Progress Energy
Crystal River Nuclear Plant
Docket No. 50-302
Operating License No. DPR-72

Ref: 10 CFR 54

June 28, 2010
3F0610-07

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: Crystal River Unit 3 – Response to Request for Additional Information for the Review of the Crystal River Unit 3 Nuclear Generating Plant, License Renewal Application (TAC NO. ME0278) – Environmental Review

References:
(1) CR-3 to NRC letter, dated December 16, 2008, "Crystal River Unit 3 – Application for Renewal of Operating License"

(2) NRC to CR-3 letter, dated June 3, 2010, "Request for Additional Information for the Review of the Crystal River Unit 3 Nuclear Generating Plant, License Renewal Application (TAC NO. ME0278)"

Dear Sir:

On December 16, 2008, Florida Power Corporation (FPC), doing business as Progress Energy Florida, Inc. (PEF), requested renewal of the operating license for Crystal River Unit 3 (CR-3) to extend the term of its operating license an additional 20 years beyond the current expiration date (Reference 1). Subsequently, the Nuclear Regulatory Commission (NRC), by letter dated June 3, 2010, provided a request for additional information (RAI) concerning the CR-3 License Renewal Application and a request for documents (Reference 2). The Enclosure to this letter provides the response to the RAI. A response to the request for documents is being provided in a separate letter (CR-3 letter 3F0610-08 dated June 28, 2010).

No new regulatory commitments are contained in this submittal.

If you have any questions regarding this submittal, please contact Mr. Mike Heath, Supervisor, License Renewal, at (910) 457-3487, e-mail at mike.heath@pgnmail.com.

Sincerely,

Jon A. Franke
Vice President
Crystal River Unit 3

JAF/dwh

Enclosure: Response to Request for Additional Information

xc: NRC CR-3 Project Manager
NRC License Renewal Project Manager
NRC Regional Administrator, Region II
Senior Resident Inspector

A140
NRR

Progress Energy Florida, Inc.
Crystal River Nuclear Plant
15760 W. Power Line Street
Crystal River, FL 34428

STATE OF FLORIDA

COUNTY OF CITRUS

Jon A. Franke states that he is the Vice President, Crystal River Nuclear Plant for Florida Power Corporation, doing business as Progress Energy Florida, Inc.; that he is authorized on the part of said company to sign and file with the Nuclear Regulatory Commission the information attached hereto; and that all such statements made and matters set forth therein are true and correct to the best of his knowledge, information, and belief.

Jon A. Franke
Vice President
Crystal River Nuclear Plant

The foregoing document was acknowledged before me this 28 day of June, 2010, by Jon A. Franke.

Carolyn E Portmann

Signature of Notary Public
State of Florida

CAROLYN E. PORTMANN
Commission # DD 937553
Expires March 1, 2014
Bonded Thru Troy Fain Insurance 800-385-7019

(Print, type, or stamp Commissioned
Name of Notary Public)

Personally Known ✓ -OR- Produced Identification ____

PROGRESS ENERGY FLORIDA, INC.

CRYSTAL RIVER UNIT 3

DOCKET NUMBER 50 - 302 / LICENSE NUMBER DPR - 72

ENCLOSURE

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

This enclosure provides the request for additional information that is needed by the U.S. Nuclear Regulatory Commission (NRC) staff to complete its review of the Crystal River Nuclear Generating Plant, Unit 3 (CR-3) application for license renewal and prepare the draft supplemental environmental impact statement. To support the staff's continued review of the CR-3 environmental report (ER), please provide the information described below.

RAI 1 Provide a status of plans to study elevated levels of Na, As, Ra-226 and Ra-228, and gross alpha in some monitoring wells associated with Industrial Wastewater Permit No. FLA016960, including a description of study plan (Geosyntec).

Response

Progress Energy Florida, Inc. (PEF) has commissioned two studies: the first study involving exceedences of sodium, while the second addresses arsenic and radionuclides (gross alpha and radium 226/228). Draft copies of the sodium evaluation and arsenic and radionuclide Plan of Study have been submitted to Crystal River Energy Complex (CREC) personnel for their review/approval. No deadline was imposed by Florida Department of Environmental Protection (FDEP) to complete these studies.

Sodium Evaluation

Groundwater monitoring is currently being conducted at the CREC in accordance with the groundwater monitoring plan specified in the industrial wastewater permit for the facility. Recent review of the groundwater quality data indicated that elevated sodium concentrations have been detected in the groundwater at the site at concentrations that exceed the FDEP's primary drinking water standard (PDWS) as defined in Rule 62-550, Florida Administrative Code. However, these levels of sodium may be due to natural background levels associated with sea water influences from the Gulf of Mexico. Therefore, PEF is currently seeking relief from having to meet the PDWS for sodium at the site; Geosyntec will prepare a sodium background study for relief from the sodium groundwater standard. The sodium study will be prepared based on existing site groundwater quality data provided to Geosyntec by PEF and other available data from published sources. The study will include the following tasks:

- *Development of a site conceptual model to present the historic and current site conditions regarding geology, hydrogeology, and surface and groundwater quality in the vicinity of the CREC,*
- *Evaluation of existing site conditions, including background surface and groundwater quality, operational processes, and evaluation of potential sodium sources; and*
- *Development of a rationale and justification for the elimination of sodium from the groundwater monitoring plan at the CREC to achieve regulatory acceptance. This includes an evaluation and inventory of current and future potential groundwater resources in the vicinity of the CREC.*

Arsenic and Radionuclides Plan of Study

The objective of the plan of study (POS) is to assess the presence of arsenic and radionuclides (gross alpha and radium 226/228) in the soil and groundwater at the CREC and to evaluate various remedial technologies that will enable the CREC to meet the FDEP's PDWSs for these constituents. Therefore, the POS will contain the following elements:

- *Evaluation of existing soil and groundwater data – Geosyntec will evaluate all available soil and groundwater data that has been collected during the operation of the CREC. The main objective of this task is to assess the distribution of arsenic and radionuclides in the environment at the CREC and to identify and evaluate the potential source(s) of these constituents currently detected in the groundwater at the site.*

- *Collection of additional data – if data gaps are identified during the data evaluation process, a work plan will be developed to collect additional data. Collection of additional data may include soil and groundwater sampling, hydrogeologic testing, and bench/pilot testing. The main objective of this task is to identify the data necessary to design and implement a remedy for the site, if appropriate.*

- *Remedial alternatives evaluation – Geosyntec will utilize the information obtained from the previous two steps to evaluate various remedial alternatives for the site. Each remedial alternative will include a conceptual design of a corrective action for bringing the CREC station into compliance with the PDWSs for arsenic and radionuclides. It is anticipated that several remedial alternatives will be evaluated for the site. The report will recommend the most appropriate and cost effective alternative to achieve the mandated compliance.*

RAI 2 Provide annual groundwater use data from 2000 to 2009 in a spreadsheet format.

Response

Refer to the spreadsheet on the following page.

PROGRESS ENERGY
CRYSTAL RIVER POWER PLANT WATER USE DATA
2000-2009

Facility		Actual Water Usage (Entered in Mgal then converted to m3)									
		Year 2000	Year 2001	Year 2002	Year 2003	Year 2004	Year 2005	Year 2006	Year 2007	Year 2008	Year 2009
Crystal River North											
FreshWater - Floridan	Ground	285.28	309.77	299.92	356.12	305.42	325.99	362.95	335.38	368.34	354.55
	Surface										
Saline	Ground										
Gulf	Surface	32,796.50	35,733.50	32,796.50	35,831.40	35,831.40	34,726.90	31,107.60	33,199.41	29,902.89	30,949.29
Public Supplied											
Reuse											
Water Discharged to Receiving Body		32,796.50	35,733.50	32,796.50	35,831.40	35,831.40	34,726.90	31,107.60	29,237.67	29,902.89	30,949.29
Total (Mgal)		33,081.78	36,043.27	33,096.42	36,187.52	36,136.82	35,052.89	31,470.75	33,534.79	30,271.23	31,303.84
Total (Mgal) Consumed		285.28	309.77	299.92	356.12	305.42	325.99	362.95	4,297.12	368.34	354.55
Total (m3)		125,214,537.30	136,423,776.95	125,269,949.70	136,969,763.20	136,777,863.70	132,675,188.65	119,116,788.75	126,929,180.15	114,576,605.55	118,485,045.06
Total (m3) Consumed		1,079,784.80	1,172,479.45	1,135,197.20	1,347,914.20	1,156,014.70	1,233,672.15	1,373,765.75	16,264,589.20	1,394,166.90	1,341,982.41
Crystal River South											
FreshWater - Floridan	Ground	237.88	229.62	244.79	265.08	245.41	256.09	258.58	282.84	307.60	303.44
	Surface										
Saline											
Units 1, 2, & 3	Ground										
Gulf	Surface	100,466.38	568,801.50	607,478.30	542,010.50	587,869.90	577,227.20	585,670.85	550,950.90	573,000.10	493,754.65
HCT	Surface							122,670.76	128,695.34	59,679.89	142,861.10
Public Supplied											
Reuse											
Water Discharged to Receiving Body		100,466.38	568,801.50	607,478.30	542,010.50	587,869.90	577,227.20	585,670.85	550,950.90	573,000.10	493,754.65
Total (Mgal)		100,704.26	569,031.12	607,723.09	542,275.58	588,115.31	577,483.28	708,800.19	679,929.08	632,987.59	636,919.19
Total (Mgal) Consumed		237.88	229.62	244.79	265.08	245.41	256.09	123,129.34	128,978.18	59,987.49	143,164.54
Total (m3)		381,165,624.10	2,229,482,789.20	2,300,231,895.65	2,052,513,070.30	2,226,016,448.35	2,185,774,252.65	2,682,808,719.15	2,573,531,578.59	2,395,858,028.15	2,410,739,131.61
Total (m3) Consumed		900,375.80	869,111.70	926,530.15	1,003,327.80	928,876.85	969,300.65	466,044,551.90	488,182,422.09	227,052,649.65	541,877,781.36

RAI 3 Provide summary of design features for two coal runoff ponds, including bottom and top areas, bottom and top elevations, peak inflow and outflow, peak storage, and fact that they are lined with a geosynthetic clay liner.

Response

Coal Runoff Pond Design Features:

Bottom area:	*320 ft. x 591 ft. (each)*
Top area (at elevation 97.5 ft.):	*347 ft. x 618 ft.*
Bottom elevation:	*93.0 ft.*
Top elevation:	*100.0 ft.*
Peak inflow:	*193.17 cubic feet per second (cfs)*
Peak outflow:	*2.23 cfs*
Peak storage:	*25.79 acre-feet*

The ponds are lined with a geosynthetic clay liner (GCL). The GCL on the bottom of the pond is overtopped with 6 in. of sand/pea gravel, 12 in. of crushed rock and 6 in. of concrete pavement.

RAI 4 Provide a brief documentation that the oil storage tanks were cleaned, closed (including date), and converted to warehouse facilities.

Response

As stated in Section 5.2 of the Crystal river Units 1, 2, 3 Storm Water Pollution Prevention and Best Management Practices Plan, two oil tanks located west of Crystal River Units 1 and 2 have been modified and are now used as material/equipment storage warehouses. The tank that is used by Crystal River Units 1 & 2 was inspected on July 10, 1991, to determine the condition of the structure for future conversion to a warehouse. No comparable information regarding the inspection or preparation of the tank used by CR-3 could be located; however, both tanks that are in use were converted to warehouses prior to the end of 1993.

RAI 5 Provide Progress Energy's response to RAI from Florida Department of Environmental Protection on NPDES Major Permit Modification Application – Units 1, 2, and 3.

Response

Refer to the attached letter from Progress Energy (L. Hatcher) to Florida Department of Environmental Protection (M. Harris), dated May 20, 2010: Re: Progress Energy Florida, Inc. - Crystal River Units 1, 2, & 3 DEP File No. FL0000159-013-IW1S/NR Request for Additional Information (RFI) No.1 NPDES Permit Renewal Application.

PROGRESS ENERGY FLORIDA, INC.

CRYSTAL RIVER UNIT 3

DOCKET NUMBER 50 - 302 / LICENSE NUMBER DPR - 72

ATTACHMENT

RAI 5: Progress Energy's Response to RAI from Florida Department of Environmental Protection on NPDES Major Permit Modification Application – Units 1, 2, and 3

Progress Energy

Larry E. Hatcher
Manager, Crystal River
Fossil Plant & Fuel Operations

May 20, 2010

Mr. Marc Harris, P.E.
Supervisor, Power Plant NPDES Permitting
Industrial Wastewater Section
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Re: Progress Energy Florida, Inc. –Crystal River Units 1, 2, & 3
DEP File No. FL0000159-013-IW1S/NR
Request for Additional Information (RFI) No. 1
NPDES Permit Renewal Application

Dear Mr. Harris:

Progress Energy Florida (PEF) received the request for additional information (RAI) dated December 8, 2009 in response to the application for renewal of the Crystal River Units 1, 2 & 3 NPDES Permit FL0000159. The Department's request for additional information is provided in bold type, followed by the response from PEF.

Additionally, please note that additional information is provided that was unavailable at the time of the original permit renewal application submittal back on October 30, 2009. This includes Form 2CS data for Outfall I-0FE (LSST discharge) as well as supplemental Form 2F data relative to several storm water outfalls. This information is included in Attachment 1 of this submittal.

1. **As the responses to the requests below require engineering review and calculations, please submit the responses under the seal of Progress Energy's Engineer of Record for this project.**

PEF Response
Comment acknowledged.

2. **The information in Section VII, Part A, of Form 2CS, shows values that exceed existing permit limits for the combined cooling water flow of once-through cooling water from Units 1, 2, and 3 (Outfalls D-011, D-012, D-013 and D-00F). The maximum daily flow is limited to 1897.9 MGD for May 1st through October 31st and 1613.2 MGD during the remainder of the year. Please provide the following:**

    a. **Clarification whether the maximum combined flow of the cooling water intake structures actually exceeds permitted flows;**

b. **A graph for each of the intake structure cooling water pumps for units 1, 2, and 3 that shows the pump performance curve, the system head curve and the intersection of the two curves; and,**

c. **Engineering data and calculations, signed by a Professional Engineer licensed in Florida, for each system head curve including the pump static suction and discharge head and friction losses associated with the pipe system.**

PEF Response
The information provided in Section VII, Part A, of Form 2CS, shows a maximum value of once through condenser cooling water from Outfall D-013 as being 985.0 MGD. This flow should actually be reported as 979.2 MGD based on the design point for each of the four CR-3 circulating water pumps (170,000 gpm at 35 ft. Total Dynamic Head - TDH). The adjusted combined condenser cooling water flow of once-through cooling water from Units 1, 2, and 3 (Outfalls D-011, D-012, and D-013) therefore, should be 1897.9 MGD, which is the current permit limitation during the period May 1st through October 31st. Please note that flow is reduced by throttling Units 1 and 2 circulating water pumps during the remainder of the year in order to meet the 1,613.2 MGD limitation.

Attachment 2 contains results from a dye test of the CR-3 circulating water pumps conducted during February 2009. All four circulating water pumps tested at various RPM and TDH levels averaged 160,843 gpm each. Corrected to 252 RPM, these pumps averaged 169,094 gpm, which is very close to the design point of 170,000 gpm per pump. The primary purpose of the test was to assist the plant in determining the impact of having a certain heat exchanger in service, however, pressure taps on the "A" and 'B" pumps also allowed data to be taken and compared to design curves, copies of which are attached.

Section I.A.1. of the active permit states "During the period beginning on the issuance date and lasting through the expiration date of this permit, the permittee is authorized to discharge once-through non-contact condenser cooling water (OTCW) from Outfalls D-011, D-012, and D-013 to the site discharge canal thence the Gulf of Mexico." Flow from Outfalls D-011, D-012, and D-013 is limited by item I.A.3, which says "Combined OTCW discharge from Units 1, 2, and 3 shall not exceed 1,897.9 MGD during the period May 1st through October 31st of each year, or 1,613.2 MGD during the remainder of the year. Outfall D-00F is not limited by Section I.A.1., or item I.A.3. Instead, Outfall D-00F is limited by Section I.A.15 of the permit. The only requirement for flow on Outfall D-00F is "report only" daily maximum and daily average flows. Therefore, permitted OTCW flows from Units 1, 2, and 3 have not been exceeded.

3. **Please provide a process description for the block identified as "MWST" on the Nuclear Services and Decay Heat Non-Contact Cooling Water system shown on the flow diagram in Attachment 3.**

PEF Response
"MWST" which stands for "Miscellaneous Waste Storage Tank" receives low-volume wastestreams from a number of sources consisting mostly of sump and floor drains within the reactor and auxiliary buildings. Attachment 3 contains a diagram detailing inputs to the MWST. Please note that, per NRC regulations, wastewater from these internal CR3 outfalls are required to be monitored, and meet limits for, several radionuclides.

4. **Please provide a description of the nuclear services and decay heat non-contact cooling water system. In addition, please provide the design cooling water discharge flow rate and temperature and the design temperature rise across the cooling water system (D-00F).**

PEF Response
The Nuclear Services and Decay Heat Seawater system also referred to as the Raw Water (RW) system is comprised of two "sub-systems". One sub-system services the nuclear services closed cycle cooling water system heat exchangers, also referred to as the RW/SW system. The other sub-system services the decay heat closed cycle cooling system heat exchangers, also referred to as the RW/DC system.

Average RW/SW flow to the SW heat exchangers during normal operation is approximately 12,000 gpm (17.3 mgd). At this flow rate, average delta T is approximately 7° F. The flow rate is based on providing sufficient capacity to remove heat generated by equipment and components during normal operations. Please note that this flow represents less than 1% of the total condenser cooling water flow of Units 1, 2, & 3.

The Decay Heat Closed Cycle Cooling Water (DC) system only operates for short time periods during unit shutdown, which occurs predominately during refueling outages once every two years.

5. **Please describe the cleaning process, including final disposition of wastewaters, for the Unit 3 ion exchange unit shown on the flow diagram in Attachment 3.**

PEF Response
As stated in Attachment 4 of the permit renewal application, the ECST system (rad-waste treatment system) utilizes an ion exchange system as a pollution control device. Spent resin from the ion exchange system is not regenerated on-site. Spent resins are sluiced to a spent resin storage tank along with other spent resins (i.e. those used to polish water used for the spent fuel pool), whereby they are then disposed off-site. The treated sluice water is then discharged by batch releases via the ECST internal outfall through outfall D-00F. This is the same ion exchange unit shown on the flow diagram in Attachment 3 of the permit renewal application.

6. **Please confirm whether the Unit 3 screen wash water is discharged to the intake canal and whether it is recycled as once-through cooling water.**

PEF Response
Unit 3 screen wash water enters a common trough, which flows to a trash collection basket. This water then enters the intake bay behind the bar racks directly in front of the traveling screens where it is ultimately recycled as once-through cooling water.

7. **The description for Outfall D-0C1 indicates that the wastewater discharge from the FGD blowdown treatment pond system is directed to the industrial wastewater percolation pond system. However, the flow diagram in Attachment 3 does not show this interconnection. Please provide the following:**
    a. **an updated flow diagram**
    b. **signed and sealed drawings of the FGD blowdown/stormwater pond system; and**

c. **signed and sealed percolation basin capacity, loading rate and storage calculations.**

PEF Response
Since the NPDES outfall associated with the IWW percolation ponds is only meant as an emergency outfall, specific inputs to the IWW percolation ponds were not listed on the drawing. Rather, these descriptions are all found in IWW permit no. FLA016960 (copy provided in Attachment 4). Nevertheless, we have revised the drawing to show the treated FDG blowdown to the IWW pond system (see Attachment 5). As far as signed and sealed drawings of the FGD blowdown ponds, this information was submitted to the Southwest District, via the siting office, on June 22, 2009.

In addition, information related to loading rate and storage calculations were provided to the FDEP-Southwest District as part of an IWW permit modification package submitted June 30, 2009. The most recent versions of the Conditions of Certification (PA77-09A2) and IWW permit (FLA016960) reflect the FGD blowdown ponds and percolation capacity of the IWW percolation pond system. We respectfully request that you discuss these issues with Yanisa Angulo of the Southwest District since they were heavily involved in permitting issues related to the FGD blowdown treatment ponds and disposal of treated FGD blowdown within the IWW percolation pond system.

8. **Please provide a detailed description of the FGD operations, including wastewaters generated by production and storage of any gypsum, the final disposition of these wastewaters, whether the FGD system is connected to selective catalytic or noncatalytic reduction units, and the FGD blowdown treatment system.**

PEF Response
Attached, please find an overview of the Crystal River Units 4 & 5 Clean Air Project that contains descriptions of the FGD and SCR systems (Attachment 6). Runoff from gypsum storage and other FGD systems are addressed in the most recent versions of the Conditions of Certification (PA77-09A2) and IWW permit (FLA016960).

9. **Please provide wastewater characterizations for the FGD blowdown and effluent from the FGD blowdown treatment pond system. The wastewater characterization should include metals (such as arsenic, copper, lead, mercury, selenium and zinc) cyanide, nutrients, and radionuclides.**

PEF Response
Little data exists to date from which to characterize actual treated FDG blowdown. However, Attachment 7 contains two sets of recently collected data. The first set contains first quarter 2010 data pertaining to industrial wastewater entering the percolation pond system from the existing Units 1, 2, and 3 (sample point EFF-1 in IWW Permit FLA016960) as well as from the FGD blowdown treatment system (sample point EFF-2). The Units 1, 2, 3, IWW discharge data have been collected quarterly since the second quarter, 2007 per the requirements of IWW Permit FLA016960. Sampling of the treated FGD blowdown began with the first quarter of 2010 per the requirements of modified IWW Permit FLA0169960.

Some things to note concerning these data. First, EFF-1 flows to the percolation pond have averaged approximately 0.350 mgd since flow measurement requirements began in July 2007. By contrast, treated FGD blowdown flows for the past several weeks discharged to the percolation pond system via EFF-2 have averaged approximately 0.105 mgd.

Second, this FGD blowdown flow is only for a single FGD system, i.e. the system associated with Crystal River Unit 5 scrubber. The Unit 4 FGD system has only recently begun operation. A reasonable estimate of total treated FGD blowdown flow from both scrubbers would be around double the current flows or around 0.210 mgd during the "shake-down" phase and approximately 0.16 mgd once the systems have been tuned. Therefore, total treated FGD blowdown flow, once both FGD systems are in operation and tuned, will represent less than half the total industrial wastewater flow to the IWW percolation pond system.

Third, the values measured during the first quarter 2010 for EFF-2 represent FGD blowdown treated with a temporary filter press system as opposed to the FGD blowdown treatment pond system. Approval for use of this temporary system was granted by the Department pending final review and approval of the FGD blowdown treatment pond system. This system was approved and placed into operation on February 23, 2010. The second quarter 2010 sampling of EFF-2 is representative of the smaller FGD backup treatment pond operation. The reason we used the backup pond rather than the larger primary pond was to force a discharge to calibrate the EFF-2 flow meter, and to send flow to the percolation pond system in order to complete a groundwater mounding study. The larger FGD blowdown treatment pond (in service now) is not expected to discharge to the percolation pond system for several weeks. Finally, again, you should note that both FGD systems are still undergoing the tuning process.

Therefore, the data shown for EFF-2:

- must be flow-weighted with values measured for EFF-1; and,
- while representative of current operation, may or may not be representative in the long-term since:
    - the current FGD systems are still undergoing the tuning process;
    - EFF-2 sample results are representative of treatment utilizing a temporary filter press arrangement and/or smaller backup treatment pond and not the larger, primary FGD blowdown treatment pond; and,
    - may change as a result of the switch to a different coal source.

Future monitoring results from EFF-2, treated FGD blowdown to the IWW percolation pond system, can be sent to the NPDES permit writer as these data become available.

10. Please provide a topographic map extending one-quarter mile beyond the property boundaries of the facility, showing: (several items not listed).

PEF Response

These items appear to apply to Form 2F relative to the stormwater outfalls. All of the information requested is contained within the BMP plan that was submitted as part of the NPDES permit renewal package and contained on the compact disk. Attached is a hard copy of the BMP plan for Crystal River Units 1, 2, & 3 that contains the requested information (see Attachment 8).

11. The discharge from the Plant Industrial Wastewater Percolation Pond System no longer discharges to the canal. Please provide signed and sealed drawings of the percolation pond depicting the overflow structure.

PEF Response
The Department is correct in that Outfall D-0C2, the former outfall structure from the IWW pond system, no longer discharges to the site discharge canal due to pending construction of the new Helper Cooling Tower South (HCTS). The new replacement outfall structure (i.e. suggested outfall D-0C2R) for the IWW pond system is proposed to discharge to the site intake canal. Signed and sealed drawings of this new outfall structure were included in the helper cooling tower NPDES permit modification request submitted September 11, 2009. Additional information pertaining to the outfall structure was submitted January 25, 2010 as part of the RAI response to this NPDES permit modification request.

12. Based on the modification of the Plant Industrial Wastewater Percolation Pond System, which includes the addition of the Helper Cooling Tower South and the relocation of the percolation pond overflow structure, please provide the following:
   a. percolation basin capacity and storage calculations; and
   b. signed and sealed drawing and dimensional cross-section of the percolation pond.

PEF Response
The information requested was provided to the Department in the Helper Cooling Tower South (HCTS) NPDES Permit Modification RAI response submitted January 25, 2010. Information related to the IWW percolation pond system has also been submitted to the Southwest District IWW section in support of the IWW permit modification.

13. The Department understands that Outfalls D-0H and D-0C1 discharge infrequently. Please provide data from prior discharges and/or engineering estimates of anticipated future discharges.

PEF Response
We reviewed discharge records from January 1999 to the present (May 2010). During this time, Outfall D-00H (South Coal Pile Runoff Discharge) discharged only once, which was in September, 2004, and was due to the successive hurricanes that occurred in August and September of that year. Regarding C-0C1 (North Ash Pond Discharge), this outfall also only discharged during a single month from January 1999 through January 2010. This occurred in September 2008 as a result of dewatering activities resulting from site preparation to construct the FGD blowdown ponds. Both sets of results are provided in Attachment 9.

It is anticipated that further discharge events from these outfalls will continue to be extremely rare. Also, in the case of D-0C1, per the information supplied with the application, this area has changed significantly since the September 2008 discharge event. The area has been cleaned of all residual ash and largely serves as a non-contact storm water management system for the area around the FGD blowdown treatment ponds (a recent aerial photo of the area is provided in Attachment 10). As such, the data collected during the September 2008 event will likely not be representative of any potential future discharges from this outfall.

Another option to consider for dealing with these outfalls is to remove them from the list of permitted NPDES outfalls, but recognize them in special conditions subject to bypass provisions. Attachment 11 contains a page from NPDES Permit IL0048321.

In this case, an emergency outfall from a generating station's cooling pond had been listed as permitted outfall, but due to the extreme rarity in discharges from this outfall, the permitting agency (Illinois EPA) removed it from the list of permitted outfalls for this facility and instead covered this discharge location with a special condition subject to the bypass provisions of 40 CFR 122.41(m). Under the bypass provisions, we would be required to sample this outfall pursuant to the same conditions that would be imposed on, say, outfall D-0C2R – the percolation pond discharge point.

A similar condition as exists in this example could be applied to outfall D-0C1 and would be applicable only in the event of a discharge from the FGD blowdown treatment pond emergency overflow into the non-contact stormwater management system that reads:

Special Condition xx: An emergency overflow exists from the FGD blowdown treatment pond area storm water management system to the Gulf of Mexico via the Units 1, 2, & 3 discharge canal. In the event of discharge from the FGD treatment pond emergency overflow point, discharges from this outfall shall be subject to the bypass provisions of 40 CFR 122.41(m) and 62-620 F.A.C.

Additionally, given the rarity of discharge events from D-00H, a similar condition could be imposed for that emergency discharge location. This condition could read:

Special Condition xx: An emergency discharge point exists from the coal pile runoff area storm water management system to the Gulf of Mexico via a marshy area (wetlands) located west of the coal pile storage area. Discharges from this overflow shall be subject to the bypass provisions of 40 CFR 122.41(m) and 62-620 F.A.C.

In the case of Outfall D-0C1, this special condition would require sampling of the outfall in the event industrial wastewater (i.e. discharge from the emergency FGD treatment pond overflow) were to co-mingle with the non-contact storm water that would otherwise discharge from D-0C1. In the case of D-00H, again, rather than submitting DMR forms every month indicated "no discharge", any discharges from this outfall would be subject to the bypass provisions which would include analytical monitoring.

14. The effluent characterizations in Section VII of Form 2CS indicated exceedences of Class III marine water quality standards (WQS) for total recoverable aluminum, arsenic, copper and selenium. The exceedences are as follows:

a. Effluent value reported for total recoverable aluminum at Outfall D-00H was 120 mg/L. The class III marine water quality standard is 1.5 mg/L

b. Effluent values reported for total recoverable arsenic at Outfalls D-011, D-013, D-091, D-092 and D-071 were 48, 66, 75, 75, 75, and 71 ug/L, respectively. The Class III marine water quality standard is 36 ug/L.

c. Effluent values for total recoverable copper at Outfalls D-00H, D-072, D-013, and D-094 were 73, 84, 54, and 87 ug/L, respectively. The Class III marine water quality standard is 3.7 ug/L and the reported intake value of 35 ug/L.

d. Effluent value reported for selenium at Outfall D-013 was 74 ug/L. The Class III marine water quality standard is 71 ug/L.

Please clarify whether effluents actually exceed the WQSs as indicated. Clarification may require additional monitoring for any constituent demonstrated to exceed WQS. PEF will need to identify the source(s) of the constituent and the method that will be used to meet WQS, as appropriate. If these are exceedences, please identify and provide information on the sources of these exceedences.

PEF Response

a. As stated in the permit renewal application, attachment 5, given the lack of historic discharge events from Outfall D-00H, we collected grab samples from within the coal pile perimeter ditch system and, as such, likely represent worst-case conditions should the outfall discharge. Therefore, these were not exceedences of permit limits, since the samples were collected within the treatment system.

b. Outfalls D-011, D-013, D-091, D-092 and D-071 are all "non-process" outfalls. D-011 and D-013 are non-contact cooling water outfalls; D-091 and D-092 are intake screen backwash water discharges and D-071 is once-through helper cooling water tower discharge. In all cases, no pollutants are added with the exception of heat for Outfalls D-011, D-013 and D-071. The screen backwash discharges consist of wash water associated with the traveling screens. No arsenic-containing wastewater is introduced or is arsenic-containing compounds utilized within these systems. We believe that the arsenic levels measured represent natural variability of the intake water.

c. As stated in item a. above, samples collected for D-00H were collected within the coal pile runoff treatment system given the lack of historic discharges from this outfall, and, therefore, are not exceedences of permit limits. Regarding exceedences of copper limits at Outfalls D-072, D-013, D-091 and D-092, again, these outfalls are all non-process wastewater outfalls. Once again, we believe the copper values measured from these outfalls reflect intake water only.

d. See above. Outfall D-013 consists solely of once-though non-contact cooling water. No selenium is introduced into this outfall. The only possible source is the intake water.

