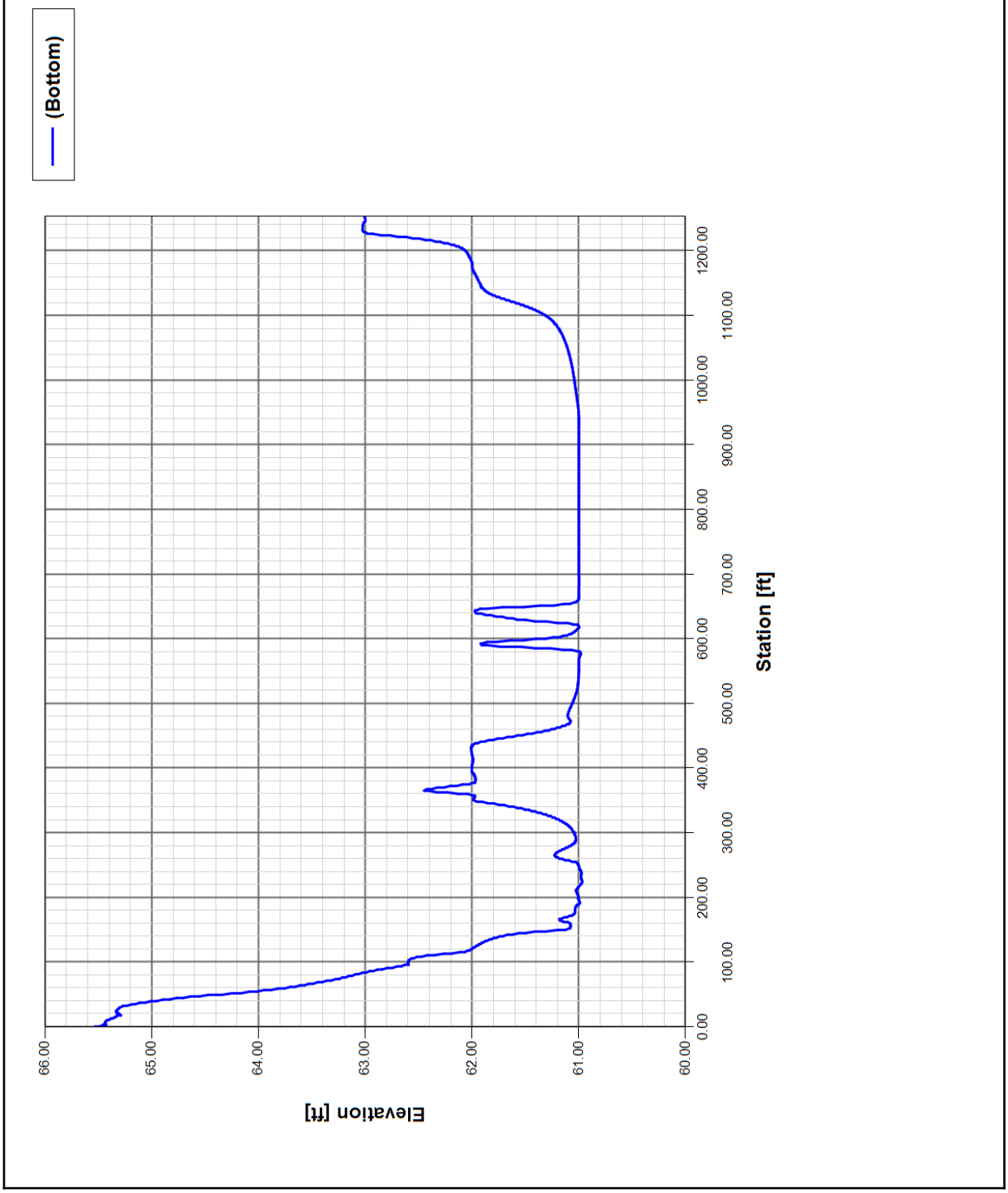
Weir Cross Section: X-OFF1-8 Scenario: X-OFF1-8



Weir Cross Section: X-W14-WPA001 Scenario: X-W14-WPA001



Weir Cross Section: X-W3-GBS004 Scenario: X-W3-GBS004



Simulation: 100yr-72hr

Scenario: Pre
Run Date/Time: 6/8/2018 9:48:31 AM
Program Version: ICPR4 4.03.02.00

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.00
End Time:	0	0	0	100.00

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

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.00	15.00

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.00	15.00

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set: Basin Composite CN
Green-Ampt Set:
Vertical Layers Set:
Impervious Set: Basin Composite DCIA

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
IA Recovery Time: 24.00 hr
Manual Basin Rain Opt: Global

Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~SFWMD-72
		Rainfall Amount:	11.40 in
Edge Length Option:	Automatic	Storm Duration:	72.00 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 10yr-72hr

Scenario: Pre
Run Date/Time: 6/8/2018 9:48:53 AM
Program Version: ICPR4 4.03.02.00

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.00
End Time:	0	0	0	100.00

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

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.00	15.00
0	0	0	60.00	0.60
0	0	0	65.00	15.00
0	0	0	100.00	15.00

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.00	15.00
0	0	0	60.00	0.60
0	0	0	65.00	15.00
0	0	0	100.00	15.00

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set: Basin Composite CN
Green-Ampt Set:
Vertical Layers Set:
Impervious Set: Basin Composite DCIA

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

IA Recovery Time: 24.00 hr
Manual Basin Rain Opt: Global
Rainfall Name: ~SFWMD-72
Rainfall Amount: 7.50 in
Storm Duration: 72.00 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: MEAN

Scenario: Pre
Run Date/Time: 6/8/2018 9:49:40 AM
Program Version: ICPR4 4.03.02.00

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.00
End Time:	0	0	0	30.00

Hydrology [sec]	Surface Hydraulics [sec]

Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		60.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.00	15.00

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.00	15.00

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:

Extern Hydrograph Set:

Curve Number Set: Basin Composite CN

Green-Ampt Set:

Vertical Layers Set:

Impervious Set: Basin Composite DCIA

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.00 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Manual Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~FLMOD
		Rainfall Amount:	4.00 in
Edge Length Option:	Automatic	Storm Duration:	24.00 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Node Max Conditions [Pre]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
GBS-001	100yr-72hr	54.50	54.00	0.0000	133.38	0.00	0
GBS-004	100yr-72hr	57.50	57.00	0.0000	370.72	0.00	0
LK TOHO	100yr-72hr	54.50	54.00	0.0000	167.36	0.00	0
OFF	100yr-72hr	65.50	65.00	0.0000	10.57	0.00	0
OFF-1	100yr-72hr	68.00	67.60	0.0010	13.55	12.86	29213
PRE-8	100yr-72hr	67.00	66.19	0.0010	46.21	46.06	157458
W-10	100yr-72hr	57.00	56.00	0.0010	88.08	66.99	349438
W-11	100yr-72hr	57.00	56.05	0.0006	60.11	53.97	394841
W-14	100yr-72hr	56.00	55.30	0.0010	360.85	323.40	1609291
W-3	100yr-72hr	63.00	61.23	0.0008	180.79	179.80	306426
W-4	100yr-72hr	61.00	60.19	0.0010	243.16	187.06	1244680
WPA-001	100yr-72hr	54.50	54.00	0.0000	253.33	0.00	0
WPA-006	100yr-72hr	54.50	54.00	0.0000	19.50	0.00	0
GBS-001	10yr-72hr	54.50	54.00	0.0000	80.34	0.00	0
GBS-004	10yr-72hr	57.50	57.00	0.0000	173.94	0.00	0
LK TOHO	10yr-72hr	54.50	54.00	0.0000	109.40	0.00	0
OFF	10yr-72hr	65.50	65.00	0.0000	6.49	0.00	0
OFF-1	10yr-72hr	68.00	67.52	0.0010	7.80	7.17	26967
PRE-8	10yr-72hr	67.00	66.14	0.0010	28.03	27.92	141852
W-10	10yr-72hr	57.00	55.75	0.0010	49.09	39.58	256594
W-11	10yr-72hr	57.00	55.99	0.0009	37.39	28.99	382373
W-14	10yr-72hr	56.00	55.14	0.0010	220.09	152.59	1483709
W-3	10yr-72hr	63.00	61.17	0.0009	111.28	110.46	290624
W-4	10yr-72hr	61.00	59.97	0.0010	145.88	74.30	1185116
WPA-001	10yr-72hr	54.50	54.00	0.0000	87.57	0.00	0
WPA-006	10yr-72hr	54.50	54.00	0.0000	12.20	0.00	0
GBS-001	MEAN	54.50	54.00	0.0000	37.70	0.00	0
GBS-004	MEAN	57.50	57.00	0.0000	71.21	0.00	0
LK TOHO	MEAN	54.50	54.00	0.0000	62.72	0.00	0
OFF	MEAN	65.50	65.00	0.0000	3.24	0.00	0
OFF-1	MEAN	68.00	67.38	0.0010	2.90	1.92	23465
PRE-8	MEAN	67.00	66.09	0.0010	12.79	12.60	125239
W-10	MEAN	57.00	55.26	0.0007	10.78	8.36	115464
W-11	MEAN	57.00	55.82	0.0009	20.46	3.68	340846
W-14	MEAN	56.00	54.51	0.0010	101.34	61.64	1066676
W-3	MEAN	63.00	61.12	0.0010	57.26	56.65	275162
W-4	MEAN	61.00	59.54	0.0009	69.85	23.81	1020774
WPA-001	MEAN	54.50	54.00	0.0000	18.83	0.00	0
WPA-006	MEAN	54.50	54.00	0.0000	7.09	0.00	0

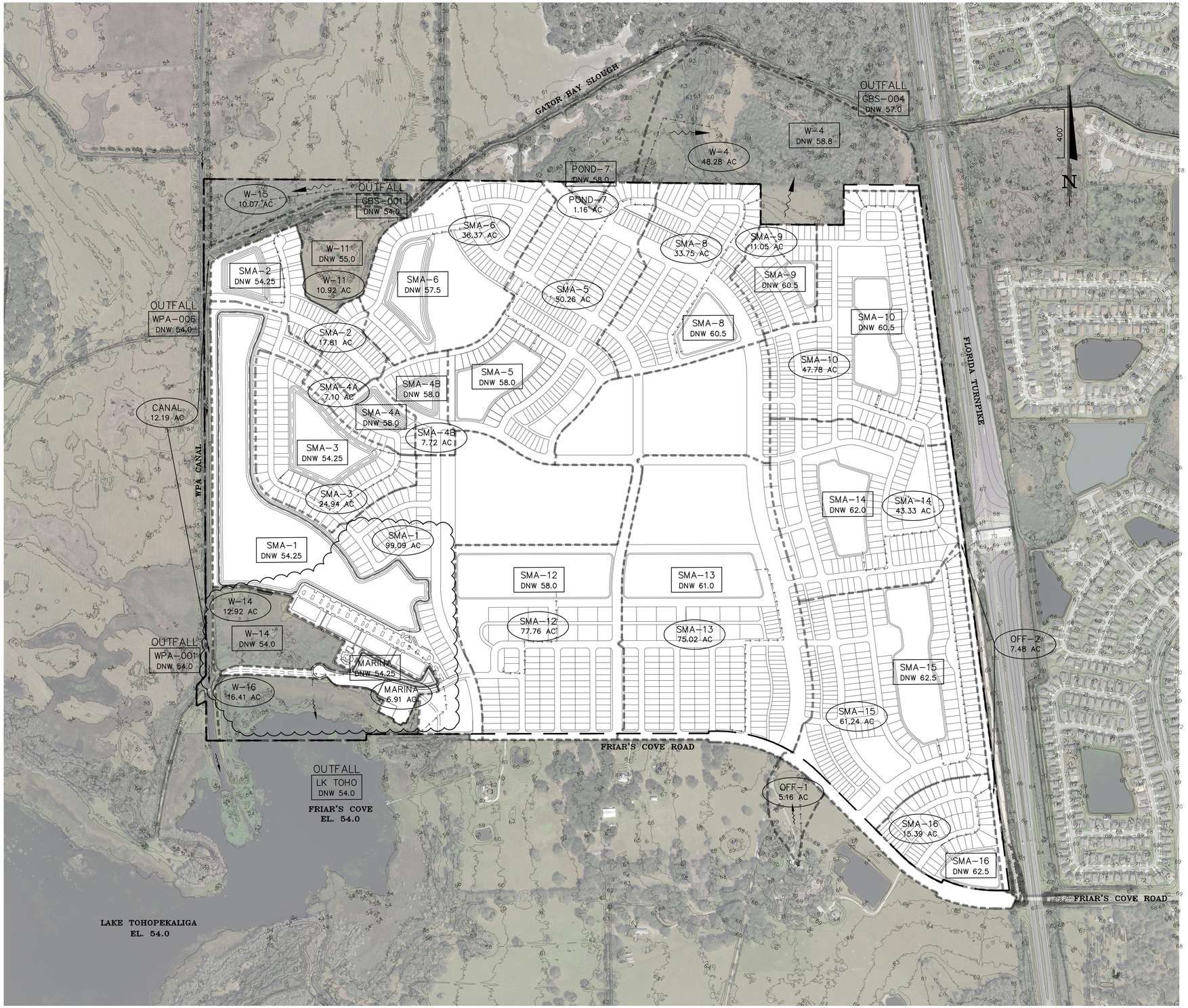
Link Min/Max Conditions [Pre]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-1	100yr-72hr	30.11	0.00	-0.08	6.13	6.13	6.13
P-2	100yr-72hr	20.85	0.00	-0.06	4.25	6.24	5.24
P-3	100yr-72hr	15.91	0.00	-0.05	5.07	9.63	7.35
P-4	100yr-72hr	14.50	0.00	-0.04	4.61	5.26	4.94
P-5	100yr-72hr	18.81	0.00	-0.05	5.99	5.99	5.99
W-8-GBS004	100yr-72hr	46.06	0.00	-0.10	1.20	1.20	1.20
W-OFF1-8	100yr-72hr	12.86	0.00	0.05	1.44	1.44	1.44
W-W10-W14	100yr-72hr	66.99	0.00	-0.13	2.60	2.60	2.60
W-W11-W10	100yr-72hr	53.97	0.00	0.14	1.26	1.26	1.26
W-W14-WPA001	100yr-72hr	223.22	0.00	1.01	1.46	1.46	1.46
W-W3-GBS004	100yr-72hr	179.80	0.00	0.47	1.26	1.26	1.26
W-W4-GBS004	100yr-72hr	187.06	0.00	-0.50	2.30	2.30	2.30
P-1	10yr-72hr	28.19	0.00	-0.08	5.74	5.74	5.74
P-2	10yr-72hr	19.52	0.00	-0.06	3.98	5.84	4.91
P-3	10yr-72hr	14.66	0.00	-0.05	4.67	9.44	7.05
P-4	10yr-72hr	13.23	0.00	-0.04	4.21	4.80	4.51
P-5	10yr-72hr	17.61	0.00	-0.05	5.61	5.61	5.61
W-8-GBS004	10yr-72hr	27.92	0.00	0.06	1.03	1.03	1.03
W-OFF1-8	10yr-72hr	7.17	0.00	0.04	1.27	1.27	1.27
W-W10-W14	10yr-72hr	39.58	0.00	-0.07	2.37	2.37	2.37
W-W11-W10	10yr-72hr	28.99	0.00	0.07	1.25	1.25	1.25
W-W14-WPA001	10yr-72hr	59.38	0.00	0.52	0.96	0.96	0.96
W-W3-GBS004	10yr-72hr	110.46	0.00	0.40	1.09	1.09	1.09
W-W4-GBS004	10yr-72hr	74.30	0.00	-0.10	2.30	2.30	2.30
P-1	MEAN	18.83	0.00	0.09	3.84	3.84	3.84
P-2	MEAN	13.09	0.00	0.06	2.74	3.92	3.33
P-3	MEAN	9.68	0.00	0.05	3.28	3.18	3.23
P-4	MEAN	8.28	0.00	0.05	3.08	3.00	3.04
P-5	MEAN	11.76	0.00	0.05	3.74	3.74	3.74
W-8-GBS004	MEAN	12.60	0.00	0.13	0.85	0.85	0.85
W-OFF1-8	MEAN	1.92	0.00	0.01	0.99	0.99	0.99
W-W10-W14	MEAN	8.36	0.00	0.02	1.53	1.53	1.53

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-W11-W10	MEAN	3.68	0.00	0.04	0.79	0.79	0.79
W-W14-WPA001	MEAN	0.00	0.00	0.00	0.00	0.00	0.00
W-W3-GBS004	MEAN	56.65	0.00	0.18	0.90	0.90	0.90
W-W4-GBS004	MEAN	23.81	0.00	0.04	2.09	2.09	2.09

APPENDIX C.2

POST DEVELOPMENT WATER QUANTITY ANALYSIS



LEGEND

Property Boundary	
Basins	
TC Path	
SMA-1 DNW 54.25	NODE I.D. INITIAL STAGE ELEVATION
SMA-1 99.09 AC	BASIN I.D. BASIN ACREAGE
OUTFALL LK TOHO DNW 54.0	OUTFALL OUTFALL I.D. INITIAL STAGE ELEVATION

GENERAL NOTES:

1. THE SCALE OF THIS DRAWING MAY HAVE CHANGED DUE TO REPRODUCTION.
2. LIDAR TOPO FROM OSCEOLA COUNTY (2016)
3. ELEVATIONS ARE IN NAVD88 DATUM

NO.	DATE	REVISIONS	CHK.
3	06/18/21	REVISED MARINA PARKING LOT PER SFWMD RAI	JCN
2	4/24/20	ADDING MARINA LAYOUT	JCN
1	10/18/18	UPDATING MULTI-USE ROAD AND SMA1, 2, 4 AND 6	JCN

JAMES C. NUGENT
FLORIDA P.E. No. 57553
DATE:

DONALD W. McINTOSH ASSOCIATES, INC.
ENGINEERS PLANNERS SURVEYORS
2200 PARK AVENUE NORTH, WINTER PARK, FL 32789 407.644.4068
CERTIFICATE OF AUTHORIZATION NO. 68

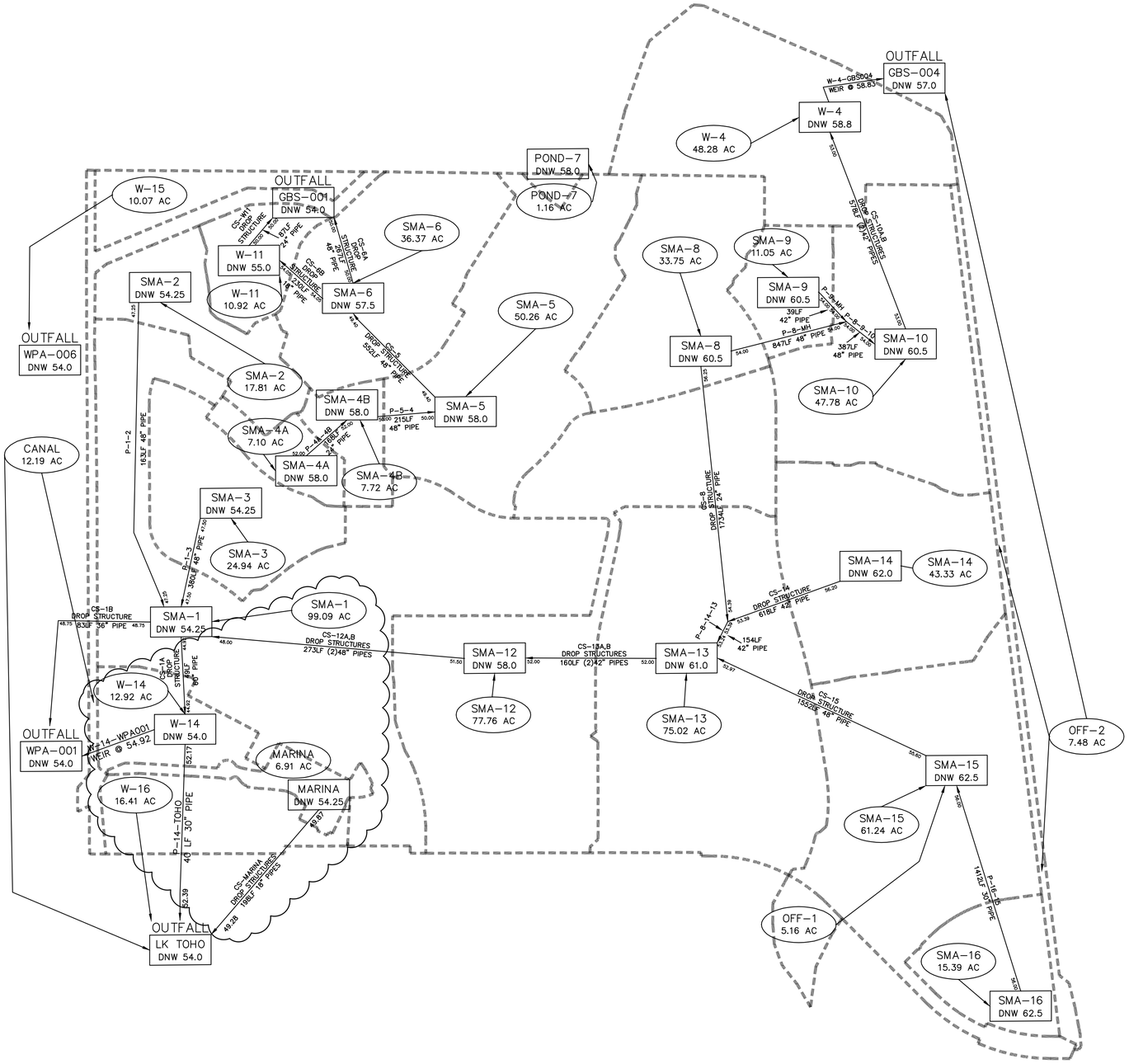
DRAWN BY	DESIGNED BY	CHECKED BY	DATE	SCALE	JOB NUMBER
ACC	ACC	JCN	4/23/18	1"=400'	13189

FONTANA
OSCEOLA COUNTY, FL
POST-DEVELOPMENT BASIN MAP

DRAWING 13189-XPOSTMAP

SHEET 1 OF 1

F:\Proj2013\13189\EDWG\Exhibits\13189-XPOSTMAP.dwg



LEGEND

SMA-1
DNW 54.25
NODE I.D.
INITIAL STAGE
ELEVATION

SMA-1
99.08 AC
BASIN I.D.
BASIN
ACREAGE

OUTFALL
LK TOHO
DNW 54.0
OUTFALL
OUTFALL I.D.
INITIAL STAGE
ELEVATION

W-14-WPA001
WEIR @ 54.92
LINK I.D.
LINK
DESCRIPTION

GENERAL NOTES:

1. ELEVATIONS ARE IN NAVD88 DATUM

NO.	DATE	REVISIONS	CHK.
2	06/18/21	REVISED MARINA PARKING LOT PER SFWMD RAI	JCN
1	10/18/18	UPDATING MULTI-USE ROAD AND SMA1, 2, 4 AND 6	JCN

JAMES C. NUGENT
FLORIDA P.E. No. 57553
DATE:

DONALD W. McINTOSH ASSOCIATES, INC.
ENGINEERS PLANNERS SURVEYORS
2200 PARK AVENUE NORTH, WINTER PARK, FL 32789 407.644.4068
CERTIFICATE OF AUTHORIZATION NO. 68

DRAWN BY	DESIGNED BY	CHECKED BY	JOB NUMBER
ACC	ACC	JCN	13189
DATE	SCALE		
4/23/18	1"=400'		

FONTANA
OSCEOLA COUNTY, FL
POST-DEVELOPMENT NODAL DIAGRAM

DRAWING
13189-XPOSTNODE

SHEET
1 OF 1

F:\Proj2013\13189\EDWG\Exhibits\13189-XPOSTNODE.dwg

Fontana
Post Development Basin Hydrology Calculations

Date: 7/2/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

Basin Name:	**CANAL**
Receiving Node:	**LK TOHO**
Basin Area:	**12.19 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
5	Basinger fine sand	A/D
10	Delray loamy fine sand, depressional	A/D
17	Kaliga muck	C/D
32	Placid fine sand, depressional	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Pasture (Good)	D	80	1.86		1.86	149
Woods (Good)	D	77	1.55		1.55	119
Wetlands	D	98		0.62	0.62	0
Water Surface	D	98		8.15	8.15	0
Totals:			3.41	8.78	12.19	268

Composite CN (exc. DCIA) =	**79**
Composite DCIA =	**72%**

Time of Concentration (T_c) Calculations

Equations

Sheet Flow: $T_t = \frac{0.007(nL)^{0.8}}{(4.8)^{0.5}(S^{0.4}/100)}$ where: $L \leq 100$ ft., S = slope (%), n = Manning's "n"

Shallow Concentrated Flow: $T_t = \frac{L}{60V}$ where:

$V = 2.516(S)^{0.5}$	Forest & Meadow (F&M)
$V = 5.032(S)^{0.5}$	Fallow & Woodland (F&W)
$V = 6.962(S)^{0.5}$	Short Grass Pasture (Pasture)
$V = 8.762(S)^{0.5}$	Nearly Bare Ground (Bare)
$V = 9.965(S)^{0.5}$	Cultivated Straight Row Crops (Cultivated)
$V = 16.135(S)^{0.5}$	Grassed Waterway (GW)
$V = 20.328(S)^{0.5}$	Pavement & Small Upland Gullies (Paved)

Note: Shallow Concentrated Flow Velocity equations obtained from the National Engineering Handbook, Part 630 Hydrology, Chapter 15, Table 15-3

Channel Flow: $T_t = \frac{L}{60V}$ where: V = 2.5 fps (assumed)

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	65	0.24	6.2	-	5.3

Note: 10-minute Time of Concentration is used when calculated value is less.

Time of Conc. =	**5 Minutes**

Fontana
Post Development Basin Hydrology Calculations

Date: 7/2/2018
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Basin Name:	**OFF-1**
Receiving Node:	**SMA-15**
Basin Area:	**5.16 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
24	Narcoossee fine sand	A
42	Smyrna fine sand	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Pasture (Good)	A	39	0.21		0.21	8
Pasture (Good)	D	80	4.26		4.26	341
Woods-Grass Comb. (Good)	A	32	0.68		0.68	22
Woods-Grass Comb. (Good)	D	79	0.01		0.01	1
Totals:			5.16	-	5.16	372

Composite CN (exc. DCIA) =	**72**
Composite DCIA =	**-**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.24	1.9	-	11.9
Shallow Conc. (Pasture)	495		0.4	0.44	18.7

Time of Conc. =	**31 Minutes**

Basin Name:	**OFF-2**
Receiving Node:	**GBS-004**
Basin Area:	**7.48 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
5	Basinger fine sand	A/D
6	Basinger fine sand, depressional	A/D
22	Myakka fine sand	A/D
42	Smyrna fine sand	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Open Space (Good)	D	80	7.48		7.48	598
Totals:			7.48	-	7.48	598

Composite CN (exc. DCIA) =	**80**
Composite DCIA =	**-**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	50	0.3	6.0	-	5.2

Note: 10-minute Time of Concentration is used when calculated value is less.

Time of Conc. =	**5 Minutes**

Fontana
Post Development Basin Hydrology Calculations

Date: 7/2/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

Basin Name:	**SMA-1**
Receiving Node:	**SMA-1**
Basin Area:	**99.09 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
5	Basinger fine sand	A/D
10	Delray loamy fine sand, depressional	A/D
32	Placid fine sand, depressional	A/D
99	Water	N/A

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Condominiums (70%)	D	82	2.99	5.94	8.93	245
Residential (70%)	D	92	10.97	0.85	11.82	1009
Residential (60%)	D	90	0.19	0.01	0.20	17
Civ-Com-Multi (80%)	D	92	14.56	9.70	24.26	1339
Open Space (Good)	D	80	6.55		6.55	524
Park (25%)	D	84	8.44	0.56	9.00	709
50' R/W (72%)	D	90	1.40	0.84	2.24	126
60' R/W (77%)	D	91	0.65	0.47	1.12	59
80' R/W (82.5%)	D	92	2.58	2.45	5.03	238
Friar's Cove Road (82.5%)	D	92	0.08	0.08	0.16	8
Water Surface	N/A	98		29.78	29.78	0
Totals:			48.40	50.69	99.09	4273

Composite CN (exc. DCIA) =	**88**
Composite DCIA =	**51%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.3	1.00	-	18.4
Shallow Conc. (GW)	50		1.00	1.61	0.5
Shallow Conc. (Paved)	65		0.40	1.29	0.8
Channel/Pipe Flow	750			2.50	5.0

Time of Conc. =	**25 Minutes**

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Post Development Basin Hydrology Calculations

Date: 7/2/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

Basin Name:	**SMA-2**
Receiving Node:	**SMA-2**
Basin Area:	**17.81 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
5	Basinger fine sand	A/D
10	Delray loamy fine sand, depressional	A/D
32	Placid fine sand, depressional	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Residential (70%)	D	92	4.19	0.25	4.44	386
Residential (60%)	D	90	4.26	0.33	4.59	383
Open Space (Good)	D	80	2.10		2.10	168
Park (25%)	D	84	0.08	0.01	0.08	6
50' R/W (72%)	D	90	0.74	0.44	1.18	66
80' R/W (82.5%)	D	92	1.26	1.19	2.45	116
Alley (100%)	D	98		0.61	0.61	0
Water Surface	N/A	98		2.36	2.36	0
Totals:			12.62	5.19	17.81	1125

Composite CN (exc. DCIA) =	**89**
Composite DCIA =	**29%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.24	1.50	-	13.1
Shallow Conc. (GW)	100		1.50	1.98	0.8
Shallow Conc. (Paved)	150		0.40	1.29	1.9
Channel/Pipe Flow	945			2.50	6.3

Time of Conc. =	**22 Minutes**

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Post Development Basin Hydrology Calculations

Date: 7/2/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

Basin Name:	**SMA-3**
Receiving Node:	**SMA-3**
Basin Area:	**24.94 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
32	Placid fine sand, depressional	A/D
40	Samsula muck	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Residential (70%)	D	92	11.24	0.67	11.91	1034
Residential (60%)	D	90	1.57	0.12	1.69	141
Open Space (Good)	D	80	1.90		1.90	152
50' R/W (72%)	D	90	1.78	1.07	2.85	160
60' R/W (77%)	D	91	0.09	0.06	0.15	8
Water Surface	N/A	98		6.44	6.44	0
Totals:			16.58	8.36	24.94	1496

Composite CN (exc. DCIA) =	**90**
Composite DCIA =	**34%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	80	0.24	1.50	-	10.9
Shallow Conc. (Paved)	160		1.50	2.49	1.1
Channel/Pipe Flow	1400			2.50	9.3

Time of Conc. =	**21 Minutes**

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Post Development Basin Hydrology Calculations

Date: 7/2/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

Basin Name:	**SMA-4A**
Receiving Node:	**SMA-4A**
Basin Area:	**7.10 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
5	Basinger fine sand	A/D
32	Placid fine sand, depressional	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Residential (70%)	D	92	0.99	0.06	1.05	91
Residential (60%)	D	90	1.61	0.12	1.73	144
Open Space (Good)	D	80	0.86		0.86	69
50' R/W (72%)	D	90	0.29	0.17	0.46	26
60' R/W (77%)	D	91	0.73	0.54	1.27	67
80' R/W (82.5%)	D	92	0.25	0.24	0.49	23
Water Surface	N/A	98		1.24	1.24	0
Totals:			4.73	2.37	7.10	420

Composite CN (exc. DCIA) =	**89**
Composite DCIA =	**33%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.24	1.50	-	13.1
Shallow Conc. (GW)	20		1.50	1.98	0.2
Shallow Conc. (Paved)	160		0.40	1.29	2.1
Channel/Pipe Flow	750			2.50	5.0

Time of Conc. =	**20 Minutes**

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Post Development Basin Hydrology Calculations

Date: 7/2/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

Basin Name:	**SMA-4B**
Receiving Node:	**SMA-4B**
Basin Area:	**7.72 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
5	Basinger fine sand	A/D
32	Placid fine sand, depressional	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Residential (70%)	D	92	1.22	0.07	1.29	112
Residential (60%)	D	90	0.06	0.00	0.06	5
Civ-Com-Multi (80%)	D	92	0.45	0.30	0.75	41
Open Space (Good)	D	80	0.88		0.88	70
Park (25%)	D	84	1.31	0.09	1.40	110
50' R/W (72%)	D	90	0.42	0.25	0.67	38
80' R/W (82.5%)	D	92	0.68	0.64	1.32	62
Alley (100%)	D	98		0.04	0.04	0
Water Surface	N/A	98		1.31	1.31	0
Totals:			5.01	2.71	7.72	439

Composite CN (exc. DCIA) =	**88**
Composite DCIA =	**35%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.24	1.50	-	13.1
Shallow Conc. (GW)	20		1.50	1.98	0.2
Shallow Conc. (Paved)	160		0.40	1.29	2.1
Channel/Pipe Flow	750			2.50	5.0

Time of Conc. =	**20 Minutes**

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Post Development Basin Hydrology Calculations

Date: 7/2/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

Basin Name:	**SMA-5**
Receiving Node:	**SMA-5**
Basin Area:	**50.26 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
5	Basinger fine sand	A/D
16	Immokalee fine sand	A/D
22	Myakka fine sand	A/D
24	Narcoossee fine sand	A
27	Ona fine sand	B/D
32	Placid fine sand, depressional	A/D
42	Smyrna fine sand	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Residential (70%)	D	92	16.41	0.97	17.38	1509
Residential (65%)	D	91	1.85	0.12	1.97	169
Residential (60%)	A	73	0.11	0.01	0.12	8
Residential (60%)	D	90	7.84	0.61	8.45	706
Open Space (Good)	D	80	1.61		1.61	129
Park (25%)	D	84	1.04	0.07	1.11	87
132' R/W (70%)	D	90	1.76	0.95	2.70	158
50' R/W (72%)	A	72	0.04	0.03	0.07	3
50' R/W (72%)	D	90	2.23	1.34	3.57	201
60' R/W (77%)	D	91	2.42	1.77	4.19	220
80' R/W (82.5%)	D	92	1.72	1.64	3.36	159
Alley (100%)	A	98		0.06	0.06	0
Alley (100%)	D	98		1.03	1.03	0
Water Surface	N/A	98		4.64	4.64	0
Totals:			37.04	13.22	50.26	3349

Composite CN (exc. DCIA) =	**90**
Composite DCIA =	**26%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.24	1.50	-	13.1
Shallow Conc. (GW)	25		1.50	1.98	0.2
Shallow Conc. (Paved)	180		0.40	1.29	2.3
Channel/Pipe Flow	2225			2.50	14.8

Time of Conc. =	**30 Minutes**

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Post Development Basin Hydrology Calculations

Date: 7/2/2018
By: NRB
Chk: JCN
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Basin Name:	**SMA-6**
Receiving Node:	**SMA-6**
Basin Area:	**36.37 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
5	Basinger fine sand	A/D
10	Delray loamy fine sand, depressional	A/D
27	Ona fine sand	B/D
32	Placid fine sand, depressional	A/D
42	Smyrna fine sand	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Residential (70%)	D	92	8.23	0.49	8.72	757
Residential (60%)	D	90	3.12	0.24	3.36	281
Open Space (Good)	D	80	2.33		2.33	186
Park (25%)	D	84	11.54	0.77	12.31	969
50' R/W (72%)	D	90	1.60	0.95	2.55	144
60' R/W (77%)	D	91	0.54	0.39	0.93	49
80' R/W (82.5%)	D	92	0.85	0.81	1.66	78
Alley (100%)	D	98		0.54	0.54	0
Water Surface	N/A	98		3.97	3.97	0
Totals:			28.20	8.17	36.37	2465

Composite CN (exc. DCIA) =	**87**
Composite DCIA =	**22%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.24	1.50	-	13.1
Shallow Conc. (GW)	90		1.50	1.98	0.8
Shallow Conc. (Paved)	90		0.40	1.29	1.2
Channel/Pipe Flow	665			2.50	4.4

Time of Conc. =	**19 Minutes**

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Post Development Basin Hydrology Calculations

Date: 7/2/2018
By: NRB
Chk: JCN
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Basin Name:	**POND-7**
Receiving Node:	**POND-7**
Basin Area:	**1.16 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
27	Ona fine sand	B/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Open Space (Good)	D	80	0.66		0.66	53
Water Surface	D	98		0.50	0.50	0
Totals:			0.66	0.50	1.16	53

Composite CN (exc. DCIA) =	**80**
Composite DCIA =	**43%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.24	1.50	-	13.1
Shallow Conc. (GW)	15		1.50	1.98	0.1

Time of Conc. =	**13 Minutes**

Basin Name:	**SMA-8**
Receiving Node:	**SMA-8**
Basin Area:	**33.75 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
5	Basinger fine sand	A/D
6	Basinger fine sand, depressional	A/D
16	Immokalee fine sand	A/D
22	Myakka fine sand	A/D
24	Narcoossee fine sand	A

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Residential (70%)	A	79	0.65	0.04	0.69	51
Residential (70%)	D	92	11.74	0.70	12.44	1080
Residential (60%)	A	73	1.32	0.10	1.42	96
Residential (60%)	D	90	4.05	0.31	4.36	364
Open Space (Good)	D	80	1.54		1.54	123
132' R/W (70%)	D	90	2.57	1.38	3.95	231
50' R/W (72%)	A	72	0.26	0.15	0.41	18
50' R/W (72%)	D	90	2.04	1.22	3.26	184
60' R/W (77%)	D	91	0.97	0.71	1.68	88
80' R/W (82.5%)	A	78	0.39	0.37	0.76	30
80' R/W (82.5%)	D	92	0.03	0.02	0.05	2
Alley (100%)	D	98		0.39	0.39	0
Water Surface	N/A	98		2.80	2.80	0
Totals:			25.55	8.20	33.75	2269

Composite CN (exc. DCIA) =	**89**
Composite DCIA =	**24%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	60	0.3	1.50	-	10.4
Shallow Conc. (GW)	150		1.50	1.98	1.3
Channel/Pipe Flow	1445			2.50	9.6

Time of Conc. =	**21 Minutes**

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Post Development Basin Hydrology Calculations

Date: 7/2/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

Basin Name:	**SMA-9**
Receiving Node:	**SMA-9**
Basin Area:	**11.05 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
5	Basinger fine sand	A/D
6	Basinger fine sand, depressional	A/D
16	Immokalee fine sand	A/D
22	Myakka fine sand	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Residential (70%)	D	92	4.57	0.27	4.84	420
Residential (60%)	D	90	2.38	0.19	2.57	215
Open Space (Good)	D	80	0.79		0.79	63
50' R/W (72%)	D	90	0.39	0.23	0.62	35
60' R/W (77%)	D	91	0.56	0.41	0.97	51
Alley (100%)	D	98		0.27	0.27	0
Water Surface	N/A	98		0.99	0.99	0
Totals:			8.69	2.36	11.05	784

Composite CN (exc. DCIA) =	**90**
Composite DCIA =	**21%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.3	1.50	-	15.6
Shallow Conc. (GW)	120		1.50	1.98	1.0
Channel/Pipe Flow	225		1.00	2.50	1.5

Time of Conc. =	**18 Minutes**

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Post Development Basin Hydrology Calculations

Date: 7/2/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

Basin Name:	**SMA-10**
Receiving Node:	**SMA-10**
Basin Area:	**47.78 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
5	Basinger fine sand	A/D
6	Basinger fine sand, depressional	A/D
16	Immokalee fine sand	A/D
22	Myakka fine sand	A/D
24	Narcoossee fine sand	A
42	Smyrna fine sand	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Residential (70%)	A	79	1.70	0.10	1.80	134
Residential (70%)	D	92	22.32	1.32	23.64	2053
Residential (60%)	A	73	1.27	0.10	1.37	93
Residential (60%)	D	90	1.22	0.09	1.31	109
Civ-Com-Multi (80%)	D	92	1.40	0.93	2.33	129
Open Space (Good)	D	80	1.98		1.98	158
Park (25%)	D	84	0.96	0.06	1.02	80
50' R/W (72%)	A	72	0.19	0.11	0.30	14
50' R/W (72%)	D	90	4.58	2.74	7.32	412
60' R/W (77%)	A	74	0.32	0.23	0.55	23
60' R/W (77%)	D	91	0.31	0.22	0.53	28
Alley (100%)	D	98		0.29	0.29	0
Water Surface	N/A	98		5.34	5.34	0
Totals:			36.23	11.55	47.78	3234

Composite CN (exc. DCIA) =	**89**
Composite DCIA =	**24%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	80	0.3	1.50	-	13.1
Shallow Conc. (GW)	160		1.50	1.98	1.3
Channel/Pipe Flow	2540			2.50	16.9

Time of Conc. =	**31 Minutes**

Fontana
Post Development Basin Hydrology Calculations

Date: 7/2/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

Basin Name:	**SMA-12**
Receiving Node:	**SMA-12**
Basin Area:	**77.76 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
5	Basinger fine sand	A/D
22	Myakka fine sand	A/D
24	Narcoossee fine sand	A
32	Placid fine sand, depressional	A/D
42	Smyrna fine sand	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Residential (70%)	D	92	12.27	0.73	13.00	1129
Residential (65%)	D	91	5.15	0.32	5.47	469
Residential (60%)	A	73	0.62	0.05	0.67	45
Residential (60%)	D	90	0.51	0.04	0.55	46
Civ-Com-Multi (80%)	A	78	1.56	1.04	2.60	122
Civ-Com-Multi (80%)	D	92	11.60	7.74	19.34	1068
Open Space (Good)	D	80	3.53		3.53	282
Park (25%)	D	84	6.22	0.41	6.63	522
132' R/W (70%)	A	71	1.06	0.57	1.63	75
132' R/W (70%)	D	90	0.81	0.43	1.24	73
50' R/W (72%)	A	72	0.04	0.03	0.07	3
50' R/W (72%)	D	90	1.83	1.10	2.93	165
60' R/W (77%)	D	91	0.94	0.69	1.63	86
80' R/W (82.5%)	A	78	0.17	0.17	0.34	14
80' R/W (82.5%)	D	92	3.21	3.04	6.25	295
Friar's Cove Road (82.5%)	D	92	0.88	0.83	1.71	81
Alley (100%)	D	98		0.77	0.77	0
Water Surface	N/A	98		9.40	9.40	0
Totals:			50.41	27.35	77.76	4474

Composite CN (exc. DCIA) =	**89**
Composite DCIA =	**35%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	50	0.3	1.50	-	9.0
Shallow Conc. (Paved)	265		0.40	1.29	3.4
Channel/Pipe Flow	840			2.50	5.6

Time of Conc. =	**18 Minutes**

Fontana
Post Development Basin Hydrology Calculations

Date: 7/2/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

Basin Name:	**SMA-13**
Receiving Node:	**SMA-13**
Basin Area:	**75.02 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
22	Myakka fine sand	A/D
42	Smyrna fine sand	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Residential (70%)	D	92	14.71	0.87	15.58	1353
Residential (65%)	D	91	6.93	0.43	7.36	631
Residential (60%)	D	90	4.08	0.32	4.40	367
Civ-Com-Multi (80%)	D	92	8.59	5.73	14.32	790
Open Space (Good)	D	80	2.50		2.50	200
Park (25%)	D	84	4.31	0.29	4.60	362
132' R/W (70%)	D	90	4.82	2.59	7.41	433
50' R/W (72%)	D	90	2.22	1.33	3.55	200
60' R/W (77%)	D	91	1.05	0.78	1.83	96
80' R/W (82.5%)	D	92	0.84	0.80	1.64	77
80' R/W (82.5%)	D	92	1.28	1.21	2.49	118
Alley (100%)	D	98		1.21	1.21	0
Water Surface	N/A	98		8.13	8.13	0
Totals:			51.34	23.68	75.02	4628

Composite CN (exc. DCIA) =	**90**
Composite DCIA =	**32%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	35	0.3	1.50	-	6.7
Shallow Conc. (GW)	125		1.50	1.98	1.1
Shallow Conc. (Paved)	175		0.40	1.29	2.3
Channel/Pipe Flow	1610			2.50	10.7

Time of Conc. =	**21 Minutes**

Fontana

Post Development Basin Hydrology Calculations

Date: 7/2/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

Basin Name:	**SMA-14**
Receiving Node:	**SMA-14**
Basin Area:	**43.33 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
6	Basinger fine sand, depressional	A/D
16	Immokalee fine sand	A/D
22	Myakka fine sand	A/D
24	Narcoossee fine sand	A
42	Smyrna fine sand	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Residential (70%)	A	79	0.88	0.05	0.93	69
Residential (70%)	D	92	15.61	0.93	16.54	1436
Residential (65%)	D	91	3.60	0.22	3.82	327
Residential (60%)	A	73	0.67	0.05	0.72	49
Residential (60%)	D	90	0.96	0.07	1.03	86
Civ-Com-Multi (80%)	D	92	1.12	0.75	1.87	103
Open Space (Good)	D	80	1.90		1.90	152
Park (25%)	D	84	3.17	0.21	3.38	266
50' R/W (72%)	D	90	3.51	2.10	5.61	316
60' R/W (77%)	A	74	0.13	0.10	0.23	10
60' R/W (77%)	D	91	1.05	0.77	1.82	95
Alley (100%)	A	98		0.08	0.08	0
Alley (100%)	D	98		0.55	0.55	0
Water Surface	N/A	98		4.85	4.85	0
Totals:			32.59	10.74	43.33	2910

Composite CN (exc. DCIA) =	**89**
Composite DCIA =	**25%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.3	1.00	-	18.4
Shallow Conc. (GW)	155		1.00	1.61	1.6
Shallow Conc. (Paved)	135		0.50	1.44	1.6
Channel/Pipe Flow	1120			2.50	7.5

Time of Conc. =	**29 Minutes**

Fontana
Post Development Basin Hydrology Calculations

Date: 7/2/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

Basin Name:	**SMA-15**
Receiving Node:	**SMA-15**
Basin Area:	**61.24 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
22	Myakka fine sand	A/D
42	Smyrna fine sand	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Residential (70%)	D	92	20.30	1.20	21.50	1867
Residential (60%)	D	90	7.43	0.58	8.01	669
Civ-Com-Multi (80%)	D	92	1.46	0.97	2.43	134
Open Space (Good)	D	80	2.47		2.47	198
Park (25%)	D	84	2.65	0.18	2.83	223
50' R/W (72%)	D	90	3.20	1.91	5.11	288
60' R/W (77%)	D	91	1.50	1.11	2.61	137
80' R/W (82.5%)	D	92	0.93	0.89	1.82	86
Friar's Cove Road (82.5%)	D	92	2.89	2.74	5.63	266
Alley (100%)	D	98		0.92	0.92	0
Water Surface	N/A	98		7.91	7.91	0
Totals:			42.84	18.40	61.24	3867

Composite CN (exc. DCIA) =	**90**
Composite DCIA =	**30%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	55	0.3	1.50	-	9.7
Shallow Conc. (GW)	155		1.50	1.98	1.3
Shallow Conc. (Paved)	185		0.40	1.29	2.4
Channel/Pipe Flow	1870			2.50	12.5

Time of Conc. =	**26 Minutes**

Basin Name:	**SMA-16**
Receiving Node:	**SMA-16**
Basin Area:	**15.39 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
42	Smyrna fine sand	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Residential (70%)	D	92	6.45	0.38	6.83	593
Residential (60%)	D	90	2.01	0.16	2.17	181
Open Space (Good)	D	80	1.51		1.51	121
50' R/W (72%)	D	90	0.88	0.52	1.40	79
60' R/W (77%)	D	91	0.58	0.43	1.01	53
Alley (100%)	D	98		0.31	0.31	0
Water Surface	N/A	98		2.16	2.16	0
Totals:			11.43	3.96	15.39	1027

Composite CN (exc. DCIA) =	**90**
Composite DCIA =	**26%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.3	1.50	-	15.6
Shallow Conc. (GW)	155		1.50	1.98	1.3
Channel/Pipe Flow	775			2.50	5.2

Time of Conc. =	**22 Minutes**

Fontana
Post Development Basin Hydrology Calculations

Date: 7/2/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

Basin Name:	**MARINA**
Receiving Node:	**MARINA**
Basin Area:	**6.91 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
5	Basinger fine sand	A/D
10	Delray loamy fine sand, depressional	A/D
32	Placid fine sand, depressional	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Future Marina (80%)	D	85	1.11	2.87	3.98	95
Access Easement	D	85		1.12	1.12	0
Water Surface	D	98	0.46	1.35	1.81	45
Totals:			1.57	5.34	6.91	140

Composite CN (exc. DCIA) =	**89**
Composite DCIA =	**77%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	40	0.24	1.50	-	6.3
Shallow Conc. (Paved)	50		1.50	2.49	0.3
Channel/Pipe Flow	400			2.50	2.7

Note: 10-minute Time of Concentration is used when calculated value is less.

Time of Conc. =	**9 Minutes**

Basin Name:	**W-4**
Receiving Node:	**W-4**
Basin Area:	**48.28 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
5	Basinger fine sand	A/D
6	Basinger fine sand, depressional	A/D
16	Immokalee fine sand	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Open Space (Good)	D	80	0.71		0.71	57
Brush (Good)	D	73	11.83		11.83	864
Pasture (Good)	D	80	5.39		5.39	431
Wetlands	D	80		23.19	23.19	0
Woods-Grass Comb. (Good)	D	79	7.16		7.16	566
Totals:			25.09	23.19	48.28	1917

Composite CN (exc. DCIA) =	**76**
Composite DCIA =	**48%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.24	0.8	-	16.8
Shallow Conc. (Pasture)	820		0.7	0.58	23.5

Time of Conc. =	**40 Minutes**

Fontana
Post Development Basin Hydrology Calculations

Date: 7/2/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

Basin Name:	**W-11**
Receiving Node:	**WPA**
Basin Area:	**10.92 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
10	Delray loamy fine sand, depressional	A/D
32	Placid fine sand, depressional	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Pasture (Good)	D	80	4.36		4.36	349
Wetlands	D	98		6.44	6.44	0
Water Surface	D	98		0.12	0.12	0
Totals:			4.36	6.56	10.92	349

Composite CN (exc. DCIA) =	**80**
Composite DCIA =	**60%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.24	2.30	-	11.0
Shallow Conc. (Pasture)	125		0.800	0.62	3.3

Time of Conc. =	**14 Minutes**

Basin Name:	**W-14**
Receiving Node:	**LK TOHO**
Basin Area:	**12.92 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
10	Delray loamy fine sand, depressional	A/D
32	Placid fine sand, depressional	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Pasture (Good)	D	80	0.42		0.42	34
Wetlands	D	98		12.09	12.09	0
Water Surface	D	98		0.41	0.41	0
Totals:			0.42	12.50	12.92	34

Composite CN (exc. DCIA) =	**80**
Composite DCIA =	**97%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	80	0.24	1.00	-	12.9

Time of Conc. =	**13 Minutes**

Fontana
Post Development Basin Hydrology Calculations

Date: 7/2/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

Basin Name:	**W-15**
Receiving Node:	**WPA-006**
Basin Area:	**10.07 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
5	Basinger fine sand	A/D
10	Delray loamy fine sand, depressional	A/D
17	Kaliga muck	C/D
32	Placid fine sand, depressional	A/D

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Woods (Good)	D	77	5.55		5.55	427
Wetlands	D	98		4.52	4.52	0
Totals:			5.55	4.52	10.07	427

Composite CN (exc. DCIA) =	**77**
Composite DCIA =	**45%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.24	1.60	-	12.7
Shallow Conc. (Pasture)	1070		0.300	0.38	46.8

Time of Conc. =	**60 Minutes**

Basin Name:	**W-16**
Receiving Node:	**LK TOHO**
Basin Area:	**16.41 acres**

Curve Number (CN) Calculations

Soil Index Number	Soil Index Name	Hydrologic Group
10	Delray loamy fine sand, depressional	A/D
32	Placid fine sand, depressional	A/D
99	Water	N/A

Land Cover	Hydrologic Group	Curve Number (Excluding DCIA)	Pervious & NDCIA Area (ac)	DCIA (ac)	Total Area (ac)	CN x Area (exc. DCIA)
Open Space (Good)	D	80	0.20		0.20	16
Pasture (Good)	D	80	0.92		0.92	74
Park (25%)	D	84	0.03	0.06	0.09	2
Water Surface	D	98		15.20	15.20	0
Totals:			1.15	15.26	16.41	92

Composite CN (exc. DCIA) =	**80**
Composite DCIA =	**93%**

Time of Concentration (T_c) Calculations

Type of Flow	Length (L) (ft)	Roughness Coefficient (n)	Slope (S) (%)	Velocity (V) (fps)	Travel Time (Tt) (min)
Sheet Flow	100	0.24	1.0	-	15.4
Shallow Conc. (Pasture)	190		1.0	0.70	4.5

Time of Conc. =	**20 Minutes**

Fontana
Spreader Swale Sizing Calculations

Date: 4/26/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

Equations

$Q=VA$

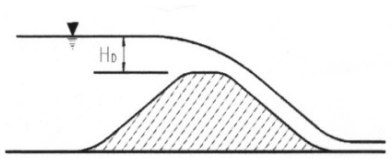
$Q=qL$

$q=3H_D^{3/2}$

Where:

Q = Design Storm Discharge (cfs)
V = Velocity (fps)
A = Area (ft^2)
q = Discharge per linear foot (cfs/ft)
L = Length of Swale (ft)
H_D = Depth of Flow (ft)

H_D (ft)	q (cfs/ft)	V (fps)
0.10	0.1	0.9
0.20	0.3	1.3
0.30	0.5	1.6
0.40	0.8	1.9
0.45	**0.9**	**2.0**
0.50	1.1	2.1
0.60	1.4	2.3
0.70	1.8	2.5
0.80	2.1	2.7
0.90	2.6	2.8
1.00	3.0	3.0



Discharge From	Discharge To	Link Name	Q_{MAX} (cfs)	$L_{Req'd}$ (ft)	$L_{Provided}$ (ft)
SMA-1	W-14	BU-W14	82.26	90.8	124
SMA-6	W-11	BU-W11	9.61	10.6	40
SMA-10	W-4	BU-W4A,B	76.67	84.7	99
MARINA	LK TOHO/W-16	BU-W16	7.91	8.7	14

Note:
$L_{Req'd}$ = Length of swale required to maintain non-erosive velocity. (V < 2.0 fps)
$L_{Req'd} = Q_{max} / q$

Manual Basin: CANAL

Scenario: Post
Node: LK TOHO
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 10.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256
Area: 12.19 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
12.19	CANAL	D	

Comment:

Manual Basin: MARINA

Scenario: Post
Node: MARINA
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 10.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256
Area: 6.91 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
6.91	MARINA	D	

Comment:

Manual Basin: OFF-1

Scenario: Post
Node: SMA-15
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 31.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256
Area: 5.16 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
5.16	OFF-1	D	

Comment:

Manual Basin: OFF-2

Scenario: Post
Node: GBS-004
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 10.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256
Area: 7.48 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
7.48	OFF-2	D	

Comment:

Manual Basin: POND-7

Scenario: Post
Node: POND-7
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 13.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256
Area: 1.16 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
1.16	POND-7	D	

Comment:

Manual Basin: SMA-1

Scenario: Post
Node: SMA-1
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 25.00 min
Max Allowable Q: 0.00 cfs

Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256
Area: 99.09 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
99.09	SMA-1	D	

Comment:

Manual Basin: SMA-10

Scenario: Post
Node: SMA-10
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 31.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256
Area: 47.78 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
47.78	SMA-10	D	

Comment:

Manual Basin: SMA-12

Scenario: Post
Node: SMA-12
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 18.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256
Area: 77.76 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
77.76	SMA-12	D	

Comment:

Manual Basin: SMA-13

Scenario: Post
Node: SMA-13
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 21.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256
Area: 75.02 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
75.02	SMA-13	D	

Comment:

Manual Basin: SMA-14

Scenario: Post
Node: SMA-14
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 29.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256
Area: 43.33 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
43.33	SMA-14	D	

Comment:

Manual Basin: SMA-15

Scenario: Post
Node: SMA-15
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 26.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256
Area: 61.24 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
61.24	SMA-15	D	

Comment:

Manual Basin: SMA-16

Scenario: Post
Node: SMA-16
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 22.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256
Area: 15.39 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
15.39	SMA-16	D	

Comment:

Manual Basin: SMA-2

Scenario: Post
Node: SMA-2
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 22.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256
Area: 17.81 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
17.81	SMA-2	D	

Comment:

Manual Basin: SMA-3

Scenario: Post
Node: SMA-3
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 21.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr

Unit Hydrograph: UH256
Peaking Factor: 256
Area: 24.94 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
24.94	SMA-3	D	

Comment:

Manual Basin: SMA-4A

Scenario: Post
Node: SMA-4A
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 20.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256
Area: 7.10 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
7.10	SMA-4A	D	

Comment:

Manual Basin: SMA-4B

Scenario: Post
Node: SMA-4B
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 20.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256
Area: 7.72 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
7.72	SMA-4B	D	

Comment:

Manual Basin: SMA-5

Scenario: Post

Node: SMA-5
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 30.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256
Area: 50.26 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
50.26	SMA-5	D	

Comment:

Manual Basin: SMA-6

Scenario: Post
Node: SMA-6
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 19.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256
Area: 36.37 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
36.37	SMA-6	D	

Comment:

Manual Basin: SMA-8

Scenario: Post
Node: SMA-8
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 21.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256
Area: 33.75 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
33.75	SMA-8	D	

Comment:

Manual Basin: SMA-9

Scenario: Post
Node: SMA-9
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 18.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256
Area: 11.05 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
11.05	SMA-9	D	

Comment:

Manual Basin: W-11

Scenario: Post
Node: W-11
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 14.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256
Area: 10.92 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
10.92	W-11	D	

Comment:

Manual Basin: W-14

Scenario: Post
Node: W-14
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 13.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256
Area: 12.92 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
12.92	W-14	D	

Comment:

Manual Basin: W-15

Scenario: Post
Node: WPA-006
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 60.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256
Area: 10.07 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
10.07	W-15	D	

Comment:

Manual Basin: W-16

Scenario: Post
Node: LK TOHO
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 20.00 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256
Area: 16.41 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
16.41	W-16	D	

Comment:

Manual Basin: W-4

Scenario: Post
Node: W-4
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 40.00 min
Max Allowable Q: 0.00 cfs

Time Shift: 0.00 hr
Unit Hydrograph: UH256
Peaking Factor: 256
Area: 48.28 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
48.28	W-4	D	

Comment:

Curve Number: Basin Composite CN [Set]

Land Cover Zone	Soil Zone	Curve Number [dec]
CANAL	D	79.0
MARINA	D	89.0
OFF-1	D	72.0
OFF-2	D	80.0
POND-7	D	80.0
SMA-1	D	88.0
SMA-10	D	89.0
SMA-12	D	89.0
SMA-13	D	90.0
SMA-14	D	89.0
SMA-15	D	90.0
SMA-16	D	90.0
SMA-2	D	89.0
SMA-3	D	90.0
SMA-4A	D	89.0
SMA-4B	D	88.0
SMA-5	D	90.0
SMA-6	D	87.0
SMA-8	D	89.0
SMA-9	D	90.0
W-10	D	80.0
W-11	D	80.0
W-14	D	80.0
W-15	D	77.0
W-16	D	80.0
W-4	D	76.0

Impervious: Basin Composite DCIA [Set]

Land Cover Zone	% Impervious	% DCIA	% Direct	Ia Impervious [in]	Ia Pervious [in]
CANAL	72.00	72.00	0.00	0.000	0.000
MARINA	77.00	77.00	0.00	0.000	0.000
OFF-1	0.00	0.00	0.00	0.000	0.000

Land Cover Zone	% Impervious	% DCIA	% Direct	Ia Impervious [in]	Ia Pervious [in]
OFF-2	0.00	0.00	0.00	0.000	0.000
POND-7	43.00	43.00	0.00	0.000	0.000
SMA-1	51.00	51.00	0.00	0.000	0.000
SMA-10	24.00	24.00	0.00	0.000	0.000
SMA-12	35.00	35.00	0.00	0.000	0.000
SMA-13	32.00	32.00	0.00	0.000	0.000
SMA-14	25.00	25.00	0.00	0.000	0.000
SMA-15	30.00	30.00	0.00	0.000	0.000
SMA-16	26.00	26.00	0.00	0.000	0.000
SMA-2	29.00	29.00	0.00	0.000	0.000
SMA-3	34.00	34.00	0.00	0.000	0.000
SMA-4A	33.00	33.00	0.00	0.000	0.000
SMA-4B	35.00	35.00	0.00	0.000	0.000
SMA-5	26.00	26.00	0.00	0.000	0.000
SMA-6	22.00	22.00	0.00	0.000	0.000
SMA-8	24.00	24.00	0.00	0.000	0.000
SMA-9	21.00	21.00	0.00	0.000	0.000
W-10	58.00	58.00	0.00	0.000	0.000
W-11	60.00	60.00	0.00	0.000	0.000
W-14	97.00	97.00	0.00	0.000	0.000
W-15	45.00	45.00	0.00	0.000	0.000
W-16	93.00	93.00	0.00	0.000	0.000
W-4	48.00	48.00	0.00	0.000	0.000

Node: BU-W11

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 57.50 ft
Warning Stage: 60.50 ft

Stage [ft]	Area [ac]	Area [ft2]
50.00	0.00	44
60.50	0.00	44

Comment:

Node: BU-W14

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 54.00 ft
Warning Stage: 57.00 ft

Stage [ft]	Area [ac]	Area [ft2]
40.00	0.00	44
57.00	0.00	44

Comment:

Node: BU-W16

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 54.00 ft
Warning Stage: 55.00 ft

Stage [ft]	Area [ac]	Area [ft2]
53.00	0.00	44
55.00	0.00	44

Comment:

Node: BU-W4A,B

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 60.00 ft
Warning Stage: 63.00 ft

Stage [ft]	Area [ac]	Area [ft2]
50.00	0.00	44
63.00	0.00	44

Comment:

Node: GBS-001

Scenario: Post
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 54.00 ft
Warning Stage: 54.50 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.00	54.00

Year	Month	Day	Hour	Stage [ft]
0	0	0	100.00	54.00

Comment:

Node: GBS-004

Scenario: Post
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 57.00 ft
Warning Stage: 57.50 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.00	57.00
0	0	0	100.00	57.00

Comment:

Node: LK TOHO

Scenario: Post
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 54.00 ft
Warning Stage: 54.50 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.00	54.00
0	0	0	100.00	54.00

Comment:

Node: MARINA

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 54.25 ft
Warning Stage: 57.25 ft

Stage [ft]	Area [ac]	Area [ft2]
54.25	1.35	58806

Stage [ft]	Area [ac]	Area [ft2]
55.25	1.50	65340
56.25	1.65	71874
57.25	1.81	78844

Comment:

Node: MH-8-14

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 61.00 ft
Warning Stage: 67.00 ft

Stage [ft]	Area [ac]	Area [ft2]
54.00	0.00	44
67.00	0.00	44

Comment:

Node: MH-8-9-10

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 60.50 ft
Warning Stage: 65.00 ft

Stage [ft]	Area [ac]	Area [ft2]
50.00	0.00	44
65.00	0.00	44

Comment:

Node: POND-7

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 58.00 ft
Warning Stage: 62.00 ft

Stage [ft]	Area [ac]	Area [ft2]
58.00	0.50	21649

Stage [ft]	Area [ac]	Area [ft2]
59.00	0.55	23958
60.00	0.61	26572
61.00	0.68	29621
62.00	0.84	36590

Comment:

Node: SMA-1

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 54.25 ft
Warning Stage: 58.25 ft

Stage [ft]	Area [ac]	Area [ft2]
54.25	29.78	1297217
55.25	30.43	1325531
56.25	31.08	1353845
57.25	31.73	1382159
58.25	33.35	1452726

Comment:

Node: SMA-10

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 60.50 ft
Warning Stage: 64.50 ft

Stage [ft]	Area [ac]	Area [ft2]
60.50	5.34	232610
61.50	5.56	242194
62.50	5.78	251777
63.50	6.01	261796
64.50	6.59	287060

Comment:

Node: SMA-12

Scenario: Post

Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 58.00 ft
Warning Stage: 62.00 ft

Stage [ft]	Area [ac]	Area [ft2]
58.00	9.40	409464
59.00	9.68	421661
60.00	9.97	434293
61.00	10.26	446926
62.00	11.00	479160

Comment:

Node: SMA-13

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 61.00 ft
Warning Stage: 65.00 ft

Stage [ft]	Area [ac]	Area [ft2]
61.00	8.13	354143
62.00	8.39	365468
63.00	8.64	376358
64.00	8.90	387684
65.00	9.56	416434

Comment:

Node: SMA-14

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 62.00 ft
Warning Stage: 66.00 ft

Stage [ft]	Area [ac]	Area [ft2]
62.00	4.85	211266
63.00	5.04	219542
64.00	5.22	227383
65.00	5.41	235660
66.00	5.89	256568

Comment:

Node: SMA-15

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 62.50 ft
Warning Stage: 66.50 ft

Stage [ft]	Area [ac]	Area [ft2]
62.50	7.91	344560
63.50	8.20	357192
64.50	8.49	369824
65.50	8.78	382457
66.50	9.52	414691

Comment:

Node: SMA-16

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 62.50 ft
Warning Stage: 66.50 ft

Stage [ft]	Area [ac]	Area [ft2]
62.50	2.16	94090
63.50	2.28	99317
64.50	2.40	104544
65.50	2.51	109336
66.50	2.82	122839

Comment:

Node: SMA-2

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 54.25 ft
Warning Stage: 58.25 ft

Stage [ft]	Area [ac]	Area [ft2]
54.25	2.36	102802
55.25	2.48	108029
56.25	2.60	113256
57.25	2.72	118483
58.25	3.04	132422

Comment:

Node: SMA-3

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 54.25 ft
Warning Stage: 58.25 ft

Stage [ft]	Area [ac]	Area [ft2]
54.25	6.44	280526
55.25	6.65	289674
56.25	6.86	298822
57.25	7.08	308405
58.25	7.64	332798

Comment:

Node: SMA-4A

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 58.00 ft
Warning Stage: 62.00 ft

Stage [ft]	Area [ac]	Area [ft2]
58.00	1.24	54014
59.00	1.33	57935
60.00	1.43	62291
61.00	1.53	66647
62.00	1.79	77972

Comment:

Node: SMA-4B

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 58.00 ft
Warning Stage: 62.00 ft

Stage [ft]	Area [ac]	Area [ft2]
58.00	1.31	57064
59.00	1.40	60984
60.00	1.50	65340
61.00	1.59	69260
62.00	1.84	80150

Comment:

Node: SMA-5

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 58.00 ft
Warning Stage: 62.00 ft

Stage [ft]	Area [ac]	Area [ft2]
58.00	4.64	202118
59.00	4.82	209959
60.00	5.01	218236
61.00	5.20	226512
62.00	5.69	247856

Comment:

Node: SMA-6

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 57.50 ft
Warning Stage: 61.50 ft

Stage [ft]	Area [ac]	Area [ft2]
57.50	3.97	172933
58.50	4.16	181210
59.50	4.35	189486
60.50	4.54	197762
61.50	5.03	219107

Comment:

Node: SMA-8

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 60.50 ft
Warning Stage: 65.00 ft

Stage [ft]	Area [ac]	Area [ft2]
60.50	2.74	119354
61.50	2.87	125017
62.50	3.00	130680
63.50	3.13	136343
64.50	3.38	147233
65.00	3.55	154638

Comment:

Node: SMA-9

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 60.50 ft
Warning Stage: 64.50 ft

Stage [ft]	Area [ac]	Area [ft2]
60.50	0.99	43124
61.50	1.07	46609
62.50	1.16	50530
63.50	1.25	54450
64.50	1.49	64904

Comment:

Node: W-11

Scenario: Post
Type: Stage/Volume
Base Flow: 0.00 cfs
Initial Stage: 55.00 ft
Warning Stage: 57.00 ft

Stage [ft]	Volume [ac-ft]	Volume [ft3]
54.00	0.00	0
55.00	0.00	0
55.50	2.40	104544
56.00	5.99	260924
56.50	10.58	460865

Stage [ft]	Volume [ac-ft]	Volume [ft3]
57.00	15.51	675616

Comment:

Node: W-14

Scenario: Post
Type: Stage/Volume
Base Flow: 0.00 cfs
Initial Stage: 54.00 ft
Warning Stage: 56.00 ft

Stage [ft]	Volume [ac-ft]	Volume [ft3]
54.00	0.14	6098
54.50	7.30	317988
55.00	15.51	675616
55.50	24.48	1066349
56.00	33.62	1464487

Comment:

Node: W-4

Scenario: Post
Type: Stage/Volume
Base Flow: 0.00 cfs
Initial Stage: 58.83 ft
Warning Stage: 61.00 ft

Stage [ft]	Volume [ac-ft]	Volume [ft3]
58.00	0.01	436
59.00	6.30	274428
59.50	16.75	729630
60.00	29.37	1279357
60.50	44.18	1924481
61.00	59.89	2608808

Comment:

Node: WPA-001

Scenario: Post
Type: Time/Stage
Base Flow: 0.00 cfs

Initial Stage: 54.00 ft
Warning Stage: 54.50 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.00	54.00
0	0	0	100.00	54.00

Comment:

Node: WPA-006

Scenario: Post
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 54.00 ft
Warning Stage: 54.50 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.00	54.00
0	0	0	100.00	54.00

Comment:

Weir Link: BU-W11

Scenario: Post
From Node: BU-W11
To Node: W-11
Link Count: 1
Flow Direction: Both
Damping: 0.0000 ft
Weir Type: Broad Crested Vertical
Geometry Type: Rectangular
Invert: 57.50 ft
Control Elevation: 57.50 ft
Max Depth: 999.00 ft
Max Width: 40.00 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: 3.000
Weir Table:
Orifice Default: 0.600
Orifice Table:

Comment:

Weir Link: BU-W14

Scenario: Post

Bottom Clip

From Node:	BU-W14
To Node:	W-14
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Broad Crested Vertical
Geometry Type:	Rectangular
Invert:	54.00 ft
Control Elevation:	54.00 ft
Max Depth:	999.00 ft
Max Width:	124.00 ft
Fillet:	0.00 ft

Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients

Weir Default:	3.000
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Weir Link: BU-W16

Scenario:	Post
From Node:	BU-W16
To Node:	LK TOHO
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Broad Crested Vertical
Geometry Type:	Rectangular
Invert:	54.00 ft
Control Elevation:	54.00 ft
Max Depth:	999.00 ft
Max Width:	10.00 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:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Weir Link: BU-W4A,B

Scenario:	Post
From Node:	BU-W4A,B
To Node:	W-4
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Broad Crested Vertical
Geometry Type:	Rectangular
Invert:	60.00 ft
Control Elevation:	60.00 ft
Max Depth:	999.00 ft
Max Width:	99.00 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:	3.000
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Drop Structure Link: CS-10A		Upstream Pipe		Downstream Pipe	
Scenario:	Post	Invert:	53.00 ft	Invert:	53.00 ft
From Node:	SMA-10	Manning's N:	0.012	Manning's N:	0.012
To Node:	BU-W4A,B	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.50 ft	Max Depth:	3.50 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Split	Default:	0.00 ft	Default:	0.00 ft
Pipe Count:	1	Op Table:		Op Table:	
Damping:	0.1000 ft	Ref Node:		Ref Node:	
Length:	575.00 ft	Manning's N:	0.000	Manning's N:	0.000
FHWA Code:	1	Top Clip			
Entr Loss Coef:	0.50	Default:	0.00 ft	Default:	0.00 ft
Exit Loss Coef:	1.00	Op Table:		Op Table:	
Bend Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Location:	0.00 dec	Manning's N:	0.000	Manning's N:	0.000
Energy Switch:	Energy				

Pipe Comment:

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	2	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Horizontal	Default:	0.00 ft
Geometry Type:	Circular	Op Table:	
Invert:	60.00 ft	Ref Node:	
Control Elevation:	60.50 ft	Discharge Coefficients	
Max Depth:	0.42 ft	Weir Default:	3.200
		Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment: (2) 5" orifices

Weir Component		Bottom Clip	
Weir:	2	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:	62.20 ft	Ref Node:	
Control Elevation:	62.20 ft	Discharge Coefficients	
Max Depth:	1.17 ft	Weir Default:	3.200
Max Width:	14.00 ft		

Fillet:	0.00 ft		
		Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment: (2) 3'x1'-2" and (1) 8'x1'-2"

Weir Component			
Weir:	3	Bottom Clip	
Weir Count:	1	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:	63.50 ft	Op Table:	
Control Elevation:	63.50 ft	Ref Node:	
Max Depth:	3.00 ft	Discharge Coefficients	
Max Width:	8.75 ft	Weir Default:	3.200
Fillet:	0.00 ft	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment: FDOT TYPE H (4-grate)

Drop Structure Comment:

Drop Structure Link: CS-10B		Upstream Pipe		Downstream Pipe	
Scenario:	Post	Invert:	53.00 ft	Invert:	53.00 ft
From Node:	SMA-10	Manning's N:	0.012	Manning's N:	0.012
To Node:	BU-W4A,B	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.50 ft	Max Depth:	3.50 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Split	Default:	0.00 ft	Default:	0.00 ft
Pipe Count:	1	Op Table:		Op Table:	
Damping:	0.1000 ft	Ref Node:		Ref Node:	
Length:	581.00 ft	Manning's N:	0.000	Manning's N:	0.000
FHWA Code:	1	Top Clip			
Entr Loss Coef:	0.50	Default:	0.00 ft	Default:	0.00 ft
Exit Loss Coef:	1.00	Op Table:		Op Table:	
Bend Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Location:	0.00 dec	Manning's N:	0.000	Manning's N:	0.000
Energy Switch:	Energy				

Pipe Comment:

Weir Component			
Weir:	1	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	

Weir Type:	Horizontal
Geometry Type:	Rectangular
Invert:	62.50 ft
Control Elevation:	62.50 ft
Max Depth:	3.00 ft
Max Width:	6.58 ft
Fillet:	0.00 ft

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: FDOT TYPE H

Drop Structure Comment:

Drop Structure Link: CS-12A	
Scenario:	Post
From Node:	SMA-12
To Node:	SMA-1
Link Count:	1
Flow Direction:	Both
Solution:	Split
Pipe Count:	1
Damping:	0.1000 ft
Length:	272.00 ft
FHWA Code:	1
Entr Loss Coef:	0.50
Exit Loss Coef:	1.00
Bend Loss Coef:	0.00
Bend Location:	0.00 dec
Energy Switch:	Energy

Upstream Pipe	
Invert:	51.50 ft
Manning's N:	0.012
Geometry: Circular	
Max Depth:	4.00 ft
Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.000
Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.000

Downstream Pipe	
Invert:	48.00 ft
Manning's N:	0.012
Geometry: Circular	
Max Depth:	4.00 ft
Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.000
Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.000

Pipe Comment:

Weir Component	
Weir:	1
Weir Count:	2
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Horizontal
Geometry Type:	Circular
Invert:	57.50 ft
Control Elevation:	58.00 ft
Max Depth:	0.42 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: (2) 5" orifices

Weir Component		Bottom Clip	
Weir:	2	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:	59.40 ft	Ref Node:	
Control Elevation:	59.40 ft	Discharge Coefficients	
Max Depth:	0.75 ft	Weir Default:	3.200
Max Width:	10.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment: (2) 2'x9" and (1) 6'x9"

Weir Component		Bottom Clip	
Weir:	3	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Horizontal	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	60.50 ft	Ref Node:	
Control Elevation:	60.50 ft	Discharge Coefficients	
Max Depth:	3.00 ft	Weir Default:	3.200
Max Width:	8.75 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment: FDOT TYPE H (4-grate)

Drop Structure Comment:

Drop Structure Link: CS-12B		Upstream Pipe		Downstream Pipe	
Scenario:	Post	Invert:	51.50 ft	Invert:	48.00 ft
From Node:	SMA-12	Manning's N:	0.012	Manning's N:	0.012
To Node:	SMA-1	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	4.00 ft	Max Depth:	4.00 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Split	Default:	0.00 ft	Default:	0.00 ft
Pipe Count:	1	Op Table:		Op Table:	
Damping:	0.1000 ft	Ref Node:		Ref Node:	
Length:	274.00 ft	Manning's N:	0.000	Manning's N:	0.000
FHWA Code:	1	Top Clip			
Entr Loss Coef:	0.50	Default:	0.00 ft	Default:	0.00 ft

Exit Loss Coef:	1.00	Op Table:		Op Table:	
Bend Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Location:	0.00 dec	Manning's N:	0.000	Manning's N:	0.000
Energy Switch:	Energy				

Pipe Comment:

Weir Component

Weir:	1
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Horizontal
Geometry Type:	Rectangular
Invert:	59.50 ft
Control Elevation:	59.50 ft
Max Depth:	3.00 ft
Max Width:	8.75 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: FDOT TYPE H (4-grate)

Drop Structure Comment:

Drop Structure Link: CS-13A

Scenario:	Post
From Node:	SMA-13
To Node:	SMA-12
Link Count:	1
Flow Direction:	Both
Solution:	Split
Pipe Count:	1
Damping:	0.1000 ft
Length:	160.00 ft
FHWA Code:	1
Entr Loss Coef:	0.50
Exit Loss Coef:	1.00
Bend Loss Coef:	0.00
Bend Location:	0.00 dec
Energy Switch:	Energy

