



September 20, 2019

19-125665

Mr. Robert Stafford

Duke Energy Florida
299 1st Avenue North
St. Petersburg, FL 33701

**RE: REVISED SOLID WASTE MATERIALS OPERATIONS PLAN
ASH STORAGE/DISPOSAL AREA
CRYSTAL RIVER ENERGY COMPLEX
CRYSTAL RIVER, FLORIDA**

Dear Mr. Stafford:

In conjunction with Duke Energy Florida, Inc., Golder Associates Inc. has prepared this revised Operations Plan for the ash storage/disposal area (AS/DA) at Crystal River Energy Complex (CREC). This revised Operations Plan is intended to comply with the applicable requirements of Chapter 62-701.500(2), FAC and provide operation guidance for the AS/DA.

Should you have any questions or comments, please contact me at (904) 363-3430 or by email at sstafford@golder.com.

Sincerely,

Golder Associates Inc.

Samuel F. Stafford, PE
*Florida Professional Engineer No. 78648
Certificate of Authorization No. 1670*

Don E. Grigg, PE
Senior Engineer and Group Leader

SFS/DEG/ams

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ASH STORAGE/DISPOSAL AREA SOLID WASTE MATERIALS OPERATIONS PLAN



DUKE ENERGY FLORIDA
CRYSTAL RIVER ENERGY COMPLEX
CRYSTAL RIVER, FLORIDA

SEPTEMBER 2019

(REVISION 0 – FEBRUARY 2012)
(REVISION 1 – DECEMBER 2013)
(REVISION 2 – AUGUST 2019)
(REVISION 3 – SEPTEMBER 2019)

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1.0 INTRODUCTION

1.1 Purpose

This Operations Plan is intended to be a reference for the personnel who operate and supervise the Ash Storage/Disposal Area (AS/DA) at the Crystal River Energy Complex (CREC) operated by Duke Energy Florida, Inc. (DEF) and generally complies with applicable sections of Chapter 62-701.500(2), Florida Administrative Code (FAC). As the operations of the AS/DA vary from that of a Class I or Class III landfill, some of the components of Chapter 62-701.500(2) are not applicable. The following presents the requirements for an Operations Plan developed under the applicable requirements of Chapter 62-701.500(2) with references to the sections within this plan where those requirements are addressed (or in some cases if those requirements are not applicable (NA) to AS/DA operations):

Operation Plan. *Each landfill owner or operator shall have an operational plan that provides written, detailed instructions for the daily operation of the landfill. The operation plan shall be kept at or near the landfill facility and shall be accessible to landfill operators. The operation plan shall be substantially complied with at all times and shall be revised if operational procedures change. The plan shall include procedures for:*

- a. Designation of persons responsible for operation and maintenance of the facility; **[see Section 1.1]**
- b. Emergency preparedness and response, as required in subsection 62-701.320(16), FAC; **[see Section 2.5]**
- c. Controlling the type of waste received at the site. The plan shall specify inspection procedures, number and location of spotters for each working face, and procedures to be followed if unauthorized waste is discovered; **[NA – only wastes generated at the plant and approved by the Florida Department of Environmental Protection (FDEP) are placed in the AS/DA, as identified in the Site-Wide Coal Combustion Products (CCP)/ Solid Waste Management Plan]**
- d. Weighing incoming waste, if required under paragraph 62-701.500(4)(a), FAC; **[see Section 2.2 – Truck Weighing and Counts are tracked]**
- e. Vehicle traffic control and unloading; **[see Section 2.2]**
- f. Method and sequence of filling waste; **[see Section 2.3]**
- g. Waste compaction and application of cover; **[see Section 2.3]**
- h. Operations of gas **[NA]**, leachate **[NA]**, and stormwater controls; **[see Section 2.3.5]**
- i. Water quality monitoring; and **[see Section 4.0]**
- j. Maintaining and cleaning the leachate collection system. **[NA]**

The AS/DA is permitted under the plant's Conditions of Certification (PA 77-09). It is primarily used for the storage and disposal of fly ash, bottom ash, and gypsum referred to as CCPs produced at CREC. This plan presents background information on the facility and describes the hauling and placement of CCPs; operation and maintenance of the AS/DA; monitoring; and sequencing and closure of the AS/DA.

The designated responsible person for the CREC AS/DA should be the Site Operator:

Contact Name: Mr. Kerem Esin, PE – System Owner
Crystal River Energy Complex
Telephone Number: (352) 501-5024 (office)

1.2 Facility Description

The CREC is located near the Gulf of Mexico in Citrus County, Florida. The main entrance of the facility is located at 15760 West Powerline Street, Crystal River, Florida. CREC consists of two active electrical generating units. Units 4, and 5 are active coal-fired steam units, located on the northern portion of the plant area. Unit 3 is a retired nuclear unit and is not covered by this plan. Units 1 and 2 are retired coal-fired steam units located on the southern portion of the plant area. A site plan of CREC is presented on Figure 1.

The AS/DA is located in the northeast corner of the property and currently receives CCPs generated by Units 4 and 5. In the past, the AS/DA also received CCPs generated by Units 1 and 2, which were retired at the end of 2018. The AS/DA has an overall footprint of 62 acres and provides an estimated 6 million cubic yards of airspace for CCPs¹. The current (based on May 15, 2019 topography) and final cover configuration of the AS/DA is presented in Figures 2 and 3, respectively.

CCPs are typically transported to the AS/DA via dump trucks and less frequently by vacuum trucks. Figure 1 presents the loading areas and haul routes for the various CCPs produced at the site. Fly ash generated by Units 4 and 5 is pneumatically conveyed from each unit's electrostatic precipitators (ESPs) to individual storage silos. Bottom ash generated by Units 4 and 5 is sluiced to individual dewatering bins and associated handling tanks. Overflow gypsum from the temporary gypsum storage pad is loaded in dump trucks for transport to off-site beneficial use or infrequently to the AS/DA for disposal.

¹ Based on a 120-foot height 3H:1V sideslope configuration that has been approved by the Florida Department of Environmental Protection (FDEP).

2.0 OPERATIONS

2.1 Organization

The CREC AS/DA typically operates on a 5-day per week, 10-hour per day schedule, but extended hours may occur during heavy load periods and also to accommodate plant outage schedules as needed. The AS/DA and associated daily operations typically occur between 7:00 AM and 5:00 PM.

DEF has a contract with a Primary CCP Contractor who is responsible for marketing CCPs generated at CREC for off-site beneficial reuse, hauling unmarked CCPs to the AS/DA, and disposal operations at the AS/DA. The Primary CCP Contractor has subcontracted a disposal vendor. DEF also has a contract with a Reclamation Contractor who is responsible for marketing and reclaiming CCPs from the AS/DA for off-site beneficial reuse. An organization chart is provided in **Appendix A**.