15. Please provide a detailed description of ECST System (radwaste system) for Unit 3.

PEF Response

Please see response to RAI comment no. 3. The MWST (miscellaneous waste storage tank) is part of the ECST system. Basically, the ECST receives processed low-volume wastestreams from the reactor building (i.e. floor and equipment drains) as well as auxiliary building sumps and drains. These wastewaters are collected in the MWST from which they are sent to the rad-waste treatment system, which is a filtration, cation bed, ion exchange resin and purification system. From this treatment system, treated wastewater is collected in the ECST's. Discharges from the ECST's must be sampled, analyzed, and processed through radiological monitors to comply with NRC regulatory requirements pertaining to isotopic releases.

16. Please explain the alternate flow path from SDT-1 and condensate system (CD) to industrial wastewater percolation pond system. Please clarify whether this waste stream contains any radionuclides.

PEF Response

The alternate flow path from SDT-1 and the CD system to the industrial wastewater percolation pond system has always existed, but is used rarely. It exists in the event that sampling indicates that a batch release from SDT-1 or CD system may exceed surface water discharge permit limits, or, if there were to be a simultaneous need to discharge from the CD system and SDT-1 at the same time. Current configuration disallows simultaneous discharges from the CD and SDT-1 systems to the discharge canal. There is also a mechanism to pump the turbine building sum directly to the percolation pond system in the event that the SDT-1 discharge path is incapacitated or overwhelmed due to the need to release large volumes at shutdown.

Please note that, regardless of discharge flow path – whether to D-00F or to the IWW percolation pond system, all discharges must be radiologically monitored and must meet strict NRC limits relative to isotopic releases.

17. The backup pump test discharge describes flood from the spent fuel pool. Please clarify whether the waste stream contains radionuclides.

PEF Response
As stated in Attachment 4, the NRC is requiring the backup pump in the event that there was a real emergency that requires, among other activities, emergency flooding of the spent fuel pool. Routine testing of the pump does not involve these activities. Rather, testing of the pump (also an NRC requirement) simply involves pumping water from the intake, through the pump, and back into the intake canal. It is this routine testing activity for which we require a new outfall designation. Should the pump be required in an actual emergency, discharges will likely proceed through one of the currently permitted outfalls that already have radiological monitors.

18. Progress Energy requested discontinuation of whole effluent toxicity testing during Spectrus CT1300 treatment of the Nuclear Services Heat Decay System that discharges via D-00F. The toxicity data submitted to the Department is based on application concentration of 2.25 mg/L; however, the current permit currently authorizes a maximum application concentration of 4.5 mg/L. Please clarify whether Progress Energy is requesting a maximum application concentration of 2.25 mg/L.

PEF Response
We believe the confusion is over terminology. Basically, CR3 applies (injects) Spectrus CT1300 at a maximum concentration of 4.5 mg/L in order to achieve a target concentration of ≤ 2.5 mg/L in the D-00F discharge. In fact, in order to build in conservatism, we set our target discharge concentration not to exceed 2.25 mg/L. Again, these target discharge concentrations are predicated on an initial application concentration of ≤ 4.5 mg/L. We request that the current permit condition relative to application rates not to exceed 4.5 mg/L remain unchanged.

19. Please provide information on the amount used and final application concentration for Neutral Multi-Use Cleaner, Crud Remover Cleaner, and Foamtrol AF1440.

PEF Response
In looking at historical records of usage of these products, we note the following. Both the Neutral product and the Crud Remover Cleaner are typically used for decontamination activities within the aux and containment buildings. In looking at work orders and amounts of this product checked out of the CR-3 warehouse, typical use involves 1-2 gallons of product. In 2009, a total of 94 gallons of this cleaning product was used. The prior year (2008) a total of 31 gallons of this product was used. Worst-case discharge would be through the ECST system, and thence through D-00F. Average concentrations in the D-00F discharge are calculated to be around 5.5 mg/L with maximum discharge concentrations around 10-12 mg/L.

Regarding Neutral Multi-Use Cleaner, at most, approximately 12 gallons are used at any one time. Again, worst case discharge concentrations would be through D-00F via the ECST system would be around 1.8 mg/L.

Finally, Foamtrol AF1440 was first permitted to control foaming in the heat exchanges. The last time Foamtrol was purchased for use at CR3 was in 2004. Calculated worst case discharge concentrations to D-00F through SDT-1, would be approximately 1.9 mg/L.

Please note that all of these concentrations assume worst-case conditions in that we assume that none of these products degrade and that all product used is discharged through the outfalls. This certainly would not be the case for the two cleaning products, i.e. Crud Remover and Neutral Multi-Use cleaner where we know that some quantity is contained in rags, etc., which are disposed as solid waste and do not end up in the wastewater streams.

20. Various potential miscellaneous discharges indicate untreated groundwater is discharged to the intake/discharge canal and AC condensate is being discharged via stormwater outfalls. Please explain.

PEF Response

As you know, treated groundwater (i.e. groundwater that has been filtered and disinfected with chlorine) is used for a number of service water applications. At times, groundwater that has not undergone this treatment process, i.e. groundwater is simply pumped into a storage tank, is substituted and used in lieu of treated groundwater. This "raw" groundwater may then be discharged via the same processes that discharge the treated groundwater (service water). AC condensate is simply the condensation that collects on the outside of a heat exchanger or chiller and drips off to the ground, much like a home air conditioning unit.

Finally, per EPA Guidance Document EPA 833-B-09-002 – *Developing Your Stormwater Pollution Prevention Plan – A Guide for Industrial Operators*, there are a number of allowable non-stormwater discharges that may be discharged through storm water outfalls. These include:

- Discharges from fire-fighting activities;
- Fire hydrant flushings;
- Potable water, including water line flushings;
- Uncontaminated condensate from air conditioners, coolers, and other compressors and from the outside storage of refrigerated gases or liquids;
- Irrigation drainage;
- Landscape watering provided all pesticides, herbicides and fertilizer have been applied in accordance with the approved labeling;
- Pavement wash waters where no detergents are used and no spills or leaks of toxic or hazardous materials have occurred (unless all spilled material has been removed);
- Routine external building washdown that does not use detergents;
- Uncontaminated ground water or spring water;
- Foundation or footing drains where flows are not contaminated with process materials; and
- Incidental wind-blown mist from cooling towers that collects on rooftops or adjacent portions of your facility, but not intentional discharges from the cooling tower (e.g. "piped" cooling tower blowdown or drains).

The guidance goes on to state the recommendation that these allowable non-stormwater discharges via stormwater outfalls be incorporated into a site's existing NPDES permit to avoid confusion over what is allowable and what is not. Accordingly, we request that the above list be incorporated into the CR123 NPDES permit which would provide consistency with the federal guidance.

21. Please include the proposed discharges from Levy Nuclear Plant in the permit renewal application.

PEF Response
The Levy Nuclear Plant discharges are described in the NPDES permit application associated with that facility. In addition, PEF recently announced a further delay in the construction and operation of the Levy facility until 2021, which is likely well beyond the time frame encompassing the upcoming reissued CR123 NPDES permit.

22. Please indicate the status of the mericulture center for the abatement of thermal pollution.

PEF Response
PEF's intention is to continue with operation of the Mariculture Center as part of a mitigation strategy for addressing potential thermal impacts.

23. (Introduction to this RAI purposely omitted). Please provide information on the measures Progress Energy will implement for minimizing entrainment and impingement mortality of aquatic organisms, including implementation timeframes and estimates in tons per year for reduction in entrainment and impingement mortality.

PEF Response
Recent events have necessitated that PEF reevaluate the business strategies and operational plans for addressing entrainment and impingement reductions at Crystal River Units 1, 2, & 3, the results of which could change the content of responses PEF can make at this time to RFI#23. Decisions as they may relate to the RFI response are forthcoming but are currently not available. PEF will provide appropriate responses to the comments contained in this request as accurate information becomes available. PEF understands that the permit renewal application cannot be deemed complete, until the FDEP comments contained in RFI#23 are addressed satisfactorily and hopes that the Department understands the need of PEF to temporarily postpone the submission of responses to this RAI comment at this time.

24. (Introduction to this RAI purposely omitted). Please provide information on Progress Energy's progress with re-planting, including the number of acres that are currently barren, number of acres replanted, species of sea grasses replanted, and survival and propagation rates for the re-planted sea grass beds.

PEF Response
The evaluation of a seagrass replanting program was included in an earlier version of the NPDES permit as a requirement should seagrass re-colonization not be demonstrated. Per the settlement agreement associated with thermal discharges associated with operation of CR Units 1, 2, & 3, the Company installed the Helper Cooling Towers (HCTs) along the discharge canal. After the cooling towers began operation, PEF conducted three years of sea grass surveys and convened a technical advisory committee (TAC) to review the results. This TAC was comprised of members from PEF, the Department, private research organizations, and expert consultants.

Though seagrass monitoring data has demonstrated temporal variations in seagrass colonization and expansion in the previously thermally impacted areas of Crystal Bay, the Seagrass TAC concluded that light intensity, turbidity, salinity variation and suspended load have a significant impact on seagrass colonization and could be more critical than the temperature factor. The TAC discussed the cost and benefits of seagrass sprig planting and subsequent monitoring. The TAC agreed that sprig planting would be futile since turbidity and light intensity may be critical limiting factors to seagrass growth in the area. As a result, the requirement for replanting was removed from the NPDES permit requirements.

25. According to the Crystal River Power Plant Fish Impingement Report, the number of diel sampling events was reduced from two to one night and day samples starting in March 2007. It was not clear whether the duration of the collection was increased to 12 hours instead of 6 hours of if it remained 6 hours. Please provide details about the sampling times and durations after February 2007.

PEF Response

During the December 7-8, 2006 to April 12-13, 2007 sampling events, sampling was conducted at 6 hour intervals resulting in four samples over a 24 hour period. This was later modified to a 12 hour sampling interval over a 24 hour period, starting with the April 26, 2007 sampling event. The modification allowed for better interface with plant operations and more time to process samples resulting in larger subsample sizes to be analyzed during periods of high debris loads. Impingement samples continued to be collected over an entire 24 hour period (6-12 hr intervals) biweekly for one year. Sampling would typically begin at 0800 on day 1 and end at 0800 the following day.

26. (Introduction to this RAI purposely omitted). Please provide details as to the methodology employed for determining which species and the number of each species at each trophic level to be released from the mericulture center to maintain a balanced indigenous population. In addition, please provide information on the species and number of each species released from the mericulture center for the past permit cycle.

PEF Response

While it is correct that the numbers of fish and invertebrates collected during the 2006-2007 impingement study was approximately one-half those collected during the 1985 study, we note that diversity remained relatively unchanged. It's likely that changes in numbers simply reflect natural population variation. The original intent of the Mariculture Center was not to represent each trophic level, but rather was designed to address selected important organisms (SIO's) focusing on commercially, recreationally, or ecologically important species. PEF convened a technical advisory committee that included fisheries professionals, private research organizations, and Agency representatives to provide input on species selected and to develop targets regarding numbers of each species to be released. See attachment 12 for a table showing Mariculture Center releases from 1992 through 2009.

27. The Department could not reproduce the adjustment factor calculations as given in Tables 38-40 of the Crystal River Power Plant Fish Impingement Report. (additional sentences purposely omitted). Please describe the derivation of the calculated values given in Tables 38-40.

PEF Response
Adjustment factors were calculated before rounding. Rounding to two places for ease of display in the tables results in the apparent variations noted when calculating using the final rounded values. Adjustment values depicted on the tables are correct.

28. Quality control for the taxonomic results was not included in the Crystal River Power Plant Fish Impingement Report. Please provide information for the quality control.

PEF Response
A QA/QC Plan was implemented as part of the Crystal River Impingement Study to ensure that work performance and work products provided were of the highest quality and provided in a cost-effective, scientifically defensible, and timely manner. All deliverables were subject to QA/QC guidelines, checks, and reviews. As part of this plan, field and laboratory taxonomic identification and measurements were standardized for sample specimens and data collection. Species collected were identified to the lowest practicable taxonomic level using current reference and taxonomic keys. Depending on the taxon, this was species, genera, or species group. Samples of all taxonomically vague specimens were delivered to independent experts for identification/verification. A random 5% subset of all samples was reviewed by an independent qualified expert taxonomist to ensure consistency in identifications of samples sent for QA/QC purposes. Where appropriate, voucher specimens were collected and retained during the study.

29. Key information is missing in order for the submerged aquatic vegetation (SAV) mapping results to be assessed in the context of the Crystal River thermal discharge plume. Please provide vertical temperature profile data, Bathymetry data, the extent (lateral and vertical) and duration of the thermal plume.

PEF Response
Extensive physical water quality data, analysis, and modeling were performed during the 1985 316(a) and (b) demonstration study. The modeling studies used conservative assumptions for NPDES permitting purposes. The existing physical conditions near the CREC discharge as used in the 316 studies modeling have not substantially changed since 1985. The negotiated settlement resulted in the requirements for the construction and operation of helper cooling towers and a 3 hour rolling maximum temperature limit of 96.5 degrees F. These conditions resulted in a significant decrease in the size and maximum temperature of the thermal plume, the extent of which was demonstrated using study results. Data indicated the thermal plume is well mixed vertically. Modeling provided a depiction of both summer and winter conditions while the plume discharge is considered to be constant.

30. (Introduction to this RAI purposely omitted). Please describe Progress Energy's plans to mitigate any affects from the thermal plume.

PEF Response
Extensive water quality data, analysis, and modeling indicate that the thermal plume is well mixed and evenly distributed throughout the water column in this shallow water basin of Crystal Bay. There is little evidence of thermal stratification in the area. The presence of spoil islands to the north and spoil islands to the south of the CREC discharge creates a basin area where considerable seiche activity occurs during prevailing westerly wind and wave conditions.

Erosion of the spoil banks coupled with persistent seiche activity also results in a highly turbid basin. Significant freshwater inputs from the Withlacoochee River to the north during high flow periods results in significant localized reductions in salinity. Furthermore, astronomical low tides results in extremely shallow flats throughout many parts of Crystal Bay, especially during extreme weather conditions. All these factors conspire to create regional conditions that contribute significant influence on sea grass bed speciation, distribution, expansion and contraction. The installation of helper cooling towers and reduction in thermal maximum discharge temperature has created conditions whereby the recolonization of sea grasses can occur within areas formally impacted by thermal discharge. The rate and extent of this recolonization is related to the external factors described above and not by the existing thermal regime.

31. **The study conducted by ReMetrix was successful at mapping the SAV. Comparison of 2007 SAV biomass to that of 2001 is problematic due to the different methods used to collect the data. A different analysis of the data from what is presented in the ReMetrix report is needed to determine expansion of the contraction of the SAV. Please re-analyze the SAV data.**

PEF Response

Progress Energy has completed studies over several years in an attempt to characterize sea grass distribution and trends in the vicinity of the Crystal River Energy Complex. The Seagrass Technical Advisory Committee concluded that the three years of studies completed after the construction and initial operation of the helper cooling towers indicated the coastal region surrounding the CREC was very dynamic, with variable expansion and contraction of sea grass areas occurring over several growing seasons. Results also suggested that that there were external factors not associated with the thermal regime contributing to sea grass distribution and trends.

These historical studies further indicated that traditional aerial photographic mapping methods are problematic because of prevalent conditions of poor water clarity, persistent active sea state, and cloud cover/poor meteorological factors. As a result of these conditions, alternative methods have been employed in an attempt to better characterize sea grass distribution.
A diver study was completed in 2001 to provide additional information on the distribution of sea grasses. Bounce dives along selected transects provided evidence that some historic sea grass beds were expanding and *Halodule* sea grass appeared to be colonizing areas within Crystal Bay that had previously reported to be devoid of vegetation.

Since diver surveys are both restrictive in their coverage and dependent on water visibility and weather conditions, other methods were sought to provide a more comprehensive survey of sea grass beds. In 2008, the use of sonar-based technology was evaluated. Results indicated a variable presence of sea grasses within the Crystal Bay area, but the results also indicated that the technology was constrained somewhat by issues associated with minimum water depth and the need for extensive emergent blade growth for good target acquisition.

The intent of utilizing different methodologies was not to allow for the analysis of results between methods, but rather was to provide a method that provides the most accurate characterization of sea grasses in the vicinity of the CREC. Results of studies performed to date provide the following conclusions: (1) Seagrass beds in the vicinity of the CREC are in a dynamic environment, and expand and contract seasonally based on the influence of a number of factors. (2) The installation and operation of the helper cooling towers has reduced the size of the thermal plume and allowed the expansion of sea grass beds into areas previously considered to be impacted by the historic thermal plume.

(3) Factors not associated with the thermal plume, such as light penetration, salinity, precipitation amounts, and water depth have an effect on sea grass distribution. (4) Traditional aerial photography is of limited use for mapping sea grass distribution in the area.

32. Progress Energy claims in its application that the main discharge canal for Crystal River Energy Complex is not waters of the State. However, according to EPA and Department factsheets, associated with issuance of previous NPDES permits, the main discharge canal is considered jurisdictional waters. Please provide documentation for any Federal or State determinations contrary to the administrative record.

PEF Response

We want to emphasize that the Crystal River Energy Complex's (CREC's) main discharge canal is not waters of the State; instead, it is an essential component of the "point source" or "wastewater facility" for regulatory purposes. PEF relies on the heat loss in the canal to come into temperature compliance by the end of it, hence the helper cooling towers along its banks.

Pursuant to Section 403.0885(2), Florida Statutes, the Department "is empowered to establish a state NPDES program in accordance with Section 402 of the federal Clean Water Act."

Requirements under the Clean Water Act are applicable to discharge from point sources that are released into jurisdictional waters. See Rule 62-660.400(1), F.A.C. The term "point source" is defined as "any discernible, confined, and discrete conveyance," such as a "ditch" or "channel," Rule 62-620.200(37), F.A.C. Similarly, the term "wastewater facility" includes the wastewater "transmission system," Rule 62-620.200(55), F.A.C.

Simply put, the CREC main discharge canal is a classic example of an existing "discrete conveyance" that constitutes part of an existing point source, not jurisdictional waters. As explained in Rule 62-302.520(3)(g), F.A.C., the point of discharge for a thermal discharge is "that point at which the effluent physically leaves its carrying conduit (open or closed), and discharges into the waters of the state...." (Emphasis added.) This confirms that the main discharge canal itself is not jurisdictional waters. Note that the main discharge canal was constructed specifically to transport the Crystal River cooling water from the plant to jurisdictional waters. Because "waste transport" is specifically excluded as a permissible designated use for jurisdictional waters (40 CFR 131.10), it would not be logical to assert that water quality standards (which include designated uses) apply within the main discharge canal.

Note that in the last EPA-issued NPDES permit for the CR Units 1, 2, & 3, EPA described the "receiving waters" as "Gulf of Mexico." EPA did not identify the main discharge canal as jurisdictional waters.

In sum, the receiving (jurisdictional) water is the Gulf of Mexico. It is not the CREC main discharge canal.

33. Progress Energy has requested new outfalls associated with the proposed Helper Cooling Tower South (HCTS). Please refer to the letter, dated October 5, 2009, requesting additional information for questions on the proposed HCTS.

PEF Response
Progress Energy submitted responses to the HCTS RFI no. 1 on January 25, 2010. PEF subsequently received a second RFI from the Department dated February 22, 2010.

On April 6, 2010, PEF requested that the Substantial Revision Request DEP File No. FL0000159-012IW1S/NR be incorporated into the renewal of the CR 1, 2 and 3 NPDES permit. Consequently, please note the following concerning HCTS RFI #2 questions 1 though 7.

Recent events have necessitated that PEF reevaluate the business strategies and operational plans for the proposed Helper Cooling Tower South, the results of which could change the content of responses PEF can make at this time to RFI#2. Decisions as they may relate to the RFI responses are forthcoming but are currently not available.

PEF will provide appropriate responses to the comments contained in RFI#2 as accurate information becomes available. PEF understands that the permit renewal application cannot be deemed complete, until the FDEP comments contained in RFI#2 are addressed satisfactorily and hopes that the Department understands the need of PEF to temporarily postpone the submission of responses to the RFI#2 comments.

34. The Department comments on the "Plan of Study for a Thermal Plume Assessment of Crystal River Units 1, 2, and 3, Citrus County, Florida," please refer to Attachment 2 of this letter.

PEF Response – Attachment 2, comment #1
Extensive modeling verified with field data was presented in the 1985 study to characterize the thermal plume. Verified model results were then utilized to predict thermal plume estimates based on helper cooling tower operation. Physical conditions at the site have not changed since that time. It is reasonable to assume that the model results are still valid for the site.

PEF Response – Attachment 2, comment #2
Near-field study results from 1985 showed that there was little summer –winter differences in isotherm estimates. Differences between the winter and summer isotherm locations were largely due to differences in heat transfer coefficients. However, summer months were chosen for this thermal plume assessment study because the most pronounced effect of the thermal effluent will be seen during the summer when the benthic communities are normally exposed to natural water temperatures closer to their maximum thermal tolerance limits.

PEF Response – Attachment 2, comment #3
Representative sampling times and locations were selected to validate previous conclusions regarding the thermal plume delineation and effects.

PEF Response – Attachment 2, comment #4
Since Crystal River Units 1, 2, & 3 are "base load" generation facilities, generally speaking, plant conditions are stable and flows remain constant over time.

PEF Response – Attachment 2, comment #5
During the 1985 study, no significant or consistent plume stratification could be detected due either to temperature or salinity.

PEF Response – Attachment 2, comment #6
The largest volume of the discharge effluent is confined to the dredged channel adjacent to the discharge spoil bank and exits into the adjacent basin to the west. The plume at that point tends towards the southwest, but rapidly becomes well mixed in the relatively shallow water. Areas north of Drum Island were not selected for sampling sites as a result of this thermal regime.

If you have any questions or require further information regarding this response, please contact Mr. Doug Yowell at (727) 820-5228.

Sincerely,

Rob Odom
Shift Operations Manager, Crystal River
Fossil Plant & Fuel Operations

Enclosures

CERTIFIED

Progress Energy Florida, Inc. –Crystal River Units 1, 2, & 3

DEP File No. FL0000159-013-IW1S/NR

Attachment 1

Form 2CS Information for Outfall I-0FE and Form 2F Information for Outfalls D-100, D-200, D-300 and D-400

Facility ID. Number: FL0000159 Outfall No. I-0FE - LSST

PLEASE PRINT OR TYPE ONLY: You may report some or all of this information on separate sheets instead of completing these pages. Use the same format. SEE INSTRUCTIONS.

VII. INTAKE AND EFFLUENT CHARACTERISTICS

PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. Pollutant	2. Effluent							3. Units		4. Intake (optional)		
	a. Max. Daily Value		b. Max. 30-day Value		c. Annual Avg. Value		d. No. of Analyses	a. Concentration	b. Mass	a. Long Term Avg. Value		b. No. of Analyses
	(1) Conc.	(2) Mass	(1) Conc.	(2) Mass	(1) Conc.	(2) Mass				(1) Conc.	(2) Mass	
a. Carbonaceous Biochemical Oxygen Demand (CBOD)	37.9 H						1	mg/L				
b. Chemical Oxygen Demand (COD)	256						1	mg/L				
c. Total Organic Carbon (TOC)	28.6						1	mg/L				
d. Total Suspended Solids (TSS)	29.0		29.0		6.14		34	mg/L				
e. Total Nitrogen (as N)	7.55						1	mg/L				
f. Total Phosphorus (as P)	1.44						1	mg/L				
g. Ammonia (as N)	7.55						1	mg/L				
h. Flow - actual or projected	Value 0.001523		Value 0.001268		Value 0.0000673		50		mgd	Value		
i. Flow - design	Value N/A		Value		Value					Value		
j. Specific Conductivity	Value 415		Value		Value		1	umhos/cm		Value		
k. Temperature (winter)	Value 28		Value		Value		1	°C		Value		
l. Temperature (summer)	Value		Value		Value			°C		Value		
m. pH	Min. 6.30	Max 7.86	Min.	Max.			34	STANDARD UNITS				

PART B - Mark "X" in column 2a for each pollutant you know or have reason to believe is present. Mark "X" in column 2b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additonal details and requirements.

1. Pollutant and CAS No. (if available)	2. Mark "X"		3. Effluent							4. Units		5. Intake (optional)		
	a. believed present	b. believed absent	a. Maximum Daily Value		b. Max. 30-day Value (if available)		c. Long Term Avg. Value (if available)		d. No. of Analyses	a. Conc.	b. Mass	a. Long Term Avg. Value		b. No. of Analyses
			(1) Conc.	(2) Mass	(1) Conc.	(2) Mass	(1) Conc.	(2) Mass				(1) Conc.	(2) Mass	
a. Bromide (24949-67-9)	☐	☐	< 0.66						1	mg/L				
b. Chlorine, Total Residual	☐	☒							1	mg/L				
c. Color	☐	☐	50.0 H						1	PCU				
d. Fecal Coliform	☐	☒												
e. Fluoride (16984-48-8)	☐	☐	0.141						1	mg/L				
f. Nitrate-Nitrite (as N)	☐	☐	< 0.050						1	mg/L				

: Item VII-B Contd. Facility ID. Number FL0000159 Outfall No. I-0FE - LSST

1. Pollutant and CAS No. (if available)	2. Mark "X"		3. Effluent							4. Units		5. Intake (optional)		
	a. believed present	b. believed absent	a. Maximum Daily Value		b. Max. 30-day Value (if available)		c. Long Term Avg. Value (if available)		d. No. of Analyses	a. Conc.	b. Mass	a. Long Term Avg. Value		b. No. of Analyses
			(1) Conc.	(2) Mass	(1) Conc.	(2) Mass	(1) Conc.	(2) Mass				(1) Conc.	(2) Mass	
g. Nitrogen, Total Organic (as N)	☐	☐	7.55						1	mg/L				
h. Oil and grease	☐	☐	8.41		8.41		< 2.77		34	mg/L				
i. Phosphorus, Total (as P) (7723-14-0)	☐	☐	1.44						1	mg/L				
j. Radioactivity														
(1) Alpha, Total	☐	☐	< 2.08						1	pCi/L				
(2) Beta, Total	☐	☐	75.6						1	pCi/L				
(3) Radium, Total	☐	☐	< 0.363						1	pCi/L				
(4) Radium 226, Total	☐	☐	< 0.280						1	pCi/L				
k. Sulfate (as SO_4) (14808-79-8)	☐	☐	6.69						1	mg/L				
l. Sulfide (as S)	☐	☐	< 0.03						1	mg/L				
m. Sulfite (as SO_3) (14265-45-3)	☐	☐	1.50 H						1	mg/L				
n. Surfactants	☐	☐	0.156 H						1	mg/L				
o. Aluminum, Total (7429-90-5)	☐	☐	0.101						1	mg/L				
p. Barium, Total (7440-39-3)	☐	☐	0.00878						1	ug/L				
q. Boron, Total (7440-42-8)	☐	☐	0.705						1	mg/L				
r. Cobalt, Total (7440-48-4)	☐	☐	0.00114						1	mg/L				
s. Iron, Total (7439-89-6)	☐	☐	0.796						1	mg/L				
t. Maagnesium, Total (7439-95-4)	☐	☐	5.71						1	mg/L				
u. Molybdenum, Total (7439-98-7)	☐	☐	0.724						1	ug/L				
v. Manganese, Total (7439-96-5)	☐	☐	0.141						1	mg/L				
w. Tin, Total (7440-31-5)	☐	☐	< 0.001						1	mg/L				
x. Titanium, Total (7440-32-6)	☐	☐	< 0.001						1	mg/L				

Facility ID. Number: FL0000159 Outfall No. I-0FE - LSST

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2a for all GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2a (secondary industries, non-process wastewater outfalls, and non-required GC/MS fractions), mark "X" in column 2b for each pollutant you know or have reason to believe is present. Mark "X" in column 2c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one anlysis for that pollutnat if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4,dinitrophenol, or 2-methyl-4,6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table (all 7 pages) for each outfall. See instructions for additional details and requirements.