Upstream Pipe

Invert:	52.00 ft
Manning's N:	0.012

Geometry: Circular

Max Depth:	3.50 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.000

Top Clip

Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.000

Downstream Pipe

Invert:	52.00 ft
Manning's N:	0.012

Geometry: Circular

Max Depth:	3.50 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.000

Top Clip

Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.000

Pipe Comment:

Weir Component

Weir:	1
Weir Count:	2
Weir Flow Direction:	Both

Bottom Clip

Default:	0.00 ft
Op Table:	

Damping:	0.0000 ft
Weir Type:	Horizontal
Geometry Type:	Circular
Invert:	60.50 ft
Control Elevation:	61.00 ft
Max Depth:	0.38 ft

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: (2) 4.5" orifices

Weir Component

Weir:	2
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Horizontal
Geometry Type:	Rectangular
Invert:	62.60 ft
Control Elevation:	62.60 ft
Max Depth:	3.00 ft
Max Width:	6.58 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: FDOT TYPE H

Drop Structure Comment:

Drop Structure Link: CS-13B		Upstream Pipe		Downstream Pipe	
Scenario:	Post	Invert:	52.00 ft	Invert:	52.00 ft
From Node:	SMA-13	Manning's N:	0.012	Manning's N:	0.012
To Node:	SMA-12	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.50 ft	Max Depth:	3.50 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Split	Default:	0.00 ft	Default:	0.00 ft
Pipe Count:	1	Op Table:		Op Table:	
Damping:	0.1000 ft	Ref Node:		Ref Node:	
Length:	160.00 ft	Manning's N:	0.000	Manning's N:	0.000
FHWA Code:	1	Top Clip			
Entr Loss Coef:	0.50	Default:	0.00 ft	Default:	0.00 ft
Exit Loss Coef:	1.00	Op Table:		Op Table:	
Bend Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Location:	0.00 dec	Manning's N:	0.000	Manning's N:	0.000
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:	Horizontal	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	62.60 ft	Ref Node:	
Control Elevation:	62.60 ft	**Discharge Coefficients**	
Max Depth:	3.00 ft	Weir Default:	3.200
Max Width:	6.58 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment: FDOT TYPE H

Drop Structure Comment:

Drop Structure Link: CS-14		Upstream Pipe		Downstream Pipe	
Scenario:	Post	Invert:	56.20 ft	Invert:	53.39 ft
From Node:	SMA-14	Manning's N:	0.012	Manning's N:	0.012
To Node:	MH-8-14	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.50 ft	Max Depth:	3.50 ft
Flow Direction:	Both	**Bottom Clip**			
Solution:	Split	Default:	0.00 ft	Default:	0.00 ft
Pipe Count:	1	Op Table:		Op Table:	
Damping:	0.1000 ft	Ref Node:		Ref Node:	
Length:	618.00 ft	Manning's N:	0.000	Manning's N:	0.000
FHWA Code:	1	**Top Clip**			
Entr Loss Coef:	0.50	Default:	0.00 ft	Default:	0.00 ft
Exit Loss Coef:	1.00	Op Table:		Op Table:	
Bend Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Location:	0.00 dec	Manning's N:	0.000	Manning's N:	0.000
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:	Horizontal	Default:	0.00 ft
Geometry Type:	Circular	Op Table:	
Invert:	61.50 ft	Ref Node:	
Control Elevation:	62.00 ft		

Max Depth:	0.42 ft

Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment: 5" orifice

Weir Component	
Weir:	2
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Geometry Type:	Rectangular
Invert:	63.50 ft
Control Elevation:	63.50 ft
Max Depth:	0.83 ft
Max Width:	9.00 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: (2) 2'x10" and (1) 5'x10"

Weir Component	
Weir:	3
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Horizontal
Geometry Type:	Rectangular
Invert:	64.50 ft
Control Elevation:	64.50 ft
Max Depth:	3.00 ft
Max Width:	8.75 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: FDOT TYPE H (4-grate)

Drop Structure Comment:

Drop Structure Link: CS-15	
Scenario:	Post
From Node:	SMA-15
To Node:	SMA-13
Link Count:	1

Upstream Pipe	
Invert:	55.60 ft
Manning's N:	0.012
Geometry: Circular	
Max Depth:	4.00 ft

Downstream Pipe	
Invert:	52.97 ft
Manning's N:	0.012
Geometry: Circular	
Max Depth:	4.00 ft

		Bottom Clip			
Flow Direction:	Both				
Solution:	Split	Default:	0.00 ft	Default:	0.00 ft
Pipe Count:	1	Op Table:		Op Table:	
Damping:	0.1000 ft	Ref Node:		Ref Node:	
Length:	1552.00 ft	Manning's N:	0.000	Manning's N:	0.000
FHWA Code:	1	Top Clip			
Entr Loss Coef:	0.50	Default:	0.00 ft	Default:	0.00 ft
Exit Loss Coef:	1.00	Op Table:		Op Table:	
Bend Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Location:	0.00 dec	Manning's N:	0.000	Manning's N:	0.000
Energy Switch:	Energy				

Pipe Comment:

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	2	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Horizontal	Default:	0.00 ft
Geometry Type:	Circular	Op Table:	
Invert:	62.00 ft	Ref Node:	
Control Elevation:	62.50 ft	Discharge Coefficients	
Max Depth:	0.42 ft	Weir Default:	3.200
		Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment: 2-5" orifices

Weir Component		Bottom Clip	
Weir:	2	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Horizontal	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	64.10 ft	Ref Node:	
Control Elevation:	64.10 ft	Discharge Coefficients	
Max Depth:	3.00 ft	Weir Default:	3.200
Max Width:	8.75 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment: FDOT TYPE H

Drop Structure Comment:

Drop Structure Link: CS-1A		Upstream Pipe		Downstream Pipe	
Scenario:	Post	Invert:	44.92 ft	Invert:	44.92 ft
From Node:	SMA-1	Manning's N:	0.012	Manning's N:	0.012
To Node:	BU-W14	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	5.00 ft	Max Depth:	5.00 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Split	Default:	0.00 ft	Default:	0.00 ft
Pipe Count:	1	Op Table:		Op Table:	
Damping:	0.1500 ft	Ref Node:		Ref Node:	
Length:	49.00 ft	Manning's N:	0.000	Manning's N:	0.000
FHWA Code:	1	Top Clip			
Entr Loss Coef:	0.50	Default:	0.00 ft	Default:	0.00 ft
Exit Loss Coef:	1.00	Op Table:		Op Table:	
Bend Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Location:	0.00 dec	Manning's N:	0.000	Manning's N:	0.000
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:	54.25 ft	Ref Node:	
Control Elevation:	54.25 ft	Discharge Coefficients	
Max Depth:	0.25 ft	Weir Default:	3.200
Max Width:	2.58 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment: 3"X31" slot

Weir Component		Bottom Clip	
Weir:	2	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:	54.90 ft	Ref Node:	
Control Elevation:	54.90 ft	Discharge Coefficients	
Max Depth:	1.00 ft	Weir Default:	3.200
Max Width:	10.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment: (2) 2'x1' and (1) 6'x1'

Weir Component		Bottom Clip	
Weir:	3	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	**Top Clip**	
Weir Type:	Horizontal	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	56.25 ft	Ref Node:	
Control Elevation:	56.25 ft	**Discharge Coefficients**	
Max Depth:	3.00 ft	Weir Default:	3.200
Max Width:	8.75 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment: FDOT TYPE H (4-grate)

Drop Structure Comment:

Drop Structure Link: CS-1B		Upstream Pipe		Downstream Pipe	
Scenario:	Post	Invert:	48.75 ft	Invert:	48.75 ft
From Node:	SMA-1	Manning's N:	0.012	Manning's N:	0.012
To Node:	WPA-001	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	**Bottom Clip**			
Solution:	Split	Default:	0.00 ft	Default:	0.00 ft
Pipe Count:	1	Op Table:		Op Table:	
Damping:	0.1000 ft	Ref Node:		Ref Node:	
Length:	83.00 ft	Manning's N:	0.000	Manning's N:	0.000
FHWA Code:	1	**Top Clip**			
Entr Loss Coef:	0.50	Default:	0.00 ft	Default:	0.00 ft
Exit Loss Coef:	1.00	Op Table:		Op Table:	
Bend Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Location:	0.00 dec	Manning's N:	0.000	Manning's N:	0.000
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:	54.90 ft	Ref Node:	
Control Elevation:	54.90 ft	**Discharge Coefficients**	
Max Depth:	0.50 ft	Weir Default:	3.200
Max Width:	2.00 ft		

Fillet:	0.00 ft

Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment: (1) 2'x6" slot

Weir Component

Weir:	2
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Horizontal
Geometry Type:	Rectangular
Invert:	56.25 ft
Control Elevation:	56.25 ft
Max Depth:	3.08 ft
Max Width:	4.08 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: FDOT TYPE D

Drop Structure Comment:

Drop Structure Link: CS-5

Scenario:	Post
From Node:	SMA-5
To Node:	SMA-6
Link Count:	1
Flow Direction:	Both
Solution:	Split
Pipe Count:	1
Damping:	0.1000 ft
Length:	552.00 ft
FHWA Code:	1
Entr Loss Coef:	0.50
Exit Loss Coef:	1.00
Bend Loss Coef:	0.00
Bend Location:	0.00 dec
Energy Switch:	Energy

Upstream Pipe

Invert:	49.40 ft
Manning's N:	0.012

Geometry: Circular

Max Depth:	4.00 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.000

Top Clip

Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.000

Downstream Pipe

Invert:	49.40 ft
Manning's N:	0.012

Geometry: Circular

Max Depth:	4.00 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.000

Top Clip

Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.000

Pipe Comment:

Weir Component

Weir:	1
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Weir Type:	Horizontal
Geometry Type:	Circular
Invert:	57.50 ft
Control Elevation:	58.00 ft
Max Depth:	0.50 ft

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: 6" orifice

Weir Component

Weir:	2
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Geometry Type:	Rectangular
Invert:	59.50 ft
Control Elevation:	59.50 ft
Max Depth:	0.83 ft
Max Width:	11.00 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: (2) 2'x10" and (1) 7'x10"

Weir Component

Weir:	3
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Horizontal
Geometry Type:	Rectangular
Invert:	60.50 ft
Control Elevation:	60.50 ft
Max Depth:	3.00 ft
Max Width:	8.75 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: FDOT TYPE H (4-grate)

Drop Structure Comment:

Drop Structure Link: CS-6A	Upstream Pipe	Downstream Pipe

Scenario:	Post	Invert:	50.00 ft	Invert:	50.00 ft
From Node:	SMA-6	Manning's N:	0.012	Manning's N:	0.012
To Node:	GBS-001	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	4.00 ft	Max Depth:	4.00 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Split	Default:	0.00 ft	Default:	0.00 ft
Pipe Count:	1	Op Table:		Op Table:	
Damping:	0.1000 ft	Ref Node:		Ref Node:	
Length:	267.00 ft	Manning's N:	0.000	Manning's N:	0.000
FHWA Code:	1	Top Clip			
Entr Loss Coef:	0.50	Default:	0.00 ft	Default:	0.00 ft
Exit Loss Coef:	1.00	Op Table:		Op Table:	
Bend Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Location:	0.00 dec	Manning's N:	0.000	Manning's N:	0.000
Energy Switch:	Energy				

Pipe Comment:

Weir Component			
Weir:	1	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Horizontal	Top Clip	
Geometry Type:	Circular	Default:	0.00 ft
Invert:	57.00 ft	Op Table:	
Control Elevation:	57.50 ft	Ref Node:	
Max Depth:	0.42 ft	Discharge Coefficients	
		Weir Default:	3.200
		Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment: 5" orifice

Weir Component			
Weir:	2	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Sharp Crested Vertical	Top Clip	
Geometry Type:	Rectangular	Default:	0.00 ft
Invert:	58.80 ft	Op Table:	
Control Elevation:	58.80 ft	Ref Node:	
Max Depth:	1.00 ft	Discharge Coefficients	
Max Width:	10.00 ft	Weir Default:	3.200
Fillet:	0.00 ft	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment: (2) 2'x1' and (1) 6'x1'

Weir Component

Weir:	3
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Horizontal
Geometry Type:	Rectangular
Invert:	60.00 ft
Control Elevation:	60.00 ft
Max Depth:	3.00 ft
Max Width:	6.58 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: FDOT TYPE H

Drop Structure Comment:

Drop Structure Link: CS-6B		Upstream Pipe		Downstream Pipe	
Scenario:	Post	Invert:	54.05 ft	Invert:	54.05 ft
From Node:	SMA-6	Manning's N:	0.012	Manning's N:	0.012
To Node:	BU-W11	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Split	Default:	0.00 ft	Default:	0.00 ft
Pipe Count:	1	Op Table:		Op Table:	
Damping:	0.1000 ft	Ref Node:		Ref Node:	
Length:	230.00 ft	Manning's N:	0.000	Manning's N:	0.000
FHWA Code:	1	Top Clip			
Entr Loss Coef:	0.50	Default:	0.00 ft	Default:	0.00 ft
Exit Loss Coef:	1.00	Op Table:		Op Table:	
Bend Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Location:	0.00 dec	Manning's N:	0.000	Manning's N:	0.000
Energy Switch:	Energy				

Pipe Comment:

Weir Component	
Weir:	1
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Horizontal
Geometry Type:	Rectangular
Invert:	58.80 ft
Control Elevation:	58.80 ft
Max Depth:	2.00 ft
Max Width:	3.08 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

Fillet:	0.00 ft		
		Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment: FDOT TYPE C

Drop Structure Comment:

Drop Structure Link: CS-8		Upstream Pipe		Downstream Pipe	
Scenario:	Post	Invert:	56.25 ft	Invert:	54.39 ft
From Node:	SMA-8	Manning's N:	0.012	Manning's N:	0.012
To Node:	MH-8-14	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Positive	Bottom Clip			
Solution:	Split	Default:	0.00 ft	Default:	0.00 ft
Pipe Count:	1	Op Table:		Op Table:	
Damping:	0.1000 ft	Ref Node:		Ref Node:	
Length:	1734.00 ft	Manning's N:	0.000	Manning's N:	0.000
FHWA Code:	1	Top Clip			
Entr Loss Coef:	0.50	Default:	0.00 ft	Default:	0.00 ft
Exit Loss Coef:	1.00	Op Table:		Op Table:	
Bend Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Location:	0.00 dec	Manning's N:	0.000	Manning's N:	0.000
Energy Switch:	Energy				

Pipe Comment:

Weir Component			
Weir:	1	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.1000 ft	Ref Node:	
Weir Type:	Horizontal	Top Clip	
Geometry Type:	Rectangular	Default:	0.00 ft
Invert:	62.20 ft	Op Table:	
Control Elevation:	62.20 ft	Ref Node:	
Max Depth:	2.00 ft	Discharge Coefficients	
Max Width:	3.08 ft	Weir Default:	3.200
Fillet:	0.00 ft	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment: FDOT TYPE C

Drop Structure Comment:

Drop Structure Link: CS-MARINA	Upstream Pipe	Downstream Pipe

Scenario:	Post	Invert:	49.87 ft	Invert:	49.28 ft
From Node:	MARINA	Manning's N:	0.012	Manning's N:	0.012
To Node:	BU-W16	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:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.000	Manning's N:	0.000
Length:	198.00 ft	Top Clip			
FHWA Code:	1	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.50	Op Table:		Op Table:	
Exit Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.000	Manning's N:	0.000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component			
Weir:	1	Bottom Clip	
Weir Count:	1	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:	55.00 ft	Op Table:	
Control Elevation:	55.00 ft	Ref Node:	
Max Depth:	3.08 ft	Discharge Coefficients	
Max Width:	2.00 ft	Weir Default:	3.200
Fillet:	0.00 ft	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment: FDOT TYPE C

Weir Component			
Weir:	2	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Sharp Crested Vertical	Top Clip	
Geometry Type:	Circular	Default:	0.00 ft
Invert:	54.25 ft	Op Table:	
Control Elevation:	54.25 ft	Ref Node:	
Max Depth:	0.23 ft	Discharge Coefficients	
		Weir Default:	3.200
		Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment:

Drop Structure Link: CS-W11		Upstream Pipe		Downstream Pipe	
Scenario:	Post	Invert:	50.00 ft	Invert:	50.00 ft
From Node:	W-11	Manning's N:	0.012	Manning's N:	0.012
To Node:	GBS-001	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Split	Default:	0.00 ft	Default:	0.00 ft
Pipe Count:	1	Op Table:		Op Table:	
Damping:	0.0000 ft	Ref Node:		Ref Node:	
Length:	87.00 ft	Manning's N:	0.000	Manning's N:	0.000
FHWA Code:	1	Top Clip			
Entr Loss Coef:	0.50	Default:	0.00 ft	Default:	0.00 ft
Exit Loss Coef:	1.00	Op Table:		Op Table:	
Bend Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Location:	0.00 dec	Manning's N:	0.000	Manning's N:	0.000
Energy Switch:	Energy				

Pipe Comment:

Weir Component			
Weir:	1	Bottom Clip	
Weir Count:	1	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:	55.70 ft	Op Table:	
Control Elevation:	55.70 ft	Ref Node:	
Max Depth:	3.00 ft	Discharge Coefficients	
Max Width:	4.50 ft	Weir Default:	3.200
Fillet:	0.00 ft	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment: FDOT TYPE E

Drop Structure Comment:

Pipe Link: P-1-2		Upstream		Downstream	
Scenario:	Post	Invert:	47.25 ft	Invert:	47.25 ft
From Node:	SMA-1	Manning's N:	0.012	Manning's N:	0.012
To Node:	SMA-2	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	4.00 ft	Max Depth:	4.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.1000 ft	Default:	0.00 ft	Default:	0.00 ft

Length:	185.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.000	Manning's N:	0.000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.000	Manning's N:	0.000

Comment:

Pipe Link: P-1-3		Upstream		Downstream	
Scenario:	Post	Invert:	47.50 ft	Invert:	47.50 ft
From Node:	SMA-1	Manning's N:	0.012	Manning's N:	0.012
To Node:	SMA-3	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	4.00 ft	Max Depth:	4.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.1000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	380.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.000	Manning's N:	0.000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.000	Manning's N:	0.000

Comment:

Pipe Link: P-16-15		Upstream		Downstream	
Scenario:	Post	Invert:	56.00 ft	Invert:	56.00 ft
From Node:	SMA-16	Manning's N:	0.012	Manning's N:	0.012
To Node:	SMA-15	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.50 ft	Max Depth:	2.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.1000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	1412.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.70	Manning's N:	0.000	Manning's N:	0.000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.000	Manning's N:	0.000

Comment:

Pipe Link: P-4A-4B		Upstream		Downstream	
Scenario:	Post	Invert:	52.00 ft	Invert:	52.00 ft
From Node:	SMA-4A	Manning's N:	0.012	Manning's N:	0.012
To Node:	SMA-4B	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.1000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	168.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.000	Manning's N:	0.000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.000	Manning's N:	0.000
Comment:					

Pipe Link: P-5-4		Upstream		Downstream	
Scenario:	Post	Invert:	50.00 ft	Invert:	50.00 ft
From Node:	SMA-5	Manning's N:	0.012	Manning's N:	0.012
To Node:	SMA-4A	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	4.00 ft	Max Depth:	4.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.1000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	215.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.000	Manning's N:	0.000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.000	Manning's N:	0.000
Comment:					

Pipe Link: P-8-14-13		Upstream		Downstream	
Scenario:	Post	Invert:	53.39 ft	Invert:	53.24 ft
From Node:	MH-8-14	Manning's N:	0.012	Manning's N:	0.012
To Node:	SMA-13	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.50 ft	Max Depth:	3.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.1000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	154.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.000	Manning's N:	0.000
Exit Loss Coef:	1.00	Top Clip			

Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.000	Manning's N:	0.000

Comment:

Pipe Link: P-8-9-10		Upstream		Downstream	
Scenario:	Post	Invert:	54.00 ft	Invert:	54.00 ft
From Node:	MH-8-9-10	Manning's N:	0.012	Manning's N:	0.012
To Node:	SMA-10	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	4.00 ft	Max Depth:	4.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.1000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	387.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.000	Manning's N:	0.000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.000	Manning's N:	0.000

Comment:

Pipe Link: P-8-MH		Upstream		Downstream	
Scenario:	Post	Invert:	54.00 ft	Invert:	54.00 ft
From Node:	SMA-8	Manning's N:	0.012	Manning's N:	0.012
To Node:	MH-8-9-10	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	4.00 ft	Max Depth:	4.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.1000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	847.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.000	Manning's N:	0.000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.000	Manning's N:	0.000

Comment:

Pipe Link: P-9-MH		Upstream		Downstream	
Scenario:	Post	Invert:	54.00 ft	Invert:	54.00 ft

From Node:	SMA-9	Manning's N:	0.012	Manning's N:	0.012
To Node:	MH-8-9-10	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.50 ft	Max Depth:	3.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.1000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	39.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.50	Manning's N:	0.000	Manning's N:	0.000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.000	Manning's N:	0.000

Comment:

Pipe Link: P-W14-TOHO		Upstream		Downstream	
Scenario:	Post	Invert:	52.17 ft	Invert:	52.39 ft
From Node:	W-14	Manning's N:	0.012	Manning's N:	0.012
To Node:	LK TOHO	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.50 ft	Max Depth:	2.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	40.00 ft	Op Table:		Op Table:	
FHWA Code:	6	Ref Node:		Ref Node:	
Entr Loss Coef:	0.90	Manning's N:	0.000	Manning's N:	0.000
Exit Loss Coef:	1.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.000	Manning's N:	0.000

Comment:

Weir Link: W-W14-WPA001			
Scenario:	Post	Bottom Clip	
From Node:	W-14	Default:	0.00 ft
To Node:	WPA-001	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Irregular	Ref Node:	
Invert:	54.92 ft	Discharge Coefficients	
Control Elevation:	54.92 ft	Weir Default:	2.800
Cross Section:	X-W14-WPA001	Weir Table:	
		Orifice Default:	0.600

Orifice Table:	

Comment:

Weir Link: W-W4-GBS004

Scenario:	Post
From Node:	W-4
To Node:	GBS-004
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Broad Crested Vertical
Geometry Type:	Irregular
Invert:	58.83 ft
Control Elevation:	58.83 ft
Cross Section:	X-W4-GBS004

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip

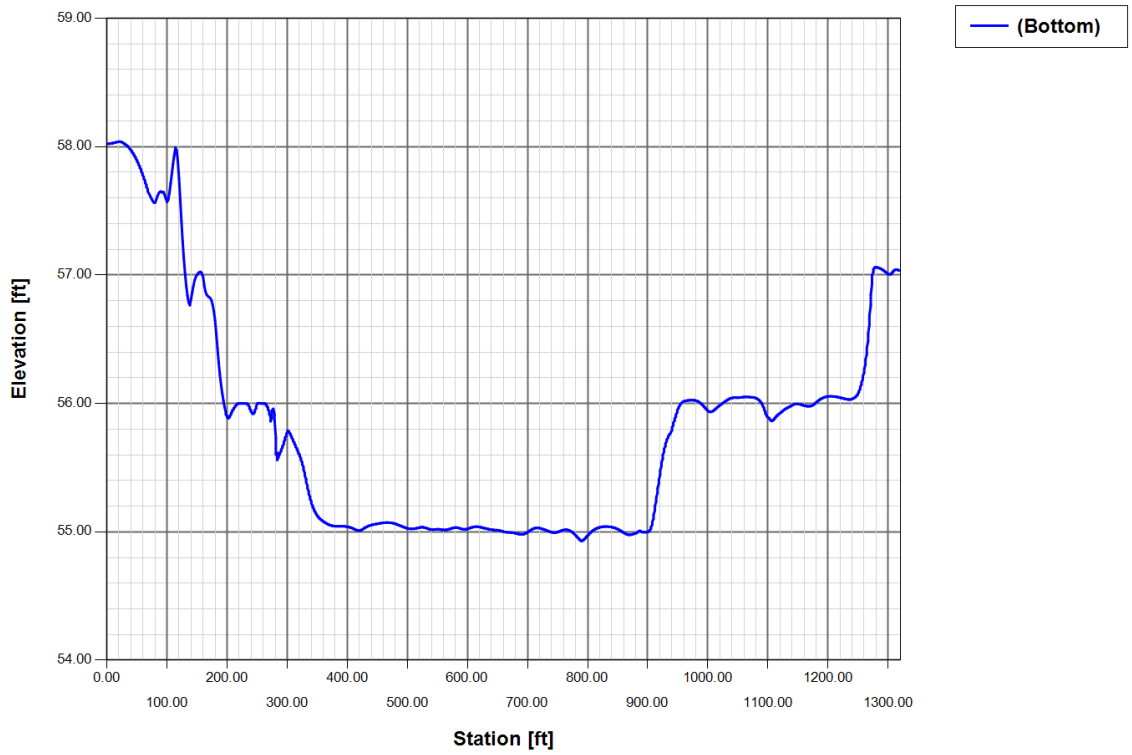
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients

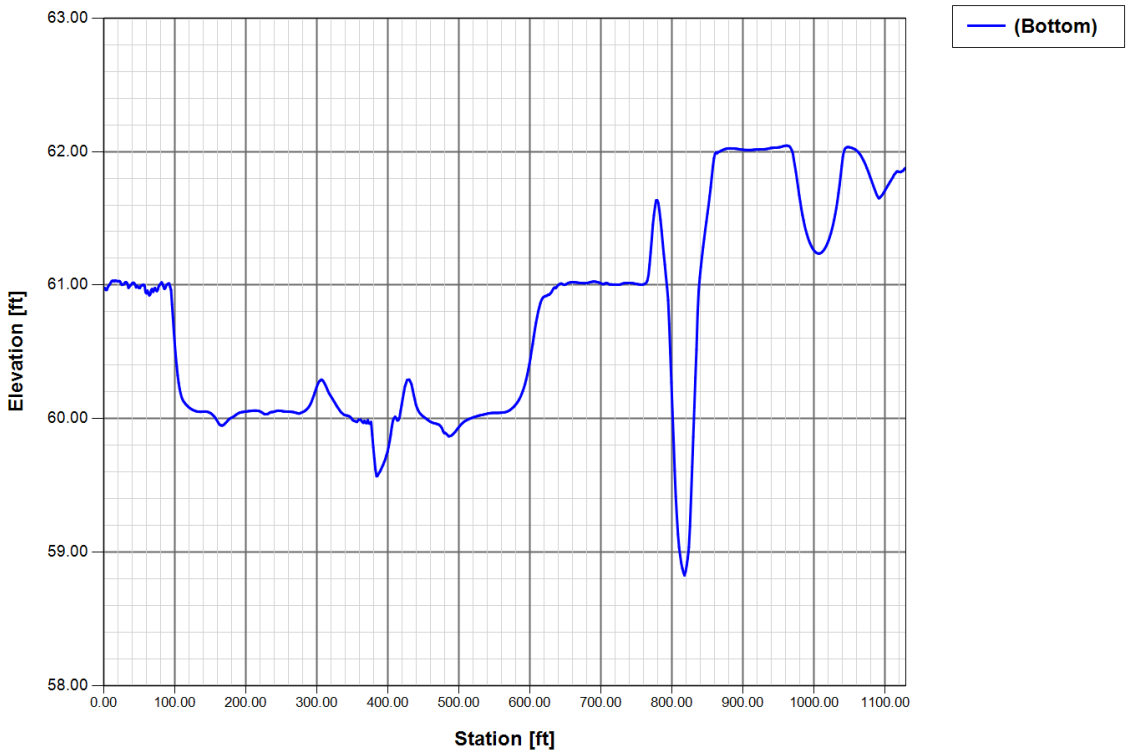
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Weir Cross Section: X-W14-WPA001 Scenario: X-W14-WPA001



Weir Cross Section: X-W4-GBS004 Scenario: X-W4-GBS004



Simulation: 100YR-24HR

Scenario:	Post
Run Date/Time:	6/23/2021 9:16:12 AM
Program Version:	ICPR4 4.07.04

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.00
End Time:	0	0	0	30.00

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

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.00	15.00

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.00	15.00

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set: Basin Composite CN
Green-Ampt Set:
Vertical Layers Set:
Impervious Set: Basin Composite DCIA

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

IA Recovery Time: 24.00 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: ~SCSII-24
Rainfall Amount: 8.00 in
Storm Duration: 24.00 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 100YR-72HR

Scenario: Post
Run Date/Time: 6/23/2021 9:17:08 AM

Program Version: ICPR4 4.07.04

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.00
End Time:	0	0	0	100.00

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

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.00	15.00

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.00	15.00

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:

Extern Hydrograph Set:

Curve Number Set: Basin Composite CN

Green-Ampt Set:

Vertical Layers Set:

Impervious Set: Basin Composite DCIA

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

IA Recovery Time: 24.00 hr

Smp/Man Basin Rain Opt: Global

Rainfall Name: ~SFWMD-72

		Rainfall Amount:	11.40 in
Edge Length Option:	Automatic	Storm Duration:	72.00 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 10YR-24HR

Scenario: Post
Run Date/Time: 6/23/2021 9:19:45 AM
Program Version: ICPR4 4.07.04

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.00
End Time:	0	0	0	30.00

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

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.00	15.00

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.00	15.00

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:

Unit Hydrograph Folder:		Curve Number Set:	Basin Composite CN
		Green-Ampt Set:	
		Vertical Layers Set:	
		Impervious Set:	Basin Composite DCIA

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.00 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~SCSII-24
		Rainfall Amount:	5.00 in
Edge Length Option:	Automatic	Storm Duration:	24.00 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 10YR-72HR

Scenario: Post
Run Date/Time: 6/23/2021 9:20:36 AM
Program Version: ICPR4 4.07.04

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.00
End Time:	0	0	0	100.00

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

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.00	15.00
0	0	0	60.00	0.60
0	0	0	65.00	15.00
0	0	0	100.00	15.00

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.00	15.00
0	0	0	60.00	0.60
0	0	0	65.00	15.00
0	0	0	100.00	15.00

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set: Basin Composite CN
Green-Ampt Set:
Vertical Layers Set:
Impervious Set: Basin Composite DCIA

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

IA Recovery Time: 24.00 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: ~SFWMD-72
Rainfall Amount: 7.50 in
Storm Duration: 72.00 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 25YR-24HR

Scenario: Post
Run Date/Time: 6/23/2021 9:23:20 AM
Program Version: ICPR4 4.07.04

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.00
End Time:	0	0	0	30.00

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

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.00	15.00

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.00	15.00

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set: Basin Composite CN
Green-Ampt Set:
Vertical Layers Set:
Impervious Set: Basin Composite DCIA

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft

IA Recovery Time: 24.00 hr
Smp/Man Basin Rain: Global

		Opt:	
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~SCSII-24
		Rainfall Amount:	6.00 in
Edge Length Option:	Automatic	Storm Duration:	24.00 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 5YR-24HR

Scenario: Post
Run Date/Time: 6/23/2021 9:24:13 AM
Program Version: ICPR4 4.07.04

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.00
End Time:	0	0	0	30.00

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

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.00	15.00

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.00	15.00

Restart File

Save Restart: False

Resources & Lookup Tables

Resources		Lookup Tables	
Rainfall Folder:		Boundary Stage Set:	
		Extern Hydrograph Set:	
Unit Hydrograph Folder:		Curve Number Set:	Basin Composite CN
		Green-Ampt Set:	
		Vertical Layers Set:	
		Impervious Set:	Basin Composite DCIA

Tolerances & Options			
Time Marching:	SAOR	IA Recovery Time:	24.00 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~SCSII-24
		Rainfall Amount:	4.50 in
Edge Length Option:	Automatic	Storm Duration:	24.00 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: MEAN

Scenario: Post
Run Date/Time: 6/23/2021 9:24:46 AM
Program Version: ICPR4 4.07.04

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.00
End Time:	0	0	0	60.00

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

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.00	15.00

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.00	15.00

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set: Basin Composite CN
Green-Ampt Set:
Vertical Layers Set:
Impervious Set: Basin Composite DCIA

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

IA Recovery Time: 24.00 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: ~FLMOD
Rainfall Amount: 4.00 in
Storm Duration: 24.00 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Node Max Conditions w/ Times [Post]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
BU-W11	100YR-24HR	60.50	57.69	0.0001	9.93	9.93	100	13.36	11.99	13.35	13.36
BU-W11	100YR-72HR	60.50	57.70	0.0000	10.72	10.72	100	60.78	47.57	60.77	60.78
BU-W11	10YR-24HR	60.50	57.66	0.0001	7.98	7.98	100	14.44	12.38	14.43	14.44
BU-W11	10YR-72HR	60.50	57.69	0.0000	9.61	9.61	100	61.24	59.73	61.23	61.24
BU-W11	25YR-24HR	60.50	57.67	0.0001	8.78	8.78	100	13.79	12.19	13.79	13.79
BU-W11	5YR-24HR	60.50	57.65	0.0001	7.14	7.14	100	14.65	12.55	14.64	14.65
BU-W11	MEAN	60.50	57.60	0.0000	4.01	4.01	100	16.24	13.20	16.23	16.24
BU-W14	100YR-24HR	57.00	55.17	0.0027	92.94	100.12	100	17.31	13.18	17.28	15.98
BU-W14	100YR-72HR	57.00	55.25	-0.0030	154.31	162.91	100	63.85	56.22	63.79	63.22
BU-W14	10YR-24HR	57.00	55.03	-0.0030	32.16	39.99	100	26.99	17.40	21.61	21.61
BU-W14	10YR-72HR	57.00	55.15	-0.0032	82.26	93.15	100	64.96	59.65	64.64	63.99
BU-W14	25YR-24HR	57.00	55.09	-0.0027	47.85	60.83	100	21.07	13.65	20.98	20.98
BU-W14	5YR-24HR	57.00	54.73	-0.0029	23.50	29.98	100	29.99	16.35	23.03	24.83
BU-W14	MEAN	57.00	54.39	-0.0031	16.10	19.28	100	30.48	19.10	24.58	24.58
BU-W16	100YR-24HR	55.00	54.47	0.0005	8.88	8.88	100	12.69	11.91	12.67	12.69
BU-W16	100YR-72HR	55.00	54.47	0.0002	9.10	9.10	100	60.65	59.69	60.63	60.66
BU-W16	10YR-24HR	55.00	54.38	0.0002	6.53	6.53	100	12.62	12.02	12.60	12.62
BU-W16	10YR-72HR	55.00	54.43	0.0002	7.91	7.91	100	60.54	59.84	60.52	60.54
BU-W16	25YR-24HR	55.00	54.42	0.0002	7.63	7.63	100	12.63	12.00	12.61	12.63
BU-W16	5YR-24HR	55.00	54.33	0.0002	5.26	5.26	100	12.66	12.08	12.64	12.66
BU-W16	MEAN	55.00	54.24	0.0001	3.21	3.21	100	12.85	12.19	12.82	12.85
BU-W4A,B	100YR-24HR	63.00	60.47	-0.0010	94.98	94.98	100	13.30	2.70	13.30	13.30
BU-W4A,B	100YR-72HR	63.00	60.55	-0.0010	122.00	122.00	100	60.98	15.48	60.98	60.98
BU-W4A,B	10YR-24HR	63.00	60.19	-0.0010	24.61	24.61	100	14.34	9.61	14.30	14.34
BU-W4A,B	10YR-72HR	63.00	60.41	-0.0010	76.67	76.67	100	61.05	29.87	61.05	61.05
BU-W4A,B	25YR-24HR	63.00	60.30	-0.0010	49.45	49.45	100	13.81	6.93	13.81	13.81
BU-W4A,B	5YR-24HR	63.00	60.13	-0.0010	13.68	13.68	100	14.92	3.18	14.92	14.92
BU-W4A,B	MEAN	63.00	60.08	-0.0010	6.96	6.95	100	18.58	5.13	18.57	18.58
GBS-001	100YR-24HR	54.50	54.00	0.0000	65.84	0.00	0	0.00	0.00	13.45	0.00
GBS-001	100YR-72HR	54.50	54.00	0.0000	118.74	0.00	0	0.00	0.00	60.79	0.00

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
GBS-001	10YR-24HR	54.50	54.00	0.0000	17.36	0.00	0	0.00	0.00	15.54	0.00
GBS-001	10YR-72HR	54.50	54.00	0.0000	56.55	0.00	0	0.00	0.00	61.31	0.00
GBS-001	25YR-24HR	54.50	54.00	0.0000	32.46	0.00	0	0.00	0.00	14.36	0.00
GBS-001	5YR-24HR	54.50	54.00	0.0000	11.30	0.00	0	0.00	0.00	18.02	0.00
GBS-001	MEAN	54.50	54.00	0.0000	6.89	0.00	0	0.00	0.00	21.34	0.00
GBS-004	100YR-24HR	57.50	57.00	0.0000	88.75	0.00	0	0.00	0.00	14.84	0.00
GBS-004	100YR-72HR	57.50	57.00	0.0000	167.42	0.00	0	0.00	0.00	61.75	0.00
GBS-004	10YR-24HR	57.50	57.00	0.0000	24.51	0.00	0	0.00	0.00	16.25	0.00
GBS-004	10YR-72HR	57.50	57.00	0.0000	62.16	0.00	0	0.00	0.00	62.92	0.00
GBS-004	25YR-24HR	57.50	57.00	0.0000	41.42	0.00	0	0.00	0.00	15.61	0.00
GBS-004	5YR-24HR	57.50	57.00	0.0000	20.04	0.00	0	0.00	0.00	12.05	0.00
GBS-004	MEAN	57.50	57.00	0.0000	12.54	0.00	0	0.00	0.00	12.07	0.00
LK TOHO	100YR-24HR	54.50	54.00	0.0000	159.56	0.00	0	0.00	0.00	12.07	0.00
LK TOHO	100YR-72HR	54.50	54.00	0.0000	145.31	0.00	0	0.00	0.00	60.05	0.00
LK TOHO	10YR-24HR	54.50	54.00	0.0000	94.96	0.00	0	0.00	0.00	12.08	0.00
LK TOHO	10YR-72HR	54.50	54.00	0.0000	94.03	0.00	0	0.00	0.00	60.05	0.00
LK TOHO	25YR-24HR	54.50	54.00	0.0000	117.94	0.00	0	0.00	0.00	12.08	0.00
LK TOHO	5YR-24HR	54.50	54.00	0.0000	84.04	0.00	0	0.00	0.00	12.07	0.00
LK TOHO	MEAN	54.50	54.00	0.0000	57.65	0.00	0	0.00	0.00	12.08	0.00
MARINA	100YR-24HR	57.25	55.96	0.0004	44.76	8.88	69957	12.68	11.91	12.05	12.67
MARINA	100YR-72HR	57.25	56.04	0.0002	34.66	9.10	70483	60.64	59.72	60.02	60.63
MARINA	10YR-24HR	57.25	55.37	0.0002	27.55	6.53	66099	12.61	11.83	12.05	12.60
MARINA	10YR-72HR	57.25	55.62	0.0002	22.68	7.91	67785	60.53	59.97	60.02	60.52
MARINA	25YR-24HR	57.25	55.55	0.0003	33.29	7.63	67313	12.62	11.86	12.05	12.61
MARINA	5YR-24HR	57.25	55.29	0.0003	24.68	5.26	65612	12.65	11.91	12.05	12.64
MARINA	MEAN	57.25	55.21	0.0003	15.88	3.21	65050	12.84	11.84	12.05	12.82
MH-8-14	100YR-24HR	67.00	64.16	-0.0010	31.84	31.84	105	13.52	5.86	14.40	14.40
MH-8-14	100YR-72HR	67.00	65.03	0.0009	36.10	36.11	105	61.43	4.22	63.64	63.64
MH-8-14	10YR-24HR	67.00	63.17	-0.0009	11.22	11.24	105	14.02	2.57	14.58	14.55
MH-8-14	10YR-72HR	67.00	63.90	-0.0009	27.22	27.23	105	61.20	4.31	61.87	61.87
MH-8-14	25YR-24HR	67.00	63.51	-0.0010	19.30	19.30	105	13.84	2.83	14.27	14.27

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
MH-8-14	5YR-24HR	67.00	63.01	0.0010	7.03	7.03	105	14.31	8.88	15.00	15.00
MH-8-14	MEAN	67.00	62.85	-0.0010	3.77	3.71	105	15.69	3.20	17.28	17.28
MH-8-9-10	100YR-24HR	65.00	63.67	-0.0010	35.13	35.11	100	13.44	9.22	13.63	13.62
MH-8-9-10	100YR-72HR	65.00	64.39	-0.0010	47.54	47.54	100	61.15	45.54	61.65	61.65
MH-8-9-10	10YR-24HR	65.00	62.77	0.0012	21.78	21.73	100	14.43	11.83	12.20	12.21
MH-8-9-10	10YR-72HR	65.00	63.44	-0.0010	30.40	30.39	100	61.16	19.73	61.33	61.32
MH-8-9-10	25YR-24HR	65.00	63.05	0.0010	24.49	24.43	100	13.83	7.19	12.21	12.21
MH-8-9-10	5YR-24HR	65.00	62.63	0.0010	20.32	20.28	100	15.18	9.21	12.20	12.20
MH-8-9-10	MEAN	65.00	62.47	0.0011	15.72	15.69	100	18.68	11.92	12.20	12.20
POND-7	100YR-24HR	62.00	59.21	0.0002	6.04	0.00	24516	25.28	11.91	12.07	0.00
POND-7	100YR-72HR	62.00	59.77	0.0001	5.16	0.00	25958	73.28	59.72	60.03	0.00
POND-7	10YR-24HR	62.00	58.71	0.0001	3.45	0.00	23292	25.28	12.02	12.07	0.00
POND-7	10YR-72HR	62.00	59.13	0.0001	3.27	0.00	24299	73.28	59.97	60.03	0.00
POND-7	25YR-24HR	62.00	58.88	0.0001	4.31	0.00	23680	25.28	11.86	12.07	0.00
POND-7	5YR-24HR	62.00	58.63	0.0001	3.02	0.00	23099	25.28	11.91	12.07	0.00
POND-7	MEAN	62.00	58.54	0.0001	1.93	0.00	22907	25.28	11.84	12.08	0.00
SMA-1	100YR-24HR	58.25	56.89	0.0002	463.49	123.77	1371883	17.24	12.21	12.24	14.96
SMA-1	100YR-72HR	58.25	57.65	0.0001	576.78	219.38	1410149	63.74	60.08	60.19	63.76
SMA-1	10YR-24HR	58.25	55.80	0.0001	255.02	34.06	1341063	21.23	12.18	12.20	20.79
SMA-1	10YR-72HR	58.25	56.76	0.0002	348.19	106.27	1368188	64.66	59.97	60.22	62.47
SMA-1	25YR-24HR	58.25	56.25	0.0001	311.39	54.91	1353768	19.87	12.45	12.20	16.12
SMA-1	5YR-24HR	58.25	55.59	0.0001	226.35	24.60	1335272	23.97	12.04	12.20	23.32
SMA-1	MEAN	58.25	55.40	0.0001	158.73	16.57	1329701	24.63	11.84	12.22	24.49
SMA-10	100YR-24HR	64.50	63.30	0.0004	185.81	94.98	259802	13.30	12.21	12.25	13.30
SMA-10	100YR-72HR	64.50	63.73	0.0001	184.16	122.00	267499	60.99	60.08	60.22	60.98
SMA-10	10YR-24HR	64.50	62.71	0.0002	113.65	24.60	253940	14.34	12.18	12.25	14.34
SMA-10	10YR-72HR	64.50	63.16	0.0003	116.55	76.67	258412	61.04	59.97	60.22	61.04
SMA-10	25YR-24HR	64.50	62.95	0.0003	137.99	49.45	256299	13.81	12.45	12.25	13.81
SMA-10	5YR-24HR	64.50	62.58	0.0002	101.38	13.67	252574	14.92	12.28	12.25	14.92
SMA-10	MEAN	64.50	62.43	0.0002	73.65	6.93	251161	18.70	11.84	12.27	18.70
SMA-12	100YR-24HR	62.00	61.12	0.0005	381.47	205.66	450938	13.41	11.91	12.13	13.31

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
SMA-12	100YR-72HR	62.00	61.78	0.0002	459.91	244.08	472031	61.09	60.08	60.10	60.65
SMA-12	10YR-24HR	62.00	60.12	0.0002	217.19	58.36	435835	14.47	12.09	12.12	14.47
SMA-12	10YR-72HR	62.00	60.98	0.0003	279.49	189.93	446747	61.11	59.97	60.13	61.04
SMA-12	25YR-24HR	62.00	60.50	0.0003	266.45	107.87	440605	13.96	12.05	12.12	13.96
SMA-12	5YR-24HR	62.00	59.94	0.0002	192.53	36.98	433600	14.99	12.04	12.12	14.99
SMA-12	MEAN	62.00	59.78	0.0003	129.61	20.22	431497	16.83	11.84	12.13	16.83
SMA-13	100YR-24HR	65.00	63.87	0.0005	322.75	147.95	386284	13.27	11.91	12.15	13.18
SMA-13	100YR-72HR	65.00	64.68	0.0002	338.42	153.91	407187	61.25	60.08	60.12	61.76
SMA-13	10YR-24HR	65.00	63.10	0.0002	193.43	44.87	377552	13.91	12.18	12.15	13.91
SMA-13	10YR-72HR	65.00	63.68	0.0003	203.00	135.48	384107	60.88	59.97	60.15	60.82
SMA-13	25YR-24HR	65.00	63.38	0.0003	236.78	86.66	380771	13.62	12.05	12.15	13.62
SMA-13	5YR-24HR	65.00	62.96	0.0002	171.70	27.58	375948	13.99	12.04	12.15	13.99
SMA-13	MEAN	65.00	62.82	0.0003	118.08	13.70	374412	15.39	11.84	12.17	15.39
SMA-14	100YR-24HR	66.00	64.99	0.0004	148.75	31.83	235559	14.00	12.21	12.23	14.40
SMA-14	100YR-72HR	66.00	65.89	0.0002	136.39	36.09	254170	61.92	60.08	60.18	63.64
SMA-14	10YR-24HR	66.00	64.01	0.0002	87.55	11.21	227504	14.55	12.18	12.23	14.55
SMA-14	10YR-72HR	66.00	64.71	0.0003	87.99	27.22	233261	61.65	59.97	60.18	61.87
SMA-14	25YR-24HR	66.00	64.30	0.0003	108.01	19.29	229896	14.18	12.45	12.23	14.27
SMA-14	5YR-24HR	66.00	63.87	0.0002	77.31	6.99	226337	14.95	12.28	12.23	14.96
SMA-14	MEAN	66.00	63.72	0.0002	55.01	3.63	225210	17.77	11.84	12.27	17.78
SMA-15	100YR-24HR	66.50	65.35	0.0004	240.30	44.77	380593	14.03	12.21	12.20	14.61
SMA-15	100YR-72HR	66.50	66.35	0.0002	222.79	51.45	410023	62.00	60.08	60.17	64.40
SMA-15	10YR-24HR	66.50	64.42	0.0002	141.60	14.74	368793	14.51	12.18	12.20	14.51
SMA-15	10YR-72HR	66.50	65.05	0.0003	140.63	41.11	376781	61.69	59.97	60.17	62.08
SMA-15	25YR-24HR	66.50	64.66	0.0003	174.51	31.89	371884	14.03	12.45	12.20	14.09
SMA-15	5YR-24HR	66.50	64.29	0.0002	125.15	7.95	367264	16.87	12.12	12.20	16.90
SMA-15	MEAN	66.50	64.21	0.0002	87.78	4.30	366203	22.70	11.84	12.23	22.69
SMA-16	100YR-24HR	66.50	65.49	0.0004	63.72	7.33	109330	14.59	12.21	12.15	17.63
SMA-16	100YR-72HR	66.50	66.53	0.0002	56.18	9.41	122875	62.60	60.08	60.12	67.71
SMA-16	10YR-24HR	66.50	64.47	0.0002	37.90	2.50	104413	15.43	12.18	12.17	16.26
SMA-16	10YR-72HR	66.50	65.21	0.0003	36.38	6.49	107960	62.09	59.97	60.12	64.32

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
SMA-16	25YR-24HR	66.50	64.75	0.0002	46.53	4.46	105774	14.52	12.45	12.17	15.81
SMA-16	5YR-24HR	66.50	64.35	0.0002	33.57	1.50	103784	17.16	12.04	12.17	17.81
SMA-16	MEAN	66.50	64.25	0.0002	23.10	0.82	103288	22.71	11.84	12.18	23.21
SMA-2	100YR-24HR	58.25	56.92	0.0002	73.27	28.53	116765	17.36	12.21	12.17	12.27
SMA-2	100YR-72HR	58.25	57.69	0.0001	64.86	21.26	124581	63.87	60.08	60.12	60.18
SMA-2	10YR-24HR	58.25	55.82	0.0001	43.36	20.66	111015	21.47	12.18	12.17	12.24
SMA-2	10YR-72HR	58.25	56.78	0.0002	41.91	15.71	116057	64.80	59.97	60.12	60.13
SMA-2	25YR-24HR	58.25	56.27	0.0001	53.36	23.65	113383	20.00	12.05	12.17	12.27
SMA-2	5YR-24HR	58.25	55.61	0.0001	38.36	18.73	109938	23.93	12.04	12.17	12.23
SMA-2	MEAN	58.25	55.41	0.0001	26.34	13.30	108877	24.41	11.84	12.18	12.24
SMA-3	100YR-24HR	58.25	56.92	0.0002	106.95	11.24	305226	18.08	12.21	12.15	12.15
SMA-3	100YR-72HR	58.25	57.69	0.0001	101.00	15.10	319090	64.29	60.08	60.13	67.18
SMA-3	10YR-24HR	58.25	55.82	0.0001	63.98	5.52	294889	22.95	12.18	12.15	12.22
SMA-3	10YR-72HR	58.25	56.77	0.0002	61.90	7.14	303829	65.59	59.97	60.12	68.15
SMA-3	25YR-24HR	58.25	56.27	0.0001	78.35	8.12	299007	20.88	12.45	12.15	12.20
SMA-3	5YR-24HR	58.25	55.61	0.0001	56.78	4.26	293004	24.34	12.04	12.15	12.24
SMA-3	MEAN	58.25	55.39	0.0001	38.93	2.33	290974	25.88	11.84	12.17	12.36
SMA-4A	100YR-24HR	62.00	61.11	0.0004	43.61	10.68	67855	14.10	12.21	12.25	15.35
SMA-4A	100YR-72HR	62.00	61.89	0.0002	31.74	15.54	76750	61.66	60.08	60.23	63.47
SMA-4A	10YR-24HR	62.00	60.08	0.0002	26.30	5.44	62644	14.80	12.18	12.31	12.84
SMA-4A	10YR-72HR	62.00	60.86	0.0003	22.89	9.12	66036	61.69	59.97	60.18	63.15
SMA-4A	25YR-24HR	62.00	60.40	0.0003	32.45	6.03	64039	14.39	12.45	12.29	15.67
SMA-4A	5YR-24HR	62.00	59.93	0.0002	23.17	5.01	61984	15.27	12.28	12.32	12.84
SMA-4A	MEAN	62.00	59.78	0.0002	17.47	4.23	61324	17.94	11.84	12.38	12.81
SMA-4B	100YR-24HR	62.00	61.13	0.0003	36.44	5.31	70718	14.48	12.21	12.15	15.99
SMA-4B	100YR-72HR	62.00	61.95	0.0002	29.41	7.67	79576	62.02	60.08	60.10	64.47
SMA-4B	10YR-24HR	62.00	60.10	0.0002	21.15	1.74	65716	15.43	12.18	12.15	16.26
SMA-4B	10YR-72HR	62.00	60.90	0.0003	20.35	4.61	68864	62.08	59.97	60.13	63.77
SMA-4B	25YR-24HR	62.00	60.42	0.0002	26.29	3.10	66983	14.86	12.45	12.15	15.81
SMA-4B	5YR-24HR	62.00	59.95	0.0002	18.60	1.11	65120	16.19	12.04	12.15	17.20
SMA-4B	MEAN	62.00	59.81	0.0002	13.39	0.62	64505	18.70	11.84	12.32	19.78

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
SMA-5	100YR-24HR	62.00	61.08	0.0004	170.40	42.39	228270	13.88	12.21	12.23	14.12
SMA-5	100YR-72HR	62.00	61.85	0.0002	155.85	57.13	244673	61.59	60.08	60.20	62.07
SMA-5	10YR-24HR	62.00	60.07	0.0002	101.11	17.50	218807	14.39	12.18	12.25	13.64
SMA-5	10YR-72HR	62.00	60.82	0.0003	100.88	35.82	225061	61.61	59.97	60.20	61.83
SMA-5	25YR-24HR	62.00	60.38	0.0003	124.27	26.62	221421	14.09	12.45	12.23	13.45
SMA-5	5YR-24HR	62.00	59.92	0.0002	89.52	12.22	217563	14.73	12.28	12.25	13.78
SMA-5	MEAN	62.00	59.75	0.0002	64.18	9.50	216213	17.05	11.84	12.28	12.58
SMA-6	100YR-24HR	61.50	60.29	0.0005	160.11	68.67	196065	13.37	11.91	12.13	13.37
SMA-6	100YR-72HR	61.50	60.73	0.0002	168.97	107.52	202656	60.78	60.08	60.10	60.78
SMA-6	10YR-24HR	61.50	59.37	0.0002	93.04	22.68	188437	14.44	12.18	12.13	14.44
SMA-6	10YR-72HR	61.50	60.12	0.0003	105.04	57.02	194668	61.23	59.97	60.12	61.23
SMA-6	25YR-24HR	61.50	59.71	0.0003	115.43	37.45	191229	13.80	12.05	12.13	13.80
SMA-6	5YR-24HR	61.50	59.19	0.0002	81.85	15.80	186941	14.66	12.04	12.13	14.66
SMA-6	MEAN	61.50	59.05	0.0003	54.89	8.78	185765	16.25	11.84	12.15	16.25
SMA-8	100YR-24HR	65.00	64.03	0.0005	142.53	27.29	142197	13.51	12.21	12.15	13.69
SMA-8	100YR-72HR	65.00	65.02	0.0003	125.60	36.10	154672	61.26	60.08	60.12	61.60
SMA-8	10YR-24HR	65.00	62.83	0.0003	84.01	16.20	132564	14.49	12.18	12.15	12.36
SMA-8	10YR-72HR	65.00	63.70	0.0004	81.05	23.37	138580	61.26	59.97	60.12	61.45
SMA-8	25YR-24HR	65.00	63.15	0.0003	103.58	19.54	134392	13.77	12.05	12.15	12.36
SMA-8	5YR-24HR	65.00	62.67	0.0003	74.20	15.09	131690	15.26	12.04	12.15	12.34
SMA-8	MEAN	65.00	62.51	0.0003	50.56	11.80	130773	18.67	11.84	12.17	12.28
SMA-9	100YR-24HR	64.50	63.72	0.0005	51.53	10.88	56791	13.44	11.91	12.12	12.13
SMA-9	100YR-72HR	64.50	64.46	0.0002	44.34	13.13	64457	61.15	60.08	60.08	60.14
SMA-9	10YR-24HR	64.50	62.80	0.0002	30.56	7.34	51714	14.49	12.09	12.12	12.12
SMA-9	10YR-72HR	64.50	63.49	0.0004	28.68	7.30	54411	61.17	59.97	60.08	61.13
SMA-9	25YR-24HR	64.50	63.09	0.0003	37.58	8.68	52829	13.85	12.05	12.12	12.14
SMA-9	5YR-24HR	64.50	62.65	0.0002	27.05	6.81	51126	15.25	11.91	12.12	12.10
SMA-9	MEAN	64.50	62.49	0.0003	18.13	4.72	50509	18.65	11.84	12.13	12.11
W-11	100YR-24HR	57.00	56.07	0.0001	61.55	10.80	364481	17.06	11.91	12.10	17.06
W-11	100YR-72HR	57.00	56.31	0.0001	57.58	21.98	393094	60.95	0.56	60.05	60.93
W-11	10YR-24HR	57.00	55.98	0.0001	33.31	7.08	352336	19.27	11.83	12.08	19.27

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
W-11	10YR-72HR	57.00	56.07	0.0001	39.02	10.70	364219	63.84	59.97	60.05	63.84
W-11	25YR-24HR	57.00	56.02	0.0001	41.05	8.62	358460	19.32	11.86	12.08	19.32
W-11	5YR-24HR	57.00	55.93	0.0001	29.46	5.32	343083	19.80	11.91	12.08	19.80
W-11	MEAN	57.00	55.86	0.0001	19.22	3.20	330469	23.62	11.84	12.08	23.62
W-14	100YR-24HR	56.00	55.14	0.0001	102.62	94.83	759956	17.50	11.91	15.98	17.49
W-14	100YR-72HR	56.00	55.21	0.0001	166.23	157.49	765249	63.96	59.72	63.22	63.96
W-14	10YR-24HR	56.00	55.02	0.0000	49.11	23.97	750320	27.05	12.02	12.07	27.05
W-14	10YR-72HR	56.00	55.13	0.0001	95.30	83.10	758811	64.99	59.97	63.99	64.99
W-14	25YR-24HR	56.00	55.08	0.0000	61.77	48.14	754804	20.70	11.86	20.98	20.70
W-14	5YR-24HR	56.00	54.72	0.0000	44.21	15.58	704888	30.00	11.91	12.07	29.96
W-14	MEAN	56.00	54.38	0.0000	29.91	11.41	648434	30.57	11.84	12.07	30.85
W-4	100YR-24HR	61.00	60.02	0.0001	169.23	87.15	1200943	14.84	12.79	12.89	14.84
W-4	100YR-72HR	61.00	60.16	0.0001	232.39	164.38	1237283	61.77	60.08	60.35	61.77
W-4	10YR-24HR	61.00	59.54	0.0000	69.47	23.74	1019751	16.19	12.18	12.35	16.19
W-4	10YR-72HR	61.00	59.90	0.0001	131.93	60.99	1156431	62.93	60.61	60.66	62.93
W-4	25YR-24HR	61.00	59.74	0.0001	87.11	40.44	1095405	15.60	12.45	12.35	15.60
W-4	5YR-24HR	61.00	59.43	0.0000	60.79	17.10	947912	16.67	12.28	12.35	16.67
W-4	MEAN	61.00	59.32	0.0000	45.06	11.20	853236	16.50	11.84	12.43	16.50
WPA-001	100YR-24HR	54.50	54.00	0.0000	104.78	0.00	0	0.00	0.00	17.36	0.00
WPA-001	100YR-72HR	54.50	54.00	0.0000	202.45	0.00	0	0.00	0.00	63.93	0.00
WPA-001	10YR-24HR	54.50	54.00	0.0000	9.04	0.00	0	0.00	0.00	27.01	0.00
WPA-001	10YR-72HR	54.50	54.00	0.0000	86.09	0.00	0	0.00	0.00	64.90	0.00
WPA-001	25YR-24HR	54.50	54.00	0.0000	34.16	0.00	0	0.00	0.00	20.69	0.00
WPA-001	5YR-24HR	54.50	54.00	0.0000	3.22	0.00	0	0.00	0.00	23.16	0.00
WPA-001	MEAN	54.50	54.00	0.0000	2.25	0.00	0	0.00	0.00	24.52	0.00
WPA-006	100YR-24HR	54.50	54.00	0.0000	18.84	0.00	0	0.00	0.00	12.60	0.00
WPA-006	100YR-72HR	54.50	54.00	0.0000	19.50	0.00	0	0.00	0.00	60.52	0.00
WPA-006	10YR-24HR	54.50	54.00	0.0000	10.54	0.00	0	0.00	0.00	12.60	0.00
WPA-006	10YR-72HR	54.50	54.00	0.0000	12.20	0.00	0	0.00	0.00	60.53	0.00
WPA-006	25YR-24HR	54.50	54.00	0.0000	13.27	0.00	0	0.00	0.00	12.60	0.00
WPA-006	5YR-24HR	54.50	54.00	0.0000	9.20	0.00	0	0.00	0.00	12.60	0.00

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
WPA-006	MEAN	54.50	54.00	0.0000	7.09	0.00	0	0.00	0.00	12.68	0.00

Link Min/Max Conditions with Times [Post]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
BU-W11	100YR-24HR	9.93	0.00	0.01	1.31	1.31	13.36	0.00	12.06	13.36	13.36
BU-W11	100YR-72HR	10.72	0.00	0.00	1.34	1.34	60.78	0.00	51.97	60.78	60.78
BU-W11	10YR-24HR	7.98	0.00	0.00	1.22	1.22	14.44	0.00	12.79	14.49	14.49
BU-W11	10YR-72HR	9.61	0.00	0.00	1.29	1.29	61.24	0.00	59.72	61.25	61.25
BU-W11	25YR-24HR	8.78	0.00	0.00	1.25	1.25	13.79	0.00	12.29	13.79	13.79
BU-W11	5YR-24HR	7.14	0.00	0.00	1.17	1.17	14.65	0.00	13.22	14.65	14.65
BU-W11	MEAN	4.01	0.00	0.00	0.97	0.97	16.24	0.00	13.20	16.24	16.24
BU-W14	100YR-24HR	100.12	0.00	-23.25	0.84	0.84	15.98	0.67	23.57	13.26	13.26
BU-W14	100YR-72HR	162.91	0.00	-20.54	1.05	1.05	63.22	0.70	97.82	63.22	63.22
BU-W14	10YR-24HR	39.99	0.00	-20.14	0.65	0.65	21.61	0.73	21.61	16.41	16.41
BU-W14	10YR-72HR	93.15	0.00	23.31	0.97	0.97	63.99	0.78	63.99	60.89	60.89
BU-W14	25YR-24HR	60.83	0.00	26.94	0.76	0.76	20.98	0.70	20.98	14.17	14.17
BU-W14	5YR-24HR	29.98	0.00	-17.65	0.59	0.59	24.83	0.75	25.92	15.85	15.85
BU-W14	MEAN	19.28	0.00	-9.88	0.59	0.59	24.58	0.71	24.58	19.10	19.10
BU-W16	100YR-24HR	8.88	0.00	0.01	1.91	1.91	12.69	0.00	11.91	12.70	12.70
BU-W16	100YR-72HR	9.10	0.00	0.01	1.92	1.92	60.66	0.00	59.70	60.64	60.64
BU-W16	10YR-24HR	6.53	0.00	0.00	1.72	1.72	12.62	0.00	12.09	12.62	12.62
BU-W16	10YR-72HR	7.91	0.00	0.01	1.84	1.84	60.54	0.00	59.84	60.55	60.55
BU-W16	25YR-24HR	7.63	0.00	0.01	1.82	1.82	12.63	0.00	12.05	12.64	12.64
BU-W16	5YR-24HR	5.26	0.00	0.00	1.60	1.60	12.66	0.00	12.12	12.65	12.65
BU-W16	MEAN	3.21	0.00	0.00	1.36	1.36	12.85	0.00	12.32	12.86	12.86
BU-W4A,B	100YR-24HR	94.98	0.00	0.21	2.05	2.05	13.30	0.00	6.53	13.30	13.30
BU-W4A,B	100YR-72HR	122.00	0.00	-0.33	2.23	2.23	60.98	0.00	43.17	61.00	61.00
BU-W4A,B	10YR-24HR	24.61	0.00	-0.23	1.31	1.31	14.34	0.00	9.61	14.34	14.34
BU-W4A,B	10YR-72HR	76.67	0.00	-0.25	1.91	1.91	61.05	0.00	49.53	61.05	61.05
BU-W4A,B	25YR-24HR	49.45	0.00	-0.23	1.65	1.65	13.81	0.00	8.81	13.81	13.81
BU-W4A,B	5YR-24HR	13.68	0.00	0.23	1.08	1.08	14.92	0.00	9.96	14.92	14.92
BU-W4A,B	MEAN	6.95	0.00	0.22	0.86	0.86	18.58	0.00	9.07	18.53	18.53
CS-10A - Pipe	100YR-24HR	51.15	0.00	-0.57	5.32	5.32	13.29	0.00	6.53	13.29	13.29

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
CS-10A - Weir: 1	100YR-24HR	2.00	0.00	0.00	7.21	7.21	12.43	0.00	0.45	12.43	12.43
CS-10A - Weir: 2	100YR-24HR	49.88	0.00	0.02	3.27	3.27	13.30	0.00	12.35	12.95	12.95
CS-10A - Weir: 3	100YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-10A - Pipe	100YR-72HR	60.97	0.00	-0.98	6.34	6.34	60.98	0.61	42.46	60.98	60.98
CS-10A - Weir: 1	100YR-72HR	2.00	0.00	0.00	7.21	7.21	59.08	0.00	0.56	59.08	59.08
CS-10A - Weir: 2	100YR-72HR	56.23	0.00	0.01	3.43	3.43	60.40	0.00	62.69	60.40	60.40
CS-10A - Weir: 3	100YR-72HR	8.03	0.00	0.00	1.52	1.52	60.99	0.00	60.48	60.99	60.99
CS-10A - Pipe	10YR-24HR	18.52	0.00	-0.63	1.92	1.92	14.33	0.00	9.61	14.33	14.33
CS-10A - Weir: 1	10YR-24HR	1.98	0.00	0.00	7.16	7.16	14.34	0.00	0.62	14.34	14.34
CS-10A - Weir: 2	10YR-24HR	16.53	0.00	0.01	2.30	2.30	14.34	0.00	13.23	14.34	14.34
CS-10A - Weir: 3	10YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-10A - Pipe	10YR-72HR	43.74	0.00	-0.72	4.55	4.55	61.05	0.00	49.53	61.05	61.05
CS-10A - Weir: 1	10YR-72HR	2.00	0.00	0.00	7.21	7.21	60.18	0.00	0.61	60.18	60.18
CS-10A - Weir: 2	10YR-72HR	42.19	0.00	0.02	3.14	3.14	61.04	0.00	59.97	61.04	61.04
CS-10A - Weir: 3	10YR-72HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-10A -	25YR-24HR	30.95	0.00	-0.54	3.22	3.22	13.81	0.00	8.81	13.81	13.81

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
Pipe											
CS-10A - Weir: 1	25YR-24HR	2.00	0.00	0.00	7.21	7.21	12.96	0.00	0.54	12.96	12.96
CS-10A - Weir: 2	25YR-24HR	29.09	0.00	0.01	2.77	2.77	13.81	0.00	12.76	13.81	13.81
CS-10A - Weir: 3	25YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-10A - Pipe	5YR-24HR	12.34	0.00	-0.57	1.28	1.28	14.88	0.00	9.96	14.88	14.88
CS-10A - Weir: 1	5YR-24HR	1.92	0.00	0.00	6.94	6.94	14.92	0.00	0.63	14.92	14.92
CS-10A - Weir: 2	5YR-24HR	10.41	0.00	0.00	1.97	1.97	14.92	0.00	13.37	14.92	14.92
CS-10A - Weir: 3	5YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-10A - Pipe	MEAN	6.96	0.00	-0.55	0.72	0.72	18.57	0.62	9.07	18.57	18.57
CS-10A - Weir: 1	MEAN	1.85	0.00	0.00	6.69	6.69	18.70	0.00	0.56	18.70	18.70
CS-10A - Weir: 2	MEAN	5.08	0.00	0.00	1.55	1.55	18.70	0.00	14.34	18.69	18.69
CS-10A - Weir: 3	MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-10B - Pipe	100YR-24HR	43.83	-0.02	-0.03	4.56	4.56	13.30	12.31	18.40	13.30	13.30
CS-10B - Weir: 1	100YR-24HR	43.83	0.00	0.01	2.86	2.86	13.30	0.00	12.76	13.30	13.30
CS-10B - Pipe	100YR-72HR	61.03	0.00	0.04	6.34	6.34	60.97	4.86	58.76	60.97	60.97
CS-10B - Weir: 1	100YR-72HR	61.03	0.00	-0.02	3.09	3.09	60.98	0.00	60.25	60.98	60.98

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
CS-10B - Pipe	10YR-24HR	6.11	-0.01	0.10	0.63	0.63	14.30	12.93	13.77	14.30	14.30
CS-10B - Weir: 1	10YR-24HR	6.09	0.00	0.00	1.48	1.48	14.34	0.00	13.42	14.34	14.34
CS-10B - Pipe	10YR-72HR	32.93	-0.01	-0.02	3.42	3.42	61.04	59.99	65.58	61.04	61.04
CS-10B - Weir: 1	10YR-72HR	32.93	0.00	0.01	2.60	2.60	61.04	0.00	60.34	61.04	61.04
CS-10B - Pipe	25YR-24HR	18.50	-0.01	-0.04	1.92	1.92	13.80	12.60	17.22	13.80	13.80
CS-10B - Weir: 1	25YR-24HR	18.50	0.00	0.01	2.15	2.15	13.81	0.00	12.84	13.81	13.81
CS-10B - Pipe	5YR-24HR	1.34	0.00	-0.02	0.14	0.14	14.94	13.33	5.63	14.94	14.94
CS-10B - Weir: 1	5YR-24HR	1.34	0.00	0.00	0.89	0.89	14.92	0.00	14.08	14.92	14.92
CS-10B - Pipe	MEAN	0.01	0.00	-0.01	0.00	0.00	2.81	2.88	2.81	2.81	2.81
CS-10B - Weir: 1	MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-12A - Pipe	100YR-24HR	81.34	0.00	0.07	6.47	6.47	13.41	0.00	29.31	13.41	13.41
CS-12A - Weir: 1	100YR-24HR	2.36	0.00	0.00	8.51	8.51	13.41	0.00	0.37	13.41	13.41
CS-12A - Weir: 2	100YR-24HR	41.92	0.00	0.02	5.59	5.59	13.41	0.00	12.21	13.41	13.41
CS-12A - Weir: 3	100YR-24HR	37.08	0.00	0.02	2.53	2.53	13.41	0.00	12.76	13.41	13.41
CS-12A - Pipe	100YR-72HR	123.29	0.00	1.04	9.81	9.81	60.77	0.00	51.35	60.77	60.77
CS-12A -	100YR-72HR	2.35	0.00	0.00	8.49	8.49	60.10	0.00	0.42	60.10	60.10

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
Weir: 1											
CS-12A - Weir: 2	100YR-72HR	45.94	0.00	-0.01	6.13	6.13	60.27	0.00	60.27	60.27	60.27
CS-12A - Weir: 3	100YR-72HR	91.98	0.00	-0.03	3.29	3.29	60.97	0.00	60.43	60.44	60.44
CS-12A - Pipe	10YR-24HR	21.54	0.00	-0.08	1.71	1.71	14.47	0.00	29.46	14.47	14.47
CS-12A - Weir: 1	10YR-24HR	1.94	0.00	0.00	7.01	7.01	14.47	0.00	0.45	14.47	14.47
CS-12A - Weir: 2	10YR-24HR	19.60	0.00	0.00	2.72	2.72	14.47	0.00	12.90	14.47	14.47
CS-12A - Weir: 3	10YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-12A - Pipe	10YR-72HR	67.39	0.00	-0.52	5.36	5.36	61.11	0.00	58.65	61.11	61.11
CS-12A - Weir: 1	10YR-72HR	2.30	0.00	0.00	8.31	8.31	61.11	0.00	0.51	61.11	61.11
CS-12A - Weir: 2	10YR-72HR	39.70	0.00	0.02	5.29	5.29	61.11	0.00	59.97	61.11	61.11
CS-12A - Weir: 3	10YR-72HR	25.40	0.00	0.01	2.23	2.23	61.11	0.00	60.60	61.11	61.11
CS-12A - Pipe	25YR-24HR	32.80	0.00	0.07	2.61	2.61	13.96	0.00	27.00	13.96	13.96
CS-12A - Weir: 1	25YR-24HR	2.11	0.00	0.00	7.61	7.61	13.96	0.00	0.41	13.96	13.96
CS-12A - Weir: 2	25YR-24HR	30.70	0.00	0.01	4.09	4.09	13.96	0.00	12.76	13.96	13.96
CS-12A - Weir: 3	25YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-12A - Pipe	5YR-24HR	14.73	0.00	-0.07	1.18	1.17	14.96	0.00	15.48	14.96	14.96

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
CS-12A - Weir: 1	5YR-24HR	1.86	0.00	0.00	6.71	6.71	14.99	0.00	0.47	14.99	14.99
CS-12A - Weir: 2	5YR-24HR	12.85	0.00	0.00	2.36	2.36	14.99	0.00	13.22	14.99	14.99
CS-12A - Weir: 3	5YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-12A - Pipe	MEAN	9.24	0.00	0.11	0.76	0.74	16.93	0.00	15.86	16.61	16.93
CS-12A - Weir: 1	MEAN	1.78	0.00	0.00	6.42	6.42	16.83	0.00	0.43	16.83	16.83
CS-12A - Weir: 2	MEAN	7.43	0.00	0.00	1.97	1.97	16.83	0.00	14.01	16.83	16.83
CS-12A - Weir: 3	MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-12B - Pipe	100YR-24HR	126.99	-0.02	0.05	10.11	10.11	12.91	12.03	27.69	12.91	12.91
CS-12B - Weir: 1	100YR-24HR	127.04	0.00	0.05	4.84	4.84	12.91	0.00	12.21	12.91	12.91
CS-12B - Pipe	100YR-72HR	122.17	0.00	0.96	9.72	9.72	60.28	26.05	52.11	60.28	60.28
CS-12B - Weir: 1	100YR-72HR	122.20	0.00	0.04	4.66	4.66	60.27	0.00	66.16	60.27	60.27
CS-12B - Pipe	10YR-24HR	36.81	-0.02	-0.04	2.93	2.93	14.47	12.14	23.90	14.47	14.47
CS-12B - Weir: 1	10YR-24HR	36.82	0.00	0.01	2.52	2.52	14.47	0.00	12.90	14.47	14.47
CS-12B - Pipe	10YR-72HR	123.04	0.00	0.56	9.79	9.79	60.89	57.50	58.69	60.89	60.89
CS-12B - Weir: 1	10YR-72HR	123.06	0.00	0.05	3.73	3.73	60.88	0.00	59.97	60.56	60.56
CS-12B -	25YR-24HR	75.05	-0.02	0.07	5.97	5.97	13.96	12.12	27.26	13.96	13.96

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
Pipe											
CS-12B - Weir: 1	25YR-24HR	75.06	0.00	0.02	3.20	3.20	13.96	0.00	12.76	13.96	13.96
CS-12B - Pipe	5YR-24HR	22.27	-0.02	-0.06	1.78	1.77	14.99	12.15	22.53	14.90	14.99
CS-12B - Weir: 1	5YR-24HR	22.27	0.00	0.01	2.13	2.13	14.99	0.00	13.22	14.99	14.99
CS-12B - Pipe	MEAN	11.04	-0.02	0.08	0.90	0.88	16.84	12.17	15.83	16.74	16.84
CS-12B - Weir: 1	MEAN	11.01	0.00	0.00	1.69	1.69	16.83	0.00	14.01	16.83	16.83
CS-13A - Pipe	100YR-24HR	74.11	0.00	0.06	7.70	7.70	13.18	0.00	27.35	13.18	13.18
CS-13A - Weir: 1	100YR-24HR	1.68	0.00	0.00	7.39	7.39	12.34	0.00	0.37	12.34	12.34
CS-13A - Weir: 2	100YR-24HR	73.24	0.00	0.04	3.32	3.32	13.18	0.00	12.21	12.60	12.60
CS-13A - Pipe	100YR-72HR	77.06	0.00	-0.49	8.01	8.01	61.76	0.00	47.36	61.76	61.76
CS-13A - Weir: 1	100YR-72HR	1.66	0.00	0.00	7.33	7.33	59.70	0.00	0.42	59.70	59.70
CS-13A - Weir: 2	100YR-72HR	76.18	0.00	0.03	3.86	3.86	61.76	0.00	64.49	61.76	61.76
CS-13A - Pipe	10YR-24HR	23.22	0.00	-0.04	2.41	2.41	13.91	0.00	25.95	13.91	13.91
CS-13A - Weir: 1	10YR-24HR	1.58	0.00	0.00	6.97	6.97	13.91	0.00	0.45	13.91	13.91
CS-13A - Weir: 2	10YR-24HR	21.64	0.00	0.01	2.26	2.26	13.91	0.00	12.90	13.91	13.91
CS-13A - Pipe	10YR-72HR	68.03	0.00	-0.15	7.07	7.07	60.81	0.00	58.24	60.81	60.81

