Seminole Electric
COOPERATIVE, INC.
IN PARTNERSHIP WITH THOSE WE SERVE

6/24/2016

Ms. Cindy Mulkey
Florida Department of Environmental Protection
Siting Office
2600 Blair Stone Road
Tallahassee, Florida 32399-3000

Re: Seminole Electric Cooperative, Inc.
Midulla Generating Station, Hardee County Florida
Power Plant Certification No. PA89-25F
Post-Certification Amendment to Application

Dear Ms. Mulkey:

Pursuant to Section 403.5113(1)(a), Florida Statues and Rule 62-17.205, Florida Administrative Code, please accept this letter and attachments as a post-certification amendment to the Seminole Electric Cooperative, Inc. ("Seminole") Site Certification Application ("Application") for the Midulla Generating Station in Hardee County, Florida. This post-certification amendment addresses the installation of a new 9ft x 12ft security booth with entrance road modification, as well as a containment area for sodium hypochlorite unloading.

The new security booth will be located in the center of the current entrance road, which is already an impervious surface. The new entrance road will require widening a portion of the current road and result in an increase of asphalt by 2,430 square feet (ft^2). The removal of the existing security booth and restroom will reduce the impervious area by 192 ft^2. (See figure 1 of the attached report).

The proposed containment area for sodium hypochlorite unloading will be adjacent to an existing sodium hypochlorite tank near the northwest portion of the MGS site within the service water pretreatment area (see figure 2 of the attached report). The containment area would help to control incidental spills during unloading operations. The size of the containment area will be 13ft x 15ft, with a 4 inch berm.

The proposed entrance road modification and unloading containment area will result in an increased impervious surface total of approximately 2,433 ft^2. 2,238 ft^2 is from the modified entrance road minus the old security booth/restroom that will be removed. 195 ft^2 is from the installation of the proposed sodium hypochlorite containment area. Both areas eventually drain into an onsite 4.28-acre stormwater detention pond. To ensure that the existing pond has sufficient storage capacity to attenuate the runoff from the new impervious surface, IBC Consulting conducted the stormwater analysis that is attached below. Based on the results of the stormwater analysis, the existing stormwater treatment system has sufficient storage and attenuation capacity to accommodate the entrance road modification and the sodium hypochlorite unloading containment area.

If the Department concurs, Seminole requests that this letter and its attachments be forwarded to all appropriate agencies and parties to the original certification proceeding as a permissible post-certification amendment to the Application. If you or any of the parties have any questions or concerns, or require additional information, please contact me at (813) 963-0994, ext. 1281.

Sincerely,

Michael W. Lee

Michael Lee
Senior Environmental
Regulatory Coordinator

Cc: Lewis Snyder, SECI
David Childs, HG&S

IBC Consulting
4126 NW 66th Terrace
Gainesville FL 32606
352-256-1883
ivanbchou@gmail.com

June 22, 2016

Mr. Michael Lee
Seminole Electric Cooperative, Inc.
P.O. Box 272000
Tampa, Florida 33688-2000

Re: Seminole Electric Cooperative Inc.'s Midulla Generating Station (MGS) Stormwater Analysis for Entrance Road Modification and Sodium Hypochlorite Unloading Containment

Dear Michael:

I am submitting this report to present the results of a hydraulic/hydrological analysis to assess the hydrological effects of the proposed constructions at the Seminole Electric Cooperative Inc. (SECI) Richard J. Midulla Generating Station (MGS), including the entrance road modification and a containment area for sodium hypochlorite unloading.

PROJECT DESCRIPTION

1. Currently, there is a small 8-ft-by-8-ft security booth located at the south side (exit lane) of the MGS entrance road. The security guard has to walk across the exit lane to check in visitors, which can be a safety concern. SECI plans to widen a portion of the entrance road and construct a new 9-ft-by-12-ft security booth located in the center of the entrance road between the entrance and exit lanes so the security guard can check visitors in and out without stepping onto the road. This larger climate-controlled guardhouse, with a restroom, will house various types of electronic equipment to comply with the North American Electric Reliability Corporation (NERC) Critical Infrastructure Protection (CIP) physical security standard. The existing 8-ft-by-8-ft security booth, along with a 12-ft-by-12-ft concrete slab that the booth sits on, will be demolished. An adjacent 6-ft-by-8-ft restroom will be demolished also. The configuration of the modified entrances road is shown in Figure 1. The road widening will increase the asphalt surface by 2,430 square feet (ft^2). The removal of the existing security booth and the restroom will reduce the impervious area by 192 ft^2.

2. There is an existing sodium hypochlorite tank near the northwest portion of the MGS site within the service water pretreatment area. SECI plans to construct a concrete-paved unloading area, with the containment berm, adjacent to the tank to control incidental spills during unloading operations. In the event of an incidental spill, the spilled chemical will be contained, cleaned up, and transported to an approved disposal/treatment site by approved contractors. The size of the containment area will be 13 ft by 15 ft, and the height of the containment berm will be 4 inches. The location of the proposed containment area is shown in Figure 2.

The proposed entrance road modification and the proposed unloading containment area will result in increased impervious surface area and, thus, more stormwater runoff, which drains into an onsite 4.28-acre stormwater detention pond. To ensure the existing pond has sufficient storage capacity to attenuate the runoff from the new impervious surfaces, IBC Consulting (IBC) conducted the stormwater analysis presented herein.

HYDROLOGICAL AND HYDRAULIC ANALYSIS

In 2004, Environmental Consulting & Technology, Inc. (ECT) conducted a stormwater management study (ECT, 2004)[1] for the construction of peaker units on the MGS site and subsequently obtained the permits for the peaker project. The drainage basin delineation of the MGS site area presented in ECT's previous study was used and modified for this analysis.

Figure 3 presents the drainage basin delineation of the MGS facility, and Figure 4 depicts the drainage pattern. Appendix A contains the construction drawings of the stormwater management system. The proposed entrance road modification (in Basin 5B) will slightly shift the sub-basin boundary. The proposed unloading containment (in Basin 5C) will not change the basin boundary. The total drainage basin area of the MGS site within the stormwater management system is 47.22 acres. To identify land use cover and compute the curve numbers (CN) of the sub-basins, an aerial photograph flown on January 17, 2016 was obtained (Figure 5).

The areas covered by buildings, concrete, asphalt, gravel, and grass are determined using the recent aerial photograph and onsite investigation (Figure 5). Subsequently, CNs were calculated (Appendix B) based on hydrologic soil conditions and the land use distribution after the proposed installation of the entrance road modification, unloading containment, and the switchyard house addition.

The following subsections provide a description of each sub-basin.

SUB-BASIN 1A

Currently, Sub-basin 1A is an open area that was originally used as a construction laydown area during the construction of the peaker units. A limestone base was constructed in a majority of the sub-basin area to provide a stable base for construction equipment staging and an asphalt road was constructed to provide access to the combustion turbines. Since that time, grass has grown and is well established in this area, making it much more pervious. A 12-ft-by-12-ft concrete pad that supports the security booth and a 6-ft-by-8-ft restroom will be demolished and replaced by grass coverage (Figure 1). The CN calculation for Sub-basin 1A reflects the demolition of the security booth and the restroom.

SUB-BASIN 1B

The majority of Sub-basin 1B is the power block for the peaker project combustion turbines (CTs) and substation. Ground cover is predominately gravel and buildings. The transformers sit in three containment areas with 58-inch-high concrete containment walls. Rainfall on

[1] Environmental Consulting & Technology, Inc. (ECT). 2004. Stormwater Management Report for Payne Creek Generating Station Peaker Project, ECT No. 030790-0100. August.

these containment areas is pumped to and treated by an oil/water separator, then discharged into a 570-acre cooling water reservoir and does not drain into the stormwater pond. The total area of the transformer containment is 2,772 ft^2.

SUB-BASIN 1C

Land cover within Sub-basin 1C primarily consists of dense grass. A small gravel-covered gas metering and gas regulating station is located in the sub-basin.

SUB-BASIN 1D

Sub-basin 1D consists of a grassy area and a drainage channel.

SUB-BASIN 3

The plant's substation for the CT units is located within this sub-basin, and the majority of the land cover is gravel. Similar to Sub-basin 1B, there are two concrete containments with 18.5-inch-high concrete walls that enclose the transformer equipment. Rainfall on these 2,778-ft^2 areas is pumped to and treated by an oil/water separator then discharged into a 570-acre cooling water reservoir, which has a permitted National Pollutant Discharge Elimination System (NPDES) outfall.

SUB-BASIN 4

Sub-basin 4 is the combined-cycle site, and the land cover is mainly concrete and gravel. An ammonia hydroxide tank is located within a 798-ft^2 containment area with a 48-inch high concrete wall. A 12.5-ft-by-57-ft unloading area with a 6-inch containment berm is adjacent to the tank containment. The design storm is 8.4 inches (25-year, 24-hour event). Therefore, the unloading containment can contain 71 percent of the design rainfall. As a reasonable approximation, 71 percent of the unloading area is considered to be containment and 29 percent of the unloading area is considered to be concrete without containing berms. The total area of the tank containment and unloading containment, as used by the hydrological analysis, is 1,307 ft^2. Rainfall on these containment areas is pumped to and treated by an oil/water separator, then discharged into a 570-acre cooling water reservoir.

SUB-BASIN 5A

Sub-basin 5A was originally used as construction parking area during the peaker project construction. Since that time, grass has grown into this area, making it somewhat more pervious. A portion of this area is now used for contractor parking.

SUB-BASIN 5B

The existing land use consists of two warehouse buildings, equipment storage area, and open space (grass). A large portion of Sub-basin 5B was originally designated as a construction laydown area. However, only a small portion of this planned laydown area is currently used. A lubricating oil building was constructed in 2011 in this sub-basin. In an area south of the fuel oil storage tanks, there are five concrete containment basins (total of 1,131 ft^2 with various containment depths) that enclose fuel pumps. There is also a 2,905 ft^2 fuel unloading area with a 6.5-inch-high containment berm and two floor drains. The floor of the fuel unloading area is graded with slopes to allow rainwater to drain toward the floor drains at the lower locations. It was estimated that the unloading containment area has the capacity to contain at least 7 inches of rainfall. Comparing to the design storm of 8.4 inches, these areas are equivalent to a deep containment of 3,438 ft^2. Rainfall onto these containment areas is pumped to and treated by an oil/water separator and is discharged into a 570-acre cooling water reservoir.

SUB-BASIN 5C

A truck turnaround and demineralized water tank are in Sub-basin 5C along with two water tanks and a treatment facility. The rest of this sub-basin is open space (grass). As shown in Figure 2, a proposed sodium hypochlorite unloading containment area (13 ft by 15 ft) will be located in this basin. This unloading area will be enclosed by a 4-inch berm. The design storm (25-year, 24-hour event) is 8.4 inches. Therefore, the unloading containment can contain 48 percent of the design rainfall. In the event of an incidental spill, the spilled chemical will be contained, cleaned up, and transported to an approved disposal/treatment site by approved contractors.

SUB-BASIN 6

Sub-basin 6 includes a substation, an administrative building, and a water treatment building. The land cover in this area is mainly concrete and gravel. In 2011, SECI obtained a permit to construction a 19-ft-by-38-ft (722 ft^2) free-standing roof between the contractor service building and water treatment building. This permitted structure has not been built to date. In August 2015, SECI submitted a post-certification amendment request to install a 20-ft-by-20-ft concrete monolithic slab to support the switchyard control house addition The CN calculation for Sub-basin 6 includes the switchyard control house addition and the not-yet-built roof. Similar to Sub-basins 1B and 3, there are three containments with 18.5-inch concrete walls that enclose the transformer equipment. Rainfall on these 2,777-ft^2 areas is pumped to and treated by an oil/water separator, then discharged into a 570-acre cooling reservoir.

SUB-BASIN 7 AND 7A

This area includes three fuel tanks within containment berms. Rainfall onto these two sub-basins is pumped and treated by an oil/water separator then is discharged into a 570-acre cooling reservoir, an NPDES wastewater system. Stormwater is contained within the bermed area and released to the cooling reservoir. Therefore, the area within the containment berm (3.7 acres) was not considered in the detention pond analysis.

SUB-BASIN 8

Sub-basin 8 includes an existing 4.28-acre stormwater pond. The bottom elevation of the existing stormwater pond is 114 feet referenced to the National Geodetic Vertical Datum (ft-NGVD). The control structure of the detention pond includes a 4-inch bleed-down orifice (at elevation 120 ft-NGVD), a 15-ft overflow weir (at elevation 121.1 ft-NGVD), and a 100-ft emergency spillway (at elevation 123.0 ft-NGVD). The top elevation of the berm around the detention pond is 125 ft-NGVD. Appendix A presents the construction drawings of the control structure. Table 1 provides the stage-area-volume information for the stormwater pond.

Table 1. Stage-Area-Volume Information for the Stormwater Detention Pond

Stage (ft-NGVD)	Area (acre)	Volume (ac-ft)
114	1.58	0.00
115	0.52	1.05
116	1.80	2.21
117	1.91	4.06
118	2.29	6.16
119	2.98	8.80
120	3.43	12.00
121	3.60	15.52
122	3.76	19.20
123	3.93	23.04
124	4.10	27.06
125	4.28	31.25

Source: ECT, 2012.

SUB-BASIN 9

Sub-basin 9 includes a truck turnaround area. It is mostly grass with some asphalt. This basin is a deep depressional area. It is a self-contained, isolated basin and does not drain to the 4.28-acre stormwater pond.