1. Pollutant and CAS No. (if available)	2. Mark "X"			3. Effuent							4. Units		5. Intake (optional)		
	a. testing required	b. believed present	c. believed absent	a. Maximum Daily Value		b. Max. 30-day Value (if available)		c. Long Term Avg. Value (if available)		d. No. of Analyses	a. Conc.	b. Mass	a. Long Term Avg. Value		b. No. of Analyses
				(1) Conc.	(2) Mass	(1) Conc.	(2) Mass	(1) Conc.	(2) Mass				(1) Conc.	(2) Mass	
METALS, CYANIDE, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-0)	☐	☐	☐	< 0.600						1	ug/L				
2M. Arsenic, Total (7723-14-0)	☐	☐	☐	< 1.66						1	ug/L				
3M. Beryllium, Total (7440-41-7)	☐	☐	☐	< 0.100						1	ug/L				
4M. Cadmium, Total (7440-43-9)	☐	☐	☐	0.902						1	ug/L				
5M. Chromium, Total (7440-47-3)	☐	☐	☐	60.8						1	ug/L				
6M. Copper, Total (7440-50-8)	☐	☐	☐	44.9						1	ug/L				
7M. Lead, Total (7439-92-1)	☐	☐	☐	7.78						1	ug/L				
8M. Mercury, Total (7439-97-6)	☐	☐	☐	728						1	ng/L				
9M. Nickel, Total (7440-02-0)	☐	☐	☐	18.7						1	ug/L				
10M. Selenium, Total (7782-49-2)	☐	☐	☐	< 1.00						1	ug/L				
11M. Silver, Total (7440-22-4)	☐	☐	☐	0.334						1	ug/L				
12M. Thallium, Total (7440-28-0)	☐	☐	☐	0.340						1	ug/L				
13M. Zinc, Total (7440-66-6)	☐	☐	☐	342						1	ug/L				
14M. Cyanide, Total (57-12-5)	☐	☐	☐	< 1.66						1	ug/L				
15M. Phenols, Total	☐	☐	☐	232						1	ug/L				
DIOXIN															
2,3,7,8-Tetra-chlorodibenzo-P-Dioxin (1764-01-6)	☐	☐	☒												
GC/MS FRACTION-VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)	☐	☐	☐	< 1.25						1	ug/L				
2V. Acrylonitrile (107-13-1)	☐	☐	☐	< 1.00						1	ug/L				

Facility ID. Number: FL0000159 Outfall No. I-0FE - LSST

1. Pollutant and CAS No. (if available)	2. Mark "X"			3. Effluent							4. Units		5. Intake (optional)		
	a. testing required	b. believed present	c. believed absent	a. Maximum Daily Value		b. Max. 30-day Value (if available)		c. Long Term Avg. Value (if available)		d. No. of Analyses	a. Conc.	b. Mass	a. Long Term Avg. Value		b. No. of Analyses
				(1) Conc.	(2) Mass	(1) Conc.	(2) Mass	(1) Conc.	(2) Mass				(1) Conc.	(2) Mass	
GC/MS FRACTION - VOLATILE COMPOUNDS (continued)															
3V. Benzene (71-43-2)	☐	☐	☐	< 0.300						1	ug/L				
4V. Bis (Chloromethyl) Ether (542-88-1)	☐	☐	☒												
5V. Bromoform (75-25-2)	☐	☐	☐	< 0.250						1	ug/L				
6V. Carbon Tetrachloride (56-23-5)	☐	☐	☐	< 0.300						1	ug/L				
7V Chlorobenzene (108-90-7)	☐	☐	☐	< 0.250						1	ug/L				
8V. Chlorodi-bromomethane (124-8-1)	☐	☐	☐	< 0.300						1	ug/L				
9V. Chloroethane (74-00-3)	☐	☐	☐	< 0.300						1	ug/L				
10V. 2-Chloro-ethylvinyl Ether (110-75-8)	☐	☐	☐	< 1.50						1	ug/L				
11V. Chloroform (67-86-3)	☐	☐	☐	< 0.250						1	ug/L				
12V. Dichloro-bromomethane (75-24-4)	☐	☐	☐	< 0.250						1	ug/L				
13V. Dichloro-difluoromethane (75-71-8)	☐	☐	☐	< 0.300						1	ug/L				
14V. 1,1-Dichloroethane (75-34-3)	☐	☐	☐	< 0.300						1	ug/L				
15V. 1,2-Dichloroethane (107-06-2)	☐	☐	☐	< 0.250						1	ug/L				
16V. 1,1-Dichloroethylene (75-35-4)	☐	☐	☐	< 0.300						1	ug/L				
17V. 1,2,-Dichloropropane (78-87-5)	☐	☐	☐	< 0.250						1	ug/L				
18V. 1,3-Dichloropropylene (542-75-6)	☐	☐	☐	< 0.250						1	ug/L				
19V. Ethylbenzene (100-41-4)	☐	☐	☐	< 0.250						1	ug/L				
20V. Methyl Bromide (74-83-9)	☐	☐	☐	< 0.300						1	ug/L				
21V. Methyl Chloride (74-87-3)	☐	☐	☐	< 0.300						1	ug/L				
22V. Methylene Chloride (74-98-2)	☐	☐	☐	< 2.00						1	ug/L				
23V. 1,1,2,2-Tetra-chloroethane (79-34-5)	☐	☐	☐	< 0.250						1	ug/L				
24V. Tetrachloroethylene (127-18-4)	☐	☐	☐	< 0.300						1	ug/L				

Facility ID. Number: FL0000159 Outfall No: I-0FE - LSST

1. Pollutant and CAS No. (if available)	2. Mark "X"			3. Effluent							4. Units		5. Intake (optional)		
	a. testing required	b. believed present	c. believed absent	a. Maximum Daily Value		b. Max. 30-day Value (if available)		c. Long Term Avg. Value (if available)		d. No. of Analyses	a. Conc.	b. Mass	a. Long Term Avg. Value		b. No. of Analyses
				(1) Conc.	(2) Mass	(1) Conc.	(2) Mass	(1) Conc.	(2) Mass				(1) Conc.	(2) Mass	
GC/MS FRACTION - VOLATILE COMPOUNDS (continued)															
25V. Toluene (108-88-3)	☐	☐	☐	< 0.250						1	ug/L				
26V. 1,2-Trans-Dichloroethylene (156-60-5)	☐	☐	☐	< 0.300						1	ug/L				
27V. 1,1,2-Trichloroethane (71-55-6)	☐	☐	☐	< 0.250						1	ug/L				
28V. 1,1,2-Trichloroethane (79-00-5)	☐	☐	☐	< 0.325						1	ug/L				
29V. Trichloroethylene (79-01-6)	☐	☐	☐	< 0.250						1	ug/L				
30V. Trichloro-fluoromethane (75-69-4)	☐	☐	☐	< 0.300						1	ug/L				
31V. Vinyl Chloride (75-01-4)	☐	☐	☐	< 0.500						1	ug/L				
GC/MS FRACTION - ACID COMPOUNDS															
1A. 2-Chlorophenol (95-57-8)	☐	☐	☐	< 1.89						1	ug/L				
2A. 2,4-Dichlorophenol (120-83-2)	☐	☐	☐	< 1.89						1	ug/L				
3A. 2,4-Dimethylphenol (105-67-9)	☐	☐	☐	1.98						1	ug/L				
4A. 4,6-Dinitro-O-Cresol (534-53-1)	☐	☐	☐	< 2.83						1	ug/L				
5A. 2,4-Dinitrophenol (51-28-5)	☐	☐	☐	< 4.72						1	ug/L				
6A. 2-Nitrophenol (88-75-5)	☐	☐	☐	< 1.89						1	ug/L				
7A. 4-Nitrophenol (100-02-7)	☐	☐	☐	< 1.89						1	ug/L				
8A P-Chloro-M-Cresol (59-50-7)	☐	☐	☐	< 1.89						1	ug/L				
9A Pentachlorophenol (87-86-5)	☐	☐	☐	< 1.89						1	ug/L				
10A Phenol (108-95-2)	☐	☐	☐	7.59						1	ug/L				
11A 2,4,5-Trichloro-phenol (88-06-2)	☐	☐	☐	< 1.89						1	ug/L				
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (63-32-9)	☐	☐	☐	< 0.292						1	ug/L				
2B. Acenaphtylene (208-96-8)	☐	☐	☐	< 1.89						1	ug/L				
3B. Anthracene (120-12-7)	☐	☐	☐	< 1.89						1	ug/L				
4B. Benzidine (92-87-5)	☐	☐	☐	< 2.83						1	ug/L				

Facility ID. Number: FL0000159 Outfall No. I-0FE - LSST

1. Pollutant and CAS No. (if available)	2. Mark "X"			3. Effluent							4. Units		5. Intake (optional)		
	a. testing required	b. believed present	c. believed absent	a. Maximum Daily Value		b. Max. 30-day Value (if available)		c. Long Term Avg. Value (if available)		d. No. of Analyses	a. Conc.	b. Mass	a. Long Term Avg. Value		b. No. of Analyses
				(1) Conc.	(2) Mass	(1) Conc.	(2) Mass	(1) Conc.	(2) Mass				(1) Conc.	(2) Mass	
5B. Benzo *(a)* Anthracene (56-55-3)	☐	☐	☐	< 1.89						1	ug/L				
6B. Benzo *(a)* Pyrene (50-32-8)	☐	☐	☐	< 1.89						1	ug/L				
7B. 3,4-Benzo-fluoranthene (205-99-2)	☐	☐	☐	< 1.89						1	ug/L				
8B. Benzo *(ghi)* Perylene (191-24-2)	☐	☐	☐	< 1.89						1	ug/L				
9B. Benzo *(k)* Fluoranthene (207-08-9)	☐	☐	☐	< 1.89						1	ug/L				
10B. Bis *(2-Chloroethoxy)* Methane (111-91-1)	☐	☐	☐	< 2.83						1	ug/L				
11B. Bis *(2-chloroethyl)* Ether (111-44-4)	☐	☐	☐	< 1.89						1	ug/L				
12B. Bis *(2-Chloroisopropyl)* Ether (102-60-1)	☐	☐	☐	< 1.89						1	ug/L				
13B. Bis *(2-Ethylhexyl)* Phthalate (117-81-7)	☐	☐	☐	3.40						1	ug/L				
14B. 4-Bromophenyl Phenyl Ether (101-55-3)	☐	☐	☐	< 1.89						1	ug/L				
15B Butyl Benzyl Phthalate (84-68-7)	☐	☐	☐	< 1.89						1	ug/L				
16B. 2-Chloronaphthalene (91-58-7)	☐	☐	☐	< 0.283						1	ug/L				
17B. 4-Chlorophenyl Phenyl Ether (7005-72-3)	☐	☐	☐	< 1.89						1	ug/L				
18B. Chrysene (218-01-9)	☐	☐	☐	< 1.89						1	ug/L				
19B. Dibenzo *(a,h)* Anthracene (53-70-3)	☐	☐	☐	< 1.89						1	ug/L				
20B. 1,2-Dichlorobenzene (95-50-1)	☐	☐	☐	< 1.89						1	ug/L				
21B. 1,3-Dichlorobenzene (541-73-1)	☐	☐	☐	< 1.89						1	ug/L				
22B. 1,4-Dichlorobenzene (106-46-7)	☐	☐	☐	< 1.89						1	ug/L				
23B. 3,3-Dichlorobenzidine (92-94-1)	☐	☐	☐	< 1.89						1	ug/L				
24B. Diethyl Phthalate (84-66-2)	☐	☐	☐	< 1.89						1	ug/L				
25B. Dimethyl Phthalate (131-11-3)	☐	☐	☐	< 1.89						1	ug/L				
26B. Di-N-Butyl Phthalate (84-74-2)	☐	☐	☐	< 1.89						1	ug/L				
27B. 2,4-Dinitrotoluene (121-14-2)	☐	☐	☐	< 1.89						1	ug/L				
28B. 2,6-Dinitrotoluene (606-20-2)	☐	☐	☐	< 1.89						1	ug/L				

Facility ID. Number: FL0000159 Outfall No. I-0FE - LSST

1. Pollutant and CAS No. (if available)	2. Mark "X"			3. Effluent							4. Units		5. Intake (optional)		
	a. testing required	b. believed present	c. believed absent	a. Maximum Daily Value		b. Max. 30-day Value (if available)		c. Long Term Avg. Value (if available)		d. No. of Analyses	a. Conc.	b. Mass	a. Long Term Avg. Value		b. No. of Analyses
				(1) Conc.	(2) Mass	(1) Conc.	(2) Mass	(1) Conc.	(2) Mass				(1) Conc.	(2) Mass	
29B. Di-N-Octyl Phthalate (117-84-0)	☐	☐	☐	< 2.83						1	ug/L				
30B. 1,2-Diphenylhydrazine *(as Azobenzene)* (122-66-7)	☐	☐	☐	< 1.89						1	ug/L				
31B. Fluoranthene (206-44-0)	☐	☐	☐	< 1.89						1	ug/L				
32B. Fluorene (86-73-7)	☐	☐	☐	< 1.89						1	ug/L				
33B. Hexachlorobenzene (118-74-1)	☐	☐	☐	< 1.89						1	ug/L				
34B. Hexachlorobutadiene (87-68-3)	☐	☐	☐	< 1.89						1	ug/L				
35B. Hexachlorocyclopentadiene (77-47-4)	☐	☐	☐	< 2.83						1	ug/L				
36B. Hexachloroethane (67-72-1)	☐	☐	☐	< 1.89						1	ug/L				
37B. Indeno *(1,2,3-cd)* Pyrene (193-39-5)	☐	☐	☐	< 1.89						1	ug/L				
38B. Isophorone (78-59-1)	☐	☐	☐	< 2.83						1	ug/L				
39B. Naphthalene (91-20-3)	☐	☐	☐	< 0.283						1	ug/L				
40B. Nitrobenzene (98-95-9)	☐	☐	☐	< 2.83						1	ug/L				
41B N-Nitrosodimethylamine (62-75-9)	☐	☐	☐	< 1.89						1	ug/L				
42B. N-Nitrosodi-N-Propylamine (621-64-7)	☐	☐	☐	< 1.89						1	ug/L				
43B. N-Nitro-sodiphenylamine (86-30-6)	☐	☐	☐	< 1.89						1	ug/L				
44B Phenanthrene (85-01-8)	☐	☐	☐	< 1.89						1	ug/L				
45B. Pyrene (129-00-0)	☐	☐	☐	< 0.283						1	ug/L				
46B. 1,2,4-Trichlorobenzene (120-82-1)	☐	☐	☐	< 1.89						1	ug/L				
GC/MS FRACTION - PESTICIDES															
1P. Aldrin (309-00-2)	☐	☐	☒												
2P. -BHC (319-84-6)	☐	☐	☒												
3P -BHC (319-85-7)	☐	☐	☒												
4P. -BHC (58-89-9)	☐	☐	☒												
5P. -BHC (319-86-8)	☐	☐	☒												

Facility ID. Number: FL0000159 Outfall No. I-0FE - LSST

1. Pollutant and CAS No. (if available)	2. Mark "X"			3. Effluent							4. Units		5. Intake (optional)		
	a. testing required	b. believed present	c. believed absent	a. Maximum Daily Value		b. Max. 30-day Value (if available)		c. Long Term Avg. Value (if available)		d. No. of Analyses	a. Conc.	b. Mass	a. Long Term Avg. Value		b. No. of Analyses
				(1) Conc.	(2) Mass	(1) Conc.	(2) Mass	(1) Conc.	(2) Mass				(1) Conc.	(2) Mass	
6P. Chlordane (57-74-9)	☐	☐	☒												
7P. 4,4'-DDT (50-29-3)	☐	☐	☒												
8P. 4,4'-DDE (72-55-9)	☐	☐	☒												
9P. 4,4'-DDD (72-54-8)	☐	☐	☒												
10P. Dieldrin (60-57-1)	☐	☐	☒												
11P. -Endosulfan (115-29-7)	☐	☐	☒												
12P. -Endosulfan (115-29-7)	☐	☐	☒												
13P. Endosulfan Sulfate (1031-07-8)	☐	☐	☒												
14P. Endrin (72-20-8)	☐	☐	☒												
15P. Endrin Aldehyde (7421-92-4)	☐	☐	☒												
16P. Heptachlor (76-44-8)	☐	☐	☒												
17P. Heptachlor Epoxide (1024-57-3)	☐	☐	☒												
18P. PCB-1242 (53469-21-9)	☐	☐	☒												
19P. PCB-1254 (11097-69-1)	☐	☐	☒												
20P. PCB-1221 (11104-28-2)	☐	☐	☒												
21P. PCB-1232 (11141-16-5)	☐	☐	☒												
22P. PCB-1248 (12672-29-6)	☐	☐	☒												
23P. PCB-1260 (11096-82-5)	☐	☐	☒												
24P. PCB-1016 (12674-11-2)	☐	☐	☒												
25P. Toxaphene (8001-35-2)	☐	☐	☒												

VII. Discharge Information (Continued from page 2F-15 of Form 2F)

Part A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

Pollutant and CAS Number (if available)	Minimum Values (include units)		Average Values (include units)		# of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite		
Oil and Grease	N/A	N/A	N/A	N/A	1	
Biochemical Oxygen Demand (BOD_5)	13 mg/L	21 mg/L	N/A	N/A	1	VehiclVehicle Traffic/General Site Runoffe Traffic
Chemical Oxygen Demand (COD)	224 mg/L	210 mg/L	N/A	N/A	1	Vehicle Traffic/General Site Runoff
Total Suspended Solids (TSS)	412 mg/L	188 mg/L	N/A	N/A	1	Vehicle Traffic/General Site Runoff
Total Kjeldahl Nitrogen	4.9 mg/L	4.0 mg/L	N/A	N/A	1	Vehicle Traffic/General Site Runoff
Nitrate + Nitrite Nitrogen	1.3 mg/L	1.0 mg/L	N/A	N/A	1	Vehicle Traffic/General Site Runoff
Total Phosphorus	1.6 mg/L	1.2 mg/L	N/A	N/A	1	Vehicle Traffic/General Site Runoff
pH	Minimum	Maximum	Minimum	Maximum	1	

Part B - List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's wastewater permit for its wastewater effluent if the facility is operating under an existing wastewater permit. Complete one table for each outfall. See instructions for additional details and requirements.

Pollutant and CAS Number (if available)	Minimum Values (include units)		Average Values (include units)		# of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 30 Minutes	Flow-weighted composite	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite		
Arsenic	0.0097 mg/L	0.0073 mg/L			1	NPDES Permit requirement
Cadmium	0.0011 (I) mg/L	0.0027 mg/L			1	NPDES Permit requirement
Chromium	0.028 mg/L	0.016 mg/L			1	NPDES Permit requirement
Copper	0.16 mg/L	0.12 mg/L			1	NPDES Permit requirement
Iron	4.5 mg/L	2.7 mg/L			1	NPDES Permit requirement
Nickel	0.022 mg/L	0.013 mg/L			1	NPDES Permit requirement
Lead	0.016 mg/L	0.0074 mg/L			1	NPDES Permit requirement
Selenium	0.0063 mg/L	0.0030 (I) mg/L			1	NPDES Permit requirement
Vanadium	0.043 mg/L	0.033 (I) mg/L			1	NPDES Permit requirement
Zinc	0.56 mg/L	0.69 mg/L			1	NPDES Permit requirement

VII. Discharge Information (Continued from Table VII on page VII - 1 of Form 2F)

Part C - List each pollutant shown in Tables 2F-2, 2F-3, and 2F-4 that you know or have reasons to believe is present. Complete one table for each outfall. See instructions for additional details.

Pollutant and CAS Number (if available)	Minimum Values (include units)		Average Values (include units)		# of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite		

Part D - Provide data for the storm event(s) which resulted in the maximum values for the flow weighted composite sample.

1. Date of Storm Event	2. Duration of Storm Event (in minutes)	3. Total rainfall during storm event (in inches)	4. Number of hours between beginning of storm measured and end of previous measurable rain event	5. Maximum flow rate during rain event (specify units)	6. Total flow from rain event (specify units)	7. Comments
Oct. 27, 2009	330	0.16	528	2,087 gpm	4,174 gal.	

Provide a description of the method of flow measurement or estimate.
Total daily rainfall and maximum rainfall rates were obtained from a local weather monitoring facility located on-site at Lat: N 28 ° 57 ' 31 " (28.959 °) Lon: W 82 ° 41 ' 48 " (-82.697 °), which is within 1/4 mile of the outfall locations. Flow volumes and flow rates were determined by using exposed surface area, rainfall data, and runoff coefficients. A runoff coefficient of 0.9 was used for impervious surface area and 0.5 was used for pervious area.
Note that this is the second sampled rainfall event for this outfall. The first rainfall event sampled for this outfall occurred on August 18, 2009.

VII. Discharge Information (Continued from page 2F-15 of Form 2F)

Part A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

Pollutant and CAS Number (if available)	Minimum Values (include units)		Average Values (include units)		# of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite		
Oil and Grease		N/A				
Biochemical Oxygen Demand (BOD_5)	12 mg/L	9.8 mg/L			1	Vehicular Traffic; misc. Unit 3 activities
Chemical Oxygen Demand (COD)	240 mg/L	97 mg/L			1	Vehicular Traffic; misc. Unit 3 activities
Total Suspended Solids (TSS)	164 mg/L	124 mg/L			1	Vehicular Traffic; misc. Unit 3 activities
Total Kjeldahl Nitrogen	1.9 mg/L	2.1 mg/L			1	Vehicular Traffic; misc. Unit 3 activities
Nitrate + Nitrite Nitrogen	0.92 mg/L	0.66 mg/L			1	Vehicular Traffic; misc. Unit 3 activities
Total Phosphorus	0.50 mg/L	0.73 mg/L			1	Vehicular Traffic; misc. Unit 3 activities
pH	Minimum	Maximum	Minimum	Maximum		

Part B - List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's wastewater permit for its wastewater effluent if the facility is operating under an existing wastewater permit. Complete one table for each outfall. See instructions for additional details and requirements.

Pollutant and CAS Number (if available)	Minimum Values (include units)		Average Values (include units)		# of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 30 Minutes	Flow-weighted composite	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite		
Arsenic	0.0060 mg/L	0.0048 mg/L			1	NPDES Permit requirement
Cadmium	0.00060 (I) mg/L	0.00055 (I)			1	NPDES Permit requirement
Chromium	0.022 mg/L	0.019 mg/L			1	NPDES Permit requirement
Copper	0.080 mg/L	0.062 mg/L			1	NPDES Permit requirement
Iron	2.7 mg/L	2.2 mg/L			1	NPDES Permit requirement
Nickel	0.016 mg/L	0.014 mg/L			1	NPDES Permit requirement
Lead	0.018 mg/L	0.018 mg/L			1	NPDES Permit requirement
Selenium	0.0073 mg/L	0.0068 mg/L			1	NPDES Permit requirement
Vanadium	0.032 (I) mg/L	0.027 (I) mg/L			1	NPDES Permit requirement
Zinc	0.37 mg/L	0.43 mg/L			1	NPDES Permit requirement

VII. Discharge Information (Continued from Table VII on page VII - 1 of Form 2F)

Part C - List each pollutant shown in Tables 2F-2, 2F-3, and 2F-4 that you know or have reasons to believe is present. Complete one table for each outfall. See instructions for additional details.

Pollutant and CAS Number (if available)	Minimum Values (include units)		Average Values (include units)		# of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite		

Part D - Provide data for the storm event(s) which resulted in the maximum values for the flow weighted composite sample.

1. Date of Storm Event	2. Duration of Storm Event (in minutes)	3. Total rainfall during storm event (in inches)	4. Number of hours between beginning of storm measured and end of previous measurable rain event	5. Maximum flow rate during rain event (specify units)	6. Total flow from rain event (specify units)	7. Comments
Oct. 27, 2009	330	0.16	528	7,488 gpm	14,975 gal	2nd event sampled

Provide a description of the method of flow measurement or estimate.
Total daily rainfall and maximum rainfall rates were obtained from a local weather monitoring facility located on-site at Lat: N 28 ° 57 ' 31 " (28.959 °) Lon: W 82 ° 41 ' 48 " (-82.697 °); which is within 1/4 mile of the outfall locations. Flow volumes and flow rates were determined by using exposed surface area, rainfall data, and runoff coefficients. A runoff coefficient of 0.9 was used for impervious surface area and 0.5 was used for pervious area.
Note that this is the second sampled rainfall event for this outfall. The first rainfall event sampled for this outfall occurred on August 7, 2009.

VII. Discharge Information (Continued from page 2F-15 of Form 2F)

Part A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

Pollutant and CAS Number (if available)	Minimum Values (include units)		Average Values (include units)		# of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite		
Oil and Grease	4.6 (I) mg/L	N/A			1	Material Storage/Veh. Traffic
Biochemical Oxygen Demand (BOD_5)	23 mg/L	15 mg/L			1	Material Storage/Veh. Traffic
Chemical Oxygen Demand (COD)	250 mg/L	250 mg/L			1	Material Storage/Veh. Traffic
Total Suspended Solids (TSS)	280 mg/L	292 mg/L			1	Material Storage/Veh. Traffic
Total Kjeldahl Nitrogen	2.8 mg/L	2.4 mg/L			1	Material Storage/Veh. Traffic
Nitrate + Nitrite Nitrogen	1.4 mg/L	0.99 mg/L			1	Material Storage/Veh. Traffic
Total Phosphorus	1.1 mg/L	0.72 mg/L			1	Material Storage/Veh. Traffic
pH	Minimum	Maximum	Minimum	Maximum	1	NPDES Permit requirement

Part B - List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's wastewater permit for its wastewater effluent if the facility is operating under an existing wastewater permit. Complete one table for each outfall. See instructions for additional details and requirements.

Pollutant and CAS Number (if available)	Minimum Values (include units)		Average Values (include units)		# of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 30 Minutes	Flow-weighted composite	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite		
Hydrazine	< 0.006 mg/L	N/A				NPDES Permit requirement
Morpholine	0.068 mg/L *	N/A				NPDES Permit requirement
Hydroquinone	2.17 mg/L *	N/A				NPDES Permit requirement
TRC	0.1 mg/L	N/A				NPDES Permit requirement
Copper	0.058 mg/L	0.058 mg/L				NPDES Permit requirement
Iron	7.5 mg/L	8.3 mg/L				NPDES Permit requirement
Arsenic	0.023 mg/L	0.019 mg/L				NPDES Permit requirement
Cadmium	0.0015 (I) mg/L	0.0018 (I) mg/L				NPDES Permit requirement
Chromium	0.046 mg/L	0.058 mg/L				NPDES Permit requirement
Nickel	0.044 mg/L	< 0.001 mg/L				NPDES Permit requirement
Lead	0.015 mg/L	0.023 mg/L				NPDES Permit requirement
Selenium	0.011 mg/L	0.010 mg/L				NPDES Permit requirement
Vanadium	0.090 mg/L	0.088 mg/L				NPDES Permit requirement
Zinc	0.56 mg/L	0.74 mg/L				NPDES Permit requirement
Mercury (low-level)	22 ng/L	N/A				NPDES Permit requirement
PCB-1248	< 0.2 ug/L	N/A				Effluent guidelines 40CFR423
PCB-1254	< 0.2 ug/L	N/A				Effluent guidelines 40CFR423
PCB1260	< 0.2 ug/L	N/A				Effluent guidelines 40CFR423
Temperature	29 deg. C	N/A				NPDES Permit requirement

VII. Discharge Information (Continued from Table VII on page VII - 1 of Form 2F).

Part C - List each pollutant shown in Tables 2F-2, 2F-3, and 2F-4 that you know or have reasons to believe is present. Complete one table for each outfall. See instructions for additional details.

Pollutant and CAS Number (if available)	Minimum Values (include units)		Average Values (include units)		# of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite		

Part D - Provide data for the storm event(s) which resulted in the maximum values for the flow weighted composite sample.

1. Date of Storm Event	2. Duration of Storm Event (in minutes)	3. Total rainfall during storm event (in inches)	4. Number of hours between beginning of storm measured and end of previous measurable rain event	5. Maximum flow rate during rain event (specify units)	6. Total flow from rain event (specify units)	7. Comments
Oct. 27, 2009	330	0.16	528	3,910 gpm	7,820 gal.	

Provide a description of the method of flow measurement or estimate.
Total daily rainfall and maximum rainfall rates were obtained from a local weather monitoring facility located on-site at Lat: N 28° 57' 31" (28.959°) Lon: W 82° 41' 48" (-82.697°), which is within 1/4 mile of the outfall locations. Flow volumes and flow rates were determined by using exposed surface area, rainfall data, and runoff coefficients. A runoff coefficient of 0.9 was used for impervious surface area and 0.5 was used for pervious area.

Facility I.D. Number: FL0000159; D-400

VII. Discharge Information (Continued from page 2F-15 of Form 2F)

Part A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

Pollutant and CAS Number (if available)	Minimum Values (include units)		Average Values (include units)		# of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite		
Oil and Grease	N/A	N/A				
Biochemical Oxygen Demand (BOD_5)	27 mg/L	19 mg/L			1	Vehic. traf. equip. staging
Chemical Oxygen Demand (COD)	230 mg/L	200 mg/L			1	Vehic. traf. equip. staging
Total Suspended Solids (TSS)	900 mg/L	552 mg/L			1	Vehic. traf. equip. staging
Total Kjeldahl Nitrogen	2.4 mg/L	2.0 mg/L			1	Vehic. traf. equip. staging
Nitrate + Nitrite Nitrogen	0.59 mg/L	0.57 mg/L			1	Vehic. traf. equip. staging
Total Phosphorus	0.88 mg/L	0.70 mg/L			1	Vehic. traf. equip. staging
pH	Minimum	Maximum	Minimum	Maximum		

Part B - List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's wastewater permit for its wastewater effluent if the facility is operating under an existing wastewater permit. Complete one table for each outfall. See instructions for additional details and requirements.

Pollutant and CAS Number (if available)	Minimum Values (include units)		Average Values (include units)		# of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 30 Minutes	Flow-weighted composite	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite		
Arsenic	0.012 mg/L	0.011 mg/L			1	NPDES Permit requirement
Cadmium	0.0019 (D) mg/L	0.0014 (D) mg/L			1	NPDES Permit requirement
Chromium	0.056 mg/L	0.045 mg/L			1	NPDES Permit requirement
Copper	0.043 mg/L	0.039 mg/L			1	NPDES Permit requirement
Iron	8.5 mg/L	6.7 mg/L			1	NPDES Permit requirement
Nickel	0.039 mg/L	0.030 mg/L			1	NPDES Permit requirement
Lead	0.012 mg/L	0.012 mg/L			1	NPDES Permit requirement
Selenium	0.0057 mg/L	0.010 mg/L			1	NPDES Permit requirement
Vanadium	0.15 mg/L	0.12 mg/L			1	NPDES Permit requirement
Zinc	0.54 mg/L	0.42 mg/L			1	NPDES Permit requirement

Facility I.D. Number: FL0000159; D-400

VII. Discharge Information (Continued from Table VII on page VII - 1 of Form 2F)

Part C - List each pollutant shown in Tables 2F-2, 2F-3, and 2F-4 that you know or have reasons to believe is present. Complete one table for each outfall. See instructions for additional details.

Pollutant and CAS Number (if available)	Minimum Values (include units)		Average Values (include units)		# of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite		

Part D - Provide data for the storm event(s) which resulted in the maximum values for the flow weighted composite sample.

1. Date of Storm Event	2. Duration of Storm Event (in minutes)	3. Total rainfall during storm event (in inches)	4. Number of hours between beginning of storm measured and end of previous measurable rain event	5. Maximum flow rate during rain event (specify units)	6. Total flow from rain event (specify units)	7. Comments
Oct. 27, 2009	330	0.16	528	4,027 gpm	8,055 gal.	2nd event sampled

Provide a description of the method of flow measurement or estimate.
Total daily rainfall and maximum rainfall rates were obtained from a local weather monitoring facility located on-site at Lat: N 28° 57' 31" (28.959°) Lon: W 82° 41' 48" (-82.697°), which is within 1/4 mile of the outfall locations. Flow volumes and flow rates were determined by using exposed surface area, rainfall data, and runoff coefficients. A runoff coefficient of 0.9 was used for impervious surface area and 0.5 was used for pervious area.
Note that this is the second sampled rainfall event for this outfall. The first rainfall event sampled for this outfall occurred on August 18, 2009.