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
CS-13A - Weir: 1	10YR-72HR	1.66	0.00	0.00	7.33	7.33	60.10	0.00	0.50	60.10	60.10
CS-13A - Weir: 2	10YR-72HR	66.98	0.00	-0.03	3.27	3.27	60.81	0.00	60.59	60.60	60.60
CS-13A - Pipe	25YR-24HR	44.13	0.00	0.04	4.59	4.59	13.62	0.00	26.47	13.62	13.62
CS-13A - Weir: 1	25YR-24HR	1.67	0.00	0.00	7.35	7.35	13.15	0.00	0.41	13.15	13.15
CS-13A - Weir: 2	25YR-24HR	42.53	0.00	0.02	2.83	2.83	13.62	0.00	12.44	13.62	13.62
CS-13A - Pipe	5YR-24HR	14.56	0.00	0.19	1.51	1.51	14.00	0.00	7.08	14.00	14.00
CS-13A - Weir: 1	5YR-24HR	1.53	0.00	0.00	6.73	6.73	13.99	0.00	0.47	13.99	13.99
CS-13A - Weir: 2	5YR-24HR	13.03	0.00	0.00	1.91	1.91	13.99	0.00	13.22	13.99	13.99
CS-13A - Pipe	MEAN	7.61	0.00	0.06	0.79	0.79	15.50	0.00	17.94	15.50	15.50
CS-13A - Weir: 1	MEAN	1.47	0.00	0.00	6.48	6.48	15.39	0.00	0.43	15.39	15.39
CS-13A - Weir: 2	MEAN	6.11	0.00	0.00	1.48	1.48	15.39	0.00	13.42	15.39	15.39
CS-13B - Pipe	100YR-24HR	73.82	-0.08	0.04	7.67	7.67	13.18	12.03	26.88	13.18	13.18
CS-13B - Weir: 1	100YR-24HR	73.83	0.00	0.04	3.33	3.33	13.18	0.00	12.21	12.62	12.62
CS-13B - Pipe	100YR-72HR	76.87	0.00	0.08	7.99	7.99	61.76	43.65	48.26	61.76	61.76
CS-13B - Weir: 1	100YR-72HR	76.86	0.00	0.02	3.89	3.89	61.76	0.00	59.82	61.76	61.76
CS-13B -	10YR-24HR	21.64	-0.05	0.04	2.25	2.25	13.91	12.12	23.95	13.91	13.91

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
Pipe											
CS-13B - Weir: 1	10YR-24HR	21.64	0.00	0.01	2.26	2.26	13.91	0.00	12.90	13.91	13.91
CS-13B - Pipe	10YR-72HR	67.44	0.00	-0.14	7.01	7.01	60.82	55.94	58.69	60.82	60.82
CS-13B - Weir: 1	10YR-72HR	67.45	0.00	0.03	3.29	3.29	60.82	0.00	59.97	60.63	60.63
CS-13B - Pipe	25YR-24HR	42.53	-0.06	0.05	4.42	4.42	13.62	12.12	25.51	13.62	13.62
CS-13B - Weir: 1	25YR-24HR	42.53	0.00	0.02	2.83	2.83	13.62	0.00	12.44	13.62	13.62
CS-13B - Pipe	5YR-24HR	13.04	-0.05	0.05	1.36	1.36	14.04	12.12	20.17	14.04	14.04
CS-13B - Weir: 1	5YR-24HR	13.03	0.00	0.00	1.91	1.91	13.99	0.00	13.22	13.99	13.99
CS-13B - Pipe	MEAN	6.14	-0.03	0.06	0.64	0.64	15.41	12.13	15.69	15.41	15.41
CS-13B - Weir: 1	MEAN	6.11	0.00	0.00	1.48	1.48	15.39	0.00	13.42	15.39	15.39
CS-14 - Pipe	100YR-24HR	31.84	0.00	-0.15	3.31	3.31	14.40	0.00	5.86	14.40	14.40
CS-14 - Weir: 1	100YR-24HR	0.60	0.00	0.00	4.35	4.35	29.99	0.00	0.45	29.99	29.99
CS-14 - Weir: 2	100YR-24HR	23.76	0.00	0.01	3.17	3.17	16.17	0.00	12.35	16.17	16.17
CS-14 - Weir: 3	100YR-24HR	17.69	0.00	0.01	1.69	1.69	14.12	0.00	13.06	15.00	15.00
CS-14 - Pipe	100YR-72HR	36.10	0.00	-0.20	3.75	3.75	63.64	0.00	4.26	63.64	63.64
CS-14 - Weir: 1	100YR-72HR	0.60	0.00	0.00	4.34	4.34	82.17	0.00	0.56	82.17	82.17
CS-14 - Weir: 2	100YR-72HR	23.67	0.00	-0.01	3.16	3.16	66.33	0.00	60.14	66.33	66.33

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
CS-14 - Weir: 3	100YR-72HR	26.44	0.00	0.01	1.70	1.70	62.89	0.00	60.14	65.35	65.35
CS-14 - Pipe	10YR-24HR	11.22	0.00	-0.16	1.17	1.17	14.58	0.00	4.37	14.58	14.58
CS-14 - Weir: 1	10YR-24HR	0.60	0.00	0.00	4.36	4.36	29.98	0.00	0.62	29.98	29.98
CS-14 - Weir: 2	10YR-24HR	10.63	0.00	0.00	2.30	2.30	14.55	0.00	13.28	14.55	14.55
CS-14 - Weir: 3	10YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-14 - Pipe	10YR-72HR	27.22	0.00	-0.14	2.83	2.83	61.87	0.00	4.31	61.87	61.87
CS-14 - Weir: 1	10YR-72HR	0.60	0.00	0.00	4.36	4.36	79.62	0.00	0.61	79.62	79.62
CS-14 - Weir: 2	10YR-72HR	23.78	0.00	0.01	3.17	3.17	62.97	0.00	59.97	62.97	62.97
CS-14 - Weir: 3	10YR-72HR	7.24	0.00	0.00	1.47	1.47	61.65	0.00	61.01	61.65	61.65
CS-14 - Pipe	25YR-24HR	19.30	0.00	0.24	2.01	2.01	14.27	0.00	7.12	14.27	14.27
CS-14 - Weir: 1	25YR-24HR	0.60	0.00	0.00	4.36	4.36	29.95	0.00	0.54	29.95	29.95
CS-14 - Weir: 2	25YR-24HR	18.81	0.00	0.01	2.63	2.63	14.26	0.00	12.84	14.94	14.94
CS-14 - Weir: 3	25YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-14 - Pipe	5YR-24HR	7.03	0.00	-0.21	0.73	0.73	15.00	0.00	9.67	15.00	15.00
CS-14 - Weir: 1	5YR-24HR	0.60	0.00	0.00	4.37	4.37	29.99	0.00	0.63	29.99	29.99
CS-14 - Weir: 2	5YR-24HR	6.39	0.00	0.00	1.94	1.94	14.95	0.00	13.77	14.95	14.95
CS-14 - Weir: 3	5YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-14 - Pipe	MEAN	3.77	0.00	0.30	0.39	0.39	17.28	0.00	17.28	17.28	17.28

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
CS-14 - Weir: 1	MEAN	0.61	0.00	0.00	4.38	4.38	18.29	0.00	0.56	18.29	18.29
CS-14 - Weir: 2	MEAN	3.03	0.00	0.00	1.51	1.51	17.77	0.00	14.34	17.77	17.77
CS-14 - Weir: 3	MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-15 - Pipe	100YR-24HR	44.78	0.00	0.03	3.56	3.56	14.61	0.00	27.03	14.61	14.61
CS-15 - Weir: 1	100YR-24HR	1.56	0.00	0.00	5.70	5.70	29.99	0.00	0.45	29.99	29.99
CS-15 - Weir: 2	100YR-24HR	44.29	0.00	0.02	2.40	2.40	14.60	0.00	12.35	17.92	17.92
CS-15 - Pipe	100YR-72HR	51.46	0.00	0.03	4.09	4.09	64.40	0.00	78.57	64.40	64.40
CS-15 - Weir: 1	100YR-72HR	1.56	0.00	0.00	5.72	5.72	81.23	0.00	0.56	81.23	81.23
CS-15 - Weir: 2	100YR-72HR	50.92	0.00	0.01	2.42	2.42	64.40	0.00	69.36	69.32	69.32
CS-15 - Pipe	10YR-24HR	14.74	0.00	0.03	1.17	1.17	14.50	0.00	13.49	14.50	14.50
CS-15 - Weir: 1	10YR-24HR	1.56	0.00	0.00	5.71	5.71	29.96	0.00	0.56	29.96	29.96
CS-15 - Weir: 2	10YR-24HR	13.33	0.00	0.01	1.80	1.80	14.51	0.00	13.42	14.51	14.51
CS-15 - Pipe	10YR-72HR	41.11	0.00	-0.03	3.27	3.27	62.08	0.00	73.70	62.08	62.08
CS-15 - Weir: 1	10YR-72HR	1.56	0.00	0.00	5.71	5.71	79.07	0.00	0.61	79.07	79.07
CS-15 - Weir: 2	10YR-72HR	40.54	0.00	0.01	2.39	2.39	62.07	0.00	60.07	64.19	64.19
CS-15 - Pipe	25YR-24HR	31.90	0.00	0.04	2.54	2.54	14.09	0.00	25.74	14.09	14.09
CS-15 - Weir: 1	25YR-24HR	1.56	0.00	0.00	5.71	5.71	30.00	0.00	0.54	30.00	30.00
CS-15 - Weir: 2	25YR-24HR	30.97	0.00	0.01	2.36	2.36	14.08	0.00	12.84	14.34	14.34

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
CS-15 - Pipe	5YR-24HR	7.98	0.00	0.03	0.64	0.64	17.08	0.00	17.08	17.08	17.08
CS-15 - Weir: 1	5YR-24HR	1.56	0.00	0.00	5.71	5.71	29.95	0.00	0.51	29.95	29.95
CS-15 - Weir: 2	5YR-24HR	6.45	0.00	0.00	1.41	1.41	16.87	0.00	13.87	16.87	16.87
CS-15 - Pipe	MEAN	4.32	0.00	0.03	0.34	0.34	22.32	0.00	21.11	22.32	22.32
CS-15 - Weir: 1	MEAN	1.56	0.00	0.00	5.71	5.71	29.69	0.00	0.56	29.69	29.69
CS-15 - Weir: 2	MEAN	2.76	0.00	0.00	1.06	1.06	22.70	0.00	16.92	22.70	22.70
CS-1A - Pipe	100YR-24HR	92.94	0.00	-5.08	4.73	4.73	17.28	0.40	12.68	17.28	17.28
CS-1A - Weir: 1	100YR-24HR	3.93	0.00	0.00	6.09	6.09	13.80	0.00	12.63	13.80	13.80
CS-1A - Weir: 2	100YR-24HR	55.43	0.00	0.01	5.54	5.54	14.96	0.00	12.80	14.96	14.96
CS-1A - Weir: 3	100YR-24HR	38.10	0.00	0.00	2.55	2.55	17.24	0.00	14.02	17.24	17.24
CS-1A - Pipe	100YR-72HR	154.31	0.00	4.10	7.86	7.86	63.79	0.00	58.26	63.79	63.79
CS-1A - Weir: 1	100YR-72HR	3.70	0.00	0.00	5.72	5.72	60.19	0.00	99.63	60.19	60.19
CS-1A - Weir: 2	100YR-72HR	55.71	0.00	0.01	5.57	5.57	60.42	0.00	91.02	60.42	60.42
CS-1A - Weir: 3	100YR-72HR	108.28	0.00	-0.03	3.30	3.30	63.76	0.00	68.16	62.40	62.40
CS-1A - Pipe	10YR-24HR	32.16	0.00	5.16	1.64	1.64	21.61	0.00	16.41	21.61	21.61
CS-1A - Weir: 1	10YR-24HR	3.37	0.00	0.00	5.22	5.22	16.29	0.00	20.45	16.29	16.29
CS-1A - Weir: 2	10YR-24HR	27.19	0.00	-0.01	3.03	3.03	21.23	0.00	21.59	21.23	21.23
CS-1A - Weir: 3	10YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
CS-1A - Pipe	10YR-72HR	82.26	0.00	4.17	4.19	4.19	64.64	0.00	60.89	64.64	64.64
CS-1A - Weir: 1	10YR-72HR	3.97	0.00	0.00	6.15	6.15	61.53	0.00	97.79	61.53	61.53
CS-1A - Weir: 2	10YR-72HR	54.55	0.00	0.01	5.46	5.46	63.09	0.00	60.60	63.09	63.09
CS-1A - Weir: 3	10YR-72HR	26.99	0.00	0.00	2.27	2.27	64.66	0.00	61.65	64.66	64.66
CS-1A - Pipe	25YR-24HR	47.85	0.00	-5.27	2.44	2.44	20.98	0.00	13.65	20.98	20.98
CS-1A - Weir: 1	25YR-24HR	3.60	0.00	0.00	5.57	5.57	15.19	0.00	13.65	15.19	15.19
CS-1A - Weir: 2	25YR-24HR	44.25	0.00	-0.01	4.43	4.43	19.87	0.00	29.00	19.87	19.87
CS-1A - Weir: 3	25YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-1A - Pipe	5YR-24HR	23.50	0.00	4.59	1.20	1.20	23.03	0.00	19.99	23.03	23.03
CS-1A - Weir: 1	5YR-24HR	3.26	0.00	0.00	5.04	5.04	17.56	0.00	28.90	17.56	17.56
CS-1A - Weir: 2	5YR-24HR	18.44	0.00	0.00	2.66	2.66	23.97	0.00	13.77	23.97	23.97
CS-1A - Weir: 3	5YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-1A - Pipe	MEAN	16.10	0.00	3.72	0.82	0.82	24.58	0.00	24.58	24.58	24.58
CS-1A - Weir: 1	MEAN	3.13	0.00	0.00	4.84	4.84	23.69	0.00	35.90	23.69	23.69
CS-1A - Weir: 2	MEAN	11.17	0.00	0.00	2.25	2.25	24.63	0.00	15.82	24.63	24.63
CS-1A - Weir: 3	MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-1B - Pipe	100YR-24HR	29.56	0.00	0.03	4.18	4.18	17.24	0.00	14.02	17.24	17.24
CS-1B - Weir: 1	100YR-24HR	6.34	0.00	0.00	6.34	6.34	17.24	0.00	12.28	17.24	17.24

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
CS-1B - Weir: 2	100YR-24HR	23.21	0.00	0.00	2.55	2.55	17.24	0.00	14.02	17.24	17.24
CS-1B - Pipe	100YR-72HR	65.10	0.00	0.05	9.21	9.21	63.81	0.00	60.10	63.81	63.81
CS-1B - Weir: 1	100YR-72HR	6.73	0.00	0.00	6.73	6.73	60.86	0.00	60.08	60.86	60.86
CS-1B - Weir: 2	100YR-72HR	60.30	0.00	-0.02	4.80	4.80	63.71	0.00	67.03	63.71	63.71
CS-1B - Pipe	10YR-24HR	3.89	0.00	-0.05	0.55	0.55	21.34	0.00	27.90	21.34	21.34
CS-1B - Weir: 1	10YR-24HR	3.87	0.00	0.00	3.87	3.87	21.23	0.00	13.42	21.23	21.23
CS-1B - Weir: 2	10YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-1B - Pipe	10YR-72HR	22.54	0.00	0.06	3.19	3.19	64.65	0.00	60.74	64.65	64.65
CS-1B - Weir: 1	10YR-72HR	6.10	0.00	0.00	6.10	6.10	64.66	0.00	59.97	64.66	64.66
CS-1B - Weir: 2	10YR-72HR	16.45	0.00	0.00	2.27	2.27	64.66	0.00	61.65	64.66	64.66
CS-1B - Pipe	25YR-24HR	5.06	0.00	-0.04	0.72	0.72	20.41	0.00	21.57	20.41	20.41
CS-1B - Weir: 1	25YR-24HR	5.04	0.00	0.00	5.04	5.04	19.87	0.00	13.01	19.87	19.87
CS-1B - Weir: 2	25YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-1B - Pipe	5YR-24HR	3.22	0.00	-0.03	0.46	0.46	23.16	0.00	18.39	23.16	23.16
CS-1B - Weir: 1	5YR-24HR	3.20	0.00	0.00	3.20	3.20	23.97	0.00	13.77	23.97	23.97
CS-1B - Weir: 2	5YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-1B - Pipe	MEAN	2.25	0.00	0.03	0.32	0.32	24.52	0.00	26.40	24.52	24.52
CS-1B - Weir: 1	MEAN	2.23	0.00	0.00	2.25	2.25	24.63	0.00	15.82	24.63	24.63
CS-1B -	MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
Weir: 2											
CS-5 - Pipe	100YR-24HR	42.39	0.00	0.05	3.37	3.37	14.12	0.00	25.75	14.12	14.12
CS-5 - Weir: 1	100YR-24HR	0.78	0.00	0.00	3.97	3.97	25.85	0.00	0.45	25.85	25.85
CS-5 - Weir: 2	100YR-24HR	28.03	0.00	0.01	3.07	3.07	17.12	0.00	12.21	17.12	17.12
CS-5 - Weir: 3	100YR-24HR	23.49	0.00	0.01	1.79	1.79	13.95	0.00	12.80	15.02	15.02
CS-5 - Pipe	100YR-72HR	57.13	0.00	0.07	4.55	4.55	62.07	0.00	55.13	62.07	62.07
CS-5 - Weir: 1	100YR-72HR	0.78	0.00	0.00	3.96	3.96	75.37	0.00	0.56	75.37	75.37
CS-5 - Weir: 2	100YR-72HR	28.23	0.00	0.01	3.09	3.09	66.91	0.00	70.35	66.91	66.91
CS-5 - Weir: 3	100YR-72HR	42.15	0.00	0.01	1.82	1.82	62.06	0.00	60.08	65.01	65.01
CS-5 - Pipe	10YR-24HR	15.82	0.00	0.04	1.26	1.26	14.40	0.00	22.30	14.40	14.40
CS-5 - Weir: 1	10YR-24HR	0.78	0.00	0.00	3.96	3.96	25.55	0.00	0.62	25.55	25.55
CS-5 - Weir: 2	10YR-24HR	15.07	0.00	0.00	2.41	2.41	14.39	0.00	13.23	14.39	14.39
CS-5 - Weir: 3	10YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-5 - Pipe	10YR-72HR	35.82	0.00	0.05	2.85	2.85	61.83	0.00	68.94	61.83	61.83
CS-5 - Weir: 1	10YR-72HR	0.78	0.00	0.00	3.97	3.97	73.67	0.00	0.61	73.67	73.67
CS-5 - Weir: 2	10YR-72HR	28.04	0.00	0.01	3.07	3.07	63.75	0.00	59.97	63.75	63.75
CS-5 - Weir: 3	10YR-72HR	13.16	0.00	0.01	1.74	1.74	61.65	0.00	60.60	61.84	61.84
CS-5 - Pipe	25YR-24HR	25.71	0.00	0.05	2.05	2.05	14.11	0.00	21.33	14.11	14.11
CS-5 - Weir:	25YR-24HR	0.78	0.00	0.00	3.97	3.97	25.67	0.00	0.54	25.67	25.67

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
1											
CS-5 - Weir: 2	25YR-24HR	25.09	0.00	0.01	2.75	2.75	14.12	0.00	12.60	14.12	14.12
CS-5 - Weir: 3	25YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-5 - Pipe	5YR-24HR	10.29	0.00	0.06	0.82	0.82	14.74	0.00	19.60	14.74	14.74
CS-5 - Weir: 1	5YR-24HR	0.78	0.00	0.00	3.96	3.96	19.11	0.00	0.63	19.11	19.11
CS-5 - Weir: 2	5YR-24HR	9.50	0.00	0.00	2.07	2.07	14.73	0.00	13.22	14.73	14.73
CS-5 - Weir: 3	5YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-5 - Pipe	MEAN	5.33	0.00	-0.05	0.42	0.42	16.98	0.00	16.29	16.98	16.98
CS-5 - Weir: 1	MEAN	0.78	0.00	0.00	3.96	3.96	25.60	0.00	0.56	25.60	25.60
CS-5 - Weir: 2	MEAN	4.52	0.00	0.00	1.61	1.61	17.05	0.00	14.01	17.05	17.05
CS-5 - Weir: 3	MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-6A - Pipe	100YR-24HR	58.73	0.00	0.08	4.67	4.67	13.36	0.00	12.13	13.36	13.36
CS-6A - Weir: 1	100YR-24HR	1.11	0.00	0.00	8.04	8.04	13.37	0.00	0.44	13.37	13.37
CS-6A - Weir: 2	100YR-24HR	47.93	0.00	0.02	4.79	4.79	13.37	0.00	12.21	13.37	13.37
CS-6A - Weir: 3	100YR-24HR	9.69	0.00	0.01	1.73	1.73	13.37	0.00	12.80	13.37	13.37
CS-6A - Pipe	100YR-72HR	96.81	0.00	0.07	7.70	7.70	60.78	0.00	53.90	60.78	60.78
CS-6A - Weir: 1	100YR-72HR	1.20	0.00	0.00	8.65	8.65	60.78	0.00	0.48	60.78	60.78
CS-6A - Weir: 2	100YR-72HR	57.51	0.00	0.01	5.75	5.75	60.78	0.00	59.82	60.78	60.78

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
CS-6A - Weir: 3	100YR-72HR	38.10	0.00	0.01	2.73	2.73	60.78	0.00	60.10	60.78	60.78
CS-6A - Pipe	10YR-24HR	14.72	0.00	-0.06	1.17	1.17	14.37	0.00	17.80	14.37	14.37
CS-6A - Weir: 1	10YR-24HR	0.91	0.00	0.00	6.58	6.58	14.44	0.00	0.50	14.44	14.44
CS-6A - Weir: 2	10YR-24HR	13.79	0.00	0.00	2.42	2.42	14.44	0.00	12.90	14.45	14.45
CS-6A - Weir: 3	10YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-6A - Pipe	10YR-72HR	47.41	0.00	0.08	3.77	3.77	61.23	0.00	59.97	61.23	61.23
CS-6A - Weir: 1	10YR-72HR	1.08	0.00	0.00	7.79	7.79	61.23	0.00	0.52	61.23	61.23
CS-6A - Weir: 2	10YR-72HR	43.67	0.00	0.02	4.37	4.37	61.23	0.00	59.97	61.23	61.23
CS-6A - Weir: 3	10YR-72HR	2.66	0.00	0.00	1.12	1.12	61.23	0.00	60.62	61.23	61.23
CS-6A - Pipe	25YR-24HR	28.68	0.00	0.07	2.28	2.28	13.79	0.00	12.45	13.79	13.79
CS-6A - Weir: 1	25YR-24HR	0.99	0.00	0.00	7.15	7.15	13.80	0.00	0.48	13.80	13.80
CS-6A - Weir: 2	25YR-24HR	27.68	0.00	0.01	3.05	3.05	13.80	0.00	12.44	13.80	13.80
CS-6A - Weir: 3	25YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-6A - Pipe	5YR-24HR	8.70	0.00	-0.06	0.69	0.69	14.69	0.00	16.46	14.69	14.69
CS-6A - Weir: 1	5YR-24HR	0.87	0.00	0.00	6.26	6.26	14.66	0.00	0.51	14.66	14.66
CS-6A - Weir: 2	5YR-24HR	7.79	0.00	0.00	2.00	2.00	14.66	0.00	13.13	14.66	14.66
CS-6A - Weir: 3	5YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-6A - Pipe	MEAN	4.81	0.00	-0.04	0.38	0.38	16.18	0.00	19.84	16.18	16.18

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
CS-6A - Weir: 1	MEAN	0.83	0.00	0.00	5.99	5.99	16.25	0.00	0.49	16.25	16.25
CS-6A - Weir: 2	MEAN	3.95	0.00	0.00	1.59	1.59	16.25	0.00	13.20	16.25	16.25
CS-6A - Weir: 3	MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-6B - Pipe	100YR-24HR	9.93	0.00	0.01	5.62	5.62	13.35	0.00	12.06	13.35	13.35
CS-6B - Weir: 1	100YR-24HR	9.93	0.00	0.01	1.96	1.96	13.36	0.00	12.06	12.12	12.12
CS-6B - Pipe	100YR-72HR	10.72	0.00	0.00	6.06	6.06	60.77	0.00	82.78	60.77	60.77
CS-6B - Weir: 1	100YR-72HR	10.72	0.00	0.00	1.90	1.90	60.76	0.00	56.45	56.45	56.45
CS-6B - Pipe	10YR-24HR	7.98	0.00	-0.01	4.51	4.51	14.43	0.00	29.44	14.43	14.43
CS-6B - Weir: 1	10YR-24HR	7.98	0.00	0.00	1.91	1.91	14.43	0.00	18.85	12.80	12.80
CS-6B - Pipe	10YR-72HR	9.61	0.00	-0.01	5.44	5.44	61.23	0.00	76.71	61.23	61.23
CS-6B - Weir: 1	10YR-72HR	9.61	0.00	0.00	1.91	1.91	61.21	0.00	59.70	59.73	59.73
CS-6B - Pipe	25YR-24HR	8.78	0.00	0.00	4.97	4.97	13.79	0.00	12.21	13.79	13.79
CS-6B - Weir: 1	25YR-24HR	8.78	0.00	0.00	1.93	1.93	13.79	0.00	12.29	12.39	12.39
CS-6B - Pipe	5YR-24HR	7.14	0.00	-0.01	4.04	4.04	14.64	0.00	29.12	14.64	14.64
CS-6B - Weir: 1	5YR-24HR	7.14	0.00	0.00	1.90	1.90	14.65	0.00	13.40	13.40	13.40
CS-6B - Pipe	MEAN	4.01	0.00	-0.01	2.27	2.27	16.23	0.00	28.62	16.23	16.23
CS-6B - Weir: 1	MEAN	4.01	0.00	0.00	1.59	1.59	16.25	0.00	13.20	16.25	16.25
CS-8 - Pipe	100YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-8 - Weir: 1	100YR-24HR	1.88	-0.01	-0.03	1.24	1.24	12.12	14.88	12.12	12.12	12.12
CS-8 - Pipe	100YR-72HR	0.01	0.00	0.00	0.00	0.00	60.90	0.00	61.08	60.90	60.90

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
CS-8 - Weir: 1	100YR-72HR	0.20	-0.02	0.00	0.01	0.01	53.22	62.93	53.22	53.38	53.38
CS-8 - Pipe	10YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-8 - Weir: 1	10YR-24HR	0.77	0.00	-0.01	0.92	0.92	12.71	15.63	12.71	12.71	12.71
CS-8 - Pipe	10YR-72HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-8 - Weir: 1	10YR-72HR	0.43	-0.01	-0.01	0.75	0.75	59.48	62.46	59.49	59.48	59.48
CS-8 - Pipe	25YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-8 - Weir: 1	25YR-24HR	1.26	0.00	-0.02	1.08	1.08	12.36	14.93	12.36	12.36	12.36
CS-8 - Pipe	5YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-8 - Weir: 1	5YR-24HR	0.64	0.00	-0.01	0.86	0.86	13.04	25.28	13.05	13.04	13.04
CS-8 - Pipe	MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CS-8 - Weir: 1	MEAN	0.34	0.00	-0.01	0.11	0.11	13.87	25.28	13.88	13.88	13.88
CS-MARINA - Pipe	100YR-24HR	8.88	0.00	0.01	0.00	0.00	12.67	0.00	11.91	0.00	0.00
CS-MARINA - Weir: 1	100YR-24HR	8.82	0.00	0.01	1.81	1.81	12.67	0.00	11.91	11.94	11.94
CS-MARINA - Weir: 2	100YR-24HR	0.18	0.00	0.00	0.00	0.00	11.85	0.00	11.91	0.00	0.00
CS-MARINA - Pipe	100YR-72HR	9.10	0.00	0.01	0.00	0.00	60.63	0.00	59.68	0.00	0.00
CS-MARINA - Weir: 1	100YR-72HR	9.04	0.00	0.01	1.81	1.81	60.63	0.00	59.68	59.71	59.71
CS-MARINA - Weir: 2	100YR-72HR	0.18	0.00	0.00	0.00	0.00	59.10	0.00	59.68	0.00	0.00
CS-MARINA - Pipe	10YR-24HR	6.53	0.00	0.01	0.00	0.00	12.60	0.00	12.15	0.00	0.00

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
CS-MARINA - Weir: 1	10YR-24HR	6.44	0.00	0.01	1.81	1.81	12.60	0.00	12.15	13.00	13.00
CS-MARINA - Weir: 2	10YR-24HR	0.18	0.00	0.00	0.00	0.00	12.13	0.00	12.31	0.00	0.00
CS-MARINA - Pipe	10YR-72HR	7.91	0.00	0.01	0.00	0.00	60.52	0.00	59.83	0.00	0.00
CS-MARINA - Weir: 1	10YR-72HR	7.85	0.00	-0.01	1.81	1.81	60.52	0.00	62.45	59.85	59.85
CS-MARINA - Weir: 2	10YR-72HR	0.18	0.00	0.00	0.00	0.00	59.64	0.00	61.93	0.00	0.00
CS-MARINA - Pipe	25YR-24HR	7.63	0.00	0.01	0.00	0.00	12.61	0.00	12.05	0.00	0.00
CS-MARINA - Weir: 1	25YR-24HR	7.57	0.00	-0.01	1.81	1.81	12.61	0.00	13.98	12.10	12.10
CS-MARINA - Weir: 2	25YR-24HR	0.18	0.00	0.00	0.00	0.00	12.02	0.00	13.80	0.00	0.00
CS-MARINA - Pipe	5YR-24HR	5.26	0.00	-0.01	0.00	0.00	12.64	0.00	12.75	0.00	0.00
CS-MARINA - Weir: 1	5YR-24HR	5.12	0.00	-0.01	1.73	1.73	12.64	0.00	12.75	12.67	12.67
CS-MARINA - Weir: 2	5YR-24HR	0.18	0.00	0.00	0.00	0.00	12.24	0.00	12.75	0.00	0.00
CS-MARINA - Pipe	MEAN	3.21	0.00	0.00	0.00	0.00	12.82	0.00	12.57	0.00	0.00
CS-MARINA - Weir: 1	MEAN	3.03	0.00	0.00	1.45	1.45	12.82	0.00	12.59	12.82	12.82
CS-MARINA - Weir: 2	MEAN	0.18	0.00	0.00	0.00	0.00	12.59	0.00	9.96	0.00	0.00
CS-W11 - Pipe	100YR-24HR	10.80	0.00	0.05	3.44	3.44	17.05	0.00	12.33	17.05	17.05
CS-W11 -	100YR-24HR	10.80	0.00	0.00	1.95	1.95	17.06	0.00	12.76	17.06	17.06

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
Weir: 1											
CS-W11 - Pipe	100YR-72HR	21.98	0.00	0.10	7.00	7.00	60.93	0.00	54.39	60.93	60.93
CS-W11 - Weir: 1	100YR-72HR	21.98	0.00	-0.01	2.44	2.44	60.93	0.00	60.40	60.40	60.40
CS-W11 - Pipe	10YR-24HR	7.08	0.00	0.05	2.25	2.25	19.31	0.00	13.83	19.31	19.31
CS-W11 - Weir: 1	10YR-24HR	7.08	0.00	0.00	1.69	1.69	19.27	0.00	14.30	19.27	19.27
CS-W11 - Pipe	10YR-72HR	10.70	0.00	-0.09	3.41	3.41	63.84	0.00	88.23	63.84	63.84
CS-W11 - Weir: 1	10YR-72HR	10.70	0.00	0.00	1.94	1.94	63.84	0.00	59.97	63.84	63.84
CS-W11 - Pipe	25YR-24HR	8.62	0.00	0.05	2.74	2.74	19.37	0.00	12.98	19.37	19.37
CS-W11 - Weir: 1	25YR-24HR	8.62	0.00	0.00	1.81	1.81	19.32	0.00	13.01	19.32	19.32
CS-W11 - Pipe	5YR-24HR	5.32	0.00	-0.07	1.69	1.69	19.73	0.00	14.79	19.73	19.73
CS-W11 - Weir: 1	5YR-24HR	5.32	0.00	0.00	1.54	1.54	19.80	0.00	15.04	19.80	19.80
CS-W11 - Pipe	MEAN	3.21	0.00	-0.10	1.02	1.02	23.67	0.00	17.22	23.67	23.67
CS-W11 - Weir: 1	MEAN	3.20	0.00	0.00	1.30	1.30	23.62	0.00	17.28	23.62	23.62
P-1-2	100YR-24HR	4.10	-28.53	-0.03	-2.27	-2.27	14.11	12.27	17.33	12.27	12.27
P-1-2	100YR-72HR	0.00	-21.26	-0.04	-1.69	-1.69	0.00	60.18	63.83	60.18	60.18
P-1-2	10YR-24HR	0.70	-20.66	-0.02	-1.64	-1.64	15.68	12.24	11.87	12.24	12.24
P-1-2	10YR-72HR	3.34	-15.71	-0.03	-1.25	-1.25	61.83	60.13	64.76	60.13	60.13
P-1-2	25YR-24HR	2.11	-23.65	-0.02	-1.88	-1.88	14.77	12.27	19.97	12.27	12.27
P-1-2	5YR-24HR	0.08	-18.73	-0.03	-1.49	-1.49	16.85	12.23	11.96	12.23	12.23

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
P-1-2	MEAN	0.00	-13.30	-0.02	-1.06	-1.06	0.00	12.24	11.94	12.24	12.24
P-1-3	100YR-24HR	24.10	-11.24	-0.06	1.92	1.92	13.90	12.15	17.90	13.90	13.90
P-1-3	100YR-72HR	17.82	-15.10	-0.08	1.42	1.42	60.67	67.18	64.20	60.67	60.67
P-1-3	10YR-24HR	8.01	-5.52	-0.03	0.64	0.64	14.17	12.22	22.72	14.17	14.17
P-1-3	10YR-72HR	21.74	-7.14	-0.03	1.73	1.73	61.56	68.15	65.57	61.56	61.56
P-1-3	25YR-24HR	14.92	-8.12	-0.03	1.19	1.19	14.01	12.20	20.69	14.01	14.01
P-1-3	5YR-24HR	4.34	-4.26	-0.01	0.35	0.35	14.76	12.24	24.25	14.76	14.76
P-1-3	MEAN	1.91	-2.33	-0.01	-0.19	-0.19	16.64	12.36	27.55	12.36	12.36
P-16-15	100YR-24HR	7.33	-1.00	0.00	1.49	1.49	17.63	12.51	14.22	17.63	17.63
P-16-15	100YR-72HR	9.41	0.00	0.00	1.92	1.92	67.71	1.07	74.90	67.71	67.71
P-16-15	10YR-24HR	2.50	-1.88	0.02	0.51	0.51	16.26	13.12	15.18	16.26	16.26
P-16-15	10YR-72HR	6.49	-0.01	-0.01	1.32	1.32	64.32	59.63	69.77	64.32	64.32
P-16-15	25YR-24HR	4.46	-2.06	0.01	0.91	0.91	15.81	12.81	14.22	15.81	15.81
P-16-15	5YR-24HR	1.50	-1.74	0.01	-0.35	-0.35	17.81	13.66	17.11	13.66	13.66
P-16-15	MEAN	0.82	-1.28	0.00	-0.26	-0.26	23.21	13.79	21.37	13.79	13.79
P-4A-4B	100YR-24HR	6.56	-5.31	-0.02	2.09	2.09	12.73	15.99	14.43	12.73	12.73
P-4A-4B	100YR-72HR	3.33	-7.67	-0.02	-2.44	-2.44	60.62	64.47	61.84	64.47	64.47
P-4A-4B	10YR-24HR	5.44	-1.74	-0.01	1.73	1.73	12.84	16.26	15.30	12.84	12.84
P-4A-4B	10YR-72HR	3.44	-4.61	-0.02	-1.47	-1.47	60.48	63.77	61.97	63.77	63.77
P-4A-4B	25YR-24HR	5.96	-3.10	-0.01	1.90	1.90	12.75	15.81	14.79	12.75	12.75
P-4A-4B	5YR-24HR	5.01	-1.11	-0.01	1.59	1.59	12.84	17.20	15.96	12.84	12.84
P-4A-4B	MEAN	4.23	-0.62	-0.01	1.35	1.35	12.81	19.78	18.62	12.81	12.81
P-5-4	100YR-24HR	18.59	-10.68	-0.04	1.48	1.48	12.39	15.35	14.04	12.39	12.39
P-5-4	100YR-72HR	9.25	-15.54	-0.05	-1.24	-1.24	60.42	63.47	61.63	63.47	63.47
P-5-4	10YR-24HR	13.02	-3.38	-0.02	1.04	1.04	12.46	16.10	14.75	12.46	12.46
P-5-4	10YR-72HR	8.05	-9.12	-0.04	-0.73	-0.73	60.33	63.15	61.66	63.15	63.15
P-5-4	25YR-24HR	15.71	-6.03	-0.02	1.25	1.25	12.43	15.67	14.40	12.43	12.43
P-5-4	5YR-24HR	11.62	-2.15	-0.02	0.92	0.92	12.46	17.06	15.17	12.46	12.46
P-5-4	MEAN	8.89	-1.21	-0.02	0.71	0.71	12.58	19.58	17.94	12.58	12.58
P-8-14-13	100YR-24HR	31.84	0.00	0.10	3.31	3.31	14.40	0.17	5.86	14.40	14.40
P-8-14-13	100YR-72HR	36.11	0.00	0.09	3.75	3.75	63.64	0.19	56.13	63.64	63.64

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
P-8-14-13	10YR-24HR	11.24	0.00	-0.09	1.17	1.17	14.55	0.00	8.84	14.55	14.55
P-8-14-13	10YR-72HR	27.23	0.00	0.07	2.83	2.83	61.87	0.00	59.97	61.87	61.87
P-8-14-13	25YR-24HR	19.30	0.00	-0.13	2.01	2.01	14.27	0.00	7.12	14.27	14.27
P-8-14-13	5YR-24HR	7.03	0.00	-0.14	0.73	0.73	15.00	0.00	9.64	15.00	15.00
P-8-14-13	MEAN	3.71	0.00	-0.22	0.39	0.39	17.28	0.00	17.28	17.28	17.28
P-8-9-10	100YR-24HR	35.11	0.00	1.07	2.79	2.79	13.62	0.31	11.67	13.62	13.62
P-8-9-10	100YR-72HR	47.54	0.00	-0.38	3.78	3.78	61.65	0.35	48.26	61.65	61.65
P-8-9-10	10YR-24HR	21.73	0.00	-1.38	1.73	1.73	12.21	0.37	11.78	12.21	12.21
P-8-9-10	10YR-72HR	30.39	0.00	-0.77	2.42	2.42	61.32	0.39	59.60	61.32	61.32
P-8-9-10	25YR-24HR	24.43	0.00	-1.29	1.94	1.94	12.21	0.35	11.86	12.21	12.21
P-8-9-10	5YR-24HR	20.28	0.00	-1.20	1.61	1.61	12.20	0.38	11.73	12.20	12.20
P-8-9-10	MEAN	15.69	0.00	1.05	1.25	1.25	12.20	0.35	11.92	12.20	12.20
P-8-MH	100YR-24HR	27.29	0.00	-0.83	2.17	2.17	13.69	0.00	11.67	13.69	13.69
P-8-MH	100YR-72HR	36.10	0.00	0.31	2.87	2.87	61.60	0.00	43.10	61.60	61.60
P-8-MH	10YR-24HR	16.20	0.00	1.05	1.29	1.29	12.36	0.00	11.78	12.36	12.36
P-8-MH	10YR-72HR	23.37	0.00	0.69	1.86	1.86	61.45	0.00	59.84	61.45	61.45
P-8-MH	25YR-24HR	18.33	0.00	1.08	1.46	1.46	12.39	0.00	11.86	12.39	12.39
P-8-MH	5YR-24HR	15.09	0.00	0.94	1.20	1.20	12.34	0.00	11.73	12.34	12.34
P-8-MH	MEAN	11.80	0.00	0.84	0.94	0.94	12.28	0.00	11.92	12.28	12.28
P-9-MH	100YR-24HR	10.88	0.00	0.84	1.13	1.13	12.13	0.00	11.82	12.13	12.13
P-9-MH	100YR-72HR	13.13	0.00	0.16	1.36	1.36	60.14	0.00	43.10	60.14	60.14
P-9-MH	10YR-24HR	7.34	0.00	0.83	0.76	0.76	12.12	13.44	11.78	12.12	12.12
P-9-MH	10YR-72HR	7.30	0.00	0.94	0.76	0.76	61.13	0.00	59.84	61.13	61.13
P-9-MH	25YR-24HR	8.68	0.00	1.14	0.90	0.90	12.14	0.00	11.86	12.14	12.14
P-9-MH	5YR-24HR	6.81	-0.63	0.72	0.71	0.71	12.10	13.71	11.73	12.10	12.10
P-9-MH	MEAN	4.72	-0.65	0.65	0.49	0.49	12.11	13.85	11.92	12.11	12.11
P-W14-TOHO	100YR-24HR	19.58	0.00	0.05	3.99	5.86	17.74	0.00	0.84	17.74	17.74
P-W14-TOHO	100YR-72HR	20.13	0.00	0.05	4.10	6.02	63.66	0.00	1.30	63.66	63.66
P-W14-TOH	10YR-24HR	18.53	0.00	0.05	3.78	5.55	27.22	0.00	1.27	27.22	27.22

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
O											
P-W14-TOHO	10YR-72HR	19.46	0.00	0.06	3.96	5.82	64.94	0.00	21.37	64.94	64.94
P-W14-TOHO	25YR-24HR	19.03	0.00	0.05	3.88	5.69	20.63	0.00	0.82	20.63	20.63
P-W14-TOHO	5YR-24HR	15.58	0.00	0.05	3.17	4.66	29.96	0.00	1.32	29.96	29.96
P-W14-TOHO	MEAN	11.41	0.00	0.05	2.48	3.41	30.85	0.00	1.50	30.95	30.85
W-W14-WPA001	100YR-24HR	75.26	0.00	0.01	1.03	1.03	17.49	0.00	15.48	17.49	17.49
W-W14-WPA001	100YR-72HR	137.36	0.00	0.02	1.25	1.25	63.96	0.00	60.88	63.97	63.97
W-W14-WPA001	10YR-24HR	5.44	0.00	0.00	0.55	0.55	27.05	0.00	25.78	27.05	27.05
W-W14-WPA001	10YR-72HR	63.65	0.00	0.01	0.98	0.98	64.99	0.00	63.49	64.99	64.99
W-W14-WPA001	25YR-24HR	29.11	0.00	0.01	0.78	0.78	20.70	0.00	18.89	20.70	20.70
W-W14-WPA001	5YR-24HR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W-W14-WPA001	MEAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W-W4-GBS004	100YR-24HR	87.15	0.00	0.01	2.30	2.30	14.84	0.00	13.13	17.34	17.34
W-W4-GBS004	100YR-72HR	164.38	0.00	0.01	2.30	2.30	61.77	0.00	60.95	66.21	66.21
W-W4-GBS004	10YR-24HR	23.74	0.00	0.00	2.09	2.09	16.19	0.00	13.42	16.19	16.19
W-W4-GBS004	10YR-72HR	60.99	0.00	0.01	2.30	2.30	62.93	0.00	61.01	63.57	63.57

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
W-W4-GBS004	25YR-24HR	40.44	0.00	0.00	2.23	2.23	15.60	0.00	13.01	15.60	15.60
W-W4-GBS004	5YR-24HR	17.10	0.00	0.00	1.92	1.92	16.67	0.00	13.22	16.67	16.67
W-W4-GBS004	MEAN	11.20	0.00	0.00	1.72	1.72	16.50	0.00	13.20	16.50	16.50

APPENDIX C.3

SUPPORTING DOCUMENTATION

MASTER SURFACE WATER MANAGEMENT PLAN

for the

GATOR BAY SLOUGH DRAINAGE BASIN STUDY

Osceola County, Florida

RHPA
Ron Howse, P.A.
An Engineering and Land Planning Professional Association

June 2001

SECTION 3.8

adICPR INPUT DATA

for

GATOR BAY SLOUGH DRAINAGE BASIN STUDY

Osceola County, Florida

RHPA

Advanced Interconnected Channel & Pond Routing (ICPR Ver 2.20) [1]
Copyright 1995, Streamline Technologies, Inc.

Gator Bay Slough Present Condition (100yr/72hr)
Revised June 2001

********** Input Report **********

--------Class: Node----------

Name: 999 Base Flow(cfs): 0 Init Stage(ft): 53.5
Group: BL-A Warn Stage(ft): 9999
Comment: West Lake Tohopekaliga (100yr/72hr)

Time(hrs)	Stage(ft)
0	53.5
39.3	53.5
57	54
65.3	55
69.8	56
74.6	57
81.2	58
86.6	58.5
95.6	59.5
140	59.48

--------Class: Node----------

Name: GBS-001 Base Flow(cfs): 0 Init Stage(ft): 53.5
Group: BL-A Warn Stage(ft): 9999
Comment: Junction sta.52+00 (BL-A)

Stage(ft) Area(ac)

--------Class: Node----------

Name: GBS-002 Base Flow(cfs): 0 Init Stage(ft): 54.25
Group: BL-A Warn Stage(ft): 9999
Comment: Junction sta.68+00 (BL-A)

Stage(ft) Area(ac)

--------Class: Node----------

Name: GBS-003 Base Flow(cfs): 0 Init Stage(ft): 54.74
Group: BL-A Warn Stage(ft): 9999
Comment: Junction sta.84+00 (BL-A)

Stage(ft) Area(ac)

--------Class: Node----------

Name: GBS-003A Base Flow(cfs): 0 Init Stage(ft): 59.2
Group: BL-A Warn Stage(ft): 9999
Comment: Stage/Area Relationship of Wetland #8

Stage(ft)	Area(ac)
59.2	4.45
60	17.62
61	27.2
62	35.17
63	40.01
64	47.97

Advanced Interconnected Channel & Pond Routing (ICPR Ver 2.20) [2]
Copyright 1995, Streamline Technologies, Inc.

Gator Bay Slough Present Condition (100yr/72hr)
Revised June 2001

********** Input Report **********

--------Class: Node----------

Name: GBS-003B Base Flow(cfs): 0 Init Stage(ft): 58.6
Group: BL-A Warn Stage(ft): 9999
Comment: Stage/Area Relationship of Wetland #7

Stage(ft)	Area(ac)
58.6	6.08
59	9.44
60	24.92
61	36.95
62	57.54
63	70.39
64	80.7

--------Class: Node----------

Name: GBS-004 Base Flow(cfs): 0 Init Stage(ft): 56.45
Group: BL-A Warn Stage(ft): 9999
Comment: Junction sta.100+00 (BL-A)

Stage(ft)	Area(ac)
56.45	0.2
61	0.6
62	8.8
63	15.6
64	23.5
65	37.7

--------Class: Node----------

Name: GBS-005 Base Flow(cfs): 0 Init Stage(ft): 56.45
Group: BL-A Warn Stage(ft): 9999
Comment: Junction sta.100+00 (BL-A)

Stage(ft) Area(ac)

--------Class: Node----------

Name: GBS-006 Base Flow(cfs): 0 Init Stage(ft): 57.2
Group: BL-A Warn Stage(ft): 9999
Comment: Junction sta.114+00 (BL-A)

Stage(ft) Area(ac)

--------Class: Node----------

Name: GBS-007 Base Flow(cfs): 0 Init Stage(ft): 57.48
Group: BL-A Warn Stage(ft): 9999
Comment: Wetland 6 / Junction sta.128+00 (BL-A)

Stage(ft) Area(ac)

Advanced Interconnected Channel & Pond Routing (ICPR Ver 2.20) [5]
Copyright 1995, Streamline Technologies, Inc.

Gator Bay Slough Present Condition (100yr/72hr)
Revised June 2001

********** Input Report **
--------Class: Node--
Name: WPA-001 Base Flow(cfs): 0 Init Stage(ft): 53.5
Group: BL-A Warn Stage(ft): 9999
Comment: Junction sta.0+00 (BL-A)

Stage(ft) Area(ac)
--------Class: Node--
Name: WPA-002 Base Flow(cfs): 0 Init Stage(ft): 53.5
Group: BL-A Warn Stage(ft): 9999
Comment: Junction sta.0+00 (Upstream Face of Timber Bridge)

Stage(ft) Area(ac)
--------Class: Node--
Name: WPA-002A Base Flow(cfs): 0 Init Stage(ft): 53.5
Group: BL-A Warn Stage(ft): 60
Comment: Stage/Area Relationship of Wetland #11

Stage(ft)	Area(ac)
53.5	0.28
54	0.96
55	24.4
56	31.6
57	45.7
58	69.5
59	80.3
60	89.9

--------Class: Node--
Name: WPA-002B Base Flow(cfs): 0 Init Stage(ft): 53.9
Group: BL-A Warn Stage(ft): 60
Comment: Stage/Area Relationship of Wetland #12

Stage(ft)	Area(ac)
53.9	1
54	11
55	52.8
56	81.9
57	143.1
58	169.3
59	176.3
60	181.7

--------Class: Node--
Name: WPA-003 Base Flow(cfs): 0 Init Stage(ft): 53.5
Group: BL-A Warn Stage(ft): 9999
Comment: Junction sta. 6+00 (BL-A)

Stage(ft) Area(ac)

Advanced Interconnected Channel & Pond Routing (ICPR Ver 2.20) [6]

Gator Bay Slough Present Condition (100yr/72hr)
Revised June 2001

```
********** Input Report ********************************************************
--------Class: Node-------------------------------------------------------------
   Name: WPA-004     Base Flow(cfs): 0          Init Stage(ft): 53.5
  Group: BL-A                                   Warn Stage(ft): 9999
Comment: Junction sta.18+00 (BL-A)

Stage(ft)     Area(ac)
--------Class: Node-------------------------------------------------------------
   Name: WPA-005     Base Flow(cfs): 0          Init Stage(ft): 53.5
  Group: BL-A                                   Warn Stage(ft): 9999
Comment: Junction Sta. 27+75 (BL-A)

Stage(ft)     Area(ac)
--------Class: Node-------------------------------------------------------------
   Name: WPA-005A    Base Flow(cfs): 0          Init Stage(ft): 54.9
  Group: BL-A                                   Warn Stage(ft): 60
Comment: Stage/Area Relationship of Wetland #10

Stage(ft)     Area(ac)
54.9          0.5
55            4.9
56            10.7
57            24.2
58            39.6
59            50.5
60            57.2
--------Class: Node-------------------------------------------------------------
   Name: WPA-006     Base Flow(cfs): 0          Init Stage(ft): 53.5
  Group: BL-A                                   Warn Stage(ft): 9999
Comment: Junction Sta. 35+50 (BL-A)

Stage(ft)     Area(ac)
--------Class: Node-------------------------------------------------------------
   Name: WPA-007     Base Flow(cfs): 0          Init Stage(ft): 53.5
  Group: BL-A                                   Warn Stage(ft): 60
Comment: Wetland #9 - WPA Canal Connection

Stage(ft)     Area(ac)
49.76         0.4
53.5          2.4
54            38.1
55            120.7
56            187.3
57            267
58            321.7
59            382.4
60            413.2
```

ALLOWABLE DISCHARGE VALUES FOR PROJECTS WITHIN THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT

February 17, 1994

Formerly known as “Appendix 2”

USE OF APPENDIX 2 TO DETERMINE ALLOWABLE DISCHARGE VALUES

The assignment of allowable discharge values for waterways in south Florida is based on very inexact science. Not only are the properties of the waterway often in doubt, but they are constantly changing. Inflows to the waterway are even more of a mystery, since their varying amounts and times, subject to all the variables of hydrology, are additive if and when they reach the waterway. In south Florida almost all inflows are also constrained by waterway tailwaters at some point in time.

Many of the allowable discharges derived over the years were estimated from a single or minimum number of hydraulic routings of inflows and waterway flows, using traditional hydrologic methods, which didn't provide for sheetflow, out of bank flow, tailwater constraints, reverse flow, pumped discharge, etc. The allowable discharge values which were derived for many of the lower east coast canals were of the form:

$$Q = \left[\frac{a}{A^{0.5}} + b\right] A$$

where: Q = allowable discharge (cubic feet/second)
a and b = constants (conversion units)
A = contributing area (square miles)

The form of the equation was established during the 1920's for the Everglades Agricultural Area (EAA) by unknown parties based on unknown principle. It obviously assigns larger unit discharge values to smaller contributing areas and vice-versa. This makes sense, usually. It presumes inflow hydrograph peaks are not additive (the sum of the parts exceeds the whole at any single point in time). It just so happens it really applies less in the EAA than anywhere else in the District because most contributing areas in the EAA are pumped discharges and thus the peaks are additive. The allowable discharge for the EAA should actually be 0.75 inches per day, the pump capacity of the overall system.

The constants a and b were different for each canal and derived from two points on a curve, one for the discharge for the entire basin and one for an estimated discharge for one square mile. In general the method gave extremely generous allowable discharge values with typical values for one square mile of three to five inches per day.

In addition to the problem caused by pumped discharge peaks being coincident, an additional problem was that many contributing areas were small (high unit discharge) and highly impervious. Thus, their actual discharge was much greater than the allowable discharge formula estimates. The end result is that there is very little correlation between the old allowable discharge formulas and actual discharges. Without basin studies, no one can say how a basin performs.

In recent years, knowledge of the above problem has caused allowable discharge to be computed from the pure division of the waterway capacity by the area of the basin. This would be conservative for an undeveloped basin, but few such basins exist. Many of the basins in

Appendix 2 have received this treatment since publication of earlier versions of Appendix 2.

The new values in Appendix 2 come from many sources, some as described above, a few from basin studies, and others from estimates by the District, local governments, permit applicants, etc. The best available sources were used, but new studies were not conducted.

The end result of the above is a series of values which generally ignore basin size. They range from less than one half inch per day to as much as 12 inches per day. These of course range from a large flat basin to a steeper basin. It is unlikely that there is really that much disparity in south Florida waterways or the discharges to them. It is also likely that the smaller basins should have higher unit area discharges. Therefore, Appendix 2 should be used as follows:

Case 1: If the immediate receiving water is a natural stream, overland sheetflow area, secondary or tertiary man made ditch, swale or other conveyance with undefined capacity; then the post-development instantaneous peak discharge rate should equal the pre-development rate for the approprate design storm event such that new adverse water quantity impacts are not created.

Case 2: If the immediate receiving water is a primary waterway with allowable discharge capacity listed in Appendix 2, then the allowable instantaneous peak discharge rate is the lesser of either the listed value or the value calculated by using the appropriate formula below:

For a 25 year/3 day design storm: $Q = 53A^{0.64}$

For a 25 year/1 day design storm: $Q = 46A^{0.64}$

For a 10 year/3 day design storm: $Q = 30A^{0.64}$

where: Q = allowable discharge (cubic feet/second)

A = contributing area (square miles)

Note: These two cases do not apply to the C-51 Basin. Use the subbasin discharge coefficients for that basin.

The above formulas were derived from the experience gained in many years of issuing permits and reviewing applicants submissions. They generally fit an average basin with an SCS curve number of 65. If an applicant believes either the formula or the listed value are inappropriate, the District will consider other submitted information. It is acknowledged that such conditions as; downstream flow attenuation areas, steep slopes, reduced soil storage and other such factors may make pre-development/post-development values more appropriate. The important factors are:

1) That waterway capacity not be unused,
2) That new adverse impacts are not created,
3) That historic drainage rights are preserved and,
4) Recognition is given to contributing drainage area size when possible.

LAKE TOHOPEKALIGA BASIN (Osceola and Orange County)

The design storm is a 10 year event in Osceola County and a 25 year event in Orange County. The allowable discharge rate is 17.5 CSM. See Figures 1 and 10.

SHINGLE CREEK BASIN (Orange and Osceola Counties)

The design storm is a 10 year event in Osceola County and a 25 year event in Orange County. See Figures 1 and 11. The maximum allowable discharge rate for areas located north of Sand Lake Road is 320 CSM. The maximum allowable discharge rate for those areas located south of Sand Lake road, within Orange County, is 192 CSM. For those areas south of Sand lake Road, within Osceola County, the allowable discharge rate is 64 CSM, except for the following areas which should be allowed a maximum rate of 192 CSM.

T25S/R28E/Sections 1, 2, the East half of 3, all of 11 except for that part of the West half of the Southwest quarter which is not presently developed.

T25S/R29E/Sections 5, East portion of 6 and East portion of Northeast quarter of 7 which lie East of Shingle Creek, that part of 8 which lies North of the East-West ditch which approximately bisects this section, the Northwest quarter of 9.

EAST LAKE TOHOPEKALIGA BASIN (Orange and Osceola Counties)

The design storm is a 10 year event in Osceola County and a 25 year event in Orange County. The allowable discharge rate is 16.1 CSM. See Figures 1 and 12.

BOGGY CREEK BASIN (Orange and Osceola Counties)

The design storm is a 25 year event in Orange County and a 10 year event in Osceola County. The allowable discharge rate is 50 CSM. See Figures 1 and 13.

LAKE HART BASIN (Orange and Osceola Counties)

The design storm is a 10 year event in Osceola County and a 25 year event in Orange County. The allowable discharge rate is 10.6 CSM. See Figures 1 and 14.

LAKE MYRTLE BASIN (Osceola and Orange Counties)

The design storm is a 10 year event in Osceola County and a 25 year event in Orange County. The allowable discharge rate is 3.6 CSM. See Figures 1 and 15.

LAKE CYPRESS BASIN (Osceola and Polk Counties)

The design storm is a 10 year event in Osceola County and a 25 year event in Polk County. The allowable discharge rates for the various subbasins can be determined from Figure 5 (Drainage Analysis Unit 8/Kissimmee River Above Lake Hatchineha). This illustration was taken from the Surface Water Management Plan which was prepared for Polk County by Envisors, Inc. It covers numerous drainage basins within Polk and Osceola Counties and has been modified by the District in order to reflect allowable discharge rates in units of cfs per square mile (CSM). The allowable discharge rate for portions of the basin not covered by Figure 5 is 31.1 CSM. Also see Figures 1 and 16.

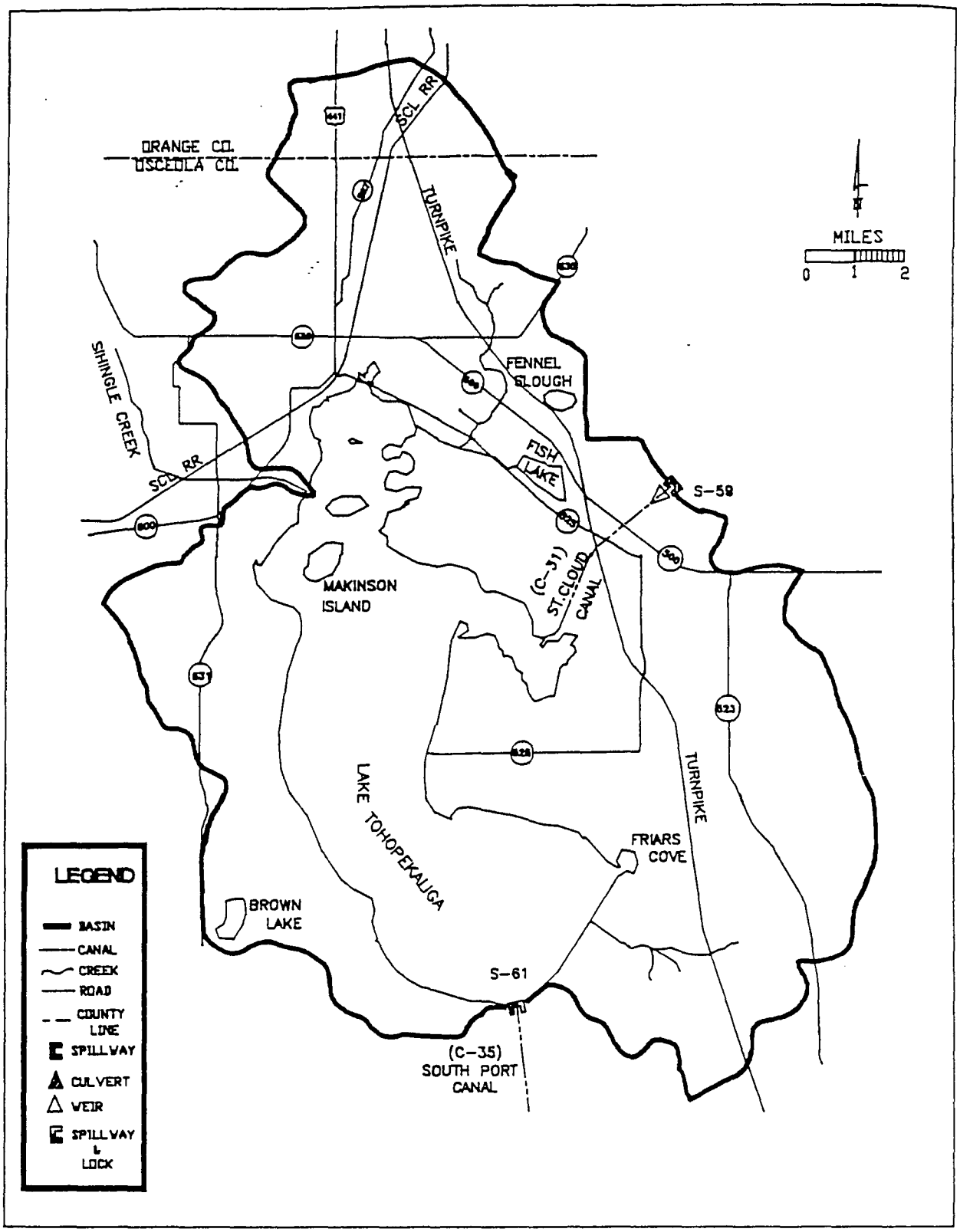


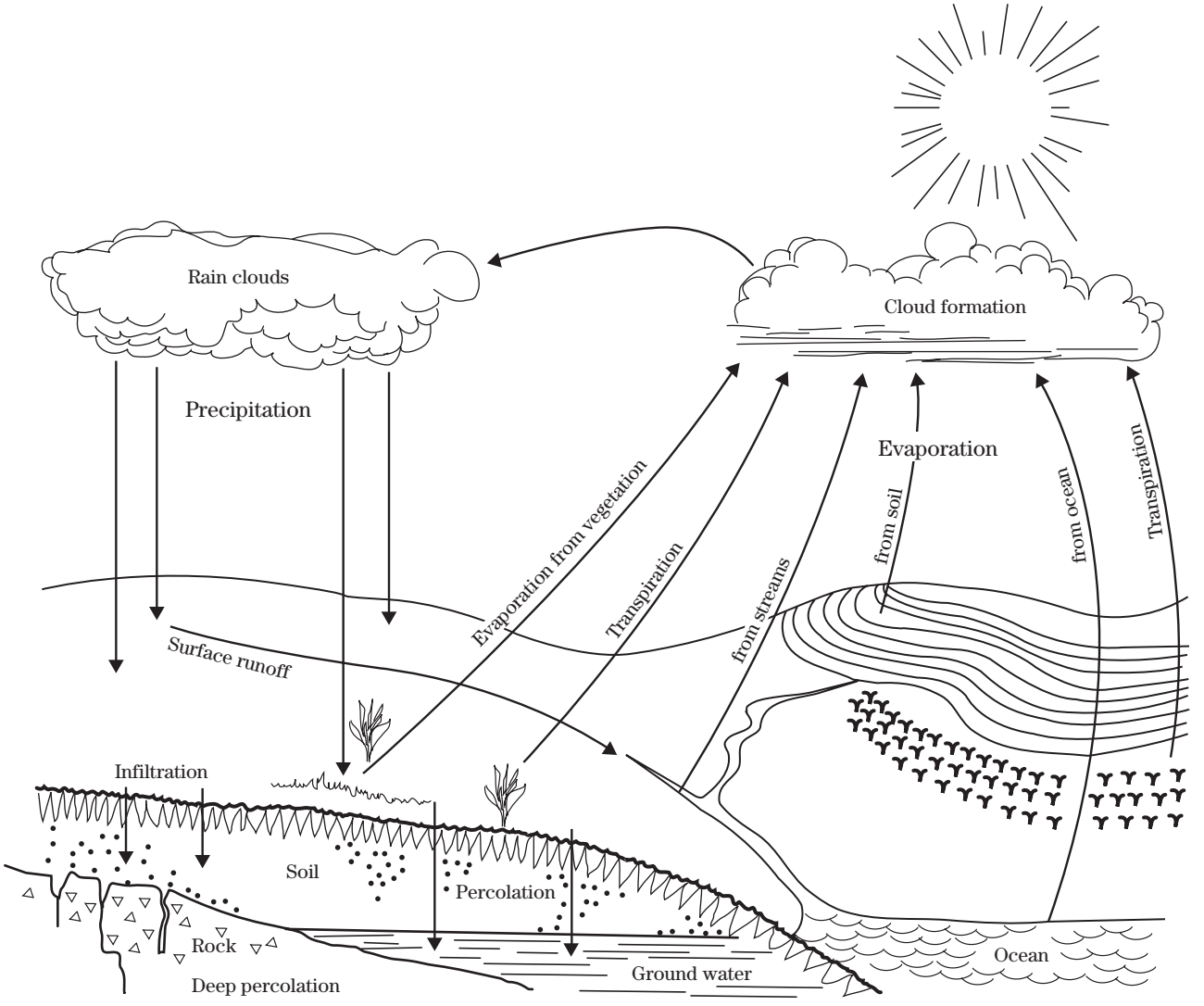
FIGURE 10 Lake Tohopekaliga Basin (84,130 acres).

United States
Department of
Agriculture

**Natural
Resources
Conservation
Service**

Part 630 Hydrology
National Engineering Handbook

Chapter 15 Time of Concentration



APPENDIX D

WATER QUALITY ANALYSIS

APPENDIX D.1

WET DETENTION WATER QUALITY CALCULATIONS

Fontana
Wet Detention Water Quality Calculations

Date: 7/2/18
By: NRB
Chk: JCN
Rev: 6/18/2021

Basin:	**SMA-1**
Treatment Ponds:	**SMA-1,2,&3**
Basin Area:	**106.00 acres**

*Including future marina for treatment - Marina is its own basin as shown in Hydrology calculations

Basin Summary

Land Cover	Pervious Area (ac)	Impervious Area (ac)	Water Surface (ac)	Roof Area (ac)	Total Area (ac)
Condominiums (70%)	2.68	4.06		2.19	8.93
Residential (70%)	3.55	6.21		2.07	11.82
Residential (60%)	0.08	0.09		0.03	0.20
Civ-Com-Multi (80%)	4.85	12.62		6.79	24.26
Open Space (Good)	6.55				6.55
Park (25%)	6.75	2.25			9.00
50' R/W (72%)	0.63	1.61			2.24
60' R/W (77%)	0.26	0.86			1.12
80' R/W (82.5%)	0.88	4.15			5.03
Friar's Cove Road (82.5%)	0.03	0.13			0.16
Water Surface			29.78		29.78
Future Marina (80%)	1.53	3.84	1.35	0.19	6.91
Totals:	**27.78**	**35.82**	**31.13**	**11.27**	**106.00**

Basin:	**SMA-2**
Treatment Ponds:	**SMA-1,2,&3**
Basin Area:	**17.81 acres**

Basin Summary

Land Cover	Pervious Area (ac)	Impervious Area (ac)	Water Surface (ac)	Roof Area (ac)	Total Area (ac)
Residential (70%)	1.33	2.33		0.78	4.44
Residential (60%)	1.84	2.07		0.69	4.59
Open Space (Good)	2.10				2.10
Park (25%)	0.06	0.02			0.08
50' R/W (72%)	0.33	0.85			1.18
80' R/W (82.5%)	0.43	2.02			2.45
Alley (100%)		0.61			0.61
Water Surface			2.36		2.36
Totals:	**6.09**	**7.90**	**2.36**	**1.47**	**17.81**

Basin:	**SMA-3**
Treatment Ponds:	**SMA-1,2,&3**
Basin Area:	**24.94 acres**

Basin Summary

Land Cover	Pervious Area (ac)	Impervious Area (ac)	Water Surface (ac)	Roof Area (ac)	Total Area (ac)
Residential (70%)	3.57	6.25		2.08	11.91
Residential (60%)	0.68	0.76		0.25	1.69
Open Space (Good)	1.90				1.90
50' R/W (72%)	0.80	2.05			2.85
60' R/W (77%)	0.03	0.12			0.15
Water Surface			6.44		6.44
Totals:	**6.98**	**9.18**	**6.44**	**2.34**	**24.94**

Fontana
Wet Detention Water Quality Calculations

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Basins:	**SMA-1,2,&3**
Treatment Ponds:	**SMA-1,2,&3**
Basin Area:	**141.84 acres**

*Including future marina for treatment - Marina is its own basin as shown in Hydrology calculations

Basin Summary

Land Cover	Pervious Area (ac)	Impervious Area (ac)	Water Surface (ac)	Roof Area (ac)	Total Area (ac)
Condominiums (70%)	2.68	4.06		2.19	8.93
Residential (70%)	8.45	14.79		4.93	28.17
Residential (60%)	2.59	2.92		0.97	6.48
Civ-Com-Multi (80%)	4.85	12.62		6.79	24.26
Open Space (Good)	10.55				10.55
Park (25%)	6.81	2.27			9.08
50' R/W (72%)	1.76	4.51			6.27
60' R/W (77%)	0.29	0.98			1.27
80' R/W (82.5%)	1.31	6.17			7.48
Friar's Cove Road (82.5%)	0.03	0.13			0.16
Alley (100%)		0.61			0.61
Water Surface			38.58		38.58
Future Marina (80%)	1.53	3.84	1.35	0.19	6.91
Totals:	**40.85**	**52.90**	**39.93**	**15.07**	**148.75**

Percent Impervious =	56%

Does basin discharge directly to waters listed in A.H. 4.2.2(b) and is greater than 40% impervious?	**No**
Is project zoned commercial or industrial?	**No**
No dry pretreatment required.	

Wet Detention Treatment Volume Calculations

1" x Total Area =	12.40 ac-ft	
2.5" x % Impervious =	12.79 ac-ft	Minimum required PAV

Does basin discharge to an O.F.W. or impaired water body? **Yes**

Additional Treatment Volume for loss of littoral zone = 2sf x 1191 lf 0.05 ac-ft (0.075 ac-ft with 50% treatment volume)

Req'd Wet Det. Treatment Volume = 19.27 ac-ft (includes additional 50% treatment volume)

Pond Data

Stage (ft - NAVD)	SMA-1 Area (ac)	SMA-2 Area (ac)	SMA-3 Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
44.25	24.95	1.66	5.11	345.75		Pond Bottom
51.25	27.54	2.03	5.81	110.93		Grade Break
54.25	29.78	2.36	6.44	0.00	0.00	**DNW**
55.25	30.43	2.48	6.65		39.07	
56.25	31.08	2.60	6.86		79.12	
57.25	31.73	2.72	7.08		120.16	
58.25	33.35	3.04	7.64		162.94	Outside Top of Berm

Minimum weir elevation = 54.74 ft

Design Weir Elevation =	**54.90 ft**
Treatment Volume Provided =	**25.40 ac-ft**

Control Device Calculations

Control device:	Rectangular slot	
Height, h (in.) =	3	
Width (in.) =	31.00	
Total Head (ft) =	0.37	*Total Head = Min. weir elevation - DNW+h/2
1/2" Detention Volume =	4.53 ac-ft	*1/2" runoff over the contributing area (total area - water surface)
Recovery Time =	**29.1 hours**	

Fontana
Wet Detention Water Quality Calculations

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Basin:	**SMA-4A**
Treatment Ponds:	**SMA-4A,4B&5**
Basin Area:	**7.10 acres**

Basin Summary

Land Cover	Pervious Area (ac)	Impervious Area (ac)	Water Surface (ac)	Roof Area (ac)	Total Area (ac)
Residential (70%)	0.32	0.55		0.18	1.05
Residential (60%)	0.69	0.78		0.26	1.73
Open Space (Good)	0.86				0.86
50' R/W (72%)	0.13	0.33			0.46
60' R/W (77%)	0.29	0.98			1.27
80' R/W (82.5%)	0.09	0.40			0.49
Water Surface			1.24		1.24
Totals:	**2.37**	**3.04**	**1.24**	**0.44**	**7.10**

Note: Commercial development within this basin will require dry pretreatment to be designed with project-specific final design

Basin:	**SMA-4B**
Treatment Ponds:	**SMA-4A,4B&5**
Basin Area:	**7.72 acres**

Basin Summary

Land Cover	Pervious Area (ac)	Impervious Area (ac)	Water Surface (ac)	Roof Area (ac)	Total Area (ac)
Residential (70%)	0.39	0.68		0.23	1.29
Residential (60%)	0.02	0.03		0.01	0.06
Civ-Com-Multi (80%)	0.15	0.39		0.21	0.75
Open Space (Good)	0.88				0.88
Park (25%)	1.05	0.35			1.40
50' R/W (72%)	0.19	0.48			0.67
80' R/W (82.5%)	0.23	1.09			1.32
Alley (100%)		0.04			0.04
Water Surface			1.31		1.31
Totals:	**2.91**	**3.06**	**1.31**	**0.44**	**7.72**

Note: Commercial development within this basin will require dry pretreatment to be designed with project-specific final design

Basin:	**SMA-5**
Treatment Ponds:	**SMA-4A,4B&5**
Basin Area:	**50.26 acres**

Basin Summary

Land Cover	Pervious Area (ac)	Impervious Area (ac)	Water Surface (ac)	Roof Area (ac)	Total Area (ac)
Residential (70%)	5.21	9.12		3.04	17.38
Residential (65%)	0.69	0.96		0.32	1.97
Residential (60%)	3.43	3.86		1.29	8.57
Open Space (Good)	1.61				1.61
Park (25%)	0.83	0.28			1.11
132' R/W (70%)	0.81	1.89			2.70
50' R/W (72%)	1.02	2.62			3.64
60' R/W (77%)	0.96	3.23			4.19
80' R/W (82.5%)	0.59	2.77			3.36
Alley (100%)		1.09			1.09
Water Surface			4.64		4.64
Totals:	**15.15**	**25.82**	**4.64**	**4.65**	**50.26**

Fontana
Wet Detention Water Quality Calculations

Date: 7/2/18
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Basins:	**SMA-4A,4B&5**
Treatment Ponds:	**SMA-4A,4B&5**
Basin Area:	**65.08 acres**

Basin Summary

Land Cover	Pervious Area (ac)	Impervious Area (ac)	Water Surface (ac)	Roof Area (ac)	Total Area (ac)
Residential (70%)	5.92	10.35		3.45	19.72
Residential (65%)	0.69	0.96		0.32	1.97
Residential (60%)	4.14	4.66		1.55	10.36
Civ-Com-Multi (80%)	0.15	0.39		0.21	0.75
Open Space (Good)	3.35				3.35
Park (25%)	1.88	0.63			2.51
132' R/W (70%)	0.81	1.89			2.70
50' R/W (72%)	1.34	3.43			4.77
60' R/W (77%)	1.26	4.20			5.46
80' R/W (82.5%)	0.90	4.27			5.17
Alley (100%)		1.13			1.13
Water Surface			7.19		7.19
Totals:	**20.44**	**31.92**	**7.19**	**5.54**	**65.08**

Note: Commercial development within Basin SMA-4 will require dry pretreatment to be designed with project-specific final design

Percent Impervious =	61%

Does basin discharge directly to waters listed in A.H. 4.2.2(b) and is greater than 40% impervious?	**No**
Is project zoned commercial or industrial?	**No**
No dry pretreatment required.	

Wet Detention Treatment Volume Calculations

1" x Total Area =	5.42 ac-ft	
2.5" x % Impervious =	7.35 ac-ft	Minimum required PAV

Does basin discharge to an O.F.W. or impaired water body? **Yes**

Req'd Wet Det. Treatment Volume =	**11.03 ac-ft**	(includes additional 50% treatment volume)

Pond Data

Stage (ft - NAVD)	SMA-4A Area (ac)	SMA-4B Area (ac)	SMA-5 Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
38			2.68	96.95		Pond Bottom (SMA-5)
48	0.69	0.78	3.49	58.75		Pond Bottom (SMA-4A&4B)
55	0.97	1.06	4.09	19.97		Grade Break
58	1.24	1.31	4.64	0.00	0.00	**DNW**
59	1.33	1.40	4.82		7.38	
60	1.43	1.50	5.01		15.13	
61	1.53	1.59	5.20		23.26	
62	1.79	1.84	5.69		32.07	Outside Top of Berm

Minimum weir elevation = 59.47 ft

Design Weir Elevation =	**59.50 ft**
Treatment Volume Provided =	**11.25 ac-ft**

Control Device Calculations

Control device:	Circular Orifice	
# of devices:	1	
Diameter, d (in.) =	6.00	
Total Head (ft) =	1.22	*Total Head = Min. weir elevation - DNW+d/2
1/2" Detention Volume =	2.41 ac-ft	*1/2" runoff over the contributing area (total area - water surface)
Recovery Time =	**27.9 hours**	

Fontana
Wet Detention Water Quality Calculations

Date: 7/2/18
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Chk: JCN
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Basin:	**SMA-6**
Treatment Pond:	**SMA-6**
Basin Area:	**36.37 acres**

Basin Summary

Land Cover	Pervious Area (ac)	Impervious Area (ac)	Water Surface (ac)	Roof Area (ac)	Total Area (ac)
Residential (70%)	2.62	4.58		1.53	8.72
Residential (60%)	1.34	1.51		0.50	3.36
Open Space (Good)	2.33				2.33
Park (25%)	9.23	3.08			12.31
50' R/W (72%)	0.71	1.84			2.55
60' R/W (77%)	0.21	0.72			0.93
80' R/W (82.5%)	0.29	1.37			1.66
Alley (100%)		0.54			0.54
Water Surface			3.97		3.97
Totals:	**16.74**	**13.63**	**3.97**	**2.03**	**36.37**

Percent Impervious =	45%

Does basin discharge directly to waters listed in A.H. 4.2.2(b) and is greater than 40% impervious?	**No**
Is project zoned commercial or industrial?	**No**
No dry pretreatment required.	