Among the total drainage area of 47.22 acres, the total containment area, or isolated basins, is 4.84 acres. Therefore, only 42.38 acres of the drainage area actually drains into the stormwater pond.

Table 2 lists the CN values determined for each sub-basin that drains into the stormwater pond. The CNs for Sub-basins 1A, 5B, 5C, and 6 include the proposed constructions and demolitions.

Table 2. Post-Construction Stormwater Sub-basin Weighted Average CNs

Sub-basin ID	Sub-basin Area (acres)	Weighted Average CN (Post-Construction)
1A	3.15	89.3
1B	7.65	93.9
1C	4.48	83.5
1D	1.00	81.7
3	2.66	91.4
4	2.09	93.7
5A	4.19	85.7
5B	4.67	87.1
5C	3.48	86.8
6	3.61	92.9
8	5.38	95.6
Composite	42.38*	90.0

*4.84 acres of containment area is not included.

ECT (2004) reported a pre-development (pre-MGS) drainage basin area of 44.8 acres, which was incorrect, probably because of the less accurate mapping technique used at the time. The correct basin size is 47.22 acres, which is consistent with the post-development drainage basin area. A weighted average CN of 84.6 was used for pre-development runoff modeling. The land use distribution and the weighted average CNs for the pre- and post-development sub-basins are presented in Appendix B.

RESULTS

The Interconnected Channel and Pond Routing Model (ICPR) was used to compute the surface runoff and discharge hydrograph for the pre- and post-development conditions under a 25-year, 24-hour storm event (8.4 inches). According to the 36-hour drawdown requirement [Section 5.2.a.5 of Southwest Florida Water Management District's (SWFWMD's) Basis of Review], a 36-hour drawdown elevation of 120.77 ft-NGVD was computed by the ICPR and used as the initial water level condition for flood routing. Appendix C contains the model inputs/outputs. According to the model results, the peak discharge under the pre-construction conditions is 90.02 cubic feet per second (cfs). The post-development peak discharge from the stormwater pond under a 25-year, 24-hour storm event is 78.94 cfs. The post-construction peak discharge is less than the pre-development discharge. Therefore, the peak flow requirement is met.

SWFWMD's stormwater rules (Section 5.2.a.1, Basis of Review) requires that the stormwater detention pond should have a water quality treatment capacity of 1 inch of runoff from the contributing drainage area. The required water quality treatment volume was calculated to be 3.53 acre-ft, based on the 42.38-acres drainage area contributing to the pond. The stormwater pond at MGS has a water quality treatment capacity between elevations 120 ft-NGVD and 121.1 ft-NGVD. Based on the interpolation of Table 1, the stormwater pond has a water quality treatment capacity of 3.89 acre-ft, which is greater than the required water quality treatment volume of 3.53 acre-ft. The 120-hour drawdown water level in the stormwater pond computed by ICPR is 120.22 ft-NGVD. Therefore, the quality treatment volume is discharged in no less than 120 hours, which complies with Section 5.2.a.4 of the Basis of Review. The 60-hour drawdown water level in the stormwater pond computed by ICPR is 120.58 ft-NGVD. The 60-hour drawdown volume, based on Table 1, is 1.9 acre-ft, less than one-half of the quality treatment volume capacity, which also complies with Section 5.2.a.4 of the Basis of Review. Therefore, the treatment volume requirement is met.

The ICPR model results indicate that the peak water level in the stormwater pond under a 25-year, 24-hour storm event is 122.98 ft-NGVD, which allows approximately 2.02 ft. of freeboard in the pond. Under a 100-year, 24-hour storm event (10.5 inches), the ICPR simulated peak water elevation in the pond is 123.39 ft-NGVD. All of the plant infrastructures at MGS are above elevation 128 ft-NGVD, therefore the plant facility and personnel are protected from 100-year flood.

Based on the results of this stormwater analysis, the existing stormwater treatment system has sufficient storage and attenuation capacity to accommodate the entrance road modification and the sodium hypochlorite unloading containment.

DISCUSSION

The stormwater analysis by ECT (2004) and the subsequent hydrological analyses by ECT for minor site modifications had considered Sub-basin 9 as a self-contained, isolated basin. The security guard, whose workplace is only 200-ft from Sub-basin 9, indicated that the road

2430 - new road
-192 - old Guardhouse / restroom
2238

195 sqft for containment

in the area had never been flooded. Therefore, it was a reasonable assertion that Sub-basin 9 is an isolated basin, even though there had been no infiltration test data to technically verify this claim. A sensitivity analysis was conducted to evaluate the hydrological effects of Sub-basin 9, if it were to be included in ICPR model. In this sensitivity analysis, Sub-basin 9 (0.83 acres) was included in the model and was assigned a worst case CN value of 100. The result of this sensitivity analysis with the inclusion of Sub-basin 9 under the worst case condition under a 25-year 24 hour storm indicated that the peak discharge from the stormwater pond would be 81.08 cfs, which is still less than the pre-development peak discharge of 90.02 cfs.

CONCLUSION

The results of the hydrological/hydraulic analysis indicate that the existing stormwater pond has sufficient capacity to provide both water quality and quantity treatment for the proposed entrance road modification and the sodium hypochlorite unloading containment.

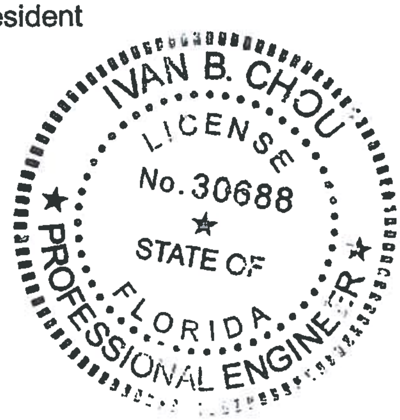
Appendix D provides the operation and maintenance plan of the stormwater management system.

Please let me know if you have any questions regarding this stormwater analysis.

Sincerely,

IBC CONSULTING

Ivan B. Chou, P.E. No 30688
President



June 22, 2016
Date

cc: Justin Gostnell
Robert Burleson

Attachment

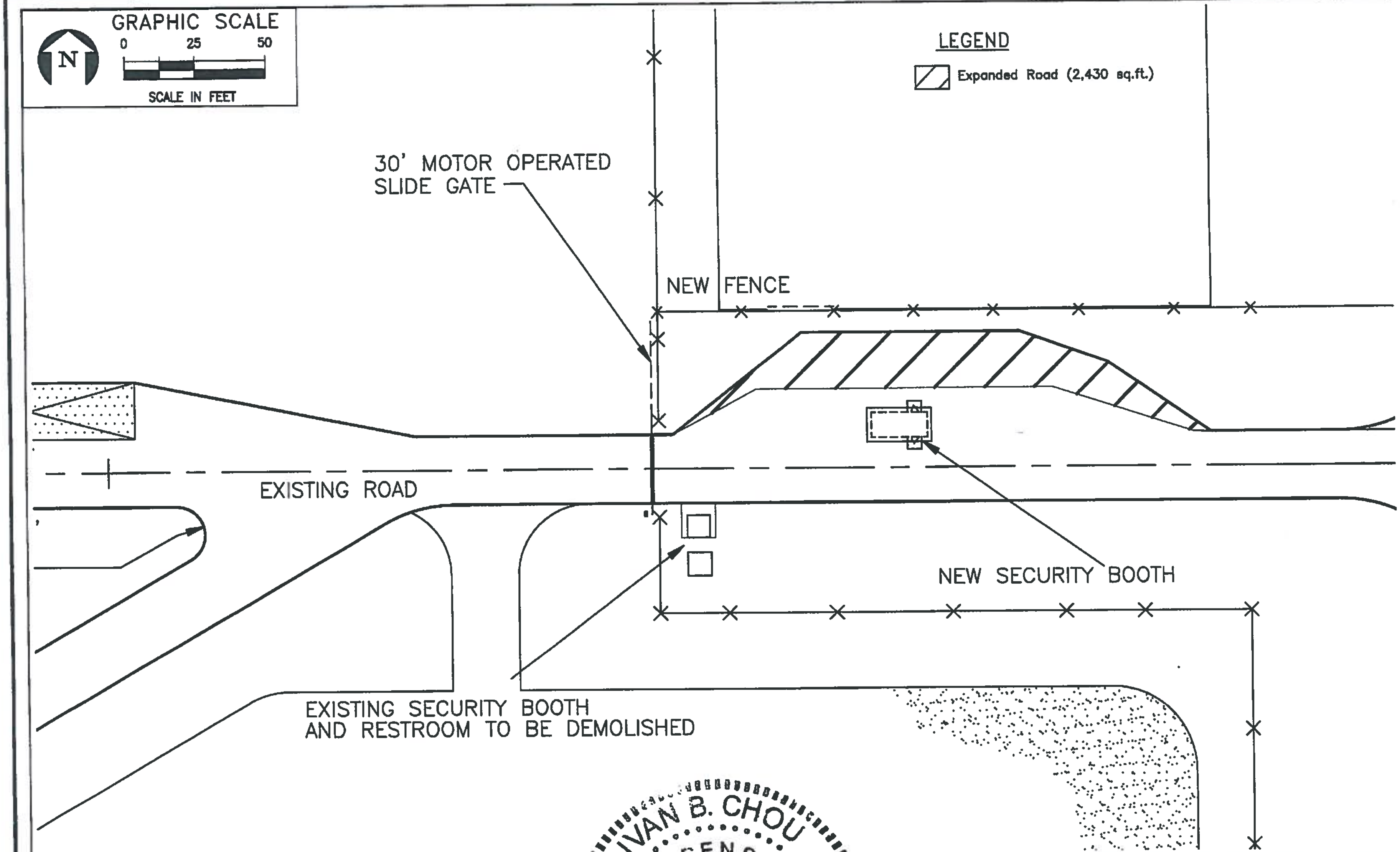


FIGURE 1.
PROPOSED ENTRANCE ROAD MODIFICATION
MIDULLA STATION
Source: SECI, 2016; IBC consulting, 2016.

IVAN B. CHOU LICENSE No. 30688 STATE OF FLORIDA PROFESSIONAL ENGINEER
6/22/2016

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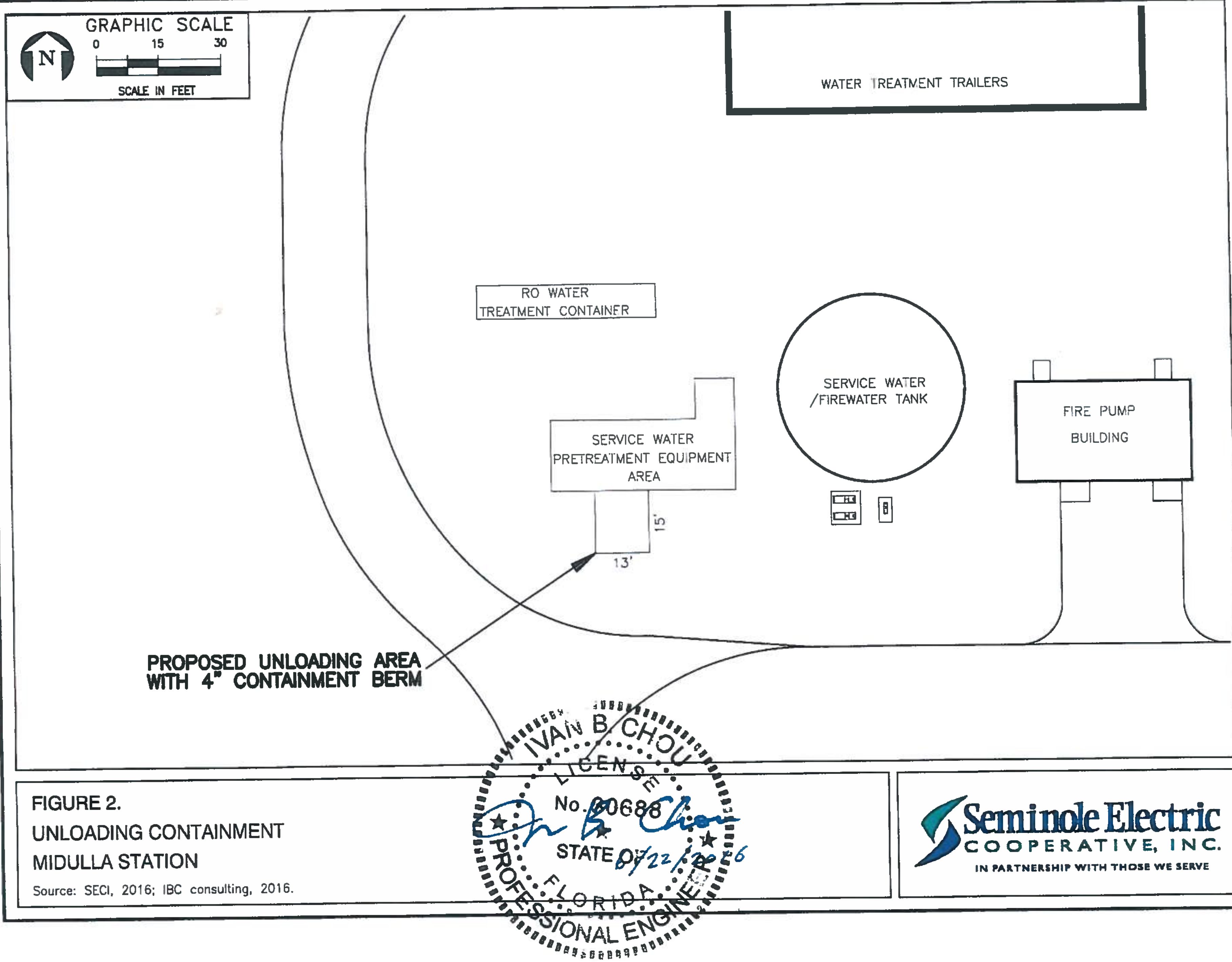

FIGURE 2.
UNLOADING CONTAINMENT
MIDULLA STATION
Source: SECI, 2016; IBC consulting, 2016.