Progress Energy Florida, Inc. –Crystal River Units 1, 2, & 3

DEP File No. FL0000159-013-IW1S/NR

Attachment 2

CR-3 Circulating Water Pump Flow Measurement Study

Progress Energy

Crystal River Unit 3
Circulating Water Pump Flow Measurement
February 2009

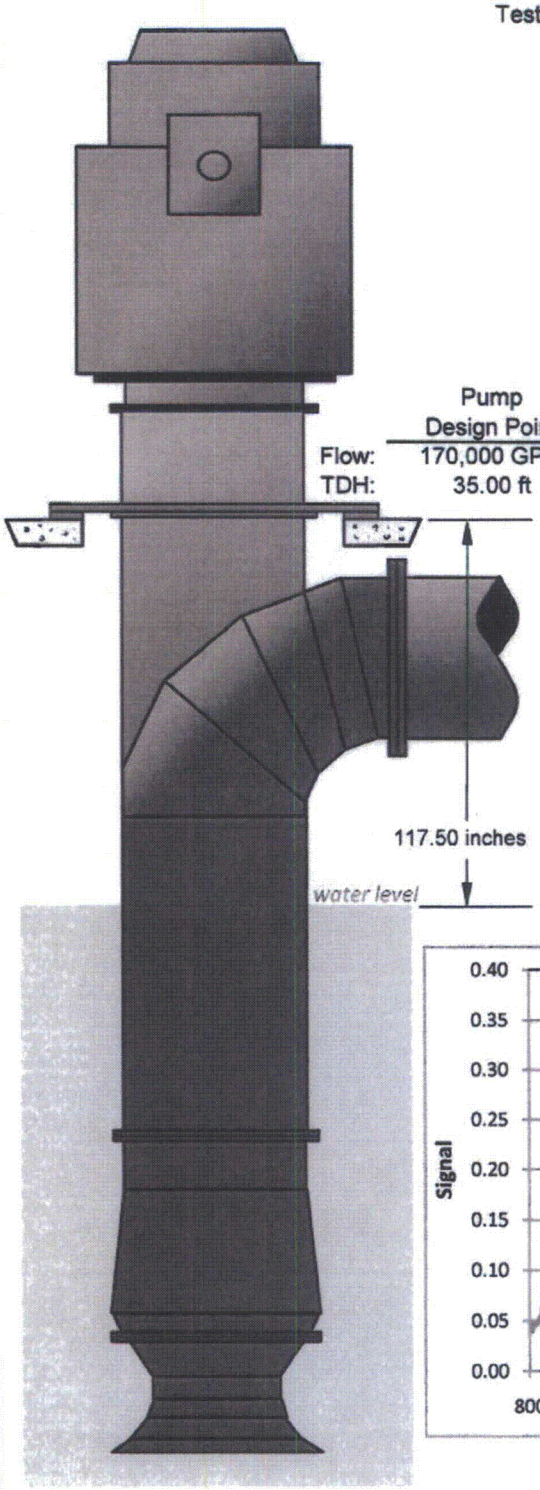
Final Report
May 8, 2009

Prepared by:
Dick Fletcher, P.E.

Test Team:
Earl Green
Jerry Warren

Crystal River Unit 3

Circulating Water Pump Tests
A Pump, Test 1
Test Date: 2-10-2009



Pump Design Point	
Flow:	170,000 GPM
TDH:	35.00 ft

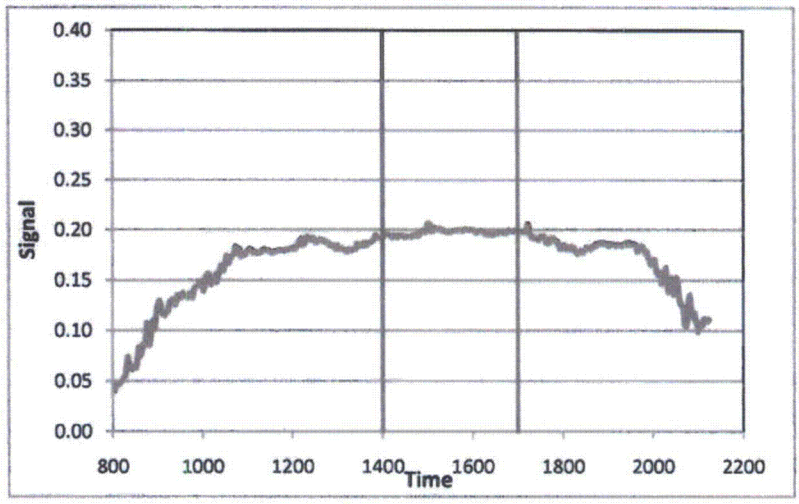
Motor Data

	As Tested	Design
Motor Power:		2,250 bhp
Motor Voltage:		4,000 V
Motor Amps:		325 A
Speed:	231 RPM	248 RPM

Pump Test Data

	Tested at 231 RPM	Corrected to 252 RPM
Flow:	163,961 GPM	178,867 GPM
TDH:	27.68 ft	32.94 ft
Pump Power:	1,182 whp	1,534 whp

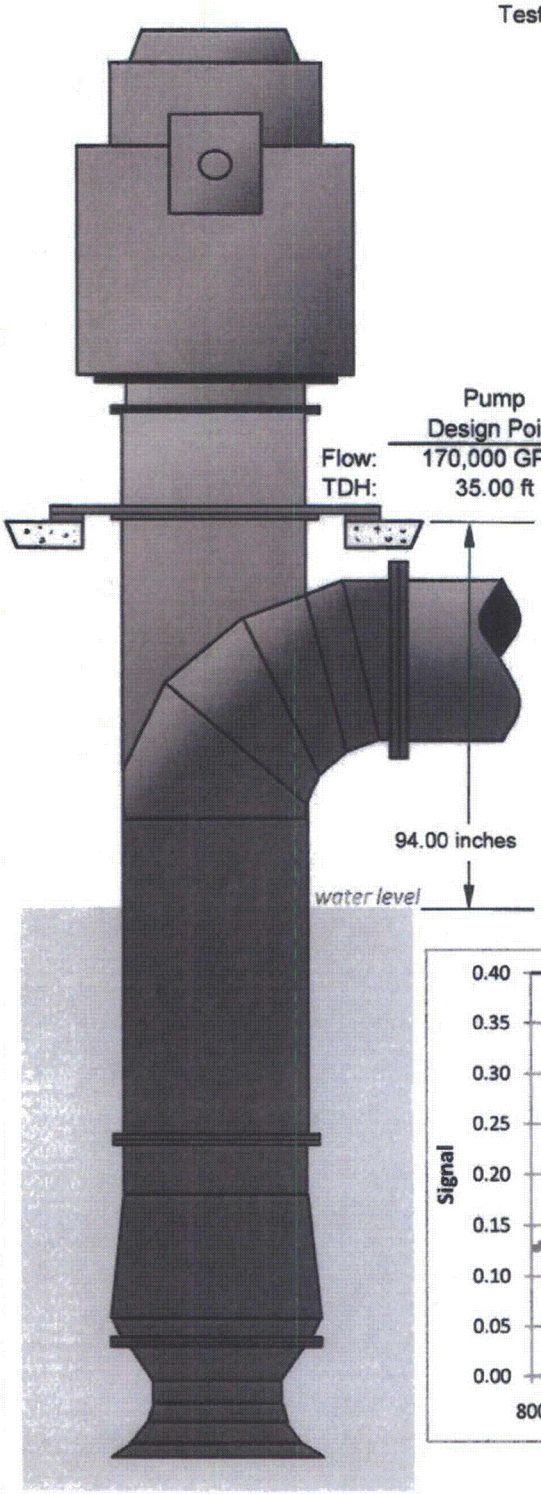
DYE CONCENTRATION



vertical lines indicate test period

Crystal River Unit 3

Circulating Water Pump Tests
B Pump, Test 2
Test Date: 2-10-2009



	Pump Design Point
Flow:	170,000 GPM
TDH:	35.00 ft

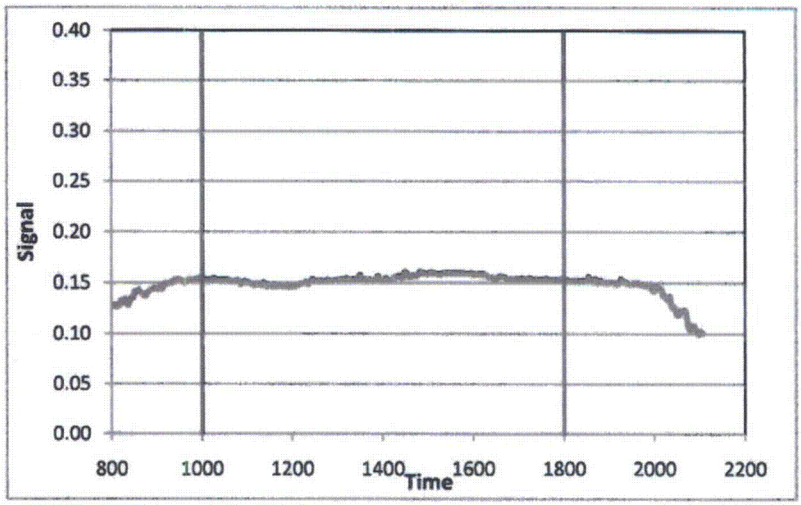
Motor Data

	As Tested	Design
Motor Power:		2,250 bhp
Motor Voltage:		4,000 V
Motor Amps:		325 A
Speed:	249 RPM	248 RPM

Pump Test Data

	Tested at 249 RPM	Corrected to 252 RPM
Flow:	164,660 GPM	166,644 GPM
TDH:	31.33 ft	32.09 ft
Pump Power:	1,343 whp	1,392 whp

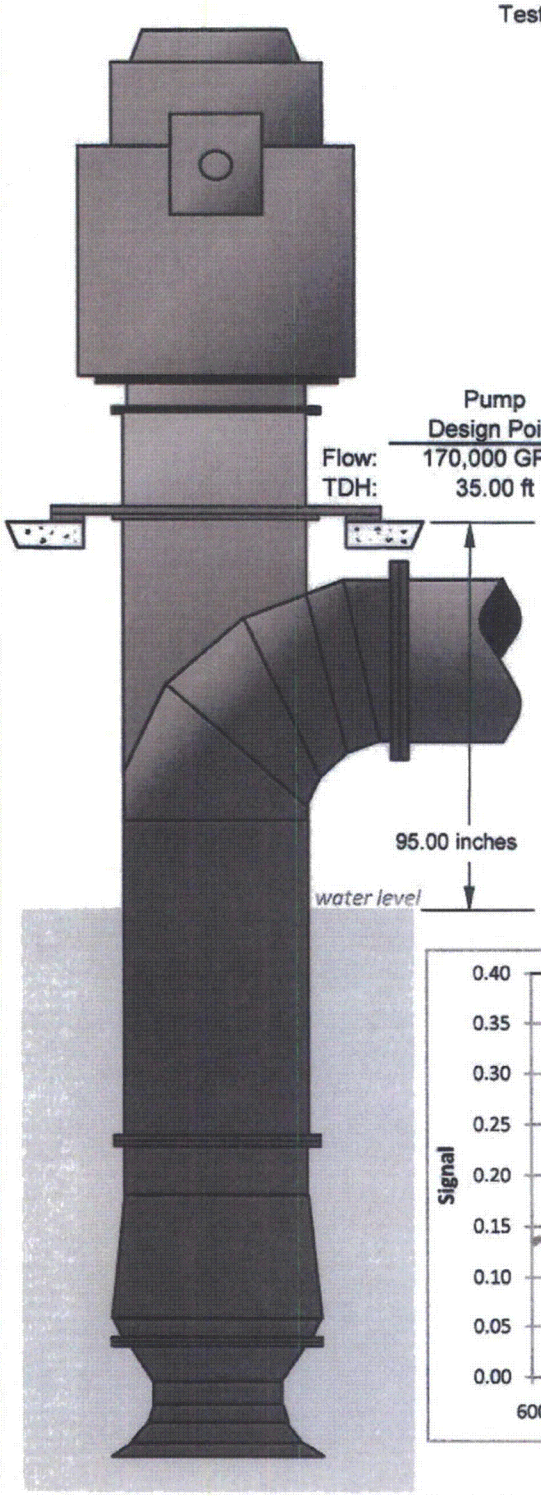
DYE CONCENTRATION



vertical lines indicate test period

Crystal River Unit 3

Circulating Water Pump Tests
C Pump, Test 3
Test Date: 2-10-2009



	Pump Design Point
Flow:	170,000 GPM
TDH:	35.00 ft

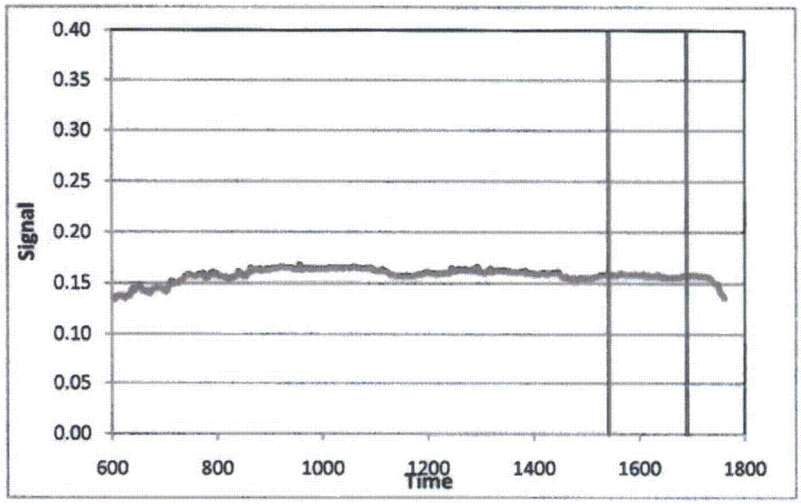
Motor Data

	As Tested	Design
Motor Power:		2,250 bhp
Motor Voltage:		4,000 V
Motor Amps:		325 A
Speed:	249 RPM	248 RPM

Pump Test Data

	Tested at 249 RPM	Corrected to 252 RPM
Flow:	167,366 GPM	169,383 GPM
TDH:		
Pump Power:		

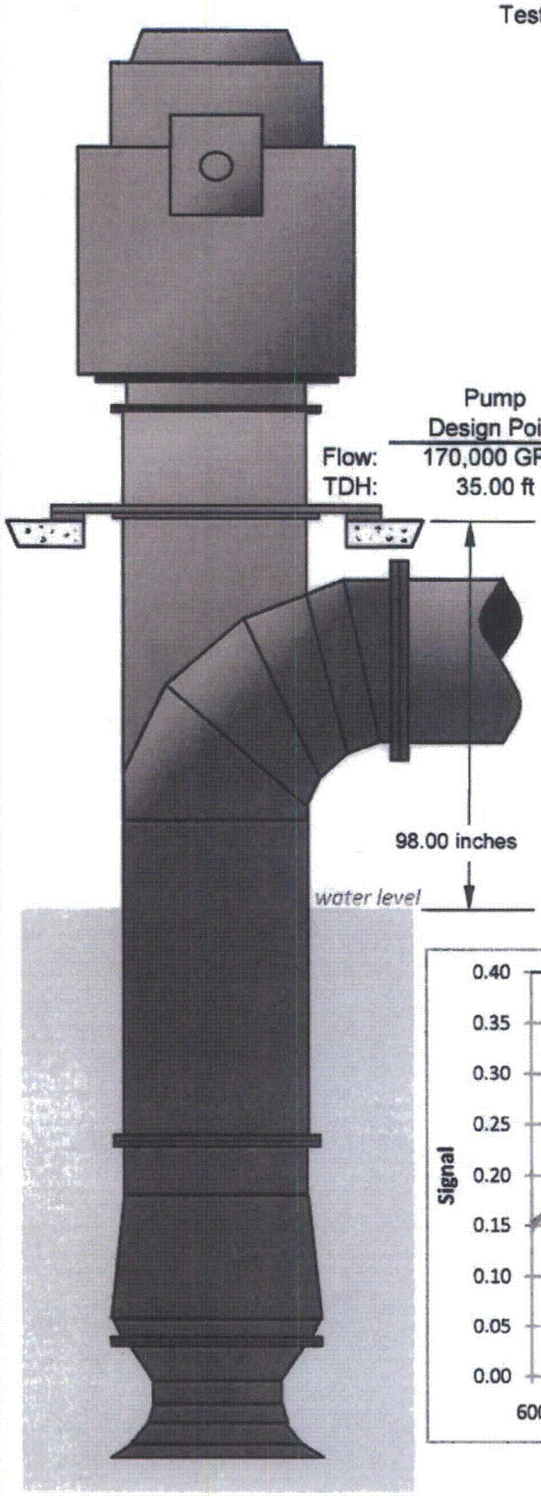
DYE CONCENTRATION



vertical lines indicate test period

Crystal River Unit 3

Circulating Water Pump Tests
D Pump, Test 4
Test Date: 2-10-2009

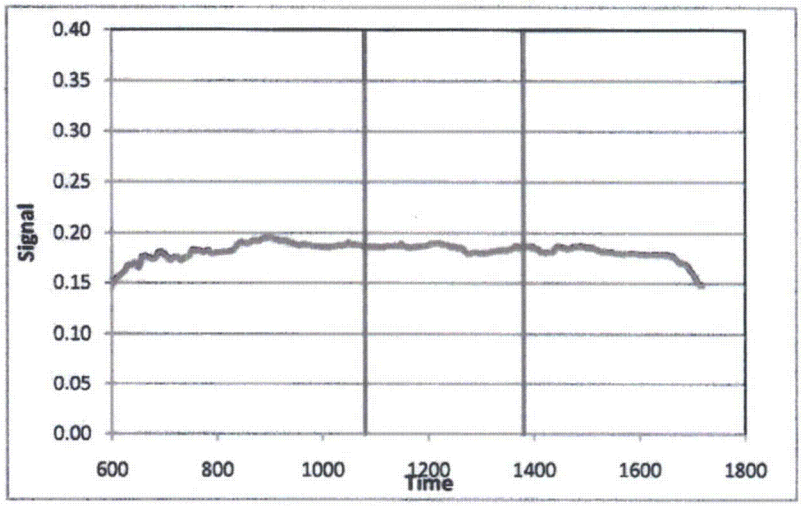


Motor Data	As Tested	Design
Motor Power:		2,250 bhp
Motor Voltage:		4,000 V
Motor Amps:		325 A
Speed:	230 RPM	248 RPM

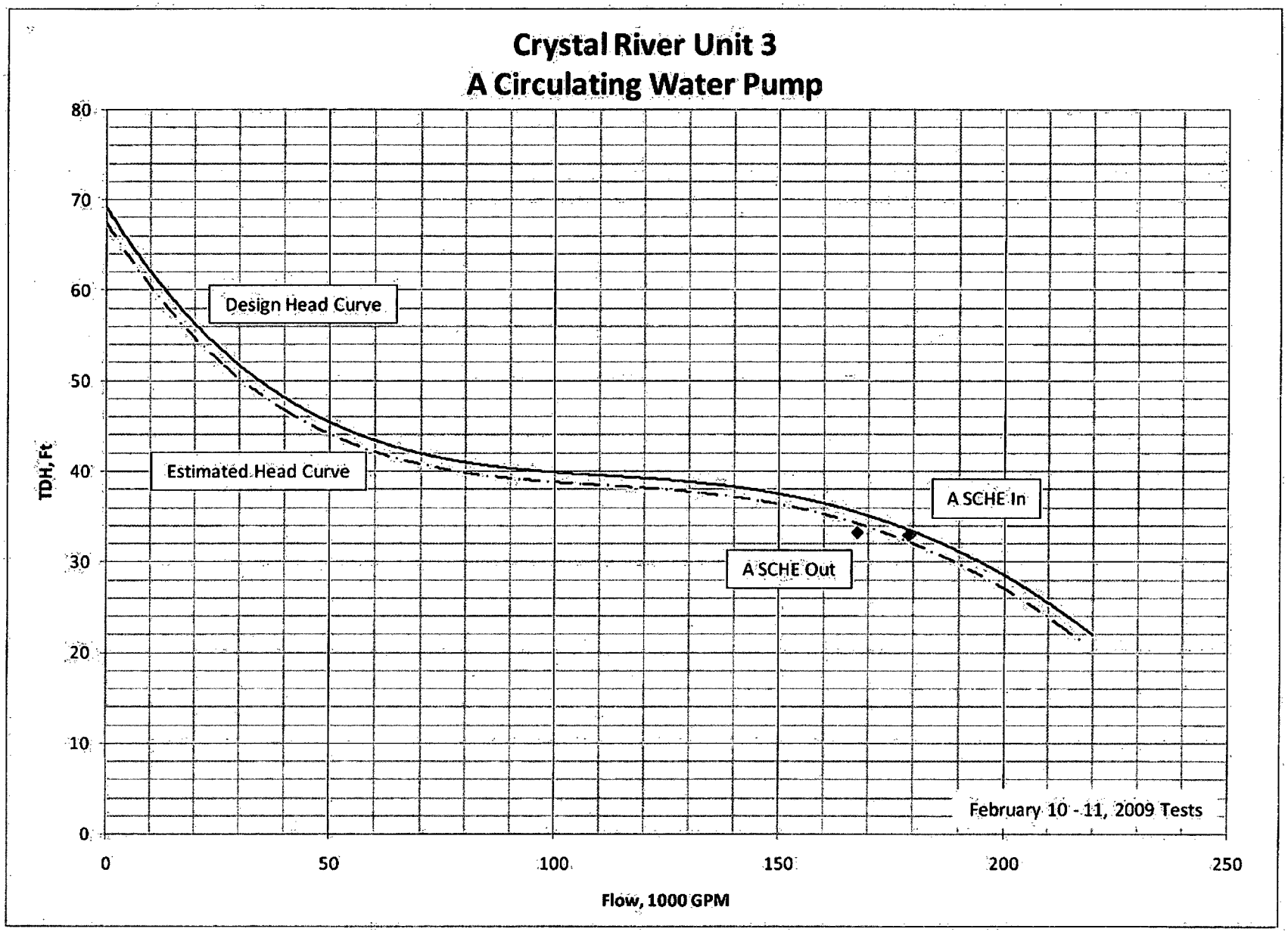
Pump Design Point	
Flow:	170,000 GPM
TDH:	35.00 ft

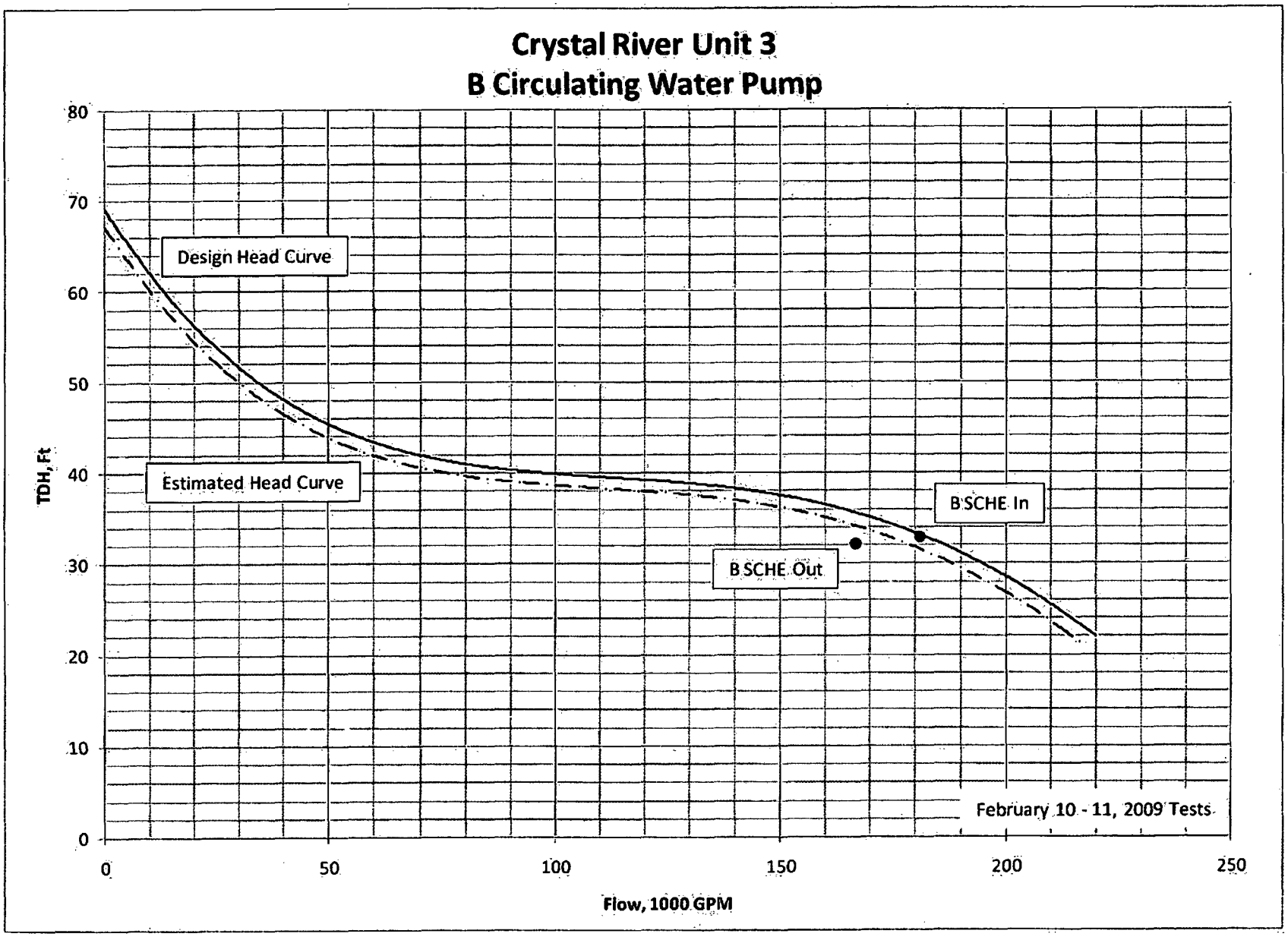
Pump Test Data	Tested at 230 RPM	Corrected to 252 RPM
Flow:	147,384 GPM	161,482 GPM
TDH:		
Pump Power:		

DYE CONCENTRATION



vertical lines indicate test period


Crystal River Unit 3
A Circulating Water Pump
TDH, Ft
80
70
60
50
40
30
20
10
0
Design Head Curve
Estimated Head Curve
A SCHE In
A SCHE Out
February 10 - 11, 2009 Tests
0
50
100
150
200
250
Flow, 1000 GPM


Crystal River Unit 3
B Circulating Water Pump
Design Head Curve
Estimated Head Curve
B SCHE In
B SCHE Out
February 10 - 11, 2009 Tests
TDH, Ft
Flow, 1000 GPM
0
10
20
30
40
50
60
70
80
0
50
100
150
200
250

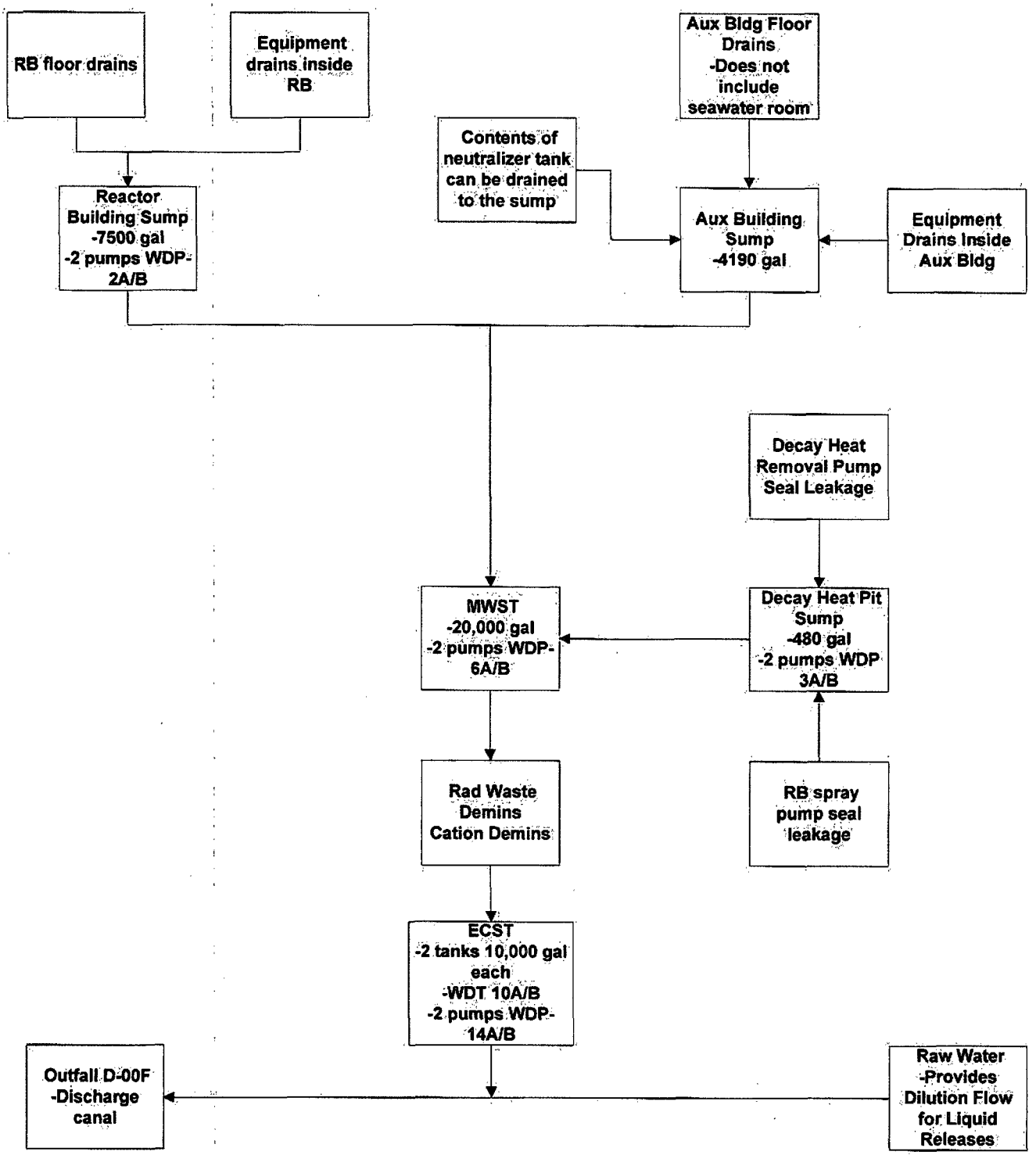
Progress Energy Florida, Inc. –Crystal River Units 1, 2, & 3

DEP File No. FL0000159-013-IW1S/NR

Attachment 3

Miscellaneous Waste Storage Tank (MWST) Diagram

MWST Waste Stream



Note: Numerous scenarios of valve alignments can alter the flow paths indicated by this flow diagram. Examples are: tanks can be put on recirc, pumped back to another tank for reprocessing, pumped to another system, etc.