Wet Detention Treatment Volume Calculations

1" x Total Area =	3.03 ac-ft	Minimum required PAV
2.5" x % Impervious =	3.03 ac-ft	

Does basin discharge to an O.F.W. or impaired water body? **Yes**

Req'd Wet Det. Treatment Volume =	**4.55 ac-ft**	(includes additional 50% treatment volume)

Pond Data

Stage (ft - NAVD)	Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
47.5	2.81	32.89		Pond Bottom
54.5	3.42	11.09		Grade Break
57.5	3.97	0.00	0.00	**DNW**
58.5	4.16		4.06	
59.5	4.35		8.32	
60.5	4.54		12.76	
61.5	5.03		17.55	Outside Top of Berm

Minimum weir elevation = 58.61 ft

Design Weir Elevation =	**58.80 ft**
Treatment Volume Provided =	**5.34 ac-ft**

Control Device Calculations

Control device:	Circular Orifice	
# of devices:	1	
Diameter, d (in.) =	5.00	
Total Head (ft) =	0.90	*Total Head = Min. weir elevation - DNW+d/2
1/2" Detention Volume =	1.35 ac-ft	*1/2" runoff over the contributing area (total area - water surface)
Recovery Time =	**26.2 hours**	

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Wet Detention Water Quality Calculations

Date: 7/2/18
By: NRB
Chk: JCN
Rev: 6/18/2021

Basin:	**SMA-8**
Treatment Ponds:	**SMA-8,9,&10**
Basin Area:	**33.75 acres**

Basin Summary

Land Cover	Pervious Area (ac)	Impervious Area (ac)	Water Surface (ac)	Roof Area (ac)	Total Area (ac)
Residential (70%)	3.94	6.89		2.30	13.13
Residential (60%)	2.31	2.60		0.87	5.78
Open Space (Good)	1.54				1.54
132' R/W (70%)	1.19	2.77			3.95
50' R/W (72%)	1.03	2.64			3.67
60' R/W (77%)	0.39	1.29			1.68
80' R/W (82.5%)	0.14	0.67			0.81
Alley (100%)		0.39			0.39
Water Surface			2.80		2.80
Totals:	**10.53**	**17.25**	**2.80**	**3.17**	**33.75**

Basin:	**SMA-9**
Treatment Ponds:	**SMA-8,9,&10**
Basin Area:	**11.05 acres**

Basin Summary

Land Cover	Pervious Area (ac)	Impervious Area (ac)	Water Surface (ac)	Roof Area (ac)	Total Area (ac)
Residential (70%)	1.45	2.54		0.85	4.84
Residential (60%)	1.03	1.16		0.39	2.57
Open Space (Good)	0.79				0.79
50' R/W (72%)	0.17	0.45			0.62
60' R/W (77%)	0.22	0.75			0.97
Alley (100%)		0.27			0.27
Water Surface			0.99		0.99
Totals:	**3.67**	**5.16**	**0.99**	**1.23**	**11.05**

Basin:	**SMA-10**
Treatment Ponds:	**SMA-8,9,&10**
Basin Area:	**47.78 acres**

Basin Summary

Land Cover	Pervious Area (ac)	Impervious Area (ac)	Water Surface (ac)	Roof Area (ac)	Total Area (ac)
Residential (70%)	7.63	13.36		4.45	25.44
Residential (60%)	1.07	1.21		0.40	2.68
Civ-Com-Multi (80%)	0.47	1.21		0.65	2.33
Open Space (Good)	1.98				1.98
Park (25%)	0.77	0.26			1.02
50' R/W (72%)	2.13	5.49			7.62
60' R/W (77%)	0.25	0.83			1.08
Alley (100%)		0.29			0.29
Water Surface			5.34		5.34
Totals:	**14.30**	**22.64**	**5.34**	**5.50**	**47.78**

Note: Commercial development within this basin will require dry pretreatment to be designed with project-specific final design

Fontana
Wet Detention Water Quality Calculations

Date: 7/2/18
By: NRB
Chk: JCN
Rev: 6/18/2021

Basins:	**SMA-8,9,&10**
Treatment Ponds:	**SMA-8,9,&10**
Basin Area:	**92.58 acres**

Basin Summary

Land Cover	Pervious Area (ac)	Impervious Area (ac)	Water Surface (ac)	Roof Area (ac)	Total Area (ac)
Residential (70%)	13.02	22.79		7.60	43.41
Residential (60%)	4.41	4.96		1.65	11.03
Civ-Com-Multi (80%)	0.47	1.21		0.65	2.33
Open Space (Good)	4.31				4.31
Park (25%)	0.77	0.26			1.02
132' R/W (70%)	1.19	2.77			3.95
50' R/W (72%)	3.33	8.58			11.91
60' R/W (77%)	0.86	2.87			3.73
80' R/W (82.5%)	0.14	0.67			0.81
Alley (100%)		0.95			0.95
Water Surface			9.13		9.13
Totals:	**28.50**	**45.05**	**9.13**	**9.90**	**92.58**

Note: Commercial development within Basin SMA-10 will require dry pretreatment to be designed with project-specific final design

Percent Impervious =	61%

Does basin discharge directly to waters listed in A.H. 4.2.2(b) and is greater than 40% impervious?	**No**
Is project zoned commercial or industrial?	**No**
No dry pretreatment required.	

Wet Detention Treatment Volume Calculations

1" x Total Area =	7.72 ac-ft	
2.5" x % Impervious =	10.65 ac-ft	Minimum required PAV

Does basin discharge to an O.F.W. or impaired water body? **Yes**

Req'd Wet Det. Treatment Volume =	**15.97 ac-ft**	(includes additional 50% treatment volume)

Pond Data

Stage (ft - NAVD)	SMA-8 Area (ac)	SMA-9 Area (ac)	SMA-10 Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
35.5		0.10	2.51	149.47		Pond Bottom (SMA-9,10)
40.5	1.43	0.20	2.97	131.41		Pond Bottom (SMA-8)
57.5	2.43	0.75	4.69	25.40		Grade Break
60.5	2.74	0.99	5.34	0.00	0.00	**DNW**
61.5	2.87	1.07	5.56		9.29	
62.5	3.00	1.16	5.78		19.01	
63.5	3.13	1.25	6.01		29.18	
64.5	3.38	1.49	6.59		40.10	Outside Top of Berm (SMA-9,10)
65	3.55				43.85	Outside Top of Berm (SMA-8)

Minimum weir elevation = 62.19 ft

Design Weir Elevation =	**62.20 ft**
Treatment Volume Provided =	**16.09 ac-ft**

Control Device Calculations

Control device:	Circular Orifice	
# of devices:	2	
Diameter, d (in.) =	5.00	
Total Head (ft) =	1.48	*Total Head = Min. weir elevation - DNW+d/2
1/2" Detention Volume =	3.48 ac-ft	*1/2" runoff over the contributing area (total area - water surface)
Recovery Time =	**26.3 hours**	

Fontana
Wet Detention Water Quality Calculations

Date: 7/2/18
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Chk: JCN
Rev: 6/18/2021

Basin:	**SMA-12**
Treatment Pond:	**SMA-12**
Basin Area:	**77.76 acres**

Basin Summary

Land Cover	Pervious Area (ac)	Impervious Area (ac)	Water Surface (ac)	Roof Area (ac)	Total Area (ac)
Residential (70%)	3.90	6.83		2.28	13.00
Residential (65%)	1.91	2.67		0.89	5.47
Residential (60%)	0.49	0.55		0.18	1.22
Civ-Com-Multi (80%)	4.39	11.41		6.14	21.94
Open Space (Good)	3.53				3.53
Park (25%)	4.97	1.66			6.63
132' R/W (70%)	0.86	2.01			2.87
50' R/W (72%)	0.84	2.16			3.00
60' R/W (77%)	0.37	1.26			1.63
80' R/W (82.5%)	1.15	5.44			6.59
Friar's Cove Road (82.5%)	0.30	1.41			1.71
Alley (100%)		0.77			0.77
Water Surface			9.40		9.40
Totals:	**22.72**	**36.15**	**9.40**	**9.49**	**77.76**

Percent Impervious =	61%

Does basin discharge directly to waters listed in A.H. 4.2.2(b) and is greater than 40% impervious?	**No**
Is project zoned commercial or industrial?	**No**
No dry pretreatment required.	

Wet Detention Treatment Volume Calculations

1" x Total Area =	6.48 ac-ft	
2.5" x % Impervious =	8.74 ac-ft	Minimum required PAV

Does basin discharge to an O.F.W. or impaired water body? **Yes**

Req'd Wet Det. Treatment Volume =	**13.12 ac-ft**	(includes additional 50% treatment volume)

Pond Data

Stage (ft - NAVD)	Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
38	3.05	128.84		Pond Bottom
45	7.19	105.63		
55	8.55	26.92		Grade Break
58	9.40	0.00	0.00	**DNW**
59	9.68		9.54	
60	9.97		19.37	
61	10.26		29.49	
62	11.00		40.12	Outside Top of Berm

Minimum weir elevation = 59.36 ft

Design Weir Elevation =	**59.40 ft**
Treatment Volume Provided =	**13.47 ac-ft**

Control Device Calculations

Control device:	Circular Orifice	
# of devices:	2	
Diameter, d (in.) =	5.00	
Total Head (ft) =	1.16	*Total Head = Min. weir elevation - DNW+d/2
1/2" Detention Volume =	2.85 ac-ft	*1/2" runoff over the contributing area (total area - water surface)
Recovery Time =	**24.4 hours**	

Fontana
Wet Detention Water Quality Calculations

Date: 7/2/18
By: NRB
Chk: JCN
Rev: 6/18/2021

Basin:	**SMA-13**
Treatment Pond:	**SMA-13**
Basin Area:	**75.02 acres**

Basin Summary

Land Cover	Pervious Area (ac)	Impervious Area (ac)	Water Surface (ac)	Roof Area (ac)	Total Area (ac)
Residential (70%)	4.67	8.18		2.73	15.58
Residential (65%)	2.58	3.59		1.20	7.36
Residential (60%)	1.76	1.98		0.66	4.40
Civ-Com-Multi (80%)	2.86	7.45		4.01	14.32
Open Space (Good)	2.50				2.50
Park (25%)	3.45	1.15			4.60
132' R/W (70%)	2.22	5.19			7.41
50' R/W (72%)	0.99	2.56			3.55
60' R/W (77%)	0.42	1.41			1.83
80' R/W (82.5%)	0.29	1.35			1.64
Friar's Cove Road (82.5%)	0.44	2.05			2.49
Alley (100%)		1.21			1.21
Water Surface			8.13		8.13
Totals:	**22.18**	**36.12**	**8.13**	**8.59**	**75.02**

Note: Commercial development within this basin will require dry pretreatment to be designed with project-specific final design

Percent Impervious =	62%

Does basin discharge directly to waters listed in A.H. 4.2.2(b) and is greater than 40% impervious?	**No**
Is project zoned commercial or industrial?	**No**
No dry pretreatment required.	

Wet Detention Treatment Volume Calculations

1" x Total Area =	6.25 ac-ft	
2.5" x % Impervious =	8.63 ac-ft	Minimum required PAV

Does basin discharge to an O.F.W. or impaired water body? **Yes**

Req'd Wet Det. Treatment Volume =	**12.95 ac-ft**	(includes additional 50% treatment volume)

Pond Data

Stage (ft - NAVD)	Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
37	4.93	152.49		Pond Bottom
58	7.38	23.26		Grade Break
61	8.13	0.00	0.00	**DNW**
62	8.39		8.26	
63	8.64		16.77	
64	8.90		25.55	
65	9.56		34.78	Outside Top of Berm

Minimum weir elevation = 62.55 ft

Design Weir Elevation =	**62.60 ft**
Treatment Volume Provided =	**13.37 ac-ft**

Control Device Calculations

Control device:	Circular Orifice	
# of devices:	2	
Diameter, d (in.) =	4.50	
Total Head (ft) =	1.36	*Total Head = Min. weir elevation - DNW+d/2
1/2" Detention Volume =	2.79 ac-ft	*1/2" runoff over the contributing area (total area - water surface)
Recovery Time =	**27.2 hours**	

Fontana
Wet Detention Water Quality Calculations

Date: 7/2/18
By: NRB
Chk: JCN
Rev: 6/18/2021

Basin:	**SMA-14**
Treatment Pond:	**SMA-14**
Basin Area:	**43.33 acres**

Basin Summary

Land Cover	Pervious Area (ac)	Impervious Area (ac)	Water Surface (ac)	Roof Area (ac)	Total Area (ac)
Residential (70%)	5.24	9.17		3.06	17.47
Residential (65%)	1.34	1.86		0.62	3.82
Residential (60%)	0.70	0.79		0.26	1.75
Civ-Com-Multi (80%)	0.37	0.97		0.52	1.87
Open Space (Good)	1.90				1.90
Park (25%)	2.54	0.85			3.38
50' R/W (72%)	1.57	4.04			5.61
60' R/W (77%)	0.47	1.58			2.05
Alley (100%)		0.63			0.63
Water Surface			4.85		4.85
Totals:	**14.13**	**19.89**	**4.85**	**4.46**	**43.33**

Note: Commercial development within this basin will require dry pretreatment to be designed with project-specific final design

Percent Impervious =	58%

Does basin discharge directly to waters listed in A.H. 4.2.2(b) and is greater than 40% impervious?	**No**
Is project zoned commercial or industrial?	**No**
No dry pretreatment required.	

Wet Detention Treatment Volume Calculations

1" x Total Area =	3.61 ac-ft	
2.5" x % Impervious =	4.69 ac-ft	Minimum required PAV

Does basin discharge to an O.F.W. or impaired water body? **Yes**

Req'd Wet Det. Treatment Volume =	**7.03 ac-ft**	(includes additional 50% treatment volume)

Pond Data

Stage (ft - NAVD)	Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
37	2.54	89.14		Pond Bottom
59	4.31	13.75		Grade Break
62	4.85	0.00	0.00	**DNW**
63	5.04		4.94	
64	5.22		10.07	
65	5.41		15.39	
66	5.89		21.04	Outside Top of Berm

Minimum weir elevation = 63.41 ft

Design Weir Elevation =	**63.50 ft**
Treatment Volume Provided =	**7.51 ac-ft**

Control Device Calculations

Control device:	Circular Orifice	
# of devices:	1	
Diameter, d (in.) =	5.00	
Total Head (ft) =	1.20	*Total Head = Min. weir elevation - DNW+d/2
1/2" Detention Volume =	1.60 ac-ft	*1/2" runoff over the contributing area (total area - water surface)
Recovery Time =	**27.0 hours**	

Fontana
Wet Detention Water Quality Calculations

Date: 7/2/18
By: NRB
Chk: JCN
Rev: 6/18/2021

Basin:	**SMA-15**
Treatment Ponds:	**SMA-15&16**
Basin Area:	**61.24 acres**

Basin Summary

Land Cover	Pervious Area (ac)	Impervious Area (ac)	Water Surface (ac)	Roof Area (ac)	Total Area (ac)
Residential (70%)	6.45	11.29		3.76	21.50
Residential (60%)	3.20	3.60		1.20	8.01
Civ-Com-Multi (80%)	0.49	1.26		0.68	2.43
Open Space (Good)	2.47				2.47
Park (25%)	2.12	0.71			2.83
50' R/W (72%)	1.43	3.68			5.11
60' R/W (77%)	0.60	2.01			2.61
80' R/W (82.5%)	0.32	1.50			1.82
Friar's Cove Road (82.5%)	0.99	4.64			5.63
Alley (100%)		0.92			0.92
Water Surface			7.91		7.91
Totals:	**18.07**	**29.62**	**7.91**	**5.64**	**61.24**

Note: Commercial development within this basin will require dry pretreatment to be designed with project-specific final design

Basin:	**SMA-16**
Treatment Ponds:	**SMA-15&16**
Basin Area:	**15.39 acres**

Basin Summary

Land Cover	Pervious Area (ac)	Impervious Area (ac)	Water Surface (ac)	Roof Area (ac)	Total Area (ac)
Residential (70%)	2.05	3.59		1.20	6.83
Residential (60%)	0.87	0.98		0.33	2.17
Open Space (Good)	1.51				1.51
50' R/W (72%)	0.39	1.01			1.40
60' R/W (77%)	0.23	0.78			1.01
Alley (100%)		0.31			0.31
Water Surface			2.16		2.16
Totals:	**5.05**	**6.66**	**2.16**	**1.52**	**15.39**

Fontana
Wet Detention Water Quality Calculations

Date: 7/2/18
By: NRB
Chk: JCN
Rev: 6/18/2021

Basins:	**SMA-15&16**
Treatment Ponds:	**SMA-15&16**
Basin Area:	**76.63 acres**

Basin Summary

Land Cover	Pervious Area (ac)	Impervious Area (ac)	Water Surface (ac)	Roof Area (ac)	Total Area (ac)
Residential (70%)	8.50	14.87		4.96	28.33
Residential (60%)	4.07	4.58		1.53	10.18
Civ-Com-Multi (80%)	0.49	1.26		0.68	2.43
Open Space (Good)	3.98				3.98
Park (25%)	2.12	0.71			2.83
R.O.W. (72%)	1.82	4.69			6.51
60' R/W (77%)	0.83	2.79			3.62
80' R/W (82.5%)	0.32	1.50			1.82
Friar's Cove Road (82.5%)	0.99	4.64			5.63
Alley (100%)		1.23			1.23
Water Surface			10.07		10.07
Totals:	**23.12**	**36.28**	**10.07**	**7.17**	**76.63**

Note: Commercial development within Basin SMA-15 will require dry pretreatment to be designed with project-specific final design

Percent Impervious =	61%

Does basin discharge directly to waters listed in A.H. 4.2.2(b) and is greater than 40% impervious?	**No**
Is project zoned commercial or industrial?	**No**
No dry pretreatment required.	

Wet Detention Treatment Volume Calculations

1" x Total Area =	6.39 ac-ft	
2.5" x % Impervious =	8.47 ac-ft	Minimum required PAV

Does basin discharge to an O.F.W. or impaired water body? **Yes**

Req'd Wet Det. Treatment Volume =	**12.70 ac-ft**	(includes additional 50% treatment volume)

Pond Data

Stage (ft - NAVD)	SMA-15 Area (ac)	SMA-16 Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
36.5		0.79	168.98		Pond Bottom (SMA-16)
44.5	5.04	1.11	141.24		Pond Bottom (SMA-15)
59.5	7.06	1.83	28.45		Grade Break
62.5	7.91	2.16	0.00	0.00	**DNW**
63.5	8.20	2.28		10.27	
64.5	8.49	2.40		20.95	
65.5	8.78	2.51		32.04	
66.5	9.52	2.82		43.86	Outside Top of Berm

Minimum weir elevation = 63.73 ft

Design Weir Elevation =	**64.10 ft**
Treatment Volume Provided =	**16.68 ac-ft**

Control Device Calculations

Control device:	Circular Orifice	
# of devices:	2	
Diameter, d (in.) =	5.00	
Total Head (ft) =	1.02	*Total Head = Min. weir elevation - DNW+d/2
1/2" Detention Volume =	2.77 ac-ft	*1/2" runoff over the contributing area (total area - water surface)
Recovery Time =	**25.3 hours**	

Fontana
Wet Detention Water Quality Calculations

Date: 7/2/18
By: NRB
Chk: JCN
Rev: 6/18/2021

Basin:	**MARINA**
Treatment Pond:	**MARINA**
Basin Area:	**6.91 acres**

Basin Summary

Land Cover	Pervious Area (ac)	Impervious Area (ac)	Water Surface (ac)	Roof Area (ac)	Total Area (ac)
Future Marina (80%)	0.61	3.18		0.19	3.98
Access Easement		1.12			1.12
Water Surface	0.46		1.35		1.81
Totals:	**1.07**	**4.30**	**1.35**	**0.19**	**6.91**

Percent Impervious =	80%

Does basin discharge directly to waters listed in A.H. 4.2.2(b) and is greater than 40% impervious?	**No**
Is project zoned commercial or industrial?	**No**
No dry pretreatment required.	

Wet Detention Treatment Volume Calculations

1" x Total Area = 0.58 ac-ft Minimum required PAV

Does basin discharge to an O.F.W. or impaired water body? **Yes**

Req'd Wet Det. Treatment Volume =	**0.86 ac-ft**

(includes additional 50% treatment volume)

Pond Data

Stage (ft - NAVD)	Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
48.25	0.70	5.78		Pond Bottom
51.25	0.91	3.38		Grade Break
54.25	1.35	0.00	0.00	**DNW**
55.25	1.50		1.42	
56.25	1.65		3.00	
57.25	1.81		4.73	Outside Top of Berm

Minimum weir elevation = 54.90 ft

Design Weir Elevation =	**55.00 ft**
Treatment Volume Provided =	**1.03 ac-ft**

Control Device Calculations

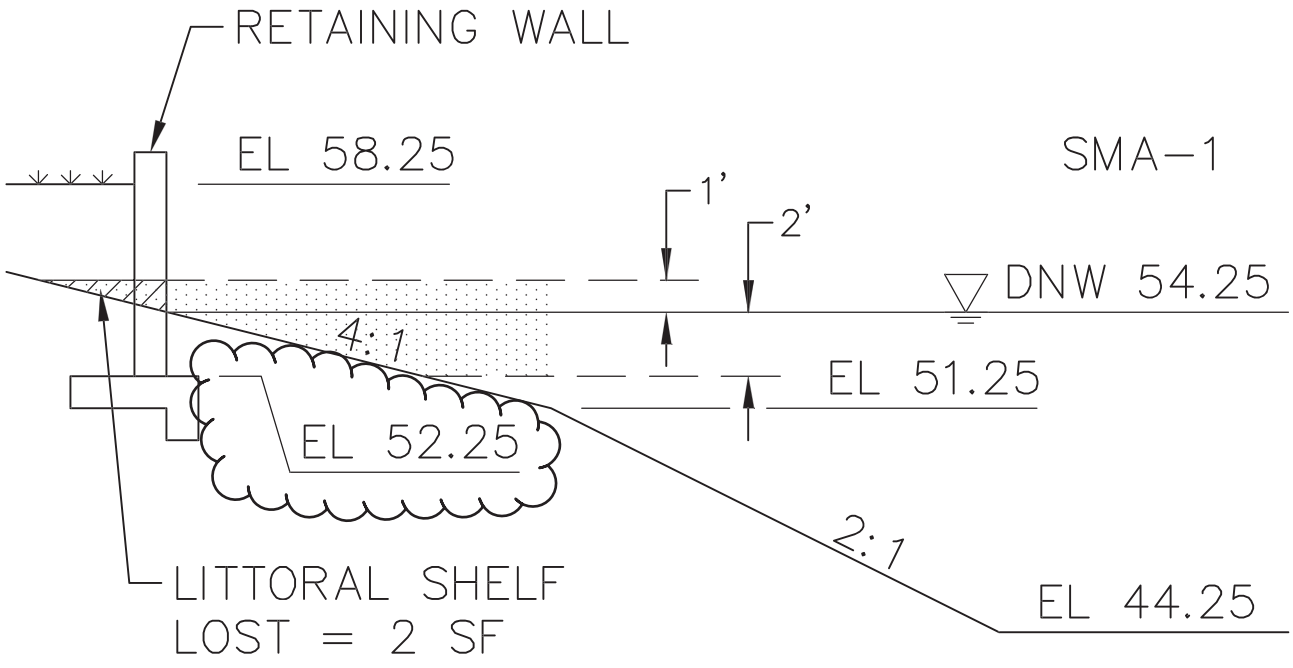
Control device:	Circular Orifice	
# of devices:	1	
Diameter, d (in.) =	2.75	
Total Head (ft) =	0.53	*Total Head = Min. weir elevation - DNW+d/2
1/2" Detention Volume =	0.23 ac-ft	*1/2" runoff over the contributing area (total area - water surface)
Recovery Time =	**19.4 hours**	

Fontana
POND-7 Stage-Storage Calculations

Date: 5/29/2018
By: ACC
Chk: JCN

POND-7 Pond Data				
Stage (ft - NAVD)	Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
40	0.06	4.25		Pond Bottom
55	0.34	1.25		Grade Break
58	0.50	0.00	0.00	**DNW**
59	0.55		0.53	
60	0.61		1.11	
61	0.68		1.76	
62	0.84		2.51	Outside Top of Berm

Note: No treatment or attenuation proposed in POND-7



6/18/21 ADDED FOOTING ELEV. PER SFWMD RAI

DONALD W. MCINTOSH ASSOCIATES, INC.
ENGINEERS PLANNERS SURVEYORS
2200 PARK AVENUE NORTH, WINTER PARK, FL 32789 407.644.4068

DRAWN BY: ET	DESIGNED BY: JCN	APPROVED BY: JCN	SCALE	JOB NUMBER
DATE: 9/21/20	DATE: 9/21/20	DATE: 9/21/20	1"=6'H,1"=6'V	13189

FONTANA
OSCEOLA COUNTY, FLORIDA

SMA-1 LITTORAL SHELF EXHIBIT

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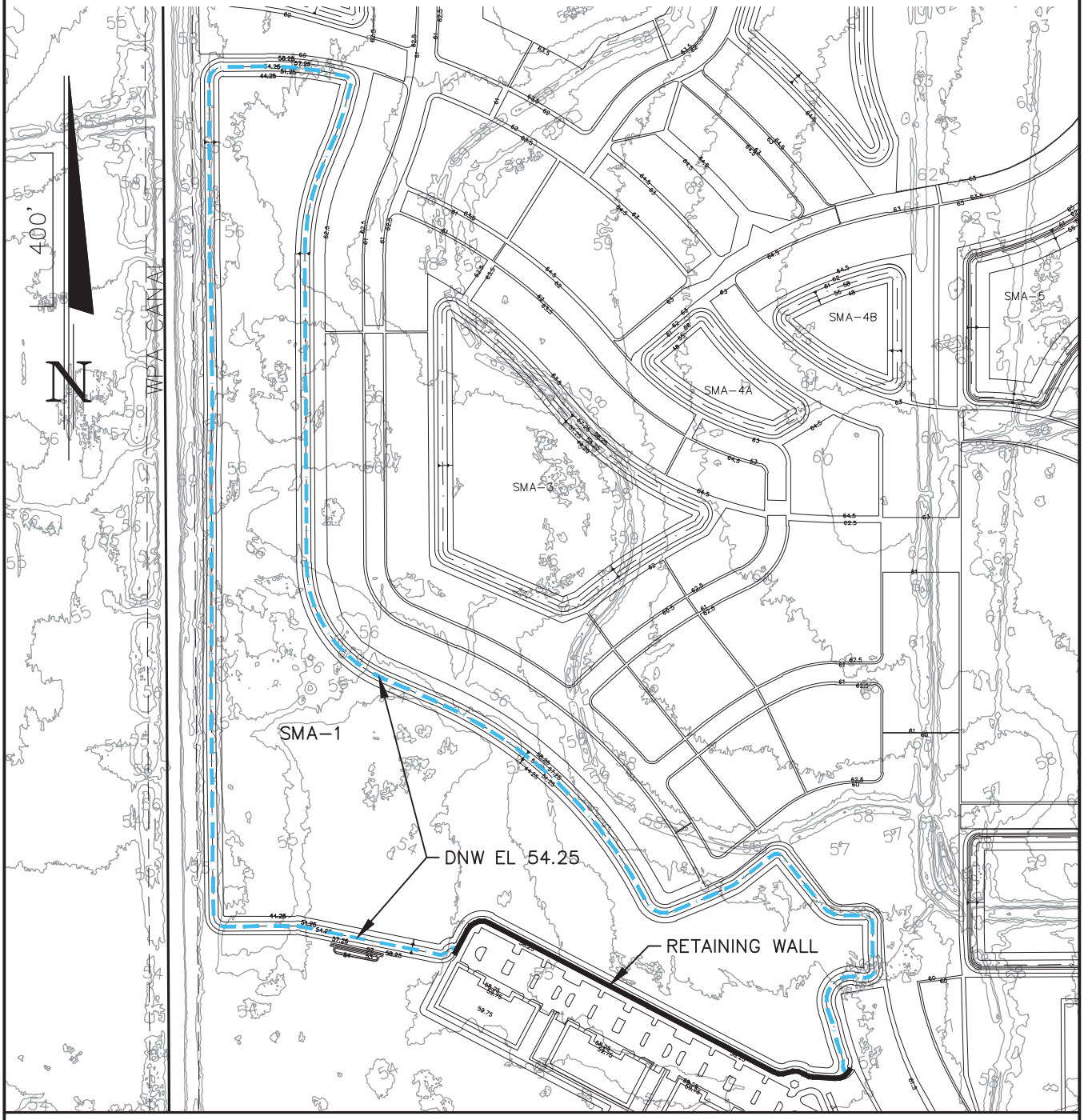

SMA-1 PERIMETER LENGTH AT CONTROL ELEVATION: 8,189 LF
RETAINING WALL LENGTH: 1,191 LF
1,191 LF ÷ 8,189 X 100 = 14.5%

6/18/21 ADDED SHEET PER SFWMD RAI

DONALD W. MCINTOSH ASSOCIATES, INC.
ENGINEERS PLANNERS SURVEYORS
2200 PARK AVENUE NORTH, WINTER PARK, FL 32789 407.644.4068

FONTANA
OSCEOLA COUNTY, FLORIDA

SMA-1 RETAINING WALL EXHIBIT

DRAWN BY:	DESIGNED BY:	APPROVED BY:	SCALE	JOB NUMBER
ET	JCN	JCN	1"=400'	13189
DATE: 4/9/21	DATE: 4/9/21	DATE: 4/9/21		

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APPENDIX D.2

BMPTRAINS POLLUTANT LOADING ANALYSIS

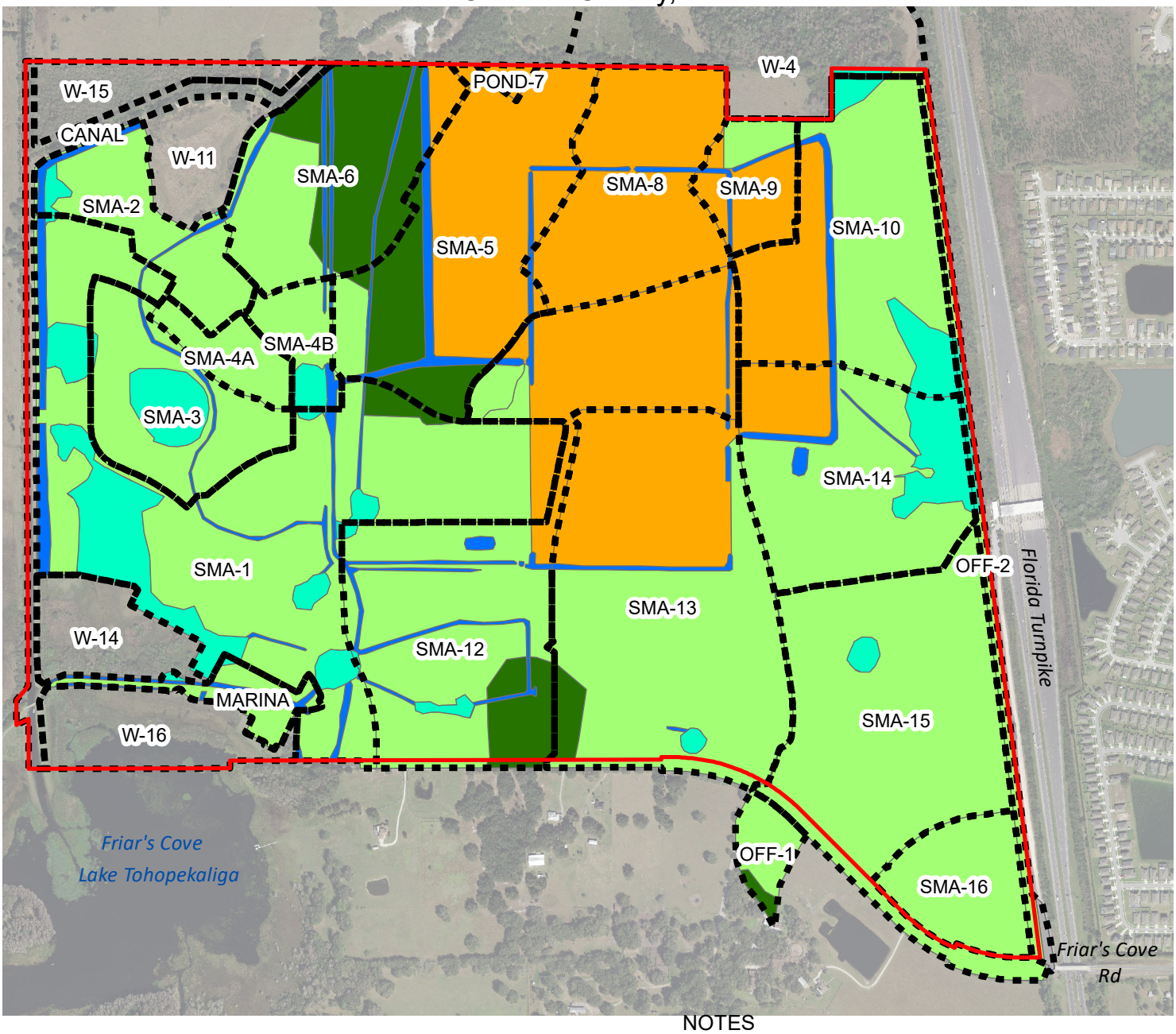
N

N/A

Fontana

Section 27, 28, 33 & 34, Township 26 S, Range 30 E

Osceola County, FL



Legend

- Project Boundary
- Post-Development Drainage Basins

BMPTRAINS

- HIGHWAY
- PASTURE
- RUDERAL UPLAND PINE
- UNDEVELOPED
- WATER
- WETLAND

NOTES

1) This is not a survey.
2) This map is for planning and permitting activity for the above named project and should be used for those purposes only.
3) The land use data shown hereon is based upon land use determined by Bio-Tech Consultants, Inc.

BMPTRAINS Land Use Pre-Development

DONALD W. McINTOSH ASSOCIATES, INC.
CIVIL ENGINEERS - LAND PLANNERS - SURVEYORS
2200 PARK AVENUE NORTH, WINTER PARK, FL 32789
PHONE 407.644.4068 FAX 407.644.8318

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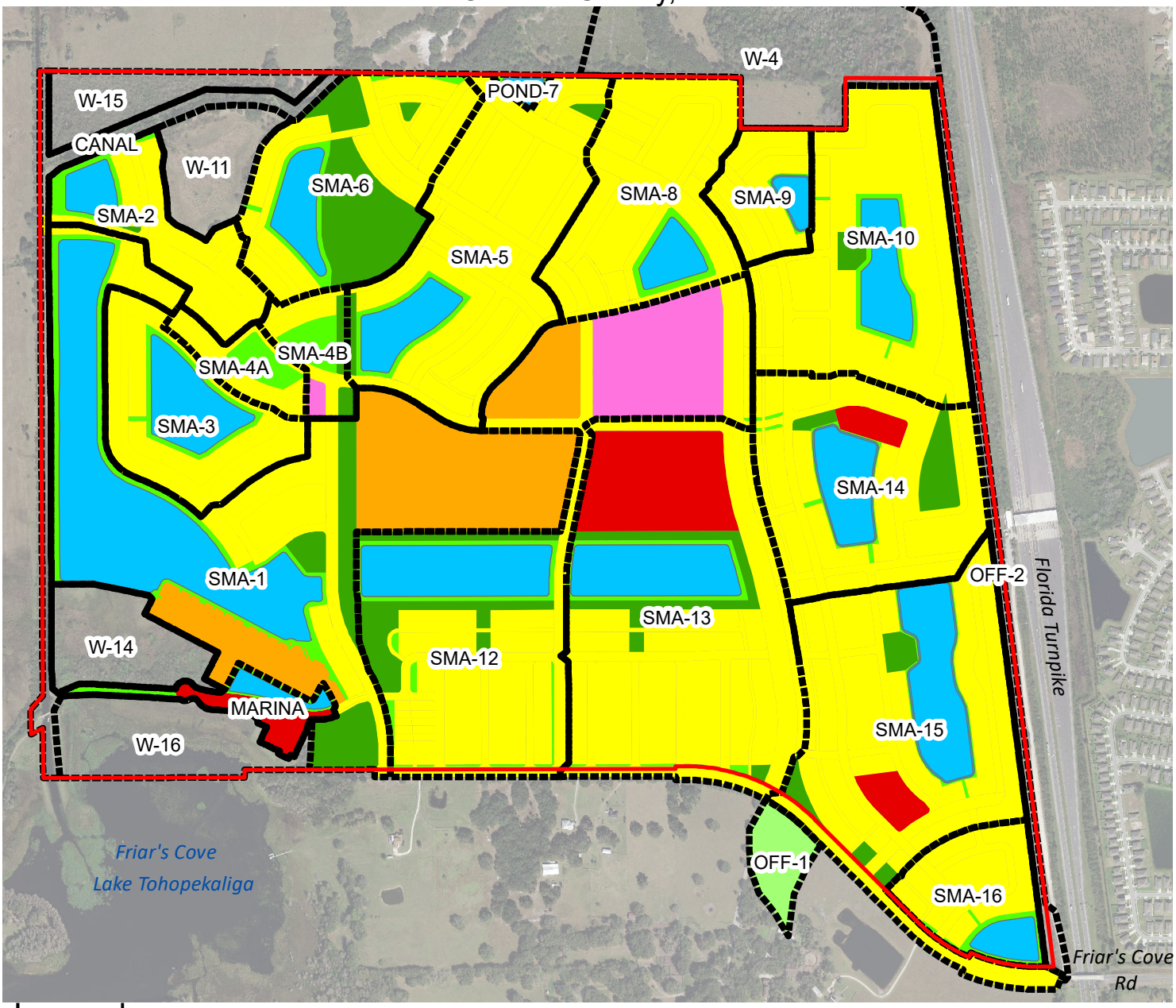
N

N/A

Fontana

Section 27, 28, 33 & 34, Township 26 S, Range 30 E

Osceola County, FL



Legend

- Project Boundary
- Post-Development Drainage Basins

Land Cover

- AVG OF MFR + UNDEVELOPED
- HIGH INTENSITY COMMERCIAL
- LOW INTENSITY COMMERCIAL
- MULTI-FAMILY RESIDENTIAL
- PASTURE
- SINGLE FAMILY RESIDENTIAL
- UNDEVELOPED
- WATER SURFACE

NOTES

1) This is not a survey.
2) This map is for planning and permitting activity for the above named project and should be used for those purposes only.

BMPTRAINS Land Use Post Development

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Fontana
BMPTRAINS Phosphorous Loading Summary

Date: 4/27/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

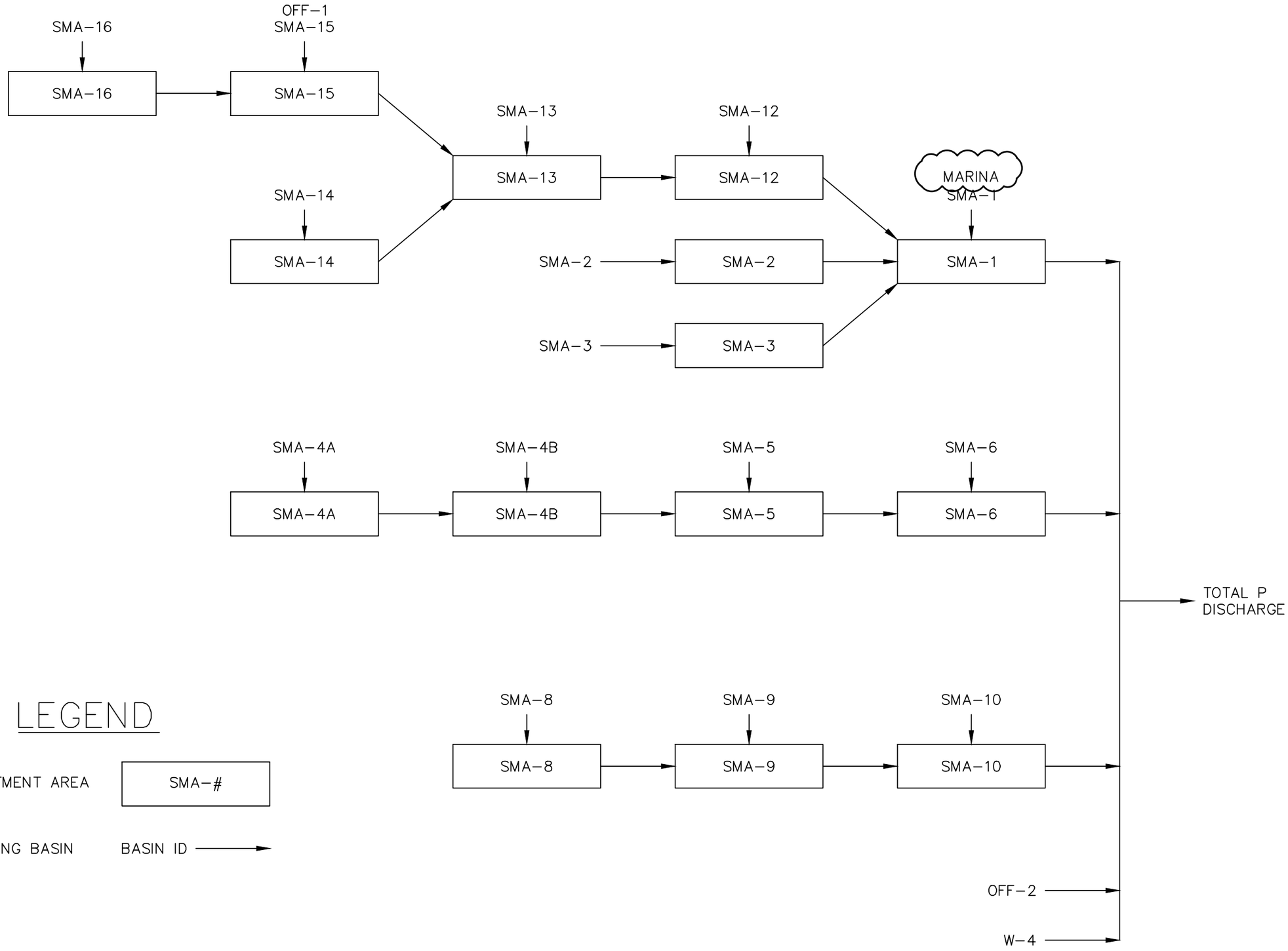
Basin	Area (ac)	Pre-Development TP Load (kg/yr)	Post Development TP Load (kg/yr)	Provided BMP	BMP Name	Provided BMP TP Removal Efficiency (%)	Discharged TP to SMA-1 (kg/yr)	Discharged TP Load (kg/yr)
SMA-1[1]	106.0	37.21	122.05	Wet Detention	SMA-1	86.75%		38.75
SMA-2	17.8	6.64	11.26	Wet Detention	SMA-2	85.61%	3.72	
SMA-3	24.9	9.28	17.42	Wet Detention	SMA-3	87.96%		
SMA-4A	7.1	5.41	10.25	Wet Detention	SMA-4A	86.43%		9.70
SMA-4B	7.7			Wet Detention	SMA-4B			
SMA-5	50.3	9.95	32.96	Wet Detention	SMA-5	86.00%		
SMA-6	36.4	9.20	22.21	Wet Detention	SMA-6	83.14%		
SMA-8	33.8	1.07	16.12	Wet Detention	SMA-8	85.24%		5.93
SMA-9	11.1	1.49	4.99	Wet Detention	SMA-9	84.79%		
SMA-10	47.8	5.51	23.47	Wet Detention	SMA-10	87.96%		
SMA-12	77.8	11.27	45.61	Wet Detention	SMA-12	86.24%	18.94	
SMA-13	75.0	7.58	39.43	Wet Detention	SMA-13	87.96%		
SMA-14	43.3	5.85	22.41	Wet Detention	SMA-14	87.96%		
OFF-1, SMA-15	66.4	6.89	34.65	Wet Detention	SMA-15	87.83%		
SMA-16	15.4	1.72	7.60	Wet Detention	SMA-16	87.96%		
OFF-2	6.7	0.91	0.36					0.36
W-4	0.7	2.22	0.04					0.04
Totals:		**122.20**	**410.83**					**54.77**

Required Removal Efficiency:	**70.26%**
Provided Removal Efficiency:	**86.67%**

Notes

- Ponds which discharge into downstream ponds are included in the "Discharged TP to SMA-1" column; all other ponds discharge off-site
- See BMPTRAINS input and results for detailed phosphorous loading analysis

1. Marina basin is included in SMA-1 calculations



REVISIONS			
DESCRIPTION	BY	DATE	
ADDING MARINA BASIN	NRB	06/23/20	
UPDATING MULTI-USE ROAD AND SMA1,2,4 AND 6	NRB	10/18/18	
REVISED PER SFWMD COMMENTS	ACC	6/14/18	

DONALD W. McINTOSH ASSOCIATES, INC.
ENGINEERS PLANNERS SURVEYORS
2200 PARK AVENUE NORTH, WINTER PARK, FL 32789 407.644.4068

DRAWN BY: ACC
CHECKED BY: JCN
JOB NO. 13189
SCALE NTS
SHEET 1 OF 1
DATE 6/14/2018

FONTANA
OSCEOLA COUNTY, FLORIDA
BMPTRAINS SCHEMATIC DIAGRAM

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Fontana
Residence Time Calculations

Date: 5/29/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

SMA-1				
Stage (ft - NAVD)	Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
44.25	24.95	269.68		Pond Bottom
51.25	27.54	85.98		Grade Break
54.25	29.78	0.00	0.00	**DNW**
55.25	30.43		30.11	
56.25	31.08		60.86	
57.25	31.73		92.27	
58.25	33.35		124.81	Outside Top of Berm

BMPTRAINS Annual Runoff (ac-ft/yr):	228.59
Pond Volume below DNW (ac-ft):	269.68
Residence Time (yr):	1.18
Residence Time (days):	**431**

SMA-2				
Stage (ft - NAVD)	Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
44.25	1.66	19.50		Pond Bottom
51.25	2.03	6.59		Grade Break
54.25	2.36	0.00	0.00	**DNW**
55.25	2.48		2.42	
56.25	2.60		4.96	
57.25	2.72		7.62	
58.25	3.04		10.50	Outside Top of Berm

BMPTRAINS Annual Runoff (ac-ft/yr):	25.16
Pond Volume below DNW (ac-ft):	19.50
Residence Time (yr):	0.78
Residence Time (days):	**283**

SMA-3				
Stage (ft - NAVD)	Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
44.25	5.11	56.57		Pond Bottom
51.25	5.81	18.37		Grade Break
54.25	6.44	0.00	0.00	**DNW**
55.25	6.65		6.54	
56.25	6.86		13.30	
57.25	7.08		20.27	
58.25	7.64		27.63	Outside Top of Berm

BMPTRAINS Annual Runoff (ac-ft/yr):	39.00
Pond Volume below DNW (ac-ft):	56.57
Residence Time (yr):	1.45
Residence Time (days):	**529**

Fontana
Residence Time Calculations

Date: 5/29/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

SMA-4A				
Stage (ft - NAVD)	Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
48	0.69	9.12		Pond Bottom
55	0.97	3.32		Grade Break
58	1.24	0.00	0.00	**DNW**
59	1.33		1.29	
60	1.43		2.67	
61	1.53		4.15	
62	1.79		5.81	Outside Top of Berm

BMPTRAINS Annual Runoff (ac-ft/yr):	22.42
Pond Volume below DNW (ac-ft):	9.12
Residence Time (yr):	0.41
Residence Time (days):	**148**

SMA-4B				
Stage (ft - NAVD)	Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
48	0.78	10.00		Pond Bottom
55	1.06	3.56		Grade Break
58	1.31	0.00	0.00	**DNW**
59	1.40		1.36	
60	1.50		2.81	
61	1.59		4.35	
62	1.84		6.07	Outside Top of Berm

BMPTRAINS Annual Runoff (ac-ft/yr):	22.42
Pond Volume below DNW (ac-ft):	10.00
Residence Time (yr):	0.45
Residence Time (days):	**163**

SMA-5				
Stage (ft - NAVD)	Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
38	2.68	70.69		Pond Bottom
55	4.09	13.10		Grade Break
58	4.64	0.00	0.00	**DNW**
59	4.82		4.73	
60	5.01		9.65	
61	5.20		14.75	
62	5.69		20.20	Outside Top of Berm

BMPTRAINS Annual Runoff (ac-ft/yr):	64.18
Pond Volume below DNW (ac-ft):	70.69
Residence Time (yr):	1.10
Residence Time (days):	**402**

Fontana
Residence Time Calculations

Date: 5/29/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

SMA-6				
Stage (ft - NAVD)	Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
47.5	2.81	32.89		Pond Bottom
54.5	3.42	11.09		Grade Break
57.5	3.97	0.00	0.00	**DNW**
58.5	4.16		4.06	
59.5	4.35		8.32	
60.5	4.54		12.76	
61.5	5.03		17.55	Outside Top of Berm

BMPTRAINS Annual Runoff (ac-ft/yr):	35.15
Pond Volume below DNW (ac-ft):	32.89
Residence Time (yr):	0.94
Residence Time (days):	**342**

SMA-8				
Stage (ft - NAVD)	Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
40.5	1.43	40.55		Pond Bottom
57.5	2.43	7.75		Grade Break
60.5	2.74	0.00	0.00	**DNW**
61	2.80		1.39	
62	2.93		4.25	
63	3.07		7.26	
64	3.20		10.39	
65	3.55		13.77	Outside Top of Berm

BMPTRAINS Annual Runoff (ac-ft/yr):	40.15
Pond Volume below DNW (ac-ft):	40.55
Residence Time (yr):	1.01
Residence Time (days):	**369**

SMA-9				
Stage (ft - NAVD)	Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
35.5	0.10	11.98		Pond Bottom
57.5	0.75	2.60		Grade Break
60.5	0.99	0.00	0.00	**DNW**
61.5	1.07		1.03	
62.5	1.16		2.15	
63.5	1.25		3.36	
64.5	1.49		4.80	Outside Top of Berm

BMPTRAINS Annual Runoff (ac-ft/yr):	12.46
Pond Volume below DNW (ac-ft):	11.98
Residence Time (yr):	0.96
Residence Time (days):	**351**

Fontana
Residence Time Calculations

Date: 5/29/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

SMA-10				
Stage (ft - NAVD)	Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
35.5	2.51	94.23		Pond Bottom
57.5	4.69	15.04		Grade Break
60.5	5.34	0.00	0.00	**DNW**
61.5	5.56		5.45	
62.5	5.78		11.12	
63.5	6.01		17.02	
64.5	6.59		23.49	Outside Top of Berm

BMPTRAINS Annual Runoff (ac-ft/yr):	57.80
Pond Volume below DNW (ac-ft):	94.23
Residence Time (yr):	1.63
Residence Time (days):	**595**

SMA-12				
Stage (ft - NAVD)	Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
38	3.05	128.84		Pond Bottom
45	7.19	105.63		Grade Break
55	8.55	26.92	0.00	**DNW**
58	9.40	0.00	26.92	
59	9.68		36.47	
60	9.97			
61	10.26		56.42	
62	11.00		67.50	Outside Top of Berm

BMPTRAINS Annual Runoff (ac-ft/yr):	114.00
Pond Volume below DNW (ac-ft):	128.84
Residence Time (yr):	1.13
Residence Time (days):	**413**

SMA-13				
Stage (ft - NAVD)	Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
37	4.93	152.49		Pond Bottom
58	7.38	23.26		Grade Break
61	8.13	0.00	0.00	**DNW**
62	8.39		8.26	
63	8.64		16.77	
64	8.90		25.55	
65	9.56		34.98	Outside Top of Berm

BMPTRAINS Annual Runoff (ac-ft/yr):	106.22
Pond Volume below DNW (ac-ft):	152.49
Residence Time (yr):	1.44
Residence Time (days):	**524**

Fontana
Residence Time Calculations

Date: 5/29/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

SMA-14				
Stage (ft - NAVD)	Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
37	2.54	89.14		Pond Bottom
59	4.31	13.75		Grade Break
62	4.85	0.00	0.00	**DNW**
63	5.04		4.94	
64	5.22		10.07	
65	5.41		15.39	
66	5.89		21.19	Outside Top of Berm

BMPTRAINS Annual Runoff (ac-ft/yr):	52.09
Pond Volume below DNW (ac-ft):	89.14
Residence Time (yr):	1.71
Residence Time (days):	**625**

SMA-15				
Stage (ft - NAVD)	Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
44.5	5.04	113.17		Pond Bottom
59.5	7.06	22.45		Grade Break
62.5	7.91	0.00	0.00	**DNW**
63.5	8.20		8.05	
64.5	8.49		16.39	
65.5	8.78		25.03	
66.5	9.52		34.40	Outside Top of Berm

BMPTRAINS Annual Runoff (ac-ft/yr):	83.82
Pond Volume below DNW (ac-ft):	113.17
Residence Time (yr):	1.35
Residence Time (days):	**493**

SMA-16				
Stage (ft - NAVD)	Area (ac)	Volume Below DNW (ac-ft)	Volume Above DNW (ac-ft)	
36.5	0.79	36.16		Pond Bottom
59.5	1.83	6.00		Grade Break
62.5	2.16	0.00	0.00	**DNW**
63.5	2.28		2.22	
64.5	2.40		4.56	
65.5	2.51		7.01	
66.5	2.82		9.78	Outside Top of Berm

BMPTRAINS Annual Runoff (ac-ft/yr):	19.05
Pond Volume below DNW (ac-ft):	36.16
Residence Time (yr):	1.90
Residence Time (days):	**693**

GENERAL SITE INFORMATION: V 8.6 | GO TO INTRODUCTION PAGE | 4/27/2018 | Blue Numbers = Input data | Red Numbers = Calculated or Carryover

Select the appropriate Meteorological Zone, input the appropriate Mean Annual Rainfall amount and select the type of analysis

NAME OF PROJECT: Fontana (SMA-15-16)

HELP Rainfall

VIEW ZONE MAP

Meteorological Zone (Please use zone map): CLICK ON CELL BELOW TO SELECT — Zone 2

Mean Annual Rainfall (Please use rainfall map): 49.00 Inches

VIEW MEAN ANNUAL RAINFALL

Type of analysis: CLICK ON CELL BELOW TO SELECT — Net improvement

Treatment efficiency (N, P) (ex 80 70 (no decimal points) **use only for specified removal efficiency**): % %

GO TO WATERSHED

Select the STORMWATER TREATMENT ANALYSIS Button below to begin analyzing the effectiveness of Best Management Practices.

Model documentation and example problems.

STORMWATER TREATMENT ANALYSIS

Systems available for analysis:
Retention Basin with option for calculating effluent concentration
Wet Detention
Exfiltration Trench
Pervious Pavement
Stormwater Harvesting
Biofiltration
Greenroof
Rainwater Harvesting
Managed Aquatic Plants Detention
Vegetated Natural Buffer
Vegetated Filter Strip
Swale
Rain Garden
Tree Well
Lined reuse pond
User Defined BMP

There is a user's manual for the BMPTRAINS model. It can be downloaded from www.stormwater.ucf.edu. The results from the example problems shown in the manual however may not reflect current model results due to ongoing updates of the model.

RESET INPUT FOR STORMWATER TREATMENT ANALYSIS

METHODOLOGY FOR CALCULATING REQUIRED TREATMENT

METHODOLOGY FOR

METHODOLOGY FOR WET

METHODOLOGY FOR

METHODOLOGY FOR

WATERSHED CHARACTERISTICS V 8.6

GO TO STORMWATER TREATMENT ANALYSIS

Blue Numbers = Input data | Red Numbers = Calculated

LAND USES/EMC

SELECT CATCHMENT CONFIGURATION 4/27/2018

CLICK ON CELL BELOW TO SELECT CONFIGURATION

F - Mixed-3 Catchment-2 Series-Parallel (A)

VIEW CATCHMENT CONFIGURATION

For comingling, the off-site catchment must be upstream. The delay is only for retention BMPs and must be used in hours as measured by the time of concentration at a one inch/hour rain

COMINGLING | MULTI-LAND USE

GO TO GENERAL SITE INFORMATION PAGE

Delay [hrs] | CATCHMENT NO.1 NAME: OFF-1

max delay = 15 hrs,

CLICK ON CELL BELOW TO SELECT

Pre-development land use: GIS Import Data

with default EMCs CLICK ON CELL BELOW TO SELECT

Post-development land use: GIS Import Data

with default EMCs

VIEW AVERAGE ANNUAL

VIEW EMC & FLUCCS

GO TO GIS LANDUSE DATA

OVERWRITE DEFAULT CONCENTRATIONS USING:

	PRE:	POST:
EMC(N):	mg/L	mg/L
EMC(P):	mg/L	mg/L

IMPORT GIS CONCENTRATIONS

Total pre-development catchment area:	5.200	AC	From GIS data	Average annual pre runoff volume:	0.542 ac-ft/year
Total post-development catchment or for BMP analysis:	5.200	AC	5.2	Average annual post runoff volume (note no BMP area):	0.542 ac-ft/year
Pre-development Non DCIA CN:	57.20		57.2	Pre-development Annual Mass Loading - **Nitrogen:**	2.346 kg/year
Pre-development DCIA percentage:	0.00	%	0%	Pre-development Annual Mass Loading - **Phosphorus:**	0.458 kg/year
Post-development Non DCIA CN:	57.20		57.2	Post-development Annual Mass Loading - **Nitrogen:**	2.346 kg/year
Post-development DCIA percentage:	0.00	%	0%	Post-development Annual Mass Loading - **Phosphorus:**	0.458 kg/year
Estimated BMP Area (No loading from this area)		AC			

CATCHMENT NO.2 NAME: SMA-16

CLICK ON CELL BELOW TO SELECT

Pre-development land use: GIS Import Data

with default EMCs CLICK ON CELL BELOW TO SELECT

Post-development land use: GIS Import Data

with default EMCs

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:	POST:
EMC(N):	mg/L	mg/L
EMC(P):	mg/L	mg/L

IMPORT GIS CONCENTRATIONS

Total pre-development catchment area:	15.400	AC	From GIS data	Average annual pre runoff volume:	2.037 ac-ft/year
Total post-development catchment or BMP analysis area:	15.400	AC	15.4	Average annual post runoff volume (note no BMP area):	19.052 ac-ft/year
Pre-development Non DCIA CN:	61.00		61.0	Pre-development Annual Mass Loading - **Nitrogen:**	8.819 kg/year
Pre-development DCIA percentage:	0.00	%	0%	Pre-development Annual Mass Loading - **Phosphorus:**	1.724 kg/year
Post-development Non DCIA CN:	81.50		81.5	Post-development Annual Mass Loading - **Nitrogen:**	48.347 kg/year
Post-development DCIA percentage:	26.00	%	26%	Post-development Annual Mass Loading - **Phosphorus:**	7.602 kg/year
Estimated BMP Area (No loading from this area)		AC			

CATCHMENT NO.3 NAME: SMA-15

CLICK ON CELL BELOW TO SELECT

Pre-development land use: GIS Import Data

with default EMCs CLICK ON CELL BELOW TO SELECT

Post-development land use: GIS Import Data

with default EMCs

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:	POST:
EMC(N):	mg/L	mg/L
EMC(P):	mg/L	mg/L

IMPORT GIS CONCENTRATIONS

Total pre-development catchment area:	61.200	AC	From GIS data	Average annual pre runoff volume:	10.036 ac-ft/year
Total post-development catchment or BMP analysis area:	61.200	AC	61.2	Average annual post runoff volume (note no BMP area):	83.816 ac-ft/year
Pre-development Non DCIA CN:	61.00		61.0	Pre-development Annual Mass Loading - **Nitrogen:**	35.750 kg/year
Pre-development DCIA percentage:	1.00	%	1%	Pre-development Annual Mass Loading - **Phosphorus:**	6.435 kg/year
Post-development Non DCIA CN:	82.20		82.2	Post-development Annual Mass Loading - **Nitrogen:**	216.439 kg/year
Post-development DCIA percentage:	30.00	%	30%	Post-development Annual Mass Loading - **Phosphorus:**	34.190 kg/year
Estimated BMP Area (no loading from this area)		AC			

IMPORT GIS LAND USE DATA

V 8.6

Instructions: The data required for this analysis is as follows; Basin ID, FLUCCSCODE, Soils Hydro Group, CN, and Area. This data is typically derived by using the ArcGIS geoprocessing tool intersect and performing an intersect on the basins of interest, soils polygons, and land use polygons. The resulting attribute table can then be exported to Excel where any final data formatting and processing can be done to get it ready to copy into this spreadsheet. Data must be sorted by Basin ID for this table to work properly. The user can use up to four catchments for this analysis. The user may overwrite any EMC by manualy entering in a value in the first two columns. All this must be done for both the pre and post development conditions when this tool is used.

Note: Soil hydrologic groups should be single class. For example, A/D would be assigned B, B/D would be assigned C, and C/D would be assigned D. This is due to the fact that this is an annual average analysis and the soils will behave as drained during part of the year and not drained during other parts of the year. To assume D would artificially increase runoff. Additionally, it is recommended that, due to compaction, the soil hydrologic group remain consistent in the pre and post development conditions for these dual class soils.

GO TO WATERSHED CHARACTERISTICS

VIEW EMC & FLUCCS

Pre-Development EMC Calculation Table

EMC Overwrite														EMC's Based on						Subbasin Summary						
TN [mg/L]	TP [mg/L]	Basin ID	FLUCCSCODE	FLUCSDESC	HYDROGRP	CN	DCIA [Yes/ No]	Area [acres]	Compressed Land Use	Area [acres] (for CN	CN*Area	C	C*Area	TN [mg/L]	TP [mg/L]	C*Area* TN_{EMC}	C*Area* TP_{EMC}	New Basin?	TN [mg/L]	TP [mg/L]	Basin ID	Basin Area [acres]	DCIA [acres]	DCIA [%]	Basin CN [area weighted
		OFF-1	2110	Woodland Pasture	A	39.0	No	0.21	PASTURE	0.21	8.19	0.0064	0.00134	3.51	0.686	0.00472	0.00092	YES	3.51	0.686	OFF-1	5.2		0%	57.2
		OFF-1	2110	Improved Pasture	B	61.0	No	4.26	PASTURE	4.26	259.86	0.0324	0.13802	3.51	0.686	0.48446	0.09468	NO							
		OFF-1	2130	Woodland Pasture	A	39.0	No	0.68	PASTURE	0.68	26.52	0.0064	0.00435	3.51	0.686	0.01528	0.00299	NO							
		OFF-1	2130	Improved Pasture	B	61.0	No	0.01	PASTURE	0.01	0.61	0.0324	0.00032	3.51	0.686	0.00114	0.00022	NO							
		SMA-16	2110	Improved Pastures	B	61.0	No	15.39	PASTURE	15.39	938.79	0.0324	0.49864	3.51	0.686	1.75021	0.34206	YES	3.51	0.686	SMA-16	15.4		0%	61.0
		SMA-15	2110	Improved Pasture	B	61.0	No	5.6	PASTURE	5.6	341.6	0.0324	0.18144	3.51	0.686	0.63685	0.12447	YES	2.89	0.520	SMA-15	61.2		1%	61.0
		SMA-15	8140	Roads and Highways	B	89.0	No	0.02	HIGHWAY	0.02	1.78	0.2256	0.00451	1.52	0.2	0.00686	0.0009	NO							
		SMA-15	6400	Vegetated Non-Forested Wetlands	B	98.0	Yes	0.86	WETLAND*	0.86	84.28	0.809	0.69574	1.15	0.055	0.8001	0.03827	NO					0.9		
		SMA-15	2110	Improved Pastures	B	61.0	No	51.02	PASTURE	51.02	3112.22	0.0324	1.65305	3.51	0.686	5.8022	1.13399	NO							
		SMA-15	2110	Improved Pastures	B	61.0	No	3.74	PASTURE	3.74	228.14	0.0324	0.12118	3.51	0.686	0.42533	0.08313	NO							

Post-Development EMC Calculation Table

EMC Overwrite		Basin ID	FLUCCSCODE	FLUCSDESC	HYDROG RP	CN	DCIA [Yes/No]	Area [acres]	Compressed Land Use	Area [acres] (for CN	CN*Area	C	C*Area	EMC's Based on		C*Area* TN_{EMC}	C*Area* TP_{EMC}	New Basin?	Subbasin Summary		Basin ID	Basin Area [acres]	DCIA [acres]	DCIA [%]	Basin CN [area weighted
TN [mg/L]	TP [mg/L]													TN [mg/L]	TP [mg/L]				TN [mg/L]	TP [mg/L]					
		OFF-1	2110	Woodland Pasture	A	39.0	No	0.21	PASTURE	0.21	8.19	0.0064	0.00134	3.51	0.686	0.00472	0.00092	YES	3.51	0.686	OFF-1	5.2		0%	57.2
		OFF-1	2110	Improved Pasture	B	61.0	No	4.26	PASTURE	4.26	259.86	0.0324	0.13802	3.51	0.686	0.48446	0.09468	NO							
		OFF-1	2130	Woodland Pasture	A	39.0	No	0.68	PASTURE	0.68	26.52	0.0064	0.00435	3.51	0.686	0.01528	0.00299	NO							
		OFF-1	2130	Improved Pasture	B	61.0	No	0.01	PASTURE	0.01	0.61	0.0324	0.00032	3.51	0.686	0.00114	0.00022	NO							
		SMA-16	1210	Residential (70%)	B	86.0	Yes	0.38	SINGLE FAMILY RES	0.38	32.68	0.809	0.30742	2.07	0.327	0.63636	0.10053	YES	2.06	0.324	SMA-16	15.4	0.4	26%	81.5
		SMA-16	1210		B	86.0	No	6.45	SINGLE FAMILY RES	6.45	554.7	0.1764	1.13778	2.07	0.327	2.3552	0.37205	NO							
		SMA-16	1210	Residential (60%)	B	82.0	Yes	0.16	SINGLE FAMILY RES	0.16	13.12	0.809	0.12944	2.07	0.327	0.26794	0.04233	NO					0.2		
		SMA-16	1210		B	82.0	No	2.01	SINGLE FAMILY RES	2.01	164.82	0.1306	0.26251	2.07	0.327	0.54339	0.08584	NO							
		SMA-16	1210	50' R/W (72%)	B	81.0	Yes	0.52	SINGLE FAMILY RES	0.52	42.12	0.809	0.42068	2.07	0.327	0.87081	0.13756	NO					0.5		
		SMA-16	1210		B	81.0	No	0.88	SINGLE FAMILY RES	0.88	71.28	0.1208	0.1063	2.07	0.327	0.22005	0.03476	NO							
		SMA-16	1210	60' R/W (77%)	B	83.0	Yes	0.43	SINGLE FAMILY RES	0.43	35.69	0.809	0.34787	2.07	0.327	0.72009	0.11375	NO					0.4		
		SMA-16	1210		B	83.0	No	0.58	SINGLE FAMILY RES	0.58	48.14	0.1404	0.08143	2.07	0.327	0.16856	0.02663	NO							
		SMA-16	1210	Alley (100%)	B	98.0	Yes	0.31	SINGLE FAMILY RES	0.31	30.38	0.809	0.25079	2.07	0.327	0.51914	0.08201	NO					0.3		
		SMA-16	1900	Open Space (Good)	B	61.0	No	1.51	UNDEVELOPED	1.51	92.11	0.0324	0.04892	1.288	0.107	0.06301	0.00523	NO							
		SMA-16	8370	Water Surface	B	98.0	Yes	2.16	WATER			0.809		0	0			NO					2.2		
		SMA-15	1210	Residential (70%)	B	86.0	Yes	1.2	SINGLE FAMILY RES	1.2	103.2	0.809	0.9708	2.07	0.327	2.00956	0.31745	YES	2.09	0.331	SMA-15	61.2	1.2	30%	82.2
		SMA-15	1210		B	86.0	No	20.3	SINGLE FAMILY RES	20.3	1745.8	0.1764	3.58092	2.07	0.327	7.4125	1.17096	NO							
		SMA-15	1210	Residential (60%)	B	82.0	Yes	0.58	SINGLE FAMILY RES	0.58	47.56	0.809	0.46922	2.07	0.327	0.97129	0.15343	NO					0.6		
		SMA-15	1210		B	82.0	No	7.43	SINGLE FAMILY RES	7.43	609.26	0.1306	0.97036	2.07	0.327	2.00864	0.31731	NO							
		SMA-15	1400	Civ-Com-Multi (80%)	B	86.0	Yes	0.97	HIGH INTENSITY COMMERCI	0.97	83.42	0.809	0.78473	2.4	0.345	1.88335	0.27073	NO					1.0		
		SMA-15	1400		B	86.0	No	1.46	HIGH INTENSITY COMMERCI	1.46	125.56	0.1764	0.25754	2.4	0.345	0.61811	0.08885	NO							
		SMA-15	1850	Park (25%)	B	68.0	Yes	0.18	AVERAGE OF MFR+UNDEVEL	0.18	12.24	0.809	0.14562	2.32	0.52	0.33784	0.07572	NO					0.2		
		SMA-15	1850		B	68.0	No	2.65	AVERAGE OF MFR+UNDEVEL	2.65	180.2	0.051	0.13515	2.32	0.52	0.31355	0.07028	NO							
		SMA-15	1210	50' R/W (72%)	B	81.0	Yes	1.91	SINGLE FAMILY RES	1.91	154.71	0.809	1.54519	2.07	0.327	3.19854	0.50528	NO					1.9		
		SMA-15	1210		B	81.0	No	3.2	SINGLE FAMILY RES	3.2	259.2	0.1208	0.38656	2.07	0.327	0.80018	0.12641	NO							
		SMA-15	1210	60' R/W (77%)	B	83.0	Yes	1.11E+00	SINGLE FAMILY RES	1.11	92.13	0.809	0.89799	2.07	0.327	1.85884	0.29364	NO					1.1		
		SMA-15	1210		B	83.0	No	1.5	SINGLE FAMILY RES	1.5	124.5	0.1404	0.2106	2.07	0.327	0.43594	0.06887	NO							
		SMA-15	1210	80' R/W (82.5%)	B	85.0	Yes	0.89	SINGLE FAMILY RES	0.89	75.65	0.809	0.72001	2.07	0.327	1.49042	0.23544	NO					0.9		
		SMA-15	1210		B	85.0	No	0.93	SINGLE FAMILY RES	0.93	79.05	0.16	0.1488	2.07	0.327	0.30802	0.04866	NO							
		SMA-15	1210	Friar's Cove Road (82.5%)	B	85.0	Yes	2.74	SINGLE FAMILY RES	2.74	232.9	0.809	2.21666	2.07	0.327	4.58849	0.72485	NO					2.7		
		SMA-15	1210		B	85.0	No	2.89	SINGLE FAMILY RES	2.89	245.65	0.16	0.4624	2.07	0.327	0.95717	0.1512	NO							
		SMA-15	1210	Alley (100%)	B	98.0	Yes	0.92	SINGLE FAMILY RES	0.92	90.16	0.809	0.74428	2.07	0.327	1.54066	0.24338	NO					0.9		
		SMA-15	1900	Open Space (Good)	B	61.0	No	2.47	UNDEVELOPED	2.47	150.67	0.0324	0.08003	1.288	0.107	0.10308	0.00856	NO							
		SMA-15	8370	Water Surface	B	98.0	Yes	7.91	WATER			0.809		0	0			NO					7.9		

Summary									
Basin ID	Basin Area [acres]	Pre-Development				Post-Development			
		TN [mg/L]	TP [mg/L]	CN	DCIA %	TN [mg/L]	TP [mg/L]	CN	DCIA %
OFF-1	5.2	3.51	0.686	57.2	0%	3.51	0.686	57.2	0%
SMA-16	15.4	3.51	0.686	61.0	0%	2.06	0.324	81.5	26%
SMA-15	61.2	2.89	0.520	61.0	1%	2.09	0.331	82.183	30%

WET DETENTION / MANAGED AQUATIC PLANTS: 4/27/2018 V 8.6

Blue Numbers =	Input data
Red Numbers =	Calculated or Carryover

Also called: FLOATING ISLANDS and includes a wet detention pond:

Fontana (SMA-15-16)

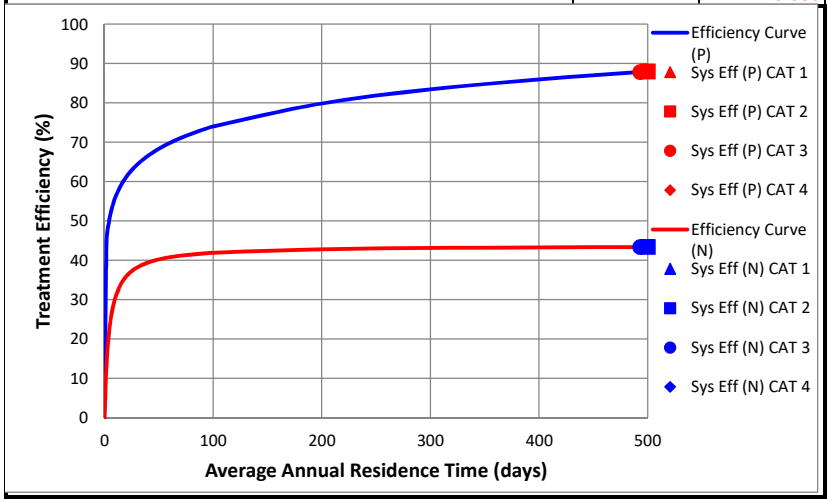
GO TO STORMWATER TREATMENT ANALYSIS

	OFF-1	SMA-16	SMA-15	Catchment 4	
Total pre-development catchment area:	5.200	15.400	61.200	0.000	ac
Total post-development catchment area:	5.200	15.400	61.200	0.000	ac
Average annual residence time (between 1 and 500 days)		500.00	493.00		days
Littoral Zone or other improvements used?*		NO	NO		
Littoral Zone or other improvement efficiency credit:					%
Floating Wetland or Mats used in the design:		NO	NO		
Floating Wetland or Mats credit:					%
Total **Nitrogen** removal required:	0.000	81.758	83.483		%
Total **Phosphorus** removal required:	0.000	77.325	81.180		%
Total **Nitrogen** removal efficiency:	0.000	43.370	43.365	0.000	%
Total **Phosphorous** removal efficiency:	0.000	87.956	87.829	0.000	%
Is the wet detention sufficient:		NO	NO		
Average annual runoff volume:	0.542	19.052	83.816		ac-ft/yr

* pond coverage must follow Regulatory Requirements

Wet Detention Pond Characteristic:

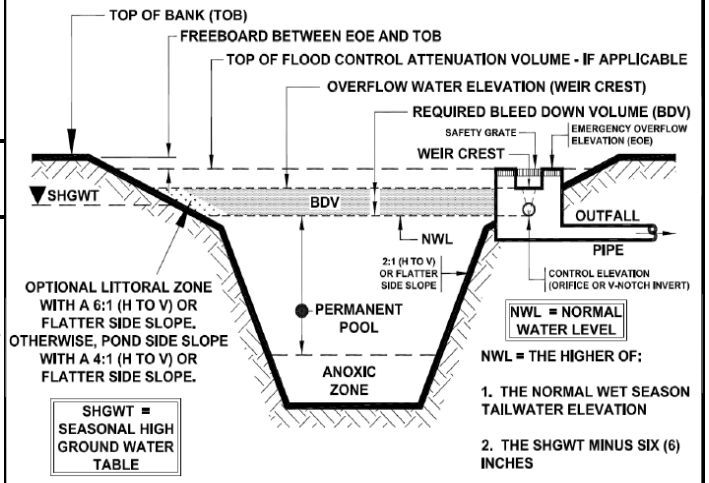
Minimum Pond Permanent Pool Volume:		26.099	113.210		ac-ft



NOTE FOR TREATMENT EFFICIENCY GRAPH:

The purpose of the treatment efficiency graphs is to help illustrate the treatment efficiency of the wet detention system as the function of average annual residence time (and permanent pool volume). The graph illustrates that there is a point of diminished return as the permanent pool volume is substantially increased. Therefore, to provide the most economical BMP treatment system, other alternatives such as "treatment trains" and compensatory treatment should be considered.

REQUIRED REMAINING TREATMENT EFFICIENCIES OF TREATMENT SYSTEM IN SERIES WITH FLOATING ISLANDS WITH WET DETENTION. USE FOR SIZING OF TREATMENT SYSTEM IN SERIES WITH FLOATING ISLANDS WITH WET DETENTION.