2.2 Material Loading and Hauling Operations

2.2.1 Fly Ash

Fly ash is an industrial byproduct that is produced during the coal combustion process and is captured from the furnace flue gas and collected in the ESPs. Unit 4 and 5 fly ash is collected in each unit's ESP collection hoppers and pneumatically conveyed to the Unit 4 and 5 Storage Silos, located east of the power block. The storage silos act as transfer point between the collection hoppers and the hauling operations. The Storage Silos are capable of unloading dry fly ash into pressure-differential trucks or conditioned fly ash into rear dump trucks. The fly ash is conditioned using the mixer loaders which mix dry fly ash with water. Fly ash load-out operations are performed by DEF Operators at each area. The locations of the Unit 4 and 5 Fly Ash Storage Silos and associated haul routes are shown on Figure 1.



Unit 4 Bottom Ash Silos



Unit 4 Fly Ash Loading for On-Site Disposal (foreground)



Unit 4 Bottom Ash Dewatering Bin (foreground)
Unit 5 Fly Ash Silo and Dewatering Bins (background)

2.2.2 Bottom Ash

Units 4 and 5 use wet systems bottom ash handling. Bottom ash from each boiler falls into a hopper and is sluiced with water into a transfer tank. An ash slurry pump transfers the bottom ash/water mixture to a dewatering bin where solids are allowed to settle. Each unit is fitted with two bottom ash dewatering bins. The wet bottom ash from each dewatering bin is loaded into dump trucks for transport. Bottom ash load-out operations are controlled by a DEF Operator at each area.

2.2.3 Gypsum

The Units 4 and 5 flue gas desulfurization system produces synthetic gypsum (calcium sulfate). The gypsum slurry from the flue gas desulfurization system is dewatered in vacuum filter beds at the gypsum dewatering facility. The dewatered gypsum cake (approximately 90% solids content by weight) is transported via conveyor to a gypsum marketer located north and adjacent of the plant's property, or to the gypsum storage pad. The short-term temporary gypsum storage pad is sized to contain approximately 32,000 tons of gypsum. From the temporary storage pad, gypsum is managed as follows: it is transported directly off-site for beneficial use; or trucked to the AS/DA for on-site storage awaiting beneficial use, or on/off-site disposal.

2.2.4 Other Approved Materials

Miscellaneous solid wastes generated by plant operations are at times transported by trucks to the AS/DA. These wastes are subject to FDEP approval and in the past have generally been limited to settled solids from various ponds/basins, outage derived wastes (i.e. ESP and plant sump cleanouts), and cooling tower solids. Additional detail on approved waste materials are provided in the current revision of the facility's CCP and Solid Waste Materials Management Plan.

2.2.5 Material Quantities

Trucks hauling CCPs are weighed on certified scales to track the quantity of materials stored, disposed, or reclaimed from the AS/DA. For other miscellaneous wastes disposed of within the AS/DA a truck count system is typically used for estimating the quantity of materials. Generally, a haul truck is weighed empty and loaded a couple of times a day to determine an average load weight and a truck count is kept estimating the daily disposal tonnage.

2.2.6 Vehicle Traffic and Control

Generally, truck traffic is controlled by first in – first out, as directed by the landfill operator, who directs each truck where and when to dump. Vehicle traffic is controlled by traffic control signage. The speed limit within the plant is 10 miles per hour.

2.2.7 Dust Control

The CCP handling/transportation operations are performed to minimize the generation of fugitive dust using one or more of the following techniques:

- Moisture conditioning of the solid prior to loading in trucks;
- Fabric truck covers;
- Watering of haul routes; and
- Washing of trucks to minimize carry-over of CCPs.

Water for dust control is applied using a water truck. The water truck obtains water from AS/DA perimeter ditches or ash settling basin truck fill station. Coal pile run-off treatment pond water is also approved for dust suppression purposes under site NPDES permit. Well water or plant service water is only used as a

last resort during dry periods. Fugitive dust control measures are outlined in the Coal Combustion Residual (CCR) Fugitive Dust Control Plan (Revision 1, March 3, 2017)².

2.3 Ash Storage/Disposal Area Operations

2.3.1 Placement and Compaction

Fly ash and bottom ash are transported to the AS/DA by dump trucks and placed within the active disposal area or active reclamation area of the AS/DA. Fly ash and bottom ash placed in the active disposal area are spread and compacted by a bulldozer. Overflow gypsum from the temporary storage pad is transported to the AS/DA by dump trucks where the material may be stored for beneficial use, stored pending off-site disposal, or permanently disposed in the AS/DA. The material is spread and compacted by a bulldozer.

The active disposal areas of the AS/DA should be minimized to reduce fugitive dust development, erosion potential, and infiltration. The overall development of the fill should be based on a progressive placement of CCPs in 6 to 18-inch thick lifts while maintaining a maximum fill slopes of 3H:1V. During wet weather, thinner lifts should be used to provide more rapid compaction of the solids. Relatively wet materials (i.e. from stormwater ditches/basins, truck wash basins, catch basins, or, plant sumps) disposed of within the AS/DA are to be decanted of free water prior to hauling to the AS/DA and/or blended with sand, ash or gypsum to improve consistency. Relatively wet materials may also be temporarily stockpiled and worked with a bulldozer periodically to allow some moisture reduction prior to blending, spreading, and compaction. The wet materials are worked into the current lift in the active disposal areas in thin lifts and mixed with fly ash, bottom ash, or gypsum prior to compaction. Following placement, the CCPs should be compacted to at least 90 percent of the maximum dry density as determined by ASTM D698 (standard Proctor compaction test). The minimum compaction test frequency is 1 test per 8,000 CY (or tons) of material disposed.



Fly Ash Placement



Spreading Fly Ash



Water Wagon and Dozer
Active Disposal Area

2.3.2 Reclamation for Beneficial Use

CCP materials (including fly ash, bottom ash, and gypsum) may be reclaimed from the AS/DA for off-site beneficial use by the Reclamation Contractor. Beneficial use and management of CCPs are elaborated in the plant's site wide CCP Management Plan. CCPs for beneficial reuse are primarily excavated using bulldozers, front-end loaders, and/or excavators. The Reclamation Contractor is proposing to operate an

² Coal Combustion Residual (CCR) Fugitive Dust Control Plan, Revision 1, Crystal River Energy Complex, Duke Energy Florida, Inc., dated March 3, 2017.

ash beneficiation system within the AS/DA to beneficiate ash and increase the reclamation rate. DEF expects the proposed ash beneficiation system will be permitted by FDEP by the end of 2019. The ash beneficiation system will be permitted, owned, and operated by the Reclamation Contractor. Reclaimed ash and beneficiated ash is transported off-site for beneficial use in covered trucks. The reclamation activities will be conducted in such way to minimize the requirement for maintenance and potential of fugitive dust emissions. Records of the reclamation activities will be maintained by the Reclamation Contractor.