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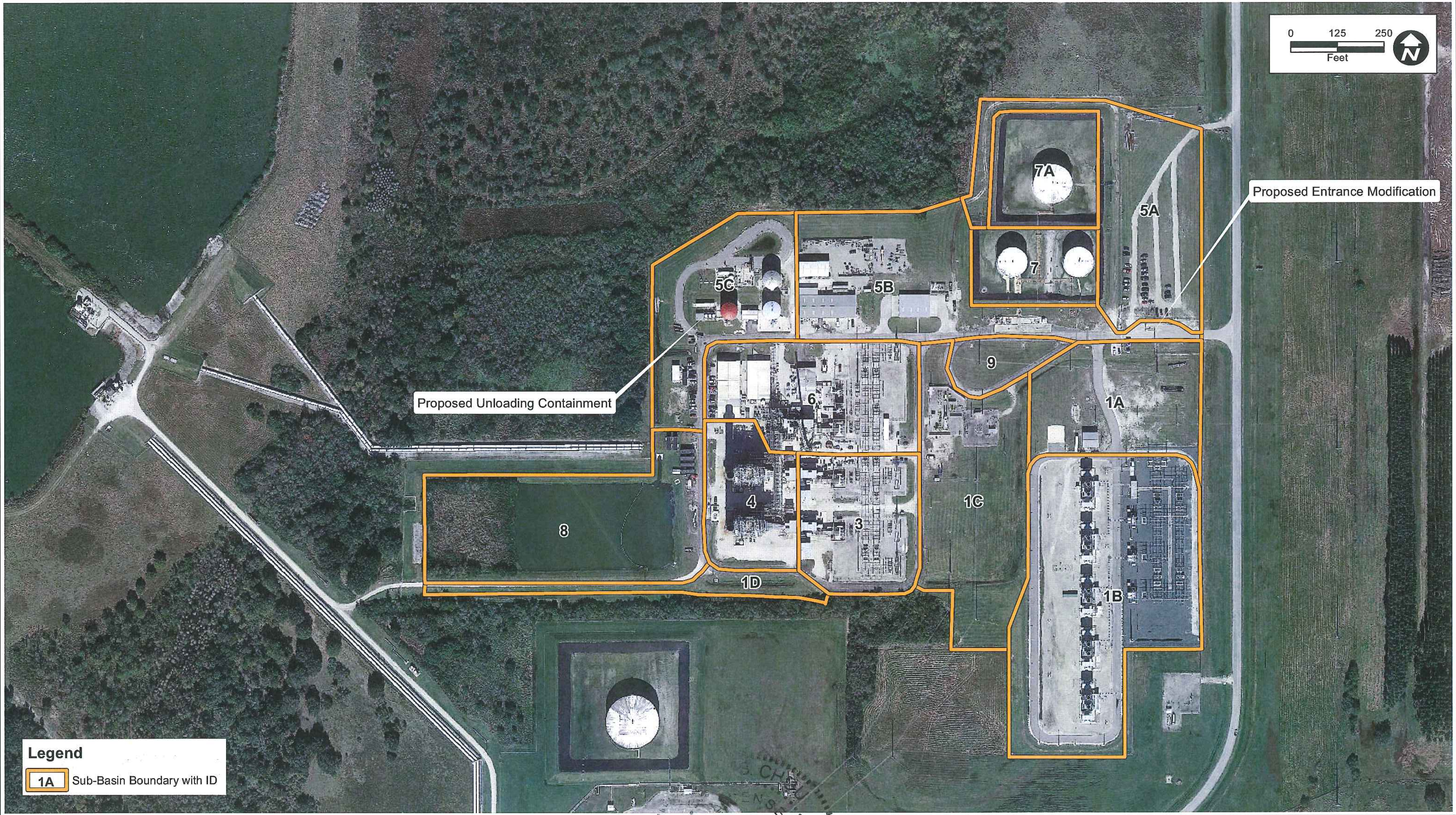

FIGURE 3.
AERIAL MAP
MIDULLA GENERATING STATION

Sources: Google Earth, 2016; ECT, 2012; IBC,2016; DMC, 2016

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PROFESSIONAL ENGINEER

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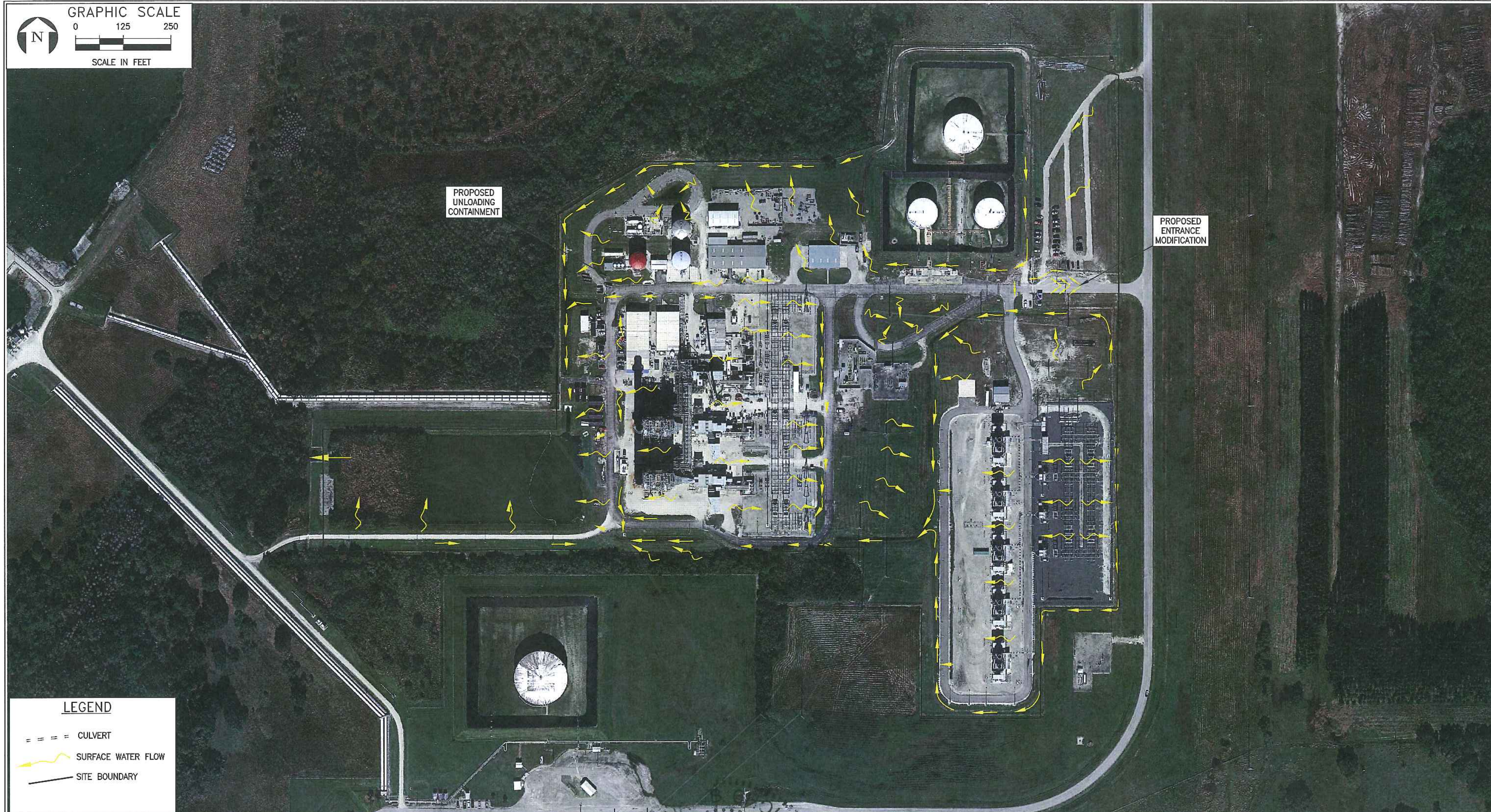

FIGURE 4.

DRAINAGE PATTERN

MIDULLA GENERATING STATION

Source: Google Earth, 2016; ECT, 2012; IBC, 2016; DMC, 2016.

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Sub-Basin	Gravel	Grass	Asphalt	Water	Buildings	Containment
1A	0.13	2.64	0.30		0.08	
1B	5.18	0.87	0.87		0.73	0.06
1C	0.23	3.52	0.71		0.02	
1D	0.04	0.89	0.07			
3	1.72	0.31	0.30		0.33	0.06
4	0.85	0.17	0.21		0.87	0.03
5A	0.46	3.73				
5B	1.17	2.39	0.65		0.47	0.08
5C	0.25	2.08	0.82		0.34	0.00
6	1.99	0.24	0.53		0.85	0.07
7						1.63
7A						2.07
8	0.23	1.07	0.15	3.93*		
9			0.00			0.83

* Water area is measured at 123 ft-NGVD elevation.

FIGURE 5.
LAND COVER MAP
MIDULLA GENERATING STATION

Sources: Google Earth, 2016; ECT, 2012; IBC,2016; DMC, 2016

B. CHOU
No. 30688
STATE OF FLORIDA
PROFESSIONAL ENGINEER
6/22/2016

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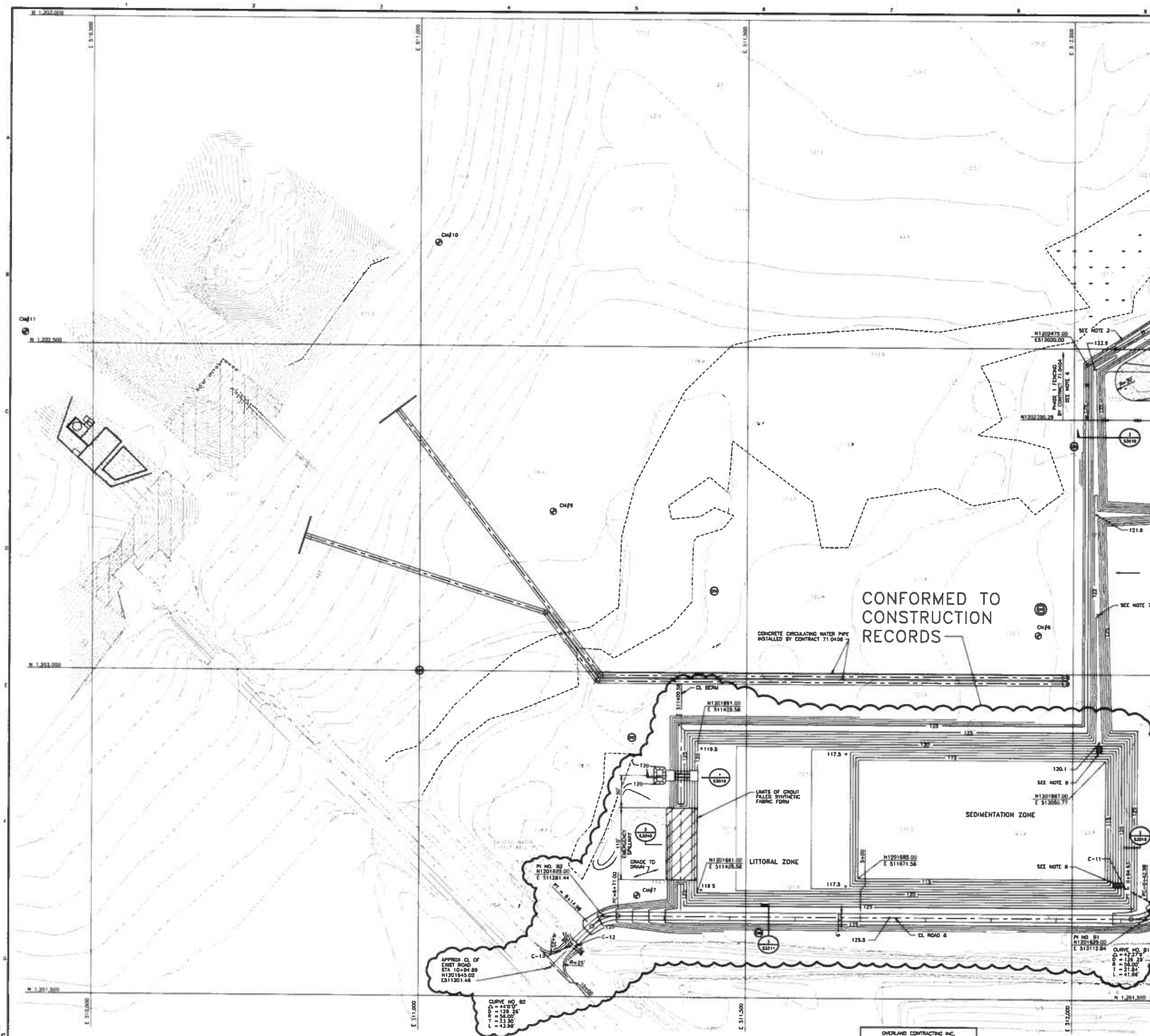
Appendix A

Construction Drawings of the Stormwater Management System



GENERAL NOTES

1. SEE DWG S3000 FOR GENERAL NOTES AND LEGEND.
2. SEE DWG S3010 FOR CULVERT DETAILS AND BEDDING REQUIREMENTS.
3. THE BERM ALONG THE NORTHWEST SIDE OF THE SITE SHALL FOLLOW THE PROPOSED FENCE.
4. SEE DRAWING S1001 & S1003 FOR LOCATIONS OF STRUCTURES.
5. BANK-RUN SHELL SURFACING SHALL BE 6 INCHES THICK.
6. SEE DRAWING S3201 FOR PHASE 2 FENCING BY CONTRACT 71.0404.
7. MINIMUM SLOPE OF DITCH BOTTOM SHALL BE 270'(H): 1'(V).
8. PLACE 12" OF (DITCH LINING) RUBBLE OVER 6" OF BEDDING STONE, AT LEAST 6'-0" WIDE, TO ELEVATION 117, AND CONFORMING WITH SECTION 530 OF FDOT'S "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION."
9. CONTRACT 71.0301 RESPONSIBLE FOR DEWATERING ASSOCIATED WITH POND OVERFLOW STRUCTURES.
10. ON-SITE WETLANDS SHALL NOT BE DISTURBED
11. COORDINATE WITH THE PROJECT FIELD MANAGER FOR THE LOCATION OF EXISTING CONSTRUCTION UTILITIES.
12. GROUND WATER (GW) MONITORING WELLS AND WATER (W) SUPPLY WELL INSTALLED BY CONTRACT 71.0204.