TYPICAL X-SECTION OF A WET DETENTION SYSTEM

Source of Graphic: draft **STORMWATER QUALITY APPLICANT'S HANDBOOK** dated March 2010, by the Department of Environmental Protection, available at: http://www.dep.state.fl.us/water/wetlands/erp/rules/stormwater, March 2010

CATCHMENTS AND TREATMENT SURFACE DISCHARGE SUMMARY V 8.6

CALCULATION METHODS:

1. The effectiveness of each BMP in a single catchment is converted to an equivalent capture volume.
2. Certain BMP treatment train combinations have not been evaluated and in practice they are at this time not used, an example is a greenroof following a tree well.
3. Wet detention is last when used in a single catchment with other BMPs, except when followed by filtration

PROJECT TITLE	Fontana (SMA-15-16)	Optional Identification		
	OFF-1	SMA-16	SMA-15	Catchment 4
BMP Name		Wet Detention/ MAPs	Wet Detention/ MAPs	
BMP Name				
BMP Name				

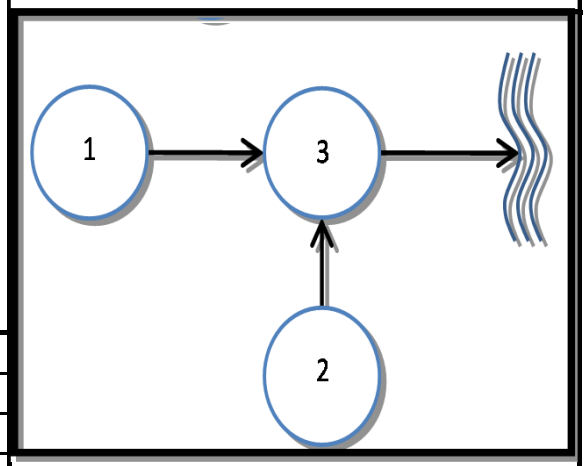
REVIEW, ONE OR MORE CATCHMENT HAS BEEN SPECIFIED WITHOUT A BMP

Surface Water Discharge Summary Performance of Entire Watershed

Catchment Configuration	F - Mixed-3 Catchment-2 Series-Parallel (A)		4/27/2018
Nitrogen Pre Load (kg/yr)	46.91		BMPTRAINS MODEL
Phosphorus Pre Load (kg/yr)	8.62		
Nitrogen Post Load (kg/yr)	267.13		
Phosphorus Post Load (kg/yr)	42.25		
Target Load Reduction (N) %	82		
Target Load Reduction (P) %	80		
Target Discharge Load, N (kg/yr)	48.08		
Target Discharge Load, P (kg/yr)	8.45		
Provided Overall Efficiency, N (%):	43		
Provided Overall Efficiency, P (%):	87		
Discharged Load, N (kg/yr & lb/yr):	152.10	335.02	
Discharged Load, P (kg/yr & lb/yr):	5.44	11.98	
Load Removed, N (kg/yr & lb/yr):	115.03	253.36	
Load Removed, P (kg/yr & lb/yr):	36.81	81.08	

Treatment Objectives or Target for

TN NOT MET
TP MET



GENERAL SITE INFORMATION: V 8.6 | GO TO INTRODUCTION PAGE | 4/27/2018 | Blue Numbers = Input data | Red Numbers = Calculated or Carryover

Select the appropriate Meteorological Zone, input the appropriate Mean Annual Rainfall amount and select the type of analysis

NAME OF PROJECT: Fontana (SMA-12-16)

HELP Rainfall

VIEW ZONE MAP

Meteorological Zone (Please use zone map): CLICK ON CELL BELOW TO SELECT — Zone 2

Mean Annual Rainfall (Please use rainfall map): 49.00 Inches

VIEW MEAN ANNUAL RAINFALL

Type of analysis: CLICK ON CELL BELOW TO SELECT — Net improvement

Treatment efficiency (N, P) (ex 80 70 (no decimal points) **use only for specified removal efficiency**): % %

GO TO WATERSHED

Select the STORMWATER TREATMENT ANALYSIS Button below to begin analyzing the effectiveness of Best Management Practices.

Model documentation and example problems.

STORMWATER TREATMENT ANALYSIS

Systems available for analysis:
Retention Basin with option for calculating effluent concentration
Wet Detention
Exfiltration Trench
Pervious Pavement
Stormwater Harvesting
Biofiltration
Greenroof
Rainwater Harvesting
Managed Aquatic Plants Detention
Vegetated Natural Buffer
Vegetated Filter Strip
Swale
Rain Garden
Tree Well
Lined reuse pond
User Defined BMP

There is a user's manual for the BMPTRAINS model. It can be downloaded from www.stormwater.ucf.edu. The results from the example problems shown in the manual however may not reflect current model results due to ongoing updates of the model.

RESET INPUT FOR STORMWATER TREATMENT ANALYSIS

METHODOLOGY FOR CALCULATING REQUIRED TREATMENT

METHODOLOGY FOR

METHODOLOGY FOR WET

METHODOLOGY FOR

METHODOLOGY FOR

WATERSHED CHARACTERISTICS V 8.6

GO TO STORMWATER TREATMENT ANALYSIS

Blue Numbers = Input data
Red Numbers = Calculated

LAND USES/EMC

SELECT CATCHMENT CONFIGURATION

4/27/2018

CLICK ON CELL BELOW TO SELECT CONFIGURATION

K - Mixed-4 Catchment-Series (B)

VIEW CATCHMENT CONFIGURATION

For comingling, the off-site catchment must be upstream. The delay is only for retention BMPs and must be used in hours as measured by the time of concentration at a one inch/hour rain

COMINGLING | MULTI-LAND USE

GO TO GENERAL SITE INFORMATION PAGE

Delay [hrs]

CATCHMENT NO.1 NAME: SMA-15-16

max delay = 15 hrs.

VIEW AVERAGE ANNUAL

CLICK ON CELL BELOW TO SELECT

Pre-development land use: GIS Import Data

with default EMCs

CLICK ON CELL BELOW TO SELECT

Post-development land use: GIS Import Data

with default EMCs

VIEW EMC & FLUCCS

GO TO GIS LANDUSE DATA

OVERWRITE DEFAULT CONCENTRATIONS USING:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

IMPORT GIS CONCENTRATIONS

Total pre-development catchment area:	81.800	AC	From GIS data	Average annual pre runoff volume:	13.256	ac-ft/year
Total post-development catchment or for BMP analysis:	81.800	AC	81.8	Average annual post runoff volume (note no BMP area):	99.720	ac-ft/year
Pre-development Non DCIA CN:	60.80		60.8	Pre-development Annual Mass Loading - **Nitrogen:**	49.201	kg/year
Pre-development DCIA percentage:	1.00	%	1%	Pre-development Annual Mass Loading - **Phosphorus:**	9.028	kg/year
Post-development Non DCIA CN:	79.90		79.9	Post-development Annual Mass Loading - **Nitrogen:**	258.135	kg/year
Post-development DCIA percentage:	27.00	%	27%	Post-development Annual Mass Loading - **Phosphorus:**	40.874	kg/year
Estimated BMP Area (No loading from this area)		AC				

CATCHMENT NO.2 NAME: SMA-14

CLICK ON CELL BELOW TO SELECT

Pre-development land use: GIS Import Data

with default EMCs

CLICK ON CELL BELOW TO SELECT

Post-development land use: GIS Import Data

with default EMCs

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

IMPORT GIS CONCENTRATIONS

Total pre-development catchment area:	43.300	AC	From GIS data	Average annual pre runoff volume:	31.260	ac-ft/year
Total post-development catchment or BMP analysis area:	43.300	AC	43.3	Average annual post runoff volume (note no BMP area):	52.091	ac-ft/year
Pre-development Non DCIA CN:	59.00		59.0	Pre-development Annual Mass Loading - **Nitrogen:**	58.380	kg/year
Pre-development DCIA percentage:	19.00	%	19%	Pre-development Annual Mass Loading - **Phosphorus:**	5.847	kg/year
Post-development Non DCIA CN:	81.30		81.3	Post-development Annual Mass Loading - **Nitrogen:**	136.290	kg/year
Post-development DCIA percentage:	25.00	%	25%	Post-development Annual Mass Loading - **Phosphorus:**	22.411	kg/year
Estimated BMP Area (No loading from this area)		AC				

CATCHMENT NO.3 NAME: SMA-13

CLICK ON CELL BELOW TO SELECT

Pre-development land use: GIS Import Data

with default EMCs

CLICK ON CELL BELOW TO SELECT

Post-development land use: GIS Import Data

with default EMCs

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

IMPORT GIS CONCENTRATIONS

Total pre-development catchment area:	75.000	AC	From GIS data	Average annual pre runoff volume:	13.867	ac-ft/year
Total post-development catchment or BMP analysis area:	75.000	AC	75.0	Average annual post runoff volume (note no BMP area):	106.221	ac-ft/year
Pre-development Non DCIA CN:	59.80		59.8	Pre-development Annual Mass Loading - **Nitrogen:**	45.108	kg/year
Pre-development DCIA percentage:	2.00	%	2%	Pre-development Annual Mass Loading - **Phosphorus:**	7.577	kg/year
Post-development Non DCIA CN:	81.90		81.9	Post-development Annual Mass Loading - **Nitrogen:**	235.740	kg/year
Post-development DCIA percentage:	32.00	%	32%	Post-development Annual Mass Loading - **Phosphorus:**	39.434	kg/year
Estimated BMP Area (no loading from this area)		AC				

CATCHMENT NO.4 NAME: SMA-12

CLICK ON CELL BELOW TO SELECT

Pre-development land use: GIS Import Data

with default EMCs

CLICK ON CELL BELOW TO SELECT

Post-development land use: GIS Import Data

with default EMCs

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

IMPORT GIS CONCENTRATIONS

Total pre-development catchment area:	77.800	AC	From GIS data	Average annual pre runoff volume:	25.621	ac-ft/year
Total post-development catchment or BMP analysis area:	77.800	AC	77.8	Average annual post runoff volume (note no BMP area):	113.997	ac-ft/year
Pre-development Non DCIA CN:	57.40		57.4	Pre-development Annual Mass Loading - **Nitrogen:**	72.858	kg/year
Pre-development DCIA percentage:	7.00	%	7%	Pre-development Annual Mass Loading - **Phosphorus:**	11.274	kg/year
Post-development Non DCIA CN:	80.60		80.6	Post-development Annual Mass Loading - **Nitrogen:**	257.852	kg/year
Post-development DCIA percentage:	35.00	%	35%	Post-development Annual Mass Loading - **Phosphorus:**	45.612	kg/year
Estimated BMP Area (no loading from this area)		AC				

IMPORT GIS LAND USE DATA V 8.6

Instructions: The data required for this analysis is as follows; Basin ID, FLUCCSCODE, Soils Hydro Group, CN, and Area. This data is typically derived by using the ArcGIS geoprocessing tool intersect and performing an intersect on the basins of interest, soils polygons, and land use polygons. The resulting attribute table can then be exported to Excel where any final data formatting and processing can be done to get it ready to copy into this spreadsheet. Data must be sorted by Basin ID for this table to work properly. The user can use up to four catchments for this analysis. The user may overwrite any EMC by manualy entering in a value in the first two columns. All this must be done for both the pre and post development conditions when this tool is used.

Note: Soil hydrologic groups should be single class. For example, A/D would be assigned B, B/D would be assigned C, and C/D would be assigned D. This is due to the fact that this is an annual average analysis and the soils will behave as drained during part of the year and not drained during other parts of the year. To assume D would artificially increase runoff. Additionally, it is recommended that, due to compaction, the soil hydrologic group remain consistent in the pre and post development conditions for these dual class soils.

GO TO WATERSHED CHARACTERISTICS

VIEW EMC & FLUCCS

Pre-Development EMC Calculation Table

EMC Overwrite TN [mg/L]	EMC Overwrite TP [mg/L]	Basin ID	FLUCCSCODE	FLUCSDESC	HYDROGRP	CN	DCIA [Yes/ No]	Area [acres]	Compressed Land Use	Area [acres] (for CN	CN*Area	C	C*Area	EMC's Based on TN [mg/L]	EMC's Based on TP [mg/L]	C*Area* TN_{EMC}	C*Area* TP_{EMC}	New Basin?	Subbasin TN [mg/L]	Subbasin TP [mg/L]	Basin ID	Basin Area [acres]	DCIA [acres]	DCIA [%]	Basin CN [area weighted
		SMA-15-16	2110	Woodland Pasture	A	39.0	No	0.21	PASTURE	0.21	8.19	0.0064	0.00134	3.51	0.686	0.00472	0.00092	YES	3.01	0.552	SMA-15-16	81.8		1%	60.8
		SMA-15-16	2110	Improved Pasture	B	61.0	No	4.26	PASTURE	4.26	259.86	0.0324	0.13802	3.51	0.686	0.48446	0.09468	NO							
		SMA-15-16	2130	Woodland Pasture	A	39.0	No	0.68	PASTURE	0.68	26.52	0.0064	0.00435	3.51	0.686	0.01528	0.00299	NO							
		SMA-15-16	2130	Improved Pasture	B	61.0	No	0.01	PASTURE	0.01	0.61	0.0324	0.00032	3.51	0.686	0.00114	0.00022	NO							
		SMA-15-16	2110	Improved Pastures	B	61.0	No	15.39	PASTURE	15.39	938.79	0.0324	0.49864	3.51	0.686	1.75021	0.34206	NO							
		SMA-15-16	2110	Improved Pasture	B	61.0	No	5.6	PASTURE	5.6	341.6	0.0324	0.18144	3.51	0.686	0.63685	0.12447	NO							
		SMA-15-16	8140	Roads and Highways	B	89.0	No	0.02	HIGHWAY	0.02	1.78	0.2256	0.00451	1.52	0.2	0.00686	0.0009	NO							
		SMA-15-16	6400	Vegetated Non-Forested Wetlands	B	98.0	Yes	0.86	WETLAND*	0.86	84.28	0.809	0.69574	1.15	0.055	0.8001	0.03827	NO					0.9		
		SMA-15-16	2110	Improved Pastures	B	61.0	No	51.02	PASTURE	51.02	3112.22	0.0324	1.65305	3.51	0.686	5.8022	1.13399	NO							
		SMA-15-16	2110	Improved Pastures	B	61.0	No	3.74	PASTURE	3.74	228.14	0.0324	0.12118	3.51	0.686	0.42533	0.08313	NO							
		SMA-14	6410	Freshwater Marshes	B	98.0	Yes	0.17	WETLAND*	0.17	16.66	0.809	0.13753	1.15	0.055	0.15816	0.00756	YES	1.51	0.152	SMA-14	43.3	0.2	19%	59.0
		SMA-14	6410	Freshwater Marshes	B	98.0	Yes	6.19	WETLAND*	6.19	606.62	0.809	5.00771	1.15	0.055	5.75887	0.27542	NO					6.2		
		SMA-14	6410	Freshwater Marshes	B	98.0	Yes	0.05	WETLAND*	0.05	4.9	0.809	0.04045	1.15	0.055	0.04652	0.00222	NO					0.1		
		SMA-14	5340	Reservoirs less than 10 acres	B	98.0	Yes	0.38	WATER			0.809		0	0			NO					0.4		
		SMA-14	5100	Streams and Waterways	B	98.0	Yes	0.07	WATER			0.809		0	0			NO					0.1		
		SMA-14	5100	Streams and Waterways	B	98.0	Yes	0.1	WATER			0.809		0	0			NO					0.1		
		SMA-14	5100	Streams and Waterways	B	98.0	Yes	1.17	WATER			0.809		0	0			NO					1.2		
		SMA-14	2240	Abandoned Citrus Groves	A	32.0	No	1.96	RUDERAL UPLAND PINE*	1.96	62.72	0.0028	0.00549	1.694	0.162	0.0093	0.00089	NO							
		SMA-14	2240	Abandoned Citrus Groves	B	58.0	No	4.36	RUDERAL UPLAND PINE*	4.36	252.88	0.0268	0.11685	1.694	0.162	0.19794	0.01893	NO							
		SMA-14	2110	Improved Pastures	B	61.0	No	6.99	PASTURE	6.99	426.39	0.0324	0.22648	3.51	0.686	0.79493	0.15536	NO							
		SMA-14	2110	Improved Pastures	B	61.0	No	1.96	PASTURE	1.96	119.56	0.0324	0.0635	3.51	0.686	0.2229	0.04356	NO							
		SMA-14	2110	Improved Pastures	B	61.0	No	2.63	PASTURE	2.63	160.43	0.0324	0.08521	3.51	0.686	0.29909	0.05846	NO							
		SMA-14	2110	Improved Pastures	B	61.0	No	17.3	PASTURE	17.3	1055.3	0.0324	0.56052	3.51	0.686	1.96743	0.38452	NO							
		SMA-13	2110	Improved Pasture	B	61.0	No	2.25	PASTURE	2.25	137.25	0.0324	0.0729	3.51	0.686	0.25588	0.05001	YES	2.64	0.443	SMA-13	75.0		2%	59.8
		SMA-13	6410	Freshwater Marshes	B	98.0	Yes	0.49	WETLAND*	0.49	48.02	0.809	0.39641	1.15	0.055	0.45587	0.0218	NO					0.5		
		SMA-13	5100	Streams and Waterways	B	98.0	Yes	0.38	WATER			0.809		0	0			NO					0.4		
		SMA-13	5100	Streams and Waterways	B	98.0	Yes	0.75	WATER			0.809		0	0			NO					0.8		
		SMA-13	2240	Abandoned Citrus Groves	B	58.0	No	2.17	RUDERAL UPLAND PINE*	2.17	125.86	0.0268	0.05816	1.694	0.162	0.09852	0.00942	NO							
		SMA-13	2240	Abandoned Citrus Groves	B	58.0	No	23.09	RUDERAL UPLAND PINE*	23.09	1339.22	0.0268	0.61881	1.694	0.162	1.04827	0.10025	NO							
		SMA-13	4270	Live Oak	B	55.0	No	2.28	UNDEVELOPED	2.28	125.4	0.022	0.05016	1.288	0.107	0.06461	0.00537	NO							
		SMA-13	2110	Improved Pastures	B	61.0	No	37.37	PASTURE	37.37	2279.57	0.0324	1.21079	3.51	0.686	4.24987	0.8306	NO							
		SMA-13	2110	Improved Pastures	B	61.0	No	6.24	PASTURE	6.24	380.64	0.0324	0.20218	3.51	0.686	0.70964	0.13869	NO							
		SMA-12	2130	Woodland Pasture	B	58.0	No	0.46	PASTURE	0.46	26.68	0.0268	0.01233	3.51	0.686	0.04327	0.00846	YES	2.31	0.357	SMA-12	77.8		7%	57.4
		SMA-12	2110	Improved Pasture	B	61.0	No	0.4	PASTURE	0.4	24.4	0.0324	0.01296	3.51	0.686	0.04549	0.00889	NO							
		SMA-12	2110	Improved Pasture	B	61.0	No	0.04	PASTURE	0.04	2.44	0.0324	0.0013	3.51	0.686	0.00455	0.00089	NO							
		SMA-12	2110	Improved Pasture	B	61.0	No	0.46	PASTURE	0.46	28.06	0.0324	0.0149	3.51	0.686	0.05231	0.01022	NO							
		SMA-12	5340	Reservoirs less than 10 acres	B	98.0	Yes	0.12	WATER			0.809		0	0			NO					0.1		
		SMA-12	5340	Reservoirs less than 10 acres	B	98.0	Yes	0.25	WATER			0.809		0	0			NO					0.3		
		SMA-12	6410	Freshwater Marshes	B	98.0	Yes	0.23	WETLAND*	0.23	22.54	0.809	0.18607	1.15	0.055	0.21398	0.01023	NO					0.2		
		SMA-12	6410	Freshwater Marshes	B	98.0	Yes	0.08	WETLAND*	0.08	7.84	0.809	0.06472	1.15	0.055	0.07443	0.00356	NO					0.1		
		SMA-12	5100	Streams and Waterways	B	98.0	Yes	0.78	WATER			0.809		0	0			NO					0.8		
		SMA-12	5100	Streams and Waterways	B	98.0	Yes	1.02	WATER			0.809		0	0			NO					1.0		
		SMA-12	5100	Streams and Waterways	B	98.0	Yes	1.01	WATER			0.809		0	0			NO					1.0		
		SMA-12	5100	Streams and Waterways	A	98.0	Yes	0.29	WATER			0.809		0	0			NO					0.3		
		SMA-12	5100	Streams and Waterways	B	98.0	Yes	0.75	WATER			0.809		0	0			NO					0.8		
		SMA-12	6400	Vegetated Non-Forested Wetlands	B	98.0	Yes	0.57	WETLAND*	0.57	55.86	0.809	0.46113	1.15	0.055	0.5303	0.02536	NO					0.6		
		SMA-12	6400	Vegetated Non-Forested Wetlands	B	98.0	Yes	0.11	WETLAND*	0.11	10.78	0.809	0.08899	1.15	0.055	0.10234	0.00489	NO					0.1		
		SMA-12	2240	Abandoned Citrus Groves	A	32.0	No	1.39	RUDERAL UPLAND PINE*	1.39	44.48	0.0028	0.00389	1.694	0.162	0.00659	0.00063	NO							
		SMA-12	2240	Abandoned Citrus Groves	B	58.0	No	1.19	RUDERAL UPLAND PINE*	1.19	69.02	0.0268	0.03189	1.694	0.162	0.05403	0.00517	NO							
		SMA-12	2240	Abandoned Citrus Groves	A	32.0	No	3.63E+00	RUDERAL UPLAND PINE*	3.63	116.16	0.0028	0.01016	1.694	0.162	0.01722	0.00165	NO							
		SMA-12	2240	Abandoned Citrus Groves	B	58.0	No	20.52	RUDERAL UPLAND PINE*	20.52	1190.16	0.0268	0.54994	1.694	0.162	0.93159	0.08909	NO							
		SMA-12	4270	Live Oak	B	55.0	No	0.01	UNDEVELOPED	0.01	0.55	0.022	0.00022	1.288	0.107	0.00028	2.4E-05	NO							
		SMA-12	4270	Live Oak	B	55.0	No	4.82	UNDEVELOPED	4.82	265.1	0.022	0.10604	1.288	0.107	0.13658	0.01135	NO							
		SMA-12	2110	Improved Pastures	B	61.0	No	5.66	PASTURE	5.66	345.26	0.0324	0.18338	3.51	0.686	0.64368	0.1258	NO							
		SMA-12	2110	Improved Pastures	B	61.0	No	0.1	PASTURE	0.1	6.1	0.0324	0.00324	3.51	0.686	0.01137	0.00222	NO							
		SMA-12	2110	Improved Pastures	B	61.0	No	0.34	PASTURE	0.34	20.74	0.0324	0.01102	3.51	0.686	0.03867	0.00756	NO							
		SMA-12	4270	Live Oak	B	55.0	No	1.19	UNDEVELOPED	1.19	65.45	0.022	0.02618	1.288	0.107	0.03372	0.0028	NO							
		SMA-12	2110	Improved Pastures	B	61.0	No	3.99	PASTURE	3.99	243.39	0.0324	0.12928	3.51	0.686	0.45376	0.08868	NO							
		SMA-12	2110	Improved Pastures	B	61.0	No	5.1	PASTURE	5.1	311.1	0.0324	0.16524	3.51	0.686	0.57999	0.11335	NO							
		SMA-12	2110	Improved Pastures	B	61.0	No	0.1	PASTURE	0.1	6.1	0.0324	0.00324	3.51	0.686	0.01137	0.00222	NO							
		SMA-12	2110	Improved Pastures	B	61.0	No	0.43	PASTURE	0.43	26.23	0.0324	0.01393	3.51	0.686	0.0489	0.00956	NO							
		SMA-12	2110	Improved Pastures	B	61.0	No	0.44	PASTURE	0.44	26.84	0.0324	0.01426	3.51	0.686	0.05004	0.00978	NO							
		SMA-12	2110	Improved Pastures	B	61.0	No	4.34	PASTURE	4.34	264.74	0.0324	0.14062	3.51	0.686	0.49356	0.09646	NO							
		SMA-12	2110	Improved Pastures	B	61.0	No	7.46	PASTURE	7.46	455.06	0.0324	0.2417	3.51	0.686	0.84838	0.16581	NO							
		SMA-12	2110	Improved Pastures	B	61.0	No	7.96	PASTURE	7.96	485.56	0.0324	0.2579	3.51	0.686	0.90524	0.17692	NO							
		SMA-12	2110	Improved Pastures	B	61.0	No	0.5	PASTURE	0.5	30.5	0.0324	0.0162	3.51	0.686	0.05686	0.01111	NO							
		SMA-12	4270	Live Oak	B	55.0	No	1.76	UNDEVELOPED	1.76	96.8	0.022	0.03872	1.288	0.107	0.04987	0.00414	NO							
		SMA-12	4270	Live Oak	B	55.0	No	0.28	UNDEVELOPED	0.28	15.4	0.022	0.00616	1.288	0.107	0.00793	0.00066	NO							

Post-Development EMC Calculation Table

EMC Overwrite TN [mg/L]	EMC Overwrite TP [mg/L]	Basin ID	FLUCCSCODE	FLUCSDESC	HYDROG RP	CN	DCIA [Yes/No]	Area [acres]	Compressed Land Use	Area [acres] (for CN	CN*Area	C	C*Area	EMC's Based on TN [mg/L]	EMC's Based on TP [mg/L]	C*Area* TN_{EMC}	C*Area* TP_{EMC}	New Basin?	Subbasin Summary TN [mg/L]	Subbasin Summary TP [mg/L]	Basin ID	Basin Area [acres]	DCIA [acres]	DCIA [%]	Basin CN [area weighted
		SMA-15-16	2110	Woodland Pasture	A	39.0	No	0.21	PASTURE	0.21	8.19	0.0064	0.00134	3.51	0.686	0.00472	0.00092	YES	2.10	0.332	SMA-15-16	81.8		27%	79.9
		SMA-15-16	2110	Improved Pasture	B	61.0	No	4.26	PASTURE	4.26	259.86	0.0324	0.13802	3.51	0.686	0.48446	0.09468	NO							
		SMA-15-16	2130	Woodland Pasture	A	39.0	No	0.68	PASTURE	0.68	26.52	0.0064	0.00435	3.51	0.686	0.01528	0.00299	NO							
		SMA-15-16	2130	Improved Pasture	B	61.0	No	0.01	PASTURE	0.01	0.61	0.0324	0.00032	3.51	0.686	0.00114	0.00022	NO							
		SMA-15-16	1210	Residential (70%)	B	86.0	Yes	0.38	SINGLE FAMILY RES	0.38	32.68	0.809	0.30742	2.07	0.327	0.63636	0.10053	NO					0.4		
		SMA-15-16	1210		B	86.0	No	6.45	SINGLE FAMILY RES	6.45	554.7	0.1764	1.13778	2.07	0.327	2.3552	0.37205	NO							
		SMA-15-16	1210	Residential (60%)	B	82.0	Yes	0.16	SINGLE FAMILY RES	0.16	13.12	0.809	0.12944	2.07	0.327	0.26794	0.04233	NO					0.2		
		SMA-15-16	1210		B	82.0	No	2.01	SINGLE FAMILY RES	2.01	164.82	0.1306	0.26251	2.07	0.327	0.54339	0.08584	NO							
		SMA-15-16	1210	50' R/W (72%)	B	81.0	Yes	0.52	SINGLE FAMILY RES	0.52	42.12	0.809	0.42068	2.07	0.327	0.87081	0.13756	NO					0.5		
		SMA-15-16	1210		B	81.0	No	0.88	SINGLE FAMILY RES	0.88	71.28	0.1208	0.1063	2.07	0.327	0.22005	0.03476	NO							
		SMA-15-16	1210	60' R/W (77%)	B	83.0	Yes	0.43	SINGLE FAMILY RES	0.43	35.69	0.809	0.34787	2.07	0.327	0.72009	0.11375	NO					0.4		
		SMA-15-16	1210		B	83.0	No	0.58	SINGLE FAMILY RES	0.58	48.14	0.1404	0.08143	2.07	0.327	0.16856	0.02663	NO							
		SMA-15-16	1210	Alley (100%)	B	98.0	Yes	0.31	SINGLE FAMILY RES	0.31	30.38	0.809	0.25079	2.07	0.327	0.51914	0.08201	NO					0.3		
		SMA-15-16	1900	Open Space (Good)	B	61.0	No	1.51	UNDEVELOPED	1.51	92.11	0.0324	0.04892	1.288	0.107	0.06301	0.00523	NO							
		SMA-15-16	8370	Water Surface	B	98.0	Yes	2.16	WATER			0.809		0	0			NO					2.2		
		SMA-15-16	1210	Residential (70%)	B	86.0	Yes	1.2	SINGLE FAMILY RES	1.2	103.2	0.809	0.9708	2.07	0.327	2.00956	0.31745	NO					1.2		
		SMA-15-16	1210		B	86.0	No	20.3	SINGLE FAMILY RES	20.3	1745.8	0.1764	3.58092	2.07	0.327	7.4125	1.17096	NO							
		SMA-15-16	1210	Residential (60%)	B	82.0	Yes	0.58	SINGLE FAMILY RES	0.58	47.56	0.809	0.46922	2.07	0.327	0.97129	0.15343	NO					0.6		
		SMA-15-16	1210		B	82.0	No	7.43	SINGLE FAMILY RES	7.43	609.26	0.1306	0.97036	2.07	0.327	2.00864	0.31731	NO							
		SMA-15-16	1400	Civ-Com-Multi (80%)	B	86.0	Yes	0.97	HIGH INTENSITY COMMERCIA	0.97	83.42	0.809	0.78473	2.4	0.345	1.88335	0.27073	NO					1.0		
		SMA-15-16	1400		B	86.0	No	1.46	HIGH INTENSITY COMMERCIA	1.46	125.56	0.1764	0.25754	2.4	0.345	0.61811	0.08885	NO							
		SMA-15-16	1850	Park (25%)	B	68.0	Yes	0.18	AVERAGE OF MFR+UNDEVEL	0.18	12.24	0.809	0.14562	2.32	0.52	0.33784	0.07572	NO					0.2		
		SMA-15-16	1850		B	68.0	No	2.65	AVERAGE OF MFR+UNDEVEL	2.65	180.2	0.051	0.13515	2.32	0.52	0.31355	0.07028	NO							
		SMA-15-16	1210	50' R/W (72%)	B	81.0	Yes	1.91	SINGLE FAMILY RES	1.91	154.71	0.809	1.54519	2.07	0.327	3.19854	0.50528	NO					1.9		
		SMA-15-16	1210		B	81.0	No	3.2	SINGLE FAMILY RES	3.2	259.2	0.1208	0.38656	2.07	0.327	0.80018	0.12641	NO							
		SMA-15-16	1210	60' R/W (77%)	B	83.0	Yes	1.11E+00	SINGLE FAMILY RES	1.11	92.13	0.809	0.89799	2.07	0.327	1.85884	0.29364	NO					1.1		
		SMA-15-16	1210		B	83.0	No	1.5	SINGLE FAMILY RES	1.5	124.5	0.1404	0.2106	2.07	0.327	0.43594	0.06887	NO							
		SMA-15-16	1210	80' R/W (82.5%)	B	85.0	Yes	0.89	SINGLE FAMILY RES	0.89	75.65	0.809	0.72001	2.07	0.327	1.49042	0.23544	NO					0.9		
		SMA-15-16	1210		B	85.0	No	0.93	SINGLE FAMILY RES	0.93	79.05	0.16	0.1488	2.07	0.327	0.30802	0.04866	NO							
		SMA-15-16	1210	Friar's Cove Road (82.5%)	B	85.0	Yes	2.74	SINGLE FAMILY RES	2.74	232.9	0.809	2.21666	2.07	0.327	4.58849	0.72485	NO					2.7		
		SMA-15-16	1210		B	85.0	No	2.89	SINGLE FAMILY RES	2.89	245.65	0.16	0.4624	2.07	0.327	0.95717	0.1512	NO							
		SMA-15-16	1210	Alley (100%)	B	98.0	Yes	0.92	SINGLE FAMILY RES	0.92	90.16	0.809	0.74428	2.07	0.327	1.54066	0.24338	NO					0.9		
		SMA-15-16	1900	Open Space (Good)	B	61.0	No	2.47	UNDEVELOPED	2.47	150.67	0.0324	0.08003	1.288	0.107	0.10308	0.00856	NO							
		SMA-15-16	8370	Water Surface	B	98.0	Yes	7.91	WATER			0.809		0	0			NO					7.9		
		SMA-14	1210	Residential (70%)	A	79.0	Yes	0.05	SINGLE FAMILY RES	0.05	3.95	0.809	0.04045	2.07	0.327	0.08373	0.01323	YES	2.12	0.349	SMA-14	43.3	0.1	25%	81.3
		SMA-14	1210		A	79.0	No	0.88	SINGLE FAMILY RES	0.88	69.52	0.1046	0.09205	2.07	0.327	0.19054	0.0301	NO							
		SMA-14	1210		B	86.0	Yes	0.93	SINGLE FAMILY RES	0.93	79.98	0.809	0.75237	2.07	0.327	1.55741	0.24602	NO					0.9		
		SMA-14	1210		B	86.0	No	15.61	SINGLE FAMILY RES	15.61	1342.46	0.1764	2.7536	2.07	0.327	5.69996	0.90043	NO							
		SMA-14	1330	Residential (65%)	B	84.0	Yes	0.22	MULTI FAMILY RES	0.22	18.48	0.809	0.17798	2.32	0.52	0.41291	0.09255	NO					0.2		
		SMA-14	1330		B	84.0	No	3.6	MULTI FAMILY RES	3.6	302.4	0.1502	0.54072	2.32	0.52	1.25447	0.28117	NO							
		SMA-14	1210	Residential (60%)	A	73.0	Yes	0.05	SINGLE FAMILY RES	0.05	3.65	0.809	0.04045	2.07	0.327	0.08373	0.01323	NO					0.1		
		SMA-14	1210		A	73.0	No	0.67	SINGLE FAMILY RES	0.67	48.91	0.0702	0.04703	2.07	0.327	0.09736	0.01538	NO							
		SMA-14	1210		B	82.0	Yes	0.07	SINGLE FAMILY RES	0.07	5.74	0.809	0.05663	2.07	0.327	0.11722	0.01852	NO					0.1		
		SMA-14	1210		B	82.0	No	0.96	SINGLE FAMILY RES	0.96	78.72	0.1306	0.12538	2.07	0.327	0.25953	0.041	NO							
		SMA-14	1400	Civ-Com-Multi (80%)	B	86.0	Yes	0.75	HIGH INTENSITY COMMERCIA	0.75	64.5	0.809	0.60675	2.4	0.345	1.4562	0.20933	NO					0.8		
		SMA-14	1400		B	86.0	No	1.12	HIGH INTENSITY COMMERCIA	1.12	96.32	0.1764	0.19757	2.4	0.345	0.47416	0.06816	NO							
		SMA-14	1850	Park (25%)	B	68.0	Yes	0.21	AVERAGE OF MFR+UNDEVEL	0.21	14.28	0.809	0.16989	2.32	0.52	0.39414	0.08834	NO					0.2		
		SMA-14	1850		B	68.0	No	3.17	AVERAGE OF MFR+UNDEVEL	3.17	215.56	0.051	0.16167	2.32	0.52	0.37507	0.08407	NO							
		SMA-14	1210	50' R/W (72%)	B	81.0	Yes	2.1	SINGLE FAMILY RES	2.1	170.1	0.809	1.6989	2.07	0.327	3.51672	0.55554	NO					2.1		
		SMA-14	1210		B	81.0	No	3.51E+00	SINGLE FAMILY RES	3.51	284.31	0.1208	0.42401	2.07	0.327	0.8777	0.13865	NO							
		SMA-14	1210	60' R/W (77%)	A	74.0	Yes	0.1	SINGLE FAMILY RES	0.1	7.4	0.809	0.0809	2.07	0.327	0.16746	0.02645	NO					0.1		
		SMA-14	1210		A	74.0	No	0.13	SINGLE FAMILY RES	0.13	9.62	0.0746	0.0097	2.07	0.327	0.02007	0.00317	NO							
		SMA-14	1210		B	83.0	Yes	0.77	SINGLE FAMILY RES	0.77	63.91	0.809	0.62293	2.07	0.327	1.28947	0.2037	NO					0.8		
		SMA-14	1210		B	83.0	No	1.05	SINGLE FAMILY RES	1.05	87.15	0.1404	0.14742	2.07	0.327	0.30516	0.04821	NO							
		SMA-14	1210	Alley (100%)	A	98.0	Yes	0.08	SINGLE FAMILY RES	0.08	7.84	0.809	0.06472	2.07	0.327	0.13397	0.02116	NO					0.1		
		SMA-14	1210		B	98.0	Yes	0.55	SINGLE FAMILY RES	0.55	53.9	0.809	0.44495	2.07	0.327	0.92105	0.1455	NO					0.6		
		SMA-14	1900	Open Space (Good)	B	61.0	No	1.9	UNDEVELOPED	1.9	115.9	0.0324	0.06156	1.288	0.107	0.07929	0.00659	NO							
		SMA-14	8370	Water Surface	B	98.0	Yes	4.85	WATER			0.809		0	0			NO					4.9		
		SMA-13	1210	Residential (70%)	B	86.0	Yes	0.87	SINGLE FAMILY RES	0.87	74.82	0.809	0.70383	2.07	0.327	1.45693	0.23015	YES	1.80	0.301	SMA-13	75.0	0.9	32%	81.9
		SMA-13	1210		B	86.0	No	14.71	SINGLE FAMILY RES	14.71	1265.06	0.1764	2.59484	2.07	0.327	5.37133	0.84851	NO							
		SMA-13	1330	Residential (65%)	B	84.0	Yes	0.43	MULTI FAMILY RES	0.43	36.12	0.809	0.34787	2.32	0.52	0.80706	0.18089	NO					0.4		
		SMA-13	1330		B	84.0	No	6.93	MULTI FAMILY RES	6.93	582.12	0.1502	1.04089	2.32	0.52	2.41486	0.54126	NO							
		SMA-13	1210	Residential (60%)	B	82.0	Yes	0.32	SINGLE FAMILY RES	0.32	26.24	0.809	0.25888	2.07	0.327	0.53588	0.08465	NO					0.3		
		SMA-13	1210		B	82.0	No	4.08	SINGLE FAMILY RES	4.08	334.56	0.1306	0.53285	2.07	0.327	1.103	0.17424	NO							
		SMA-13	1710	Civ-Com-Multi (80%)	B	86.0	Yes	5.73	LOW INTENSITY COMMERCIA	5.73	492.78	0.809	4.63557	1.13	0.188	5.23819	0.87149	NO					5.7		
		SMA-13	1710		B	86.0	No	8.59	LOW INTENSITY COMMERCIA	8.59	738.74	0.1764	1.51528	1.13	0.188	1.71226	0.28487	NO							
		SMA-13	1850	Park (25%)	B	68.0	Yes	0.29	AVERAGE OF MFR+UNDEVEL	0.29	19.72	0.809	0.23461	2.32	0.52	0.5443	0.122	NO					0.3		
		SMA-13	1850		B	68.0	No	4.31	AVERAGE OF MFR+UNDEVEL	4.31	293.08	0.051	0.21981	2.32	0.52	0.50996	0.1143	NO							
		SMA-13	1210	50' R/W (72%)	B	81.0	Yes	1.33	SINGLE FAMILY RES	1.33	107.73	0.809	1.07597	2.07	0.327	2.22726	0.35184	NO					1.3		
		SMA-13	1210		B	81.0	No	2.22	SINGLE FAMILY RES	2.22	179.82	0.1208	0.26818	2.07	0.327	0.55512	0.08769	NO							
		SMA-13	1210	60' R/W (77%)	B	83.0	Yes	0.78	SINGLE FAMILY RES	0.78	64.74	0.809	0.63102	2.07	0.327	1.30621	0.20634	NO					0.8		
		SMA-13	1210		B	83.0	No	1.05	SINGLE FAMILY RES	1.05	87.15	0.1404	0.14742	2.07	0.327	0.30516	0.04821	NO							
		SMA-13	1210	80' R/W (82.5%)	B	85.0	Yes	0.8	SINGLE FAMILY RES	0.8	68	0.809	0.6472	2.07	0.327	1.3397	0.21163	NO					0.8		
		SMA-13	1210		B	85.0	No	0.84	SINGLE FAMILY RES	0.84	71.4	0.16	0.1344	2.07	0.327	0.27821	0.04395	NO							
		SMA-13	1210	Friar's Cove Road (82.5%)	B	85.0	Yes	1.21	SINGLE FAMILY RES	1.21	102.85	0.809	0.97889	2.07	0.327	2.0263	0.3201	NO					1.2		
		SMA-13	1210		B	85.0	No	1.28	SINGLE FAMILY RES	1.28	108.8	0.16	0.2048	2.07	0.327	0.42394	0.06697	NO							
		SMA-13	1210	132' R/W (70%)	B	81.0	Yes	2.59	SINGLE FAMILY RES	2.59	209.79	0.809	2.09531	2.07	0.327	4.33729	0.68517	NO					2.6		
		SMA-13	1210		B	81.0	No	4.82	SINGLE FAMILY RES	4.82	390.42	0.1208	0.58226	2.07	0.327	1.20527	0.1904	NO							
		SMA-13	1210	Alley (100%)	B	98.0	Yes	1.21	SINGLE FAMILY RES	1.21	118.58	0.809	0.97889	2.07	0.327	2.0263	0.3201	NO					1.2		
		SMA-13	1900	Open Space (Good)	B	61.0	No	2.5	UNDEVELOPED	2.5	152.5	0.0324	0.081	1.288	0.107	0.10433	0.00867	NO							
		SMA-13	8370	Water Surface	B	98.0	Yes	8.13	WATER			0.809		0	0			NO					8.1		
		SMA-12	1210	Residential (70%)	B	86.0	Yes	0.73	SINGLE FAMILY RES	0.73	62.78	0.809	0.59057	2.07	0.327	1.22248	0.19312	YES	1.83	0.324	SMA-12	77.8	0.7	35%	80.6
		SMA-12	1210		B	86.0	No	12.27	SINGLE FAMILY RES	12.27	1055.22	0.1764	2.16443	2.07	0.327	4.48037	0.70777	NO							

		SMA-12	1330	Residential (65%)	B	84.0	Yes	0.32	MULTI FAMILY RES	0.32	26.88	0.809	0.25888	2.32	0.52	0.6006	0.13462	NO					0.3		
		SMA-12	1330		B	84.0	No	5.15	MULTI FAMILY RES	5.15	432.6	0.1502	0.77353	2.32	0.52	1.79459	0.40224	NO							
		SMA-12	1210	Residential (60%)	A	73.0	Yes	5.00E-02	SINGLE FAMILY RES	0.05	3.65	0.809	0.04045	2.07	0.327	0.08373	0.01323	NO					0.1		
		SMA-12	1210		A	73.0	No	0.62	SINGLE FAMILY RES	0.62	45.26	0.0702	0.04352	2.07	0.327	0.09009	0.01423	NO							
		SMA-12	1210		B	82.0	Yes	0.04	SINGLE FAMILY RES	0.04	3.28	0.809	0.03236	2.07	0.327	0.06699	0.01058	NO					0.0		
		SMA-12	1210		B	82.0	No	0.51	SINGLE FAMILY RES	0.51	41.82	0.1306	0.06661	2.07	0.327	0.13787	0.02178	NO							
		SMA-12	1330	Civ-Com-Multi (80%)	A	78.0	Yes	0.42	MULTI FAMILY RES	0.42	32.76	0.809	0.33978	2.32	0.52	0.78829	0.17669	NO					0.4		
		SMA-12	1330		A	78.0	No	0.63	MULTI FAMILY RES	0.63	49.14	0.0982	0.06187	2.32	0.52	0.14353	0.03217	NO							
		SMA-12	1330		B	86.0	Yes	2.26	MULTI FAMILY RES	2.26	194.36	0.809	1.82834	2.32	0.52	4.24175	0.95074	NO					2.3		
		SMA-12	1330		B	86.0	No	3.39	MULTI FAMILY RES	3.39	291.54	0.1764	0.598	2.32	0.52	1.38735	0.31096	NO							
		SMA-12	1710		A	78.0	Yes	0.62	LOW INTENSITY COMMERCIA	0.62	48.36	0.809	0.50158	1.13	0.188	0.56679	0.0943	NO					0.6		
		SMA-12	1710		A	78.0	No	0.93	LOW INTENSITY COMMERCIA	0.93	72.54	0.0982	0.09133	1.13	0.188	0.1032	0.01717	NO							
		SMA-12	1710		B	86.0	Yes	5.48	LOW INTENSITY COMMERCIA	5.48	471.28	0.809	4.43332	1.13	0.188	5.00965	0.83346	NO					5.5		
		SMA-12	1710		B	86.0	No	8.21	LOW INTENSITY COMMERCIA	8.21	706.06	0.1764	1.44824	1.13	0.188	1.63652	0.27227	NO							
		SMA-12	1850	Park (25%)	B	68.0	Yes	0.41	AVERAGE OF MFR+UNDEVEL	0.41	27.88	0.809	0.33169	2.32	0.52	0.76952	0.17248	NO					0.4		
		SMA-12	1850		B	68.0	No	6.22	AVERAGE OF MFR+UNDEVEL	6.22	422.96	0.051	0.31722	2.32	0.52	0.73595	0.16495	NO							
		SMA-12	1210	50' R/W (72%)	A	72.0	Yes	0.03	SINGLE FAMILY RES	0.03	2.16	0.809	0.02427	2.07	0.327	0.05024	0.00794	NO					0.0		
		SMA-12	1210		A	72.0	No	0.04	SINGLE FAMILY RES	0.04	2.88	0.0658	0.00263	2.07	0.327	0.00545	0.00086	NO							
		SMA-12	1210		B	81.0	Yes	1.1	SINGLE FAMILY RES	1.1	89.1	0.809	0.8899	2.07	0.327	1.84209	0.291	NO					1.1		
		SMA-12	1210		B	81.0	No	1.83	SINGLE FAMILY RES	1.83	148.23	0.1208	0.22106	2.07	0.327	0.4576	0.07229	NO							
		SMA-12	1210	60' R/W (77%)	B	83.0	Yes	0.69	SINGLE FAMILY RES	0.69	57.27	0.809	0.55821	2.07	0.327	1.15549	0.18253	NO					0.7		
		SMA-12	1210		B	83.0	No	0.94	SINGLE FAMILY RES	0.94	78.02	0.1404	0.13198	2.07	0.327	0.27319	0.04316	NO							
		SMA-12	1210	80' R/W (82.5%)	A	78.0	Yes	0.17	SINGLE FAMILY RES	0.17	13.26	0.809	0.13753	2.07	0.327	0.28469	0.04497	NO					0.2		
		SMA-12	1210		A	78.0	No	0.17	SINGLE FAMILY RES	0.17	13.26	0.0982	0.01669	2.07	0.327	0.03456	0.00546	NO							
		SMA-12	1210		B	85.0	Yes	3.04	SINGLE FAMILY RES	3.04	258.4	0.809	2.45936	2.07	0.327	5.09088	0.80421	NO					3.0		
		SMA-12	1210		B	85.0	No	3.21	SINGLE FAMILY RES	3.21	272.85	0.16	0.5136	2.07	0.327	1.06315	0.16795	NO							
		SMA-12	1210	Friar's Cove Road (82.5%)	B	85.0	Yes	0.83	SINGLE FAMILY RES	0.83	70.55	0.809	0.67147	2.07	0.327	1.38994	0.21957	NO					0.8		
		SMA-12	1210		B	85.0	No	0.88	SINGLE FAMILY RES	0.88	74.8	0.16	0.1408	2.07	0.327	0.29146	0.04604	NO							
		SMA-12	1210	132' R/W (70%)	A	71.0	Yes	0.57	SINGLE FAMILY RES	0.57	40.47	0.809	0.46113	2.07	0.327	0.95454	0.15079	NO					0.6		
		SMA-12	1210		A	71.0	No	1.06	SINGLE FAMILY RES	1.06	75.26	0.0614	0.06508	2.07	0.327	0.13472	0.02128	NO							
		SMA-12	1210		B	81.0	Yes	0.43	SINGLE FAMILY RES	0.43	34.83	0.809	0.34787	2.07	0.327	0.72009	0.11375	NO					0.4		
		SMA-12	1210		B	81.0	No	0.81	SINGLE FAMILY RES	0.81	65.61	0.1208	0.09785	2.07	0.327	0.20255	0.032	NO							
		SMA-12	1210	Alley (100%)	B	98.0	Yes	0.77	SINGLE FAMILY RES	0.77	75.46	0.809	0.62293	2.07	0.327	1.28947	0.2037	NO					0.8		
		SMA-12	1900	Open Space (Good)	B	61.0	No	3.53	UNDEVELOPED	3.53	215.33	0.0324	0.11437	1.288	0.107	0.14731	0.01224	NO							
		SMA-12	8370	Water Surface	B	98.0	Yes	9.4	WATER			0.809		0	0			NO					9.4		

Summary									
Basin ID	Basin Area [acres]	Pre-Development				Post-Development			
		TN [mg/L]	TP [mg/L]	CN	DCIA %	TN [mg/L]	TP [mg/L]	CN	DCIA %
SMA-15-16	81.8	3.01	0.552	60.8	1%	2.10	0.332	79.9	27%
SMA-14	43.3	1.51	0.152	59.0	19%	2.12	0.349	81.3	25%
SMA-13	75.0	2.64	0.443	59.8	2%	1.80	0.301	81.895	32%
SMA-12	77.8	2.31	0.357	57.4	7%	1.83	0.324	80.623	35%

WET DETENTION / MANAGED AQUATIC PLANTS: 4/27/2018 V 8.6

Blue Numbers =	Input data
Red Numbers =	Calculated or Carryover

Also called: FLOATING ISLANDS and includes a wet detention pond:

Fontana (SMA-12-16)

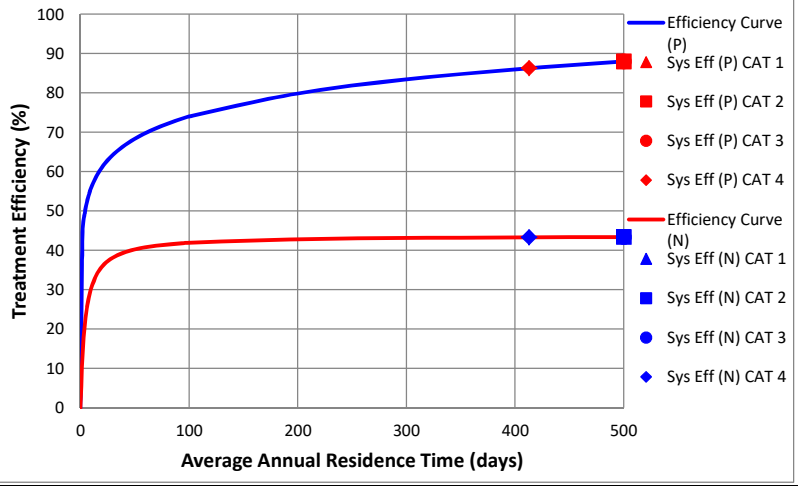
GO TO STORMWATER TREATMENT ANALYSIS

	SMA-15-16	SMA-14	SMA-13	SMA-12	
Total pre-development catchment area:	81.800	43.300	75.000	77.800	ac
Total post-development catchment area:	81.800	43.300	75.000	77.800	ac
Average annual residence time (between 1 and 500 days)		500.00	500.00	413.00	days
Littoral Zone or other improvements used?*		NO	NO	NO	
Littoral Zone or other improvement efficiency credit:					%
Floating Wetland or Mats used in the design:		NO	NO	NO	
Floating Wetland or Mats credit:					%
Total **Nitrogen** removal required:	80.940	57.165	80.865	71.744	%
Total **Phosphorus** removal required:	77.911	73.912	80.785	75.283	%
Total **Nitrogen** removal efficiency:	0.000	43.370	43.370	43.291	%
Total **Phosphorous** removal efficiency:	0.000	87.956	87.956	86.239	%
Is the wet detention sufficient:		NO	NO	NO	
Average annual runoff volume:	99.720	52.091	106.221	113.997	ac-ft/yr

* pond coverage must follow Regulatory Requirements

Wet Detention Pond Characteristic:

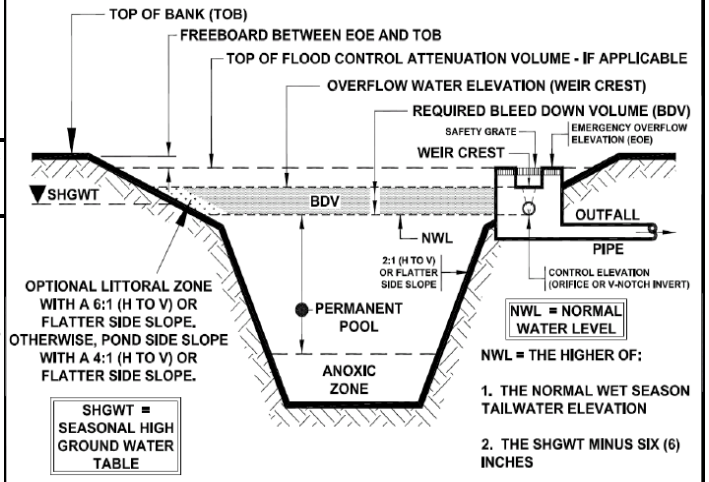
Minimum Pond Permanent Pool Volume:		71.358	145.508	128.989	ac-ft



NOTE FOR TREATMENT EFFICIENCY GRAPH:

The purpose of the treatment efficiency graphs is to help illustrate the treatment efficiency of the wet detention system as the function of average annual residence time (and permanent pool volume). The graph illustrates that there is a point of diminished return as the permanent pool volume is substantially increased. Therefore, to provide the most economical BMP treatment system, other alternatives such as "treatment trains" and compensatory treatment should be considered.

REQUIRED REMAINING TREATMENT EFFICIENCIES OF TREATMENT SYSTEM IN SERIES WITH FLOATING ISLANDS WITH WET DETENTION. USE FOR SIZING OF TREATMENT SYSTEM IN SERIES WITH FLOATING ISLANDS WITH WET DETENTION.



TYPICAL X-SECTION OF A WET DETENTION SYSTEM

Source of Graphic: draft **STORMWATER QUALITY APPLICANT'S HANDBOOK** dated March 2010, by the Department of Environmental Protection, available at: http://www.dep.state.fl.us/water/wetlands/erp/rules/stormwater, March 2010

User Defined BMP

4/27/2018 V 8.6

USER DEFINED BMP SERVING:	Fontana (SMA-12-16)				
	SMA-15-16	SMA-14	SMA-13	SMA-12	
Your Name of BMP	SMA-15-16				
Contributing catchment area	81.800	43.300	75.000	77.800	ac
Required treatment efficiency (**Nitrogen**):	80.940	57.165	80.865	71.744	%
Required treatment efficiency (**Phosphorus**):	77.911	73.912	80.785	75.283	%
Is this a retention, detention, or other system*?	Detention				
If retention, storage depth is:					in
The calculated storage volume is:	0.000	0.000	0.000	0.000	ac-ft
Provided treatment efficiency (Nitrogen):	43.00				%
Provided treatment efficiency (Phosphorus):	87.12				%

* Examples of other systems are dry detention, chemical treatment, and pre-treatment devices

Enter a short description of BMP below (no more than 200 characters)

Provided treatment efficiency taken from SMA-15-16

CATCHMENTS AND TREATMENT SURFACE DISCHARGE SUMMARY V 8.6

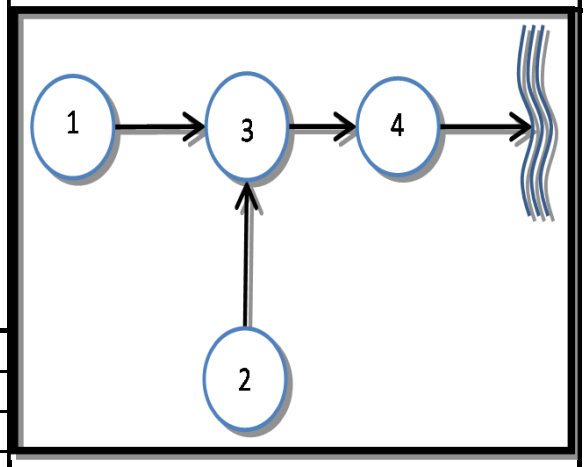
CALCULATION METHODS:

1. The effectiveness of each BMP in a single catchment is converted to an equivalent capture volume.
2. Certain BMP treatment train combinations have not been evaluated and in practice they are at this time not used, an example is a greenroof following a tree well.
3. Wet detention is last when used in a single catchment with other BMPs, except when followed by filtration

PROJECT TITLE	Fontana (SMA-12-16)	Optional Identification		
	SMA-15-16	SMA-14	SMA-13	SMA-12
BMP Name	SMA-15-16	Wet Detention/ MAPs	Wet Detention/ MAPs	Wet Detention/ MAPs
BMP Name				
BMP Name				

Surface Water Discharge Summary Performance of Entire Watershed

Catchment Configuration	K - Mixed-4 Catchment-Series (B)		
Nitrogen Pre Load (kg/yr)	225.55	Treatment Objectives or Target for	4/27/2018
Phosphorus Pre Load (kg/yr)	33.73		BMPTRAINS MODEL
Nitrogen Post Load (kg/yr)	888.02		
Phosphorus Post Load (kg/yr)	148.33		
Target Load Reduction (N) %	75		
Target Load Reduction (P) %	77		
Target Discharge Load, N (kg/yr)	222.00	TN NOT MET	
Target Discharge Load, P (kg/yr)	34.12	TP MET	
Provided Overall Efficiency, N (%):	43		
Provided Overall Efficiency, P (%):	87		
Discharged Load, N (kg/yr & lb/yr):	503.98	1110.06	
Discharged Load, P (kg/yr & lb/yr):	18.94	41.72	
Load Removed, N (kg/yr & lb/yr):	384.04	845.89	
Load Removed, P (kg/yr & lb/yr):	129.39	285.00	



GENERAL SITE INFORMATION: V 8.6 | GO TO INTRODUCTION PAGE | 5/29/2018 | Blue Numbers = Input data | Red Numbers = Calculated or Carryover

Select the appropriate Meteorological Zone, input the appropriate Mean Annual Rainfall amount and select the type of analysis

NAME OF PROJECT: Fontana (SMA-8-10)

HELP Rainfall

VIEW ZONE MAP

Meteorological Zone (Please use zone map): CLICK ON CELL BELOW TO SELECT — Zone 2

Mean Annual Rainfall (Please use rainfall map): 49.00 Inches

VIEW MEAN ANNUAL RAINFALL

Type of analysis: CLICK ON CELL BELOW TO SELECT — Net improvement

Treatment efficiency (N, P) (ex 80 70 (no decimal points) **use only for specified removal efficiency**): % %

GO TO WATERSHED

Select the STORMWATER TREATMENT ANALYSIS Button below to begin analyzing the effectiveness of Best Management Practices.

Model documentation and example problems.

STORMWATER TREATMENT ANALYSIS

Systems available for analysis:
Retention Basin with option for calculating effluent concentration
Wet Detention
Exfiltration Trench
Pervious Pavement
Stormwater Harvesting
Biofiltration
Greenroof
Rainwater Harvesting
Managed Aquatic Plants Detention
Vegetated Natural Buffer
Vegetated Filter Strip
Swale
Rain Garden
Tree Well
Lined reuse pond
User Defined BMP

There is a user's manual for the BMPTRAINS model. It can be downloaded from www.stormwater.ucf.edu. The results from the example problems shown in the manual however may not reflect current model results due to ongoing updates of the model.

RESET INPUT FOR STORMWATER TREATMENT ANALYSIS

METHODOLOGY FOR CALCULATING REQUIRED TREATMENT

METHODOLOGY FOR

METHODOLOGY FOR WET

METHODOLOGY FOR

METHODOLOGY FOR

WATERSHED CHARACTERISTICS V 8.6

GO TO STORMWATER TREATMENT ANALYSIS

Blue Numbers = Input data
Red Numbers = Calculated

LAND USES/EMC

SELECT CATCHMENT CONFIGURATION 5/29/2018

CLICK ON CELL BELOW TO SELECT CONFIGURATION

D - 3 Catchment-Series

VIEW CATCHMENT CONFIGURATION

For comingling, the off-site catchment must be upstream. The delay is only for retention BMPs and must be used in hours as measured by the time of concentration at a one inch/hour rain

COMINGLING | MULTI-LAND USE

GO TO GENERAL SITE INFORMATION PAGE

VIEW AVERAGE ANNUAL

VIEW EMC & FLUCCS

GO TO GIS LANDUSE DATA

CATCHMENT NO.1 NAME: SMA-8

Delay [hrs] | max delay = 15 hrs,

CLICK ON CELL BELOW TO SELECT

Pre-development land use: GIS Import Data

with default EMCs

CLICK ON CELL BELOW TO SELECT

Post-development land use: GIS Import Data

with default EMCs

OVERWRITE DEFAULT CONCENTRATIONS USING:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

IMPORT GIS CONCENTRATIONS

Total pre-development catchment area:	33.800	AC	From GIS data	Average annual pre runoff volume:	5.278	ac-ft/year
Total post-development catchment or for BMP analysis:	33.800	AC	33.8	Average annual post runoff volume (note no BMP area):	40.151	ac-ft/year
Pre-development Non DCIA CN:	55.40		55.4	Pre-development Annual Mass Loading - **Nitrogen:**	11.088	kg/year
Pre-development DCIA percentage:	2.00	%	2%	Pre-development Annual Mass Loading - **Phosphorus:**	1.072	kg/year
Post-development Non DCIA CN:	81.70		81.7	Post-development Annual Mass Loading - **Nitrogen:**	102.256	kg/year
Post-development DCIA percentage:	24.00	%	24%	Post-development Annual Mass Loading - **Phosphorus:**	16.123	kg/year
Estimated BMP Area (No loading from this area)		AC				

CATCHMENT NO.2 NAME: SMA-9

CLICK ON CELL BELOW TO SELECT

Pre-development land use: GIS Import Data

with default EMCs

CLICK ON CELL BELOW TO SELECT

Post-development land use: GIS Import Data

with default EMCs

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

IMPORT GIS CONCENTRATIONS

Total pre-development catchment area:	11.100	AC	From GIS data	Average annual pre runoff volume:	3.752	ac-ft/year
Total post-development catchment or BMP analysis area:	11.100	AC	11.1	Average annual post runoff volume (note no BMP area):	12.455	ac-ft/year
Pre-development Non DCIA CN:	58.80		58.8	Pre-development Annual Mass Loading - **Nitrogen:**	10.391	kg/year
Pre-development DCIA percentage:	7.00	%	7%	Pre-development Annual Mass Loading - **Phosphorus:**	1.486	kg/year
Post-development Non DCIA CN:	82.20		82.2	Post-development Annual Mass Loading - **Nitrogen:**	31.665	kg/year
Post-development DCIA percentage:	21.00	%	21%	Post-development Annual Mass Loading - **Phosphorus:**	4.986	kg/year
Estimated BMP Area (No loading from this area)		AC				

CATCHMENT NO.3 NAME: SMA-10

CLICK ON CELL BELOW TO SELECT

Pre-development land use: GIS Import Data

with default EMCs

CLICK ON CELL BELOW TO SELECT

Post-development land use: GIS Import Data

with default EMCs

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

IMPORT GIS CONCENTRATIONS

Total pre-development catchment area:	47.800	AC	From GIS data	Average annual pre runoff volume:	26.459	ac-ft/year
Total post-development catchment or BMP analysis area:	47.800	AC	47.8	Average annual post runoff volume (note no BMP area):	57.804	ac-ft/year
Pre-development Non DCIA CN:	57.40		57.4	Pre-development Annual Mass Loading - **Nitrogen:**	51.668	kg/year
Pre-development DCIA percentage:	14.00	%	14%	Pre-development Annual Mass Loading - **Phosphorus:**	5.514	kg/year
Post-development Non DCIA CN:	82.40		82.4	Post-development Annual Mass Loading - **Nitrogen:**	149.656	kg/year
Post-development DCIA percentage:	24.00	%	24%	Post-development Annual Mass Loading - **Phosphorus:**	23.467	kg/year
Estimated BMP Area (no loading from this area)		AC				

IMPORT GIS LAND USE DATA

V 8.6

Instructions: The data required for this analysis is as follows; Basin ID, FLUCCSCODE, Soils Hydro Group, CN, and Area. This data is typically derived by using the ArcGIS geoprocessing tool intersect and performing an intersect on the basins of interest, soils polygons, and land use polygons. The resulting attribute table can then be exported to Excel where any final data formatting and processing can be done to get it ready to copy into this spreadsheet. Data must be sorted by Basin ID for this table to work properly. The user can use up to four catchments for this analysis. The user may overwrite any EMC by manualy entering in a value in the first two columns. All this must be done for both the pre and post development conditions when this tool is used.

Note: Soil hydrologic groups should be single class. For example, A/D would be assigned B, B/D would be assigned C, and C/D would be assigned D. This is due to the fact that this is an annual average analysis and the soils will behave as drained during part of the year and not drained during other parts of the year. To assume D would artificially increase runoff. Additionally, it is recommended that, due to compaction, the soil hydrologic group remain consistent in the pre and post development conditions for these dual class soils.

GO TO WATERSHED CHARACTERISTICS

VIEW EMC & FLUCCS

Pre-Development EMC Calculation Table

EMC Overwrite TN [mg/L]	EMC Overwrite TP [mg/L]	Basin ID	FLUCCSCODE	FLUCSDESC	HYDROGRP	CN	DCIA [Yes/ No]	Area [acres]	Compressed Land Use	Area [acres] (for CN	CN*Area	C	C*Area	EMC's Based on TN [mg/L]	EMC's Based on TP [mg/L]	C*Area* TN_{EMC}	C*Area* TP_{EMC}	New Basin?	Subbasin TN [mg/L]	Subbasin TP [mg/L]	Basin ID	Basin Area [acres]	DCIA [acres]	DCIA [%]	Basin CN [area weighte
		SMA-8	5100	Streams and Waterways	B	98.0	Yes	0.13	WATER			0.809		0	0			YES	1.70	0.165	SMA-8	33.8	0.1	2%	55.4
		SMA-8	5100	Streams and Waterways	B	98.0	Yes	0.53	WATER			0.809		0	0			NO					0.5		
		SMA-8	2240	Abandoned Citrus Groves	B	58.0	No	7.11	RUDERAL UPLAND PINE*	7.11	412.38	0.0268	0.1905	1.694	0.162	0.3228	0.0309	NO							
		SMA-8	2240	Abandoned Citrus Groves	A	32.0	No	3.37	RUDERAL UPLAND PINE*	3.37	107.84	0.0028	0.0094	1.694	0.162	0.016	0.0015	NO							
		SMA-8	2240	Abandoned Citrus Groves	B	58.0	No	0.16	RUDERAL UPLAND PINE*	0.16	9.28	0.0268	0.0043	1.694	0.162	0.0073	0.0007	NO							
		SMA-8	2240	Abandoned Citrus Groves	B	58.0	No	18.85	RUDERAL UPLAND PINE*	18.85	1093.3	0.0268	0.5052	1.694	0.162	0.8558	0.0818	NO							
		SMA-8	2240	Abandoned Citrus Groves	B	58.0	No	3.47	RUDERAL UPLAND PINE*	3.47	201.26	0.0268	0.093	1.694	0.162	0.1575	0.0151	NO							
		SMA-8	2110	Improved Pastures	B	61.0	No	0.03	PASTURE	0.03	1.83	0.0324	0.001	3.51	0.686	0.0034	0.0007	NO							
		SMA-8	2110	Improved Pastures	B	61.0	No	0.1	PASTURE	0.1	6.1	0.0324	0.0032	3.51	0.686	0.0114	0.0022	NO							
		SMA-9	5100	Streams and Waterways	B	98.0	Yes	0.5	WATER			0.809		0	0			YES	2.25	0.321	SMA-9	11.1	0.5	7%	58.8
		SMA-9	5100	Streams and Waterways	B	98.0	Yes	0.04	WATER			0.809		0	0			NO					0.0		
		SMA-9	5100	Streams and Waterways	B	98.0	Yes	0.15	WATER			0.809		0	0			NO					0.2		
		SMA-9	5100	Streams and Waterways	B	98.0	Yes	0.06	WATER			0.809		0	0			NO					0.1		
		SMA-9	2240	Abandoned Citrus Groves	B	58.0	No	5.64	RUDERAL UPLAND PINE*	5.64	327.12	0.0268	0.1512	1.694	0.162	0.2561	0.0245	NO							
		SMA-9	2240	Abandoned Citrus Groves	B	58.0	No	0.03	RUDERAL UPLAND PINE*	0.03	1.74	0.0268	0.0008	1.694	0.162	0.0014	0.0001	NO							
		SMA-9	2240	Abandoned Citrus Groves	B	58.0	No	1.4	RUDERAL UPLAND PINE*	1.4	81.2	0.0268	0.0375	1.694	0.162	0.0636	0.0061	NO							
		SMA-9	2240	Abandoned Citrus Groves	B	58.0	No	0.52	RUDERAL UPLAND PINE*	0.52	30.16	0.0268	0.0139	1.694	0.162	0.0236	0.0023	NO							
		SMA-9	2240	Abandoned Citrus Groves	B	58.0	No	0	RUDERAL UPLAND PINE*	0	0	0.0268	0	1.694	0.162	0	0	NO							
		SMA-9	2110	Improved Pastures	B	61.0	No	0.87	PASTURE	0.87	53.07	0.0324	0.0282	3.51	0.686	0.0989	0.0193	NO							
		SMA-9	2110	Improved Pastures	B	61.0	No	0.65	PASTURE	0.65	39.65	0.0324	0.0211	3.51	0.686	0.0739	0.0144	NO							
		SMA-9	2110	Improved Pastures	B	61.0	No	1.22	PASTURE	1.22	74.42	0.0324	0.0395	3.51	0.686	0.1387	0.0271	NO							
		SMA-10	6300	Wetland Forested Mixed	B	98.0	Yes	1.3	WETLAND*	1.3	127.4	0.809	1.0517	1.15	0.055	1.2095	0.0578	YES	1.58	0.169	SMA-10	47.8	1.3	14%	57.4
		SMA-10	6300	Wetland Forested Mixed	B	98.0	Yes	0.01	WETLAND*	0.01	0.98	0.809	0.0081	1.15	0.055	0.0093	0.0004	NO					0.0		
		SMA-10	6410	Freshwater Marshes	B	98.0	Yes	3.5	WETLAND*	3.5	343	0.809	2.8315	1.15	0.055	3.2562	0.1557	NO					3.5		
		SMA-10	6410	Freshwater Marshes	B	98.0	Yes	0.19	WETLAND*	0.19	18.62	0.809	0.1537	1.15	0.055	0.1768	0.0085	NO					0.2		
		SMA-10	5100	Streams and Waterways	B	98.0	Yes	0.72	WATER			0.809		0	0			NO					0.7		
		SMA-10	5100	Streams and Waterways	B	98.0	Yes	0.16	WATER			0.809		0	0			NO					0.2		
		SMA-10	5100	Streams and Waterways	B	98.0	Yes	0.37	WATER			0.809		0	0			NO					0.4		
		SMA-10	5100	Streams and Waterways	B	98.0	Yes	0.56	WATER			0.809		0	0			NO					0.6		
		SMA-10	2240	Abandoned Citrus Groves	B	58.0	No	2.01	RUDERAL UPLAND PINE*	2.01	116.58	0.0268	0.0539	1.694	0.162	0.0913	0.0087	NO							
		SMA-10	2240	Abandoned Citrus Groves	B	58.0	No	0.14	RUDERAL UPLAND PINE*	0.14	8.12	0.0268	0.0038	1.694	0.162	0.0064	0.0006	NO							
		SMA-10	2240	Abandoned Citrus Groves	A	32.0	No	4.17	RUDERAL UPLAND PINE*	4.17	133.44	0.0028	0.0117	1.694	0.162	0.0198	0.0019	NO							
		SMA-10	2240	Abandoned Citrus Groves	B	58.0	No	5.76	RUDERAL UPLAND PINE*	5.76	334.08	0.0268	0.1544	1.694	0.162	0.2615	0.025	NO							
		SMA-10	2240	Abandoned Citrus Groves	B	58.0	No	1.26	RUDERAL UPLAND PINE*	1.26	73.08	0.0268	0.0338	1.694	0.162	0.0572	0.0055	NO							
		SMA-10	2110	Improved Pastures	B	61.0	No	5.17	PASTURE	5.17	315.37	0.0324	0.1675	3.51	0.686	0.588	0.1149	NO							
		SMA-10	2110	Improved Pastures	B	61.0	No	7.35	PASTURE	7.35	448.35	0.0324	0.2381	3.51	0.686	0.8359	0.1634	NO							
		SMA-10	2110	Improved Pastures	B	61.0	No	0.72	PASTURE	0.72	43.92	0.0324	0.0233	3.51	0.686	0.0819	0.016	NO							
		SMA-10	2110	Improved Pastures	B	61.0	No	1.27	PASTURE	1.27	77.47	0.0324	0.0411	3.51	0.686	0.1444	0.0282	NO							
		SMA-10	2110	Improved Pastures	B	61.0	No	0.33	PASTURE	0.33	20.13	0.0324	0.0107	3.51	0.686	0.0375	0.0073	NO							
		SMA-10	2110	Improved Pastures	B	61.0	No	12.79	PASTURE	12.79	780.19	0.0324	0.4144	3.51	0.686	1.4545	0.2843	NO							