Progress Energy Florida, Inc. –Crystal River Units 1, 2, & 3

DEP File No. FL0000159-013-IW1S/NR

Attachment 4

Industrial Wastewater Permit FLA016960

FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION
Southwest District Office
13051 North Telecom Parkway
Temple Terrace, Florida 33637-0926

STATE OF FLORIDA
INDUSTRIAL WASTEWATER FACILITY PERMIT

PERMITTEE:
Progress Energy Florida, Inc.
P. O. Box 14042 MAC PEF-903
St. Petersburg, FL 33701-5501

PERMIT NUMBER: FLA016960
PA FILE NUMBER: FLA016960-002-IW1N/NR
ISSUANCE DATE: January 9, 2007
PA FILE NUMBER: FLA016960-006-IWB/MR
REVISION DATE: November 17, 2009
EXPIRATION DATE: January 8, 2012

RESPONSIBLE AUTHORITY:

Mr. Larry E. Hatcher
Plant Manager
Larry.Hatcher@pgnmail.com

FACILITY:

Crystal River Energy Complex
15760 West Powerline Street
Crystal River, FL 34428
Citrus County

Latitude: 28° 57' 27" N Longitude: 82° 42' 36" W

This permit is issued under the provisions of Chapter 403, Florida Statutes (F.S.) and applicable rules of the Florida Administrative Code (F.A.C.). This permit is accompanied by an Administrative Order pursuant to Paragraphs 403.088(2) (e) and (f), Florida Statutes. Compliance with Administrative Order AO-114-SW is a specific requirement of this permit. The above named permittee is hereby authorized to operate the facilities shown on the application and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

The Crystal River Energy Complex is a steam electric power generation facility consisting of five units. Units 1, 2 4, and 5 are coal-fired while Unit #3 is a nuclear-powered unit. Units 3, 4 and 5 are certified pursuant to Power Plant Siting Act.

WASTEWATER TREATMENT:

The neutralized wastes are discharged into a percolation pond system consisting of three ponds. Ponds #1 and #2 are operated in parallel. The ponds act as settling basins and the settled effluent from either pond is routed to Pond #3 which overflows into an area called "South Pond Expansion" (7.16 acres) for percolation. The South Pond Expansion area has the capability to hold the wastewater as well as direct rainfall resulting from a 25-year 24-hour storm in the 13.6-acre pond catchment area. The sources of wastewater include power plant equipment drains, laboratory drains, floor drains, neutralized regeneration wastes from the demineralizer resin beds, wastewater from the water treatment process (carbon and media filter backwash, and lime sludge) boiler blowdown, boiler drains (chemical cleanings), air pre-heater wash drains, sewage treatment plant effluents, stormwater drainage from the transformer area, blowdown from the Flue Gas Desulfurization, precipitator washes, boiler washes, cooling water blowdown, and reverse osmosis/micro filtration concentrate.

EFFLUENT DISPOSAL:

Land Application:

An existing 0.76 MGD monthly average daily flow (MADF) land application system (G-001) consisting of percolation pond. Land application system G-001 is located approximately at latitude 28° 57' 27" N, longitude 82° 42' 36" W.

IN ACCORDANCE WITH: The limitations, monitoring requirements and other conditions as set forth in Part I through Part VIII on pages 3 through 19 of this permit.

I. Effluent Limitations and Monitoring Requirements

A. Surface Water Discharges

1. This section is not applicable to this facility.

B. Underground Injection Control Systems

1. This section is not applicable to this facility.

C. Land Application Systems

1. During the period beginning on the issuance date and lasting through the expiration date of this permit, the permittee is authorized to discharge process wastewater, non process wastewater, power plant equipment drains, laboratory drains, floor drains, neutralized regeneration wastes from the demineralizer resin beds, wastewater from the water treatment process (carbon and media filter backwash, and lime sludge) boiler blowdown, boiler drains (chemical cleanings), air pre-heater wash drains, sewage treatment plant effluents, stormwater drainage from the transformer area, blowdown from the Flue Gas Desulfurization, precipitator washes, boiler washes, cooling water blowdown, and reverse osmosis/micro filtration concentrate to Land Application System G-001, a percolation pond. Such discharge shall be limited and monitored by the permittee as specified below and reported in accordance with condition I.E.1.:

	Discharge Limitations			Monitoring Requirements		
Parameters (units)	**Monthly Average**	**Daily Maximum**	**Daily Minimum**	**Monitoring Frequency**	**Sample Type**	**Sample Point**
Flow (MGD)	0.76	Report	--	Daily	Calculated	FLW-3
Flow (MGD)	--	Report	--	Daily	Meter	FLW-1
Flow (MGD)	--	Report	--	Daily	Meter	FLW-2
Water Level Relative to NGVD	--	Report See Cond. I.C.5	--	Weekly	In-situ	OTH-1
Water Level Relative to NGVD	--	Report See Cond. I.C.5	--	Weekly	In-situ	OTH-2
Water Level Relative to NGVD	--	Report See Cond. I.C.5	--	Weekly	In-situ	OTH-3
pH (SU)	--	Report	Report	Quarterly	In-situ	EFF-1 EFF-2
Solids, Total Dissolved (TDS) (MG/L)	--	Report	--	Quarterly	Grab	EFF-1 EFF-2

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	Discharge Limitations			Monitoring Requirements		
Parameters (units)	**Monthly Average**	**Daily Maximum**	**Daily Minimum**	**Monitoring Frequency**	**Sample Type**	**Sample Point**
Specific Conductance (UMHO/CM)	--	Report	--	Quarterly	In-situ	EFF-1 EFF-2
Oil and Grease (MG/L)	--	Report	--	Quarterly	Grab	EFF-1 EFF-2
Nitrogen, Nitrate, Total (as N) (MG/L)	--	Report	--	Quarterly	Grab	EFF-1 EFF-2
Chloride (as Cl) (MG/L)	--	Report	--	Quarterly	Grab	EFF-1 EFF-2
Cyanide, Total (MG/L)	--	Report	--	Quarterly	Grab	EFF-1 EFF-2
Alpha, Gross Particle Activity (PCI/L)	--	Report	--	Quarterly	Grab	EFF-1 EFF-2
Radium 226 + Radium 228, Total (PCI/L)	--	Report	--	Quarterly	Grab	EFF-1 EFF-2
Antimony, Total Recoverable (UG/L)	--	Report	--	Quarterly	Grab	EFF-1 EFF-2
Arsenic, Total Recoverable (UG/L)	--	Report	--	Quarterly	Grab	EFF-1 EFF-2
Beryllium, Total Recoverable (UG/L)	--	Report	--	Quarterly	Grab	EFF-1 EFF-2
Boron, Total Recoverable (MG/L)	--	Report	--	Quarterly	Grab	EFF-1 EFF-2
Cadmium, Total Recoverable (UG/L)	--	Report	--	Quarterly	Grab	EFF-1 EFF-2
Copper, Total Recoverable (MG/L)	--	Report	--	Quarterly	Grab	EFF-1 EFF-2
Chromium, Total Recoverable (MG/L)	--	Report	--	Quarterly	Grab	EFF-1 EFF-2

	Discharge Limitations			Monitoring Requirements		
Parameters (units)	**Monthly Average**	**Daily Maximum**	**Daily Minimum**	**Monitoring Frequency**	**Sample Type**	**Sample Point**
Iron, Total Recoverable (MG/L)	--	Report	--	Quarterly	Grab	EFF-1 EFF-2
Lead, Total Recoverable (UG/L)	--	Report	--	Quarterly	Grab	EFF-1 EFF-2
Mercury, Total Recoverable (UG/L)	--	Report	--	Quarterly	Grab	EFF-1 EFF-2
Nickel, Total Recoverable (UG/L)	--	Report	--	Quarterly	Grab	EFF-1 EFF-2
Selenium, Total Recoverable (UG/L)	--	Report	--	Quarterly	Grab	EFF-1 EFF-2
Sodium, Total Recoverable (MG/L)	--	Report	--	Quarterly	Grab	EFF-1 EFF-2
Thallium, Total Recoverable (UG/L)	--	Report	--	Quarterly	Grab	EFF-1 EFF-2
Zinc, Total Recoverable (MG/L)	--	Report	--	Quarterly	Grab	EFF-1 EFF-2

2. Effluent samples shall be taken at the monitoring site locations listed in permit condition I.C.1 and as described below:

Sample Point	Description of Monitoring Location
FLW-3	The sum of FLW-1 and FLW-2
FLW-1	The sum of all flows to percolation pond system not including the FGD blow down.
FLW-2	Flow from the FGD blow down into evaporation/percolation pond #3
EFF-2	Effluent from the FGD treatment system. At discharge pipe into evaporation/percolation pond #3
EFF-1	At discharge pipe into the active pond, either the East Pond or West Pond. Ponds will be rotated on a yearly basis, or as necessary.

Sample Point	Description of Monitoring Location
OTH-1	Staff gauge located in Pond#1.
OTH-2	Staff gauge located in Pond#2.
OTH-3	Staff gauge located in Pond#3.

3. The permittee shall contact and request authorizations from the Department's Southwest District Office, prior to placing into service any backup/ emergency treatment system for the FGD blow down. (i.e. Filter press). The request shall provide details and specification for the proposed system and operational details along with the expected duration.

4. All flow measurement devices shall be calibrated at least once every 12 months or based on the manufacturer requirements.

5. Water levels in ponds 1, 2 & 3 shall be recoded weekly on the part B DMRs. The part B DMRs shall be submitted quarterly in accordance to the schedule in section I.E.1

D. Other Methods of Disposal or Recycling

1. There shall be no discharge of industrial wastewater from this facility to ground or surface waters, except as authorized by this permit.

E. Other Limitations and Monitoring and Reporting Requirements

1. Monitoring requirements under this permit are effective on the first day of the second month following permit issuance. Until such time, the permittee shall continue to monitor and report in accordance with previously effective permit requirements, if any. During the period of operation authorized by this permit, the permittee shall complete and submit to the Southwest District Office Discharge Monitoring Reports (DMRs) in accordance with the frequencies specified by the REPORT type (i.e., monthly, toxicity, quarterly, semiannual, annual, etc.) indicated on the DMR forms attached to this permit. Monitoring results for each monitoring period shall be submitted in accordance with the associated DMR due dates below.

REPORT Type on DMR	Monitoring Period	DMR Due Date
Monthly or Toxicity	first day of month – last day of month	28th day of following month
Quarterly	January 1 - March 31 April 1 – June 30 July 1 – September 30 October 1 – December 31	April 28 July 28 October 28 January 28
Semiannual	January 1 – June 30 July 1 – December 31	July 28 January 28
Annual	January 1 – December 31	January 28

DMRs shall be submitted for each required monitoring period including months of no discharge.

The permittee shall make copies of the attached DMR form(s) and shall submit the original completed DMR form(s) to the address specified below: (Please submit a copy of the DMR to the Southwest District Office)

Originals to:
Department of Environmental Protection
Wastewater Compliance Evaluation Section
Mail Station 3551
Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Copies to:
FDEP-Southwest District
Industrial Wastewater Program
Southwest District Office
13051 North Telecom Parkway
Temple Terrace, FL 33637-0926
Facsimile (813) 632-7662

2. Unless specified otherwise in this permit, all reports and notifications required by this permit, including twenty-four hour notifications, shall be submitted to or reported to the Southwest District Office at the address specified below:

   Southwest District Office
   13051 North Telecom Parkway
   Temple Terrace, FL 33637-0926

   Phone Number - (813) 632-7600
   FAX Number - (813) 632-7662 (All FAX copies shall be followed by original copies.)

3. All reports and other information shall be signed in accordance with requirements of Rule 62-620.305, F.A.C.

4. The permittee shall provide safe access points for obtaining representative samples which are required by this permit.

5. If there is no discharge from the facility on a day scheduled for sampling, the sample shall be collected on the day of the next discharge.

6. Any bypass of the treatment facility which is not included in the monitoring specified in sections I.A, I.B, I.C, or I.D, is to be monitored for flow and all other required parameters. For parameters other than flow, at least one grab sample per day shall be monitored. Daily flow shall be monitored or estimated, as appropriate, to obtain reportable data. All monitoring results shall be reported on the appropriate DMR.

II. Industrial Sludge/Solids Management Requirements

1. The method of sludge/solids use or disposal by this facility is a Class I or II solid waste landfill.

2. The permittee shall be responsible for proper treatment, management, use or land application of its sludges/solids. *[62-620.320(6)]*

3. Disposal of sludge/solids in a solid waste management facility permitted by the Department shall be in accordance with the requirements of Chapter 62-701, F.A.C.

4. Storage, transportation, and disposal of sludge/solids characterized as hazardous waste shall be in accordance with the requirements of Chapter 62-730, F.A.C.

5. The permittee shall maintain records available for inspection by the Department at the permitted facility, as follows:
   a. Quantity of sludge/solids generated;
   b. Quantity of sludge/solids transported for treatment and/or disposal;
   c. Name and location of the site(s) to which sludge/solids is transported;

d. If a person other than the permittee is responsible for sludge/solids transportation, treatment, and/or disposal, the permittee shall also keep records of the name and address of each transporter, and copies of all shipping manifests.
[62-620.320(6)]

III. Ground Water Monitoring Requirements

A. Construction Requirements

1. The permittee shall give at least 72 hours notice to the Department's Southwest District Office, prior to the installation of any monitoring wells detailed in this permit.

2. The QUARTERLY sampling and analysis of all new ground water monitoring wells shall begin upon proper completion of the GWMP well system in accordance with condition III.B.1. The wells shall be sampled for the parameters identified in Permit Condition III.B.3 and in accordance to the Department's "Standard Operating Procedures For Laboratory Operations and Sample Collection Activities," DEP-SOP-001/01, FS 2200 Ground water Sampling, January 1, 2002.

3. Prior to construction of new ground water monitoring wells, a soil boring shall be made at each new monitoring well location in order to establish the well depth and screen interval.

4. Within thirty days after completion of construction of the ground water monitoring wells, a properly scaled figure depicting monitor well locations (active and abandoned) with identification numbers shall be submitted. The figure shall also include (or attached) the monitoring well, top of casing and ground surface elevations referenced to National Geodetic Vertical Datum (NGVD) to the nearest 0.1 foot, along with monitor well location latitude and longitude to the nearest 0.1 second.

5. Within thirty days after completion of construction of the ground water monitoring wells, well completion reports shall be sent to the Industrial Wastewater Section, FDEP Southwest District Office. The information is to be submitted on the attached form for each well, DEP Form 62-522.900(3), Monitor Well Completion Report.

6. In Districts where applicable, within 30 days of completion of construction of new ground water monitor wells, the Department requests that the permittee submit the following information for each monitor well :
   a. A copy of the Florida Water Management District (WMD) , State of Florida Permit Application to Construct, Repair, Modify or Abandon a Well, Form 41.10-410(1), and

   b. A copy of the WMD Well Completion Report, Form 41.10-410(2), 62-610.412(2)(b)

B. Operational Requirements

1. During the period of operation authorized by this permit, the permittee shall continue to sample ground water at the existing monitoring wells identified in item III.B.2 below, in accordance with this permit and the approved ground water monitoring plan prepared in accordance with Rule 62-522.600 F.A.C. Within 90 days of placing the new or modified wastewater facility into operation, or installation of new monitoring wells, whichever occurs sooner, the permittee shall begin sampling ground water at the new monitoring wells identified in item III.B.2 below, in accordance with this permit and the approved ground water monitoring plan.

2. The following monitoring wells shall be sampled for Land Application System G-001:

Monitoring Well ID	Alternate Well Name and/or Description of Monitoring Location	Depth (Feet)	Aquifer Monitored	New or Existing
MWB-30	Background Well	20	Upper Floridan	Existing
MWC-1	Compliance Monitoring Well	20	Upper Floridan	Existing
MWI-2R2	Intermediate Monitor Well		Upper Floridan	Existing
MWI-7R	Intermediate Monitor Well (Relocated)	20	Upper Floridan	Existing
MWC-12R	Compliance Monitor Well	20	Upper Floridan	Existing
MWC-16	Compliance Monitor Well	21.1	Upper Floridan	Existing
MWC-21R	Compliance Monitor Well	20	Upper Floridan	Existing
MWC-27	Compliance Monitor Well	33	Upper Floridan	Existing
MWC-28	Compliance Monitor Well	20	Upper Floridan	Existing
MWC-29	Compliance Monitor Well	20	Upper Floridan	Existing
MWC-IF2	Compliance Monitor Well	14	Upper Floridan	Existing
MWC-31	Compliance Monitor Well	20	Upper Floridan	New

MWB = Background; MWI = Intermediate; MWC = Compliance; MWP = Piezometer

3. The monitor wells specified in Condition III.B.2 shall be sampled for the parameters listed below:

Parameter Name	Compliance Well Limit	Units	Sample Type	Monitoring Frequency
Radium 226 and 228	5.0	PCI/L	Grab	Quarterly
Copper, Total Recoverable	Report	MG/L	Grab	Quarterly
Chloride (as Cl)	Report	MG/L	Grab	Quarterly
Iron, Total Recoverable	Report	MG/L	Grab	Quarterly
Nitrogen, Nitrate, Total, (as N)	10.0	MG/L	Grab	Quarterly
pH*	Report	SU	Grab	Quarterly
Sodium, Total Recoverable	160	MG/L	Grab	Quarterly
Solids, Total Dissolved (TDS)	Report	MG/L	Grab	Quarterly
Specific Conductance*	Report	MMHOS/CM	In-situ	Quarterly
Turbidity*	Report	NTU	In-situ	Quarterly
Water Level Relative to NGVD	Report	FEET	In-situ	Quarterly
Alpha, Gross Particle Activity	15.0	PCI/L	Grab	Quarterly
Antimony, Total Recoverable	6.0	UG/L	Grab	Quarterly
Arsenic, Total Recoverable	10.0	UG/L	Grab	Quarterly
Boron, Total Recoverable	Report	MG/L	Grab	Quarterly

Parameter Name	Compliance Well Limit	Units	Sample Type	Monitoring Frequency
Barium, Total Recoverable	2.0	MG/L	Grab	Quarterly
Beryllium, Total Recoverable	4.0	UG/L	Grab	Quarterly
Cadmium, Total Recoverable	5.0	UG/L	Grab	Quarterly
Mercury, Total Recoverable	2.0	UG/L	Grab	Quarterly
Selenium, Total Recoverable	50.0	UG/L	Grab	Quarterly
Chromium, Total Recoverable	100.0	UG/L	Grab	Quarterly
Lead, Total Recoverable	15.0	UG/L	Grab	Quarterly
Nickel, Total Recoverable	100.0	UG/L	Grab	Quarterly
Thallium, Total Recoverable	2.0	UG/L	Grab	Quarterly
Oxygen, Dissolved (DO)*	Report	MG/L	In-situ	Quarterly
Zinc, Total Recoverable	Report	MG/L	Grab	Quarterly
Fluoride, Total (as F)	Report	MG/L	Grab	Quarterly
Cyanide, Total	0.2	MG/L	Grab	Quarterly
Temperature, Water*	Report	°F	In-situ	Quarterly

* The field parameters shall be sampled per DEP–SOP-001/01, FS 2200 Groundwater Sampling, Figure FS 2200-2 Groundwater Purging Procedure and recorded on Form FD 9000-24, Groundwater Sampling Log (both documents attached to this permit). The sampling logs shall be submitted with each groundwater Part D DMR. The field parameters to be reported on Part D of GW DMR shall be the last sample recorded on FD 9000-24.

4. For the land application system for G-001, all ground water quality criteria specified in Chapter 62-520, F.A.C., shall be met at the edge of the zone of discharge. The zone of discharge for this project is the lateral extent of the upland environment on the property, where ground water is discharging to the marine environment.

5. The permittee's discharge to ground water shall not cause a violation of water quality standards for ground waters at the boundary of the zone of discharge in accordance with Rules 62-520.400 and 62-520.420, F.A.C.

6. The permittee's discharge to ground water shall not cause a violation of the minimum criteria for ground water specified in Rule 62-520.400, F.A.C., within the zone of discharge.

7. If the concentration for any constituent listed in Permit Condition III.B.3 in the natural background quality of the ground water is greater than the stated maximum, or in the case of pH is also less than the minimum, the representative background quality shall be the prevailing standard.

8. Water levels shall be recorded prior to evacuating the well for sample collection. Elevation references shall include the top of the well casing and land surface at each well site (NGVD allowable) at a precision of plus or minus 0.01 feet.

9. Ground water monitoring wells shall be purged prior to sampling to obtain a representative sample.

10. Analyses shall be conducted on un-filtered samples, unless filtered samples have been approved by the Department as being more representative of ground water conditions.

11. If a monitoring well becomes damaged or cannot be sampled for some reason, the permittee shall notify the Department immediately and a written report shall follow within seven days detailing the circumstances and remedial measures taken or proposed. Repair or replacement of monitoring wells shall be approved in advance by the Department.

12. All piezometers and monitoring wells not part of the approved ground water monitoring plan are to be plugged and abandoned in accordance with Rule 62-532.500(4), F.A.C., unless there is intent for their future use.

13. Ground water monitoring test results shall be submitted on Part D of DEP Form 62-620.910(10) (attached) and shall be submitted to the address specified in I.E.3. Results shall be submitted with the DMR for each month listed in the following schedule:

SAMPLE PERIOD	REPORT DUE DATE
January - March	April 28
April - June	July 28
July - September	October 28
October - December	January 28

IV. Other Land Application Requirements

1. This section is not applicable to this facility.

V. Operation and Maintenance Requirements

A. Treatment and Disposal Facilities

1. The permittee shall ensure that the operation of this facility is as described in the application and supporting documents.

2. The operation of the pollution control facilities described in this permit shall be under the supervision of a person who is qualified by formal training and/or practical experience in the field of water pollution control.

B. Record keeping Requirements:

1. The permittee shall maintain the following records on the site of the permitted facility and make them available for inspection:

   a. Records of all compliance monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, including, if applicable, a copy of the laboratory certification showing the certification number of the laboratory, for at least three years from the date the sample or measurement was taken;

   b. Copies of all reports, other than those required in items a. and f. of this section, required by the permit for at least three years from the date the report was prepared, unless otherwise specified by Department rule;

   c. Records of all data, including reports and documents used to complete the application for the permit for at least three years from the date the application was filed, unless otherwise specified by Department rule;

   d. A copy of the current permit;

e. A copy of any required record drawings;

f. Copies of the logs and schedules showing plant operations and equipment maintenance for three years from the date on the logs or schedule.

VI. Schedules

1. The permittee shall achieve compliance with the other conditions of this permit as follows:

   Operational level attained Issuance Date of permit

2. No later than 14 calendar days following a date identified in the schedule(s) of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by an identified date, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

3. A Best Management Practices (BMP) Plan shall be prepared and implemented in accordance with Part VII of this permit and the following schedule:

Action Item		Scheduled Completion Date
1	Continue implementing the existing BMP Plan and updated accordingly for the FGD Treatment as needed.	Within ninety (90) days of the start up of the FGD system.

4. The following implementation steps shall be completed in accordance with the following schedule:

Implementation Steps		Scheduled Completion Date
1	Installation of a staff gauge in pond #1, pond #2 and evaporation/percolation pond #3	Within ninety (90) days of revision date.
2	Notify the Department when installation of the staff gauges is completed.	Within thirty (30) days after installation.
3	The permittee shall notify the Department when the Flue Gas Desulfurization system (FGD) will be placed into operation.	Provide 72-hours notice prior to start up.
4	Installation of the proposed groundwater monitoring well MWC-31	Within ninety (90) days of revision date.

5. In accordance with sections 403.088(2) (e) and (f), F.S., a compliance schedule for this facility is contained in Administrative Order AO-114-SW that is hereby incorporated by reference.

VII. Other Specific Conditions

A. Specific Conditions Applicable to All Permits

1. Drawings, plans, documents or specifications submitted by the permittee, not attached hereto, but retained on file at the Southwest District Office, are made a part hereof.

2. Where required by Chapter 471 (P.E.) or Chapter 492 (P.G.) F.S., applicable portions of reports to be submitted under this permit, shall be signed and sealed by the professional(s) who prepared them.

3. This permit satisfies Industrial Wastewater program permitting requirements only and does not authorize operation of this facility prior to obtaining any other permits required by local, state or federal agencies.

4. The permittee shall provide verbal notice to the Department as soon as practical after discovery of a sinkhole within an area for the management or application of wastewater or sludge. The permittee shall immediately implement measures appropriate to control the entry of contaminants, and shall detail these measures to the Department in a written report within 7 days of the sinkhole discovery.

B. Specific Conditions Related to Construction

This section is not applicable to this facility.

C. Duty to Reapply

1. The permittee shall apply for renewal of this permit at least 180 days before the expiration date of the permit using the appropriate forms listed in Rule 62-620.910, F.A.C., including submittal of the appropriate processing fee set forth in Rule 62-4.050, F.A.C. The existing permit shall not expire until the Department has taken final action on the application renewal in accordance with the provisions of 62-620.335(3) and (4), F.A.C.

D. Specific Conditions Related to Existing Manufacturing, Commercial, Mining, and Silviculture Wastewater Facilities or Activities

1. Existing manufacturing, commercial, mining, and silvicultural wastewater facilities or activities that discharge into surface waters shall notify the Department as soon as they know or have reason to believe:

   a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following levels
      (1) One hundred micrograms per liter,
      (2) Two hundred micrograms per liter for acrolein and acrylonitrile; five hundred micrograms per liter for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter for antimony, or
      (3) Five times the maximum concentration value reported for that pollutant in the permit application.

   b. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following levels
      (1) Five hundred micrograms per liter,
      (2) One milligram per liter for antimony, or

(3) Ten times the maximum concentration value reported for that pollutant in the permit application.

E. Specific Conditions Related to Best Management Practices

1. **BMP Plan:**

For purposes of this part, the terms "pollutant" or "pollutants" refer to any substance listed as toxic under Section 307(a)(1) of the Clean Water Act (the "Act"), oil, as defined in Section 311(a)(1) of the Act, and any substance listed as hazardous under Section 311 of the Act. The permittee shall develop and implement a Best Management Practices (BMP) plan which prevents, or minimizes, the potential for the release of pollutants from ancillary activities, including material storage areas; plant site runoff; in-plant transfer, process and material handling areas; loading and unloading operations; and sludge and waste disposal areas, to the waters of the State through plant site runoff; spillage or leaks; sludge or waste disposal; or drainage from raw material storage.

2. **Implementation:**

The BMP plan shall be developed and implemented in accordance with the schedule contained in Part VI of this permit.

3. **General Requirements:**

The BMP plan shall:

a. Be documented in narrative form, and shall include any necessary plot plans, drawings or maps.

b. Establish specific objectives for the control of pollutants.

(1) Each facility component or system shall be examined for its potential for causing a release of significant amounts of pollutants to waters of the State due to equipment failure, improper operation, natural phenomena such as rain or snowfall, etc.

(2) Where experience indicates a reasonable potential for equipment failure (e.g., a tank overflow or leakage), natural conditions (e.g., precipitation), or other circumstances to result in significant amounts of pollutants reaching surface waters, the plan should include a prediction of the direction, rate of flow, and total quantity of pollutants which could be discharged from the facility as a result of each condition or circumstance.

c. Establish specific best management practices to meet the objectives identified under paragraph (b) of this subsection, addressing each component or system capable of causing a release of significant amounts of pollutants to the waters of the State, and identifying specific preventative or remedial measures to be implemented.

d. Be reviewed by plant engineering staff and plant manager.

4. **Documentation:**

The permittee shall maintain the BMP plan at the facility and shall make the plan available to the Department upon request.

5. **BMP Plan Modification:**

The permittee shall amend the BMP plan whenever there is a change in the facility or change in the operation of the facility which materially increases the potential for the ancillary activities to result in a discharge of significant amounts of pollutants.

6. **Modification for Ineffectiveness:**

If the BMP plan proves to be ineffective in achieving the general objective of preventing the release of significant amounts of pollutants to surface waters and the specific objectives and requirements under paragraphs (b) and (c) of item 3, the permit shall be subject to modification pursuant to rule 62-620.325, F.A.C., to incorporate revised BMP requirements.

F. Reopener Clause

1. The permit shall be revised, or alternatively, revoked and reissued in accordance with the provisions contained in Rules 62-620.325 and 62-620.345, F.A.C., if applicable, or to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2) and 307(a)(2) of the Clean Water Act (the Act), as amended, if the effluent standards, limitations, or water quality standards so issued or approved:

   a. Contains different conditions or is otherwise more stringent than any condition in the permit/or;

   b. Controls any pollutant not addressed in the permit.

   The permit as revised or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

2. The permit may be reopened to adjust effluent limitations or monitoring requirements should future Water Quality Based Effluent Limitation determinations, water quality studies, DEP approved changes in water quality standards, or other information show a need for a different limitation or monitoring requirement.

3. The Department may develop a Total Maximum Daily Load (TMDL) during the life of the permit. Once a TMDL has been established and adopted by rule, the Department shall revise this permit to incorporate the final findings of the TMDL.