2.3.3 Fill Sequence and Closure

Within the AS/DA footprint, approximately 17 acres have received final cover on the eastern slope, northern slope and southern tip. Other areas (mostly on the western slope and top area) have received temporary cover in the form of soil with sod, stormwater ditch sediment with incidental vegetation, hydroseed (grass), erosion control matting, or geosynthetic rain covers placed directly on CCPs. Filling and reclamation operations are to continue in the south-central portion of the footprint.

A majority of the CCPs from the southern and central portions of the footprint have already been reclaimed and removed for beneficial use. Active disposal and reclamation areas will maintain a grade sloping to the south and west, thus keeping run-off diverted from closed slopes and towards the ditch and ponds on the western perimeter of the AS/DA footprint. The ash beneficiation facility has its own stormwater management system that includes a detention pond. Overflow from the detention pond will be routed into the existing AS/DA stormwater system. After reclamation activities are completed or terminated, the final stage of filling will consist of bringing the crown and western slopes to final grade and capping them in increments of 5 to 6 acres. The filling rate will be dictated by plant operations and CCP production rates. A layout of the AS/DA closure sequencing is provided on Figure 4.

2.3.3.1 Reclamation in Closed Areas

With the operation of the proposed ash beneficiation system, reclamation operations may encroach on previously closed areas of the AS/DA. The previously closed areas are limited to slopes along the north and east sides and southern tip of the AS/DA. The final cover cap in these areas will have to be removed in order to access and reclaim marketable CCPs underlying the cap. Prior to removal of any final cover material, DEF will submit to FDEP a plan for reclamation in previously closed areas. This reclamation plan will document the areas of proposed cap removal, stormwater control details, liner removal/repair details, final grading and stabilization of the affected areas, and proposed timelines for completing the reclamation. Following completion of the reclamation activities in previously closed areas, DEF will submit to FDEP a construction completion report documenting the final cover removal and reclamation details including revised as-built drawings. This report will also document any repairs and modifications of the previously installed and certified closure/lining system.

2.3.3.2 Closure Plans

As areas (generally in increments of 5 to 6 acres) of the AS/DA achieve their proposed final subgrade elevations (see Figure 3) final cover construction will be performed using materials described in Section 2.3.6 and shown on Detail 6, Figure 5. Note that closure may be delayed in the event that ash material is removed from the AS/DA designated for closure thus, creating additional storage/disposal capacity. After closure of the segment is complete, DEF will certify that the closure has been completed in accordance with the Closure Plan³. This certification will be signed by an independent, professional engineer, registered in the State of Florida and submitted to FDEP.

The groundwater monitoring wells located adjacent to the AS/DA will remain active following closure of sections of the AS/DA as sectionalized closure occurs. Post closure monitoring planning will be discussed with the FDEP after the AS/DA has been totally closed.

2.3.3.3 Post Closure Care

Post-closure care activities consist of monitoring and maintaining the AS/DA and monitoring groundwater in accordance with the site's groundwater monitoring plan and the Post-Closure Care Plan⁴ developed pursuant to the CCR Rule. The post-closure care period will be in accordance with the applicable requirements of Chapter 62-701 FAC to ensure the closed facility is not contributing to adverse environmental impacts. Specifically, the post-closure care requirements will include assurance that the final cover system remains effective and groundwater monitoring is conducted in accordance with the site's groundwater monitoring plan.

2.3.4 Dust Control

The AS/DA operations are to be managed in such a way as to minimize the generation of fugitive dust using one or more of the following techniques:

- Watering of all active or exposed faces of AS/DA using water trucks;
- Intermediate cover of CCPs with soil and vegetation;
- Vegetation of CCPs using hydroseed;
- Application of a dust control agent/soil stabilizer on exposed CCP surfaces; and
- Development of AS/DA to minimize size of active disposal area.

Water for dust control is applied using a water truck. The water truck will obtain water from AS/DA perimeter ditches or ash settling basin truck fill station. Coal pile run-off treatment pond water is also approved for dust suppression purposes under site NPDES permit. Well water will only be used as a last resort during dry periods.

³ Closure Plan, Ash Storage/Disposal Area, Crystal River Energy Complex, Golder Associates Inc., dated October 11, 2016.

⁴ Post-Closure Care Plan, Ash Storage/Disposal Area, Crystal River Energy Complex, Golder Associates Inc., dated October 11, 2016.

2.3.5 Stormwater Control

Stormwater runoff from the AS/DA flows into the plant's permitted stormwater management system ditches and basins surrounding the footprint. Stormwater then flows through the pond system and discharges via an overflow weir (permitted NPDES outfall). The stormwater management ponds are designed to contain the runoff from a 10-year, 24-hour storm event. As benches are constructed, stormwater should be routed to downcomer structures and pipes that will discharge to the perimeter stormwater management system. The permitted stormwater management system which serves the AS/DA is designed to manage run-off from the 100-year, 24-hour storm event without exceeding the top of bank elevations of the pond/basins. Stormwater will be eventually discharged via infiltration or (under peak storm conditions) through the NPDES outfall and eventually into the site discharge canal and the Gulf of Mexico.

Temporary sediment basins will be constructed near active disposal areas to detain sediment-laden runoff long enough to allow the majority of sediment to settle out before discharging to the perimeter stormwater management system. Temporary cover in the form of soil with sod, stormwater ditch sediment with incidental vegetation, hydroseed (grass), erosion control matting, or geosynthetic rain covers may be used to reduce erosion and infiltration of stormwater into the AS/DA. Drainage structures, ditches, and diversion berms will be cleaned of debris and accumulated sediments as required to maintain the hydraulic capacity of the stormwater management system. Routine inspection and maintenance of the stormwater management system will be performed to repair erosion problems, remove eroded materials, and maintain temporary culverts clear of debris. Sediment excavated from the basins and ditches will be placed in the interior of the AS/DA using the placement/compaction methods described in this plan. The excavated sediment will be mixed with fly ash, bottom ash, or a stabilizing agent to minimize any free liquids present.

2.3.6 Final Cover

The final cover system for the AS/DA consists of the following from top to bottom:

- 6-inch thick vegetative support layer (topsoil);
- 18-inch thick protective cover soil;
- Geosynthetic clay liner (GCL); and
- Compacted CCPs or intermediate soil cover.

According to the Conditions of Certification (COC), "the final cover shall be in compliance with Chapter 62-701 FAC, and at least 12 inches of clay or sufficient suitable liner material shall be placed on the top and exposed sides of each finished landfill cell. Sufficient topsoil to support vegetation shall be placed over the top and side clay liner. The top and exposed sides of the ash landfill shall be vegetated to control erosion".

According to the Modification to the COC (Mod Q), DEF "shall provide an ash storage/disposal area operations plan that describes the procedures for filling, compacting, and final closure of the ash storage/disposal area for Department approval".

DEF recognizes that future technologies may offer opportunities to employ alternative closure measures and procedures which would still comply with the intent and spirit of the COC and be environmentally acceptable.