Post-Development EMC Calculation Table

EMC Overwrite TN [mg/L]	EMC Overwrite TP [mg/L]	Basin ID	FLUCCSCODE	FLUCSDESC	HYDROG RP	CN	DCIA [Yes/No]	Area [acres]	Compressed Land Use	Area [acres] (for CN	CN*Area	C	C*Area	EMC's Based on TN [mg/L]	EMC's Based on TP [mg/L]	C*Area* TN_{EMC}	C*Area* TP_{EMC}	New Basin?	Subbasin TN [mg/L]	Subbasin TP [mg/L]	Basin ID	Basin Area [acres]	DCIA [acres]	DCIA [%]	Basin CN [area weighte
		SMA-8	1210	Residential (70%)	A	79.0	Yes	0.04	SINGLE FAMILY RES	0.04	3.16	0.809	0.0324	2.07	0.327	0.067	0.0106	YES	2.07	0.326	SMA-8	33.8	0.0	24%	81.7
		SMA-8	1210		A	79.0	No	0.65	SINGLE FAMILY RES	0.65	51.35	0.1046	0.068	2.07	0.327	0.1407	0.0222	NO							
		SMA-8	1210		B	86.0	Yes	0.7	SINGLE FAMILY RES	0.7	60.2	0.809	0.5663	2.07	0.327	1.1722	0.1852	NO					0.7		
		SMA-8	1210		B	86.0	No	11.74	SINGLE FAMILY RES	11.74	1009.6	0.1764	2.0709	2.07	0.327	4.2868	0.6772	NO							
		SMA-8	1210	Residential (60%)	A	73.0	Yes	0.1	SINGLE FAMILY RES	0.1	7.3	0.809	0.0809	2.07	0.327	0.1675	0.0265	NO					0.1		
		SMA-8	1210		A	73.0	No	1.32	SINGLE FAMILY RES	1.32	96.36	0.0702	0.0927	2.07	0.327	0.1918	0.0303	NO							
		SMA-8	1210		B	82.0	Yes	0.31	SINGLE FAMILY RES	0.31	25.42	0.809	0.2508	2.07	0.327	0.5191	0.082	NO					0.3		
		SMA-8	1210		B	82.0	No	4.05	SINGLE FAMILY RES	4.05	332.1	0.1306	0.5289	2.07	0.327	1.0949	0.173	NO							
		SMA-8	1210	50' R/W (72%)	A	72.0	Yes	0.15	SINGLE FAMILY RES	0.15	10.8	0.809	0.1214	2.07	0.327	0.2512	0.0397	NO					0.2		
		SMA-8	1210		A	72.0	No	0.26	SINGLE FAMILY RES	0.26	18.72	0.0658	0.0171	2.07	0.327	0.0354	0.0056	NO							
		SMA-8	1210		B	81.0	Yes	1.22	SINGLE FAMILY RES	1.22	98.82	0.809	0.987	2.07	0.327	2.043	0.3227	NO					1.2		
		SMA-8	1210		B	81.0	No	2.04	SINGLE FAMILY RES	2.04	165.24	0.1208	0.2464	2.07	0.327	0.5101	0.0806	NO							
		SMA-8	1210	60' R/W (77%)	B	83.0	Yes	0.71	SINGLE FAMILY RES	0.71	58.93	0.809	0.5744	2.07	0.327	1.189	0.1878	NO					0.7		
		SMA-8	1210		B	83.0	No	0.97	SINGLE FAMILY RES	0.97	80.51	0.1404	0.1362	2.07	0.327	0.2819	0.0445	NO							
		SMA-8	1210	80' R/W (82.5%)	A	78.0	Yes	0.37	SINGLE FAMILY RES	0.37	28.86	0.809	0.2993	2.07	0.327	0.6196	0.0979	NO					0.4		
		SMA-8	1210		A	78.0	No	0.39	SINGLE FAMILY RES	0.39	30.42	0.0982	0.0383	2.07	0.327	0.0793	0.0125	NO							
		SMA-8	1210		B	85.0	Yes	0.02	SINGLE FAMILY RES	0.02	1.7	0.809	0.0162	2.07	0.327	0.0335	0.0053	NO					0.0		
		SMA-8	1210		B	85.0	No	0.03	SINGLE FAMILY RES	0.03	2.55	0.16	0.0048	2.07	0.327	0.0099	0.0016	NO							
		SMA-8	1210	132' R/W (70%)	B	81.0	Yes	1.38	SINGLE FAMILY RES	1.38	111.78	0.809	1.1164	2.07	0.327	2.311	0.3651	NO					1.4		
		SMA-8	1210		B	81.0	No	2.57	SINGLE FAMILY RES	2.57	208.17	0.1208	0.3105	2.07	0.327	0.6426	0.1015	NO							
		SMA-8	1210	Alley (100%)	A	98.0	Yes	0.11	SINGLE FAMILY RES	0.11	10.78	0.809	0.089	2.07	0.327	0.1842	0.0291	NO					0.1		
		SMA-8	1210		B	98.0	Yes	2.80E-01	SINGLE FAMILY RES	0.28	27.44	0.809	0.2265	2.07	0.327	0.4689	0.0741	NO					0.3		
		SMA-8	1900	Open Space (Good)	B	61.0	No	1.54	UNDEVELOPED	1.54	93.94	0.0324	0.0499	1.288	0.107	0.0643	0.0053	NO							
		SMA-8	8370	Water Surface	B	98.0	Yes	2.8	WATER			0.809		0	0			NO					2.8		
		SMA-9	1210	Residential (70%)	B	86.0	Yes	0.27	SINGLE FAMILY RES	0.27	23.22	0.809	0.2184	2.07	0.327	0.4522	0.0714	YES	2.06	0.325	SMA-9	11.1	0.3	21%	82.2
		SMA-9	1210		B	86.0	No	4.57	SINGLE FAMILY RES	4.57	393.02	0.1764	0.8061	2.07	0.327	1.6687	0.2636	NO							
		SMA-9	1210	Residential (60%)	B	82.0	Yes	0.19	SINGLE FAMILY RES	0.19	15.58	0.809	0.1537	2.07	0.327	0.3182	0.0503	NO					0.2		
		SMA-9	1210		B	82.0	No	2.38	SINGLE FAMILY RES	2.38	195.16	0.1306	0.3108	2.07	0.327	0.6434	0.1016	NO							
		SMA-9	1210	50' R/W (72%)	B	81.0	Yes	0.23	SINGLE FAMILY RES	0.23	18.63	0.809	0.1861	2.07	0.327	0.3852	0.0608	NO					0.2		
		SMA-9	1210		B	81.0	No	0.39	SINGLE FAMILY RES	0.39	31.59	0.1208	0.0471	2.07	0.327	0.0975	0.0154	NO							
		SMA-9	1210	60' R/W (77%)	B	83.0	Yes	0.41	SINGLE FAMILY RES	0.41	34.03	0.809	0.3317	2.07	0.327	0.6866	0.1085	NO					0.4		
		SMA-9	1210		B	83.0	No	0.56	SINGLE FAMILY RES	0.56	46.48	0.1404	0.0786	2.07	0.327	0.1628	0.0257	NO							
		SMA-9	1210	Alley (100%)	B	98.0	Yes	0.27	SINGLE FAMILY RES	0.27	26.46	0.809	0.2184	2.07	0.327	0.4522	0.0714	NO					0.3		
		SMA-9	1900	Open Space (Good)	B	61.0	No	0.79	UNDEVELOPED	0.79	48.19	0.0324	0.0256	1.288	0.107	0.033	0.0027	NO							
		SMA-9	8370	Water Surface	B	98.0	Yes	0.99	WATER			0.809		0	0			NO					1.0		
		SMA-10	1210	Residential (70%)	A	79.0	Yes	0.1	SINGLE FAMILY RES	0.1	7.9	0.809	0.0809	2.07	0.327	0.1675	0.0265	YES	2.10	0.329	SMA-10	47.8	0.1	24%	82.4
		SMA-10	1210		A	79.0	No	1.7	SINGLE FAMILY RES	1.7	134.3	0.1046	0.1778	2.07	0.327	0.3681	0.0581	NO							
		SMA-10	1210		B	86.0	Yes	1.32	SINGLE FAMILY RES	1.32	113.52	0.809	1.0679	2.07	0.327	2.2105	0.3492	NO					1.3		
		SMA-10	1210		B	86.0	No	22.32	SINGLE FAMILY RES	22.32	1919.5	0.1764	3.9372	2.07	0.327	8.1501	1.2875	NO							
		SMA-10	1210	Residential (60%)	A	73.0	Yes	0.1	SINGLE FAMILY RES	0.1	7.3	0.809	0.0809	2.07	0.327	0.1675	0.0265	NO					0.1		
		SMA-10	1210		A	73.0	No	1.27	SINGLE FAMILY RES	1.27	92.71	0.0702	0.0892	2.07	0.327	0.1845	0.0292	NO							
		SMA-10	1210		B	82.0	Yes	0.09	SINGLE FAMILY RES	0.09	7.38	0.809	0.0728	2.07	0.327	0.1507	0.0238	NO					0.1		
		SMA-10	1210		B	82.0	No	1.22	SINGLE FAMILY RES	1.22	100.04	0.1306	0.1593	2.07	0.327	0.3298	0.0521	NO							
		SMA-10	1400	Civ-Com-Multi (80%)	B	86.0	Yes	0.93	HIGH INTENSITY COMMERC	0.93	79.98	0.809	0.7524	2.4	0.345	1.8057	0.2596	NO					0.9		
		SMA-10	1400		B	86.0	No	1.4	HIGH INTENSITY COMMERC	1.4	120.4	0.1764	0.247	2.4	0.345	0.5927	0.0852	NO							
		SMA-10	1850	Park (25%)	B	68.0	Yes	0.06	AVERAGE OF MFR+UNDEVE	0.06	4.08	0.809	0.0485	2.32	0.52	0.1126	0.0252	NO					0.1		
		SMA-10	1850		B	68.0	No	0.96	AVERAGE OF MFR+UNDEVE	0.96	65.28	0.051	0.049	2.32	0.52	0.1136	0.0255	NO							
		SMA-10	1210	50' R/W (72%)	A	72.0	Yes	0.11	SINGLE FAMILY RES	0.11	7.92	0.809	0.089	2.07	0.327	0.1842	0.0291	NO					0.1		
		SMA-10	1210		A	72.0	No	0.19	SINGLE FAMILY RES	0.19	13.68	0.0658	0.0125	2.07	0.327	0.0259	0.0041	NO							
		SMA-10	1210		B	81.0	Yes	2.74E+00	SINGLE FAMILY RES	2.74	221.94	0.809	2.2167	2.07	0.327	4.5885	0.7248	NO					2.7		
		SMA-10	1210		B	81.0	No	4.58	SINGLE FAMILY RES	4.58	370.98	0.1208	0.5533	2.07	0.327	1.1453	0.1809	NO							
		SMA-10	1210	60' R/W (77%)	A	74.0	Yes	0.23	SINGLE FAMILY RES	0.23	17.02	0.809	0.1861	2.07	0.327	0.3852	0.0608	NO					0.2		
		SMA-10	1210		A	74.0	No	0.32	SINGLE FAMILY RES	0.32	23.68	0.0746	0.0239	2.07	0.327	0.0494	0.0078	NO							
		SMA-10	1210		B	83.0	Yes	0.22	SINGLE FAMILY RES	0.22	18.26	0.809	0.178	2.07	0.327	0.3684	0.0582	NO					0.2		
		SMA-10	1210		B	83.0	No	0.31	SINGLE FAMILY RES	0.31	25.73	0.1404	0.0435	2.07	0.327	0.0901	0.0142	NO							
		SMA-10	1210	Alley (100%)	A	98.0	Yes	0.15	SINGLE FAMILY RES	0.15	14.7	0.809	0.1214	2.07	0.327	0.2512	0.0397	NO					0.2		
		SMA-10	1210		B	98.0	Yes	0.14	SINGLE FAMILY RES	0.14	13.72	0.809	0.1133	2.07	0.327	0.2344	0.037	NO					0.1		
		SMA-10	1900	Open Space (Good)	B	61.0	No	1.98	UNDEVELOPED	1.98	120.78	0.0324	0.0642	1.288	0.107	0.0826	0.0069	NO							
		SMA-10	8370	Water Surface	B	98.0	Yes	5.34	WATER			0.809		0	0			NO					5.3		

Summary									
Basin ID	Basin Area [acres]	Pre-Development				Post-Development			
		TN [mg/L]	TP [mg/L]	CN	DCIA %	TN [mg/L]	TP [mg/L]	CN	DCIA %
SMA-8	33.8	1.70	0.165	55.4	2%	2.07	0.326	81.7	24%
SMA-9	11.1	2.25	0.321	58.8	7%	2.06	0.325	82.2	21%
SMA-10	47.8	1.58	0.169	57.4	14%	2.10	0.329	82.403	24%

WET DETENTION / MANAGED AQUATIC PLANTS: 5/29/2018 V 8.6

Blue Numbers =	Input data
Red Numbers =	Calculated or Carryover

Also called: FLOATING ISLANDS and includes a wet detention pond:

Fontana (SMA-8-10)

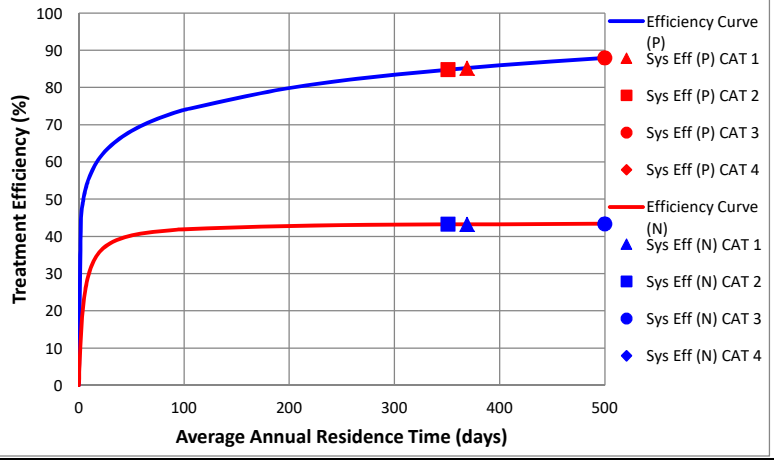
GO TO STORMWATER TREATMENT ANALYSIS

	SMA-8	SMA-9	SMA-10	Catchment 4	
Total pre-development catchment area:	33.800	11.100	47.800	0.000	ac
Total post-development catchment area:	33.800	11.100	47.800	0.000	ac
Average annual residence time (between 1 and 500 days)	369.00	351.00	500.00		days
Littoral Zone or other improvements used?*	NO	NO	NO		
Littoral Zone or other improvement efficiency credit:					%
Floating Wetland or Mats used in the design:	NO	NO	NO		
Floating Wetland or Mats credit:					%
Total **Nitrogen** removal required:	89.157	67.185	65.475		%
Total **Phosphorus** removal required:	93.350	70.194	76.503		%
Total **Nitrogen** removal efficiency:	43.237	43.211	43.370	0.000	%
Total **Phosphorous** removal efficiency:	85.235	84.791	87.956	0.000	%
Is the wet detention sufficient:	NO	NO	NO		
Average annual runoff volume:	40.151	12.455	57.804		ac-ft/yr

* pond coverage must follow Regulatory Requirements

Wet Detention Pond Characteristic:

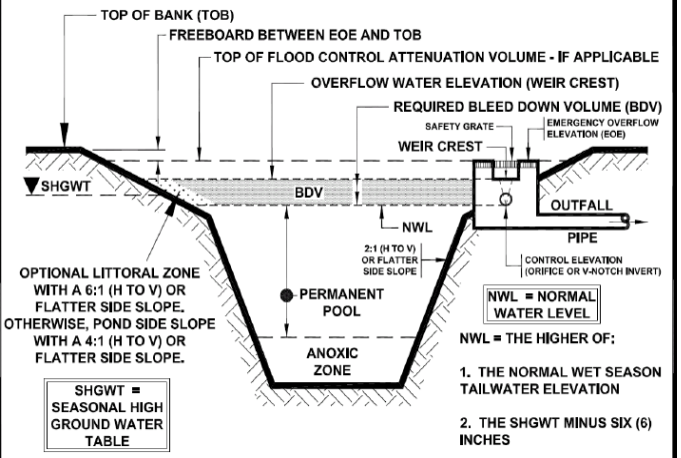
Minimum Pond Permanent Pool Volume:	40.591	11.977	79.183		ac-ft



NOTE FOR TREATMENT EFFICIENCY GRAPH:

The purpose of the treatment efficiency graphs is to help illustrate the treatment efficiency of the wet detention system as the function of average annual residence time (and permanent pool volume). The graph illustrates that there is a point of diminished return as the permanent pool volume is substantially increased. Therefore, to provide the most economical BMP treatment system, other alternatives such as "treatment trains" and compensatory treatment should be considered.

REQUIRED REMAINING TREATMENT EFFICIENCIES OF TREATMENT SYSTEM IN SERIES WITH FLOATING ISLANDS WITH WET DETENTION. USE FOR SIZING OF TREATMENT SYSTEM IN SERIES WITH FLOATING ISLANDS WITH WET DETENTION.



TYPICAL X-SECTION OF A WET DETENTION SYSTEM

Source of Graphic: draft **STORMWATER QUALITY APPLICANT'S HANDBOOK** dated March 2010, by the Department of Environmental Protection, available at: http://www.dep.state.fl.us/water/wetlands/erp/rules/stormwater, March 2010

CATCHMENTS AND TREATMENT SURFACE DISCHARGE SUMMARY V 8.6

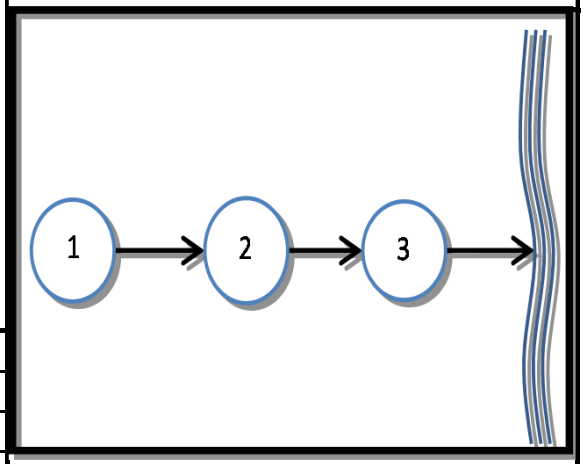
CALCULATION METHODS:

1. The effectiveness of each BMP in a single catchment is converted to an equivalent capture volume.
2. Certain BMP treatment train combinations have not been evaluated and in practice they are at this time not used, an example is a greenroof following a tree well.
3. Wet detention is last when used in a single catchment with other BMPs, except when followed by filtration

PROJECT TITLE	Fontana (SMA-8-10)	Optional Identification		
	SMA-8	SMA-9	SMA-10	Catchment 4
BMP Name	Wet Detention/ MAPs	Wet Detention/ MAPs	Wet Detention/ MAPs	
BMP Name				
BMP Name				

Surface Water Discharge Summary Performance of Entire Watershed

Catchment Configuration	D - 3 Catchment-Series	Treatment Objectives or Target for	5/29/2018
Nitrogen Pre Load (kg/yr)	73.15		BMPTRAINS MODEL
Phosphorus Pre Load (kg/yr)	8.07		
Nitrogen Post Load (kg/yr)	283.58		
Phosphorus Post Load (kg/yr)	44.58		
Target Load Reduction (N) %	74		
Target Load Reduction (P) %	82		
Target Discharge Load, N (kg/yr)	73.73		
Target Discharge Load, P (kg/yr)	8.02		
Provided Overall Efficiency, N (%):	43	TN NOT MET	
Provided Overall Efficiency, P (%):	87	TP MET	
Discharged Load, N (kg/yr & lb/yr):	160.78	354.13	
Discharged Load, P (kg/yr & lb/yr):	5.93	13.06	
Load Removed, N (kg/yr & lb/yr):	122.80	270.48	
Load Removed, P (kg/yr & lb/yr):	38.65	85.12	



GENERAL SITE INFORMATION: V 8.6 | GO TO INTRODUCTION PAGE | 11/5/2018 | Blue Numbers = Input data | Red Numbers = Calculated or Carryover

Select the appropriate Meteorological Zone, input the appropriate Mean Annual Rainfall amount and select the type of analysis

NAME OF PROJECT: Fontana (SMA-4-6)

HELP Rainfall

VIEW ZONE MAP

Meteorological Zone (Please use zone map): CLICK ON CELL BELOW TO SELECT → Zone 2

Mean Annual Rainfall (Please use rainfall map): 49.00 Inches

VIEW MEAN ANNUAL RAINFALL MAP

Type of analysis: CLICK ON CELL BELOW TO SELECT → Net improvement

Treatment efficiency (N, P) (ex 80 70 (no decimal points) **use only for specified removal efficiency**): % %

GO TO WATERSHED CHARACTERISTICS

Select the STORMWATER TREATMENT ANALYSIS Button below to begin analyzing the effectiveness of Best Management Practices.

Model documentation and example problems.

STORMWATER TREATMENT ANALYSIS

Systems available for analysis:
Retention Basin with option for calculating effluent concentration
Wet Detention
Exfiltration Trench
Pervious Pavement
Stormwater Harvesting
Biofiltration
Greenroof
Rainwater Harvesting
Managed Aquatic Plants Detention
Vegetated Natural Buffer
Vegetated Filter Strip
Swale
Rain Garden
Tree Well
Lined reuse pond
User Defined BMP

There is a user's manual for the BMPTRAINS model. It can be downloaded from www.stormwater.ucf.edu. The results from the example problems shown in the manual however may not reflect current model results due to ongoing updates of the model.

RESET INPUT FOR STORMWATER TREATMENT ANALYSIS

METHODOLOGY FOR CALCULATING REQUIRED TREATMENT EFFICIENCY

METHODOLOGY FOR RETENTION SYSTEMS

METHODOLOGY FOR WET DETENTION SYSTEMS

METHODOLOGY FOR GREENROOF SYSTEMS

METHODOLOGY FOR WATER HARVESTING SYSTEMS

WATERSHED CHARACTERISTICS V 8.6

GO TO STORMWATER TREATMENT ANALYSIS

Blue Numbers = Input data
Red Numbers = Calculated

LAND USES/EMC

SELECT CATCHMENT CONFIGURATION

11/5/2018

CLICK ON CELL BELOW TO SELECT CONFIGURATION

D - 3 Catchment-Series

VIEW CATCHMENT CONFIGURATION

For comingling, the off-site catchment must be upstream. The delay is only for retention BMPs and must be used in hours as measured by the time of concentration at a one inch/hour rain

COMINGLING | MULTI-LAND USE

GO TO GENERAL SITE INFORMATION PAGE

Delay [hrs] | CATCHMENT NO.1 NAME: SMA-4A-4B

max delay = 15 hrs,

VIEW AVERAGE ANNUAL RUNOFF "C" Factor

VIEW EMC & FLUCCS

GO TO GIS LANDUSE DATA

OVERWRITE DEFAULT CONCENTRATIONS USING:

	PRE:	POST:
EMC(N):	mg/L	mg/L
EMC(P):	mg/L	mg/L

IMPORT GIS CONCENTRATIONS

Pre-development land use:	CLICK ON CELL BELOW TO SELECT				
	GIS Import Data				
with default EMCs	CLICK ON CELL BELOW TO SELECT				
Post-development land use:	GIS Import Data				
with default EMCs					
Total pre-development catchment area:	14.820	AC	From GIS data		
Total post-development catchment or for BMP analysis:	14.820	AC	14.8	Average annual pre runoff volume:	10.106 ac-ft/year
Pre-development Non DCIA CN:	80.00		80.0	Average annual post runoff volume (note no BMP area):	25.116 ac-ft/year
Pre-development DCIA percentage:	8.00	%	8%	Pre-development Annual Mass Loading - **Nitrogen:**	32.433 kg/year
Post-development Non DCIA CN:	88.20		88.2	Pre-development Annual Mass Loading - **Phosphorus:**	5.407 kg/year
Post-development DCIA percentage:	34.00	%	34%	Post-development Annual Mass Loading - **Nitrogen:**	64.419 kg/year
Estimated BMP Area (No loading from this area)		AC		Post-development Annual Mass Loading - **Phosphorus:**	10.246 kg/year

CATCHMENT NO.2 NAME: SMA-5

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:	POST:
EMC(N):	mg/L	mg/L
EMC(P):	mg/L	mg/L

IMPORT GIS CONCENTRATIONS

	CLICK ON CELL BELOW TO SELECT				
Pre-development land use:	GIS Import Data				
with default EMCs	CLICK ON CELL BELOW TO SELECT				
Post-development land use:	GIS Import Data				
with default EMCs					
Total pre-development catchment area:	50.300	AC	From GIS data		
Total post-development catchment or BMP analysis area:	50.300	AC	50.2	Average annual pre runoff volume:	22.798 ac-ft/year
Pre-development Non DCIA CN:	80.00		79.9	Average annual post runoff volume (note no BMP area):	80.021 ac-ft/year
Pre-development DCIA percentage:	0.00	%	0%	Pre-development Annual Mass Loading - **Nitrogen:**	75.082 kg/year
Post-development Non DCIA CN:	90.00		90.4	Pre-development Annual Mass Loading - **Phosphorus:**	9.951 kg/year
Post-development DCIA percentage:	26.00	%	26%	Post-development Annual Mass Loading - **Nitrogen:**	204.658 kg/year
Estimated BMP Area (No loading from this area)		AC		Post-development Annual Mass Loading - **Phosphorus:**	32.962 kg/year

CATCHMENT NO.3 NAME: SMA-6

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:	POST:
EMC(N):	mg/L	mg/L
EMC(P):	mg/L	mg/L

IMPORT GIS CONCENTRATIONS

	CLICK ON CELL BELOW TO SELECT				
Pre-development land use:	GIS Import Data				
with default EMCs	CLICK ON CELL BELOW TO SELECT				
Post-development land use:	GIS Import Data				
with default EMCs					
Total pre-development catchment area:	36.400	AC	From GIS data		
Total post-development catchment or BMP analysis area:	36.400	AC	1.1	Average annual pre runoff volume:	14.596 ac-ft/year
Pre-development Non DCIA CN:	78.00		78.0	Average annual post runoff volume (note no BMP area):	48.799 ac-ft/year
Pre-development DCIA percentage:	0.00	%	0%	Pre-development Annual Mass Loading - **Nitrogen:**	55.234 kg/year
Post-development Non DCIA CN:	87.00		87.4	Pre-development Annual Mass Loading - **Phosphorus:**	9.201 kg/year
Post-development DCIA percentage:	22.00	%	22%	Post-development Annual Mass Loading - **Nitrogen:**	127.039 kg/year
Estimated BMP Area (no loading from this area)		AC		Post-development Annual Mass Loading - **Phosphorus:**	22.211 kg/year

IMPORT GIS LAND USE DATA

V 8.6

Instructions: The data required for this analysis is as follows; Basin ID, FLUCCSCODE, Soils Hydro Group, CN, and Area. This data is typically derived by using the ArcGIS geoprocessing tool intersect and performing an intersect on the basins of interest, soils polygons, and land use polygons. The resulting attribute table can then be exported to Excel where any final data formatting and processing can be done to get it ready to copy into this spreadsheet. Data must be sorted by Basin ID for this table to work properly. The user can use up to four catchments for this analysis. The user may overwrite any EMC by manualy entering in a value in the first two columns. All this must be done for both the pre and post development conditions when this tool is used.

Note: Soil hydrologic groups should be single class. For example, A/D would be assigned B, B/D would be assigned C, and C/D would be assigned D. This is due to the fact that this is an annual average analysis and the soils will behave as drained during part of the year and not drained during other parts of the year. To assume D would artificially increase runoff. Additionally, it is recommended that, due to compaction, the soil hydrologic group remain consistent in the pre and post development conditions for these dual class soils.

GO TO WATERSHED CHARACTERISTICS

VIEW EMC & FLUCCS

Pre-Development EMC Calculation Table

EMC Overwrite TN [mg/L]	EMC Overwrite TP [mg/L]	Basin ID	FLUCCSCODE	FLUCSDESC	HYDROGRP	CN	DCIA [Yes/ No]	Area [acres]	Compressed Land Use	Area [acres] (for CN	CN*Area	C	C*Area	EMC's Based on TN [mg/L]	EMC's Based on TP [mg/L]	C*Area* TN_{EMC}	C*Area* TP_{EMC}	New Basin?	Subbasin Summary TN [mg/L]	Subbasin Summary TP [mg/L]	Basin ID	Basin Area [acres]	DCIA [acres]	DCIA [%]	Basin CN [area weighted
		SMA-4A-4E	2110	Improved Pastures	D	80.0	No	13.676	PASTURE	13.676	1094.08	0.111	1.51804	3.51	0.686	5.32831	1.04137	YES	2.60	0.434	SMA-4A-4E	14.8		8%	80.0
		SMA-4A-4E	6430	Wet Prairie	D	98.0	Yes	1.13	WET PRAIRIE*	1.13	110.74	0.809	0.91417	1.095	0.015	1.00102	0.01371	NO					1.1		
		SMA-5	2210	Citrus Grove	A	80.0	No	0.25	AG - CITRUS	0.25	20	0.111	0.02775	2.24	0.183	0.06216	0.00508	YES	2.67	0.354	SMA-5	50.2		0%	79.9
		SMA-5	2110	Improved Pastures	D	80.0	No	13.69	PASTURE	13.69	1095.2	0.111	1.51959	3.51	0.686	5.33376	1.04244	NO							
		SMA-5	2130	Woodland Pastures	D	78.0	No	3.66	PASTURE	3.66	285.48	0.0982	0.35941	3.51	0.686	1.26154	0.24656	NO							
		SMA-5	2210	Citrus Grove	D	80.0	No	32.38	AG - CITRUS	32.38	2590.4	0.111	3.59418	2.24	0.183	8.05096	0.65773	NO							
		SMA-5	3210	Palmetto Prairies	D	80.0	No	0.261	DRY PRAIRIE*	0.261	20.88	0.111	0.02897	2.025	0.184	0.05867	0.00533	NO							
		SMA-6	2110	Improved Pastures	D	80.0	No	0.02	PASTURE	0.02	1.6	0.111	0.00222	3.51	0.686	0.00779	0.00152	YES	3.07	0.511	SMA-6	1.1		0%	78.0
		SMA-6	2130	Woodland Pastures	D	77.0	No	0.77	PASTURE	0.77	59.29	0.0918	0.07069	3.51	0.686	0.24811	0.04849	NO							
		SMA-6	2210	Citrus Grove	D	80.0	No	0.35	AG - CITRUS	0.35	28	0.111	0.03885	2.24	0.183	0.08702	0.00711	NO							

Post-Development EMC Calculation Table

EMC Overwrite		Basin ID	FLUCCSCODE	FLUCSDESC	HYDROG RP	CN	DCIA [Yes/No]	Area [acres]	Compressed Land Use	Area [acres] (for CN	CN*Area	C	C*Area	EMC's Based on		C*Area* TN_{EMC}	C*Area* TP_{EMC}	New Basin?	Subbasin Summary		Basin ID	Basin Area [acres]	DCIA [acres]	DCIA [%]	Basin CN [area weighted
TN [mg/L]	TP [mg/L]													TN [mg/L]	TP [mg/L]				TN [mg/L]	TP [mg/L]					
		SMA-4A-4E	1210	Residential (70%)	D	92.0	Yes	0.13	SINGLE FAMILY RES	0.13	11.96	0.809	0.10517	2.07	0.327	0.2177	0.03439	YES	2.08	0.331	SMA-4A-4E	14.8	0.1	34%	88.2
		SMA-4A-4E	1210		D	92.0	No	2.21	SINGLE FAMILY RES	2.21	203.32	0.3068	0.67803	2.07	0.327	1.40352	0.22172	NO							
		SMA-4A-4E	1210	Residential (60%)	D	90.0	Yes	0.12	SINGLE FAMILY RES	0.12	10.8	0.809	0.09708	2.07	0.327	0.20096	0.03175	NO					0.1		
		SMA-4A-4E	1210		D	90.0	No	1.67	SINGLE FAMILY RES	1.67	150.3	0.242	0.40414	2.07	0.327	0.83657	0.13215	NO							
		SMA-4A-4E	1210	50' R/W (72%)	D	90.0	Yes	0.42	SINGLE FAMILY RES	0.42	37.8	0.809	0.33978	2.07	0.327	0.70334	0.11111	NO					0.4		
		SMA-4A-4E	1210		D	90.0	No	0.71	SINGLE FAMILY RES	0.71	63.9	0.242	0.17182	2.07	0.327	0.35567	0.05619	NO							
		SMA-4A-4E	1210	60' R/W (77%)	D	91.0	Yes	0.54	SINGLE FAMILY RES	0.54	49.14	0.809	0.43686	2.07	0.327	0.9043	0.14285	NO					0.5		
		SMA-4A-4E	1210		D	91.0	No	0.73	SINGLE FAMILY RES	0.73	66.43	0.2744	0.20031	2.07	0.327	0.41465	0.0655	NO							
		SMA-4A-4E	1210	80' R/W (82.5%)	D	92.0	Yes	0.88	SINGLE FAMILY RES	0.88	80.96	0.809	0.71192	2.07	0.327	1.47367	0.2328	NO					0.9		
		SMA-4A-4E	1210		D	92.0	No	0.93	SINGLE FAMILY RES	0.93	85.56	0.3068	0.28532	2.07	0.327	0.59062	0.0933	NO							
		SMA-4A-4E	1400	Civ-Com-Multi (80%)	D	92.0	Yes	0.3	HIGH INTENSITY COMMERCI	0.3	27.6	0.809	0.2427	2.4	0.345	0.58248	0.08373	NO					0.3		
		SMA-4A-4E	1400		D	92.0	No	0.45	HIGH INTENSITY COMMERCI	0.45	41.4	0.3068	0.13806	2.4	0.345	0.33134	0.04763	NO							
		SMA-4A-4E	1850	Park (25%)	D	84.0	Yes	0.09	AVERAGE OF MFR+UNDEVEL	0.09	7.56	0.809	0.07281	2.32	0.52	0.16892	0.03786	NO					0.1		
		SMA-4A-4E	1850		D	84.0	No	1.31	AVERAGE OF MFR+UNDEVEL	1.31	110.04	0.1502	0.19676	2.32	0.52	0.45649	0.10232	NO							
		SMA-4A-4E	1900	Open Space (Good)	D	80.0	No	1.74	UNDEVELOPED	1.74	139.2	0.111	0.19314	1.288	0.107	0.24876	0.02067	NO							
		SMA-4A-4E	8370	Water Surface	D	98.0	Yes	2.55	WATER			0.809		0	0			NO					2.6		
		SMA-4A-4E	1210	Alley (100%)	D	98.0	Yes	0.04	SINGLE FAMILY RES	0.04	3.92	0.809	0.03236	2.07	0.327	0.06699	0.01058	NO					0.0		
		SMA-5	1210	Residential (70%)	D	92.0	Yes	0.97	SINGLE FAMILY RES	0.97	89.24	0.809	0.78473	2.07	0.327	1.62439	0.25661	YES	2.07	0.334	SMA-5	50.3	1.0	26%	90.4
		SMA-5	1210		D	92.0	No	16.41	SINGLE FAMILY RES	16.41	1509.72	0.3068	5.03459	2.07	0.327	10.4216	1.64631	NO							
		SMA-5	1330	Residential (65%)	D	91.0	Yes	0.12	MULTI FAMILY RES	0.12	10.92	0.809	0.09708	2.32	0.52	0.22523	0.05048	NO					0.1		
		SMA-5	1330		D	91.0	No	1.85	MULTI FAMILY RES	1.85	168.35	0.2744	0.50764	2.32	0.52	1.17772	0.26397	NO							
		SMA-5	1210	Residential (60%)	A	73.0	Yes	0.01	SINGLE FAMILY RES	0.01	0.73	0.809	0.00809	2.07	0.327	0.01675	0.00265	NO					0.0		
		SMA-5	1210		A	73.0	No	0.11	SINGLE FAMILY RES	0.11	8.03	0.0702	0.00772	2.07	0.327	0.01598	0.00253	NO							
		SMA-5	1210		D	90.0	Yes	0.61	SINGLE FAMILY RES	0.61	54.9	0.809	0.49349	2.07	0.327	1.02152	0.16137	NO					0.6		
		SMA-5	1210		D	90.0	No	7.84	SINGLE FAMILY RES	7.84	705.6	0.242	1.89728	2.07	0.327	3.92737	0.62041	NO							
		SMA-5	1850	Park (25%)	D	84.0	Yes	0.07	AVERAGE OF MFR+UNDEVEL	0.07	5.88	0.809	0.05663	2.32	0.52	0.13138	0.02945	NO					0.1		
		SMA-5	1850		D	84.0	No	1.04	AVERAGE OF MFR+UNDEVEL	1.04	87.36	0.1502	0.15621	2.32	0.52	0.3624	0.08123	NO							
		SMA-5	1210	50' R/W (72%)	A	72.0	Yes	0.03	SINGLE FAMILY RES	0.03	2.16	0.809	0.02427	2.07	0.327	0.05024	0.00794	NO					0.0		
		SMA-5	1210		A	72.0	No	0.04	SINGLE FAMILY RES	0.04	2.88	0.0658	0.00263	2.07	0.327	0.00545	0.00086	NO							
		SMA-5	1210		D	90.0	Yes	1.34	SINGLE FAMILY RES	1.34	120.6	0.809	1.08406	2.07	0.327	2.244	0.35449	NO					1.3		
		SMA-5	1210		D	90.0	No	2.23	SINGLE FAMILY RES	2.23	200.7	0.242	0.53966	2.07	0.327	1.1171	0.17647	NO							
		SMA-5	1210	60' R/W (77%)	D	91.0	Yes	1.77	SINGLE FAMILY RES	1.77	161.07	0.809	1.43193	2.07	0.327	2.9641	0.46824	NO					1.8		
		SMA-5	1210		D	91.0	No	2.42	SINGLE FAMILY RES	2.42	220.22	0.2744	0.66405	2.07	0.327	1.37458	0.21714	NO							
		SMA-5	1210	80' R/W (82.5%)	D	92.0	Yes	1.64	SINGLE FAMILY RES	1.64	150.88	0.809	1.32676	2.07	0.327	2.74639	0.43385	NO					1.6		
		SMA-5	1210		D	92.0	No	1.72	SINGLE FAMILY RES	1.72	158.24	0.3068	0.5277	2.07	0.327	1.09233	0.17256	NO							
		SMA-5	1210	132' R/W (70%)	D	90.0	Yes	0.95	SINGLE FAMILY RES	0.95	85.5	0.809	0.76855	2.07	0.327	1.5909	0.25132	NO					1.0		
		SMA-5	1210		D	90.0	No	1.76	SINGLE FAMILY RES	1.76	158.4	0.242	0.42592	2.07	0.327	0.88165	0.13928	NO							
		SMA-5	1210	Alley (100%)	A	98.0	Yes	0.06	SINGLE FAMILY RES	0.06	5.88	0.809	0.04854	2.07	0.327	0.10048	0.01587	NO					0.1		
		SMA-5	1210		B	98.0	Yes	1.03	SINGLE FAMILY RES	1.03	100.94	0.809	0.83327	2.07	0.327	1.72487	0.27248	NO					1.0		
		SMA-5	1900	Open Space (Good)	D	80.0	No	1.61	UNDEVELOPED	1.61	128.8	0.111	0.17871	1.288	0.107	0.23018	0.01912	NO							
		SMA-5	8370	Water Surface	B	98.0	Yes	4.64	WATER			0.809		0	0			NO					4.6		
		SMA-6	1210	Residential (70%)	D	92.0	Yes	0.49	SINGLE FAMILY RES	0.49	45.08	0.809	0.39641	2.07	0.327	0.82057	0.12963	YES	2.11	0.369	SMA-6	36.4	0.5	22%	87.4
		SMA-6	1210		D	92.0	No	8.23	SINGLE FAMILY RES	8.23	757.16	0.3068	2.52496	2.07	0.327	5.22668	0.82566	NO							
		SMA-6	1210	Residential (60%)	D	90.0	Yes	0.24	SINGLE FAMILY RES	0.24	21.6	0.809	0.19416	2.07	0.327	0.40191	0.06349	NO					0.2		
		SMA-6	1210		D	90.0	No	3.12	SINGLE FAMILY RES	3.12	280.8	0.242	0.75504	2.07	0.327	1.56293	0.2469	NO							
		SMA-6	1850	Park (25%)	D	84.0	Yes	0.77	AVERAGE OF MFR+UNDEVEL	0.77	64.68	0.809	0.62293	2.32	0.52	1.4452	0.32392	NO					0.8		
		SMA-6	1850		D	84.0	No	11.54	AVERAGE OF MFR+UNDEVEL	11.54	969.36	0.1502	1.73331	2.32	0.52	4.02127	0.90132	NO							
		SMA-6	1210	50' R/W (72%)	D	90.0	Yes	0.95	SINGLE FAMILY RES	0.95	85.5	0.809	0.76855	2.07	0.327	1.5909	0.25132	NO					1.0		
		SMA-6	1210		D	90.0	No	1.6	SINGLE FAMILY RES	1.6	144	0.242	0.3872	2.07	0.327	0.8015	0.12661	NO							
		SMA-6	1210	60' R/W (77%)	D	91.0	Yes	0.39	SINGLE FAMILY RES	0.39	35.49	0.809	0.31551	2.07	0.327	0.65311	0.10317	NO					0.4		
		SMA-6	1210		D	91.0	No	0.54	SINGLE FAMILY RES	0.54	49.14	0.2744	0.14818	2.07	0.327	0.30672	0.04845	NO							
		SMA-6	1210	80' R/W (82.5%)	D	92.0	Yes	0.81	SINGLE FAMILY RES	0.81	74.52	0.809	0.65529	2.07	0.327	1.35645	0.21428	NO					0.8		
		SMA-6	1210		D	92.0	No	0.85	SINGLE FAMILY RES	0.85	78.2	0.3068	0.26078	2.07	0.327	0.53981	0.08528	NO							
		SMA-6	1210	Alley (100%)	D	98.0	Yes	0.54	SINGLE FAMILY RES	0.54	52.92	0.809	0.43686	2.07	0.327	0.9043	0.14285	NO					0.5		
		SMA-6	1900	Open Space (Good)	D	80.0	No	2.33	UNDEVELOPED	2.33	186.4	0.111	0.25863	1.288	0.107	0.33312	0.02767	NO							
		SMA-6	8370	Water Surface	D	98.0	Yes	3.97	WATER			0.809		0	0			NO					4.0		

Summary									
Basin ID	Basin Area [acres]	Pre-Development				Post-Development			
		TN [mg/L]	TP [mg/L]	CN	DCIA %	TN [mg/L]	TP [mg/L]	CN	DCIA %
SMA-4A-4E	14.8	2.60	0.434	80.0	8%	2.08	0.331	88.2	34%
SMA-5	50.2	2.67	0.354	79.9	0%	2.07	0.334	90.4	26%
SMA-6	1.1	3.07	0.511	78.0	0%	2.11	0.369	87.382	22%

WET DETENTION / MANAGED AQUATIC PLANTS: 11/5/2018 V 8.6

Blue Numbers =	Input data
Red Numbers =	Calculated or Carryover

Also called: FLOATING ISLANDS and includes a wet detention pond: | **Fontana (SMA-4-6)**

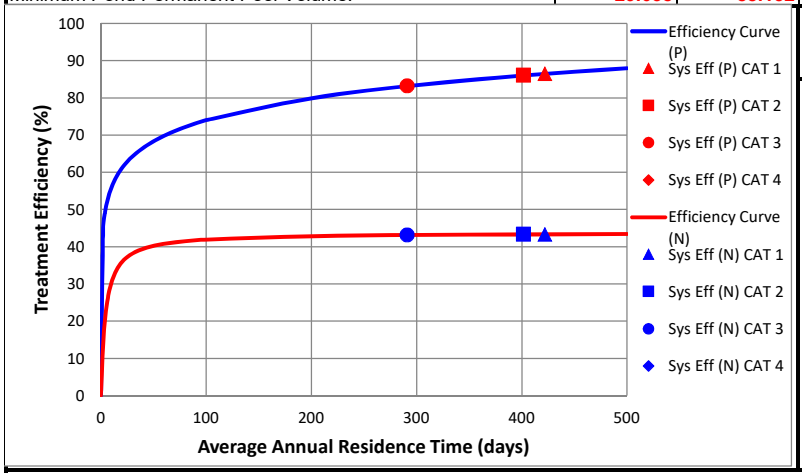
GO TO STORMWATER TREATMENT ANALYSIS

	SMA-4A-4B	SMA-5	SMA-6	Catchment 4	
Total pre-development catchment area:	14.820	50.300	36.400	0.000	ac
Total post-development catchment area:	14.820	50.300	36.400	0.000	ac
Average annual residence time (between 1 and 500 days)	422.00	402.00	291.00		days
Littoral Zone or other improvements used?*	NO	NO	NO		
Littoral Zone or other improvement efficiency credit:					%
Floating Wetland or Mats used in the design:	NO	NO	NO		
Floating Wetland or Mats credit:					%
Total **Nitrogen** removal required:	49.652	63.313	56.522		%
Total **Phosphorus** removal required:	47.235	69.811	58.576		%
Total **Nitrogen** removal efficiency:	43.301	43.278	43.101	0.000	%
Total **Phosphorous** removal efficiency:	86.432	85.998	83.136	0.000	%
Is the wet detention sufficient:	NO	NO	NO		
Average annual runoff volume:	25.116	80.021	48.799		ac-ft/yr

* pond coverage must follow Regulatory Requirements

Wet Detention Pond Characteristic:

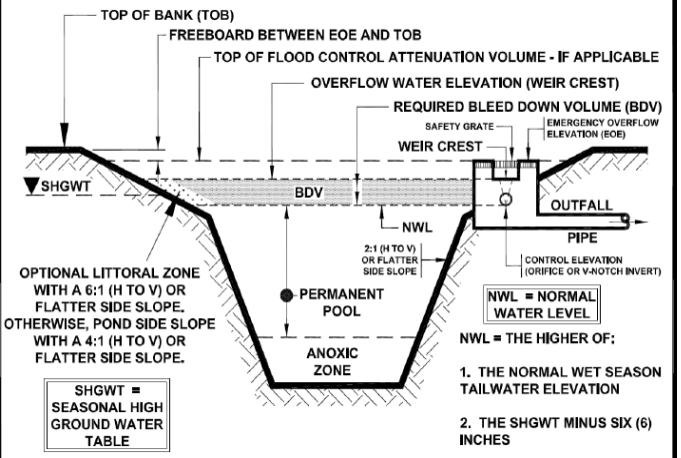
Minimum Pond Permanent Pool Volume:	29.038	88.132	38.906		ac-ft



NOTE FOR TREATMENT EFFICIENCY GRAPH:

The purpose of the treatment efficiency graphs is to help illustrate the treatment efficiency of the wet detention system as the function of average annual residence time (and permanent pool volume). The graph illustrates that there is a point of diminished return as the permanent pool volume is substantially increased. Therefore, to provide the most economical BMP treatment system, other alternatives such as "treatment trains" and compensatory treatment should be considered.

REQUIRED REMAINING TREATMENT EFFICIENCIES OF TREATMENT SYSTEM IN SERIES WITH FLOATING ISLANDS WITH WET DETENTION. USE FOR SIZING OF TREATMENT SYSTEM IN SERIES WITH FLOATING ISLANDS WITH WET DETENTION.



TYPICAL X-SECTION OF A WET DETENTION SYSTEM

Source of Graphic: draft **STORMWATER QUALITY APPLICANT'S HANDBOOK** dated March 2010, by the Department of Environmental Protection, available at: http://www.dep.state.fl.us/water/wetlands/erp/rules/stormwater, March 2010

CATCHMENTS AND TREATMENT SURFACE DISCHARGE SUMMARY V 8.6

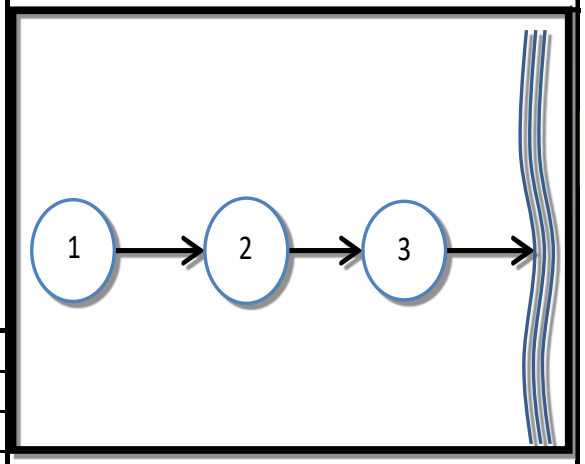
CALCULATION METHODS:

1. The effectiveness of each BMP in a single catchment is converted to an equivalent capture volume.
2. Certain BMP treatment train combinations have not been evaluated and in practice they are at this time not used, an example is a greenroof following a tree well.
3. Wet detention is last when used in a single catchment with other BMPs, except when followed by filtration

PROJECT TITLE	Fontana (SMA-4-6)	Optional Identification		
	SMA-4A-4B	SMA-5	SMA-6	Catchment 4
BMP Name	Wet Detention/ MAPs	Wet Detention/ MAPs	Wet Detention/ MAPs	
BMP Name				
BMP Name				

Surface Water Discharge Summary Performance of Entire Watershed

Catchment Configuration	D - 3 Catchment-Series	Treatment Objectives or Target for	11/5/2018
Nitrogen Pre Load (kg/yr)	162.75		BMPTRAINS MODEL
Phosphorus Pre Load (kg/yr)	24.56		
Nitrogen Post Load (kg/yr)	396.12		
Phosphorus Post Load (kg/yr)	65.42		
Target Load Reduction (N) %	59		
Target Load Reduction (P) %	62		
Target Discharge Load, N (kg/yr)	162.41	TN NOT MET	
Target Discharge Load, P (kg/yr)	24.86	TP MET	
Provided Overall Efficiency, N (%):	43		
Provided Overall Efficiency, P (%):	85		
Discharged Load, N (kg/yr & lb/yr):	224.89	495.35	
Discharged Load, P (kg/yr & lb/yr):	9.70	21.36	
Load Removed, N (kg/yr & lb/yr):	171.22	377.14	
Load Removed, P (kg/yr & lb/yr):	55.72	122.73	



GENERAL SITE INFORMATION: V 8.6

GO TO INTRODUCTION PAGE

11/5/2018

Blue Numbers = Input data

Red Numbers = Calculated or Carryover

HELP Rainfall

Select the appropriate Meteorological Zone, input the appropriate Mean Annual Rainfall amount and select the type of analysis

NAME OF PROJECT

Fontana (SMA-2-3)

VIEW ZONE MAP

CLICK ON CELL BELOW TO SELECT

Meteorological Zone (Please use zone map): Zone 2

Mean Annual Rainfall (Please use rainfall map): 49.00 Inches

VIEW MEAN ANNUAL RAINFALL MAP

CLICK ON CELL BELOW TO SELECT

Type of analysis: Net improvement

Treatment efficiency (N, P) (ex 80 70 (no decimal points) **use only for specified removal efficiency**): % %

GO TO WATERSHED CHARACTERISTICS

Select the STORMWATER TREATMENT ANALYSIS Button below to begin analyzing the effectiveness of Best Management Practices.

Model documentation and example problems.

STORMWATER TREATMENT ANALYSIS

Systems available for analysis:

Retention Basin with option for calculating effluent concentration
Wet Detention
Exfiltration Trench
Pervious Pavement
Stormwater Harvesting
Biofiltration
Greenroof
Rainwater Harvesting
Managed Aquatic Plants Detention
Vegetated Natural Buffer
Vegetated Filter Strip
Swale
Rain Garden
Tree Well
Lined reuse pond
User Defined BMP

There is a user's manual for the BMPTRAINS model. It can be downloaded from www.stormwater.ucf.edu. The results from the example problems shown in the manual however may not reflect current model results due to ongoing updates of the model.

RESET INPUT FOR STORMWATER TREATMENT ANALYSIS

METHODOLOGY FOR CALCULATING REQUIRED TREATMENT EFFICIENCY

METHODOLOGY FOR RETENTION SYSTEMS

METHODOLOGY FOR WET DETENTION SYSTEMS

METHODOLOGY FOR GREENROOF SYSTEMS

METHODOLOGY FOR WATER HARVESTING SYSTEMS

WATERSHED CHARACTERISTICS V 8.6

GO TO STORMWATER TREATMENT ANALYSIS

Blue Numbers = Input data | Red Numbers = Calculated

LAND USES/EMC

SELECT CATCHMENT CONFIGURATION

11/5/2018

CLICK ON CELL BELOW TO SELECT CONFIGURATION

C - 2 Catchment-Parallel

VIEW CATCHMENT CONFIGURATION

For comingling, the off-site catchment must be upstream. The delay is only for retention BMPs and must be used in hours as measured by the time of concentration at a one inch/hour rain

COMINGLING | MULTI-LAND USE

GO TO GENERAL SITE INFORMATION PAGE

Delay [hrs] | CATCHMENT NO.1 NAME: SMA-2

max delay = 15 hrs.

VIEW AVERAGE ANNUAL RUNOFF "C" Factor

OVERWRITE DEFAULT CONCENTRATIONS USING:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

Pre-development land use:	CLICK ON CELL BELOW TO SELECT		VIEW EMC & FLUCCS
with default EMCs	GIS Import Data		
Post-development land use:	CLICK ON CELL BELOW TO SELECT		GO TO GIS LANDUSE DATA
with default EMCs	GIS Import Data		

IMPORT GIS CONCENTRATIONS

Total pre-development catchment area:	17.810	AC	From GIS data
Total post-development catchment or for BMP analysis:	17.810	AC	17.8
Pre-development Non DCIA CN:	80.00		80.0
Pre-development DCIA percentage:	1.00	%	1%
Post-development Non DCIA CN:	89.00		89.2
Post-development DCIA percentage:	29.00	%	29%
Estimated BMP Area (No loading from this area)		AC	

Average annual pre runoff volume:	8.581	ac-ft/year
Average annual post runoff volume (note no BMP area):	28.712	ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**	34.924	kg/year
Pre-development Annual Mass Loading - **Phosphorus:**	6.643	kg/year
Post-development Annual Mass Loading - **Nitrogen:**	72.093	kg/year
Post-development Annual Mass Loading - **Phosphorus:**	11.256	kg/year

CATCHMENT NO.2 NAME: SMA-3

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

Pre-development land use:	CLICK ON CELL BELOW TO SELECT		
with default EMCs	GIS Import Data		
Post-development land use:	CLICK ON CELL BELOW TO SELECT		
with default EMCs	GIS Import Data		

IMPORT GIS CONCENTRATIONS

Total pre-development catchment area:	24.940	AC	From GIS data
Total post-development catchment or BMP analysis area:	24.940	AC	24.9
Pre-development Non DCIA CN:	80.00		80.0
Pre-development DCIA percentage:	11.00	%	11%
Post-development Non DCIA CN:	90.00		90.2
Post-development DCIA percentage:	34.00	%	34%
Estimated BMP Area (No loading from this area)		AC	

Average annual pre runoff volume:	19.146	ac-ft/year
Average annual post runoff volume (note no BMP area):	44.239	ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**	57.008	kg/year
Pre-development Annual Mass Loading - **Phosphorus:**	9.281	kg/year
Post-development Annual Mass Loading - **Nitrogen:**	111.447	kg/year
Post-development Annual Mass Loading - **Phosphorus:**	17.422	kg/year

IMPORT GIS LAND USE DATA

V 8.6

Instructions: The data required for this analysis is as follows; Basin ID, FLUCCSCODE, Soils Hydro Group, CN, and Area. This data is typically derived by using the ArcGIS geoprocessing tool intersect and performing an intersect on the basins of interest, soils polygons, and land use polygons. The resulting attribute table can then be exported to Excel where any final data formatting and processing can be done to get it ready to copy into this spreadsheet. Data must be sorted by Basin ID for this table to work properly. The user can use up to four catchments for this analysis. The user may overwrite any EMC by manualy entering in a value in the first two columns. All this must be done for both the pre and post development conditions when this tool is used.

Note: Soil hydrologic groups should be single class. For example, A/D would be assigned B, B/D would be assigned C, and C/D would be assigned D. This is due to the fact that this is an annual average analysis and the soils will behave as drained during part of the year and not drained during other parts of the year. To assume D would artificially increase runoff. Additionally, it is recommended that, due to compaction, the soil hydrologic group remain consistent in the pre and post development conditions for these dual class soils.

GO TO WATERSHED CHARACTERISTICS

VIEW EMC & FLUCCS

Pre-Development EMC Calculation Table

EMC Overwrite																								
TN [mg/L]	TP [mg/L]	Basin ID	FLUCCSCODE	FLUCSDESC	HYDROGRP	CN	DCIA [Yes/ No]	Area [acres]	Compressed Land Use	Area [acres] (for CN	CN*Area	C	C*Area	EMC's Based on TN [mg/L]	EMC's Based on TP [mg/L]	C*Area* TN_{EMC}	C*Area* TP_{EMC}	New Basin?	Subbasin Summary TN [mg/L]	Subbasin Summary TP [mg/L]	Basin ID	Basin Area [acres]	DCIA [acres]	DCIA [%]	Basin CN [area weighte
		SMA-2	2110	Improved Pastures	D	80.0	No	17.6	PASTURE	17.6	1408	0.111	1.9536	3.51	0.686	6.85714	1.34017	YES	3.30	0.628	SMA-2	17.8		1%	80.0
		SMA-2	6172	Mixed Shrubs	D	98.0	Yes	0.23	WET PRAIRIE*	0.23	22.54	0.809	0.18607	1.095	0.015	0.20375	0.00279	NO					0.2		
		SMA-3	2110	Improved Pastures	D	80.0	No	22.29	PASTURE	22.29	1783.2	0.111	2.47419	3.51	0.686	8.68441	1.69729	YES	2.41	0.393	SMA-3	24.9		11%	80.0
		SMA-3	6410	Freshwater Marshes	D	98.0	Yes	2.65	WETLAND*	2.65	259.7	0.809	2.14385	1.15	0.055	2.46543	0.11791	NO					2.7		

Post-Development EMC Calculation Table

EMC Overwrite													EMC's Based on					Subbasin Summary							
TN [mg/L]	TP [mg/L]	Basin ID	FLUCCSCODE	FLUCSDESC	HYDROG RP	CN	DCIA [Yes/No]	Area [acres]	Compressed Land Use	Area [acres] (for CN	CN*Area	C	C*Area	TN [mg/L]	TP [mg/L]	C*Area* TN_{EMC}	C*Area* TP_{EMC}	New Basin?	TN [mg/L]	TP [mg/L]	Basin ID	Basin Area [acres]	DCIA [acres]	DCIA [%]	Basin CN [area weighte
		SMA-2	1210	Residential (70%)	D	92.0	Yes	0.25	SINGLE FAMILY RES	0.25	23	0.809	0.20225	2.07	0.327	0.41866	0.06614	YES	2.04	0.318	SMA-2	17.8	0.3	29%	89.2
		SMA-2	1210		D	92.0	No	4.19	SINGLE FAMILY RES	4.19	385.48	0.3068	1.28549	2.07	0.327	2.66097	0.42036	NO							
		SMA-2	1210	Residential (60%)	D	90.0	Yes	0.33	SINGLE FAMILY RES	0.33	29.7	0.809	0.26697	2.07	0.327	0.55263	0.0873	NO					0.3		
		SMA-2	1210		D	90.0	No	4.26	SINGLE FAMILY RES	4.26	383.4	0.242	1.03092	2.07	0.327	2.134	0.33711	NO							
		SMA-2	1210	50' R/W (72%)	D	90.0	Yes	0.44	SINGLE FAMILY RES	0.44	39.6	0.809	0.35596	2.07	0.327	0.73684	0.1164	NO					0.4		
		SMA-2	1210		D	90.0	No	0.74	SINGLE FAMILY RES	0.74	66.6	0.242	0.17908	2.07	0.327	0.3707	0.05856	NO							
		SMA-2	1210	80' R/W (82.5%)	D	92.0	Yes	1.19	SINGLE FAMILY RES	1.19	109.48	0.809	0.96271	2.07	0.327	1.99281	0.31481	NO					1.2		
		SMA-2	1210		D	92.0	No	1.26	SINGLE FAMILY RES	1.26	115.92	0.3068	0.38657	2.07	0.327	0.8002	0.12641	NO							
		SMA-2	1210	Alley (100%)	D	98.0	Yes	0.61	SINGLE FAMILY RES	0.61	59.78	0.809	0.49349	2.07	0.327	1.02152	0.16137	NO					0.6		
		SMA-2	1900	Open Space (Good)	D	80.0	No	1.87	UNDEVELOPED	1.87	149.6	0.111	0.20757	1.288	0.107	0.26735	0.02221	NO							
		SMA-2	8370	Water Surface	D	98.0	Yes	2.36	WATER			0.809		0	0			NO					2.4		
		SMA-2	1850	Park (25%)	D	84.0	Yes	0.01	AVERAGE OF MFR+UNDEVEL	0.01	0.84	0.809	0.00809	2.32	0.52	0.01877	0.00421	NO					0.0		
		SMA-2	1850	Park (25%)	D	84.0	No	0.08	AVERAGE OF MFR+UNDEVEL	0.08	6.72	0.1502	0.01202	2.32	0.52	0.02788	0.00625	NO							
		SMA-2	1900	Open Space (Good)	D	84.0	No	0.23	UNDEVELOPED	0.23	19.32	0.1502	0.03455	1.288	0.107	0.0445	0.0037	NO							
		SMA-3	1210	Residential (70%)	D	92.0	Yes	0.67	SINGLE FAMILY RES	0.67	61.64	0.809	0.54203	2.07	0.327	1.122	0.17724	YES	2.04	0.319	SMA-3	24.9	0.7	34%	90.2
		SMA-3	1210		D	92.0	No	11.24	SINGLE FAMILY RES	11.24	1034.08	0.3068	3.44843	2.07	0.327	7.13825	1.12764	NO							
		SMA-3	1210	Residential (60%)	D	90.0	Yes	0.12	SINGLE FAMILY RES	0.12	10.8	0.809	0.09708	2.07	0.327	0.20096	0.03175	NO					0.1		
		SMA-3	1210		D	90.0	No	1.57	SINGLE FAMILY RES	1.57	141.3	0.242	0.37994	2.07	0.327	0.78648	0.12424	NO							
		SMA-3	1210	50' R/W (72%)	D	90.0	Yes	1.07	SINGLE FAMILY RES	1.07	96.3	0.809	0.86563	2.07	0.327	1.79185	0.28306	NO					1.1		
		SMA-3	1210		D	90.0	No	1.78	SINGLE FAMILY RES	1.78	160.2	0.242	0.43076	2.07	0.327	0.89167	0.14086	NO							
		SMA-3	1210	60' R/W (77%)	D	91.0	Yes	0.06	SINGLE FAMILY RES	0.06	5.46	0.809	0.04854	2.07	0.327	0.10048	0.01587	NO					0.1		
		SMA-3	1210		D	91.0	No	0.09	SINGLE FAMILY RES	0.09	8.19	0.2744	0.0247	2.07	0.327	0.05112	0.00808	NO							
		SMA-3	1900	Open Space (Good)	D	80.0	No	1.9	UNDEVELOPED	1.9	152	0.111	0.2109	1.288	0.107	0.27164	0.02257	NO							
		SMA-3	8370	Water Surface	D	98.0	Yes	3.79	WATER			0.809		0	0			NO					3.8		
		SMA-3	8370	Water Surface	D	98.0	Yes	2.65	WATER			0.809		0	0			NO					2.7		

Summary									
Basin ID	Basin Area [acres]	Pre-Development				Post-Development			
		TN [mg/L]	TP [mg/L]	CN	DCIA %	TN [mg/L]	TP [mg/L]	CN	DCIA %
SMA-2	17.8	3.30	0.628	80.0	1%	2.04	0.318	89.2	29%
SMA-3	24.9	2.41	0.393	80.0	11%	2.04	0.319	90.2	34%

WET DETENTION / MANAGED AQUATIC PLANTS: 11/5/2018 V 8.6

Blue Numbers =	Input data
Red Numbers =	Calculated or Carryover

Also called: FLOATING ISLANDS and includes a wet detention pond: | **Fontana (SMA-2-3)**

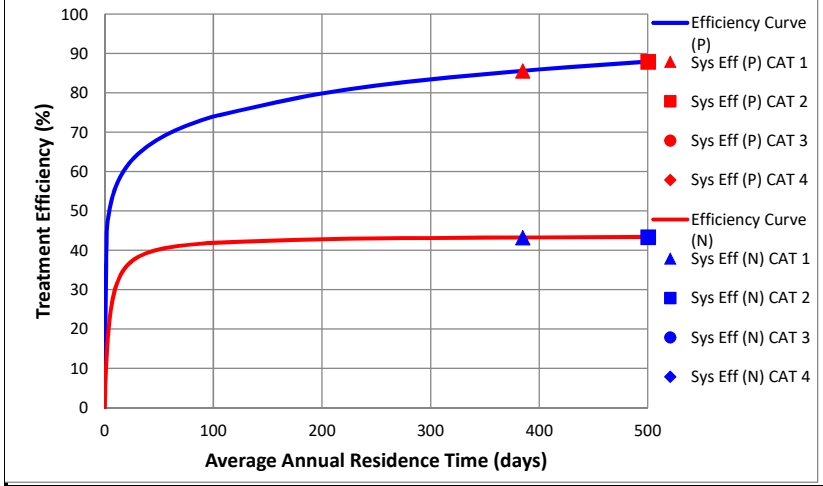
GO TO STORMWATER TREATMENT ANALYSIS

	SMA-2	SMA-3	Catchment 3	Catchment 4	
Total pre-development catchment area:	17.810	24.940	0.000	0.000	ac
Total post-development catchment area:	17.810	24.940	0.000	0.000	ac
Average annual residence time (between 1 and 500 days)	385.00	500.00			days
Littoral Zone or other improvements used?*	NO	NO			
Littoral Zone or other improvement efficiency credit:					%
Floating Wetland or Mats used in the design:	NO	NO			
Floating Wetland or Mats credit:					%
Total **Nitrogen** removal required:	51.557	48.847			%
Total **Phosphorus** removal required:	40.989	46.728			%
Total **Nitrogen** removal efficiency:	43.258	43.370	0.000	0.000	%
Total **Phosphorous** removal efficiency:	85.613	87.956	0.000	0.000	%
Is the wet detention sufficient:	NO	NO			
Average annual runoff volume:	28.712	44.239			ac-ft/yr

* pond coverage must follow Regulatory Requirements

Wet Detention Pond Characteristic:

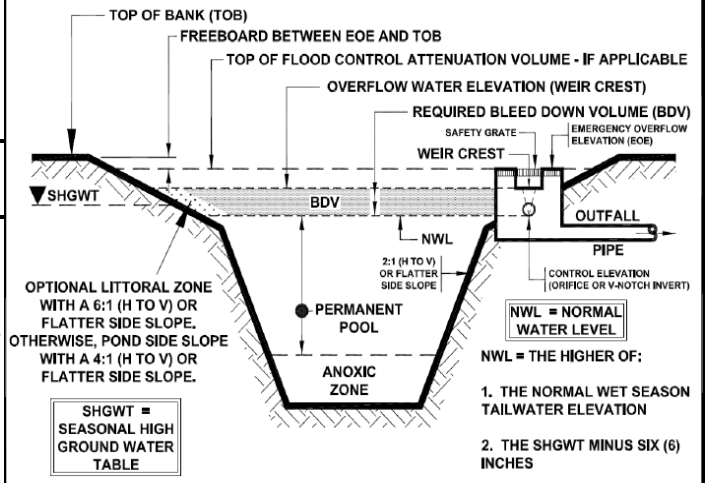
Minimum Pond Permanent Pool Volume:	30.285	60.601			ac-ft



NOTE FOR TREATMENT EFFICIENCY GRAPH:

The purpose of the treatment efficiency graphs is to help illustrate the treatment efficiency of the wet detention system as the function of average annual residence time (and permanent pool volume). The graph illustrates that there is a point of diminished return as the permanent pool volume is substantially increased. Therefore, to provide the most economical BMP treatment system, other alternatives such as "treatment trains" and compensatory treatment should be considered.

REQUIRED REMAINING TREATMENT EFFICIENCIES OF TREATMENT SYSTEM IN SERIES WITH FLOATING ISLANDS WITH WET DETENTION. USE FOR SIZING OF TREATMENT SYSTEM IN SERIES WITH FLOATING ISLANDS WITH WET DETENTION.



TYPICAL X-SECTION OF A WET DETENTION SYSTEM

Source of Graphic: draft **STORMWATER QUALITY APPLICANT'S HANDBOOK** dated March 2010, by the Department of Environmental Protection, available at: http://www.dep.state.fl.us/water/wetlands/erp/rules/stormwater, March 2010

CATCHMENTS AND TREATMENT SURFACE DISCHARGE SUMMARY V 8.6

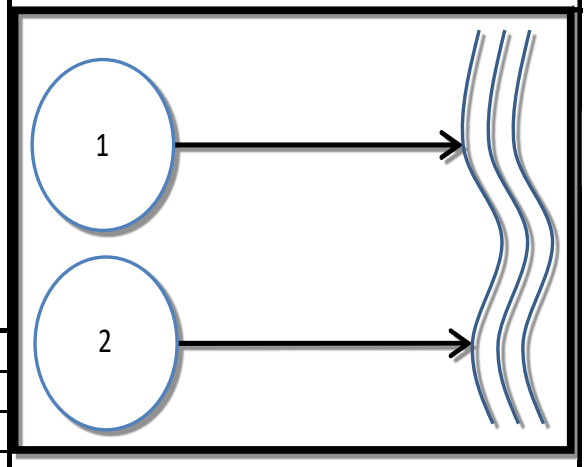
CALCULATION METHODS:

1. The effectiveness of each BMP in a single catchment is converted to an equivalent capture volume.
2. Certain BMP treatment train combinations have not been evaluated and in practice they are at this time not used, an example is a greenroof following a tree well.
3. Wet detention is last when used in a single catchment with other BMPs, except when followed by filtration

PROJECT TITLE	Fontana (SMA-2-3)	Optional Identification		
	SMA-2	SMA-3	Catchment 3	Catchment 4
BMP Name	Wet Detention/ MAPs	Wet Detention/ MAPs		
BMP Name				
BMP Name				

Surface Water Discharge Summary Performance of Entire Watershed

Catchment Configuration	C - 2 Catchment-Parallel	Treatment Objectives or Target for	11/5/2018
			BMPTRAINS MODEL
Nitrogen Pre Load (kg/yr)	91.93		
Phosphorus Pre Load (kg/yr)	15.92		
Nitrogen Post Load (kg/yr)	183.54		
Phosphorus Post Load (kg/yr)	28.68		
Target Load Reduction (N) %	50		
Target Load Reduction (P) %	44		
Target Discharge Load, N (kg/yr)	91.77	TN NOT MET	
Target Discharge Load, P (kg/yr)	16.06	TP MET	
Provided Overall Efficiency, N (%):	43		
Provided Overall Efficiency, P (%):	87		
Discharged Load, N (kg/yr & lb/yr):	104.02	229.11	
Discharged Load, P (kg/yr & lb/yr):	3.72	8.19	
Load Removed, N (kg/yr & lb/yr):	79.52	175.15	
Load Removed, P (kg/yr & lb/yr):	24.96	54.98	



GENERAL SITE INFORMATION: V 8.6

GO TO INTRODUCTION PAGE

6/17/2021

Blue Numbers = Input data

Red Numbers = Calculated or Carryover

HELP Rainfall

Select the appropriate Meteorological Zone, input the appropriate Mean Annual Rainfall amount and select the type of analysis

NAME OF PROJECT

Fontana (SMA-1-3&12-16)

VIEW ZONE MAP

Meteorological Zone (Please use zone map): CLICK ON CELL BELOW TO SELECT — Zone 2

Mean Annual Rainfall (Please use rainfall map): 49.00 Inches

VIEW MEAN ANNUAL RAINFALL MAP

Type of analysis: CLICK ON CELL BELOW TO SELECT — Net improvement

Treatment efficiency (N, P) (ex 80 70 (no decimal points) **use only for specified removal efficiency**): % %

GO TO WATERSHED CHARACTERISTICS

Select the STORMWATER TREATMENT ANALYSIS Button below to begin analyzing the effectiveness of Best Management Practices.

Model documentation and example problems.

STORMWATER TREATMENT ANALYSIS

Systems available for analysis:

Retention Basin with option for calculating effluent concentration
Wet Detention
Exfiltration Trench
Pervious Pavement
Stormwater Harvesting
Biofiltration
Greenroof
Rainwater Harvesting
Managed Aquatic Plants Detention
Vegetated Natural Buffer
Vegetated Filter Strip
Swale
Rain Garden
Tree Well
Lined reuse pond
User Defined BMP

There is a user's manual for the BMPTRAINS model. It can be downloaded from www.stormwater.ucf.edu. The results from the example problems shown in the manual however may not reflect current model results due to ongoing updates of the model.

RESET INPUT FOR STORMWATER TREATMENT ANALYSIS

METHODOLOGY FOR CALCULATING REQUIRED TREATMENT EFFICIENCY

METHODOLOGY FOR RETENTION SYSTEMS

METHODOLOGY FOR WET DETENTION SYSTEMS

METHODOLOGY FOR GREENROOF SYSTEMS

METHODOLOGY FOR WATER HARVESTING SYSTEMS

WATERSHED CHARACTERISTICS V 8.6

GO TO STORMWATER TREATMENT ANALYSIS

Blue Numbers = Input data | Red Numbers = Calculated

LAND USES/EMC

SELECT CATCHMENT CONFIGURATION

6/17/2021

CLICK ON CELL BELOW TO SELECT CONFIGURATION

F - Mixed-3 Catchment-2 Series-Parallel (A)

VIEW CATCHMENT CONFIGURATION

For comingling, the off-site catchment must be upstream. The delay is only for retention BMPs and must be used in hours as measured by the time of concentration at a one inch/hour rain

COMINGLING | MULTI-LAND USE

GO TO GENERAL SITE INFORMATION PAGE

Delay [hrs] | CATCHMENT NO.1 NAME: SMA-12-16

max delay = 15 hrs,

CLICK ON CELL BELOW TO SELECT

Pre-development land use: GIS Import Data

with default EMCs

CLICK ON CELL BELOW TO SELECT

Post-development land use: GIS Import Data

with default EMCs

VIEW AVERAGE ANNUAL RUNOFF "C" Factor

VIEW EMC & FLUCCS

GO TO GIS LANDUSE DATA

OVERWRITE DEFAULT CONCENTRATIONS USING:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

IMPORT GIS CONCENTRATIONS

Total pre-development catchment area:	277.900	AC	From GIS data	Average annual pre runoff volume:	85.910	ac-ft/year
Total post-development catchment or for BMP analysis:	277.900	AC	277.9	Average annual post runoff volume (note no BMP area):	369.477	ac-ft/year
Pre-development Non DCIA CN:	59.30		59.3	Pre-development Annual Mass Loading - **Nitrogen:**	231.864	kg/year
Pre-development DCIA percentage:	6.00	%	6%	Pre-development Annual Mass Loading - **Phosphorus:**	34.890	kg/year
Post-development Non DCIA CN:	80.80		80.8	Post-development Annual Mass Loading - **Nitrogen:**	880.562	kg/year
Post-development DCIA percentage:	30.00	%	30%	Post-development Annual Mass Loading - **Phosphorus:**	147.195	kg/year
Estimated BMP Area (No loading from this area)		AC				

CATCHMENT NO.2 NAME: SMA-2&3

CLICK ON CELL BELOW TO SELECT

Pre-development land use: GIS Import Data

with default EMCs

CLICK ON CELL BELOW TO SELECT

Post-development land use: GIS Import Data

with default EMCs

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

IMPORT GIS CONCENTRATIONS

Total pre-development catchment area:	42.750	AC	From GIS data			
Total post-development catchment or BMP analysis area:	42.750	AC	42.8	Average annual pre runoff volume:	27.930	ac-ft/year
Pre-development Non DCIA CN:	80.00		80.0	Average annual post runoff volume (note no BMP area):	73.409	ac-ft/year
Pre-development DCIA percentage:	7.00	%	7%	Pre-development Annual Mass Loading - **Nitrogen:**	92.823	kg/year
Post-development Non DCIA CN:	89.80		89.8	Pre-development Annual Mass Loading - **Phosphorus:**	16.098	kg/year
Post-development DCIA percentage:	31.92	%	32%	Post-development Annual Mass Loading - **Nitrogen:**	184.701	kg/year
Estimated BMP Area (No loading from this area)		AC		Post-development Annual Mass Loading - **Phosphorus:**	28.864	kg/year

CATCHMENT NO.3 NAME: SMA-1

CLICK ON CELL BELOW TO SELECT

Pre-development land use: GIS Import Data

with default EMCs

CLICK ON CELL BELOW TO SELECT

Post-development land use: GIS Import Data

with default EMCs

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

IMPORT GIS CONCENTRATIONS

Total pre-development catchment area:	106.000	AC	From GIS data			
Total post-development catchment or BMP analysis area:	106.000	AC	106.0	Average annual pre runoff volume:	91.155	ac-ft/year
Pre-development Non DCIA CN:	79.00		78.9	Average annual post runoff volume (note no BMP area):	228.593	ac-ft/year
Pre-development DCIA percentage:	15.00	%	15%	Pre-development Annual Mass Loading - **Nitrogen:**	246.272	kg/year
Post-development Non DCIA CN:	88.10		88.1	Pre-development Annual Mass Loading - **Phosphorus:**	37.205	kg/year
Post-development DCIA percentage:	53.00	%	53%	Post-development Annual Mass Loading - **Nitrogen:**	621.629	kg/year
Estimated BMP Area (no loading from this area)		AC		Post-development Annual Mass Loading - **Phosphorus:**	122.053	kg/year

IMPORT GIS LAND USE DATA V 8.6

Instructions: The data required for this analysis is as follows; Basin ID, FLUCCSCODE, Soils Hydro Group, CN, and Area. This data is typically derived by using the ArcGIS geoprocessing tool intersect and performing an intersect on the basins of interest, soils polygons, and land use polygons. The resulting attribute table can then be exported to Excel where any final data formatting and processing can be done to get it ready to copy into this spreadsheet. Data must be sorted by Basin ID for this table to work properly. The user can use up to four catchments for this analysis. The user may overwrite any EMC by manualy entering in a value in the first two columns. All this must be done for both the pre and post development conditions when this tool is used.

Note: Soil hydrologic groups should be single class. For example, A/D would be assigned B, B/D would be assigned C, and C/D would be assigned D. This is due to the fact that this is an annual average analysis and the soils will behave as drained during part of the year and not drained during other parts of the year. To assume D would artificially increase runoff. Additionally, it is recommended that, due to compaction, the soil hydrologic group remain consistent in the pre and post development conditions for these dual class soils.