VIII. General Conditions

1. The terms, conditions, requirements, limitations and restrictions set forth in this permit are binding and enforceable pursuant to Chapter 403, F.S. Any permit noncompliance constitutes a violation of Chapter 403, F.S., and is grounds for enforcement action, permit termination, permit revocation and reissuance, or permit revision. *[62-620.610(1), F.A.C.]*

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications or conditions of this permit constitutes grounds for revocation and enforcement action by the Department. *[62-620.610(2), F.A.C.]*

3. As provided in subsection 403.087(7), F.S., the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor authorize any infringements of federal, state, or local laws or regulations. This permit is not

a waiver of or approval of any other Department permit or authorization that may be required for other aspects of the total project which are not addressed in this permit. *[62-620.610(3), F.A.C.]*

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title. *[62-620.610(4), F.A.C.]*

5. This permit does not relieve the permittee from liability and penalties for harm or injury to human health or welfare, animal or plant life, or property caused by the construction or operation of this permitted source; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department. The permittee shall take all reasonable steps to minimize or prevent any discharge, reuse of reclaimed water, or residuals use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. *[62-620.610(5), F.A.C.]*

6. If the permittee wishes to continue an activity regulated by this permit after its expiration date, the permittee shall apply for and obtain a new permit. *[62-620.610(6), F.A.C.]*

7. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control, and related appurtenances, that are installed and used by the permittee to achieve compliance with the conditions of this permit. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to maintain or achieve compliance with the conditions of the permit. *[62-620.610(7), F.A.C.]*

8. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit revision, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition. *[62-620.610(8), F.A.C.]*

9. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, including an authorized representative of the Department and authorized EPA personnel, when applicable, upon presentation of credentials or other documents as may be required by law, and at reasonable times, depending upon the nature of the concern being investigated, to
   a. Enter upon the permittee's premises where a regulated facility, system, or activity is located or conducted, or where records shall be kept under the conditions of this permit;
   b. Have access to and copy any records that shall be kept under the conditions of this permit;
   c. Inspect the facilities, equipment, practices, or operations regulated or required under this permit; and
   d. Sample or monitor any substances or parameters at any location necessary to assure compliance with this permit or Department rules. *[62-620.610(9), F.A.C.]*

10. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data, and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except as such use is proscribed by Section 403.111, Florida Statutes, or Rule 62-620.302, F.A.C. Such evidence shall only be used to the extent that it is consistent with the Florida Rules of Civil Procedure and applicable evidentiary rules. *[62-620.610(10), F.A.C.]*

11. When requested by the Department, the permittee shall within a reasonable time provide any information required by law which is needed to determine whether there is cause for revising, revoking and reissuing, or terminating this permit, or to determine compliance with the permit. The permittee shall also provide to the Department upon request copies of records required by this permit to be kept. If the permittee becomes aware

of relevant facts that were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be promptly submitted or corrections promptly reported to the Department. *[62-620.610(11), F.A.C.]*

12. Unless specifically stated otherwise in Department rules, the permittee, in accepting this permit, agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance; provided however, the permittee does not waive any other rights granted by Florida Statutes or Department rules. A reasonable time for compliance with a new or amended surface water quality standard, other than those standards addressed in Rule 62-302.500, F.A.C., shall include a reasonable time to obtain or be denied a mixing zone for the new or amended standard. *[62-620.610(12), F.A.C.]*

13. The permittee, in accepting this permit, agrees to pay the applicable regulatory program and surveillance fee in accordance with Rule 62-4.052, F.A.C. *[62-620.610(13), F.A.C.]*

14. This permit is transferable only upon Department approval in accordance with Rule 62-620.340, F.A.C. The permittee shall be liable for any noncompliance of the permitted activity until the Department approves the transfer. *[62-620.610(14), F.A.C.]*

15. The permittee shall give the Department written notice at least 60 days before inactivation or abandonment of a wastewater facility and shall specify what steps will be taken to safeguard public health and safety during and following inactivation or abandonment. *[62-620.610(15), F.A.C.]*

16. The permittee shall apply for a revision to the Department permit in accordance with Rule 62-620.300, F.A.C., and the Department of Environmental Protection Guide to Wastewater Permitting at least 90 days before construction of any planned substantial modifications to the permitted facility is to commence or with Rule 62-620.325(2), F.A.C., for minor modifications to the permitted facility. A revised permit shall be obtained before construction begins except as provided in Rule 62-620.300, F.A.C. *[62-620.610(16), F.A.C.]*

17. The permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. The permittee shall be responsible for any and all damages which may result from the changes and may be subject to enforcement action by the Department for penalties or revocation of this permit. The notice shall include the following information:
    a. A description of the anticipated noncompliance;
    b. The period of the anticipated noncompliance, including dates and times; and
    c. Steps being taken to prevent future occurrence of the noncompliance. *[62-620.610(17), F.A.C.]*

18. Sampling and monitoring data shall be collected and analyzed in accordance with Rule 62-4.246, Chapters 62-160 and 62-601, F.A.C., and 40 CFR 136, as appropriate.
    a. Monitoring results shall be reported at the intervals specified elsewhere in this permit and shall be reported on a Discharge Monitoring Report (DMR), DEP Form 62-620.910(10), or as specified elsewhere in the permit.
    b. If the permittee monitors any contaminate more frequently than required by the permit, using Department approved test procedures, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.
    c. Calculations for all limitations which require averaging of measurements shall use an arithmetic mean unless otherwise specified in this permit.
    d. Except as specifically provided in Rule 62-160.300, F.A.C., any laboratory test required by this permit shall be performed by a laboratory that has been certified by the Department of Health Environmental Laboratory Certification Program (DOH ELCP). Such certification shall be for the matrix, test method and analyte(s) being measured to comply with this permit. For domestic wastewater facilities, testing for parameters listed in Rule 62-160.300(4), F.A.C., shall be conducted under the direction of a certified operator.

e. Field activities including on-site tests and sample collection shall follow the applicable standard operating procedures described in DEP-SOP-001/01 adopted by reference in Chapter 62-160, F.A.C.
f. Alternate field procedures and laboratory methods may be used where they have been approved in accordance with Rules 62-160.220 and 62-160.330, F.A.C. *[62-620.610(18), F.A.C.]*

19. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule detailed elsewhere in this permit shall be submitted no later than 14 days following each schedule date. *[62-620.610(19), F.A.C.]*

20. The permittee shall report to the Department's Southwest District Office any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within five days of the time the permittee becomes aware of the circumstances. The written submission shall contain: a description of the noncompliance and its cause; the period of noncompliance including exact dates and time, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.
a. The following shall be included as information which must be reported within 24 hours under this condition:
(1) Any unanticipated bypass which causes any reclaimed water or effluent to exceed any permit limitation or results in an unpermitted discharge,
(2) Any upset which causes any reclaimed water or the effluent to exceed any limitation in the permit,
(3) Violation of a maximum daily discharge limitation for any of the pollutants specifically listed in the permit for such notice, and
(4) Any unauthorized discharge to surface or ground waters.
b. Oral reports as required by this subsection shall be provided as follows:
(1) For unauthorized releases or spills of untreated or treated wastewater reported pursuant to subparagraph a.(4) that are in excess of 1,000 gallons per incident, or where information indicates that public health or the environment will be endangered, oral reports shall be provided to the Department by calling the STATE WARNING POINT TOLL FREE NUMBER (800) 320-0519, as soon as practical, but no later than 24 hours from the time the permittee becomes aware of the discharge. The permittee, to the extent known, shall provide the following information to the State Warning Point:
(a) Name, address, and telephone number of person reporting;
(b) Name, address, and telephone number of permittee or responsible person for the discharge;
(c) Date and time of the discharge and status of discharge (ongoing or ceased);
(d) Characteristics of the wastewater spilled or released (untreated or treated, industrial or domestic wastewater);
(e) Estimated amount of the discharge;
(f) Location or address of the discharge;
(g) Source and cause of the discharge;
(h) Whether the discharge was contained on-site, and cleanup actions taken to date;
(i) Description of area affected by the discharge, including name of water body affected, if any; and
(j) Other persons or agencies contacted.
(2) Oral reports, not otherwise required to be provided pursuant to subparagraph b.(1) above, shall be provided to Department's Southwest District Office within 24 hours from the time the permittee becomes aware of the circumstances.
c. If the oral report has been received within 24 hours, the noncompliance has been corrected, and the noncompliance did not endanger health or the environment, the Department's Southwest District Office shall waive the written report. *[62-620.610(20), F.A.C.]*

21. The permittee shall report all instances of noncompliance not reported under Conditions VIII.17., 18. and 19. of this permit at the time monitoring reports are submitted. This report shall contain the same information required by Condition VIII.20. of this permit. *[62-620.610(21), F.A.C.]*

22. Bypass Provisions.
   a. Bypass is prohibited, and the Department may take enforcement action against a permittee for bypass, unless the permittee affirmatively demonstrates that:
      (1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; and
      (2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and
      (3) The permittee submitted notices as required under Condition VIII.22.b. of this permit.
   b. If the permittee knows in advance of the need for a bypass, it shall submit prior notice to the Department, if possible at least 10 days before the date of the bypass. The permittee shall submit notice of an unanticipated bypass within 24 hours of learning about the bypass as required in Condition VIII.20. of this permit. A notice shall include a description of the bypass and its cause; the period of the bypass, including exact dates and times; if the bypass has not been corrected, the anticipated time it is expected to continue; and the steps taken or planned to reduce, eliminate, and prevent recurrence of the bypass.
   c. The Department shall approve an anticipated bypass, after considering its adverse effect, if the permittee demonstrates that it will meet the three conditions listed in Condition VIII.22 a.(1) through (3) of this permit.
   d. A permittee may allow any bypass to occur which does not cause reclaimed water or effluent limitations to be exceeded if it is for essential maintenance to assure efficient operation. These bypasses are not subject to the provision of Condition VIII.22.a. through c. of this permit. *[62-620.610(22), F.A.C.]*

23. Upset Provisions
   a. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed contemporaneous operating logs, or other relevant evidence that:
      (1) An upset occurred and that the permittee can identify the cause(s) of the upset;
      (2) The permitted facility was at the time being properly operated;
      (3) The permittee submitted notice of the upset as required in Condition VIII.20. of this permit; and
      (4) The permittee complied with any remedial measures required under Condition VIII.5. of this permit.
   b. In any enforcement proceeding, the burden of proof for establishing the occurrence of an upset rests with the permittee.
   c. Before an enforcement proceeding is instituted, no representation made during the Department review of a claim that noncompliance was caused by an upset is final agency action subject to judicial review. *[62-620.610(23), F.A.C.]*

Executed in Hillsborough County, Florida.

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION

Jeffrey S. Greenwell

Jeffrey S. Greenwell, P.E.
Water Facilities Administrator
Southwest District

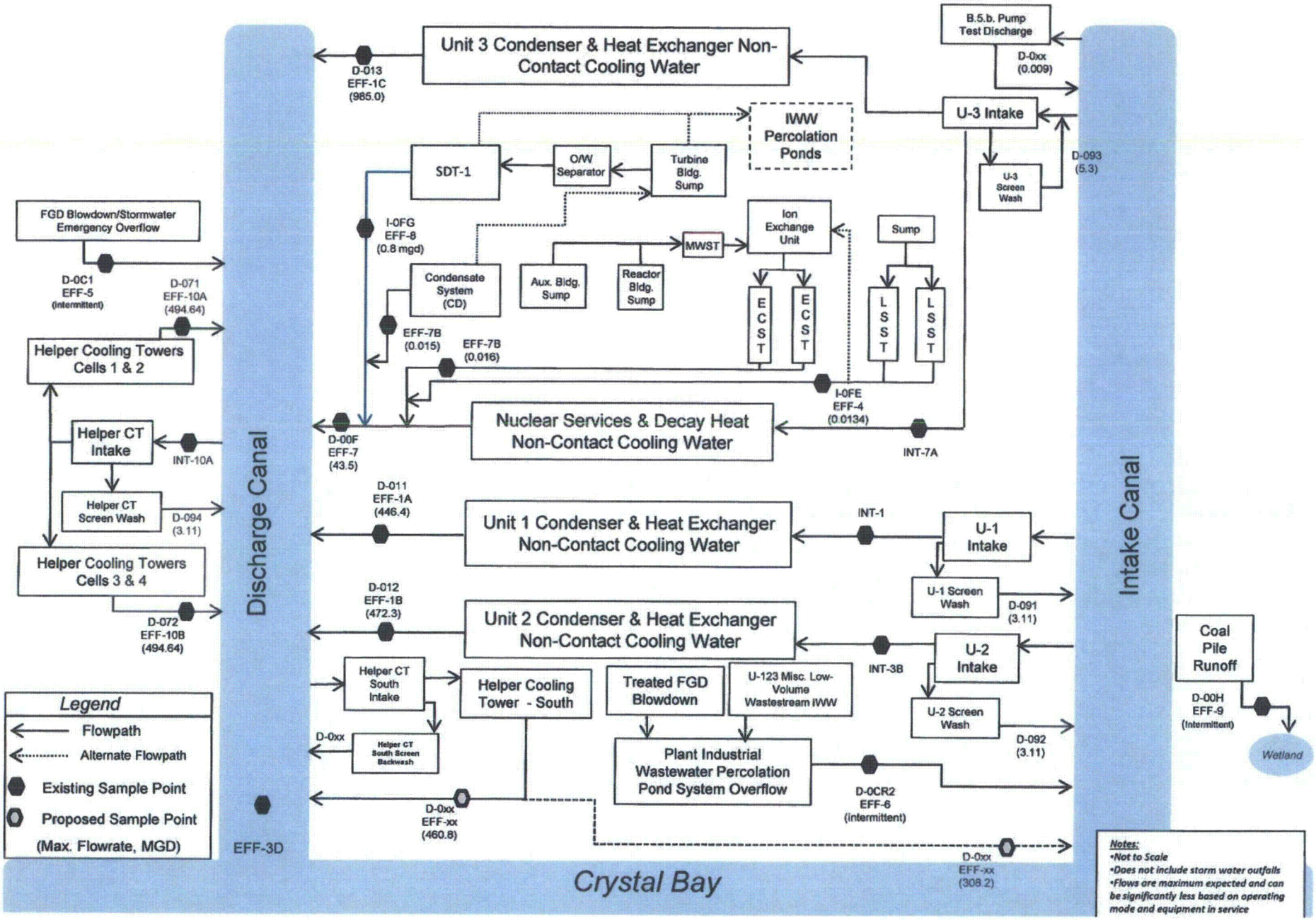
Progress Energy Florida, Inc. –Crystal River Units 1, 2, & 3

DEP File No. FL0000159-013-IW1S/NR

Attachment 5

Updated CR 123 Process Flow Diagram

Crystal River Units 1, 2, & 3 NPDES Flow Diagram – FL0000159



Progress Energy Florida, Inc. –Crystal River Units 1, 2, & 3

DEP File No. FL0000159-013-IW1S/NR

Attachment 6

CR 4&5 Clean Air Project Overview

CLEAN AIR PROJECT OVERVIEW
TRAINING MODULE

1 GENERAL OVERVIEW

1.1 FGD Operation

1.2 SCR Operation

2 PROJECT MODULES

2.1 Limestone Preparation
- *Operating Theory*
- *Equipment*

2.2 Absorber
- *Operating Theory*
- *Equipment*

2.3 Gypsum Preparation
- *Operating Theory*
- *Equipment*

2.4 Selective Catalytic Reduction
- *Operating Theory*
- *Equipment*

2.5 Urea/Ammonia Conversion
- *Operating Theory*
- *Equipment*

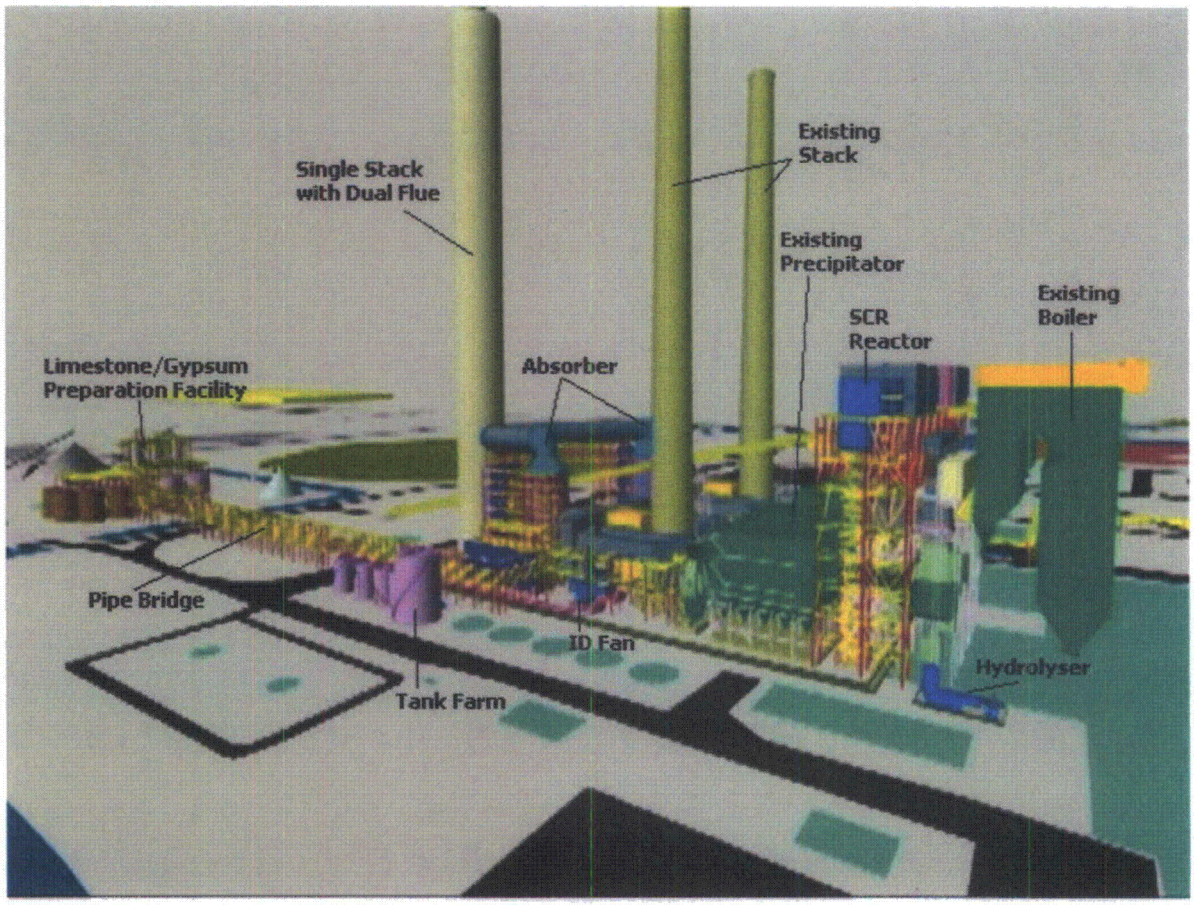
1 GENERAL OVERVIEW

The Clean Air Project consists of two (2) major systems: 1) Flue Gas Desulfurization (FGD) and 2) Selective Catalytic Reduction (SCR). The purpose of the FGD is to reduce the SO2 (sulfur component) of the boiler exit flue gas. The purpose of the SCR is to reduce the NOx (nitric oxide and nitrogen dioxide component) of the boiler exit flue gas. Low NOx burners, SO3 mitigation, coal pile liner, well water supply, access road modifications, and precipitator rebuild are all significant projects required to support the FGD and SCR project. This training module provides a general overview of the clean air project. Additional details are in the five specific PlantView training modules listed:

CA-1 Limestone Slurry Preparation
CA-2 Absorber
CA-3 Gypsum Preparation
CA-4 Selective Catalytic Reduction
CA-5 Urea / Ammonia Conversion

Figure 1 is a snap shot of a fly over of the 3D model video link on this page. You can access this video by clicking on the link below the figure.

FIGURE 1

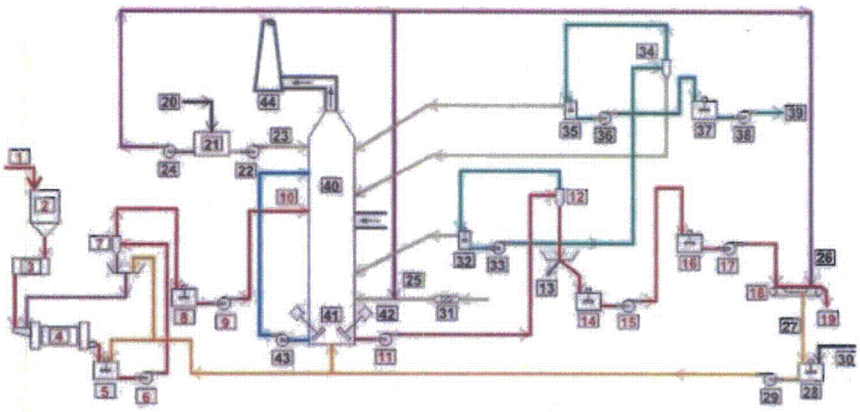


CR Clean Air Project Overview

1.1 FGD Operation

Figure 2 illustrates the mass balance diagram for the entire FGD process. The RED line illustrates the flow path from limestone to gypsum, starting with #1 and ending with #19.
The FGD process starts with receiving limestone that is ground into a slurry product (calcium carbonate). This is called the Limestone Preparation System. The limestone is used to quench the boiler exit flue gas while at the same time removing sulfur dioxide (SO2) from the flue gas. This SO2 removal occurs in the absorber module. Removing SO2 is the primary function of the absorber module. The cleaned flue gas is then discharged to the atmosphere through the associated gas stack flue. The SO2 that is removed from the flue gas mixes with the limestone slurry. The limestone slurry returns to the bottom of the absorber know as the Absorber Reaction Tank. Forced oxidation air is injected into the absorber reaction tank where "calcium sulfate", also known as "synthetic gypsum." is generated. Synthetic gypsum is commonly used to manufacture wallboard. The Gypsum Preparation System rinses and dewaters the synthetic gypsum for sale to a wallboard manufacturing company.

FIGURE 2



1. Limestone Conveyor Belt (1)
2. Limestone Silo (3 - 1/mill)
3. Limestone Silo Feeder (3 - 1/mill)
4. Limestone Ball Mill (3)
5. Limestone Ball Mill Slurry Tank (3 - 1/mill)
6. Limestone Ball Mill Slurry Pumps (6 - 2/mill)
7. Limestone Ball Mill Slurry Classifier (3 - 1/mill)
8. Limestone Slurry Storage Tank (2)
9. Limestone Slurry Feed Pumps (2)
10. Limestone Slurry Feed to Absorber
11. Absorber Bleed Pumps (2/unit)
12. Primary Hydrocyclone (1/unit)
13. Return to Absorber
14. Primary Hydrocyclone Underflow Tank (1/unit)
15. Primary Hydrocyclone Underflow Pumps (2/unit)
16. FGD Vacuum Filter Feed Tank (2)
17. FGD Vacuum Filter Feed Pumps (2)
18. FGD Vacuum Filter (2/unit)
19. To Gypsum Conveyor
20. Well Water Makeup Water to System
21. FGD Service Water Tank (1)
22. Mist Eliminator Wash Water Pumps (2)
23. Mist Eliminator Wash
24. FGD Service Water Pumps (2)
25. Oxidation Air Humidification Water
26. Gypsum Cake Wash Water
27. Filtrate Water
28. FGD Filtrate Tank (1/unit)
29. FGD Filtrate Pumps (2)
30. Well Water Makeup to FGD Filtrate Tank
31. Oxidation Air Blowers (3)

Limestone to Gypsum Flow Path
Filtrate Water
Flue Gas In / Flue Gas Out
FGD Service Water
Misc. Connections to Absorber
Limestone Slurry Re-grinding
Water/Solids Separation for Blowdown
Absorber Slurry Recycle

32. Primary Hydrocyclone Overflow Tank (1/unit)
33. Primary Hydrocyclone Overflow Pumps (2/unit)
34. Secondary Hydrocyclone (1/unit)
35. Secondary Hydrocyclone Overflow Tank (1/unit)
36. Secondary Hydrocyclone Overflow Pumps (2/unit)
37. FGD Blowdown Tank (1/unit)
38. FGD Blowdown Pumps (2/unit)
39. To Settling Pond for Disposal
40. Absorber (1/unit)
41. Absorber Reaction Tank
42. Absorber Agitators (7/unit)
43. Absorber Recycle Pumps (5/unit)
44. Chimney

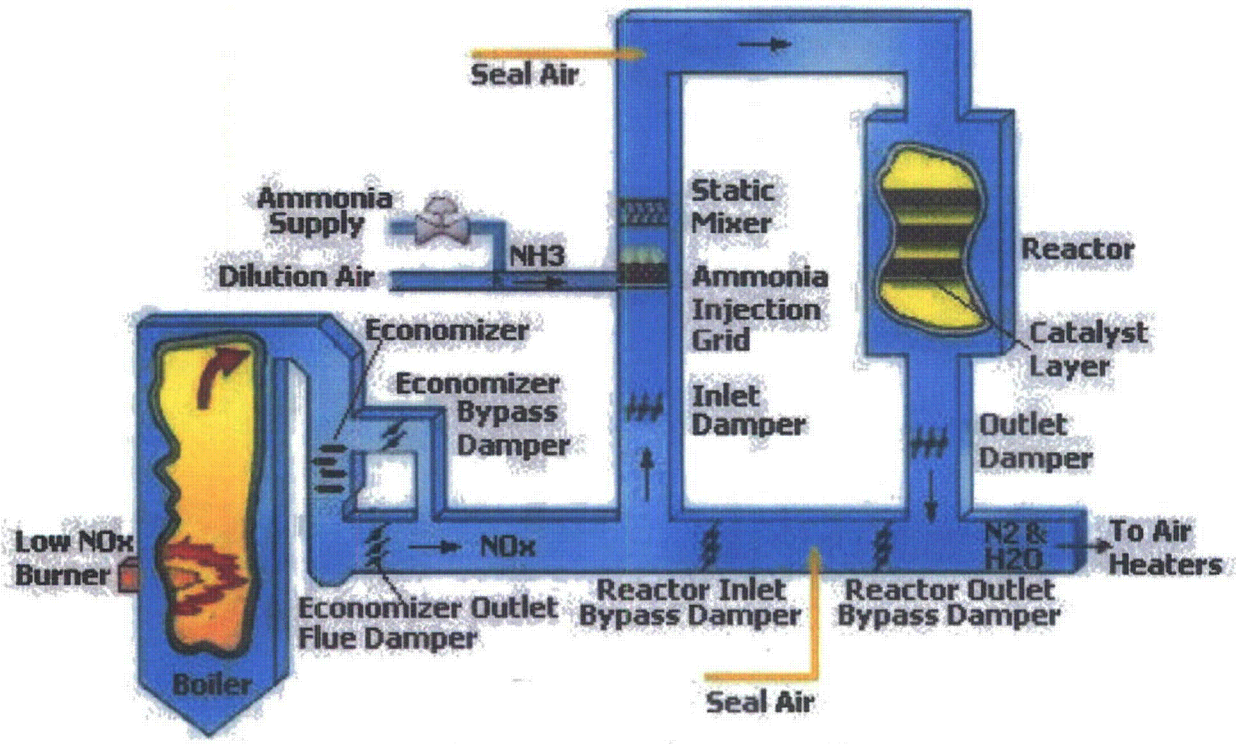
Equipment:

Equipment within the FGD process is composed of three (3) major areas: 1) Limestone Preparation Facility, 2) Absorber Island, and 3) Gypsum Preparation Facility. Generally speaking, a limestone unloading and storage facility, service water system, Dibasic Acid (DBA) system, tank farm, and waste water treatment process are needed to support the FGD process.

1.2 SCR Operation

Figure 3 is an illustration of the SCR system and gas flow.
Boiler exit flue gas enters the boiler economizer section. The flue gas temperature entering the reactor is critical to proper operation of the NOx reduction process. This operating temperature requirement is between approximately 630 - 750° F. At low loads the economizer outlet temperature can fall below the lower limit (630° F). During low loads, an economizer bypass duct and damper system will supply hot flue gas for mixing with the economizer exit gas to maintain the minimum flue gas temperature requirement at the reactor inlet. As flue gas flows out of the economizer, a baffle located at the economizer hopper outlet eliminates large particle ash (LPA) from being carried over and entering the reactor. As the flue gas flows from the economizer outlet to the inlet of the reactor, ammonia is injected into the flue gas stream. Static mixers are located downstream of the ammonia injection grid inside the flue gas duct to thoroughly mix the ammonia with the flue gas. Turning vanes are located inside the flue gas duct between the static mixers and the reactor inlet to provide even flue gas flow distribution through the reactor catalyst surface. As the ammonia treated flue gas flows through the reactor, it comes in contact with the honeycomb-type catalyst layers where the NOx reacts with the ammonia and is converted into nitrogen and water. This chemical reaction results in NOx reduction. The flue gas flow continues to the primary and secondary air heaters, precipitator, absorber and out the stack.
NOTE: The SCR process requires an ammonia source for NOx reduction. The ammonia source comes from liquid Urea which will be delivered to the CR North site and converted to ammonia gas for use in the SCR reactor.

FIGURE 3



Selective Catalytic Reduction (SCR)

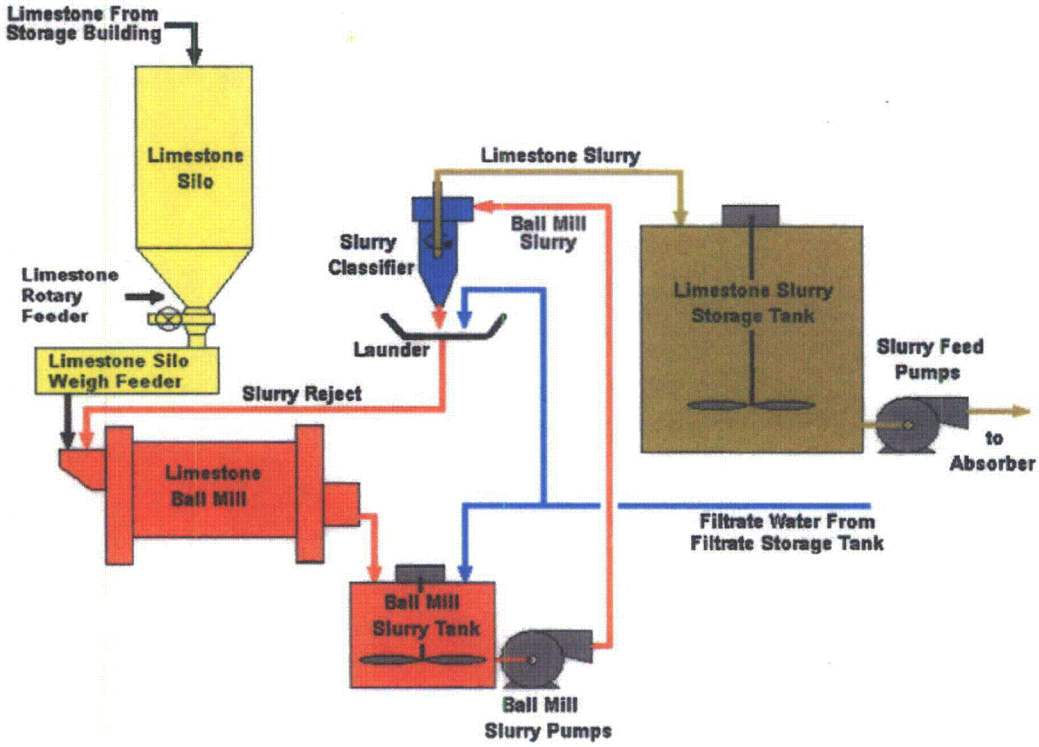
2 PROJECT MODULES

2.1 Limestone Preparation

Operating Theory

Figure 4 illustrates the Limestone Preparation system.
The purpose of the Limestone Preparation system is to receive and process limestone for use in the FGD absorber.
Limestone slurry (calcium carbonate) is needed in the absorber module operation as a reagent to feed the absorber reaction tank. Course limestone, ~ 2", is delivered to the CR North site. This material is unloaded and stored in a limestone storage building. This limestone is then conveyed to a crusher and crushed to ~ ¾", and then conveyed to a limestone silo. From there the limestone is metered utilizing a conveying belt feeder and fed to a horizontal ball mill. The mill grinds the limestone to a wet medium to produce the desired limestone slurry. This slurry is a mixture of limestone particles, 95% passing 325-mesh product, and water that is ~ 26% by weight by solids. The slurry is transported and temporarily stored in a limestone slurry storage tank. A slurry feed pump transports the slurry to each unit's absorber reaction tank.