APPROVED FOR CONSTRUCTION

NO	DATE	REVISIONS AND RECORD OF ISSUE
2	06/29/2000	CONFORMED DETENTION POND TO CONSTRUCTION RECORDS
1	03/03/2000	ISSUED APPROVED FOR CONSTRUCTION
0	01/28/2000	ISSUED FOR BID

50' 25' 0 50' 100'
SCALE: 1"=50'

OVERLAND CONTRACTING INC.
3350 GREEN COURT
ANN ARBOR, MI 48105

I HEREBY CERTIFY THAT THIS DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF FLORIDA
SIGNED JOHN P STEWERT
DATE 01/25/2000 REG NO 50041

Overland Contracting Inc.

SEMINOLE ELECTRIC COOP. INC.
PAYNE CREEK GENERATING STATION

SITE DEVELOPMENT
AREA 1 PLAN

PROJECT / DRAWING NUMBER: 60976-C112-S3001
REV 2

CULVERT AND DROP INLET TABLE

NO.	REF DWG	INSIDE DIAMETER (IN)	CULVERT LENGTH (FT)	INLET COORDINATES NORTH	INLET COORDINATES EAST	INLET INVERT ELEVATION	OUTLET COORDINATES NORTH	OUTLET COORDINATES EAST	OUTLET INVERT ELEVATION	DROP INLET WIDTH	DROP INLET TOP ELEVATION	DROP INLET BOTTOM ELEVATION	REMARKS
C-1	S3002	15	72'-9"	N1202827.50	E513523.00	129.8	N1202884.75	E513533.00	129.7				BY CONTRACT 71.0235
C-2	S3002	15	59'-0"	N1202304.00	E513533.00	129.5	N1202947.00	E513530.00	129.4				BY CONTRACT 71.0235
C-3	S3004	12	43'-8"	N1202245.00	E513073.00	128.4	N1202205.00	E513084.00	128.1				BY CONTRACT 71.0233
C-4	S3004	18	68'-0"	N1202245.75	E512462.00	123.9	SEE CB-1	SEE CB-1	SEE CB-1				BY CONTRACT 71.0233
C-5	S3002/S3004	24	84'-6"	SEE CB-4	SEE CB-4	SEE CB-4	N1202245.75	E513117.50	121.7				BY CONTRACT 71.0233
C-6	S3003	33	81'-0"	N1202770.00	E512837.50	121.0	N1201484.00	E512340.00	120.5				BY CONTRACT 71.0231
C-7	S3002/S3004	18	84'-4"	SEE CB-6	SEE CB-6	SEE CB-6	N1201896.00	E512390.00	123.0				BY CONTRACT 71.0233
C-8	S3004	15	77'-6"	N1201853.00	E512707.00	125.5	N1201785.50	E512705.50	125.3				BY CONTRACT 71.0235
C-9	S3004	18	65'-0"	N1201092.00	E512902.00	122.6	N1201028.50	E513392.00	122.4	4'-3"	125.2	-	BY CONTRACT 71.0233
C-10	S3004	15	56'-6"	N1201992.00	E512103.00	122.8	N1201676.00	E512180.00	123.0	4'-8"	125.5	-	BY CONTRACT 71.0233
C-11	S3001/S3002	30	104'-0"	N1201827.50	E512169.00	123.8	N1201975.50	E512345.00	120.1				BY CONTRACT 71.0231
C-12	S3001	24	33'-3"	N1201566.75	E511253.50	115.5	N1201569.50	E511224.50	115.4				BY CONTRACT 71.0231
C-13	S3001	24	33'-3"	N1201558.82	E511549.00	115.5	N1201585.37	E511222.00	115.4				BY CONTRACT 71.0231
C-14	S3002	12	47'-0"	N1202213.00	E513229.00	129.5	N1202212.00	E513176.00	129.1				BY CONTRACT 71.0231

CULVERT NOTES

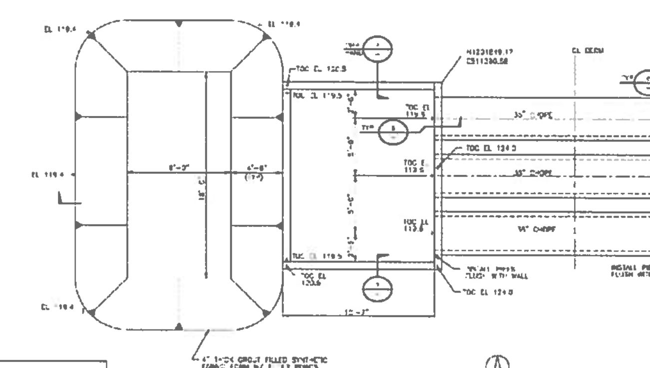
1. CULVERTS SHALL BE PROVIDED WITH FLARED END SECTIONS UNLESS OTHERWISE INDICATED.
2. CULVERT LENGTH INCLUDES TOTAL LENGTH OF CULVERT PIPE AND FLARED END SECTIONS UNLESS OTHERWISE NOTED.
3. PIPE SHALL BE LAID WITH THE TONGUE END POINTING IN THE DIRECTION OF FLOW.
4. PLACE 4 SQUARE YARDS OF CLASS I EROSION CONTROL FABRIC OR APPROVED EQUAL AT ALL CULVERT OUTLETS WHERE RIPRAP EROSION PROTECTION IS NOT SHOWN.

* LENGTHS ARE APPROXIMATE

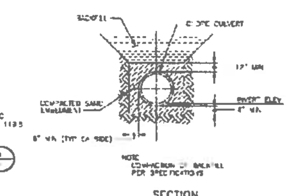
STORM SEWER CATCH BASIN TABLE

STRUCTURAL NO.	REF DWG	CENTERLINE COORDINATES NORTH	CENTERLINE COORDINATES EAST	DIAMETER	TOP ELEVATION	BOTTOM ELEVATION	NORTH INV EL	NORTH DIA	SOUTH INV EL	SOUTH DIA	EAST INV EL	EAST DIA	WEST INV EL	WEST DIA	REMARKS
CB-1	S3002	N1202245.75	E512383.00	4'-0"	125.7	122.7					123.5	18"	123.4	18"	BY CONTRACT 71.0201 / (SEE NOTE 7)
CB-2	S3002	N1202245.75	E512312.00	4'-0"	125.7	122.2	-	-	-	-	123.0	18"	122.9	18"	BY CONTRACT 71.0201 / (SEE NOTE 7)
CB-3	S3004	N1202245.75	E512258.00	4'-0"	125.7	*	-	-	-	-	122.6	18"	122.5	24"	BY CONTRACT 71.0203
CB-4	S3004	N1202245.75	E513200.00	4'-0"	125.7	*	-	-	-	-	122.3	24"	122.1	24"	BY CONTRACT 71.0203
CB-5	S3004	N1223600.00	E513178.00	4'-0"	125.9	*			124.2	12"					BY CONTRACT 71.0203
CB-6	S3004	N1221830.00	E512178.00	4'-0"	126.1	*	123.6	12"	-	-	-	-	123.6	18"	BY CONTRACT 71.0203

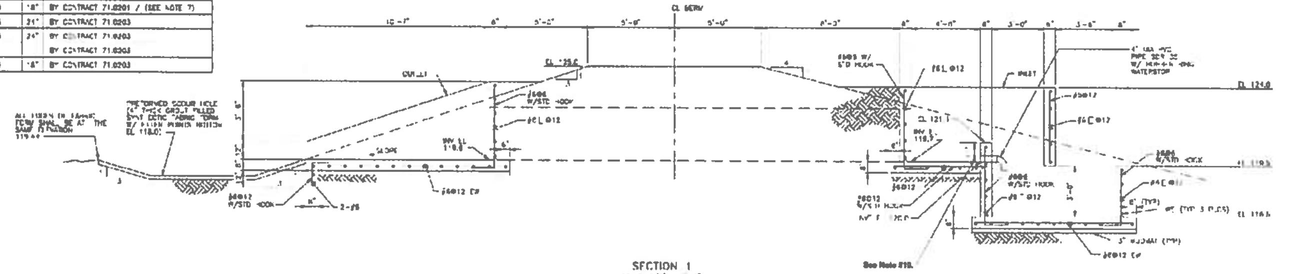
* DETERMINED BY SUBCONTRACTOR



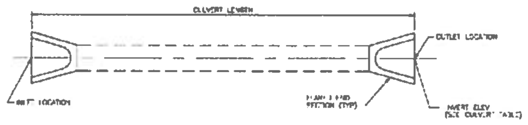
PLAN
DISCHARGE STRUCTURE (BY SPECIFICATION 71.0201)
NO SCALE



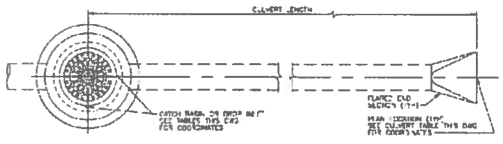
SECTION
SECOND CLASS BEDDING
NO SCALE
SEE CULVERT LIST, THIS DWG



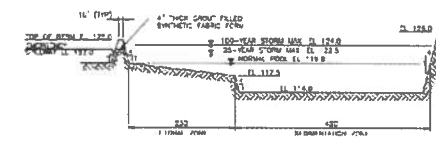
SECTION 1
SCALE: 3/8" = 1'-0"
SEE THIS DWG & DWG S3001



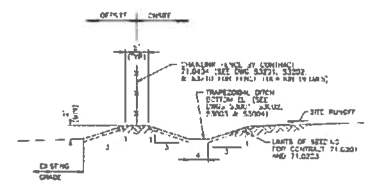
PLAN
TYPICAL CULVERT
NO SCALE



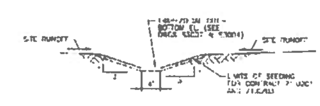
TYPICAL CULVERT PLAN
(BY CONTRACT 71.0201 & 71.0203)
NO SCALE
SEE TABLE ON THIS DWG



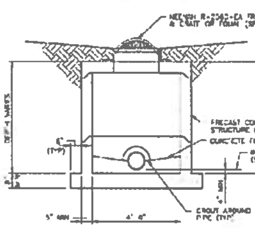
SECTION 2
DETENTION BASIN (BY SPECIFICATION 71.0201)
NO SCALE



SECTION 3
PERIMETER DITCH AND CHAINLINK FENCE
NO SCALE
SEE DWG S3001, S3002, S3003 & S3004

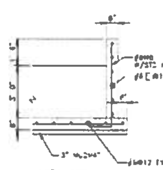


SECTION 4
TYPICAL DITCH
NO SCALE
SEE DWG S3002 & S3004

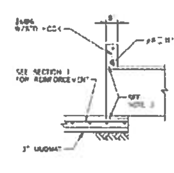


SECTION

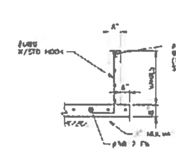
TYPICAL PRECAST CATCH BASIN
NO SCALE



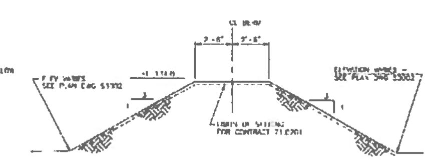
SECTION 5
SCALE: 3/8" = 1'-0"
SEE THIS DWG



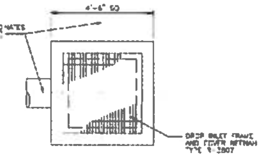
SECTION 6
SCALE: 3/8" = 1'-0"
SEE THIS DWG



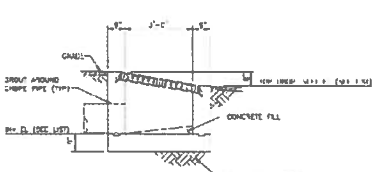
SECTION 7
SCALE: 3/8" = 1'-0"
SEE THIS DWG



SECTION 8
TYPICAL BERM CROSS-SECTION (BY SPECIFICATION 71.0201)
NO SCALE



PLAN



SECTION

TYPICAL PRECAST DROP INLET
NO SCALE

NOTES

1. SEE DRAWING S3000 FOR GENERAL NOTES AND LEGEND.
2. SEE DRAWING S3001, S3002, S3003 & S3004 FOR GRADING AND DRAINAGE.
3. CAST 30" CHDPE PIPE INTO WALL AND FLOOR.
4. ALL FLAT CONCRETE SURFACES SHALL HAVE A FLOAT FINISH.
5. DETENTION BASIN SEEDING SHALL BE FINISHED WITHIN 30 DAYS UPON COMPLETION OF DETENTION BASIN EARTHWORK.
6. COVER FRAME DURING CONSTRUCTION TO MINIMIZE SOIL INTRUSION INTO THE CATCH BASIN AND GRATE STORED ONSITE UNTIL FINAL GRADING (BY SPEC 71.0201). SPEC 71.0233 TO INSTALL GRATE FOR EXISTING CATCH BASINS.
7. CATCH BASINS INSTALLED UNDER CONTRACT 71.0201 SHALL BE CAST WITH AN INLET AND OUTLET PIPE OPENING. EXPOSED OPENINGS SHALL BE COVERED AND PLUGGED TO MINIMIZE SOIL INTRUSION THROUGH THE OPENING AND INTO THE CATCH BASIN.
8. SEE SPECIFICATION 71.0201 FOR DETENTION REQUIREMENTS.
9. ALL WORK INDICATED ON THIS DRAWING APPLIES TO CONTRACT SPEC 71.0201 UNLESS NOTED OTHERWISE.