GO TO WATERSHED CHARACTERISTICS

VIEW EMC & FLUCCS

Pre-Development EMC Calculation Table

EMC Overwrite TN [mg/L]	EMC Overwrite TP [mg/L]	Basin ID	FLUCCSCODE	FLUCCSDESC	HYDROGRP	CN	DCIA [Yes/ No]	Area [acres]	Compressed Land Use	Area [acres] (for CN	CN*Area	C	C*Area	EMC's Based on TN [mg/L]	EMC's Based on TP [mg/L]	C*Area* TN_{EMC}	C*Area* TP_{EMC}	New Basin?	Subbasin Summary TN [mg/L]	Subbasin Summary TP [mg/L]	Basin ID	Basin Area [acres]	DCIA [acres]	DCIA [%]	Basin CN [area weighted
		SMA-12-16	2110	Woodland Pasture	A	39.0	No	0.21	PASTURE	0.21	8.19	0.0064	0.001344	3.51	0.686	0.00472	0.000921984	YES	2.19	0.329	SMA-12-16	277.9		6%	59.3
		SMA-12-16	2110	Improved Pasture	B	61.0	No	4.26	PASTURE	4.26	259.86	0.0324	0.138024	3.51	0.686	0.48446	0.094684464	NO							
		SMA-12-16	2130	Woodland Pasture	A	39.0	No	0.68	PASTURE	0.68	26.52	0.0064	0.004352	3.51	0.686	0.01528	0.002985472	NO							
		SMA-12-16	2130	Improved Pasture	B	61.0	No	0.01	PASTURE	0.01	0.61	0.0324	0.000324	3.51	0.686	0.00114	0.000222264	NO							
		SMA-12-16	2110	Improved Pastures	B	61.0	No	15.39	PASTURE	15.39	938.79	0.0324	0.498636	3.51	0.686	1.75021	0.342064296	NO							
		SMA-12-16	2110	Improved Pasture	B	61.0	No	5.6	PASTURE	5.6	341.6	0.0324	0.18144	3.51	0.686	0.63685	0.12446784	NO							
		SMA-12-16	8140	Roads and Highways	B	89.0	No	0.02	HIGHWAY	0.02	1.78	0.2256	0.004512	1.52	0.2	0.00686	0.0009024	NO							
		SMA-12-16	6400	Vegetated Non-Forested Wetlands	B	98.0	Yes	0.86	WETLAND*	0.86	84.28	0.809	0.69574	1.15	0.055	0.8001	0.0382657	NO						0.9	
		SMA-12-16	2110	Improved Pastures	B	61.0	No	51.02	PASTURE	51.02	3112.22	0.0324	1.653048	3.51	0.686	5.8022	1.133990928	NO							
		SMA-12-16	2110	Improved Pastures	B	61.0	No	3.74	PASTURE	3.74	228.14	0.0324	0.121176	3.51	0.686	0.42533	0.083126736	NO							
		SMA-12-16	6410	Freshwater Marshes	B	98.0	Yes	0.17	WETLAND*	0.17	16.66	0.809	0.13753	1.15	0.055	0.15816	0.00756415	NO						0.2	
		SMA-12-16	6410	Freshwater Marshes	B	98.0	Yes	6.19	WETLAND*	6.19	606.62	0.809	5.00771	1.15	0.055	5.75887	0.27542405	NO						6.2	
		SMA-12-16	6410	Freshwater Marshes	B	98.0	Yes	0.05	WETLAND*	0.05	4.9	0.809	0.04045	1.15	0.055	0.04652	0.00222475	NO						0.1	
		SMA-12-16	5340	Reservoirs less than 10 acres	B	98.0	Yes	0.38	WATER			0.809		0	0			NO						0.4	
		SMA-12-16	5100	Streams and Waterways	B	98.0	Yes	0.07	WATER			0.809		0	0			NO						0.1	
		SMA-12-16	5100	Streams and Waterways	B	98.0	Yes	0.1	WATER			0.809		0	0			NO						0.1	
		SMA-12-16	5100	Streams and Waterways	B	98.0	Yes	1.17	WATER			0.809		0	0			NO						1.2	
		SMA-12-16	2240	Abandoned Citrus Groves	A	32.0	No	1.96	RUDERAL UPLAND PINE*	1.96	62.72	0.0028	0.005488	1.694	0.162	0.0093	0.000889056	NO							
		SMA-12-16	2240	Abandoned Citrus Groves	B	58.0	No	4.36	RUDERAL UPLAND PINE*	4.36	252.88	0.0268	0.116848	1.694	0.162	0.19794	0.018929376	NO							
		SMA-12-16	2110	Improved Pastures	B	61.0	No	6.99	PASTURE	6.99	426.39	0.0324	0.226476	3.51	0.686	0.79493	0.155362536	NO							
		SMA-12-16	2110	Improved Pastures	B	61.0	No	1.96	PASTURE	1.96	119.56	0.0324	0.063504	3.51	0.686	0.2229	0.043563744	NO							
		SMA-12-16	2110	Improved Pastures	B	61.0	No	2.63	PASTURE	2.63	160.43	0.0324	0.085212	3.51	0.686	0.29909	0.058455432	NO							
		SMA-12-16	2110	Improved Pastures	B	61.0	No	17.3	PASTURE	17.3	1055.3	0.0324	0.56052	3.51	0.686	1.96743	0.38451672	NO							
		SMA-12-16	2110	Improved Pasture	B	61.0	No	2.25	PASTURE	2.25	137.25	0.0324	0.0729	3.51	0.686	0.25588	0.0500094	NO							
		SMA-12-16	6410	Freshwater Marshes	B	98.0	Yes	0.49	WETLAND*	0.49	48.02	0.809	0.39641	1.15	0.055	0.45587	0.02180255	NO						0.5	
		SMA-12-16	5100	Streams and Waterways	B	98.0	Yes	0.38	WATER			0.809		0	0			NO						0.4	
		SMA-12-16	5100	Streams and Waterways	B	98.0	Yes	0.75	WATER			0.809		0	0			NO						0.8	
		SMA-12-16	2240	Abandoned Citrus Groves	B	58.0	No	2.17	RUDERAL UPLAND PINE*	2.17	125.86	0.0268	0.058156	1.694	0.162	0.09852	0.009421272	NO							
		SMA-12-16	2240	Abandoned Citrus Groves	B	58.0	No	23.09	RUDERAL UPLAND PINE*	23.09	1339.22	0.0268	0.618812	1.694	0.162	1.04827	0.100247544	NO							
		SMA-12-16	4270	Live Oak	B	55.0	No	2.28	UNDEVELOPED	2.28	125.4	0.022	0.05016	1.288	0.107	0.06461	0.00536712	NO							
		SMA-12-16	2110	Improved Pastures	B	61.0	No	37.37	PASTURE	37.37	2279.57	0.0324	1.210788	3.51	0.686	4.24987	0.830600568	NO							
		SMA-12-16	2110	Improved Pastures	B	61.0	No	6.24	PASTURE	6.24	380.64	0.0324	0.202176	3.51	0.686	0.70964	0.138692736	NO							
		SMA-12-16	2130	Woodland Pasture	B	58.0	No	0.46	PASTURE	0.46	26.68	0.0268	0.012328	3.51	0.686	0.04327	0.008457008	NO							
		SMA-12-16	2110	Improved Pasture	B	61.0	No	0.4	PASTURE	0.4	24.4	0.0324	0.01296	3.51	0.686	0.04549	0.00889056	NO							
		SMA-12-16	2110	Improved Pasture	B	61.0	No	0.04	PASTURE	0.04	2.44	0.0324	0.001296	3.51	0.686	0.00455	0.000889056	NO							
		SMA-12-16	2110	Improved Pasture	B	61.0	No	0.46	PASTURE	0.46	28.06	0.0324	0.014904	3.51	0.686	0.05231	0.010224144	NO							
		SMA-12-16	5340	Reservoirs less than 10 acres	B	98.0	Yes	0.12	WATER			0.809		0	0			NO						0.1	
		SMA-12-16	5340	Reservoirs less than 10 acres	B	98.0	Yes	0.25	WATER			0.809		0	0			NO						0.3	
		SMA-12-16	6410	Freshwater Marshes	B	98.0	Yes	0.23	WETLAND*	0.23	22.54	0.809	0.18607	1.15	0.055	0.21398	0.01023385	NO						0.2	
		SMA-12-16	6410	Freshwater Marshes	B	98.0	Yes	0.08	WETLAND*	0.08	7.84	0.809	0.06472	1.15	0.055	0.07443	0.0035596	NO						0.1	
		SMA-12-16	5100	Streams and Waterways	B	98.0	Yes	0.78	WATER			0.809		0	0			NO						0.8	
		SMA-12-16	5100	Streams and Waterways	B	98.0	Yes	1.02	WATER			0.809		0	0			NO						1.0	
		SMA-12-16	5100	Streams and Waterways	B	98.0	Yes	1.01	WATER			0.809		0	0			NO						1.0	
		SMA-12-16	5100	Streams and Waterways	A	98.0	Yes	0.29	WATER			0.809		0	0			NO						0.3	
		SMA-12-16	5100	Streams and Waterways	B	98.0	Yes	0.75	WATER			0.809		0	0			NO						0.8	
		SMA-12-16	6400	Vegetated Non-Forested Wetlands	B	98.0	Yes	0.57	WETLAND*	0.57	55.86	0.809	0.46113	1.15	0.055	0.5303	0.02536215	NO						0.6	
		SMA-12-16	6400	Vegetated Non-Forested Wetlands	B	98.0	Yes	0.11	WETLAND*	0.11	10.78	0.809	0.08899	1.15	0.055	0.10234	0.00489445	NO						0.1	
		SMA-12-16	2240	Abandoned Citrus Groves	A	32.0	No	1.39	RUDERAL UPLAND PINE*	1.39	44.48	0.0028	0.003892	1.694	0.162	0.00659	0.000630504	NO							
		SMA-12-16	2240	Abandoned Citrus Groves	B	58.0	No	1.19	RUDERAL UPLAND PINE*	1.19	69.02	0.0268	0.031892	1.694	0.162	0.05403	0.005166504	NO							
		SMA-12-16	2240	Abandoned Citrus Groves	A	32.0	No	3.63	RUDERAL UPLAND PINE*	3.63	116.16	0.0028	0.010164	1.694	0.162	0.01722	0.001646568	NO							
		SMA-12-16	2240	Abandoned Citrus Groves	B	58.0	No	20.52	RUDERAL UPLAND PINE*	20.52	1190.16	0.0268	0.549936	1.694	0.162	0.93159	0.089089632	NO							
		SMA-12-16	4270	Live Oak	B	55.0	No	0.01	UNDEVELOPED	0.01	0.55	0.022	0.00022	1.288	0.107	0.00028	0.00002354	NO							
		SMA-12-16	4270	Live Oak	B	55.0	No	4.82	UNDEVELOPED	4.82	265.1	0.022	0.10604	1.288	0.107	0.13658	0.01134628	NO							
		SMA-12-16	2110	Improved Pastures	B	61.0	No	5.66	PASTURE	5.66	345.26	0.0324	0.183384	3.51	0.686	0.64368	0.125801424	NO							
		SMA-12-16	2110	Improved Pastures	B	61.0	No	0.1	PASTURE	0.1	6.1	0.0324	0.00324	3.51	0.686	0.01137	0.00222264	NO							
		SMA-12-16	2110	Improved Pastures	B	61.0	No	0.34	PASTURE	0.34	20.74	0.0324	0.011016	3.51	0.686	0.03867	0.007556976	NO							
		SMA-12-16	4270	Live Oak	B	55.0	No	1.19	UNDEVELOPED	1.19	65.45	0.022	0.02618	1.288	0.107	0.03372	0.00280126	NO							
		SMA-12-16	2110	Improved Pastures	B	61.0	No	3.99	PASTURE	3.99	243.39	0.0324	0.129276	3.51	0.686	0.45376	0.088683336	NO							
		SMA-12-16	2110	Improved Pastures	B	61.0	No	5.1	PASTURE	5.1	311.1	0.0324	0.16524	3.51	0.686	0.57999	0.11335464	NO							
		SMA-12-16	2110	Improved Pastures	B	61.0	No	0.1	PASTURE	0.1	6.1	0.0324	0.00324	3.51	0.686	0.01137	0.00222264	NO							
		SMA-12-16	2110	Improved Pastures	B	61.0	No	0.43	PASTURE	0.43	26.23	0.0324	0.013932	3.51	0.686	0.0489	0.009557352	NO							
		SMA-12-16	2110	Improved Pastures	B	61.0	No	0.44	PASTURE	0.44	26.84	0.0324	0.014256	3.51	0.686	0.05004	0.009779616	NO							
		SMA-12-16	2110	Improved Pastures	B	61.0	No	4.34	PASTURE	4.34	264.74	0.0324	0.140616	3.51	0.686	0.49356	0.096462576	NO							
		SMA-12-16	2110	Improved Pastures	B	61.0	No	7.46	PASTURE	7.46	455.06	0.0324	0.241704	3.51	0.686	0.84838	0.165808944	NO							
		SMA-12-16	2110	Improved Pastures	B	61.0	No	7.96	PASTURE	7.96	485.56	0.0324	0.257904	3.51	0.686	0.90524	0.176922144	NO							
		SMA-12-16	2110	Improved Pastures	B	61.0	No	0.5	PASTURE	0.5	30.5	0.0324	0.0162	3.51	0.686	0.05686	0.0111132	NO							
		SMA-12-16	4270	Live Oak	B	55.0	No	1.76	UNDEVELOPED	1.76	96.8	0.022	0.03872	1.288	0.107	0.04987	0.00414304	NO							
		SMA-12-16	4270	Live Oak	B	55.0	No	0.28	UNDEVELOPED	0.28	15.4	0.022	0.00616	1.288	0.107	0.00793	0.00065912	NO							
		SMA-2-3	6410	Freshwater Marshes	D	98.0	Yes	2.65	WETLAND*	2.65	259.7	0.809	2.14385	1.15	0.055	2.46543	0.11791175	YES	2.69	0.467	SMA-2-3	42.8	2.7	7%	80.0
		SMA-2-3	6172	Mixed Shrubs	D	98.0	Yes	0.23	WET PRAIRIE*	0.23	22.54	0.809	0.18607	1.095	0.015	0.20375	0.00279105	NO						0.2	
		SMA-2-3	2110	Improved Pastures	D	80.0	No	39.89	PASTURE	39.89	3191.2	0.111	4.42779	3.51	0.686	15.5415	3.03746394	NO							
		SMA-1	2110	Improved Pasture	D	80.0	No	82.3	PASTURE	82.3	6584	0.111	9.1353	3.51	0.686	32.0649	6.2668158	YES	2.19	0.331	SMA-1	106.0		15%	78.9
		SMA-1	2210	Citrus Grove	D	80.0	No	2.7	AG - CITRUS	2.7	216	0.111	0.2997	2.24	0.183	0.67133	0.0548451	NO							
		SMA-1	6170	Mixed Wetland Hardwoods	D	98.0	Yes	1.7	WETLAND*	1.7	166.6	0.809	1.3753	1.15	0.055	1.5816	0.0756415	NO						1.7	
		SMA-1	6410	Freshwater Marshes	D	98.0	Yes	12.1	WETLAND*	12.1	1185.8	0.809	9.7889	1.15	0.055	11.2572	0.5383895	NO						12.1	
		SMA-1	6430	Wet Prairie	D	98.0	Yes	0.1	WET PRAIRIE*	0.1	9.8	0.809	0.0809	1.095	0.015	0.08859	0.0012135	NO						0.1	
		SMA-1	5100	Streams and Waterways	D	98.0	Yes	1.5	WATER			0.809		0	0			NO						1.5	
		SMA-1	6410	Freshwater Marshes	D	98.0	Yes	0.24	WETLAND*	0.24	23.52	0.809	0.19416	1.15	0.055	0.22328	0.0106788	NO						0.2	
		SMA-1	2100	Improved Pastures	D	61.0	No	5.4	UNDEVELOPED	5.4	329.4	0.0324	0.17496	1.288	0.107	0.22535	0.01872072	NO							

Post-Development EMC Calculation Table

EMC Overwrite TN [mg/L]	EMC Overwrite TP [mg/L]	Basin ID	FLUCCSCODE	FLUCSDESC	HYDROG RP	CN	DCIA [Yes/No]	Area [acres]	Compressed Land Use	Area [acres] (for CN	CN*Area	C	C*Area	EMC's Based on TN [mg/L]	EMC's Based on TP [mg/L]	C*Area* TN_{EMC}	C*Area* TP_{EMC}	New Basin?	Subbasin Summary TN [mg/L]	Subbasin Summary TP [mg/L]	Basin ID	Basin Area [acres]	DCIA [acres]	DCIA [%]	Basin CN [area weighted
		SMA-12-16	2110	Woodland Pasture	A	39.0	No	0.21	PASTURE	0.21	8.19	0.0064	0.00134	3.51	0.686	0.00472	0.00092	YES	1.93	0.323	SMA-12-16	277.9		30%	80.8
		SMA-12-16	2110	Improved Pasture	B	61.0	No	4.26	PASTURE	4.26	259.86	0.0324	0.13802	3.51	0.686	0.48446	0.09468	NO							
		SMA-12-16	2130	Woodland Pasture	A	39.0	No	0.68	PASTURE	0.68	26.52	0.0064	0.00435	3.51	0.686	0.01528	0.00299	NO							
		SMA-12-16	2130	Improved Pasture	B	61.0	No	0.01	PASTURE	0.01	0.61	0.0324	0.00032	3.51	0.686	0.00114	0.00022	NO							
		SMA-12-16	1210	Residential (70%)	B	86.0	Yes	0.38	SINGLE FAMILY RES	0.38	32.68	0.809	0.30742	2.07	0.327	0.63636	0.10053	NO					0.4		
		SMA-12-16	1210		B	86.0	No	6.45	SINGLE FAMILY RES	6.45	554.7	0.1764	1.13778	2.07	0.327	2.3552	0.37205	NO							
		SMA-12-16	1210	Residential (60%)	B	82.0	Yes	0.16	SINGLE FAMILY RES	0.16	13.12	0.809	0.12944	2.07	0.327	0.26794	0.04233	NO					0.2		
		SMA-12-16	1210		B	82.0	No	2.01	SINGLE FAMILY RES	2.01	164.82	0.1306	0.26251	2.07	0.327	0.54339	0.08584	NO							
		SMA-12-16	1210	50' R/W (72%)	B	81.0	Yes	0.52	SINGLE FAMILY RES	0.52	42.12	0.809	0.42068	2.07	0.327	0.87081	0.13756	NO					0.5		
		SMA-12-16	1210		B	81.0	No	0.88	SINGLE FAMILY RES	0.88	71.28	0.1208	0.1063	2.07	0.327	0.22005	0.03476	NO							
		SMA-12-16	1210	60' R/W (77%)	B	83.0	Yes	0.43	SINGLE FAMILY RES	0.43	35.69	0.809	0.34787	2.07	0.327	0.72009	0.11375	NO					0.4		
		SMA-12-16	1210		B	83.0	No	0.58	SINGLE FAMILY RES	0.58	48.14	0.1404	0.08143	2.07	0.327	0.16856	0.02663	NO							
		SMA-12-16	1210	Alley (100%)	B	98.0	Yes	0.31	SINGLE FAMILY RES	0.31	30.38	0.809	0.25079	2.07	0.327	0.51914	0.08201	NO					0.3		
		SMA-12-16	1900	Open Space (Good)	B	61.0	No	1.51	UNDEVELOPED	1.51	92.11	0.0324	0.04892	1.288	0.107	0.06301	0.00523	NO							
		SMA-12-16	8370	Water Surface	B	98.0	Yes	2.16	WATER			0.809		0	0			NO					2.2		
		SMA-12-16	1210	Residential (70%)	B	86.0	Yes	1.2	SINGLE FAMILY RES	1.2	103.2	0.809	0.9708	2.07	0.327	2.00956	0.31745	NO					1.2		
		SMA-12-16	1210		B	86.0	No	20.3	SINGLE FAMILY RES	20.3	1745.8	0.1764	3.58092	2.07	0.327	7.4125	1.17096	NO							
		SMA-12-16	1210	Residential (60%)	B	82.0	Yes	0.58	SINGLE FAMILY RES	0.58	47.56	0.809	0.46922	2.07	0.327	0.97129	0.15343	NO					0.6		
		SMA-12-16	1210		B	82.0	No	7.43	SINGLE FAMILY RES	7.43	609.26	0.1306	0.97036	2.07	0.327	2.00864	0.31731	NO							
		SMA-12-16	1400	Civ-Com-Multi (80%)	B	86.0	Yes	0.97	HIGH INTENSITY COMMERCI	0.97	83.42	0.809	0.78473	2.4	0.345	1.88335	0.27073	NO					1.0		
		SMA-12-16	1400		B	86.0	No	1.46	HIGH INTENSITY COMMERCI	1.46	125.56	0.1764	0.25754	2.4	0.345	0.61811	0.08885	NO							
		SMA-12-16	1850	Park (25%)	B	68.0	Yes	0.18	AVERAGE OF MFR+UNDEVEL	0.18	12.24	0.809	0.14562	2.32	0.52	0.33784	0.07572	NO					0.2		
		SMA-12-16	1850		B	68.0	No	2.65	AVERAGE OF MFR+UNDEVEL	2.65	180.2	0.051	0.13515	2.32	0.52	0.31355	0.07028	NO							
		SMA-12-16	1210	50' R/W (72%)	B	81.0	Yes	1.91	SINGLE FAMILY RES	1.91	154.71	0.809	1.54519	2.07	0.327	3.19854	0.50528	NO					1.9		
		SMA-12-16	1210		B	81.0	No	3.2	SINGLE FAMILY RES	3.2	259.2	0.1208	0.38656	2.07	0.327	0.80018	0.12641	NO							
		SMA-12-16	1210	60' R/W (77%)	B	83.0	Yes	1.11E+00	SINGLE FAMILY RES	1.11	92.13	0.809	0.89799	2.07	0.327	1.85884	0.29364	NO					1.1		
		SMA-12-16	1210		B	83.0	No	1.5	SINGLE FAMILY RES	1.5	124.5	0.1404	0.2106	2.07	0.327	0.43594	0.06887	NO							
		SMA-12-16	1210	80' R/W (82.5%)	B	85.0	Yes	0.89	SINGLE FAMILY RES	0.89	75.65	0.809	0.72001	2.07	0.327	1.49042	0.23544	NO					0.9		
		SMA-12-16	1210		B	85.0	No	0.93	SINGLE FAMILY RES	0.93	79.05	0.16	0.1488	2.07	0.327	0.30802	0.04866	NO							
		SMA-12-16	1210	Friar's Cove Road (82.5%)	B	85.0	Yes	2.74	SINGLE FAMILY RES	2.74	232.9	0.809	2.21666	2.07	0.327	4.58849	0.72485	NO					2.7		
		SMA-12-16	1210		B	85.0	No	2.89	SINGLE FAMILY RES	2.89	245.65	0.16	0.4624	2.07	0.327	0.95717	0.1512	NO							
		SMA-12-16	1210	Alley (100%)	B	98.0	Yes	0.92	SINGLE FAMILY RES	0.92	90.16	0.809	0.74428	2.07	0.327	1.54066	0.24338	NO					0.9		
		SMA-12-16	1900	Open Space (Good)	B	61.0	No	2.47	UNDEVELOPED	2.47	150.67	0.0324	0.08003	1.288	0.107	0.10308	0.00856	NO							
		SMA-12-16	8370	Water Surface	B	98.0	Yes	7.91	WATER			0.809		0	0			NO					7.9		
		SMA-12-16	1210	Residential (70%)	A	79.0	Yes	0.05	SINGLE FAMILY RES	0.05	3.95	0.809	0.04045	2.07	0.327	0.08373	0.01323	NO					0.1		
		SMA-12-16	1210		A	79.0	No	0.88	SINGLE FAMILY RES	0.88	69.52	0.1046	0.09205	2.07	0.327	0.19054	0.0301	NO							
		SMA-12-16	1210		B	86.0	Yes	0.93	SINGLE FAMILY RES	0.93	79.98	0.809	0.75237	2.07	0.327	1.55741	0.24602	NO					0.9		
		SMA-12-16	1210		B	86.0	No	15.61	SINGLE FAMILY RES	15.61	1342.46	0.1764	2.7536	2.07	0.327	5.69996	0.90043	NO							
		SMA-12-16	1330	Residential (65%)	B	84.0	Yes	0.22	MULTI FAMILY RES	0.22	18.48	0.809	0.17798	2.32	0.52	0.41291	0.09255	NO					0.2		
		SMA-12-16	1330		B	84.0	No	3.6	MULTI FAMILY RES	3.6	302.4	0.1502	0.54072	2.32	0.52	1.25447	0.28117	NO							
		SMA-12-16	1210	Residential (60%)	A	73.0	Yes	0.05	SINGLE FAMILY RES	0.05	3.65	0.809	0.04045	2.07	0.327	0.08373	0.01323	NO					0.1		
		SMA-12-16	1210		A	73.0	No	0.67	SINGLE FAMILY RES	0.67	48.91	0.0702	0.04703	2.07	0.327	0.09736	0.01538	NO							
		SMA-12-16	1210		B	82.0	Yes	0.07	SINGLE FAMILY RES	0.07	5.74	0.809	0.05663	2.07	0.327	0.11722	0.01852	NO					0.1		
		SMA-12-16	1210		B	82.0	No	0.96	SINGLE FAMILY RES	0.96	78.72	0.1306	0.12538	2.07	0.327	0.25953	0.041	NO							
		SMA-12-16	1400	Civ-Com-Multi (80%)	B	86.0	Yes	0.75	HIGH INTENSITY COMMERCI	0.75	64.5	0.809	0.60675	2.4	0.345	1.4562	0.20933	NO					0.8		
		SMA-12-16	1400		B	86.0	No	1.12	HIGH INTENSITY COMMERCI	1.12	96.32	0.1764	0.19757	2.4	0.345	0.47416	0.06816	NO							
		SMA-12-16	1850	Park (25%)	B	68.0	Yes	0.21	AVERAGE OF MFR+UNDEVEL	0.21	14.28	0.809	0.16989	2.32	0.52	0.39414	0.08834	NO					0.2		
		SMA-12-16	1850		B	68.0	No	3.17	AVERAGE OF MFR+UNDEVEL	3.17	215.56	0.051	0.16167	2.32	0.52	0.37507	0.08407	NO							
		SMA-12-16	1210	50' R/W (72%)	B	81.0	Yes	2.1	SINGLE FAMILY RES	2.1	170.1	0.809	1.6989	2.07	0.327	3.51672	0.55554	NO					2.1		
		SMA-12-16	1210		B	81.0	No	3.51E+00	SINGLE FAMILY RES	3.51	284.31	0.1208	0.42401	2.07	0.327	0.8777	0.13865	NO							
		SMA-12-16	1210	60' R/W (77%)	A	74.0	Yes	0.1	SINGLE FAMILY RES	0.1	7.4	0.809	0.0809	2.07	0.327	0.16746	0.02645	NO					0.1		
		SMA-12-16	1210		A	74.0	No	0.13	SINGLE FAMILY RES	0.13	9.62	0.0746	0.0097	2.07	0.327	0.02007	0.00317	NO							
		SMA-12-16	1210		B	83.0	Yes	0.77	SINGLE FAMILY RES	0.77	63.91	0.809	0.62293	2.07	0.327	1.28947	0.2037	NO					0.8		
		SMA-12-16	1210		B	83.0	No	1.05	SINGLE FAMILY RES	1.05	87.15	0.1404	0.14742	2.07	0.327	0.30516	0.04821	NO							
		SMA-12-16	1210	Alley (100%)	A	98.0	Yes	0.08	SINGLE FAMILY RES	0.08	7.84	0.809	0.06472	2.07	0.327	0.13397	0.02116	NO					0.1		
		SMA-12-16	1210		B	98.0	Yes	0.55	SINGLE FAMILY RES	0.55	53.9	0.809	0.44495	2.07	0.327	0.92105	0.1455	NO					0.6		
		SMA-12-16	1900	Open Space (Good)	B	61.0	No	1.9	UNDEVELOPED	1.9	115.9	0.0324	0.06156	1.288	0.107	0.07929	0.00659	NO							
		SMA-12-16	8370	Water Surface	B	98.0	Yes	4.85	WATER			0.809		0				NO					4.9		
		SMA-12-16	1210	Residential (70%)	B	86.0	Yes	0.87	SINGLE FAMILY RES	0.87	74.82	0.809	0.70383	2.07	0.327	1.45693	0.23015	NO					0.9		
		SMA-12-16	1210		B	86.0	No	14.71	SINGLE FAMILY RES	14.71	1265.06	0.1764	2.59484	2.07	0.327	5.37133	0.84851	NO							
		SMA-12-16	1330	Residential (65%)	B	84.0	Yes	0.43	MULTI FAMILY RES	0.43	36.12	0.809	0.34787	2.32	0.52	0.80706	0.18089	NO					0.4		
		SMA-12-16	1330		B	84.0	No	6.93	MULTI FAMILY RES	6.93	582.12	0.1502	1.04089	2.32	0.52	2.41486	0.54126	NO							
		SMA-12-16	1210	Residential (60%)	B	82.0	Yes	0.32	SINGLE FAMILY RES	0.32	26.24	0.809	0.25888	2.07	0.327	0.53588	0.08465	NO					0.3		
		SMA-12-16	1210		B	82.0	No	4.08	SINGLE FAMILY RES	4.08	334.56	0.1306	0.53285	2.07	0.327	1.103	0.17424	NO							
		SMA-12-16	1710	Civ-Com-Multi (80%)	B	86.0	Yes	5.73	LOW INTENSITY COMMERCI	5.73	492.78	0.809	4.63557	1.13	0.188	5.23819	0.87149	NO					5.7		
		SMA-12-16	1710		B	86.0	No	8.59	LOW INTENSITY COMMERCI	8.59	738.74	0.1764	1.51528	1.13	0.188	1.71226	0.28487	NO							
		SMA-12-16	1850	Park (25%)	B	68.0	Yes	0.29	AVERAGE OF MFR+UNDEVEL	0.29	19.72	0.809	0.23461	2.32	0.52	0.5443	0.122	NO					0.3		
		SMA-12-16	1850		B	68.0	No	4.31	AVERAGE OF MFR+UNDEVEL	4.31	293.08	0.051	0.21981	2.32	0.52	0.50996	0.1143	NO							
		SMA-12-16	1210	50' R/W (72%)	B	81.0	Yes	1.33	SINGLE FAMILY RES	1.33	107.73	0.809	1.07597	2.07	0.327	2.22726	0.35184	NO					1.3		
		SMA-12-16	1210		B	81.0	No	2.22	SINGLE FAMILY RES	2.22	179.82	0.1208	0.26818	2.07	0.327	0.55512	0.08769	NO							
		SMA-12-16	1210	60' R/W (77%)	B	83.0	Yes	0.78	SINGLE FAMILY RES	0.78	64.74	0.809	0.63102	2.07	0.327	1.30621	0.20634	NO					0.8		
		SMA-12-16	1210		B	83.0	No	1.05	SINGLE FAMILY RES	1.05	87.15	0.1404	0.14742	2.07	0.327	0.30516	0.04821	NO							
		SMA-12-16	1210	80' R/W (82.5%)	B	85.0	Yes	0.8	SINGLE FAMILY RES	0.8	68	0.809	0.6472	2.07	0.327	1.3397	0.21163	NO					0.8		
		SMA-12-16	1210		B	85.0	No	0.84	SINGLE FAMILY RES	0.84	71.4	0.16	0.1344	2.07	0.327	0.27821	0.04395	NO							
		SMA-12-16	1210	Friar's Cove Road (82.5%)	B	85.0	Yes	1.21	SINGLE FAMILY RES	1.21	102.85	0.809	0.97889	2.07	0.327	2.0263	0.3201	NO					1.2		
		SMA-12-16	1210		B	85.0	No	1.28	SINGLE FAMILY RES	1.28	108.8	0.16	0.2048	2.07	0.327	0.42394	0.06697	NO							
		SMA-12-16	1210	132' R/W (70%)	B	81.0	Yes	2.59	SINGLE FAMILY RES	2.59	209.79	0.809	2.09531	2.07	0.327	4.33729	0.68517	NO					2.6		
		SMA-12-16	1210		B	81.0	No	4.82	SINGLE FAMILY RES	4.82	390.42	0.1208	0.58226	2.07	0.327	1.20527	0.1904	NO							
		SMA-12-16	1210	Alley (100%)	B	98.0	Yes	1.21	SINGLE FAMILY RES	1.21	118.58	0.809	0.97889	2.07	0.327	2.0263	0.3201	NO					1.2		
		SMA-12-16	1900	Open Space (Good)	B	61.0	No	2.5	UNDEVELOPED	2.5	152.5	0.0324	0.081	1.288	0.107	0.10433	0.00867	NO							
		SMA-12-16	8370	Water Surface	B	98.0	Yes	8.13	WATER			0.809		0	0			NO					8.1		
		SMA-12-16	1210	Residential (70%)	B	86.0	Yes	0.73	SINGLE FAMILY RES	0.73	62.78	0.809	0.59057	2.07	0.327	1.22248	0.19312	NO					0.7		
		SMA-12-16	1210		B	86.0	No	12.27	SINGLE FAMILY RES	12.27	1055.22	0.1764	2.16443	2.07	0.327	4.48037	0.70777	NO							
		SMA-12-16	1330	Residential (65%)	B	84.0	Yes	0.32	MULTI FAMILY RES	0.32	26.88	0.809	0.25888	2.32	0.52	0.6006	0.13462	NO					0.3		
		SMA-12-16	1330		B	84.0	No	5.15	MULTI FAMILY RES	5.15	432.6	0.1502	0.77353	2.32	0.52	1.79459	0.40224	NO							
		SMA-12-16	1210	Residential (60%)	A	73.0	Yes	5.00E-02	SINGLE FAMILY RES	0.05	3.65	0.809	0.04045	2.07	0.327	0.08373	0.01323	NO					0.1		
		SMA-12-16	1210		A	73.0	No	0.62	SINGLE FAMILY RES	0.62	45.26	0.0702	0.04352	2.07	0.327	0.09009	0.01423	NO							
		SMA-12-16	1210		B	82.0	Yes	0.04	SINGLE FAMILY RES	0.04	3.28	0.809	0.03236	2.07	0.327	0.06699	0.01058	NO					0.0		
		SMA-12-16	1210		B	82.0	No	0.51	SINGLE FAMILY RES	0.51	41.82	0.1306	0.06661	2.07	0.327	0.13787	0.02178	NO							

	SMA-12-16	1330	Civ-Com-Multi (80%)	A	78.0	Yes	0.42	MULTI FAMILY RES	0.42	32.76	0.809	0.33978	2.32	0.52	0.78829	0.17669	NO					0.4							
	SMA-12-16	1330		A	78.0	No	0.63	MULTI FAMILY RES	0.63	49.14	0.0982	0.06187	2.32	0.52	0.14353	0.03217	NO												
	SMA-12-16	1330		B	86.0	Yes	2.26	MULTI FAMILY RES	2.26	194.36	0.809	1.82834	2.32	0.52	4.24175	0.95074	NO					2.3							
	SMA-12-16	1330		B	86.0	No	3.39	MULTI FAMILY RES	3.39	291.54	0.1764	0.598	2.32	0.52	1.38735	0.31096	NO												
	SMA-12-16	1710		A	78.0	Yes	0.62	LOW INTENSITY COMMERCIA	0.62	48.36	0.809	0.50158	1.13	0.188	0.56679	0.0943	NO					0.6							
	SMA-12-16	1710		A	78.0	No	0.93	LOW INTENSITY COMMERCIA	0.93	72.54	0.0982	0.09133	1.13	0.188	0.1032	0.01717	NO												
	SMA-12-16	1710		B	86.0	Yes	5.48	LOW INTENSITY COMMERCIA	5.48	471.28	0.809	4.43332	1.13	0.188	5.00965	0.83346	NO					5.5							
	SMA-12-16	1710		B	86.0	No	8.21	LOW INTENSITY COMMERCIA	8.21	706.06	0.1764	1.44824	1.13	0.188	1.63652	0.27227	NO												
	SMA-12-16	1850	Park (25%)	B	68.0	Yes	0.41	AVERAGE OF MFR+UNDEVEL	0.41	27.88	0.809	0.33169	2.32	0.52	0.76952	0.17248	NO					0.4							
	SMA-12-16	1850		B	68.0	No	6.22	AVERAGE OF MFR+UNDEVEL	6.22	422.96	0.051	0.31722	2.32	0.52	0.73595	0.16495	NO												
	SMA-12-16	1210	50' R/W (72%)	A	72.0	Yes	0.03	SINGLE FAMILY RES	0.03	2.16	0.809	0.02427	2.07	0.327	0.05024	0.00794	NO					0.0							
	SMA-12-16	1210		A	72.0	No	0.04	SINGLE FAMILY RES	0.04	2.88	0.0658	0.00263	2.07	0.327	0.00545	0.00086	NO												
	SMA-12-16	1210		B	81.0	Yes	1.1	SINGLE FAMILY RES	1.1	89.1	0.809	0.8899	2.07	0.327	1.84209	0.291	NO					1.1							
	SMA-12-16	1210		B	81.0	No	1.83	SINGLE FAMILY RES	1.83	148.23	0.1208	0.22106	2.07	0.327	0.4576	0.07229	NO												
	SMA-12-16	1210	60' R/W (77%)	B	83.0	Yes	0.69	SINGLE FAMILY RES	0.69	57.27	0.809	0.55821	2.07	0.327	1.15549	0.18253	NO					0.7							
	SMA-12-16	1210		B	83.0	No	0.94	SINGLE FAMILY RES	0.94	78.02	0.1404	0.13198	2.07	0.327	0.27319	0.04316	NO												
	SMA-12-16	1210	80' R/W (82.5%)	A	78.0	Yes	0.17	SINGLE FAMILY RES	0.17	13.26	0.809	0.13753	2.07	0.327	0.28469	0.04497	NO					0.2							
	SMA-12-16	1210		A	78.0	No	0.17	SINGLE FAMILY RES	0.17	13.26	0.0982	0.01669	2.07	0.327	0.03456	0.00546	NO												
	SMA-12-16	1210		B	85.0	Yes	3.04	SINGLE FAMILY RES	3.04	258.4	0.809	2.45936	2.07	0.327	5.09088	0.80421	NO					3.0							
	SMA-12-16	1210		B	85.0	No	3.21	SINGLE FAMILY RES	3.21	272.85	0.16	0.5136	2.07	0.327	1.06315	0.16795	NO												
	SMA-12-16	1210	Friar's Cove Road (82.5%)	B	85.0	Yes	0.83	SINGLE FAMILY RES	0.83	70.55	0.809	0.67147	2.07	0.327	1.38994	0.21957	NO					0.8							
	SMA-12-16	1210		B	85.0	No	0.88	SINGLE FAMILY RES	0.88	74.8	0.16	0.1408	2.07	0.327	0.29146	0.04604	NO												
	SMA-12-16	1210	132' R/W (70%)	A	71.0	Yes	0.57	SINGLE FAMILY RES	0.57	40.47	0.809	0.46113	2.07	0.327	0.95454	0.15079	NO					0.6							
	SMA-12-16	1210		A	71.0	No	1.06	SINGLE FAMILY RES	1.06	75.26	0.0614	0.06508	2.07	0.327	0.13472	0.02128	NO												
	SMA-12-16	1210		B	81.0	Yes	0.43	SINGLE FAMILY RES	0.43	34.83	0.809	0.34787	2.07	0.327	0.72009	0.11375	NO					0.4							
	SMA-12-16	1210		B	81.0	No	0.81	SINGLE FAMILY RES	0.81	65.61	0.1208	0.09785	2.07	0.327	0.20255	0.032	NO												
	SMA-12-16	1210	Alley (100%)	B	98.0	Yes	0.77	SINGLE FAMILY RES	0.77	75.46	0.809	0.62293	2.07	0.327	1.28947	0.2037	NO					0.8							
	SMA-12-16	1900	Open Space (Good)	B	61.0	No	3.53	UNDEVELOPED	3.53	215.33	0.0324	0.11437	1.288	0.107	0.14731	0.01224	NO												
	SMA-12-16	8370	Water Surface	B	98.0	Yes	9.4	WATER			0.809		0	0			NO					9.4							
	SMA-2-3	1210	Residential (70%)	D	92.0	Yes	0.92	SINGLE FAMILY RES	0.92	84.64	0.809	0.74428	2.07	0.327	1.54066	0.24338	YES	2.04	0.319	SMA-2-3	42.8	0.9	32%	89.8				
	SMA-2-3	1210		D	92.0	No	15.43	SINGLE FAMILY RES	15.43	1419.56	0.3068	4.73392	2.07	0.327	9.79922	1.54799	NO												
	SMA-2-3	1210	Residential (60%)	D	90.0	Yes	0.45	SINGLE FAMILY RES	0.45	40.5	0.809	0.36405	2.07	0.327	0.75358	0.11904	NO					0.5							
	SMA-2-3	1210		D	90.0	No	5.83	SINGLE FAMILY RES	5.83	524.7	0.242	1.41086	2.07	0.327	2.92048	0.46135	NO												
	SMA-2-3	1210	50' R/W (72%)	D	90.0	Yes	1.51	SINGLE FAMILY RES	1.51	135.9	0.809	1.22159	2.07	0.327	2.52869	0.39946	NO					1.5							
	SMA-2-3	1210		D	90.0	No	2.52	SINGLE FAMILY RES	2.52	226.8	0.242	0.60984	2.07	0.327	1.26237	0.19942	NO												
	SMA-2-3	1210	60' R/W (77%)	D	91.0	Yes	0.06	SINGLE FAMILY RES	0.06	5.46	0.809	0.04854	2.07	0.327	0.10048	0.01587	NO					0.1							
	SMA-2-3	1210		D	91.0	No	0.09	SINGLE FAMILY RES	0.09	8.19	0.2744	0.0247	2.07	0.327	0.05112	0.00808	NO												
	SMA-2-3	1210	80' R/W (82.5%)	D	92.0	Yes	1.19	SINGLE FAMILY RES	1.19	109.48	0.809	0.96271	2.07	0.327	1.99281	0.31481	NO					1.2							
	SMA-2-3	1210		D	92.0	No	1.26	SINGLE FAMILY RES	1.26	115.92	0.3068	0.38657	2.07	0.327	0.8002	0.12641	NO												
	SMA-2-3	1210	Alley (100%)	D	98.0	Yes	0.61	SINGLE FAMILY RES	0.61	59.78	0.809	0.49349	2.07	0.327	1.02152	0.16137	NO					0.6							
	SMA-2-3	1900	Open Space (Good)	D	80.0	No	4	UNDEVELOPED	4	320	0.111	0.444	1.288	0.107	0.57187	0.04751	NO												
	SMA-2-3	1850	Park (25%)	D	84.0	Yes	0.01	AVERAGE OF MFR+UNDEVEL	0.01	0.84	0.809	0.00809	2.32	0.52	0.01877	0.00421	NO					0.0							
	SMA-2-3	1850	Park (25%)	D	84.0	No	0.08	AVERAGE OF MFR+UNDEVEL	0.08	6.72	0.1502	0.01202	2.32	0.52	0.02788	0.00625	NO												
	SMA-2-3	8370	Water Surface	D	98.0	Yes	8.81	WATER			0.809		0	0			NO					8.8							
	SMA-1	1210	Residential (70%)	D	92.0	Yes	0.85	SINGLE FAMILY RES	0.85	78.2	0.809	0.68765	2.07	0.327	1.42344	0.22486	YES	2.21	0.433	SMA-1	106.0	0.9	53%	88.1				
	SMA-1	1210		D	92.0	No	10.97	SINGLE FAMILY RES	10.97	1009.24	0.3068	3.3656	2.07	0.327	6.96678	1.10055	NO												
	SMA-1	1330	Civ-Com-Multi (80%)	D	92.0	Yes	9.7	MULTI FAMILY RES	9.7	892.4	0.809	7.8473	2.32	0.52	18.2057	4.0806	NO					9.7							
	SMA-1	1330		D	92.0	No	14.56	MULTI FAMILY RES	14.56	1339.52	0.3068	4.46701	2.32	0.52	10.3635	2.32284	NO												
	SMA-1	1340	Condominiums (70%)	D	82.0	Yes	5.94	MULTI FAMILY RES	5.94	487.08	0.809	4.80546	2.32	0.52	11.1487	2.49884	NO					5.9							
	SMA-1	1340		D	82.0	No	2.99	MULTI FAMILY RES	2.99	245.18	0.1306	0.39049	2.32	0.52	0.90595	0.20306	NO												
	SMA-1	1850	Park (25%)	D	84.0	Yes	0.56	AVERAGE OF MFR+UNDEVEL	0.56	47.04	0.809	0.45304	2.32	0.52	1.05105	0.23558	NO					0.6							
	SMA-1	1850		D	84.0	No	8.44	AVERAGE OF MFR+UNDEVEL	8.44	708.96	0.1502	1.26769	2.32	0.52	2.94104	0.6592	NO												
	SMA-1	1900	Open Space (Good)	D	80.0	No	6.55	UNDEVELOPED	6.55	524	0.111	0.72705	1.288	0.107	0.93644	0.07779	NO												
	SMA-1	1210	50' R/W (72%)	D	90.0	Yes	0.84	SINGLE FAMILY RES	0.84	75.6	0.809	0.67956	2.07	0.327	1.40669	0.22222	NO					0.8							
	SMA-1	1210		D	90.0	No	1.4	SINGLE FAMILY RES	1.4	126	0.242	0.3388	2.07	0.327	0.70132	0.11079	NO												
	SMA-1	1210	80' R/W (82.5%)	D	92.0	Yes	2.45	SINGLE FAMILY RES	2.45	225.4	0.809	1.98205	2.07	0.327	4.10284	0.64813	NO					2.5							
	SMA-1	1210		D	92.0	No	2.58	SINGLE FAMILY RES	2.58	237.36	0.3068	0.79154	2.07	0.327	1.6385	0.25883	NO												
	SMA-1	1210	Friar's Cove Road (82.5%)	D	92.0	Yes	0.08	SINGLE FAMILY RES	0.08	7.36	0.809	0.06472	2.07	0.327	0.13397	0.02116	NO					0.1							
	SMA-1	1210		D	92.0	No	0.08	SINGLE FAMILY RES	0.08	7.36	0.3068	0.02454	2.07	0.327	0.05081	0.00803	NO												
	SMA-1	1210	60' R/W (77%)	D	91.0	Yes	0.47	SINGLE FAMILY RES	0.47	42.77	0.809	0.38023	2.07	0.327	0.78708	0.12434	NO					0.5							
	SMA-1	1210		D	91.0	No	0.65	SINGLE FAMILY RES	0.65	59.15	0.2744	0.17836	2.07	0.327	0.36921	0.05832	NO												
	SMA-1	8370	Water Surface	D	98.0	Yes	29.78	WATER			0.809		0	0			NO					29.8							
	SMA-1	1210	Residential (60%)	D	98.0	Yes	0.01	SINGLE FAMILY RES	0.01	0.98	0.809	0.00809	2.07	0.327	0.01675	0.00265	NO					0.0							
	SMA-1	1210		D	90.0	No	0.19	SINGLE FAMILY RES	0.19	17.1	0.242	0.04598	2.07	0.327	0.09518	0.01504	NO												
	SMA-1	1900	Access Easement	D	85.0	Yes	1.12	UNDEVELOPED	1.12	95.2	0.809	0.90608	1.288	0.107	1.16703	0.09695	NO					1.1							
	SMA-1	8370	Water Surface	D	98.0	Yes	1.35	WATER			0.809		0	0			NO					1.4							
	SMA-1	1900	Open Space (Good)	D	80.0	No	0.46	UNDEVELOPED	0.46	36.8	0.111	0.05106	1.288	0.107	0.06577	0.00546	NO												
	SMA-1	1400	Marina (80%)	D	85.0	Yes	2.87	HIGH INTENSITY COMMERCI	2.87	243.95	0.809	2.32183	2.4	0.345	5.57239	0.80103	NO					2.9							
	SMA-1	1400		D	85.0	No	1.11	HIGH INTENSITY COMMERCI	1.11	94.35	0.16	0.1776	2.4	0.345	0.42624	0.06127	NO												

Summary							
Basin ID	Basin Area [acres]	Pre-Development					
		TN [mg/L]	TP [mg/L]	CN	DCIA %	TN [mg/L]	TP [mg/L]
SMA-12-16	277.9	2.19	0.329	59.3	6%	1.93	0.323
SMA-2-3	42.8	2.69	0.467	80.0	7%	2.04	0.319
SMA-1	106.0	2.19	0.331	78.9	15%	2.21	0.433

WET DETENTION / MANAGED AQUATIC PLANTS: 6/17/2021 V 8.6

Blue Numbers =	Input data
Red Numbers =	Calculated or Carryover

Also called: FLOATING ISLANDS and includes a wet detention pond: **Fontana (SMA-1-3&12-16)**

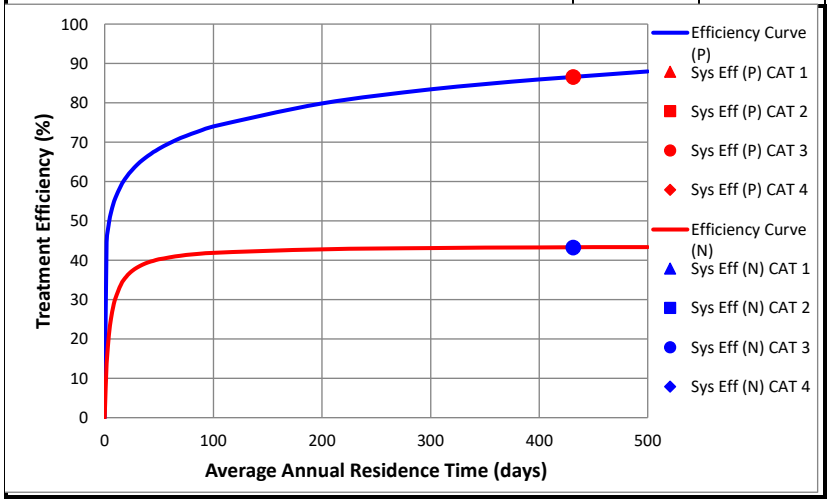
GO TO STORMWATER TREATMENT ANALYSIS

	SMA-12-16	SMA-2&3	SMA-1	Catchment 4	
Total pre-development catchment area:	277.900	42.750	106.000	0.000	ac
Total post-development catchment area:	277.900	42.750	106.000	0.000	ac
Average annual residence time (between 1 and 500 days)			431.00		days
Littoral Zone or other improvements used?*			NO		
Littoral Zone or other improvement efficiency credit:					%
Floating Wetland or Mats used in the design:			NO		
Floating Wetland or Mats credit:					%
Total **Nitrogen** removal required:	73.669	49.744	60.383		%
Total **Phosphorus** removal required:	76.297	44.229	69.517		%
Total **Nitrogen** removal efficiency:	0.000	0.000	43.310	0.000	%
Total **Phosphorous** removal efficiency:	0.000	0.000	86.621	0.000	%
Is the wet detention sufficient:			NO		
Average annual runoff volume:	369.477	73.409	228.593		ac-ft/yr

* pond coverage must follow Regulatory Requirements

Wet Detention Pond Characteristic:

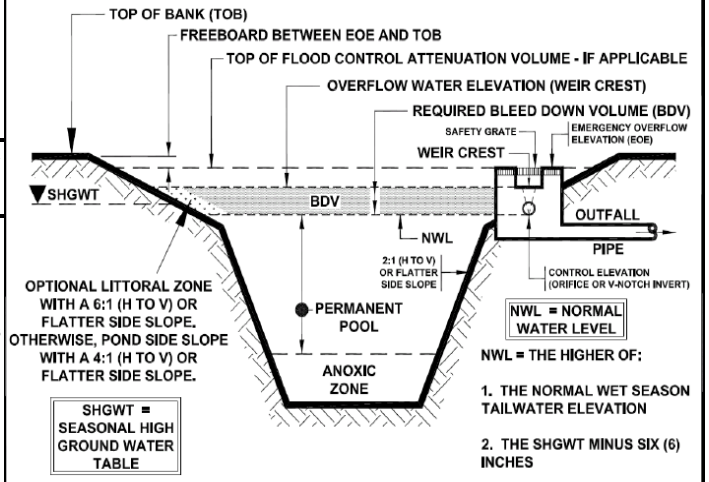
Minimum Pond Permanent Pool Volume:			269.928		ac-ft



NOTE FOR TREATMENT EFFICIENCY GRAPH:

The purpose of the treatment efficiency graphs is to help illustrate the treatment efficiency of the wet detention system as the function of average annual residence time (and permanent pool volume). The graph illustrates that there is a point of diminished return as the permanent pool volume is substantially increased. Therefore, to provide the most economical BMP treatment system, other alternatives such as "treatment trains" and compensatory treatment should be considered.

REQUIRED REMAINING TREATMENT EFFICIENCIES OF TREATMENT SYSTEM IN SERIES WITH FLOATING ISLANDS WITH WET DETENTION. USE FOR SIZING OF TREATMENT SYSTEM IN SERIES WITH FLOATING ISLANDS WITH WET DETENTION.



TYPICAL X-SECTION OF A WET DETENTION SYSTEM

Source of Graphic: draft **STORMWATER QUALITY APPLICANT'S HANDBOOK** dated March 2010, by the Department of Environmental Protection, available at: http://www.dep.state.fl.us/water/wetlands/erp/rules/stormwater, March 2010

User Defined BMP 6/17/2021 V 8.6

USER DEFINED BMP SERVING:	Fontana (SMA-1-3&12-16)				
	SMA-12-16	SMA-2&3	SMA-1	Catchment 4	
Your Name of BMP	SMA-12-16	SMA-2-3			
Contributing catchment area	277.900	42.750	106.000	0.000	ac
Required treatment efficiency (**Nitrogen**):	73.669	49.744	60.383		%
Required treatment efficiency (**Phosphorus**):	76.297	44.229	69.517		%
Is this a retention, detention, or other system*?	Detention	Detention			
If retention, storage depth is:					in
The calculated storage volume is:	0.000	0.000	0.000	0.000	ac-ft
Provided treatment efficiency (Nitrogen):	43.00	43.00			%
Provided treatment efficiency (Phosphorus):	87.23	87.03			%

* Examples of other systems are dry detention, chemical treatment, and pre-treatment devices

Enter a short description of BMP below (no more than 200 characters)

Provided treatment efficiency taken from SMA-12-16 and SMA-2-3 Discharge Summaries

CATCHMENTS AND TREATMENT SURFACE DISCHARGE SUMMARY V 8.6

CALCULATION METHODS:

1. The effectiveness of each BMP in a single catchment is converted to an equivalent capture volume.
2. Certain BMP treatment train combinations have not been evaluated and in practice they are at this time not used, an example is a greenroof following a tree well.
3. Wet detention is last when used in a single catchment with other BMPs, except when followed by filtration

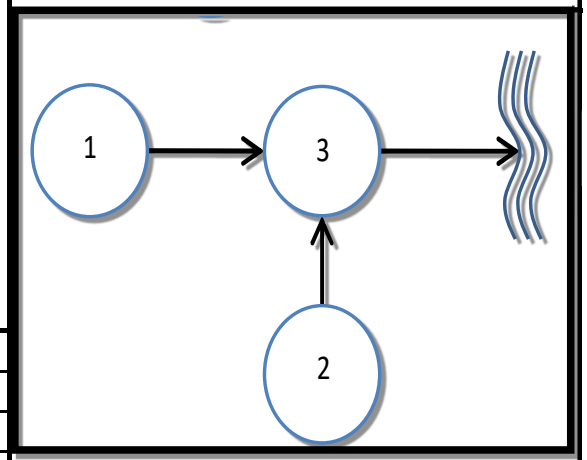
PROJECT TITLE	Fontana (SMA-1-3&12-16)	Optional Identification		
	SMA-12-16	SMA-2&3	SMA-1	Catchment 4
BMP Name	SMA-12-16	SMA-2-3	Wet Detention/ MAPs	
BMP Name				
BMP Name				

Surface Water Discharge Summary Performance of Entire Watershed

Catchment Configuration	F - Mixed-3 Catchment-2 Series-Parallel (A)		6/17/2021
Nitrogen Pre Load (kg/yr)	570.96		BMPTRAINS MODEL
Phosphorus Pre Load (kg/yr)	88.19		
Nitrogen Post Load (kg/yr)	1686.89		
Phosphorus Post Load (kg/yr)	298.11		
Target Load Reduction (N) %	66		
Target Load Reduction (P) %	70		
Target Discharge Load, N (kg/yr)	573.54		
Target Discharge Load, P (kg/yr)	89.43		
Provided Overall Efficiency, N (%):	43		
Provided Overall Efficiency, P (%):	87		
Discharged Load, N (kg/yr & lb/yr):	959.75	2113.94	
Discharged Load, P (kg/yr & lb/yr):	38.75	85.35	
Load Removed, N (kg/yr & lb/yr):	727.14	1601.61	
Load Removed, P (kg/yr & lb/yr):	259.36	571.27	

Treatment Objectives or Target for

TN NOT MET
TP MET



GENERAL SITE INFORMATION: V 8.6 | GO TO INTRODUCTION PAGE | 4/27/2018 | Blue Numbers = Input data | Red Numbers = Calculated or Carryover

Select the appropriate Meteorological Zone, input the appropriate Mean Annual Rainfall amount and select the type of analysis

NAME OF PROJECT: Fontana (OFF-2&W-4)

HELP Rainfall

VIEW ZONE MAP

Meteorological Zone (Please use zone map): CLICK ON CELL BELOW TO SELECT — Zone 2

Mean Annual Rainfall (Please use rainfall map): 49.00 Inches

VIEW MEAN ANNUAL RAINFALL

Type of analysis: CLICK ON CELL BELOW TO SELECT — Net improvement

Treatment efficiency (N, P) (ex 80 70 (no decimal points) **use only for specified removal efficiency**): % %

GO TO WATERSHED

Select the STORMWATER TREATMENT ANALYSIS Button below to begin analyzing the effectiveness of Best Management Practices.

Model documentation and example problems.

STORMWATER TREATMENT ANALYSIS

Systems available for analysis:
Retention Basin with option for calculating effluent concentration
Wet Detention
Exfiltration Trench
Pervious Pavement
Stormwater Harvesting
Biofiltration
Greenroof
Rainwater Harvesting
Managed Aquatic Plants Detention
Vegetated Natural Buffer
Vegetated Filter Strip
Swale
Rain Garden
Tree Well
Lined reuse pond
User Defined BMP

There is a user's manual for the BMPTRAINS model. It can be downloaded from www.stormwater.ucf.edu. The results from the example problems shown in the manual however may not reflect current model results due to ongoing updates of the model.

RESET INPUT FOR STORMWATER TREATMENT ANALYSIS

METHODOLOGY FOR CALCULATING REQUIRED TREATMENT

METHODOLOGY FOR

METHODOLOGY FOR WET

METHODOLOGY FOR

METHODOLOGY FOR

WATERSHED CHARACTERISTICS V 8.6

GO TO STORMWATER TREATMENT ANALYSIS

Blue Numbers = Input data | Red Numbers = Calculated

LAND USES/EMC

SELECT CATCHMENT CONFIGURATION 4/27/2018

CLICK ON CELL BELOW TO SELECT CONFIGURATION

C - 2 Catchment-Parallel

VIEW CATCHMENT CONFIGURATION

GO TO GENERAL SITE INFORMATION PAGE

For comingling, the off-site catchment must be upstream. The delay is only for retention BMPs and must be used in hours as measured by the time of concentration at a one inch/hour rain

COMINGLING | MULTI-LAND USE

Delay [hrs] | CATCHMENT NO.1 NAME: OFF-2

max delay = 15 hrs.

VIEW AVERAGE ANNUAL

VIEW EMC & FLUCCS

GO TO GIS LANDUSE DATA

OVERWRITE DEFAULT CONCENTRATIONS USING:

	PRE:	POST:
EMC(N):	mg/L	mg/L
EMC(P):	mg/L	mg/L

IMPORT GIS CONCENTRATIONS

Pre-development land use:	CLICK ON CELL BELOW TO SELECT		
	GIS Import Data		
with default EMCs	CLICK ON CELL BELOW TO SELECT		
Post-development land use:	GIS Import Data		
with default EMCs			
Total pre-development catchment area:	6.700 AC	From GIS data	
Total post-development catchment or for BMP analysis:	6.700 AC	6.7	
Pre-development Non DCIA CN:	61.00	61.0	
Pre-development DCIA percentage:	20.00 %	20%	
Post-development Non DCIA CN:	61.00	61.0	
Post-development DCIA percentage:	0.00 %	0%	
Estimated BMP Area (No loading from this area)	AC		

Average annual pre runoff volume:	5.138 ac-ft/year
Average annual post runoff volume (note no BMP area):	0.886 ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**	9.379 kg/year
Pre-development Annual Mass Loading - **Phosphorus:**	0.908 kg/year
Post-development Annual Mass Loading - **Nitrogen:**	2.263 kg/year
Post-development Annual Mass Loading - **Phosphorus:**	0.357 kg/year

CATCHMENT NO.2 NAME: W-4

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:	POST:
EMC(N):	mg/L	mg/L
EMC(P):	mg/L	mg/L

IMPORT GIS CONCENTRATIONS

	CLICK ON CELL BELOW TO SELECT		
Pre-development land use:	GIS Import Data		
with default EMCs	CLICK ON CELL BELOW TO SELECT		
Post-development land use:	GIS Import Data		
with default EMCs			
Total pre-development catchment area:	0.700 AC	From GIS data	
Total post-development catchment or BMP analysis area:	0.700 AC	0.7	
Pre-development Non DCIA CN:	61.00	61.0	
Pre-development DCIA percentage:	63.00 %	63%	
Post-development Non DCIA CN:	61.00	61.0	
Post-development DCIA percentage:	0.00 %	0%	
Estimated BMP Area (No loading from this area)	AC		

Average annual pre runoff volume:	1.493 ac-ft/year
Average annual post runoff volume (note no BMP area):	0.093 ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**	2.215 kg/year
Pre-development Annual Mass Loading - **Phosphorus:**	0.128 kg/year
Post-development Annual Mass Loading - **Nitrogen:**	0.236 kg/year
Post-development Annual Mass Loading - **Phosphorus:**	0.037 kg/year

IMPORT GIS LAND USE DATA

V 8.6

Instructions: The data required for this analysis is as follows; Basin ID, FLUCCSCODE, Soils Hydro Group, CN, and Area. This data is typically derived by using the ArcGIS geoprocessing tool intersect and performing an intersect on the basins of interest, soils polygons, and land use polygons. The resulting attribute table can then be exported to Excel where any final data formatting and processing can be done to get it ready to copy into this spreadsheet. Data must be sorted by Basin ID for this table to work properly. The user can use up to four catchments for this analysis. The user may overwrite any EMC by manualy entering in a value in the first two columns. All this must be done for both the pre and post development conditions when this tool is used.

Note: Soil hydrologic groups should be single class. For example, A/D would be assigned B, B/D would be assigned C, and C/D would be assigned D. This is due to the fact that this is an annual average analysis and the soils will behave as drained during part of the year and not drained during other parts of the year. To assume D would artificially increase runoff. Additionally, it is recommended that, due to compaction, the soil hydrologic group remain consistent in the pre and post development conditions for these dual class soils.

GO TO WATERSHED CHARACTERISTICS

VIEW EMC & FLUCCS

Pre-Development EMC Calculation Table

EMC Overwrite TN [mg/L]	EMC Overwrite TP [mg/L]	Basin ID	FLUCCSCODE	FLUCSDESC	HYDROGRP	CN	DCIA [Yes/ No]	Area [acres]	Compressed Land Use	Area [acres] (for CN	CN*Area	C	C*Area	EMC's Based on TN [mg/L]	EMC's Based on TP [mg/L]	C*Area* TN_{EMC}	C*Area* TP_{EMC}	New Basin?	Subbasin Summary TN [mg/L]	Subbasin Summary TP [mg/L]	Basin ID	Basin Area [acres]	DCIA [acres]	DCIA [%]	Basin CN [area weighte
		OFF-2	6410	Freshwater Marshes	B	98.0	Yes	1.32	WETLAND*	1.32	129.36	0.809	1.06788	1.15	0.055	1.22806	0.05873	YES	1.48	0.143	OFF-2	6.7	1.3	20%	61.0
		OFF-2	2110	Improved Pastures	B	61.0	No	3.98	PASTURE	3.98	242.78	0.0324	0.12895	3.51	0.686	0.45262	0.08846	NO							
		OFF-2	2110	Improved Pastures	B	61.0	No	0.07	PASTURE	0.07	4.27	0.0324	0.00227	3.51	0.686	0.00796	0.00156	NO							
		OFF-2	2110	Improved Pastures	B	61.0	No	0.37	PASTURE	0.37	22.57	0.0324	0.01199	3.51	0.686	0.04208	0.00822	NO							
		OFF-2	2110	Improved Pastures	B	61.0	No	0.94	PASTURE	0.94	57.34	0.0324	0.03046	3.51	0.686	0.1069	0.02089	NO							
		W-4	6300	Wetland Forested Mixed	B	98.0	Yes	0.42	WETLAND*	0.42	41.16	0.809	0.33978	1.15	0.055	0.39075	0.01869	YES	1.20	0.069	W-4	0.7	0.4	63%	61.0
		W-4	6300	Wetland Forested Mixed	B	98.0	Yes	0.03	WETLAND*	0.03	2.94	0.809	0.02427	1.15	0.055	0.02791	0.00133	NO					0.0		
		W-4	2110	Improved Pastures	B	61.0	No	0.26	PASTURE	0.26	15.86	0.0324	0.00842	3.51	0.686	0.02957	0.00578	NO							

Post-Development EMC Calculation Table

EMC Overwrite		Basin ID	FLUCCSCODE	FLUCSDESC	HYDROG RP	CN	DCIA [Yes/No]	Area [acres]	Compressed Land Use	Area [acres] (for CN	CN*Area	C	C*Area	EMC's Based on		C*Area* TN_{EMC}	C*Area* TP_{EMC}	New Basin?	Subbasin Summary		Basin ID	Basin Area [acres]	DCIA [acres]	DCIA [%]	Basin CN [area weighte
TN [mg/L]	TP [mg/L]													TN [mg/L]	TP [mg/L]				TN [mg/L]	TP [mg/L]					
		OFF-2	1210	Open Space (Good)	B	61.0	No	6.68	SINGLE FAMILY RES	6.68	407.48	0.0324	0.21643	2.07	0.327	0.44801	0.07077	YES	2.07	0.327	OFF-2	6.7		0%	61.0
		W-4	1210	Open Space (Good)	B	61.0	No	0.71	SINGLE FAMILY RES	0.71	43.31	0.0324	0.023	2.07	0.327	0.04762	0.00752	YES	2.07	0.327	W-4	0.7		0%	61.0
										0	0														
										0	0														
										0	0														
										0	0														
										0	0														
										0	0														

Summary									
Basin ID	Basin Area [acres]	Pre-Development				Post-Development			
		TN [mg/L]	TP [mg/L]	CN	DCIA %	TN [mg/L]	TP [mg/L]	CN	DCIA %
OFF-2	6.7	1.48	0.143	61.0	20%	2.07	0.327	61.0	0%
W-4	0.7	1.20	0.069	61.0	63%	2.07	0.327	61.0	0%

CATCHMENTS AND TREATMENT SURFACE DISCHARGE SUMMARY V 8.6

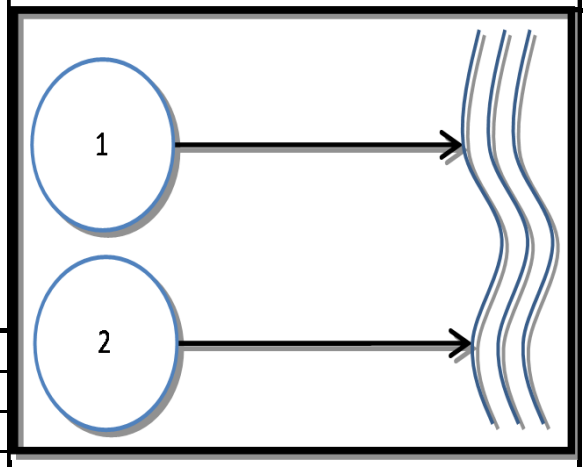
CALCULATION METHODS:

1. The effectiveness of each BMP in a single catchment is converted to an equivalent capture volume.
2. Certain BMP treatment train combinations have not been evaluated and in practice they are at this time not used, an example is a greenroof following a tree well.
3. Wet detention is last when used in a single catchment with other BMPs, except when followed by filtration

PROJECT TITLE	Fontana (OFF-2&W-4)	Optional Identification		
	OFF-2	W-4	Catchment 3	Catchment 4
BMP Name	Wet Detention/ MAPs	Wet Detention/ MAPs		
BMP Name				
BMP Name				

Surface Water Discharge Summary Performance of Entire Watershed

Catchment Configuration	C - 2 Catchment-Parallel	Treatment Objectives or Target for TN MET TP MET	4/27/2018 BMPTRAINS MODEL
Nitrogen Pre Load (kg/yr)	11.59		
Phosphorus Pre Load (kg/yr)	1.04		
Nitrogen Post Load (kg/yr)	2.50		
Phosphorus Post Load (kg/yr)	0.39		
Target Load Reduction (N) %	0		
Target Load Reduction (P) %	0		
Target Discharge Load, N (kg/yr)	2.50		
Target Discharge Load, P (kg/yr)	0.39		
Provided Overall Efficiency, N (%):	43		
Provided Overall Efficiency, P (%):	86		
Discharged Load, N (kg/yr & lb/yr):	1.42	3.12	
Discharged Load, P (kg/yr & lb/yr):	0.06	0.12	
Load Removed, N (kg/yr & lb/yr):	1.08	2.38	
Load Removed, P (kg/yr & lb/yr):	0.34	0.75	



CATCHMENTS AND TREATMENT SURFACE DISCHARGE SUMMARY V 8.6

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BMP Name	Wet Detention/ MAPs	Wet Detention/ MAPs		
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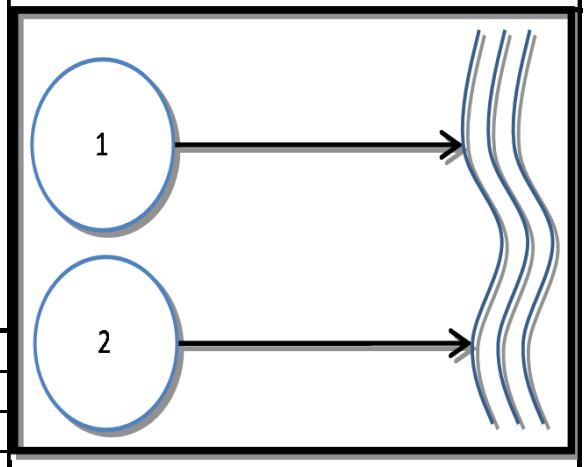
Load Removed, P (kg/yr & lb/yr):	0.34	0.75	



LAND USE CATEGORY	Event Mean Concentration (mg/l)	
	TOTAL Nitrogen	TOTAL Phosphorus
AG - CITRUS	2.240	0.183
AG - GENERAL	2.8	0.487
AVERAGE OF MFR+UNDEVELOPED	2.320	0.520
AVERAGE OF SFR + UNDEVELOPED	2.07	0.327
DRY PRAIRIE*	2.025	0.184
HIGH INTENSITY COMMERCIAL	2.4	0.345
HIGHWAY	1.52	0.2
HYDRIC HAMMOCK*	1.288	0.107
INDUSTRIAL	1.2	0.26
LOW DENSITY RES	1.645	0.270
LOW INTENSITY COMMERCIAL	1.130	0.188
MESIC FLATWOODS*	1.090	0.043
MINING	1.180	0.150
MULTI FAMILY RES	2.320	0.520
PASTURE	3.510	0.686
ROW CROPS	2.650	0.593
RUDERAL UPLAND PINE*	1.694	0.162
SCRUBBY FLATWOODS*	1.155	0.027
SFR OR MFR DEPENDING ON UNITS	2.070	0.327
SINGLE FAMILY RES	2.070	0.327
UNDEVELOPED	1.288	0.107
UNDEVELOPED User Defined (overwrite defaults)	0	0
WATER	0	0
WET FLATWOODS*	1.213	0.021
WET PRAIRIE*	1.095	0.015
WETLAND*	1.15	0.055
XERIC HAMMOCK*	1.288	0.107
XERIC SCRUB*	1.288	0.107

GENERAL CATEGORY	GENERAL LAND USE CATEGORIES FOR RUNOFF CHARACTERIZATION DATA
	DESCRIPTION
Low-Density Residential	Rural areas with lot sizes greater than 1 acre or less than one dwelling unit per acre; internal roadways associated with the homes are also included
Single-Family Residential	Typical detached home community with lot sizes generally less than 1 acre and dwelling densities greater than one dwelling unit per acre; duplexes construct on one-third to one-half acre lots are also included in this category; internal roadways associated with the homes are also included
Multi-Family Residential	Residential land use consisting primarily of apartments, condominiums, and cluster-homes; internal roadways associated with the homes are also included
Low-Intensity Commercial	Areas which receive only a moderate amount of traffic volume where cars are parked during the day for extended periods of time; these areas include universities, schools, professional office sites, and small shopping centers; internal roadways associated with the development are also included
High-Intensity Commercial	Land use consisting of commercial areas with high levels of traffic volume and constant traffic moving in and out of the area; includes downtown areas, commercial sites, regional malls, and associated parking lots; internal roadways associated with the development are also included
Industrial	Land uses include manufacturing, shipping and transportation services, sewage treatment facilities, water supply plants, and solid waste disposal; internal roadways associated with the development are also included
Highway	Includes major road systems, such as interstate highways and major arteries and thoroughfares; roadway areas associated with residential, commercial, and industrial land use categories are already included in loading rates for these categories
Agriculture	Includes cattle, grazing, row crops, citrus, and related activities
Open/ Undeveloped	Includes open space, barren land, undeveloped land which may be occupied by native vegetation, rangeland, and power lines; this land does not include golf course areas which are heavily fertilized and managed; golf course areas have runoff characteristics most similar to single-family residential areas
Mining/ Extractive	Includes a wide variety of mining activities for resources such as phosphate, sand, gravel, clay, shell, etc.
Wetlands	Includes a wide range of diverse wetland types, such as hardwood wetlands, cypress stands, grassed wetlands, freshwater marsh, and mixed wetland associations
Open Water/ Lakes	Land use consists of open water and lakes, rivers, reservoirs, and other open waterbodies

LAND USE Descriptions from Harper, 2007

SUMMARY OF LEVEL III FLUCCS CODE ASSIGNMENTS TO CONSOLIDATED LAND USE CATEGORIES AND RELATIONSHIP TO LAND USE OPTIONS IN THIS PROGRAM (FDOT REFERENCED)

FLUCCS CODE	LAND USE DESCRIPTION	GENERAL/ CONSOLIDATED LAND USE	EMC LAND USE I.D. NUMBER
1100	Residential, Low-Density-Less than two dwelling units/acre	Low-Density Residential	LOW DENSITY RES
1110	Fixed Single Family Units	Low-Density Residential	SINGLE FAMILY RES
1180	Residential, Rural < or = 0.5 dwelling units/acre	Low-Density Residential	LOW DENSITY RES
1190	Low-Density Under Construction	Low-Density Residential	LOW DENSITY RES
1200	Residential, Medium-Density (Two-five dwelling units per acre)	Medium-Density Residential	SFR OR MFR DEPENDING ON UNITS
1210	Fixed Single Family Units	Medium-Density Residential	SINGLE FAMILY RES
1290	Medium-Density Under Construction	Medium-Density Residential	SFR OR MFR DEPENDING ON UNITS
1300	Residential, High-Density	High-Density Residential	MULTI FAMILY RES
1310	Fixed Single Family Units	High-Density Residential	SINGLE FAMILY RES
1320	Mobile Home Units	High-Density Residential	MULTI FAMILY RES
1330	Residential, High-Density; Multiple Dwelling Units, Low Rise <Two stories or	High-Density Residential	MULTI FAMILY RES
1340	Residential, High-Density; Multiple Dwelling Units, High Rise <Three stories	High-Density Residential	MULTI FAMILY RES
1350	Residential, High-Density; Mixed Units <Fixed and mobile Homes>	High-Density Residential	MULTI FAMILY RES
1390	High-Density Under Construction	High-Density Residential	MULTI FAMILY RES
1400	Commercial and Services	Commercial	HIGH INTENSITY COMMERCIAL
1410	Retail Sales and Services	Commercial	HIGH INTENSITY COMMERCIAL
1420	Wholesale Sales and Services <Excluding warehouses associated with industrial use>	Commercial	LOW INTENSITY COMMERCIAL
1430	Professional Services	Commercial	LOW INTENSITY COMMERCIAL
1440	Cultural and Entertainment	Commercial	LOW INTENSITY COMMERCIAL
1450	Tourist Services	Commercial	HIGH INTENSITY COMMERCIAL
1460	Oil and Gas Storage(except industrial use or manufacturing)	Industrial	INDUSTRIAL
1470	Mixed Commercial and Services	Commercial	LOW INTENSITY COMMERCIAL
1480	Cemeteries	Recreational 1	AVERAGE OF SFR + UNDEVELOPED
1490	Commercial and Services Under	Commercial	LOW INTENSITY COMMERCIAL
1500	Industrial Under Construction	Industrial	INDUSTRIAL
1510	Food Processing	Industrial	INDUSTRIAL
1520	Timber Processing	Industrial	INDUSTRIAL
1530	Mineral Processing	Industrial	INDUSTRIAL
1540	Oil and Gas Processing	Industrial	INDUSTRIAL
1550	Other Light Industrial	Industrial	INDUSTRIAL
1560	Other Heavy Industrial	Industrial	INDUSTRIAL
1561	Ship Building and Repair	Industrial	INDUSTRIAL
1562	Pre-stressed concrete plants	Industrial	INDUSTRIAL
1590	Industrial Under Construction	Industrial	INDUSTRIAL
1600	Extractive	Mining	MINING
1610	Strip Mines	Mining	MINING

1611	Clays	Mining	MINING
1620	Sand and Gravel Pits	Mining	MINING
1632	Limerock or dolomite quarries	Mining	MINING
1633	Phosphate quarries	Mining	MINING
1650	Reclaimed Land	Mining	MINING
1660	Holding Ponds	Mining	MINING
1700	Institutional (Educational, religious, health and military facilities)	Institutional	LOW INTENSITY COMMERCIAL
1710	Educational Facilities	Institutional	LOW INTENSITY COMMERCIAL
1720	Religious	Institutional	LOW INTENSITY COMMERCIAL
1730	Military	Institutional	LOW INTENSITY COMMERCIAL
1740	Medical and Health Care	Institutional	LOW INTENSITY COMMERCIAL
1750	Governmental	Institutional	LOW INTENSITY COMMERCIAL
1770	Other Institutional	Institutional	LOW INTENSITY COMMERCIAL
1780	Commercial Child Care	Institutional	LOW INTENSITY COMMERCIAL
1790	Institutional Under Construction	Institutional	LOW INTENSITY COMMERCIAL
1800	Recreational	Recreational 1	AVERAGE OF SFR + UNDEVELOPED
1810	Swimming Beach	Open	UNDEVELOPED
1820	Golf Course	Recreational 1	AVERAGE OF SFR + UNDEVELOPED
1830	Race Tracks(horse, dog, car, motorcycle)	Recreational 2	AVERAGE OF MFR+UNDEVELOPED
1840	Marinas and Fish Camps	Recreational 1	AVERAGE OF MFR+UNDEVELOPED
1850	Parks and Zoos	Recreational 2	AVERAGE OF MFR+UNDEVELOPED
1860	Community Recreational Facilities	Recreational 2	AVERAGE OF MFR+UNDEVELOPED
1870	Stadiums (not associated with high schools, colleges, or universities)	Recreational 2	AVERAGE OF MFR+UNDEVELOPED
1890	Other Recreational(Riding stables, go-cart tracks, skeet ranges, etc)	Recreational 2	AVERAGE OF MFR+UNDEVELOPED
1900	Open Land	Open	UNDEVELOPED
1920	Inactive Land with street patterns but without structures	Open	UNDEVELOPED
2110	Improved Pasture	Pasture	PASTURE
2120	Unimproved Pastures	Pasture	PASTURE
2130	Woodland Pasture	Pasture	PASTURE
2140	Row Crops	Row Crops	ROW CROPS
2150	Field Crops	Row Crops	ROW CROPS
2160	Mixed Crops	Row Crops	ROW CROPS
2200	Tree Crops	Citrus	AG - CITRUS
2210	Citrus groves	Citrus	AG - CITRUS
2220	Fruit Orchards	Citrus	AG - CITRUS
2240	Abandoned tree crops	Ruderal	RUDERAL UPLAND PINE*
2300	Feeding Operations	Agriculture	AG - GENERAL
2310	Cattle Feeding Operations	Agriculture	AG - GENERAL
2320	Poultry feeding operations	Agriculture	AG - GENERAL
2340	Other feeding operations	Agriculture	AG - GENERAL
2400	Nurseries and Vineyards	Agriculture	AG - GENERAL
2410	Tree nurseries	Agriculture	AG - GENERAL
2420	Sod farms	Agriculture	AG - GENERAL
2430	Ornamentals	Agriculture	AG - GENERAL
2431	Shade ferns	Agriculture	AG - GENERAL
2432	Hammock ferns	Agriculture	AG - GENERAL
2450	Floriculture	Agriculture	AG - GENERAL
2500	Specialty Farms	Agriculture	AG - GENERAL
2510	Horse Farms	Agriculture	AG - GENERAL
2520	Dairies	Agriculture	AG - GENERAL
2540	Aquaculture	Industrial	INDUSTRIAL
2590	Other Specialty Farms	Agriculture	AG - GENERAL
2600	Other Open Lands - Rural	Open	UNDEVELOPED