FIGURE 4



Equipment

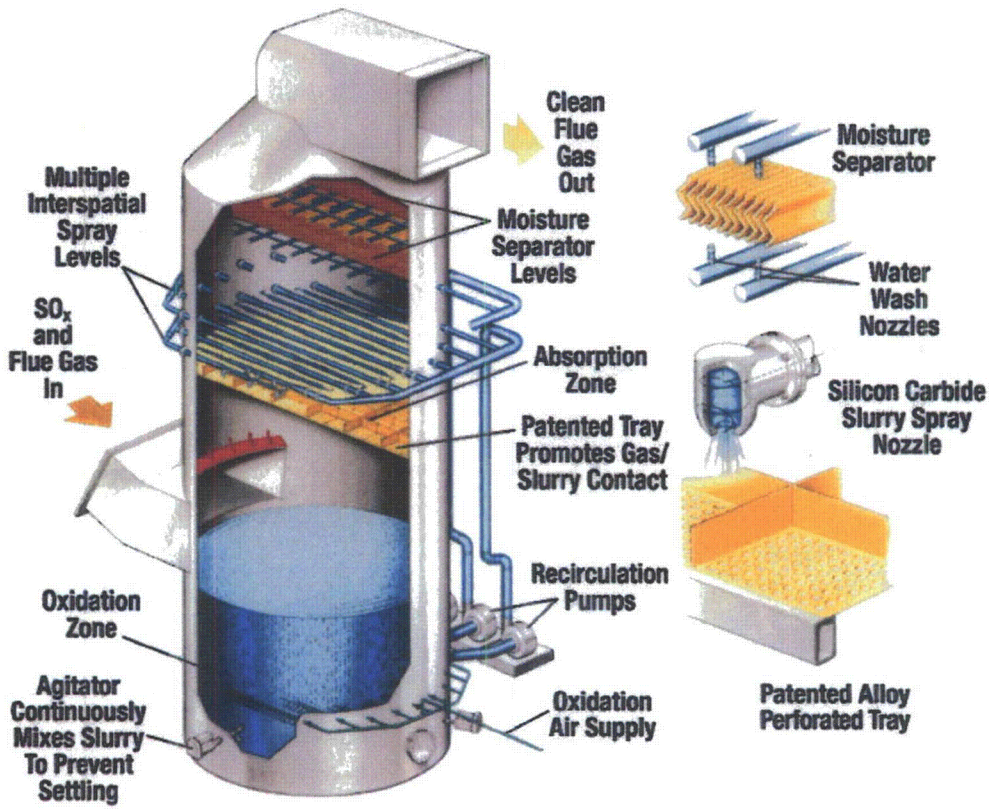
This system is a common system designed for Crystal River Units 4&5. Three (3) 74% capacity limestone milling system trains and associated equipment are provided. This capacity percentage is determined using design bases coal which is 5.5 LB SO2/MMBTU and <u>both</u> units 4 & 5 operating at continuous Overpressure Operation. The major components of the each milling train include the following: one (1) Limestone Silo, one (1) Limestone Rotary Feeder, one (l) Limestone Silo Weigh Feeder, one (1) Limestone Ball Mill with auxiliary equipment, one (1) Limestone Ball Mill Slurry Tank with Agitator, two (2) Limestone Ball Mill Slurry Pumps (1 operating, 1 stand-by), and one (1) Limestone Ball Mill Slurry Classifier.

2.2 Absorber

Operating Theory

Figure 5 illustrates the Absorber Module and its associated equipment.
The purpose of the Absorber Module is to remove SO2 from the boiler exit flue gas.
The absorber is designed to remove 97% of the SO2 from the flue gas while burning 5.5 LB SO2 / MMBTU coal. The absorber module quenches the boiler exit flue gas with limestone slurry by spraying the slurry downward as the flue gas flows upward, thus removing the sulfur dioxide (SO2) within the flue gas. The slurry that has absorbed the SO2 within the boiler flue gas falls to the lower section of the absorber module referred to as the "absorber reaction tank." Compressed air, referred to as "oxidation air" is injected in the reaction tank. A chemical reaction occurs when the limestone slurry comes in contact with the flue gas sulfur components. Ultimately this happens again as the oxidation air is injected in the reaction tank. The result of the chemical reaction between the sulfur dioxide component in the flue gas, the calcium carbonate in the limestone slurry, and forced oxidation air is the formation of "calcium sulfate", known as "synthetic gypsum." A portion of the limestone slurry containing the calcium sulfate is continuously removed from the reaction tank and is dewatered to obtain a 90% solids product. This product (synthetic gypsum) is then used to manufacture wallboard.

FIGURE 5



Equipment

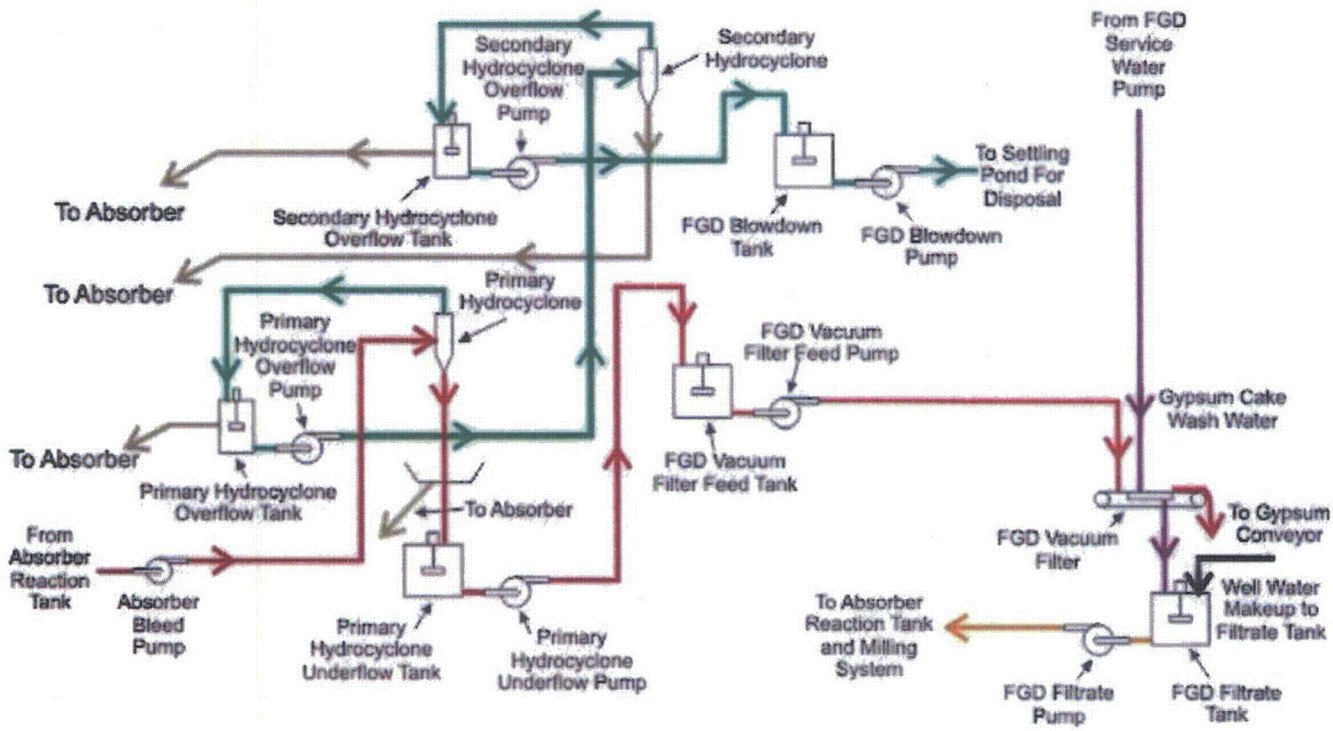
One (1) 100% capacity Absorber Module and associated equipment is provided for each unit. The major components of each Module include the following: five (5) Absorber Recycle (recirculation) Pumps, each with their designated piping headers and spray distribution nozzles, one (1) Perforated Absorber Tray, two (2) levels of Mist Eliminators, one (1) Reaction Tank which is the bottom portion of the Absorber Module, seven (7) Reaction Tank Agitators, two (2) Absorber Bleed Pumps, two (2) Absorber Limestone Slurry Feed Pumps and two (2) Absorber Blowdown Pumps.

2.3 Gypsum Preparation

Operating Theory

Figure 6 illustrates the Gypsum Preparation system.
The purpose of the Gypsum Preparation system is to support the operation of the Absorber Module by: 1) maintaining a chemical balance of the limestone slurry (calcium sulfate) within the absorber reaction tank, 2) prepare the slurry that is removed from the absorber reaction tank for sale as "synthetic gypsum." Calcium sulfate is also known as "synthetic gypsum".
As the absorber is in operation, a large percentage of the slurry in the absorber reaction tank is continuously removed. This slurry is rinsed and dewatered for use in the production of wallboard. For the gypsum to become wallboard grade, it is necessary to dewater the slurry to not less than 90% solids. As this process is taking place, a small amount of the solids within the slurry will become waste. This waste is discharged to the Waste Water Treatment Process.

FIGURE 6



Equipment

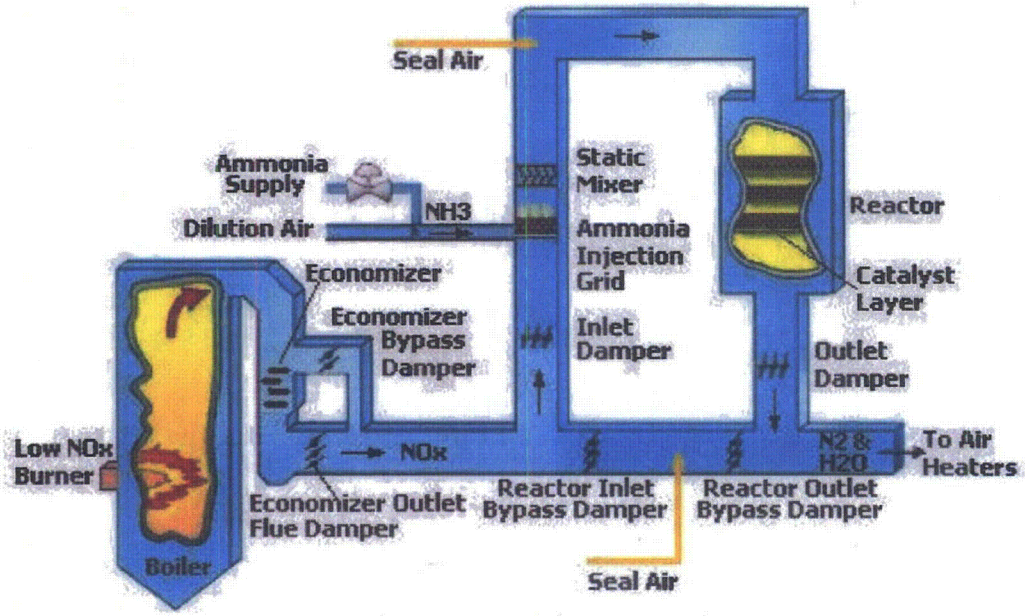
Gypsum dewatering is accomplished in two (2) stages. 1) A Primary Dewatering System is the first stage of water removal from the gypsum slurry produced in the Absorber. The major component of this system is the Primary Hydrocyclone, which dewaters the gypsum slurry bleed stream prior to feeding it to the Vacuum Filter for further dewatering. 2) A Secondary Dewatering System is the second and final stage of the gypsum slurry water removal process. The major component of this system is the Vacuum Filter which removes water from the Primary Hydrocyclone underflow slurry.

2.4 Selective Catalytic Reduction

Operating Theory

Figure 7 illustrates the SCR system.
The purpose of the Selective Catalytic Reduction (SCR) system is to reduce Nitrogen Oxide (NOx) in the boiler exit flue gas.
The design basis for the SCR system reducing NOx is 90% from the NOx value achieved with low NOx burners installed. The nitrogen contained in fossil fuels combines with oxygen during boiler combustion to create thermal NOx. When released to the atmosphere, the NOx (NO - Nitrogen Monoxide, NO2 - Nitrogen Dioxide) combine with available oxygen and water and forms nitric acid (HN03). The nitric acid returns to the earth in the form of acid rain, which is harmful to the environment. NO is the principal emitted NOx gas from high temperature combustion in air. NO2 is the lesser of the two emitted NOx gases from high temperature combustion in air. Within an SCR, the NOx in the flue gas reacts with ammonia in the reactor catalyst layers to form harmless N2 (molecular nitrogen) and H20 (water). The N2 and the H20 remain in the flue gas as it passes through the stack to the atmosphere. The result is reduced NOx emissions.

FIGURE 7



Selective Catalytic Reduction (SCR)

Equipment

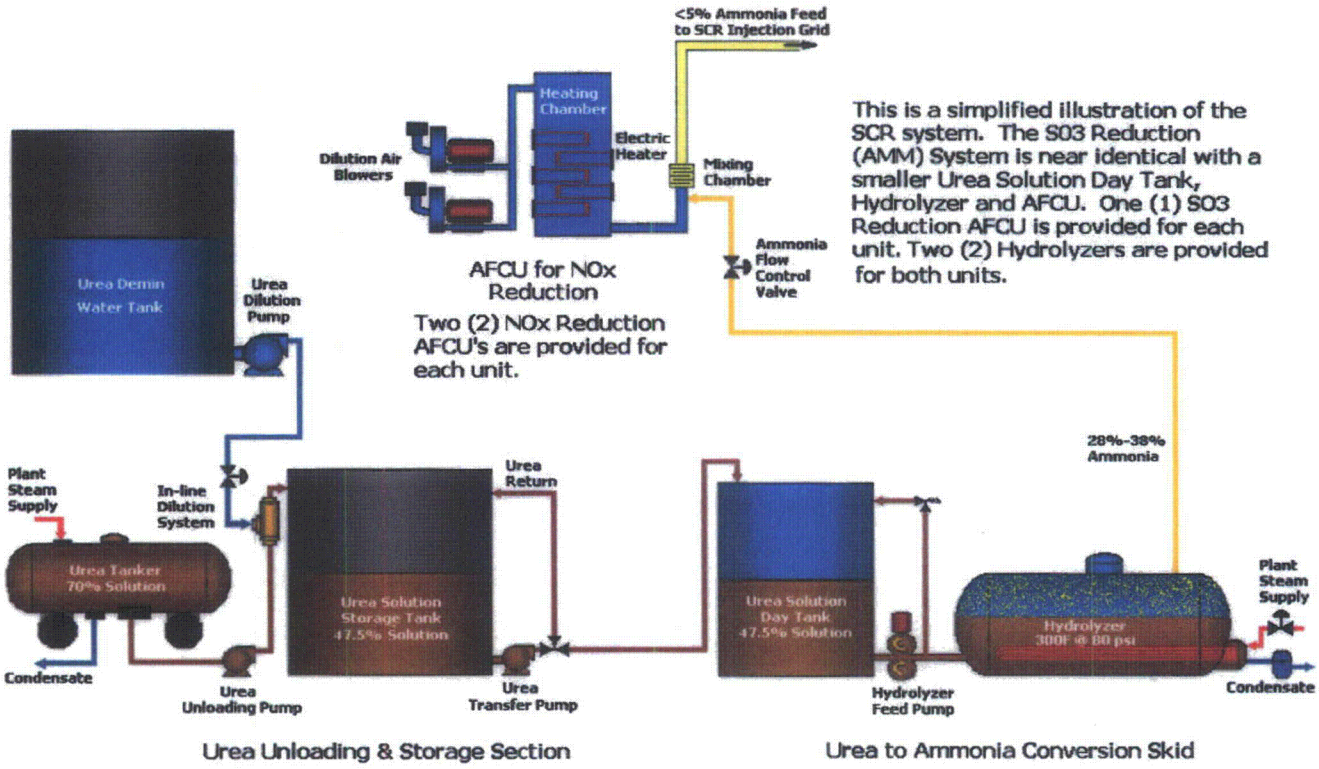
The SCR is a component / system within the Boiler Flue Gas System and is located between the economizer outlet and the air heaters.
The SCR system includes one (1) 100% capacity Reactor, Catalysts Elements, Ammonia Injection System, Sonic Horns, Reactor Inlet Dampers, Reactor Outlet Dampers, Reactor Bypass Dampers, Economizer Bypass Dampers, Reactor Seal Air, Static Mixers and Turning Vanes.

2.5 *Urea /Ammonia Conversion*

Operating Theory

Figure 8 illustrates the Urea /Ammonia Conversion process.
The purpose of the urea and the conversion of urea to ammonia is to supply the needs of the SCR reactor and the SO3 reduction system (AMM).
Urea is delivered by tanker, either by rail or truck, in a solution of 70%. While the urea tankers are on site, the urea temperature inside each tanker is maintained at approximately 140° F utilizing plant auxiliary steam. The 70% urea solution is pumped from the tanker(s) to the urea solution storage tank via a urea solution unloading pump. As the urea is unloaded, demineralized water is injected and mixed with the 70% urea solution to dilute the solution to a 47% solution. A urea solution transfer pump and heater provides continuous urea solution storage tank heating to maintain the 47% urea solution temperature at or slightly above 80° F, utilizing plant auxiliary steam. This same pump supplies the urea solution feed tank located at each units' hydrolyzer skid. The urea solution feed tank supplies the hydrolyzer. Utilizing plant auxiliary steam, the hydrolyzer converts the urea to ammonia gas of 28 - 38% ammonia concentration by volume. The ammonia gas in the two (2) 100% capacity SCR hydrolyzers, which are under pressure, supplies four (4) Ammonia Flow Control Units (AFCU). Two (2) AFCU's per unit supply ammonia gas to each unit's SCR system for NOx reduction. Two (2) separate 100% capacity hydrolyzers supply two (2) separate AFCU's, one for each unit, for injection of ammonia gas into the SCR exit gas stream for SO3 mitigation. The ammonia gas that is supplied to the areas mentioned contains less than 5% ammonia concentration by volume.

FIGURE 8



Equipment

Major systems in the urea to ammonia module are urea storage and handling, urea to ammonia conversion skids, and the ammonia flow control units for NOx and SO3 control.

Progress Energy Florida, Inc. –Crystal River Units 1, 2, & 3

DEP File No. FL0000159-013-IW1S/NR

Attachment 7

1st & 2nd Quarter, 2010 IWW Percolation Pond Sample Results

- Sample Point EFF-1 is the existing Units 123 IWW discharge
- Sample Point EFF-2 is the FGD treated blowdown discharge

Southern Analytical Laboratories, inc.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

Progress Energy Inc.
15760 West Power Line Street
Crystal River, FL 34428-

February 10, 2010
Project No: 98743

Laboratory Report

Project Name	Quarterly Land Application Analyses - Crystal River Site
Sample Description	EFF-1
Matrix	Wastewater
SAL Sample Number	98743.01
Date/Time Collected	01/18/10 11:17
Date/Time Received	01/18/10 16:20

Parameters	Units	Results	Method	Detection Limit	Date/Time Analyzed	Date/Time Prep	Analyst
Field Parameter							
Specific Conductance	umhos/cm	841	DEP FT1200	0.1	01/18/10 11:17		LRW
pH	SU	8.3	DEP FT1100	0.1	01/18/10 11:17		LRW
Inorganics							
Chloride	mg/l	29	EPA 300.0	0.05	01/19/10 15:26		VWC
Cyanide, Total	mg/l	0.005 U	SM 4500 CN	0.005	01/22/10 14:45	01/22/10 08:50	EPL
Hexane Extractable Material, Total	mg/l	1.3 U	EPA 1664A	1.3	01/23/10 13:00	01/22/10 10:00	SGF
Nitrate (as N)	mg/l	0.61	EPA 300.0	0.01	01/19/10 15:26		VWC
Total Dissolved Solids	mg/l	500	SM 2540C	10	01/21/10 12:00	01/19/10 10:35	JSB
Metals							
Arsenic	mg/l	0.0092	SM 3113B	0.001	01/22/10 10:18	01/21/10 11:10	SMW
Boron	mg/l	0.05 U	EPA 200.7	0.05	01/20/10 17:00		HWS
Beryllium	mg/l	0.0001 U	EPA 200.7	0.0001	01/20/10 17:00	01/20/10 12:40	HWS
Cadmium	mg/l	0.0020 I	EPA 200.7	0.001	01/20/10 17:00	01/20/10 12:40	HWS
Chromium	mg/l	0.004 U	EPA 200.7	0.004	01/20/10 17:00	01/20/10 12:40	HWS
Copper	mg/l	0.0065 I	EPA 200.7	0.003	01/20/10 17:00	01/20/10 12:40	HWS
Iron	mg/l	1.4	EPA 200.7	0.02	01/20/10 17:00	01/20/10 12:40	HWS
Mercury	mg/l	0.0001 U	EPA 245.1	0.0001	01/20/10 12:15	01/20/10 09:40	SMW
Sodium	mg/l	26	EPA 200.7	0.1	01/21/10 18:02		HWS
Nickel	mg/l	0.001 U	EPA 200.7	0.001	01/20/10 17:00	01/20/10 12:40	HWS
Lead	mg/l	0.001 U	EPA 200.7	0.001	01/20/10 17:00	01/20/10 12:40	HWS
Antimony	mg/l	0.01 U	EPA 200.7	0.01	01/20/10 17:00	01/20/10 12:40	HWS
Selenium	mg/l	0.05 U	EPA 200.7	0.05	01/20/10 17:00	01/20/10 12:40	HWS
Thallium	mg/l	0.005 U	EPA 200.7	0.005	01/20/10 17:00	01/20/10 12:40	HWS
Zinc	mg/l	0.043	EPA 200.7	0.003	01/20/10 17:00	01/20/10 12:40	HWS
Radiochemistry							
Gross Alpha (Incl. Uranium)	pCi/l	2.8±2.1 U1	EPA 00-02	2.8	02/02/10 08:11	02/01/10 09:00	JMK
Radium-226/228 Combined	pCi/l	1.0±0.07	Calculation	0.07	01/29/10 12:45	01/21/10 12:30	ARM
Radium-226	pCi/l	1.0±0.07	EPA 903.1	0.07	01/29/10 12:45	01/21/10 12:30	ARM
Radium-228	pCi/l	0.6±0.4 U1	EPA RA-05	0.6	01/28/10 11:49	01/21/10 12:30	JMK

FDOH Laboratory No. E84129
NELAP Accredited

Francis I. Daniels, Laboratory Director
Leslie C. Boardman, Q. A. Manager

Southern Analytical Laboratories, inc.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

Progress Energy Inc.
15760 West Power Line Street
Crystal River, FL 34428-

February 10, 2010
Project No: 98743

Laboratory Report

Project Name	**Quarterly Land Application Analyses - Crystal River Site**
Sample Description	**EFF-2**
Matrix	**Wastewater**
SAL Sample Number	**98743.02**
Date/Time Collected	**01/18/10 12:35**
Date/Time Received	**01/18/10 16:20**

Parameters	Units	Results	Method	Detection Limit	Date/Time Analyzed	Date/Time Prep	Analyst
Field Parameter							
Specific Conductance	umhos/cm	17,300	DEP FT1200	0.1	01/18/10 12:35		LRW
pH	SU	6.9	DEP FT1100	0.1	01/18/10 12:35		LRW
Inorganics							
Chloride	mg/l	6,600	EPA 300.0	0.05	01/21/10 00:00		VWC
Cyanide, Total	mg/l	0.034	SM 4500 CN	0.005	01/22/10 14:45	01/22/10 08:50	EPL
Hexane Extractable Material, Total	mg/l	1.3 U	EPA 1664A	1.3	01/23/10 13:00	01/22/10 10:00	SGF
Nitrate (as N)	mg/l	17	EPA 353.2	0.01	01/20/10 10:14		JSB
Total Dissolved Solids	mg/l	12,000	SM 2540C	10	01/21/10 12:00	01/19/10 10:35	JSB
Metals							
Arsenic	mg/l	0.0022 I	SM 3113B	0.001	01/22/10 10:18	01/21/10 11:10	SMW
Boron	mg/l	200	EPA 200.7	0.05	01/20/10 17:00		HWS
Beryllium	mg/l	0.0001 U	EPA 200.7	0.0001	01/20/10 17:00	01/20/10 12:40	HWS
Cadmium	mg/l	0.069	EPA 200.7	0.001	01/20/10 17:00	01/20/10 12:40	HWS
Chromium	mg/l	0.004 U	EPA 200.7	0.004	01/20/10 17:00	01/20/10 12:40	HWS
Copper	mg/l	0.053	EPA 200.7	0.003	01/20/10 17:00	01/20/10 12:40	HWS
Iron	mg/l	0.035 I	EPA 200.7	0.02	01/20/10 17:00	01/20/10 12:40	HWS
Mercury	mg/l	0.0001 U	EPA 245.1	0.0001	01/20/10 12:15	01/20/10 09:40	SMW
Sodium	mg/l	57	EPA 200.7	0.01	01/21/10 18:02		HWS
Nickel	mg/l	0.21	EPA 200.7	0.001	01/20/10 17:00	01/20/10 12:40	HWS
Lead	mg/l	0.01 U	EPA 200.7	0.01	01/20/10 17:00	01/20/10 12:40	HWS
Antimony	mg/l	0.056	EPA 200.7	0.01	01/20/10 17:00	01/20/10 12:40	HWS
Selenium	mg/l	0.31	EPA 200.7	0.05	01/20/10 17:00	01/20/10 12:40	HWS
Thallium	mg/l	0.005 U	EPA 200.7	0.005	01/20/10 17:00	01/20/10 12:40	HWS
Zinc	mg/l	0.30	EPA 200.7	0.003	01/20/10 17:00	01/20/10 12:40	HWS
Radiochemistry							
Gross Alpha (Incl. Uranium)	pCi/l	72±9.0	EPA 00-02	2.8	02/02/10 13:52	02/01/10 09:00	JMK
Radium-226/228 Combined	pCi/l	32±0.5	Calculation	0.6	01/29/10 12:45	01/21/10 12:30	ARM
Radium-226	pCi/l	29±0.3	EPA 903.1	0.11	01/29/10 12:45	01/21/10 12:30	ARM
Radium-228	pCi/l	2.8±0.5	EPA RA-05	0.6	01/28/10 11:49	01/21/10 12:30	JMK

FDOH Laboratory No. E84129
NELAP Accredited

Francis I. Daniels, Laboratory Director
Leslie C. Boardman, Q. A. Manager

Southern Analytical Laboratories, inc.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

Progress Energy Inc.
15760 West Power Line Street
Crystal River, FL 34428-

February 10, 2010
Project No: 98743

Laboratory Report

Footnotes

#	Questions regarding this report should be directed to Client Services at 813-855-1844.
*	Test results presented in this report meet all the requirements of the NELAC standards. Test results within this report relate only to these samples.
**	A statement of estimated uncertainty of test results is available upon request.
***	For methods marked with ***, all QC criteria have been met for this method which is equivalent to a SAL certified method.
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
U	Analyte was undetected. Indicated concentration is method detection limit.
U1	Analyte was not detected; indicated concentration is method detection limit. Radiochemistry MDL is sample specific and matrix dependent.

FDOH Laboratory No. E84129
NELAP Accredited

Approved By: **Francis I. Daniels, Laboratory Director**
Leslie C. Boardman, Q. A. Manager

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 98743

Client Name: Progress Energy, Inc.