Therefore, in an effort to meet the intent of the aforementioned requirements, areas that are completed to the final top of CCP design grades should be covered with the approved final cover system as addressed in the plant's COC. However, consistent with prior Department authorization for an approximate two acre area located in the southeast part of the AS/DA that was closed with a GCL, future final cover systems for new areas planned for closure may also consist of a GCL placed directly over the CCPs in a technically consistent manner as previously engineered, designed, and approved by the Department. Alternatively, if the facility proposes to permanently close an area of the AS/DA with material that is not mentioned in the COC (e.g. clay or suitable liner material) or with a GCL as described above, DEF would obtain Department approval for the proposed alternative material in advance of closure.

At approximately 30-foot (vertical) intervals, 2-foot deep, 10-foot wide benches (backwardly inclined channels) should be constructed on the side-slopes, with approximately 0.5 percent longitudinal slopes that outlet via downcomer pipes (18-inch diameter) spaced approximately 500 feet apart. On the top area (crown), the subgrade should be graded to a slope of approximately 2 percent towards the edges and a rim ditch/berm. The rim ditch/berm will have approximately 0.5 percent longitudinal slopes that will outlet via downcomer pipes (12-inch diameter), spaced approximately 500 feet apart.

The cover will be reseeded or re-sodded if insufficient vegetation exists to stabilize the surface, including repair or replacement of erosion control material on the side-slopes, bench drainage, downcomers, and rim ditch. Depressions or uneven surfaces which may develop over time should be re-graded if possible since they can lead to the development of erosion. In the first year following completion of final cover placement monthly inspections should be performed to detect the potential erosion problems and routine maintenance of cover soil, vegetation, and ditch/channel linings will provide erosion control for closed portions of the AS/DA. After the first year following closure, frequency of inspections can occur after major storm events or annual, whichever is less.

2.4 Work Schedule and Coordination

During periods of normal plant operations, CCPs hauling and disposal operations as well as removal operations are conducted eight hours per day each weekday using on-site equipment. The CCPs handling operations are flexible enough to accommodate variations in the plant operations and the other factors that may occur, which can influence the rate of byproduct and coal ash production. Storage within the existing coal ash and byproduct silos/bin are sufficient to handle short term surges in the ash production. Ash silo level readings are normally monitored by plant operators and CCP Contractor personnel on a daily basis to coordinate CCP removal operations. Coordination between the plant personnel and CCP Contractors is conducted daily to maintain efficient disposal operations.

2.5 Contingency Operations

During emergency conditions normal CCP disposal acceptance procedures will continue, if possible. The following procedures are to be initiated at the onset of a site emergency or major storm:

1. All personnel have been trained to understand their role in an emergency. At least one employee is to monitor the telephone. Radio communications are provided between offices and all operating areas of the AS/DA at all times.
2. All lightweight signs and equipment are to be collected and stored in a secure area.
3. All depressed and eroded areas are to be protected and the stormwater management system is to be inspected, maintained, and repaired, as necessary.
4. If CCP disposal acceptance is discontinued, work is to resume in dry areas only; at no time are CCP materials to be deposited in standing water.
5. The following emergency phone numbers are provided:
 - Site Emergency Contact – (352) 501-5555
 - Emergency Police/Fire/Medical – Site Emergency Contact (see above)
 - Crystal River Fire Department – (352) 795-1928
 - Seven Rivers Regional Medical Center – (352) 795-6560

The stormwater management system should allow for disposal operations to continue during periods of inclement weather. Temporary berms, ditches, and grading are to be used to drain stormwater away from the active face of the AS/DA.

Operational hours of the AS/DA may be extended to meet the needs of the plant. Should violent weather (such as a hurricane) be approaching the facility, DEF may elect to increase hauling and disposal activities in order to maintain as low a level as possible in the on-site storage silos in preparation for times when hauling may be delayed.

The following actions should be taken at the AS/DA following a severe storm, hurricane, or other natural disaster requiring implementation of emergency operations:

- The FDEP Southwest District Office Solid Waste Program is to be notified within 24 hours by telephone if a need for emergency and contingency operations are warranted. The phone number for FDEP is (813) 632-7600.
- Necessary additional equipment, if required, should be mobilized.
- If required, additional equipment operators and/or other personnel should be contracted.
- Contacts with local governmental bodies and local emergency agencies such as fire and rescue will be established to coordinate emergency activities.
- Installation of siltation booms upstream of overflow weir system to minimize the potential for solids carryover.
- Site personnel will monitor weir systems so that proper notifications can be made, and samples of water can be obtained during the overflow event as required by the facility NPDES permit.

2.6 Sub-Surface Instability

If surface depressions, or other occurrences which may be indicative of sinkhole activity, or sub-surface instability are discovered on site, or within 500 feet of the AS/DA, the FDEP will be notified verbally within 24 hours of the discovery. Written notification will be submitted within seven days of the discovery. The written notification will include a description of the depression, the location and size of the depression, and a corrective action plan which describes the action necessary to prevent the unimpeded discharge of waste, leachate or CCP's into ground or surface waters. If the depression or subsurface collapse occurs within the AS/DA, additional materials will not be stored or disposed in the affected area until subsurface disturbance has been fully investigated and remediated, if necessary.

3.0 MAINTENANCE

3.1 General

Formal inspections of each active and reclaimed area of the AS/DA should be carried out on a regular basis. Remedial measures for any deficiencies noted during the inspections should be carried out promptly.

3.2 Roads

The haul roads to the disposal site will be maintained for smooth traffic flow. In the event that rutting, or potholes develop, or the road edges give way, the affected areas should be repaired. Dust control should be performed on the haul road as described in Section 2.2.8. The haul road shoulders should be maintained in good condition and free from excessive buildup of ash materials and all culverts under the road should be kept clear of silt and debris as much as practical.

3.3 Stormwater Management System

The AS/DA stormwater management system is designed to manage run-off generated by a 25-year, 24-hour storm event. All drainage structures, pipes, culverts, ditches, and basins will be maintained such that any collection of silt and debris are minimized to ensure proper flow and collection of stormwater. When a significant amount of sediment has accumulated in run-off basins, the sediment should be removed and spread in a thin layer (three inches maximum) over the area where CCP disposal is taking place at the time, allowed to dry, and then compacted along with CCPs as usual. Records of sediment removal will be kept that will include date of removal, location of removal, amount of sediment removed, location sediment is removed to, and the contractor utilized (if applicable).

The AS/DA is covered under the Crystal River Units 4 & 5 NPDES permit and is therefore also covered by the Stormwater Pollution Prevention Plan (SWPPP) requirements. This Plan includes maintenance and inspection of stormwater system equipment and facilities to ensure proper operation. The SWPPP requirements also include annual training for DEF personnel and contractors involved in the proper management of stormwater systems.

3.4 Vegetated Areas

Special care should be taken to maintain a good vegetative cover and prevent erosion of cover material on both intermediate and final cover areas at the AS/DA. Any areas of erosion should be filled, stabilized, and reseeded (or re-sodded), as soon as weather permits. Final cover areas will be mowed at least twice a year.