Note 10. (By Ivan B. Chou, P.E. 01/21/2011)
Field measurement by SECI on Nov. 23, 2010 indicates that vertical distance between the top of the overflow weir and the invert of the orifice is 1.19 ft.

APPROVED FOR CONSTRUCTION

NO	DATE	REVISIONS AND RECORD OF ISSUE
3	8/14/2002	[illegible]
2	7/23/2001	ISSUED FOR CONSTRUCTION, SPEC. 71.0233
1	[illegible]	[illegible]
0	11/28/2000	ISSUED FOR 3.3

OVERLAND CONTRACTING INC.

Overland Contracting Inc.

SCALE AS NOTED

SEMINOLE ELECTRIC COOP, INC.
PAYNE CREEK GENERATING STATION

GRADING AND DRAINAGE
SECTIONS AND DETAILS

60976-C112-S3010 | REV 6

Appendix B

Curve Number Computations

IVAN B. CHOU
LICENSE
No. 30688
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

B. Chou
6/7/2016

Runoff curve number - Pre-development

Project	By	Date
MGS	IBC	6/2/2016
Location	**Checked**	**Date**
Bowling Green, Fl	RWB	6/2/016

Check one: ☑ Present ☐ Developed

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN[1] Table 2-2	CN[1] Figure 2-3	CN[1] Figure 2-4	Area ☑ acres ☐ mi2 ☐ %	Product of CN x area
D	Slough	85			15.5983	1325.9
D	Flatwood	80			24.7676	1981.4
D	Marsh & Pond	100			6.8506	685.1
				Totals ➡	47.2165	3992.3235

[1] Use only one CN source per line

CN (weighted) = total product / total area = 3992.324 / 47.2165 = 84.55357 Use CN ➡ **84.554**

2. Runoff

	Storm #1	Storm #2	Storm #3
Frequency .... yr	25 yr		
Rainfall, P (24-hour) .... in	8.4		
Runoff, Q .... in	6.55		

(Use P and CN with table 2-1, figure 2-1, or equations 2-3 and 2-4)

Post-development Runoff curve number - Basin 1A

Project	By	Date
MGS Entrance Road and Unloading Containmen	IBC	6/2/2016
Location	**Checked**	**Date**
Bowling Green, Fl	RWB	6/2/016

Check one: ☐ Present ☑ Developed

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN[1] Table 2-2	CN[1] Figure 2-3	CN[1] Figure 2-4	Area ☑ acres ☐ mi2 ☐ %	Product of CN x area
D	Asphalt	98			0.3037	29.8
D	Mature grass over limerock	88			2.6376	232.1
D	Building and Concrete	98			0.0781	7.7
D	Gravel	91			0.1331	12.1
				Totals ➡	3.1525	281.6

[1] Use only one CN source per line

CN (weighted) $= \frac{\text{total product}}{\text{total area}} = \frac{281.6373}{3.1525} = 89.33776$ Use CN ➡ **89.338**

2. Runoff

	Storm #1	Storm #2	Storm #3
Frequency .... yr	25 yr		
Rainfall, P (24-hour) .... in	8.4		
Runoff, Q .... in	7.12		

(Use P and CN with table 2-1, figure 2-1, or equations 2-3 and 2-4)

Post-development Runoff curve number - Basin 1B

Project	By	Date
MGS Entrance Road and Unloading Containmen	IBC	6/2/2016
Location	**Checked**	**Date**
Bowling Green, Fl	RWB	6/2/016

Check one: ☐ Present ☑ Developed

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN[1] Table 2-2	CN[1] Figure 2-3	CN[1] Figure 2-4	Area ☑ acres ☐ mi2 ☐ %	Product of CN x area
D	Asphalt	98			0.8740	85.7
D	Building and concrete	98			0.7285	71.4
D	Sod	80			0.8714	69.7
D	Gravel*	95			5.1770	491.8
				Totals ➡	7.6509	718.6

[1] Use only one CN source per line

CN (weighted) = total product / total area = 718.572 / 7.6509 = 93.91993 Use CN ➡ **93.920**

* Gravel was placed over existing limerock area therefore the curve number for limerock will be used

2. Runoff

	Storm #1	Storm #2	Storm #3
Frequency .... yr	25 yr		
Rainfall, P (24-hour) .... in	8.4		
Runoff, Q .... in	7.67		

(Use P and CN with table 2-1, figure 2-1, or equations 2-3 and 2-4)

Post-development Runoff curve number - Basin 1C

Project	By	Date
MGS Entrance Road and Unloading Containmen	IBC	6/2/2016
Location	**Checked**	**Date**
Bowling Green, Fl	RWB	6/2/016

Check one: ☐ Present ☑ Developed

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN[1] Table 2-2	CN[1] Figure 2-3	CN[1] Figure 2-4	Area ☑ acres ☐ mi2 ☐ %	Product of CN x area
D	Gravel	91			0.2333	21.2
D	Asphalt	98			0.7103	69.6
D	Sodded area	80			3.5166	281.3
D	Building and Concrete	98			0.0209	2.0
				Totals ➡	4.4811	374.2

[1] Use only one CN source per line

CN (weighted) = total product / total area = 374.2159 / 4.4811 = 83.50983 **Use CN** ➡ **83.510**

2. Runoff

	Storm #1	Storm #2	Storm #3
Frequency .... yr	25 yr		
Rainfall, P (24-hour) .... in	8.4		
Runoff, Q .... in	6.42		

(Use P and CN with table 2-1, figure 2-1, or equations 2-3 and 2-4)

Post-development Runoff curve number - Basin 1D

Project	By	Date
MGS Entrance Road and Unloading Containmen	IBC	6/2/2016
Location	**Checked**	**Date**
Bowling Green, Fl	RWB	6/2/016

Check one: ☐ Present ☑ Developed

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN[1] Table 2-2	CN[1] Figure 2-3	CN[1] Figure 2-4	Area ☑ acres ☐ mi2 ☐ %	Product of CN x area
D	Asphalt	98			0.0712	7.0
D	Sodded area	80			0.8868	70.9
D	Gravel	91			0.0418	3.8
				Totals	0.9998	81.7

[1] Use only one CN source per line

CN (weighted) = total product / total area = 81.7254 / 0.9998 = 81.74175 Use CN → **81.742**

2. Runoff

	Storm #1	Storm #2	Storm #3
Frequency .... yr	25 yr		
Rainfall, P (24-hour) .... in	8.4		
Runoff, Q .... in	6.21		

(Use P and CN with table 2-1, figure 2-1, or equations 2-3 and 2-4)

Post-development Runoff curve number - Basin 3

Project	By	Date
MGS Entrance Road and Unloading Containmen	IBC	6/2/2016
Location	**Checked**	**Date**
Bowling Green, Fl	RWB	6/2/016

Check one: ☐ Present ☑ Developed

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN[1] Table 2-2	CN[1] Figure 2-3	CN[1] Figure 2-4	Area ☑ acres ☐ mi2 ☐ %	Product of CN x area
D	Gravel	91			1.7156	156.1
D	Asphalt	98			0.2981	29.2
D	Sodded area	80			0.3144	25.2
D	Building and Concrete	98			0.3327	32.6
				Totals	2.6608	243.1

[1] Use only one CN source per line

CN (weighted) = total product / total area = 243.09 / 2.6608 = 91.35974 **Use CN** **91.360**

2. Runoff

	Storm #1	Storm #2	Storm #3
Frequency .... yr	25 yr		
Rainfall, P (24-hour) .... in	8.4		
Runoff, Q .... in	7.36		

(Use P and CN with table 2-1, figure 2-1, or equations 2-3 and 2-4)

Post-development Runoff curve number - Basin 4

Project	By	Date
MGS Entrance Road and Unloading Containmen	IBC	6/2/2016
Location	**Checked**	**Date**
Bowling Green, Fl	RWB	6/2/016

Check one: ☐ Present ☑ Developed

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN[1] Table 2-2	CN[1] Figure 2-3	CN[1] Figure 2-4	Area ☑ acres ☐ mi2 ☐ %	Product of CN x area
D	Building and concrete	98			0.8722	85.5
D	Asphalt	98			0.2057	20.2
D	Sodded area	80			0.1679	13.4
D	Gravel	91			0.8487	77.2
				Totals	2.0945	196.3

[1] Use only one CN source per line

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{196.2979}{2.0945} = 93.72065$ Use CN **93.721**

* included existing and expanded area

2. Runoff

	Storm #1	Storm #2	Storm #3
Frequency .... yr	25 yr		
Rainfall, P (24-hour) .... in	8.4		
Runoff, Q .... in	7.65		

(Use P and CN with table 2-1, figure 2-1, or equations 2-3 and 2-4)

Post-development Runoff curve number - Basin 5A

Project	By	Date
MGS Entrance Road and Unloading Containmen	IBC	6/2/2016
Location	**Checked**	**Date**
Bowling Green, Fl	RWB	6/2/016

Check one: ☐ Present ☑ Developed

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN[1] Table 2-2	CN[1] Figure 2-3	CN[1] Figure 2-4	Area ☑ acres ☐ mi2 ☐ %	Product of CN x area
D	Gravel	91			0.4648	42.3
D	Grass/gravel	85			3.7281	316.9
				Totals ➡	4.1929	359.2

[1] Use only one CN source per line

CN (weighted) $= \frac{\text{total product}}{\text{total area}} = \frac{359.1853}{4.1929} = 85.66512$ Use CN ➡ **85.665**

2. Runoff

	Storm #1	Storm #2	Storm #3
Frequency .... yr	25 yr		
Rainfall, P (24-hour) .... in	8.4		
Runoff, Q .... in	6.68		

(Use P and CN with table 2-1, figure 2-1, or equations 2-3 and 2-4)

Post-development Runoff curve number - Basin 5B

Project	By	Date
MGS Entrance Road and Unloading Containmen	IBC	6/2/2016
Location	**Checked**	**Date**
Bowling Green, Fl	RWB	6/2/016

Check one: ☐ Present ☑ Developed

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN[1] Table 2-2	CN[1] Figure 2-3	CN[1] Figure 2-4	Area ☑ acres ☐ mi2 ☐ %	Product of CN x area
D	Buildings and concrete	98			0.4681	45.9
D	Gravel	91			1.1680	106.3
D	Sodded area	80			2.3855	190.8
D	Asphalt	98			0.6518	63.9
				Totals ➡	4.6734	406.9

[1] Use only one CN source per line

CN (weighted) $= \frac{\text{total product}}{\text{total area}} = \frac{406.8782}{4.6734} = 87.06257$ Use CN ➡ **87.063**

2. Runoff

	Storm #1	Storm #2	Storm #3
Frequency .... yr	25 yr		
Rainfall, P (24-hour) .... in	8.4		
Runoff, Q .... in	6.85		

(Use P and CN with table 2-1, figure 2-1, or equations 2-3 and 2-4)

Post-development Runoff curve number - Basin 5C

Project	By	Date
MGS Entrance Road and Unloading Containmen	IBC	6/2/2016
Location	**Checked**	**Date**
Bowling Green, Fl	RWB	6/2/016

Check one: ☐ Present ☑ Developed

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN[1] Table 2-2	CN[1] Figure 2-3	CN[1] Figure 2-4	Area ☑ acres ☐ mi2 ☐ %	Product of CN x area
D	Gravel	91			0.2456	22.3
D	Buildings, tanks, and concrete	98			0.3402	33.3
D	Asphalt	98			0.8190	80.3
D	Sodded area	80			2.0763	166.1
				Totals	3.4811	302.1