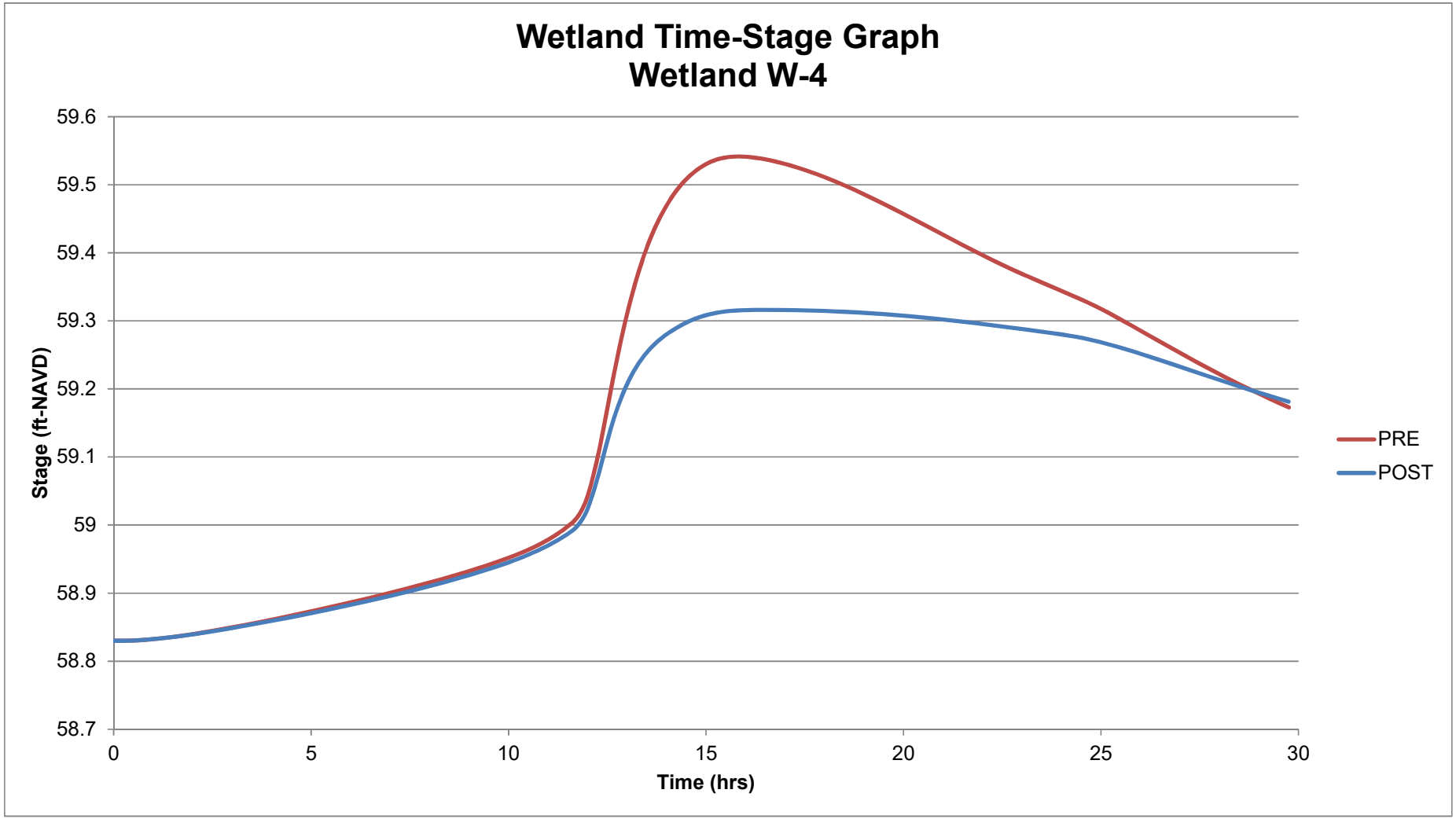
2610	Fallow cropland	Open	UNDEVELOPED
3100	Herbaceous Dry Prairie	Dry Prairie	DRY PRAIRIE*
3200	Shrub and Brushland	Scrub	SCRUBBY FLATWOODS*
3210	Palmetto Prairies	Dry Prairie	DRY PRAIRIE*
3211	Palmetto-Oak Shrubland	Dry Prairie	DRY PRAIRIE*
3212	Dry Prairie	Dry Prairie	DRY PRAIRIE*
3220	Coastal Strand	Dry Prairie	DRY PRAIRIE*
3300	Mixed Rangeland	Dry Prairie	DRY PRAIRIE*
4110	Pine flatwoods	Wet Flatwoods	WET FLATWOODS*
4111	Mesic longleaf pine flatwoods	Upland Flatwoods	MESIC FLATWOODS*
4112	Scrubby Pine flatwoods	Upland Flatwoods	MESIC FLATWOODS*
4113	Hydric pine flatwoods	Wet Flatwoods	WET FLATWOODS*
4120	Longleaf pine - xeric oak	Upland Mixed	RUDERAL UPLAND PINE*
4130	Sand pine	Scrub	XERIC SCRUB*
4140	Upland Mixed Forest	Undeveloped	UNDEVELOPED
4200	Upland Hardwood Forest	Upland Flatwoods	MESIC FLATWOODS*
4210	Xeric oak	Xeric Hammock	XERIC HAMMOCK*
4220	Brazilian Pepper	Ruderal	RUDERAL UPLAND PINE*
4260	Tropical Hardwood Hammock	Wet Flatwoods	WET FLATWOODS*
4270	Maritime Hammock	Undeveloped	UNDEVELOPED
4271	Coastal Temperate Hammock	Undeveloped	UNDEVELOPED
4272	Prairie Hammock	Undeveloped	UNDEVELOPED
4275	Red Cedar- Cabbage Palm Hammock	Undeveloped	UNDEVELOPED
4280	Cabbage palm	Wet Flatwoods	WET FLATWOODS*
4300	Upland Hardwood Forests Continued	Undeveloped	UNDEVELOPED
4321	Xeric Oak Scrub	Xeric Hammock	XERIC HAMMOCK*
4322	Xeric Hammock	Xeric Hammock	XERIC HAMMOCK*
4340	Hardwood Conifer Mixed	Upland Flatwoods	MESIC FLATWOODS*
4370	Australian pine	Xeric Hammock	XERIC HAMMOCK*
4400	Tree Plantations	Upland Mixed	UPLAND MIXED FOREST*
4410	Coniferous pine	Xeric Hammock	XERIC HAMMOCK*
4430	Forest regeneration	Ruderal	RUDERAL UPLAND PINE*
5100	Streams and waterways	Water	WATER
5120	Channelized waterways, canals	Water	WATER
5200	Lakes	Water	WATER
5201	Pond	Water	WATER
5250	Marshy Lakes	Water	WATER
5300	Reservoirs	Water	WATER
5330	Reservoirs larger >10 <100 acres	water	WATER
5400	Bays and estuaries	Water	WATER
5410	Embayments opening directly to the Gulf or	Water	WATER
5430	Enclosed saltwater ponds within a salt	Water	WATER
5474	Spoil islands/coastal islands	Open	UNDEVELOPED
5500	Major Springs	Water	WATER
5600	Slough Waters	water	WATER
5710	Atlantic Ocean	Water	WATER
6110	Bay swamps	Wetland	WETLAND*
6120	Mangrove swamp	Wetland	WETLAND*
6150	Lowland Harwdood Forest/Swamp	Wetland	WETLAND*
6151	Willow Swamp	Wetland	WETLAND*
6152	Red Maple Swamp	Wetland	WETLAND*
6153	Shrub Swamp	Wetland	WETLAND*
6170	Mixed wetland hardwoods	Wetland	WETLAND*
6172	Mixed Shrubs	Wet Prairies	WET PRAIRIE*
6181	Cabbage palm hammock	Hydric Hammock	HYDRIC HAMMOCK*
6182	Cabbage palm savannah	Hydric Hammock	HYDRIC HAMMOCK*
6200	Wetland Coniferous Forest	Wetland	WETLAND*

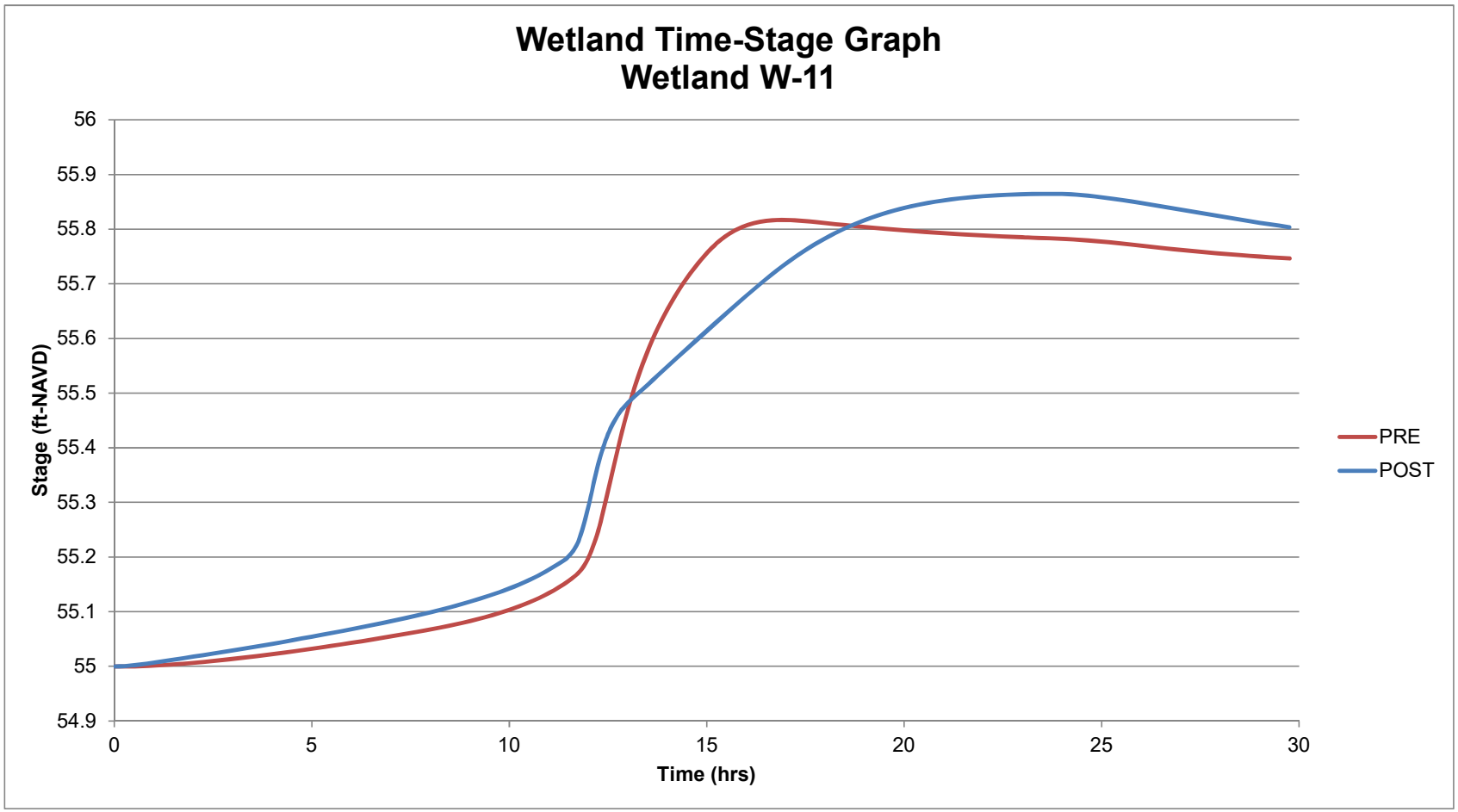
6210	Cypress	Wetland	WETLAND*
6220	Pond pine	Wetland	WETLAND*
6250	Hydric pine flatwoods	Mesic Flatwoods	MESIC FLATWOODS*
6300	Wetland Forested Mixed	Wetland	WETLAND*
6400	Freshwater marshes	Wetland	WETLAND*
6410	Freshwater marshes	Wetland	WETLAND*
6411	Sawgrass marsh	Wetland	WETLAND*
6412	Cattail marsh	Wetland	WETLAND*
6414	Graminoid marsh	Wetland	WETLAND*
6416	Flag marsh	Wetland	WETLAND*
6420	Saltwater marshes	Wetland	WETLAND*
6423	Low salt marsh	Wetland	WETLAND*
6424	High salt marsh	Wetland	WETLAND*
6430	Wet prairies	Wet Prairies	WET PRAIRIE*
6440	Emergent aquatic vegetation	Wetland	WETLAND*
6460	Mixed scrub-shrub wetland	Wetland	WETLAND*
6500	Non-vegetated Wetland	Wetland	WETLAND*
6510	Tidal creek	Wetland	WETLAND*
7100	Beaches other than swimming beaches	Open	UNDEVELOPED
7200	Sand other than beaches	Open	UNDEVELOPED
7340	Exposed rocks	Open	UNDEVELOPED
7400	Disturbed land	Open	UNDEVELOPED
7410	Rural land in transition without positive indicators of intended activity	Open	UNDEVELOPED
7420	Borrow areas	Water	WATER
7430	Spoil areas	Open	UNDEVELOPED
8100	Transportation	Transportation	HIGHWAY
8110	Airports	Institutional	LOW INTENSITY COMMERCIAL
8115	Grass Airports	Recreational 1	AVERAGE OF SFR + UNDEVELOPED
8120	Railroads	Open	UNDEVELOPED
8130	Bus and truck terminals	Commercial	HIGH INTENSITY COMMERCIAL
8140	Roads and Highways	Transportation	HIGHWAY
8150	Port facilities	Commercial	HIGH INTENSITY COMMERCIAL
8160	Canals and Locks	Commercial	LOW INTENSITY COMMERCIAL
8180	Auto parking facilities - when not directly related to other land uses	Commercial	LOW INTENSITY COMMERCIAL
8191	Highways	Transportation	HIGHWAY
8200	Communications	Industrial	INDUSTRIAL
8220	Communication Facilities	Industrial	INDUSTRIAL
8300	Utilities	Industrial	INDUSTRIAL
8310	Electrical power facilities	Industrial	INDUSTRIAL
8320	Electrical power transmission lines	Open	UNDEVELOPED
8330	Water supply plants	Industrial	INDUSTRIAL
8340	Sewage Treatment	Industrial	INDUSTRIAL
8350	Solid waste disposal	Industrial	INDUSTRIAL
8360	Other treatment ponds	Industrial	INDUSTRIAL
8370	Surface Water Collection Basin	Water	WATER
8390	Utilities under construction	Industrial	INDUSTRIAL
9999	(blank)	Open	UNDEVELOPED

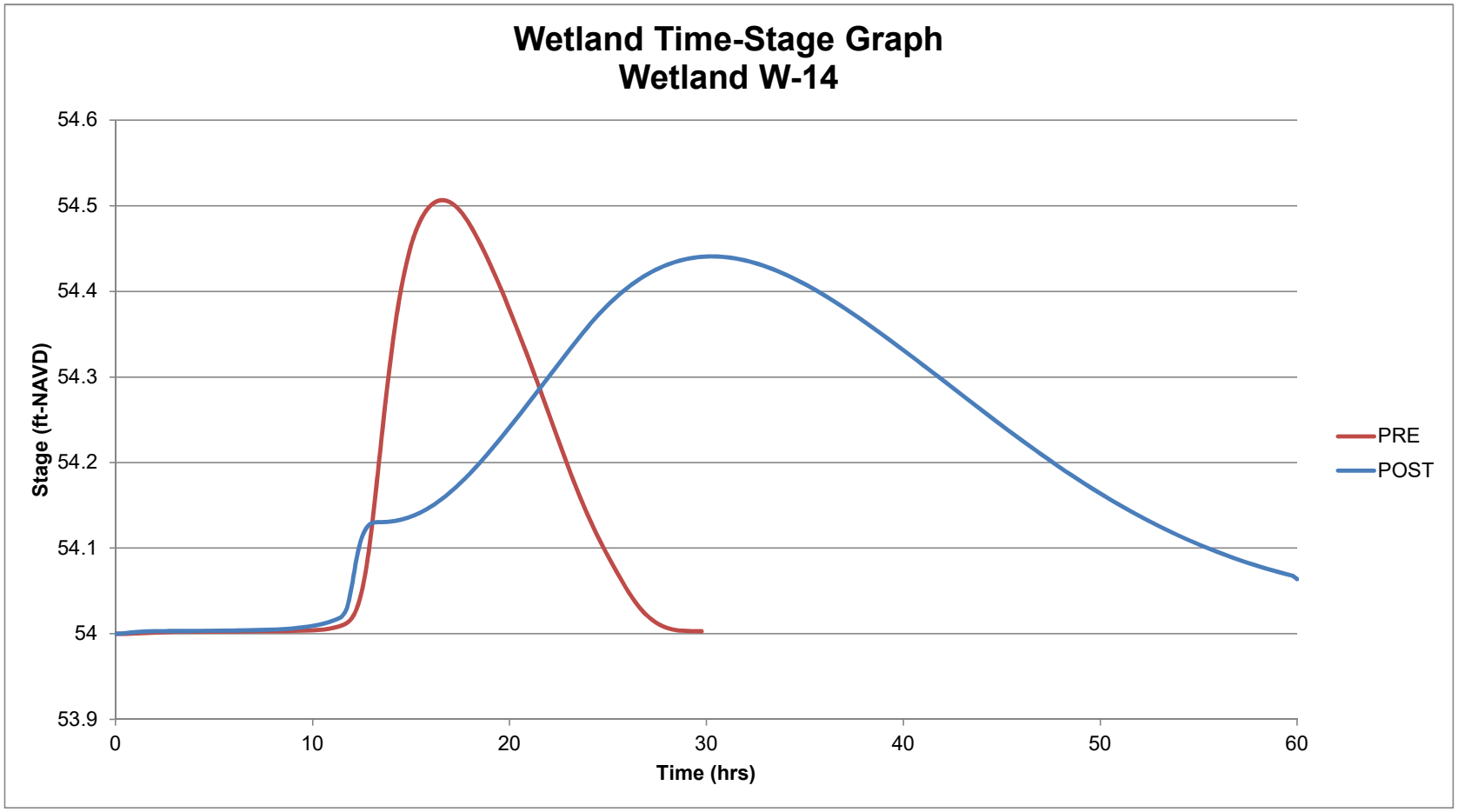
* CAN ALWAYS USE THE GENERAL UNDEVELOPED/RANGELAND/FOREST EMCS INSTEAD
and check with the reviewing agency for concurrence on the selected values.

APPENDIX E

WETLAND HYDROLOGY


Wetland Time-Stage Graph
Wetland W-4
Stage (ft-NAVD)
59.6
59.5
59.4
59.3
59.2
59.1
59
58.9
58.8
58.7
0
5
10
15
20
25
30
Time (hrs)
PRE
POST


Wetland Time-Stage Graph
Wetland W-11
Stage (ft-NAVD)
56
55.9
55.8
55.7
55.6
55.5
55.4
55.3
55.2
55.1
55
54.9
0
5
10
15
20
25
30
Time (hrs)
PRE
POST


Wetland Time-Stage Graph
Wetland W-14
54.6
54.5
54.4
54.3
54.2
54.1
54
53.9
Stage (ft-NAVD)
0
10
20
30
40
50
60
Time (hrs)
PRE
POST

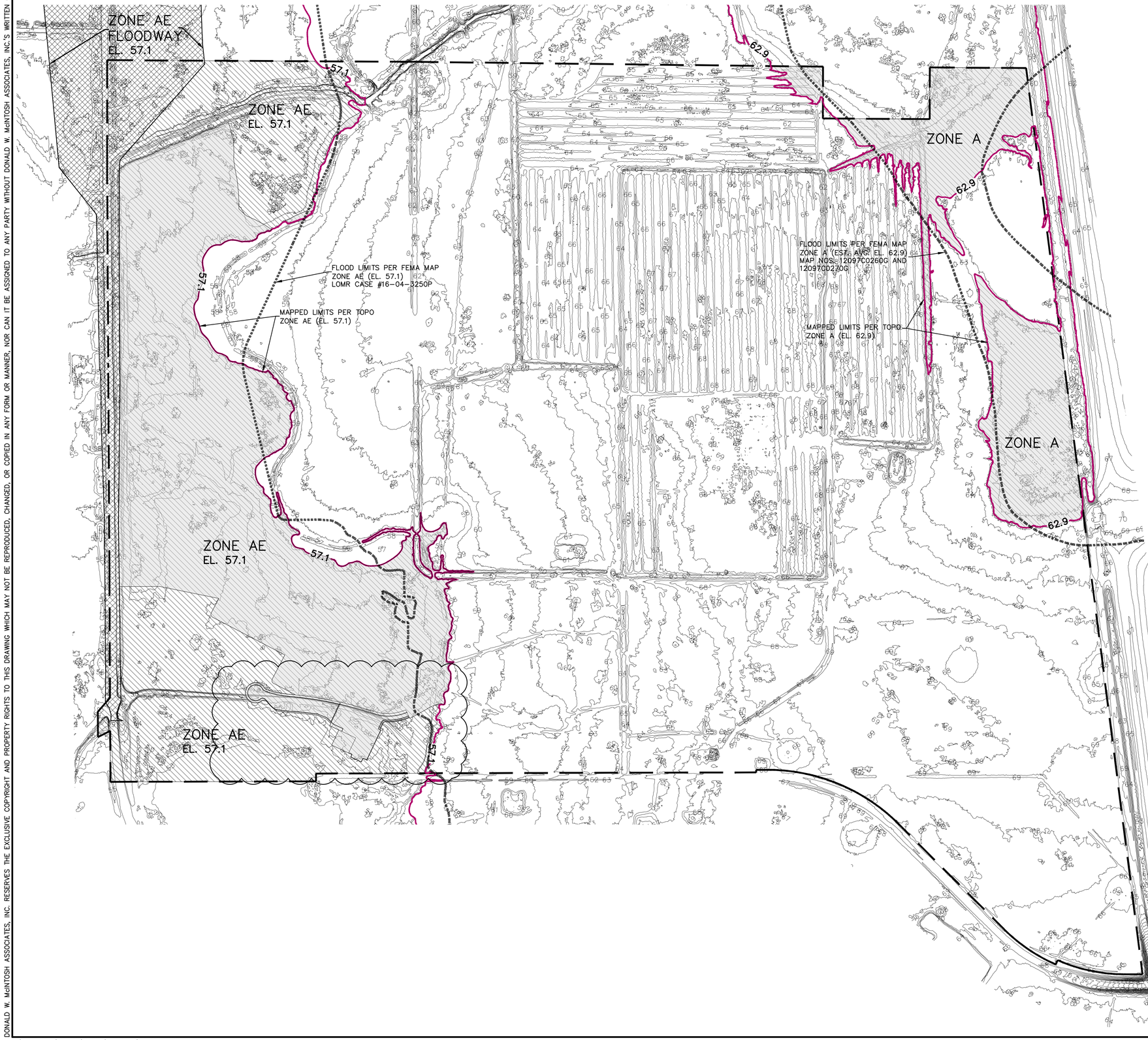
Fontana
Lake-Wetland Separation Table

Date: 6/12/2018
By: ACC
Chk: JCN
Rev: 10/18/2018

Wetland Name	Wetland SHWL Elevation (ft-NAVD)	Average Wet Season Elevation (ft-NAVD)	Adjacent Pond ID	Pond DNW (ft-NAVD)	Separation distance (ft)	Gradient (ft/ft)
W-11	55.87	54.87	SMA-2	54.25	345	0.002

APPENDIX F

COMPENSATING STORAGE



LEGEND

BOUNDARY

EXISTING FLOOD STORAGE AREA

ZONE AE FLOODWAY

FLOOD STORAGE WITHIN DEVELOPMENT AREA

ZONE AE = 121.47 AC-FT
ZONE A = 39.64 AC-FT

FLOOD LIMITS PER FEMA MAP

MAPPED LIMITS PER TOPO

GENERAL NOTES:

1. THE SCALE OF THIS DRAWING MAY HAVE CHANGED DUE TO REPRODUCTION.

NO.	DATE	REVISIONS	CHK.
4	06/18/21	REVISED MARINA PARKING LOT PER SFWMD RAI	
3	05/26/20	UPDATED TO ADD MARINA	
2	10/18/18	UPDATED MULTI-USE ROAD, SMA1, 2, 4 AND 6	
1	08/01/18	REVISED PER SFWMD COMMENTS	

JAMES C. NUGENT
FLORIDA P.E. No. 57553
DATE:

DONALD W. McINTOSH ASSOCIATES, INC.
ENGINEERS PLANNERS SURVEYORS
2200 PARK AVENUE NORTH, WINTER PARK, FL 32789 407.644.4068
CERTIFICATE OF AUTHORIZATION NO. 68

DRAWN BY	DESIGNED BY	CHECKED BY	DATE	SCALE	JOB NUMBER
ACC	ACC	JCN	4/24/2018	1"=300'	13189

FONTANA

OSCEOLA COUNTY, FL

COMPENSATING STORAGE EXHIBIT
EXISTING STORAGE

DRAWING 13189-XCOMP

SHEET 1 OF 7

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LEGEND

- BOUNDARY
- ZONE AE FLOODWAY
- FLOOD LIMITS PER FEMA MAP
- MAPPED LIMITS PER TOPO
- PROPOSED FLOOD STORAGE WITHIN DEVELOPMENT AREA STORMWATER PONDS
  ZONE AE = 118.40 AC-FT
  ZONE A = 38.93 AC-FT
- REMNANT STORAGE WITHIN DEVELOPMENT AREA BEHIND BACK SLOPE
  ZONE AE = 1.38 AC-FT
  ZONE A = 2.35 AC-FT
- COMPENSATING STORAGE AREA A
  ZONE AE = 0.14 AC-FT
- COMPENSATING STORAGE AREA B (BOAT PARKING STORAGE)
  ZONE AE = 1.98 AC-FT

ZONE AE TOTAL STORAGE = 121.90 AC-FT
ZONE A TOTAL STORAGE = 41.28 AC-FT

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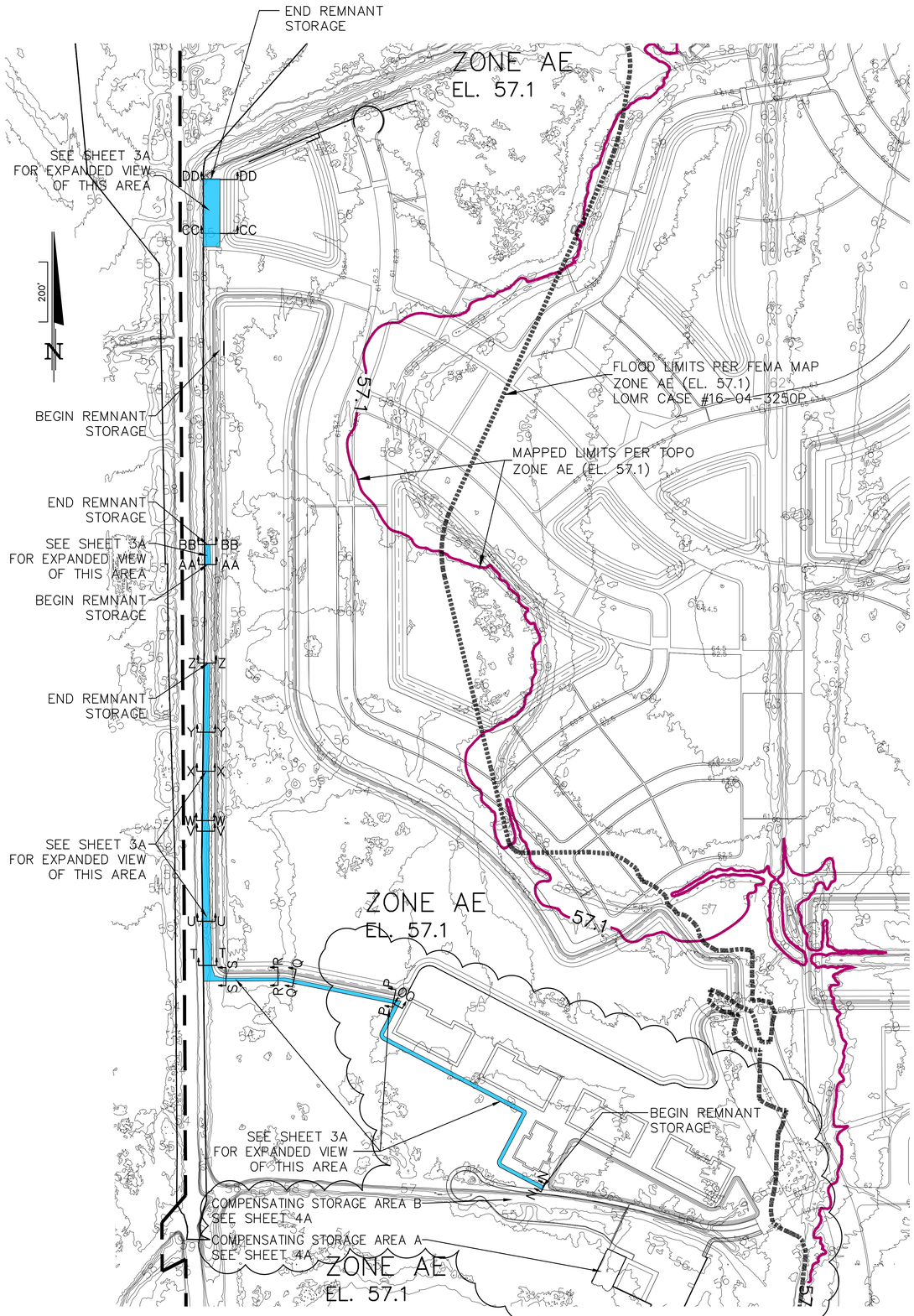
DRAWN BY	DESIGNED BY	CHECKED BY	DATE
ACC	ACC	JCN	4/24/2018

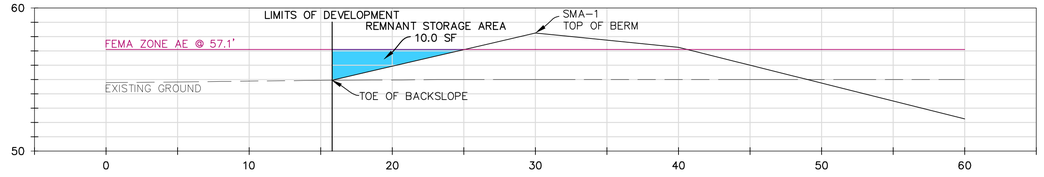
DRAWING	SCALE	JOB NUMBER
13189-XCOMP	1"=300'	13189

FONTANA
OSCEOLA COUNTY, FL
COMPENSATING STORAGE EXHIBIT
PROPOSED STORAGE

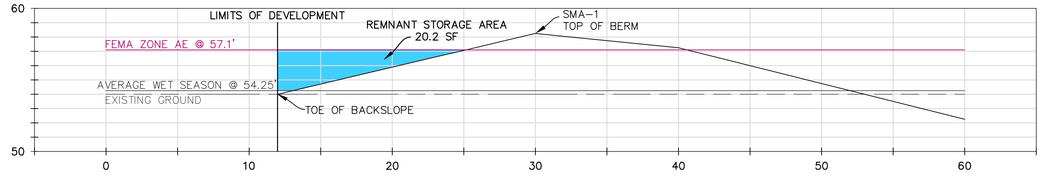
SHEET 2 OF 7

F:\Proj2013\13189\EDWG\Exhibits\13189-XCOMP.dwg





SECTION R-R
1"=5'



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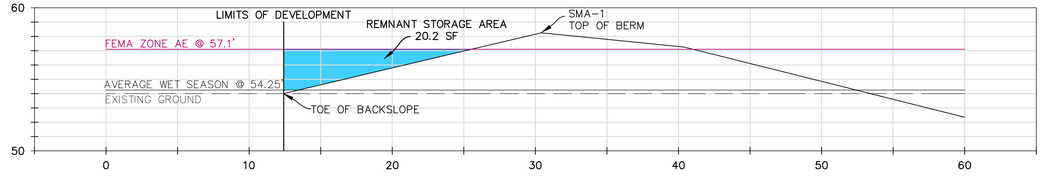
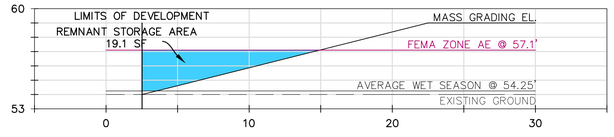


SECTION P-P
1"=5'

SECTION O-O
1"=5'



SECTION N-N
1"=5'

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CERTIFICATE OF AUTHORIZATION NO. 68

JOB NUMBER 13189
SCALE AS SHOWN
DATE 06/04/18
CHECKED BY JCN
DESIGNED BY ACC
DRAWN BY ACC

FONTANA
OSCEOLA COUNTY, FL
ZONE AE REMNANT STORAGE BEHIND BACKSLOPE

DRAWING 13189-XCOMP
SHEET 3 OF 7

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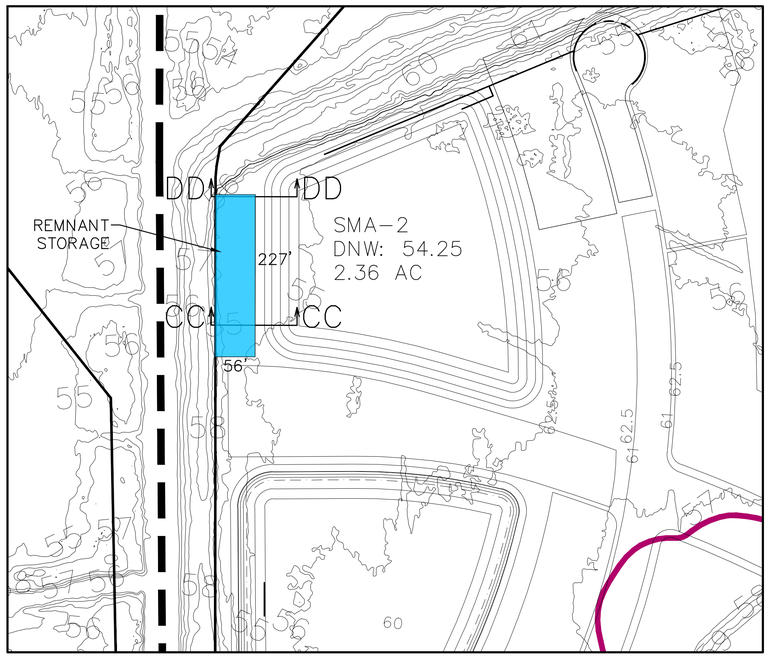

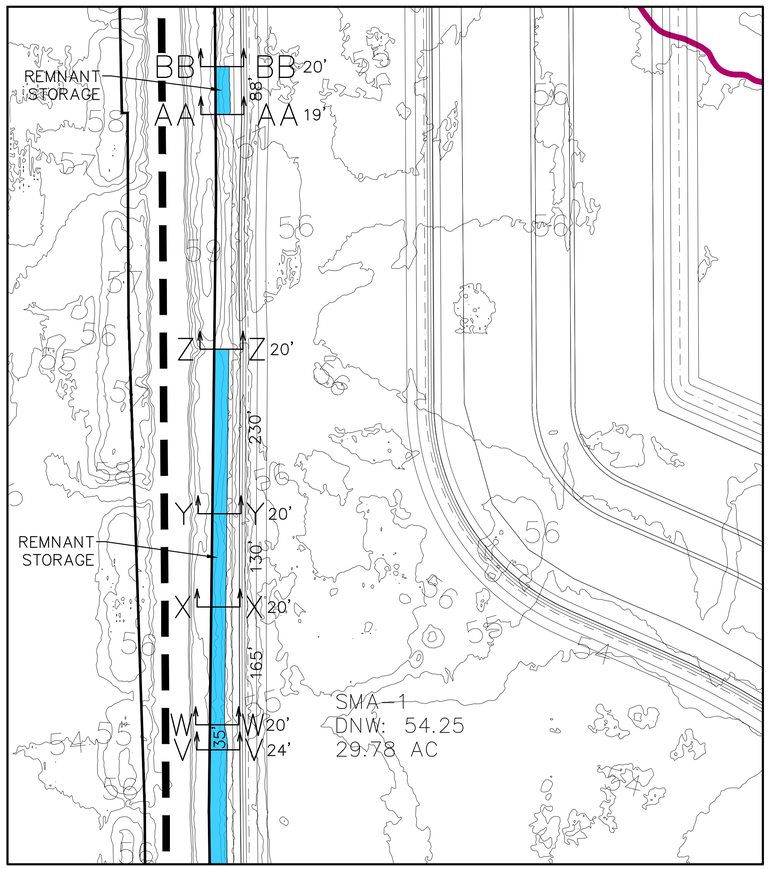

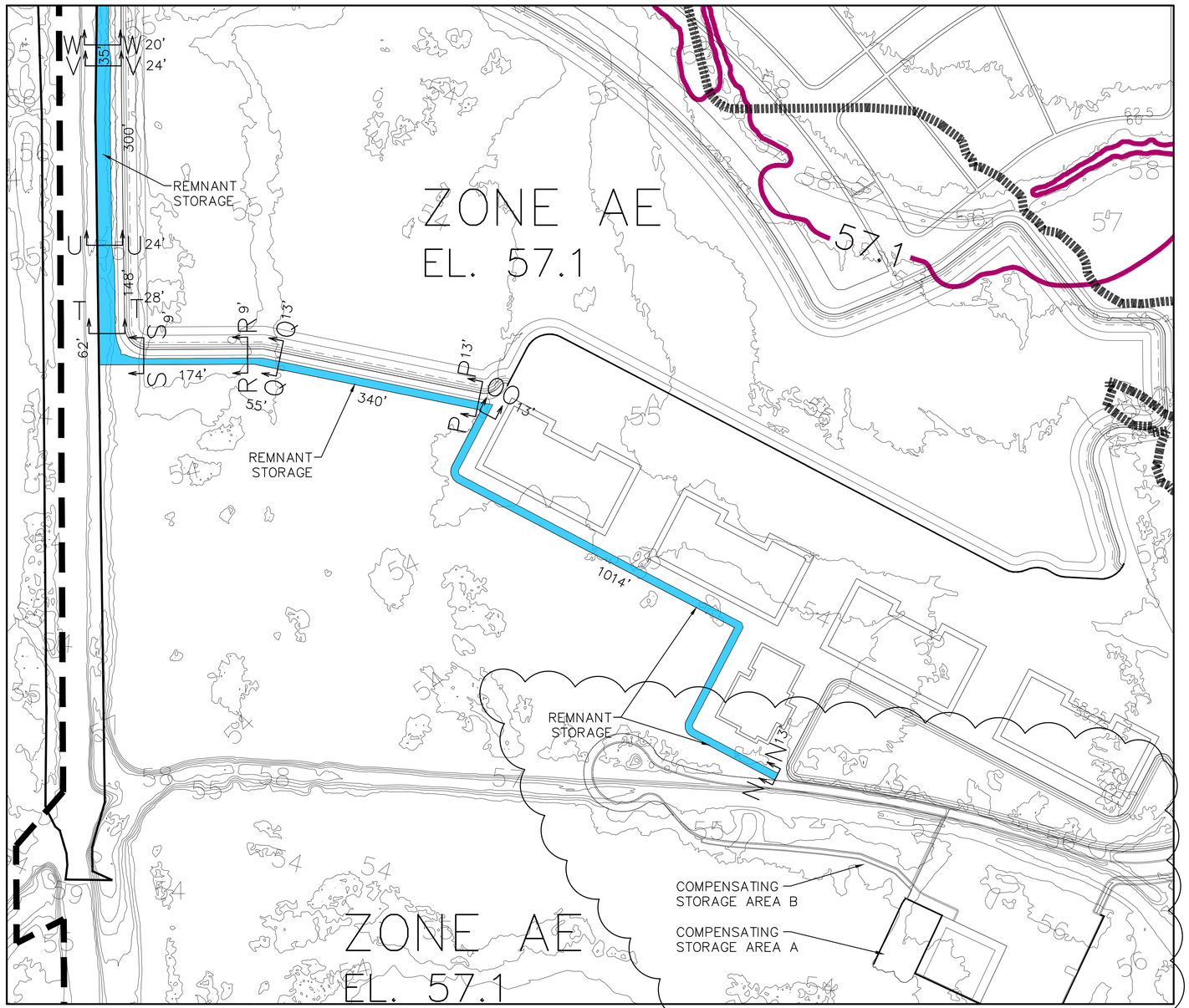

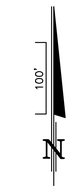

LEGEND

B WIDTH AT SECTION — LENGTH BETWEEN SECTIONS — A WIDTH AT SECTION

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CERTIFICATE OF AUTHORIZATION NO. 68

DRAWN BY	DESIGNED BY	CHECKED BY	DATE	SCALE	JOB NUMBER
ACC	ACC	JCN	6/4/2018	1"=100'	13189

FONTANA
OSCEOLA COUNTY, FL
ZONE AE REMNANT STORAGE BEHIND BACKSLOPE

DRAWING 13189-XCOMP

SHEET 3A OF 7

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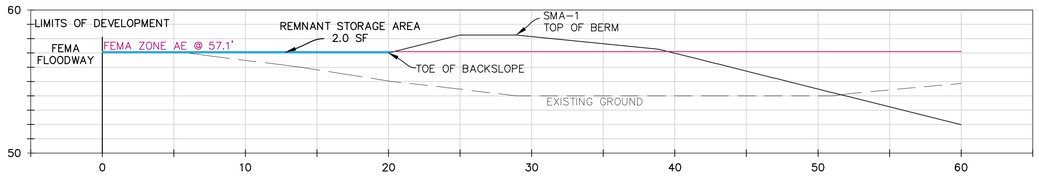
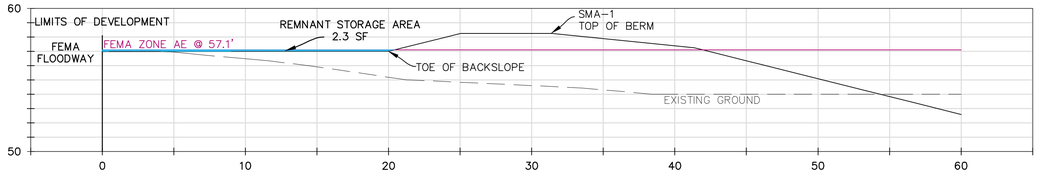
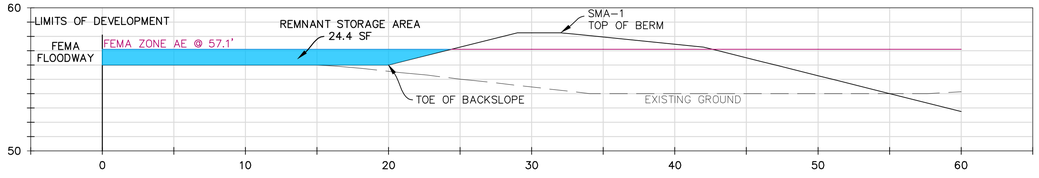


SECTION X-X
1"=5'

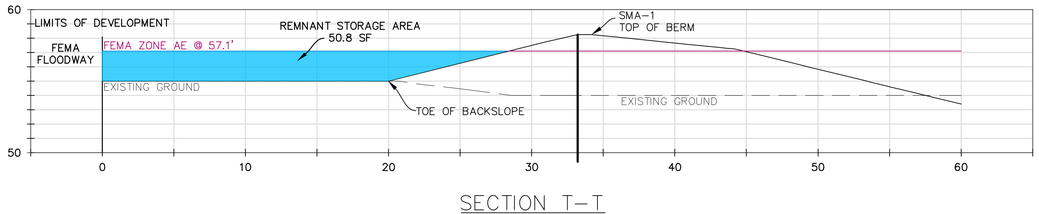


SECTION W-W
1"=5'

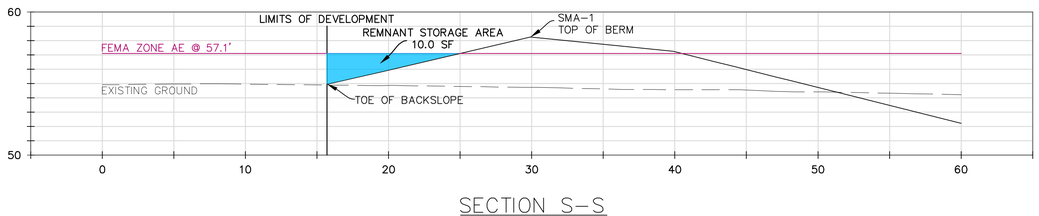


SECTION V-V
1"=5'

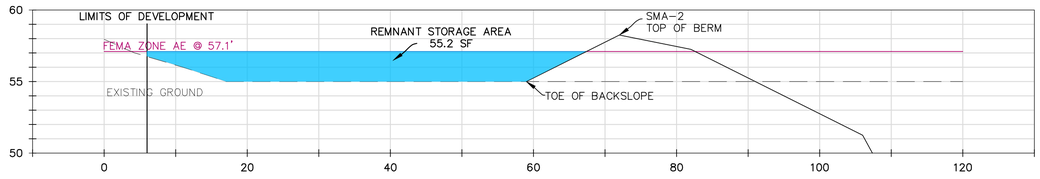
SECTION U-U
1"=5'



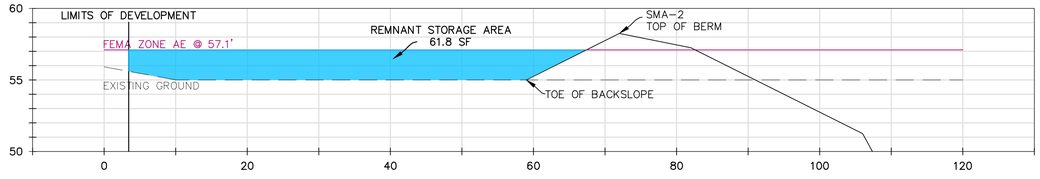
SECTION T-T
1"=5'



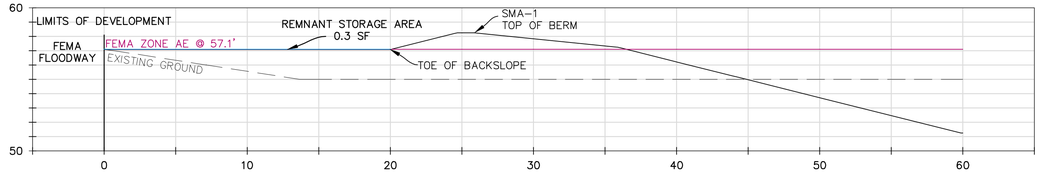
SECTION S-S
1"=5'



SECTION DD-DD
1"=10'

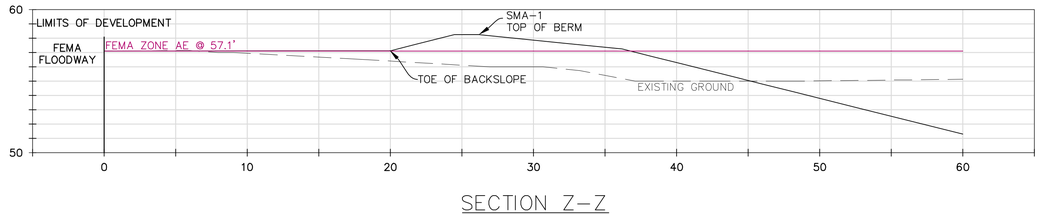


SECTION CC-CC
1"=10'

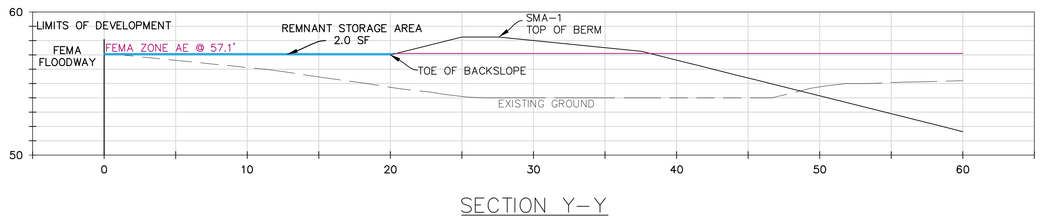


SECTION BB-BB
1"=5'

SECTION AA-AA
1"=5'



SECTION Z-Z
1"=5'



SECTION Y-Y
1"=5'

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NO.	DATE	REVISIONS	CHK.
3	10/18/18	UPDATED MULTI-USE ROAD, SMA1, 2, 4 AND 6	
2	08/01/18	REVISED PER SFWMD COMMENTS	
1	06/05/18	ADDED SHEET PER SFWMD COMMENTS	

JAMES C. NUGENT
FLORIDA P.E. No. 57553
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ENGINEERS SURVEYORS
PLANNERS
2200 PARK AVENUE NORTH, WINTER PARK, FL 32789 407.644.4068
CERTIFICATE OF AUTHORIZATION NO. 68

DRAWN BY	DESIGNED BY	CHECKED BY	DATE	JOB NUMBER
ACC	ACC	JCN	6/4/2018	13189

SCALE: AS SHOWN

FONTANA

OSCEOLA COUNTY, FL

ZONE AE REMNANT STORAGE BEHIND BACKSLOPE

DRAWING 13189-XCOMP

SHEET 4 OF 7

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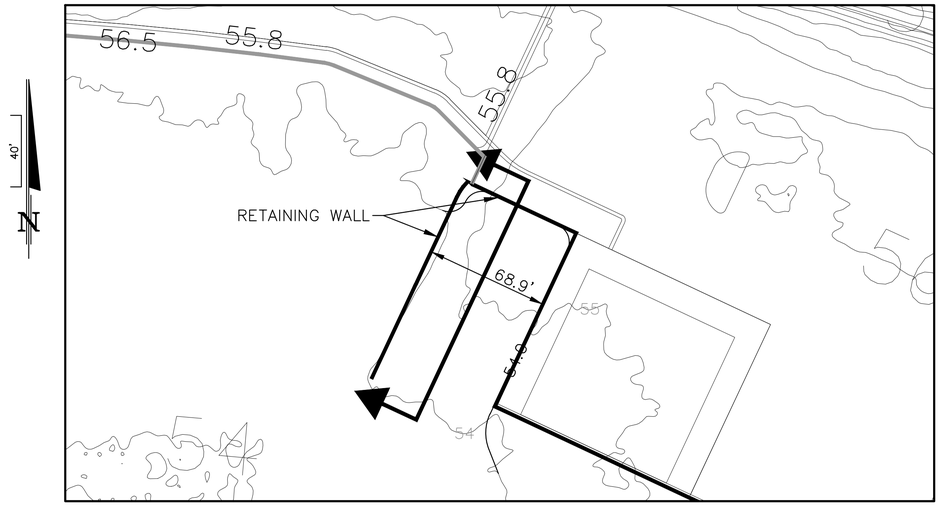
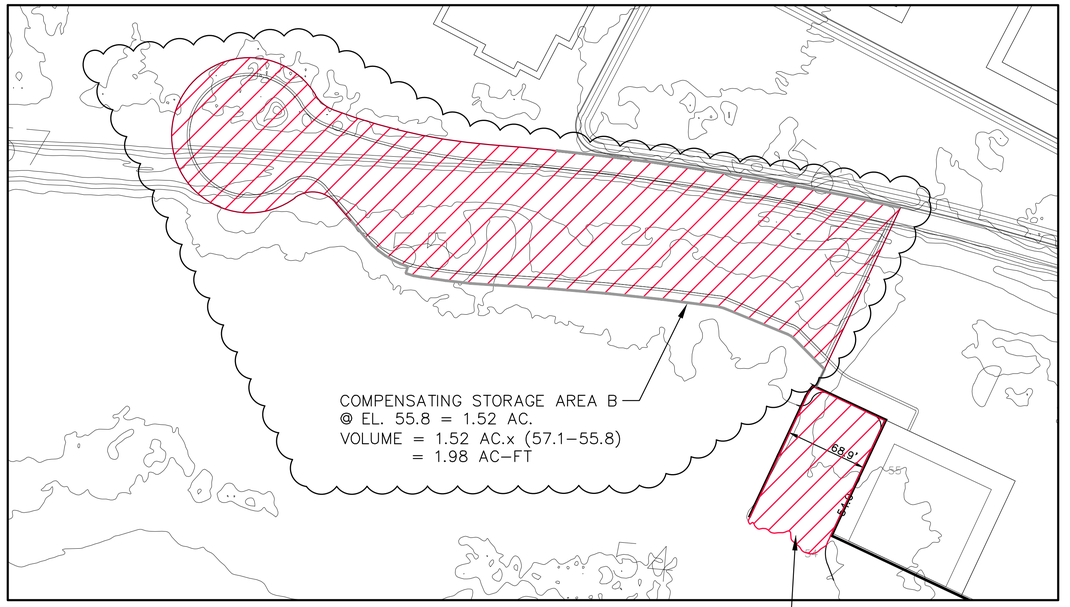
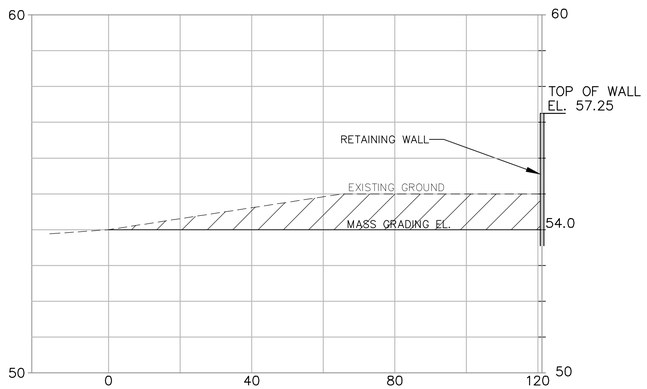


PLAN
1"=40'



COMPENSATING STORAGE AREA
1"=60'

COMPENSATING STORAGE AREA A
0.14 AC–FT (SEE SECTION THIS SHEET)



SECTION
HORIZ. 1"=20'
VERT. 1"=2'

88.0 SF X 68.9' = 6,063 CF, 0.14 AC–FT

GENERAL NOTES:

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NO.	DATE		CHK.
2	06/18/21	REVISED MARINA PARKING LOT PER SFWMD RAI	JCN
1	06/26/20	ADDED SHEET	JCN
		REVISIONS	

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DRAWN BY	DESIGNED BY	CHECKED BY	DATE	SCALE	JOB NUMBER
ET	JCN	JCN	07/__/20	AS SHOWN	13189

FONTANA
OSCEOLA COUNTY, FL
COMPENSATING STORAGE EXHIBIT
PROPOSED STORAGE – MARINA

DRAWING 13189–XCOMP
SHEET 4A OF 7

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	REMNANT STORAGE AREA	LENGTH BETWEEN SECTIONS	REMNANT STORAGE BETWEEN SECTIONS	REMNANT STORAGE BETWEEN SECTIONS
SECTION NAME	(SF)	(FT)	(CU FT)	(AC-FT)
SECTION N-N	19.1			
		1014	19,367.4	0.44
SECTION O-O	19.1			
SECTION P-P	20.2			
		340	6,868.0	0.16
SECTION Q-Q	20.2			
		55	830.5	0.02
SECTION R-R	10.0			
		174	1,740.0	0.04
SECTION S-S	10.0			
		62	1,884.8	0.04
SECTION T-T	50.8			
		148	5,564.8	0.13
SECTION U-U	24.4			
		300	7,320.0	0.17
SECTION V-V	24.4			
		35	467.3	0.01
SECTION W-W	2.3			
		165	2,178.0	0.05
SECTION X-X	2.0			
		130	279.5	0.01
SECTION Y-Y	2.0			
		230	230.0	0.01
SECTION Z-Z	0			
SECTION AA-AA	0.1			
		88	17.6	0.00
SECTION BB-BB	0.3			
SECTION CC-CC	61.8			
		227	13,279.5	0.30
SECTION DD-DD	55.2			
		TOTAL:	60,027.4	1.38

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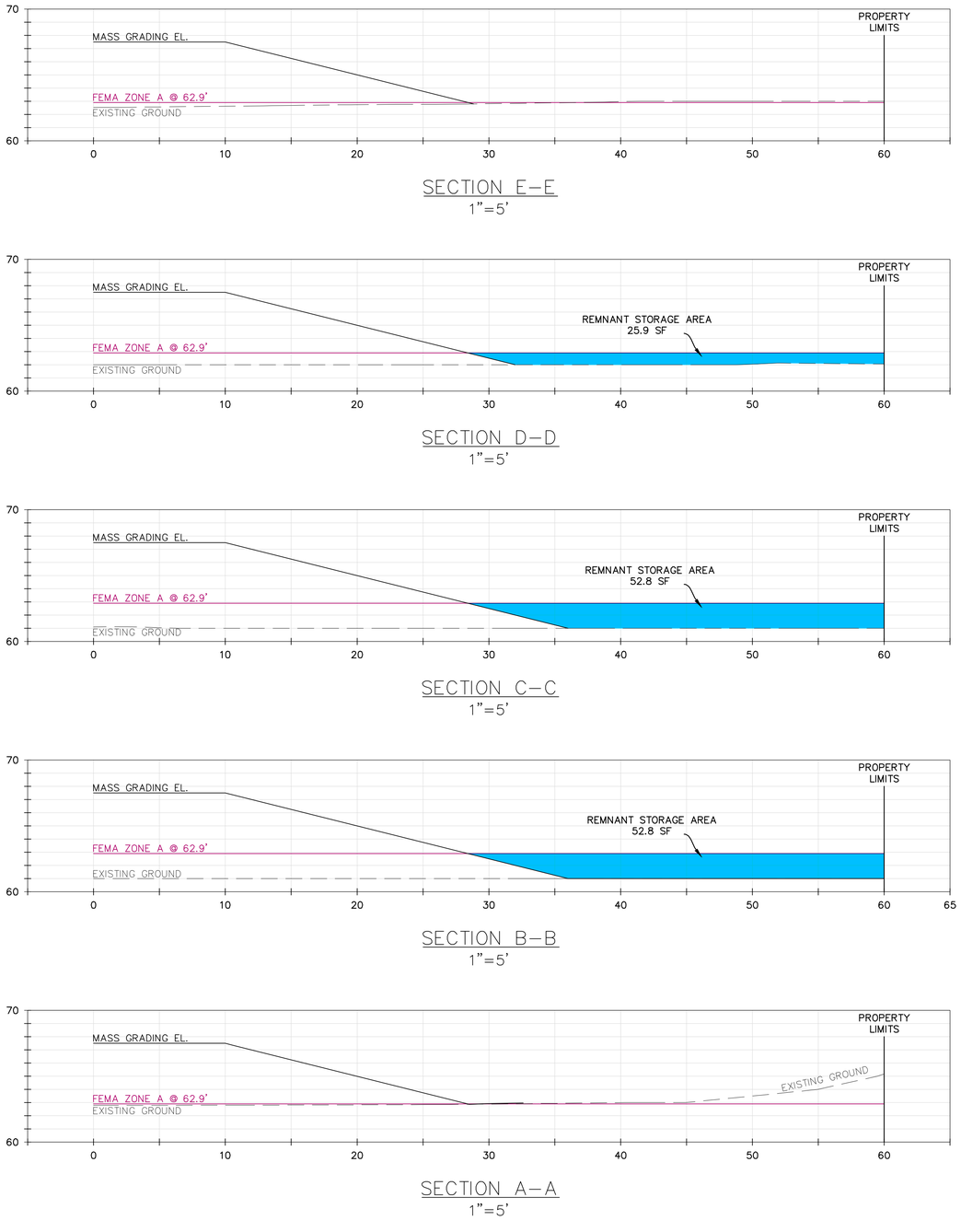
CERTIFICATE OF AUTHORIZATION NO. 68

DRAWN BY ACC | DESIGNED BY ACC | CHECKED BY JCN | SCALE AS SHOWN | DATE 6/4/2018 | JOB NUMBER 13189

FONTANA
OSCEOLA COUNTY, FL
ZONE AE REMNANT STORAGE BEHIND BACKSLOPE

DRAWING 13189-XCOMP

SHEET 5 OF 7



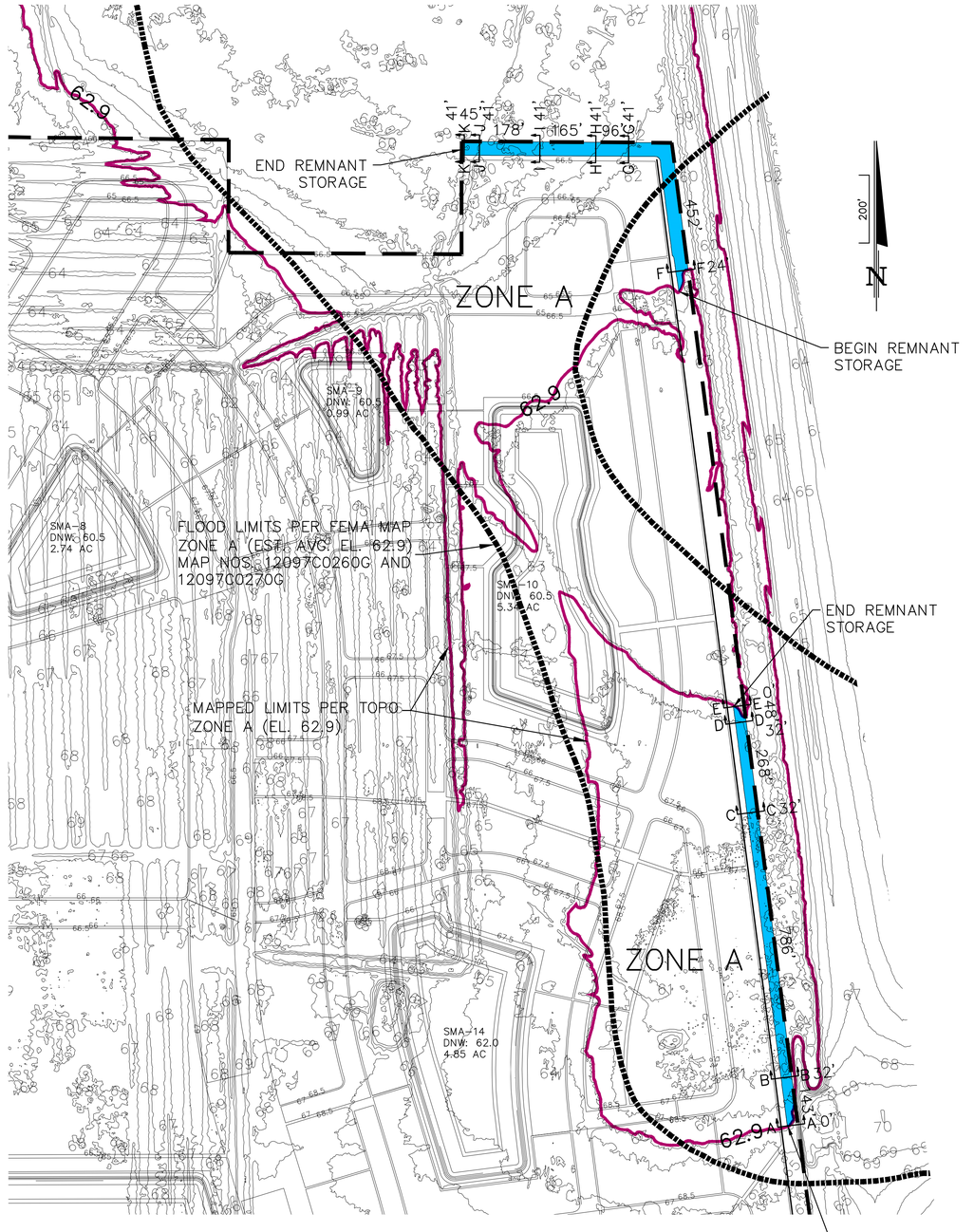
SECTION E–E
1"=5'

SECTION D–D
1"=5'

SECTION C–C
1"=5'

SECTION B–B
1"=5'

SECTION A–A
1"=5'



LEGEND

B WIDTH AT SECTION — LENGTH BETWEEN SECTIONS — A WIDTH AT SECTION

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FONTANA

OSCEOLA COUNTY, FL

ZONE A REMNANT STORAGE BEHIND BACKSLOPE

DRAWING 13189–XCOMP

SHEET 6 OF 7

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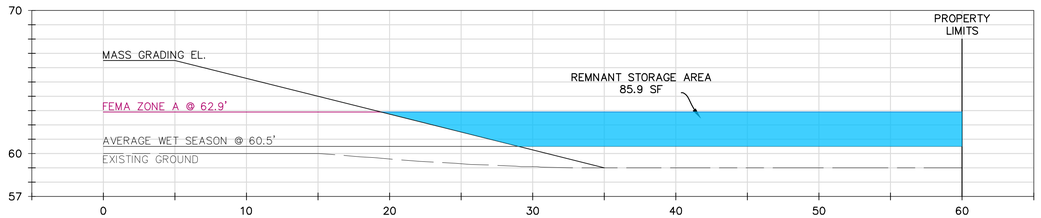
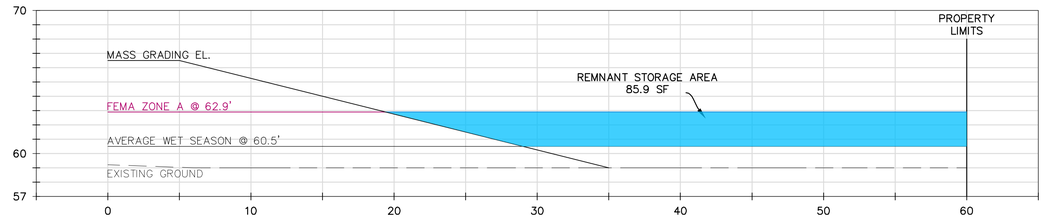
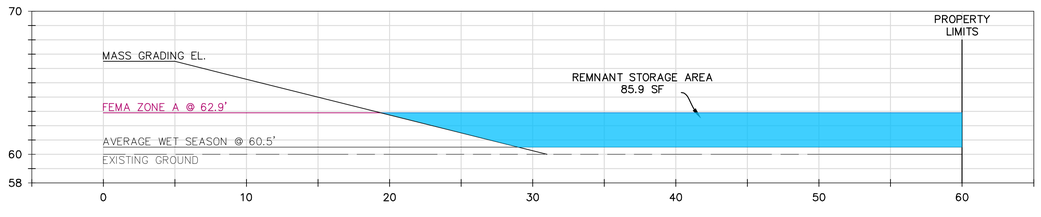


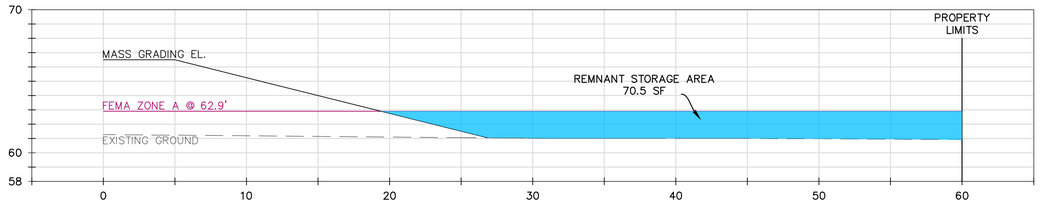
SECTION J–J
1"=5'



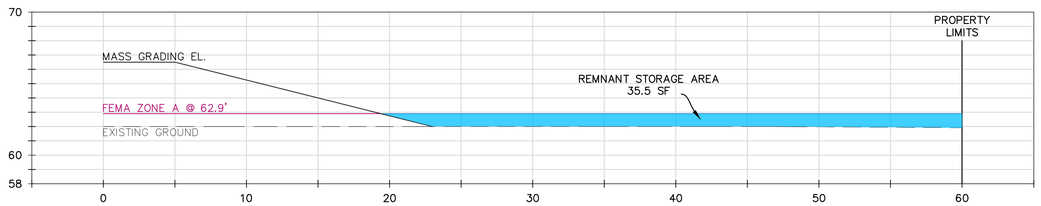
SECTION K–K
1"=5'



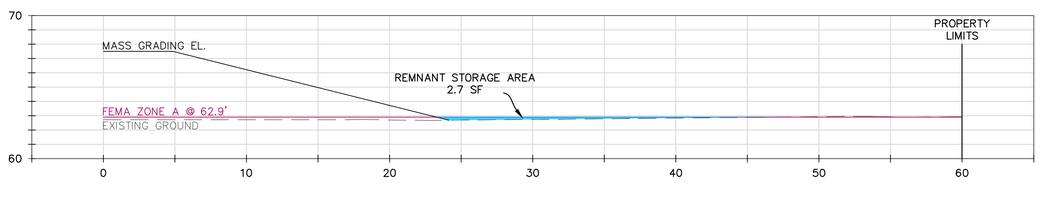
SECTION I–I
1"=5'



SECTION H–H
1"=5'



SECTION G–G
1"=5'



SECTION F–F
1"=5'

	REMNANT STORAGE AREA	LENGTH BETWEEN SECTIONS	REMNANT STORAGE BETWEEN SECTIONS	REMNANT STORAGE BETWEEN SECTIONS
SECTION NAME	(SF)	(FT)	(CU FT)	(AC-FT)
SECTION A-A	0			
		143	3,775.2	0.09
SECTION B-B	52.8			
		786	41,500.8	0.95
SECTION C-C	52.8			
		268	10,545.8	0.24
SECTION D-D	25.9			
		48	621.6	0.01
SECTION E-E	0			
SECTION F-F	2.7			
		452	8,633.2	0.20
SECTION G-G	35.5			
		96	5,088.0	0.12
SECTION H-H	70.5			
		165	12,903.0	0.30
SECTION I-I	85.9			
		178	15,290.2	0.35
SECTION J-J	85.9			
		45	3,865.5	0.09
SECTION K-K	85.9			
		TOTAL:	102,223.3	2.35

GENERAL NOTES:

1. THE SCALE OF THIS DRAWING MAY HAVE CHANGED DUE TO REPRODUCTION.
2. ALL ELEVATIONS ARE IN NAVD88 DATUM.

NO.	DATE	REVISIONS	CHK.
2	08/01/18	REVISED PER SFWMD COMMENTS	
1	06/05/18	ADDED SHEET PER SFWMD COMMENTS	

JAMES C. NUGENT
FLORIDA P.E. No. 57553
DATE:

DONALD W. McINTOSH ASSOCIATES, INC.
ENGINEERS PLANNERS SURVEYORS
2200 PARK AVENUE NORTH, WINTER PARK, FL 32789 407.644.4068
CERTIFICATE OF AUTHORIZATION NO. 68

DRAWN BY ACC | DESIGNED BY ACC | CHECKED BY JCN | DATE 6/4/2018 | SCALE AS SHOWN | JOB NUMBER 13189

FONTANA
OSCEOLA COUNTY, FL
ZONE A REMNANT STORAGE BEHIND BACKSLOPE

DRAWING 13189-XCOMP

SHEET 7 OF 7

F:\Proj2013\13189\EDWG\Exhibits\13189-XCOMP.dwg

Fontana
Compensating Storage Calculations - Existing Storage

Date: 6/5/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

FEMA Flood Zone:	**ZONE AE**
Base Flood Elevation (BFE):	**57.1'**

AWS = Average Wet Season

ArcMap Output[1]

Dataset	Plane_Height	Reference	Z_Factor	Area_2D (sqft)	Area_3D (sqft)	Volume (cu ft)
..pStor\CompStor.gdb\ZONEAEAreas	54.25	BELOW	1	483375.1492	483423.0305	116595.4231
..pStor\CompStor.gdb\ZONEAEAreas	57.1	BELOW	1	3675074.555	3676307.52	5407759.125

Stage (ft - NAVD)	Area (ac)	Volume to Ground (ac-ft)	
54.25	11.10	2.68	AWS
57.1	84.40	124.15	BFE

Existing Storage between 57.1' and 54.25' = 121.47 ac-ft

FEMA Flood Zone:	**ZONE A**
Base Flood Elevation (BFE):	**62.9'**

ArcMap Output[1]

Dataset	Plane_Height	Reference	Z_Factor	Area_2D (sqft)	Area_3D (sqft)	Volume (cu ft)
..mpStor\CompStor.gdb\ZONEAAreas	60.5	BELOW	1	88022.26096	88087.53753	46415.32784
..mpStor\CompStor.gdb\ZONEAAreas	62.9	BELOW	1	1412884.091	1413535.566	1773153.104

Stage (ft - NAVD)	Area (ac)	Volume to Ground (ac-ft)	
60.5	2.02	1.07	AWS
62.9	32.45	40.71	BFE

Existing Storage between 62.9' and 60.5' = 39.64 ac-ft

[1]Values were calculated using ArcGIS ArcMap (version 10.5) made by ESRI. The Surface Volume tool within the 3D Analyst Toolbox was used. The volume is the difference between a plane and a surface.
Please see http://pro.arcgis.com/en/pro-app/tool-reference/3d-analyst/surface-volume.htm for more details.

Fontana
Compensating Storage Calculations - Proposed Storage

Date: 6/5/2018
By: NRB
Chk: JCN
Rev: 6/18/2021

FEMA Flood Zone:	**ZONE AE**
Base Flood Elevation (BFE):	**57.1'**
Existing Storage:	**121.47 ac-ft**
Comp Storage Ponds:	**SMA-1,2,3, Marina**

DNW = Design Normal Water
AWS = Average Wet Season

Pond Data

Stage (ft - NAVD)	SMA-1 Area (ac)	SMA-2 Area (ac)	SMA-3 Area (ac)	MARINA Area (ac)	Volume (ac-ft)	
54.25	29.78	2.36	6.44	1.35	0.00	DNW/AWS
55.25	30.43	2.48	6.65	1.50	40.49	
56.25	31.08	2.60	6.86	1.65	82.12	
57.10	31.63	2.70	7.05	1.79	118.40	BFE
57.25	31.73	2.72	7.08	1.81	124.89	Outside Top of Berm for Marina
58.25	33.35	3.04	7.64		167.67	Outside Top of Berm

Pond Storage Provided @ 57.1' =	**118.40 ac-ft**

ZONE AE Remnant Storage behind Backslope from Cross Sections =	**1.38 ac-ft**

ZONE AE Storage Area A=	**0.14 ac-ft**

ZONE AE Storage Area B =	**1.98 ac-ft**

Total Proposed Storage between 57.1' and 54.25' =	**121.90 ac-ft**

FEMA Flood Zone:	**ZONE A**
Base Flood Elevation (BFE):	**62.9'**
Existing Storage:	**39.64 ac-ft**
Comp Storage Ponds:	**SMA-8,9,10,13**

Pond Data

Stage (ft - NAVD)	SMA-8 Area (ac)	SMA-9 Area (ac)	SMA-10 Area (ac)	SMA-13 Area (ac)	Volume (ac-ft)	
60.5	2.74	0.99	5.34		0.00	DNW/AWS
61.0	2.80	1.03	5.45	8.13	4.59	DNW/AWS (SMA-13)
61.5	2.87	1.07	5.56	8.26	13.38	
62.5	3.00	1.16	5.78	8.51	31.49	
62.9	3.05	1.20	5.87	8.62	38.93	BFE
63.5	3.13	1.25	6.01	8.77	50.31	
64.5	3.38	1.49	6.59	9.23	70.23	Outside Top of Berm (SMA-9, 10)
65	3.55			9.56	78.68	Outside Top of Berm (SMA-8, 13)

Pond Storage Provided @ 62.9' =	**38.93 ac-ft**

ZONE A Remnant Storage behind Backslope from Cross Sections =	**2.35 ac-ft**

Total Proposed Storage between 62.9' and 60.5' =	**41.28 ac-ft**