4.0 WATER QUALITY MONITORING

4.1 Groundwater Monitoring

Monitoring of groundwater quality is performed at the facility in accordance with requirements contained in the facility's the Groundwater Monitoring Plan as authorized by the FDEP. The monitoring wells associated with the AS/DA include TW-1R, TW-2R (piezometer – water level only), TW-3, TW-4, TW-5, MWI-2R2, and MWC-12R. Groundwater monitoring is performed by DEF on a quarterly basis and analyzed for the constituents listed in the approved Groundwater Monitoring Plan. Groundwater monitoring well locations in the vicinity of the AS/DA are shown on Figure 2.

4.2 Surface Water Monitoring

Surface water monitoring for the AS/DA is conducted by DEF per discharge event at the internal overflow weir (designated C40) prior to prior to co-mingling with the remainder of the facility's run-off collection system in accordance NPDES IWWP FL0036366. Surface water samples are analyzed for the constituents listed in the permit.

5.0 SAFETY AND SECURITY

5.1 General Safety

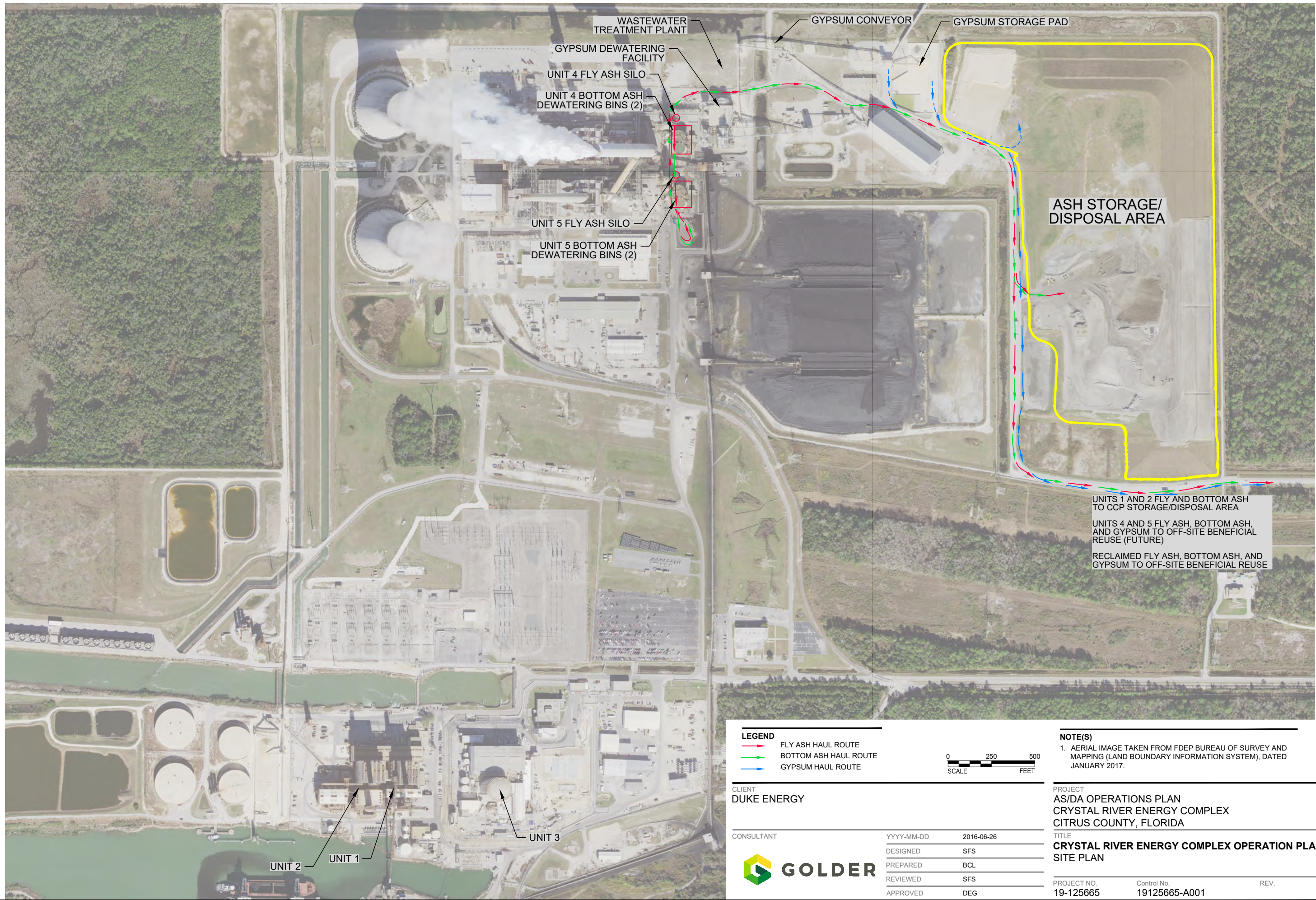
The CCP management contractors (including vendors) shall perform the work they are tasked to complete safely. In addition, contractors shall adhere to all applicable federal, state and local laws, orders, rules and regulations, including those relating to hazardous substances. The contractors shall be solely responsible for the safety of all persons performing work, hereunder, as well as others, including members of the public, affected by that work. The contractors will supply the necessary safety and protective equipment required (i.e., hard hats, safety glasses, gloves, rain suits, coveralls, etc.) to perform the work safely. The Contractors shall be familiar with all safety rules and applicable regulations associated with the CREC. All such safety rules and regulations must be followed.

5.2 Site Security

The AS/DA area is secured by an 8-foot high fence and sliding gate across the access road. A security guard is posted to monitor traffic entering and leaving the AS/DA area. The AS/DA area can be accessed by using a DEF supplied security badge to open the gate. No personnel without proper authorization from DEF will be allowed to enter CREC.

FIGURES

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LEGEND

- FLY ASH HAUL ROUTE
- BOTTOM ASH HAUL ROUTE
- GYPSUM HAUL ROUTE



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DUKE ENERGY

CONSULTANT



YYYY-MM-DD	2016-06-26
DESIGNED	SFS
PREPARED	BCL
REVIEWED	SFS
APPROVED	DEG

NOTE(S)

- AERIAL IMAGE TAKEN FROM FDEP BUREAU OF SURVEY AND MAPPING (LAND BOUNDARY INFORMATION SYSTEM), DATED JANUARY 2017.