[1] Use only one CN source per line

CN (weighted) = total product / total area = 302.0552 / 3.4811 = 86.77004 Use CN ➡ **86.770**

* Includes 1 proposed tank and 2 existing

2. Runoff

	Storm #1	Storm #2	Storm #3
Frequency .... yr	25 yr		
Rainfall, P (24-hour) .... in	8.4		
Runoff, Q .... in	6.81		

(Use P and CN with table 2-1, figure 2-1, or equations 2-3 and 2-4)

Post-development Runoff curve number - Basin 6

Project	By	Date
MGS Entrance Road and Unloading Containmen	IBC	6/2/2016
Location	**Checked**	**Date**
Bowling Green, Fl	RWB	6/2/016

Check one: ☐ Present ☑ Developed

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN[1] Table 2-2	CN[1] Figure 2-3	CN[1] Figure 2-4	Area ☑ acres ☐ mi2 ☐ %	Product of CN x area
D	Asphalt	98			0.5336	52.3
D	Buildings/concrete	98			0.8469	83.0
D	Sodded area	80			0.2417	19.3
D	Gravel	91			1.9862	180.7
				Totals	3.6084	335.4

[1] Use only one CN source per line

CN (weighted) = total product / total area = 335.3692 / 3.6084 = 92.94125 Use CN 92.941

2. Runoff

	Storm #1	Storm #2	Storm #3
Frequency .... yr	25 yr		
Rainfall, P (24-hour) .... in	8.4		
Runoff, Q .... in	7.55		

(Use P and CN with table 2-1, figure 2-1, or equations 2-3 and 2-4)

Post-development Runoff curve number - Basin 8

Project	By	Date
MGS Entrance Road and Unloading Containmen	IBC	6/2/2016
Location	**Checked**	**Date**
Bowling Green, Fl	RWB	6/2/016

Check one: ☐ Present ☑ Developed

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN[1] Table 2-2	CN[1] Figure 2-3	CN[1] Figure 2-4	Area ☑ acres ☐ mi2 ☐ %	Product of CN x area
D	Water*	100			3.9325	393.3
D	Asphalt	98			0.1455	14.3
D	Sodded area	80			1.0724	85.8
D	Gravel	91			0.2339	21.3
D						
D						
				Totals	5.3843	514.6

[1] Use only one CN source per line

CN (weighted) $= \frac{\text{total product}}{\text{total area}} = \frac{514.5859}{5.3843} = 95.57155$ **Use CN** $\boxed{95.572}$

* Water area is measured at 123 ft-NGVD elevation.

2. Runoff

	Storm #1	Storm #2	Storm #3
Frequency ..... yr	25 yr		
Rainfall, P (24-hour) ..... in	8.4		
Runoff, Q ..... in	7.87		

(Use P and CN with table 2-1, figure 2-1, or equations 2-3 and 2-4)

Appendix C

ICPR Model Input/Output

Robert Wesley Burleson
06 JUNE 2016

```
==========================================================================================
==== Basins ==============================================================================
==========================================================================================

         Name: MGS Site Pre             Node: MGS Site            Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh323                   Peaking Factor: 323.0
          Rainfall File: Flmod                Storm Duration(hrs): 24.00
    Rainfall Amount(in): 8.400                  Time of Conc(min): 72.00
               Area(ac): 47.216                   Time Shift(hrs): 0.00
           Curve Number: 84.55              Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


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

      Name: MGS Site           Base Flow(cfs): 0.000          Init Stage(ft): 120.000
     Group: BASE                                              Warn Stage(ft): 121.000
      Type: Time/Stage


      Time(hrs)       Stage(ft)
--------------- ---------------
           0.00         120.000
          30.00         120.000

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

         Name: MGS Pre
     Filename: C:\Users\rburleson\Desktop\Projects\SECI\ICPR Simulations\Pre\MGS Pre.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Flmod
    Rainfall Amount(in): 8.40

Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.00
```

SECI MGS Site
Pre-Development Scenario
Basin Output Summary

```
            Basin Name: MGS Site Pre
            Group Name: BASE
            Simulation: MGS Pre
             Node Name: MGS Site
            Basin Type: SCS Unit Hydrograph

       Unit Hydrograph: Uh323
         Peaking Fator: 323.0
  Spec Time Inc (min): 9.60
  Comp Time Inc (min): 5.00
        Rainfall File: Flmod
 Rainfall Amount (in): 8.400
 Storm Duration (hrs): 24.00
               Status: Onsite
   Time of Conc (min): 72.00
     Time Shift (hrs): 0.00
            Area (ac): 47.216
 Vol of Unit Hyd (in): 1.001
         Curve Number: 84.554
             DCIA (%): 0.000

       Time Max (hrs): 12.75
       Flow Max (cfs): 90.02
   Runoff Volume (in): 6.540
  Runoff Volume (ft3): 1120996
```

```
================================================================================
==== Basins ====================================================================
================================================================================

        Name: Basin 1A                 Node: Area1                Status: Onsite
       Group: BASE                     Type: SCS Unit Hydrograph CN

     Unit Hydrograph: Uh323                  Peaking Factor: 323.0
      Rainfall File: Flmod                Storm Duration(hrs): 24.00
 Rainfall Amount(in): 8.400               Time of Conc(min): 10.00
            Area(ac): 3.152                  Time Shift(hrs): 0.00
       Curve Number: 89.34             Max Allowable Q(cfs): 999999.000
            DCIA(%): 0.00

--------------------------------------------------------------------------------------------
        Name: Basin 1B                 Node: Area 1B              Status: Onsite
       Group: BASE                     Type: SCS Unit Hydrograph CN

     Unit Hydrograph: Uh323                  Peaking Factor: 323.0
      Rainfall File: Flmod                Storm Duration(hrs): 24.00
 Rainfall Amount(in): 8.400               Time of Conc(min): 10.00
            Area(ac): 7.651                  Time Shift(hrs): 0.00
       Curve Number: 93.92             Max Allowable Q(cfs): 999999.000
            DCIA(%): 0.00

--------------------------------------------------------------------------------------------
        Name: Basin 1C                 Node: Area1                Status: Onsite
       Group: BASE                     Type: SCS Unit Hydrograph CN

     Unit Hydrograph: Uh323                  Peaking Factor: 323.0
      Rainfall File: Flmod                Storm Duration(hrs): 24.00
 Rainfall Amount(in): 8.400               Time of Conc(min): 37.00
            Area(ac): 4.481                  Time Shift(hrs): 0.00
       Curve Number: 83.51             Max Allowable Q(cfs): 999999.000
            DCIA(%): 0.00

--------------------------------------------------------------------------------------------
        Name: Basin 1D                 Node: Area 1D              Status: Onsite
       Group: BASE                     Type: SCS Unit Hydrograph CN

     Unit Hydrograph: Uh323                  Peaking Factor: 323.0
      Rainfall File: Flmod                Storm Duration(hrs): 24.00
 Rainfall Amount(in): 8.400               Time of Conc(min): 32.00
            Area(ac): 1.000                  Time Shift(hrs): 0.00
       Curve Number: 81.74             Max Allowable Q(cfs): 999999.000
            DCIA(%): 0.00

--------------------------------------------------------------------------------------------
        Name: Basin 3                  Node: Area 3               Status: Onsite
       Group: BASE                     Type: SCS Unit Hydrograph CN
```

```
     Unit Hydrograph: Uh323              Peaking Factor: 323.0
        Rainfall File: Flmod         Storm Duration(hrs): 24.00
  Rainfall Amount(in): 8.400          Time of Conc(min): 10.00
             Area(ac): 2.661            Time Shift(hrs): 0.00
        Curve Number: 91.36        Max Allowable Q(cfs): 999999.000
             DCIA(%): 0.00

------------------------------------------------------------------------------------------
            Name: Basin 4               Node: Area 4                Status: Onsite
           Group: BASE                  Type: SCS Unit Hydrograph CN

     Unit Hydrograph: Uh323              Peaking Factor: 323.0
        Rainfall File: Flmod         Storm Duration(hrs): 24.00
  Rainfall Amount(in): 8.400          Time of Conc(min): 10.00
             Area(ac): 2.095            Time Shift(hrs): 0.00
        Curve Number: 93.72        Max Allowable Q(cfs): 999999.000
             DCIA(%): 0.00

------------------------------------------------------------------------------------------
            Name: Basin 5A              Node: Area 5A               Status: Onsite
           Group: BASE                  Type: SCS Unit Hydrograph CN

     Unit Hydrograph: Uh323              Peaking Factor: 323.0
        Rainfall File: Flmod         Storm Duration(hrs): 24.00
  Rainfall Amount(in): 8.400          Time of Conc(min): 10.00
             Area(ac): 4.193            Time Shift(hrs): 0.00
        Curve Number: 85.67        Max Allowable Q(cfs): 999999.000
             DCIA(%): 0.00

------------------------------------------------------------------------------------------
            Name: Basin 5B              Node: Area 5B               Status: Onsite
           Group: BASE                  Type: SCS Unit Hydrograph CN

     Unit Hydrograph: Uh323              Peaking Factor: 323.0
        Rainfall File: Flmod         Storm Duration(hrs): 24.00
  Rainfall Amount(in): 8.400          Time of Conc(min): 42.00
             Area(ac): 4.673            Time Shift(hrs): 0.00
        Curve Number: 87.06        Max Allowable Q(cfs): 999999.000
             DCIA(%): 0.00

------------------------------------------------------------------------------------------
            Name: Basin 5C              Node: Area 5C               Status: Onsite
           Group: BASE                  Type: SCS Unit Hydrograph CN

     Unit Hydrograph: Uh323              Peaking Factor: 323.0
        Rainfall File: Flmod         Storm Duration(hrs): 24.00
  Rainfall Amount(in): 8.400          Time of Conc(min): 32.00
             Area(ac): 3.481            Time Shift(hrs): 0.00
        Curve Number: 86.77        Max Allowable Q(cfs): 999999.000
             DCIA(%): 0.00
```

```
---------------------------------------------------------------------------------------------------
        Name: Basin 6                      Node: Area 6              Status: Onsite
       Group: BASE                         Type: SCS Unit Hydrograph CN

       Unit Hydrograph: Uh323                        Peaking Factor: 323.0
         Rainfall File: Flmod                   Storm Duration(hrs): 24.00
   Rainfall Amount(in): 8.400                     Time of Conc(min): 10.00
              Area(ac): 3.608                       Time Shift(hrs): 0.00
         Curve Number: 92.94                   Max Allowable Q(cfs): 999999.000
              DCIA(%): 0.00

---------------------------------------------------------------------------------------------------
        Name: Basin 8                      Node: POND                Status: Onsite
       Group: BASE                         Type: SCS Unit Hydrograph CN

       Unit Hydrograph: Uh323                        Peaking Factor: 323.0
         Rainfall File: Flmod                   Storm Duration(hrs): 24.00
   Rainfall Amount(in): 8.400                     Time of Conc(min): 14.00
              Area(ac): 5.384                       Time Shift(hrs): 0.00
         Curve Number: 95.57                   Max Allowable Q(cfs): 999999.000
              DCIA(%): 0.00

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

     Name: A                      Base Flow(cfs): 0.000          Init Stage(ft): 122.000
    Group: BASE                                                  Warn Stage(ft): 129.000
     Type: Stage/Area

     Stage(ft)        Area(ac)
 --------------- ---------------

-----------------------------------------------------------------------------------------
     Name: AA                     Base Flow(cfs): 0.000          Init Stage(ft): 121.000
    Group: BASE                                                  Warn Stage(ft): 128.500
     Type: Stage/Area

     Stage(ft)        Area(ac)
 --------------- ---------------

-----------------------------------------------------------------------------------------
     Name: Area 1B                Base Flow(cfs): 0.000          Init Stage(ft): 126.000
    Group: BASE                                                  Warn Stage(ft): 127.500
     Type: Stage/Area

     Stage(ft)        Area(ac)
 --------------- ---------------
```

```
--------------------------------------------------------------------------------------
      Name: Area 1D            Base Flow(cfs): 0.000          Init Stage(ft): 122.000
     Group: BASE                                              Warn Stage(ft): 128.500
      Type: Stage/Area


      Stage(ft)        Area(ac)
--------------- ---------------

--------------------------------------------------------------------------------------
      Name: Area 3             Base Flow(cfs): 0.000          Init Stage(ft): 126.000
     Group: BASE                                              Warn Stage(ft): 128.500
      Type: Stage/Area


      Stage(ft)        Area(ac)
--------------- ---------------

--------------------------------------------------------------------------------------
      Name: Area 4             Base Flow(cfs): 0.000          Init Stage(ft): 126.000
     Group: BASE                                              Warn Stage(ft): 128.500
      Type: Stage/Area


      Stage(ft)        Area(ac)
--------------- ---------------

--------------------------------------------------------------------------------------
      Name: Area 5A            Base Flow(cfs): 0.000          Init Stage(ft): 129.000
     Group: BASE                                              Warn Stage(ft): 133.000
      Type: Stage/Area


      Stage(ft)        Area(ac)
--------------- ---------------

--------------------------------------------------------------------------------------
      Name: Area 5B            Base Flow(cfs): 0.000          Init Stage(ft): 125.000
     Group: BASE                                              Warn Stage(ft): 129.000
      Type: Stage/Area


      Stage(ft)        Area(ac)
--------------- ---------------

--------------------------------------------------------------------------------------
      Name: Area 5C            Base Flow(cfs): 0.000          Init Stage(ft): 122.000
     Group: BASE                                              Warn Stage(ft): 128.500
      Type: Stage/Area


      Stage(ft)        Area(ac)
--------------- ---------------
```

```
----------------------------------------------------------------------------------------
     Name: Area 6               Base Flow(cfs): 0.000          Init Stage(ft): 125.000
    Group: BASE                                                Warn Stage(ft): 128.500
     Type: Stage/Area


     Stage(ft)        Area(ac)
--------------- ---------------

----------------------------------------------------------------------------------------
     Name: AREA 9               Base Flow(cfs): 0.000          Init Stage(ft): 127.000
    Group: BASE                                                Warn Stage(ft): 129.500
     Type: Stage/Area


     Stage(ft)        Area(ac)
--------------- ---------------

----------------------------------------------------------------------------------------
     Name: Area1                Base Flow(cfs): 0.000          Init Stage(ft): 127.000
    Group: BASE                                                Warn Stage(ft): 129.000
     Type: Stage/Area


     Stage(ft)        Area(ac)
--------------- ---------------

----------------------------------------------------------------------------------------
     Name: L                    Base Flow(cfs): 0.000          Init Stage(ft): 121.000
    Group: BASE                                                Warn Stage(ft): 128.500
     Type: Stage/Area


     Stage(ft)        Area(ac)
--------------- ---------------

----------------------------------------------------------------------------------------
     Name: Outfall              Base Flow(cfs): 0.000          Init Stage(ft): 119.000
    Group: BASE                                                Warn Stage(ft): 121.000
     Type: Time/Stage


     Time(hrs)       Stage(ft)
--------------- ---------------
          0.00         119.000
         30.00         120.000

----------------------------------------------------------------------------------------
     Name: POND                 Base Flow(cfs): 0.000          Init Stage(ft): 120.770
    Group: BASE                                                Warn Stage(ft): 125.500
     Type: Stage/Area


     Stage(ft)        Area(ac)
```

```
-------------- --------------
       119.800         3.4320
       121.000         3.5950
       122.000         3.7610
       123.000         3.9300
       124.000         4.1020
       125.000         4.2770

==========================================================================================
==== Pipes ===============================================================================
==========================================================================================

        Name: P-10              From Node: AA              Length(ft): 100.00
       Group: BASE                To Node: POND                  Count: 2
                                                      Friction Equation: Average Conveyance
              UPSTREAM       DOWNSTREAM              Solution Algorithm: Automatic
    Geometry: Circular       Circular                              Flow: Both
    Span(in): 36.00          36.00                   Entrance Loss Coef: 0.40
    Rise(in): 36.00          36.00                       Exit Loss Coef: 1.00
  Invert(ft): 120.700        120.500                     Bend Loss Coef: 0.00
 Manning's N: 0.013000       0.013000                  Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                      Inlet Ctrl Spec: Use dn
 Bot Clip(in): 0.000         0.000                    Stabilizer Option: None


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

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


----------------------------------------------------------------------------------------------------
        Name: P-11              From Node: AREA 9          Length(ft): 30.00
       Group: BASE                To Node: Area1                 Count: 1
                                                      Friction Equation: Average Conveyance
              UPSTREAM       DOWNSTREAM              Solution Algorithm: Automatic
    Geometry: Circular       Circular                              Flow: Both
    Span(in): 12.00          12.00                   Entrance Loss Coef: 0.40
    Rise(in): 12.00          12.00                       Exit Loss Coef: 1.00
  Invert(ft): 125.800        125.500                     Bend Loss Coef: 0.00
 Manning's N: 0.013000       0.013000                  Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                      Inlet Ctrl Spec: Use dn
 Bot Clip(in): 0.000         0.000                    Stabilizer Option: None


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

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


----------------------------------------------------------------------------------------------------
        Name: P-3               From Node: Area 3          Length(ft): 30.00
       Group: BASE                To Node: A                     Count: 1
```

```
                                                          Friction Equation: Average Conveyance
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Automatic
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 24.00          24.00                      Entrance Loss Coef: 0.40
     Rise(in): 24.00          24.00                          Exit Loss Coef: 1.00
   Invert(ft): 122.500        122.300                        Bend Loss Coef: 0.00
  Manning's N: 0.013000       0.013000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dn
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


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

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


----------------------------------------------------------------------------------------------------
         Name: P-4                From Node: Area 4             Length(ft): 30.00
        Group: BASE                 To Node: Area 1D                 Count: 1
                                                          Friction Equation: Average Conveyance
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Automatic
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 24.00          24.00                      Entrance Loss Coef: 0.40
     Rise(in): 24.00          24.00                          Exit Loss Coef: 1.00
   Invert(ft): 122.300        122.000                        Bend Loss Coef: 0.00
  Manning's N: 0.013000       0.013000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dn
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


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

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


----------------------------------------------------------------------------------------------------
         Name: P-5                From Node: L                  Length(ft): 110.00
        Group: BASE                 To Node: POND                    Count: 2
                                                          Friction Equation: Average Conveyance
               UPSTREAM       DOWNSTREAM                 Solution Algorithm: Automatic
     Geometry: Circular       Circular                                 Flow: Both
     Span(in): 36.00          36.00                      Entrance Loss Coef: 0.40
     Rise(in): 36.00          36.00                          Exit Loss Coef: 1.00
   Invert(ft): 120.300        120.000                        Bend Loss Coef: 0.00
  Manning's N: 0.013000       0.013000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dn
 Bot Clip(in): 0.000          0.000                       Stabilizer Option: None


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

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


-----------------------------------------------------------------------------------------------
        Name: PNEW                From Node: A              Length(ft): 300.00
       Group: BASE                  To Node: Area 1D             Count: 2
                                                      Friction Equation: Average Conveyance
              UPSTREAM        DOWNSTREAM             Solution Algorithm: Automatic
    Geometry: Circular        Circular                             Flow: Both
    Span(in): 36.00           36.00                  Entrance Loss Coef: 0.40
    Rise(in): 36.00           36.00                      Exit Loss Coef: 1.00
  Invert(ft): 123.000         121.700                    Bend Loss Coef: 0.00
 Manning's N: 0.013000        0.013000                 Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000           0.000                     Inlet Ctrl Spec: Use dn
Bot Clip(in): 0.000           0.000                  Stabilizer Option: None


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

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


=====================================================================================
==== Channels =======================================================================
=====================================================================================

        Name: C-15A               From Node: Area 5A        Length(ft): 425.00
       Group: BASE                  To Node: Area 5B             Count: 1

              UPSTREAM        DOWNSTREAM              Friction Equation: Average Conveyance
    Geometry: Trapezoidal     Trapezoidal            Solution Algorithm: Automatic
  Invert(ft): 128.000         125.000                              Flow: Both
TClpInitZ(ft): 9999.000       9999.000                 Contraction Coef: 0.000
 Manning's N: 0.025000        0.025000                   Expansion Coef: 0.000
Top Clip(ft): 0.000           0.000                  Entrance Loss Coef: 0.000
Bot Clip(ft): 0.000           0.000                      Exit Loss Coef: 0.000
   Main XSec:                                          Outlet Ctrl Spec: Use dc or tw
AuxElev1(ft):                                           Inlet Ctrl Spec: Use dn
   Aux XSec1:                                         Stabilizer Option: None
AuxElev2(ft):
   Aux XSec2:
Top Width(ft):
   Depth(ft):
Bot Width(ft): 5.000          5.000
LtSdSlp(h/v): 3.00            3.00
RtSdSlp(h/v): 3.00            3.00


-----------------------------------------------------------------------------------------------
        Name: C-15B               From Node: Area 5B        Length(ft): 620.00
       Group: BASE                  To Node: Area 5C             Count: 1
```

```
                UPSTREAM       DOWNSTREAM              Friction Equation: Average Conveyance
     Geometry: Trapezoidal    Trapezoidal            Solution Algorithm: Automatic
   Invert(ft): 124.800        121.900                              Flow: Both
TClpInitZ(ft): 9999.000       9999.000                 Contraction Coef: 0.000
  Manning's N: 0.025000       0.025000                   Expansion Coef: 0.000
 Top Clip(ft): 0.000          0.000                  Entrance Loss Coef: 0.000
 Bot Clip(ft): 0.000          0.000                      Exit Loss Coef: 0.000
    Main XSec:                                         Outlet Ctrl Spec: Use dc or tw
 AuxElev1(ft):                                          Inlet Ctrl Spec: Use dn
    Aux XSec1:                                        Stabilizer Option: None
 AuxElev2(ft):
    Aux XSec2:
Top Width(ft):
    Depth(ft):
Bot Width(ft): 6.000          6.000
 LtSdSlp(h/v): 3.00           3.00
 RtSdSlp(h/v): 3.00           3.00

------------------------------------------------------------------------------------
        Name: C-15C             From Node: Area 5C          Length(ft): 200.00
       Group: BASE                To Node: AA                    Count: 1

                UPSTREAM       DOWNSTREAM              Friction Equation: Average Conveyance
     Geometry: Trapezoidal    Trapezoidal            Solution Algorithm: Automatic
   Invert(ft): 122.000        121.000                              Flow: Both
TClpInitZ(ft): 9999.000       9999.000                 Contraction Coef: 0.000
  Manning's N: 0.032000       0.032000                   Expansion Coef: 0.000
 Top Clip(ft): 0.000          0.000                  Entrance Loss Coef: 0.000
 Bot Clip(ft): 0.000          0.000                      Exit Loss Coef: 0.000
    Main XSec:                                         Outlet Ctrl Spec: Use dc or tw
 AuxElev1(ft):                                          Inlet Ctrl Spec: Use dn
    Aux XSec1:                                        Stabilizer Option: None
 AuxElev2(ft):
    Aux XSec2:
Top Width(ft):
    Depth(ft):
Bot Width(ft): 8.000          8.000
 LtSdSlp(h/v): 3.00           3.00
 RtSdSlp(h/v): 3.00           3.00

------------------------------------------------------------------------------------
        Name: C-16              From Node: Area 6           Length(ft): 85.00
       Group: BASE                To Node: Area 5C               Count: 1

                UPSTREAM       DOWNSTREAM              Friction Equation: Average Conveyance
     Geometry: Trapezoidal    Trapezoidal            Solution Algorithm: Automatic
   Invert(ft): 122.000        121.900                              Flow: Both
TClpInitZ(ft): 9999.000       9999.000                 Contraction Coef: 0.000
  Manning's N: 0.032000       0.032000                   Expansion Coef: 0.000
 Top Clip(ft): 0.000          0.000                  Entrance Loss Coef: 0.000
 Bot Clip(ft): 0.000          0.000                      Exit Loss Coef: 0.000
    Main XSec:                                         Outlet Ctrl Spec: Use dc or tw
 AuxElev1(ft):                                          Inlet Ctrl Spec: Use dn
    Aux XSec1:                                        Stabilizer Option: None
 AuxElev2(ft):
    Aux XSec2:
```

```
 Top Width(ft):
     Depth(ft):
 Bot Width(ft): 8.000          8.000
  LtSdSlp(h/v): 3.00           3.00
  RtSdSlp(h/v): 3.00           3.00

-----------------------------------------------------------------------------------------------
          Name: C-1A              From Node: Area1           Length(ft): 510.00
         Group: BASE                To Node: Area 1B              Count: 1

                UPSTREAM       DOWNSTREAM                Friction Equation: Average Conveyance
      Geometry: Trapezoidal    Trapezoidal              Solution Algorithm: Automatic
   Invert(ft): 126.000         124.000                               Flow: Both
TClpInitZ(ft): 9999.000        9999.000                  Contraction Coef: 0.000
   Manning's N: 0.025000       0.025000                    Expansion Coef: 0.000
 Top Clip(ft): 0.000           0.000                    Entrance Loss Coef: 0.000
 Bot Clip(ft): 0.000           0.000                        Exit Loss Coef: 0.000
     Main XSec:                                           Outlet Ctrl Spec: Use dc or tw
 AuxElev1(ft):                                             Inlet Ctrl Spec: Use dn
     Aux XSec1:                                          Stabilizer Option: None
 AuxElev2(ft):
     Aux XSec2:
 Top Width(ft):
     Depth(ft):
 Bot Width(ft): 8.000          8.000
  LtSdSlp(h/v): 3.00           3.00
  RtSdSlp(h/v): 3.00           3.00

-----------------------------------------------------------------------------------------------
          Name: C-1B              From Node: Area 1B         Length(ft): 270.00
         Group: BASE                To Node: A                    Count: 1

                UPSTREAM       DOWNSTREAM                Friction Equation: Average Conveyance
      Geometry: Trapezoidal    Trapezoidal              Solution Algorithm: Automatic
   Invert(ft): 124.000         123.000                               Flow: Both
TClpInitZ(ft): 9999.000        9999.000                  Contraction Coef: 0.000
   Manning's N: 0.025000       0.025000                    Expansion Coef: 0.000
 Top Clip(ft): 0.000           0.000                    Entrance Loss Coef: 0.000
 Bot Clip(ft): 0.000           0.000                        Exit Loss Coef: 0.000
     Main XSec:                                           Outlet Ctrl Spec: Use dc or tw
 AuxElev1(ft):                                             Inlet Ctrl Spec: Use dn
     Aux XSec1:                                          Stabilizer Option: None
 AuxElev2(ft):
     Aux XSec2:
 Top Width(ft):
     Depth(ft):
 Bot Width(ft): 8.000          8.000
  LtSdSlp(h/v): 3.00           3.00
  RtSdSlp(h/v): 3.00           3.00

-----------------------------------------------------------------------------------------------
          Name: C-7               From Node: Area 1D         Length(ft): 270.00
         Group: BASE                To Node: L                    Count: 1
```

```
                 UPSTREAM       DOWNSTREAM                Friction Equation: Average Conveyance
      Geometry: Trapezoidal    Trapezoidal               Solution Algorithm: Automatic
    Invert(ft): 122.500        121.000                                 Flow: Both
 TClpInitZ(ft): 9999.000       9999.000                    Contraction Coef: 0.000
   Manning's N: 0.032000       0.032000                      Expansion Coef: 0.000
  Top Clip(ft): 0.000          0.000                     Entrance Loss Coef: 0.000
  Bot Clip(ft): 0.000          0.000                         Exit Loss Coef: 0.000
     Main XSec:                                            Outlet Ctrl Spec: Use dc or tw
  AuxElev1(ft):                                             Inlet Ctrl Spec: Use dn
     Aux XSec1:                                           Stabilizer Option: None
  AuxElev2(ft):
     Aux XSec2:
 Top Width(ft):
     Depth(ft):
 Bot Width(ft): 8.000          8.000
  LtSdSlp(h/v): 3.00           3.00
  RtSdSlp(h/v): 3.00           3.00


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

         Name: control struct      From Node: POND            Length(ft): 24.00
        Group: BASE                  To Node: Outfall              Count: 3

                UPSTREAM       DOWNSTREAM                Friction Equation: Average Conveyance
     Geometry: Circular        Circular                 Solution Algorithm: Automatic
     Span(in): 36.00           36.00                                  Flow: Both
     Rise(in): 36.00           36.00                    Entrance Loss Coef: 0.400
   Invert(ft): 119.700         119.600                      Exit Loss Coef: 1.000
  Manning's N: 0.013000        0.013000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000           0.000                       Inlet Ctrl Spec: Use dn
 Bot Clip(in): 0.000           0.000                        Solution Incs: 10

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

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


*** Weir 1 of 3 for Drop Structure control struct ***
                                                                              TABLE
                  Count: 1                     Bottom Clip(in): 0.000
                   Type: Horizontal               Top Clip(in): 0.000
                   Flow: Both                   Weir Disc Coef: 3.200
               Geometry: Circular             Orifice Disc Coef: 0.600

               Span(in): 4.00                      Invert(ft): 120.000
               Rise(in): 4.00                Control Elev(ft): 120.000

*** Weir 2 of 3 for Drop Structure control struct ***
                                                                              TABLE
                  Count: 1                     Bottom Clip(in): 0.000
                   Type: Vertical: Mavis          Top Clip(in): 0.000
                   Flow: Both                   Weir Disc Coef: 3.200
               Geometry: Rectangular          Orifice Disc Coef: 0.600
```

```
               Span(in): 180.00                   Invert(ft): 121.100
               Rise(in): 36.00              Control Elev(ft): 121.100

*** Weir 3 of 3 for Drop Structure control struct ***
                                                                    TABLE
                  Count: 1                   Bottom Clip(in): 0.000
                   Type: Vertical: Fread        Top Clip(in): 0.000
                   Flow: Both                 Weir Disc Coef: 3.200
               Geometry: Rectangular       Orifice Disc Coef: 0.600

               Span(in): 1200.00                  Invert(ft): 123.000
               Rise(in): 48.00              Control Elev(ft): 123.000

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

         Name: 100yrpro
     Filename: C:\Users\rburleson\Desktop\Projects\SECI\ICPR Simulations\Post-Development\100yr.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Flmod
    Rainfall Amount(in): 10.50

Time(hrs)        Print Inc(min)
---------------  ---------------
13.000           15.00
18.000           5.00
36.000           15.00

----------------------------------------------------------------------------------------------------
         Name: 25yrpro
     Filename: C:\Users\rburleson\Desktop\Projects\SECI\ICPR Simulations\Post-Development\POST25.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Flmod
    Rainfall Amount(in): 8.40

Time(hrs)        Print Inc(min)
---------------  ---------------
13.000           15.00
18.000           5.00
36.000           15.00

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

         Name: 100 yr post        Hydrology Sim: 100yrpro
     Filename: C:\Users\rburleson\Desktop\Projects\SECI\ICPR Simulations\Post-Development\100yr Post.I32

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

        Max Delta Z(ft): 1.00                   Delta Z Factor: 0.00500
    Time Step Optimizer: 0.000
```

```
     Start Time(hrs): 0.000                 End Time(hrs): 36.00
 Min Calc Time(sec): 0.0000            Max Calc Time(sec): 0.0000
     Boundary Stages:                       Boundary Flows:
```