PROJECT
AS/DA OPERATIONS PLAN
CRYSTAL RIVER ENERGY COMPLEX
CITRUS COUNTY, FLORIDA

TITLE
**CRYSTAL RIVER ENERGY COMPLEX OPERATION PLAN
SITE PLAN**

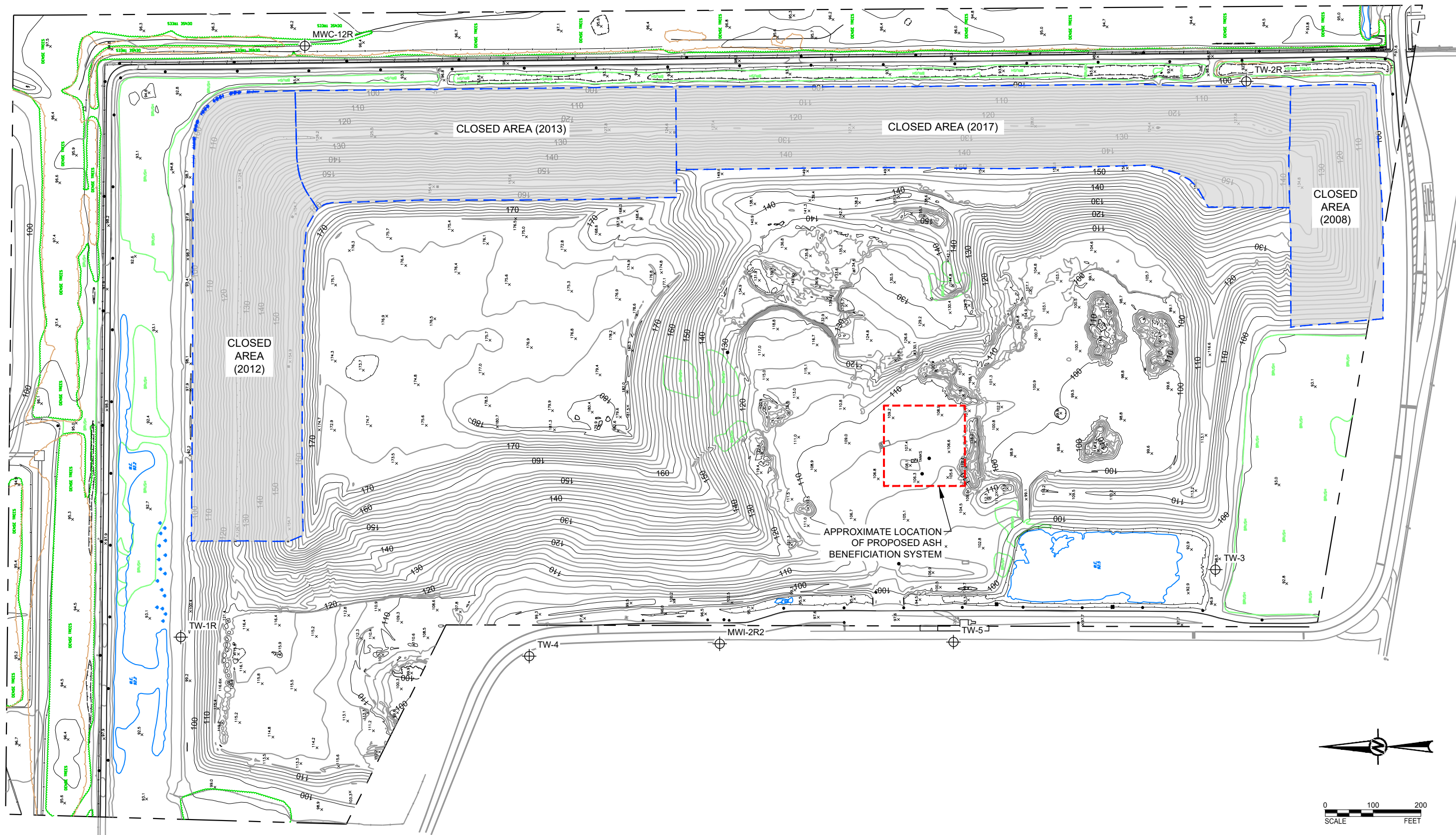
PROJECT NO.
19-125665

Control No.
19125665-A001

REV.

FIGURE
1

1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B



LEGEND



GROUNDWATER MONITORING WELL LOCATION

REFERENCE(S)

1. EXISTING CONTOURS BASED ON MAY 15, 2019 TOPOGRAPHIC SURVEY BY

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DUKE ENERGY

CONSULTANT



YYYY-MM-DD 2016-06-26

DESIGNED SFS

PREPARED BCL

REVIEWED SFS

APPROVED DEG

PROJECT
AS/DA OPERATIONS PLAN
CRYSTAL RIVER ENERGY COMPLEX
CITRUS COUNTY, FLORIDA

TITLE
**ASH STORAGE/DISPOSAL AREA
EXISTING CONDITIONS**
- MAY 15, 2019 -

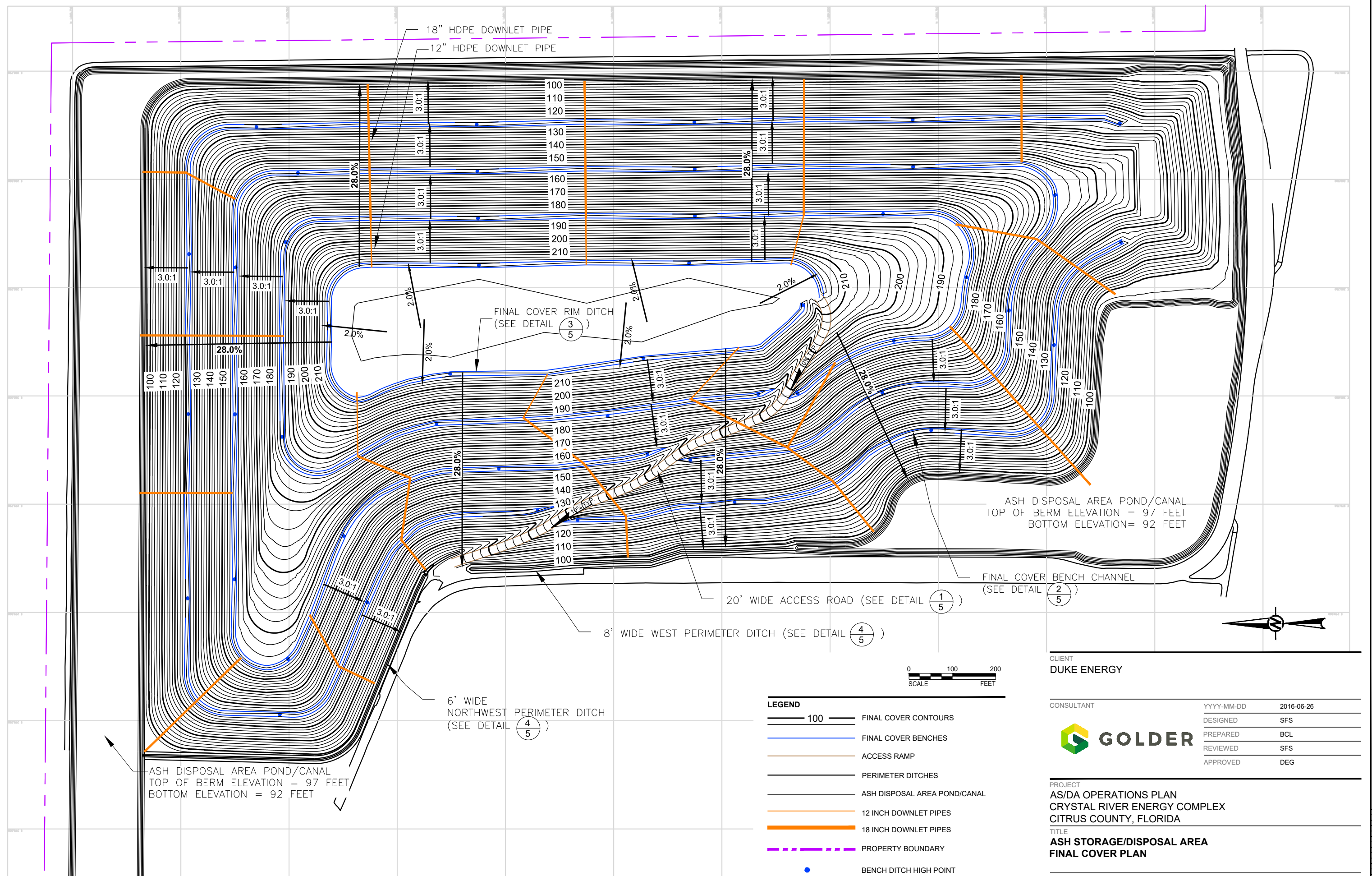
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19-125665