Time(hrs)	Print Inc(min)
36.000	15.000

Group	Run
BASE	Yes

```
-------------------------------------------------------------------------------------------------
        Name: 25 yr post         Hydrology Sim: 25yrpro
    Filename: C:\Users\rburleson\Desktop\Projects\SECI\ICPR Simulations\Post-Development\25yr post.I32

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

     Max Delta Z(ft): 1.00                 Delta Z Factor: 0.00500
 Time Step Optimizer: 0.000
     Start Time(hrs): 0.000                 End Time(hrs): 36.00
  Min Calc Time(sec): 0.0000           Max Calc Time(sec): 0.0000
     Boundary Stages:                       Boundary Flows:
```

Time(hrs)	Print Inc(min)
36.000	15.000

Group	Run
BASE	Yes

MGS Entrance Road Modification, Sodium Hypochlorite Unloading Containment, and Switchyard Control House Addition
Node Min/Max Report

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
A	BASE	100 yr post	12.15	126.571	129.000	-0.3000	3998	0.00	130.346	12.13	85.243
AA	BASE	100 yr post	12.16	123.880	128.500	-0.0049	2579	12.15	66.689	12.16	66.645
Area 1B	BASE	100 yr post	12.15	126.595	127.500	0.0043	8918	12.00	80.688	0.00	105.962
Area 1D	BASE	100 yr post	12.28	124.633	128.500	-0.0048	3420	12.10	100.373	12.13	99.612
Area 3	BASE	100 yr post	12.08	127.194	128.500	0.0050	115	12.00	17.610	0.00	24.385
Area 4	BASE	100 yr post	0.00	126.000	128.500	-0.0050	119	12.00	14.040	0.00	26.593
Area 5A	BASE	100 yr post	0.00	129.000	133.000	-0.0050	2390	12.00	26.526	0.00	26.752
Area 5B	BASE	100 yr post	12.07	125.990	129.000	0.0036	6816	12.25	38.764	11.91	41.295
Area 5C	BASE	100 yr post	12.16	123.968	128.500	0.0035	8378	0.00	210.190	12.15	66.689
Area 6	BASE	100 yr post	0.00	125.000	128.500	-0.0049	1162	12.00	24.097	0.00	209.038
AREA 9	BASE	100 yr post	12.15	127.063	129.500	0.0044	114	0.00	0.000	0.01	0.742
Area1	BASE	100 yr post	12.15	127.063	129.000	-0.0046	4366	12.00	31.406	12.54	35.572
L	BASE	100 yr post	12.30	124.554	128.500	0.0047	3800	12.13	99.612	12.15	99.101
Outfall	BASE	100 yr post	30.00	120.000	121.000	0.0001	0	12.61	111.306	0.00	0.000
POND	BASE	100 yr post	12.61	123.390	125.500	0.0029	174221	12.14	193.630	12.61	111.306
A	BASE	25 yr post	12.07	125.847	129.000	-0.3000	3781	0.00	130.346	12.08	73.734
AA	BASE	25 yr post	12.15	123.405	128.500	-0.0047	2430	12.15	52.679	12.17	52.769
Area 1B	BASE	25 yr post	0.00	126.000	127.500	0.0041	7420	12.00	64.080	0.00	105.962
Area 1D	BASE	25 yr post	12.12	124.187	128.500	-0.0047	3454	12.06	86.078	12.11	85.024
Area 3	BASE	25 yr post	12.03	126.321	128.500	-0.0050	115	12.00	13.903	0.00	24.385
Area 4	BASE	25 yr post	0.00	126.000	128.500	-0.0050	119	12.00	11.147	0.00	26.593
Area 5A	BASE	25 yr post	0.00	129.000	133.000	-0.0049	2390	12.00	20.566	0.00	26.752
Area 5B	BASE	25 yr post	12.09	125.834	129.000	0.0034	6239	12.03	29.268	12.00	40.437
Area 5C	BASE	25 yr post	12.15	123.531	128.500	0.0035	7323	0.00	210.190	12.15	52.679
Area 6	BASE	25 yr post	0.00	125.000	128.500	-0.0034	1162	12.00	19.098	0.00	209.038
AREA 9	BASE	25 yr post	0.00	127.000	129.500	-0.0050	114	0.00	0.000	0.01	0.742
Area1	BASE	25 yr post	0.00	127.000	129.000	-0.0050	4066	12.01	24.393	12.37	34.726
L	BASE	25 yr post	12.12	124.052	128.500	-0.0050	3467	12.11	85.024	12.14	85.273
Outfall	BASE	25 yr post	30.00	120.000	121.000	0.0001	0	12.64	78.940	0.00	0.000
POND	BASE	25 yr post	12.64	122.976	125.500	0.0026	171310	12.14	160.203	12.64	78.940

Appendix D

Stormwater Management Facility Operation & Maintenance Plan

Midulla Generating Station
Stormwater Management Facility Operation and Maintenance Plan

This maintenance plan is for all stormwater management features constructed as part of the .... The stormwater management components consist of inlets, pipes, grassed ditches, and wet and dry stormwater ponds with control structures. The anticipated maintenance activities include de-silting of pipes and ponds, vegetation mowing and control, control structure cleaning, and erosion repair. The following requirements have been developed in anticipation of these maintenance and operation activities.

General Maintenance

1. All surface water management system pipes, inlets, catch basins, manholes, flumes, pond inflow and outfall structures (including oil skimmers), and discharge pipes should be inspected on a regular basis (monthly or quarterly) and after major rainfalls. They should be maintained by removing built-up debris and vegetation and repairing deteriorating structures.
2. Chemicals, oils, greases, cut or dead vegetation or similar wastes are NOT to be disposed of in the surface water management system or through storm sewers.
3. Accumulated pond sediments, stormwater swales, and culverts should be disposed of in an approved solid waste management facility.
4. During any repair or maintenance activity, use care to avoid causing erosion or siltation to adjacent or offsite areas. All retention/detention pond side slopes shall be sodded and staked as necessary, to prevent erosion.
5. Alterations (filling, enlarging, etc.) of any part of the surface water management system are not permitted without prior approval from the Department and all other applicable governing agencies.
6. Establishment and survival of littoral areas provided for stormwater quality treatment in wet detention system systems shall be assured by proper and continuing maintenance procedures designed to promote viable wetlands plant growth or natural diversity and character. Perpetual maintenance shall be provided for the certified system.

Inspections

1. The side slopes of the detention pond and adjoining swale shall be inspected for bare spots, damage or erosion. Bare areas shall be sodded or seeded to replace the grass cover. In the case of erosion, replace the missing soil and bring the affected areas back to grade.
2. On a quarterly basis and following significant storm events, inspect the area in front of the outfall control structure to for built-up sediments, vegetation and debris that

impair the operation of the structure. Remove sediments, vegetation, trash and debris to an approved disposal site.

3. When littoral zone vegetation and sediment accumulate to such an extent that water depth decreases, the littoral zone may need to be re-graded and re-vegetated. When it appears that the pond has reached this state, contact the Department prior top large scale maintenance.

Notify the Department at (813) 632-7600 within 24 hours of observation of sinkhole development in the surface water management system. All pipes will be de-silted once the accumulated sediment exceeds 25% of the available pipe cross-section for the full length of the pipe.

1. Accumulated sediment in the ponds shall be removed once the average depth of sediment over the entire pond area exceeds 6 inches as measured above the design pond bottom elevation. Upon removal of the sediment, the pond bottom shall be scarified with a disc harrow or similar device to facilitate percolation and recharge.
2. All pond control structures shall be inspected at least quarterly to insure proper operation of skimmers and discharge mechanisms. Accumulated debris shall be removed that would inhibit the proper operation of the control structure.

Erosion and sediment controls

The following discussion defines general guidelines for the sequence of construction and the use of stabilization and structural practices.

- Site Construction: Install silt fence on all sides draining off site. Install soil tracking prevention device at exit points to paved surfaces. Provide a temporary sedimentation basin, as necessary, during construction. Final grading will be done once the basin is permanently stabilized. Sod all disturbed areas after construction is completed.

The contractor will be required to review the site specific erosion control plan. The contractor may also be required to modify the plan or materials to adapt to seasonal variations or site conditions. Any modifications to this plan must be signed by a professional engineer representing the contractor. Contractor shall remove all sediment that has migrated off-site. The project engineer is responsible for determining if additional controls are needed and deployment schedules for the implementation of all erosion control devices.

Stabilization practices

Temporary:

- Seed and mulch, and sod.

All stabilization practices shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased.

Structural Practices

All sediment controls shall be in place prior to any soil disturbing activity upstream of the control and may consist of one or more of the following.

- Silt Fence in accordance with FDOT Index 102.
- Sand bags.
- Hay bales.
- Berms.
- Timber bedding at construction areas.
- Turbidity barriers.
- Rip-Rap