Control No.
19125665-A002

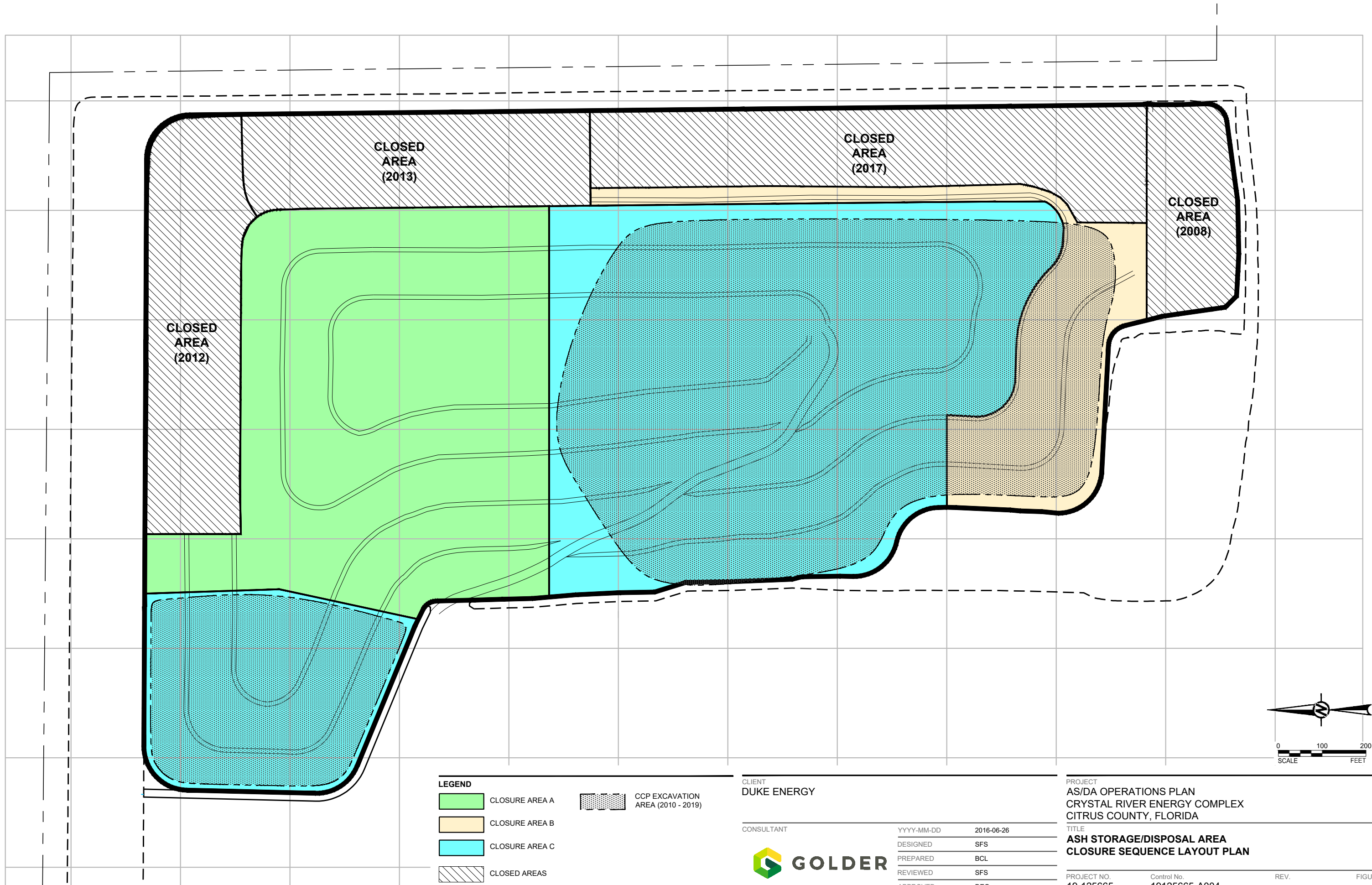
REV.

FIGURE

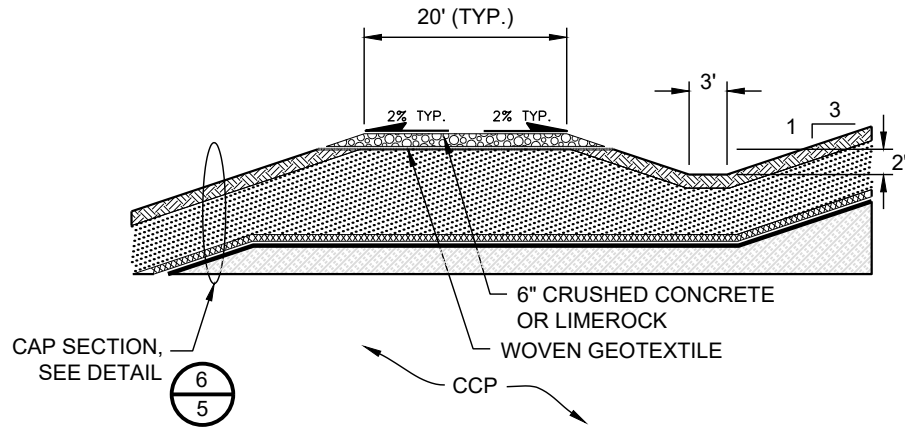
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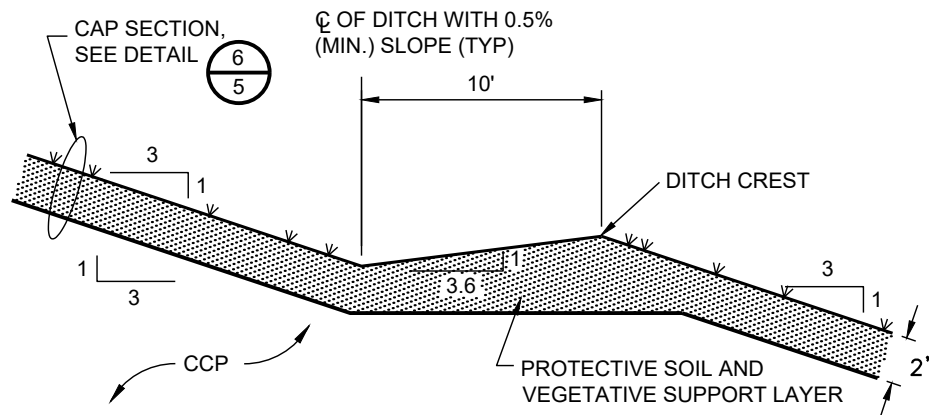
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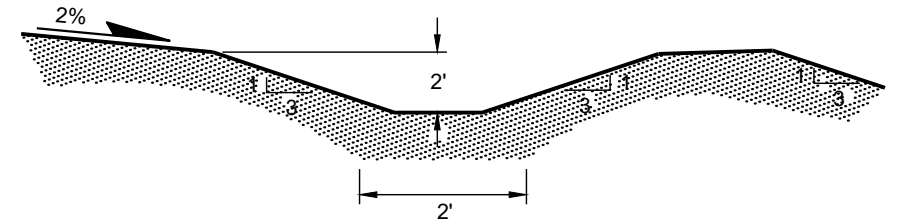
1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B



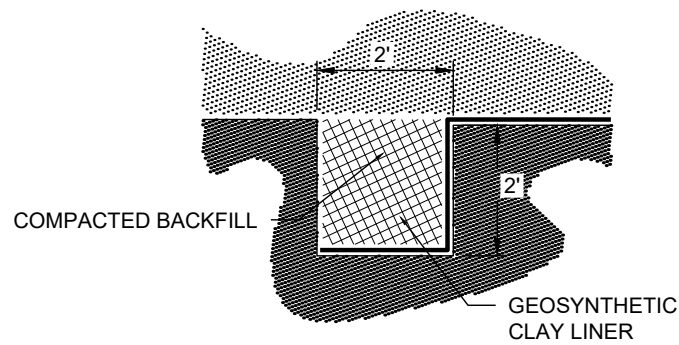
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5 **ACCESS ROAD ON FINAL COVER**
NOT TO SCALE



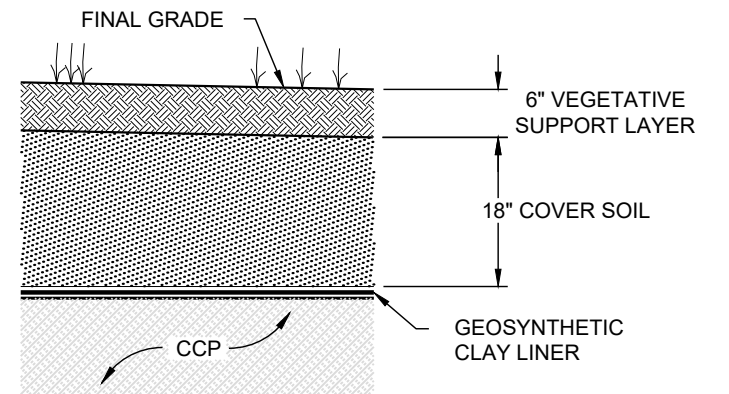
2
5 **FINAL COVER BENCH CHANNEL**
NOT TO SCALE



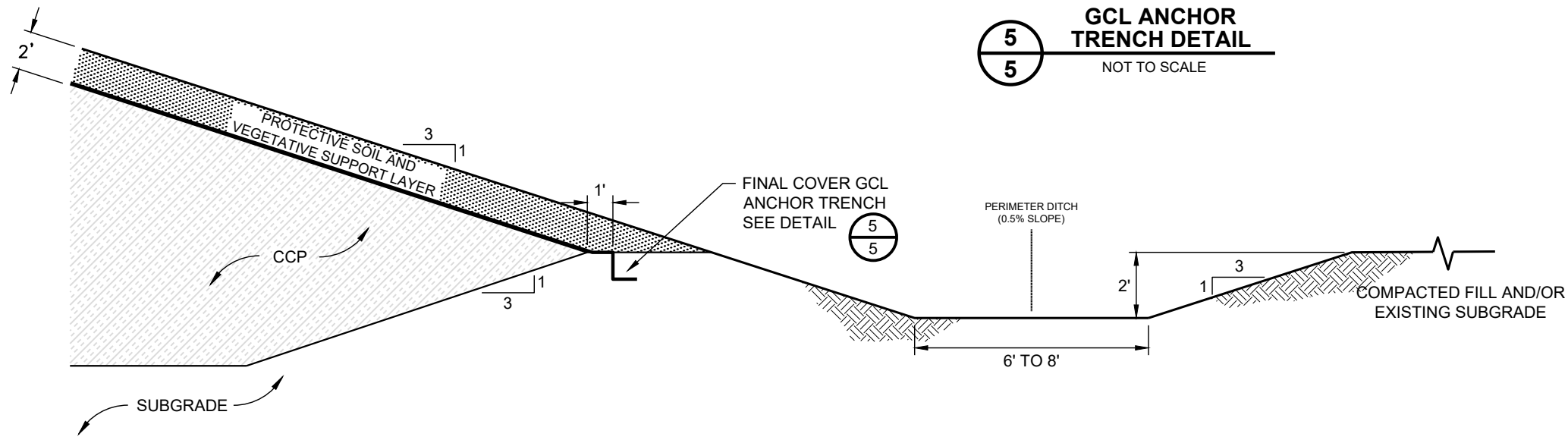
3
5 **FINAL COVER RIM DITCH**
NOT TO SCALE



5
5 **GCL ANCHOR TRENCH DETAIL**
NOT TO SCALE



6
5 **FINAL COVER SECTION**
NOT TO SCALE



4
5 **PERIMETER DITCH DETAIL**
NOT TO SCALE

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PREPARED	BCL
REVIEWED	SFS
APPROVED	DEG

PROJECT
AS/DA OPERATIONS PLAN
CRYSTAL RIVER ENERGY COMPLEX
CITRUS COUNTY, FLORIDA

TITLE
**ASH STORAGE/DISPOSAL AREA
DETAILS**

PROJECT NO.
19-125665

Control No.
19125665-A005

REV.

FIGURE
5

APPENDIX A
ORGANIZATION CHART

ORGANIZATION CHART