Contact / Phone: Cyndy Wilkinson, Erika Tuchbaum-Biro, Doug Yowell

Project Name / Location: Quarterly Land Application Analyses - Crystal River Site

Samplers: (Signature) Zay Ward

Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	1LP, Cool 4°C TDS, Cl, conductivity, NO_3	250ml P, HNO_3 Sb, As, B, Be, Cd, Cu, Cr, Fe, Pb, Hg, Ni, Se, Na, Ti, Zn	250mL P, NaOH Cyanide	1/2 Gallon Jug, HNO_3 Gross alpha, Radium 226+228	1LG, HCl HEM (Total)	125mL G, HCl HEM (Total)			No. of Containers (Total per each location)
01	EFF-1	1/18	11:17	WW		X	1	1	1	1	1	1			6
02	EFF-2	↓	1235	WW		X	1	1	1	1	1	1			6

Sample 102: 2x1LP Cool
1-1gal P HNO_3
1-250mL P HNO_3
1-250mL P NaOH
4-125mL G HCl

Containers Prepared/ Relinquished:	Date/Time:	Received: Zay Ward	Date/Time: 1/19/10 0930
Relinquished: Zay Ward	Date/Time: 1/18/10 1620	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished:	Date/Time:	Received:	Date/Time:

Seal intact? Y N (N/A)
Samples intact upon arrival? (Y) N N/A
Received on ice? Temp_____ (Y) N N/A
Proper preservatives indicated? (Y) N N/A
Rec'd within holding time? (Y) N N/A
Volatiles rec'd w/out headspace? Y N (N/A)
Proper containers used? (Y) N N/A

Instructions / Remarks

Field Measurements: pH

Chain of Custody.xls
Rev.Date 11/19/01

Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 FAX 813-855-2218

WASTEWATER SAMPLING LOG

Client Name:	Progress Energy - Crystal River	Location:	EFF-1	Contact:	Cyndy Wilkinson
				Phone:	
Date of Sample:	1/18/10	SAL Project #	98743	Project Name:	Quarterly Land Application
SAL Audit Performed:	Y N	Auditor Name:		Client Representative on Site?	Y N
		Signature:		Rep. Name:	
				Signature:	

SAMPLE DATA

Sampled By:	SAL ~~Client~~	Compositor Belongs To:	~~SAL~~ ~~Client~~ N/A	COMP Bottle Belongs To:	~~SAL~~ ~~Client~~ N/A
Compositor ID:		Bottle ID			
Intake Tubing Type:	PP PE NP TL TT SI	IntakeTubing Lot:		Pump Tubing Lot:	

COMPOSITE DATA — Composite ID Number:

START	Date:		Time:	Compositor Set-up By:	
STOP	Date:		Time:	Compositor Picked-up By:	
Composite Type:	Time Flow Continuous		Collect Sample Every:	Minutes Gallons	
Calibrated Sample Volume:		mLs			
Programmed Number of Samples:		Actual Number of Samples Collected:			
Final Compositor Temperature:		°C	Ice Present in Compositor at Pick-up?	Yes No	

GRAB SAMPLE DATA — Grab ID Number: .01

Date Collected:	1/18/10	Time Collected:	11:17	Collected By:	[illegible]

FIELD PARAMETERS

PARAMETER	READING	UNITS	PERMIT LIMIT
pH	8.2	SU	
Temperature	19.1	°C	Report Only
Specific Conductance	841		
Preservation Checked in Field?	(Y) N	Checked By:	
List any Preservatives Added in Field:			
Comments:	Cloudy		
Sampler(s) Signature:	[illegible]	Date	1/18/10
		Date	
Reviewed By:		Date:	

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 FAX 813-855-2218

WASTEWATER SAMPLING LOG

Client Name:	Progress Energy - Crystal River	Location:	EFF-2	Contact:	Cyndy Wilkinson
				Phone:	
Date of Sample:	1/18/10	SAL Project #	98743	Project Name:	Quarterly Land Application

SAL Audit Performed:	Y N	Auditor Name:		Client Representative on Site?	Y N	Rep. Name:	
		Signature:				Signature:	

SAMPLE DATA

Sampled By:	SAL ~~Client~~	Compositor Belongs To:	~~SAL~~ ~~Client~~ N/A	COMP Bottle Belongs To:	~~SAL~~ ~~Client~~ N/A
Compositor ID:		Bottle ID			
Intake Tubing Type:	PP PE NP TL TT SI	IntakeTubing Lot:		Pump Tubing Lot:	

COMPOSITE DATA Composite ID Number:

START	Date:		Time:	Compositor Set-up By:	
STOP	Date:		Time:	Compositor Picked-up By:	
Composite Type:	Time Flow Continuous		Collect Sample Every:	Minutes Gallons	
Calibrated Sample Volume:		mLs			
Programmed Number of Samples:		Actual Number of Samples Collected:			
Final Compositor Temperature:		°C	Ice Present in Compositor at Pick-up?	Yes No	

GRAB SAMPLE DATA Grab ID Number: .02

Date Collected:	1/18/10	Time Collected:	12:35	Collected By:	CMJ

FIELD PARAMETERS

PARAMETER	READING	UNITS	PERMIT LIMIT
pH	6.9	SU	
Temperature	28.4	°C	Report Only
Specific Conductance	17,300		
Preservation Checked in Field?	Y N	Checked By:	
List any Preservatives Added in Field:			
Comments:			

Sampler(s) Signature:	Jay Ward	Date	1/18/10
		Date	
Reviewed By:		Date:	

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

Progress Energy Inc.
15760 West Power Line Street
Crystal River, FL 34428-

April 29, 2010
Project No: 100874

Laboratory Report

Project Name	Quarterly Land Application Analyses - Crystal River Site
Sample Description	EFF-1
Matrix	Wastewater
SAL Sample Number	100874.01
Date/Time Collected	04/12/10 08:45
Date/Time Received	04/12/10 15:44

Parameters	Units	Results	Method	Detection Limit	Date/Time Analyzed	Date/Time Prep	Analyst
Field Parameter							
Specific Conductance	umhos/cm	887	DEP FT1200	0.1	04/12/10 08:45		LRW
pH	SU	8.3	DEP FT1100	0.1	04/12/10 08:45		LRW
Inorganics							
Chloride	mg/l	34	EPA 300.0	0.05	04/13/10 23:14		MEJ
Cyanide, Total	mg/l	0.005 U	SM 4500 CN	0.005	04/15/10 11:00	04/14/10 14:40	EPL
Hexane Extractable Material, Total	mg/l	1.3 U	EPA 1664A	1.3	04/15/10 12:00	04/13/10 09:00	CDD
Nitrate (as N)	mg/l	2.2	EPA 300.0	0.01	04/13/10 01:03		MEJ
Total Dissolved Solids	mg/l	510	SM 2540C	10	04/19/10 16:25	04/16/10 10:40	EPL
Metals							
Arsenic	mg/l	0.018	SM 3113B	0.001	04/22/10 14:10	04/14/10 09:40	MKB
Boron	mg/l	0.05 U	EPA 200.7	0.05	04/15/10 08:29		HWS
Beryllium	mg/l	0.0001 U	EPA 200.7	0.0001	04/15/10 08:29	04/14/10 15:45	HWS
Cadmium	mg/l	0.0012 I	EPA 200.7	0.001	04/15/10 08:29	04/14/10 15:45	HWS
Chromium	mg/l	0.004 U	EPA 200.7	0.004	04/15/10 08:29	04/14/10 15:45	HWS
Copper	mg/l	0.018	EPA 200.7	0.003	04/15/10 08:29	04/14/10 15:45	HWS
Iron	mg/l	2.7	EPA 200.7	0.02	04/15/10 08:29	04/14/10 15:45	HWS
Mercury	mg/l	0.00018 I	EPA 245.1	0.0001	04/15/10 15:21	04/15/10 11:50	MKB
Sodium	mg/l	29	EPA 200.7	0.1	04/21/10 17:33		HWS
Nickel	mg/l	0.001 U	EPA 200.7	0.001	04/15/10 08:29	04/14/10 15:45	HWS
Lead	mg/l	0.001 U	EPA 200.7	0.001	04/15/10 08:29	04/14/10 15:45	HWS
Antimony	mg/l	0.01 U	EPA 200.7	0.01	04/15/10 08:29	04/14/10 15:45	HWS
Selenium	mg/l	0.05 U	EPA 200.7	0.05	04/15/10 08:29	04/14/10 15:45	HWS
Thallium	mg/l	0.005 U	EPA 200.7	0.005	04/15/10 08:29	04/14/10 15:45	HWS
Zinc	mg/l	0.0097 I	EPA 200.7	0.003	04/15/10 08:29	04/14/10 15:45	HWS
Radiochemistry							
Gross Alpha (Incl. Uranium)	pCi/L	2.5±2.0 U1	EPA 00-02	2.5	04/20/10 14:59	04/19/10 08:45	JMK
Radium-226/228 Combined	pCi/L	1.0±0.2	Calculation	0.14	04/23/10 07:30	04/15/10 14:30	ARM
Radium-226	pCi/L	1.0±0.2	EPA 903.1	0.14	04/22/10 14:53	04/15/10 14:30	ARM
Radium-228	pCi/L	0.6±0.4 U1	EPA RA-05	0.6	04/21/10 14:23	04/15/10 14:30	JMK

FDOH Laboratory No. E84129
NELAP Accredited

Francis I. Daniels, Laboratory Director
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110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

Progress Energy Inc.
15760 West Power Line Street
Crystal River, FL 34428-

April 29, 2010
Project No: 100874

Laboratory Report

Project Name	Quarterly Land Application Analyses - Crystal River Site
Sample Description	EFF-2
Matrix	Wastewater
SAL Sample Number	100874.02
Date/Time Collected	04/12/10 09:12
Date/Time Received	04/12/10 15:44

Parameters	Units	Results	Method	Detection Limit	Date/Time Analyzed	Date/Time Prep	Analyst
Field Parameter							
Specific Conductance	umhos/cm	16,700	DEP FT1200	0.1	04/12/10 09:12		LRW
pH	SU	7.4	DEP FT1100	0.1	04/12/10 09:12		LRW
Inorganics							
Chloride	mg/l	6,000	EPA 300.0	0.05	04/13/10 23:31		MEJ
Cyanide, Total	mg/l	0.005 U	SM 4500 CN	0.005	04/15/10 11:00	04/14/10 14:40	EPL
Hexane Extractable Material, Total	mg/l	1.3 U	EPA 1664A	1.3	04/15/10 12:00	04/13/10 09:00	CDD
Nitrate (as N)	mg/l	19	EPA 353.2	0.01	04/13/10 12:53		SMW
Total Dissolved Solids	mg/l	12,000	SM 2540C	10	04/19/10 16:25	04/16/10 10:40	EPL
Total Suspended Solids	mg/l	58	SM 2540D	1	04/19/10 17:00	04/16/10 12:30	EPL
Metals							
Arsenic	mg/l	0.001 U	SM 3113B	0.001	04/22/10 14:10	04/14/10 09:40	MKB
Boron	mg/l	190	EPA 200.7	0.05	04/22/10 18:04		HWS
Beryllium	mg/l	0.0001 U	EPA 200.7	0.0001	04/15/10 08:29	04/14/10 15:45	HWS
Cadmium	mg/l	0.070	EPA 200.7	0.001	04/15/10 08:29	04/14/10 15:45	HWS
Chromium	mg/l	0.048	EPA 200.7	0.004	04/15/10 08:29	04/14/10 15:45	HWS
Copper	mg/l	0.052	EPA 200.7	0.003	04/15/10 08:29	04/14/10 15:45	HWS
Iron	mg/l	0.48	EPA 200.7	0.02	04/15/10 08:29	04/14/10 15:45	HWS
Mercury	mg/l	0.11	EPA 245.1	0.0001	04/15/10 15:21	04/15/10 11:50	MKB
Sodium	mg/l	42	EPA 200.7	0.01	04/21/10 17:33		HWS
Nickel	mg/l	0.19	EPA 200.7	0.001	04/15/10 08:29	04/14/10 15:45	HWS
Lead	mg/l	0.01 U	EPA 200.7	0.01	04/15/10 08:29	04/14/10 15:45	HWS
Antimony	mg/l	0.045	EPA 200.7	0.01	04/15/10 08:29	04/14/10 15:45	HWS
Selenium	mg/l	1.9	EPA 200.7	0.05	04/15/10 08:29	04/14/10 15:45	HWS
Thallium	mg/l	0.005 U	EPA 200.7	0.005	04/15/10 08:29	04/14/10 15:45	HWS
Zinc	mg/l	0.18	EPA 200.7	0.003	04/15/10 08:29	04/14/10 15:45	HWS
Radiochemistry							
Gross Alpha (Incl. Uranium)	pCi/L	110±5.3	EPA 00-02	2.5	04/21/10 16:10	04/19/10 08:45	JMK
Radium-226/228 Combined	pCi/L	50±0.9	Calculation	0.7	04/23/10 07:30	04/15/10 14:30	ARM
Radium-226	pCi/L	46±0.9	EPA 903.1	0.19	04/22/10 14:53	04/15/10 14:30	ARM
Radium-228	pCi/L	3.6±0.6	EPA RA-05	0.7	04/21/10 14:23	04/15/10 14:30	JMK

FDOH Laboratory No. E84129
NELAP Accredited

Francis I. Daniels, Laboratory Director
Leslie C. Boardman, Q. A. Manager

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

Progress Energy Inc.
15760 West Power Line Street
Crystal River, FL 34428-

April 29, 2010
Project No: 100874

Laboratory Report

Footnotes

#	Questions regarding this report should be directed to Client Services at 813-855-1844.
*	Test results presented in this report meet all the requirements of the NELAC standards. Test results within this report relate only to these samples.
**	A statement of estimated uncertainty of test results is available upon request.
***	For methods marked with ***, all QC criteria have been met for this method which is equivalent to a SAL certified method.
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
U	Analyte was undetected. Indicated concentration is method detection limit.
U1	Analyte was not detected; indicated concentration is method detection limit. Radiochemistry MDL is sample specific and matrix dependent.

FDOH Laboratory No. E84129
NELAP Accredited

Approved By: **Francis I. Daniels, Laboratory Director**
Leslie C. Boardman, Q. A. Manager

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

SAL Project No. 100874

Client Name: Progress Energy, Inc.

Contact / Phone: Cyndy Wilkinson, Erika Tuchbaum-Biro, Doug Yowell

Project Name / Location: Quarterly Land Application Analyses - Crystal River Site

Samplers: (Signature) Lucy Ward

Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water

PARAMETER / CONTAINER DESCRIPTION

SAL Use Only Sample No.	Sample Description	Date	Time	Matrix	Composite	Grab	1LP, Cool 4°C TDS, Cl, conductivity, NO_3	250ml P, HNO_3 Sb, As, B, Be, Cd, Cu, Cr, Fe, Pb, Hg, Ni, Se, Na, Tl, Zn	250mL P, NaOH Cyanide	1/2 Gallon Jug, HNO_3 Gross alpha, Radium 226+228	1LG, HCl HEM (Total)	125mL G, HCl HEM (Total)			No. of Containers (Total per each location)
01	EFF-1	4/12/10	0845	WW		X	1	1	1	1	1	1			6
02	EFF-2	↓	0912	WW		X	1	1	1	1	1	1			6

Containers Prepared/ Relinquished:	Date/Time:	Received:	Date/Time:
HH	4-8-10 1045	Lucy Ward	4/11/10 0800
Lucy Ward	4/12/10 1344		

Seal intact? Y N N/A

Samples intact upon arrival? Y N N/A

Received on ice? Temp - ____ Y N N/A

Proper preservatives indicated? Y N N/A

Rec'd within holding time? Y N N/A

Volatiles rec'd w/out headspace Y N N/A

Proper containers used? Y N N/A

Instructions / Remarks

Field Measurements: pH

EFF-2 - add TSS

Chain of Custody.xls
Rev.Date 11/10/01

Chain of Custody

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 FAX 813-855-2218

WASTEWATER SAMPLING LOG

Client Name:	Progress Energy - Crystal River	Location:	EFF-1	Contact: / Phone:	Cyndy Wilkinson
Date of Sample:	4/12/10	SAL Project #	100874	Project Name:	Quarterly Land Application
SAL Audit Performed:	Y N	Auditor Name: / Signature:		Client Representative on Site?	Y N — Rep. Name: / Signature:

SAMPLE DATA

Sampled By:	SAL ~~Client~~	Compositor Belongs To:	~~SAL~~ ~~Client~~ N/A	COMP Bottle Belongs To:	~~SAL~~ ~~Client~~ N/A
Compositor ID:		Bottle ID			
Intake Tubing Type:	PP PE NP TL TT SI	IntakeTubing Lot:		Pump Tubing Lot:	

COMPOSITE DATA — Composite ID Number:

START	Date:		Time:	Compositor Set-up By:	
STOP	Date:		Time:	Compositor Picked-up By:	
Composite Type:	Time Flow Continuous		Collect Sample Every:	Minutes Gallons	
Calibrated Sample Volume:		mLs			
Programmed Number of Samples:		Actual Number of Samples Collected:			
Final Compositor Temperature		°C	Ice Present in Compositor at Pick-up?	Yes No	

GRAB SAMPLE DATA — Grab ID Number: 01

Date Collected:	4/12/10	Time Collected:	0845	Collected By:	cw

FIELD PARAMETERS

PARAMETER	READING	UNITS	PERMIT LIMIT
pH	8.3	SU	
Temperature	20.1	°C	Report Only
Specific Conductance	887		
Preservation Checked in Field?	Y N	Checked By:	cw
List any Preservatives Added in Field:			
Comments:			
Sampler(s) Signature:	Zay Wood	Date	4/12/10
		Date	
Reviewed By:		Date:	

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 FAX 813-855-2218

WASTEWATER SAMPLING LOG

Client Name:	Progress Energy - Crystal River	Location:	EFF-2	Contact: / Phone:	Cyndy Wilkinson
Date of Sample:	4/12/10	SAL Project #	100874	Project Name:	Quarterly Land Application
SAL Audit Performed:	Y N	Auditor Name: / Signature:		Client Representative on Site?	Y N — Rep. Name: / Signature:

SAMPLE DATA

Sampled By:	SAL ~~Client~~	Compositor Belongs To:	~~SAL~~ ~~Client~~ N/A	COMP Bottle Belongs To:	~~SAL~~ ~~Client~~ N/A
Compositor ID:		Bottle ID			
Intake Tubing Type:	PP PE NP TL TT SI	IntakeTubing Lot:		Pump Tubing Lot:	

COMPOSITE DATA — Composite ID Number:

START	Date:	Time:		Compositor Set-up By:	
STOP	Date:	Time:		Compositor Picked-up By:	
Composite Type:	Time Flow Continuous	Collect Sample Every:		Minutes Gallons	
Calibrated Sample Volume:		mLs			
Programmed Number of Samples:		Actual Number of Samples Collected:			
Final Compositor Temperature:		°C	Ice Present in Compositor at Pick-up?	Yes No	

GRAB SAMPLE DATA — Grab ID Number: 02

Date Collected:	4/12/10	Time Collected:	0912	Collected By:	CW

FIELD PARAMETERS

4/12/10

PARAMETER	READING	UNITS	PERMIT LIMIT
pH	~~1672~~ 7.4	SU	
Temperature	22.4	°C	Report Only
Specific Conductance	1470		
Preservation Checked in Field?	(Y) N	Checked By:	CW
List any Preservatives Added in Field:			
Comments:	CLEAN		
Sampler(s) Signature:	Gary Wind	Date	4/12/10
		Date	
Reviewed By:		Date:	

Progress Energy Florida, Inc. –Crystal River Units 1, 2, & 3

DEP File No. FL0000159-013-IW1S/NR

Attachment 8

CR 123 BMP (SWPPP)

CRYSTAL RIVER UNITS 1,2,3

Storm Water Pollution Prevention and Best Management Practices Plan

Rev. 5 – August 2009

Plan Summary

Consistent with provisions set forth in the Clean Water Act, this Best Management Practices (BMP) Plan Storm Water Pollution Prevention Plan (SWP3) has been developed in compliance with National Pollutant Discharge Elimination System (NPDES) Permit No. FL0000159 and the Multi-Sector General Permit for Steam Electric Generating Facilities. The plan acts as a supplemental control to the NPDES permit effluent limitations guidelines, and serves to improve water quality by stipulating actions or procedures to prevent or minimize the potential for release of pollutants to waters of the United States and minimize and control pollutants in stormwater discharges.

The development of the Plan included a review of existing programs and procedures, a site assessment to identify potential sources and pathways for uncontrolled pollutant and stormwater discharges to waters of the United States. Management Practices and controls have been developed as a result of the site assessment and review of existing programs. These include:

1. Revision of existing programs and procedures, which are incorporated as part of the Plan, to reflect current conditions/requirements.

2. Management of site stormwater to minimize the possibility of offsite discharges of pollutants to Waters of the U.S.

3. Periodic evaluation of the effectiveness of the plan.

With the completion of these measures, Crystal River 1, 2, & 3 Plants will have endeavored to minimize or eliminate the potential of an improper discharge from its ancillary areas and activities and minimize and control pollutants in stormwater discharges.

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F. Designated Areas of Responsibility
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H. Crystal River Units 1, 2, and 3 NPDES Flow Diagram

SWP3 and BMP Plan

1.0 Introduction

BMP On May 1, 1995, National Pollutant Discharge Elimination System (NPDES) Permit No. FL0000159 became effective for the Florida Power's Crystal River Units 1, 2 and 3 Plant. Part VI of the NPDES Permit requires the implementation of a Best Management Practices (BMP) Plan as soon as practicable but not later than six months after the effective date of this permit. BMP requirements have been included in subsequent NPDES Permit renewals. The most recent NPDES permit became effective May 9, 2005.

SWP3 On September 29, 1995, the NPDES Multi-Sector Permit for Industrial Activities became effective for the Florida Power's Crystal River Units 1,2 and 3. Part VIII, O requires the development and implementation of a Stormwater Pollution Prevention Plan (SWP3) by September, 1996.

The development and implementation of the Plan in conjunction with the conditions of the above referenced NPDES Permits are designed to reduce pollutants of concern that could discharge to navigable waters via stormwater discharge or uncontrolled spills. The plan should address all activities that could or do contribute pollutants to surface water discharge, including storm water, water and waste treatment and plant ancillary activities. All components of this plan will not necessarily apply to all units.

2.0 Best Management/Stormwater Pollution Plan Requirements

Best management practices are procedures and/or programs which are implemented by an industry to provide pollution control, safety, industrial hygiene, fire protection, employee training and site management. The benefits to be attained through the establishment of BMPs include:

- Protection of employees,
- Reduction/elimination of adverse environmental impacts,
- Reduction in costs associated with spill cleanup,
- Compliance with applicable state and federal regulations,
- Education in the potential to discharge significant materials and/or pollutants of concern to surface waters via stormwater discharge, and
- Increased overall efficiency of the Crystal River Units 1, 2 and 3 Plant ancillary operations/procedures.

This BMP Plan is designed to prevent or minimize the potential for the release of significant amounts of pollutants to waters of United States from activities and areas which are ancillary to the operation of the Crystal River Units 1,2 and 3 Plant. The designated pollutants of concern in the BMP Plan are:

- Materials such as solvents and detergents,
- Fertilizers, pesticides, and waste products (ashes, slag and sludge),
- Oil, as defined by Section 311 of the Clean Water Act,
- Substances listed as toxic under Section 307(a)(1) of the Clean Water Act,
- Substances listed as hazardous under Section 311 of the Clean Water Act, and
- Chemicals required to be reported under Section 313 of EPCRA.

The types of ancillary activities and areas addressed by the BMP are:

- Material storage areas,
- Plant site runoff,
- In-plant transfer, material handling and process areas,
- Loading and unloading operations, and sludge and waste disposal areas,
- Oil-filled transformers,
- Coal pile storage areas, and
- General good housekeeping practices in all areas.

The Plan identifies and evaluates the risk of oil and other toxic or hazardous substances, and significant materials from any of the ancillary industrial operations at the Crystal River Units 1, 2 and 3 Plant, being discharged into navigable waters as a result of spillage, leaks, drainage, stormwater runoff and/or sludge and waste disposal practices.

The Plan was developed in accordance with the following:

- Crystal River Units 1, 2 and 3 NPDES Permit-FL0000159-009, Part VII.D "Specific Conditions Related to Best Management Practices / Pollution Control Conditions".
- Criteria and Standards for BMPs, 40 CFR Part 122.44(k).
- NPDES Stormwater Multi-Sector General Permit for Industrial Activities, FR Vol 60, No. 189, VIII, O.

3.0 BMP/Pollution Prevention Committee

In order to develop an effective plan, a BMP committee was assembled to provide representation from each Progress Energy - Florida department affected by the plan. Individuals were selected based on their knowledge of the Crystal River Units 1, 2 and 3 Plant facilities and procedures, experience with toxic and hazardous materials and familiarity with pertinent environmental regulations.

The BMP/Pollution Prevention Committee is comprised of the following persons:

Erika Tuchbaum-Biro	-	Crystal River Fossil Plant
Cyndy Wilkinson	-	Crystal River Fossil Plant
Brandon Barr	-	Crystal River Unit 3
Ron Johnson	-	Crystal River Unit 3 Major Projects
Doug Yowell	-	Environmental Health & Safety Services

4.0 Description of Crystal River Units 1,2,3 Plant Facilities

The Crystal River site is known as the Crystal River Energy Complex (CREC) and contains 5 power generating units. Units 1 and 2 (also known as Crystal River South) are coal fired and are adjacent to Unit 3, which is nuclear powered, and have a total generating capacity of 1854 MW. Units 1, 2, and 3 are permitted under the same NPDES permit. Units 4 and 5 (also known as Crystal River North) are also coal fired, but are permitted under a separate NPDES permit.

Units 1, 2 and 3 are located on the Gulf of Mexico, approximately five miles west of U.S. Highway 19 at Crystal River, Florida (See Appendix C: Crystal River Energy Complex Vicinity Map). These units utilize water from the Gulf of Mexico for cooling via a common intake canal, which is an earthen structure. The cooling water is discharged to the discharge canal, also an earthen structure, which is routed back to the Gulf of Mexico. Helper-cooling towers pull some water from the discharge canal to cool the water before it enters the Gulf. Unit 3 is built on a berm capable of withstanding storm surge from the maximum probable hurricane.

NPDES Permit No. FL0000159 authorizes the following outfalls, which are described in more detail in the permit. See Appendix H: Crystal River Units 1, 2, and 3 NPDES Flow Diagram for a summary of outfall flow paths.

Effluent Outfall No.	Description
D-011	Once through cooling water (Unit 1)
D-012	Once through cooling water (Unit 2)
I-0FE	Laundry and Shower Sump Tank (Unit 3)
D-0C1	South Ash Pond
D-013	Once through cooling water (Unit 3)
D-00F	Nuclear Services and Decay Heat Seawater System (Unit 3)
I-0FG	Regeneration Waste Neutralization Tank (Unit 3)
D-00H	Coal Pile Runoff
D-0C2	North Ash Pond
D-091	Intake Screen Backwash
D-092	Intake Screen Backwash
D-093	Intake Screen Backwash
D-071	Helper Cooling Tower
D-072	Helper Cooling Tower
D-094	HCT Intake Screen Backwash

NPDES Permit No. FL0000159 also authorizes the discharge of stormwater from plant areas to the site intake and discharge canals via outfalls D-100, D-200, D-300, D-400, D-500, and D-600. Stormwater outfall locations are shown on the aerial map of Appendix D.

5.0 Description of Potential Pollutant Sources (stormwater outfall locations)

Site assessments of the stormwater outfalls and drainage basins were conducted to evaluate impervious and pervious areas and significant materials exposed to stormwater and activities within the basins that may contribute pollutants to the stormwater discharge. A vicinity map of the CREC is in Appendix C and a map showing the storm water basins for CR 1, 2, 3 can be found in Appendix E.

5.1 Outfall Basin Inventory

Table 5.1 contains a description of each storm water outfall located on the CR 1, 2, and 3 site including potential pollutant sources within the associated basin.

Table 5.1 Outfall/Basin Inventory for Units 1, 2, and 3

Permit ID Number[1]	Outfall / Basin Number[2]	Basin Description	Receiving Water	Type of Discharge	Description of Outfall	Potential Pollutant Sources
D-100	**CRS1** (002)	CR #3 building CR #3 parking area	Discharge Canal	Stormwater	42" CMP	Vehicle Traffic
D-200	**CRS2** (003)	CR #3 building	Discharge Canal	Stormwater	42" CMP	Vehicular Traffic Miscellaneous Activities
NA	004 N/A	CR #1 and 2 parking area	Discharge Canal	Stormwater	Drainage Ditch REMOVED	Vehicle Traffic Parking Area
D-300	**CRS3** (005)	CR #1 and 2 parking area	Discharge Canal	Stormwater	24 " RCP	Used oil staging & other wastes Maintenance equipment storage Mobile equip. storage Metal storage Vehicle traffic
D-400	**CRS4** (006)	CR #1 roof drains CR #1 parking area	Discharge Canal	Stormwater	24" RCP	Vehicle traffic Equip. staging Fly ash vehicle traffic
D-500	**CRS5** (007)	CR #2 roof drains	Discharge Canal	Stormwater	24" RCP	Vehicle traffic Fly Ash vehicle traffic Bottom ash run off
NA	008 N/A	Water treatment building	Percolation Pond	Stormwater	#4 Sump	Chemical Storage Waste water storage Vehicle Traffic
D-600	**CRS6** (009)	So side of CR#3 Ea side of CR#1	Intake Canal	Stormwater	42" CMP	Vehicle traffic Material storage Intake area
NA	Discharge Canal	Storm Water System	Storm drains to discharge canal	Storm water, ground water with periodic qualitative or quantitative analyses	Storm drain	Cable Vault water
NA	Discharge Canal	Plant Access Road Ditch, North Side of CR3	Discharge Canal	Storm water, ground water, Mari culture Center (Dept. of Agriculture)	Drainage Ditch on North Side of CR3	Vehicle Traffic, Storm Water, Ground Water

Notes:
N/A - SWP3 no longer applicable to outfall.
1 – Outfall designation in NPDES Permit No. FL0000159-009
2 – Outfall designations from previous BMP plans and/or as identified in NPDES Multi-Sector General Permit submittal to the FDEP.

5.2 Site Evaluation Summary (See Appendix G for area locations)

Percolation Pond System

The percolation pond system includes an evaporation/percolation pond system and groundwater monitoring wells to ensure system efficiency. Should oil or pollutants enter the plant drain system, it would be removed from the various sumps and discharged to the evaporation/percolation ponds with no discharge to area surface waters. The evaporation/percolation pond is designed to contain a 10-year/24 hour storm event with no overflow to surface waters.

Unit 1 and 2 Material Storage Area

The area east of Units 1 and 2, next to the machine shop, is used as a miscellaneous storage area by the plant and Material and Stores. Miscellaneous pieces of equipment may be located in this area. Several storm drains are located here and the potential for equipment and material that is stored in this area to contaminate stormwater runoff is high. Plant staff has been instructed to minimize material storage in this area at all times. Additionally, used oils and other waste liquids are staged on container pallets which provide secondary containment in the event leakage occurs.

Oil Tank Storage Warehouses

There are four decommissioned oil tanks located west of Units 1 and 2. Two of these oil tanks have been modified and are now used as material/equipment storage warehouses. These can be used to store equipment and new 55 gallon drums of oil. (The remaining tanks serve as fly-ash storage tank and spare water tank, respectively).

Unit 3 Chemical Warehouse

The Chemical Warehouse is located east of Unit 3. The warehouse is used to store chemicals that are routinely used for plant activities, such as 55 gallon drums of various chemicals and lubricating oil. The drums are stored in an area with concrete curb secondary containment capable of holding the contents of at least one of these drums if it were to spill. There are also other various chemicals in smaller containers stored here. The Chemical Warehouse is a well structured building with its contents not being exposed to stormwater. The potential of a spill making it to the storm drains is low.

Unit 3 Issue Warehouse

The Issue Warehouse is used to store products that are routinely used for plant activities. These products are stored indoors in a well structured building not exposed to stormwater. Spills are not expected to occur in this building since the products are of solid form.

Unit 3 Receiving Warehouse

When products are shipped to the site, they must first be processed at the Receiving Warehouse. There are some chemicals temporarily stored in this warehouse, but the duration of storage is typically a few days. This is a well structured building with its contents not being exposed to stormwater.

Unit 1 and 2 Waste Water Neutralization Tank

The wastewater neutralization tank is located to the south of the Water Treatment Plantadjacent to the intake canal. The wastewater neutralization tank has redundant level controls and a high level alarm to minimize the possibility of an overflow. Additionally, the area adjacent to the intake canal has a concrete containment wall surrounding the area, thereby, eliminating the potential of spills in these areas impacting surface waters. The waste water line from the waste neutralization tank and low conductivity tank runs underground south and then west of the water tank area. This line on occasion has leaked causing surface emanations of treated waste water which could result in a discharge to the site intake canal.

Sewage Treatment Plant

The sewage treatment plant (STP) is located to the southwest of the Unit 3 adjacent to the intake canal. Containment is present to contain spills of sludge, untreated waste or wastewater from the sewage treatment plant. Spills from the sewage treatment plant or stormwater runoff from this area will not impact adjacent surface waters. A STP lift station is located north of Units 1 and 2, adjacent to the discharge canal. An overflow or malfunction of this lift station could result in a discharge of domestic wastewater to the site discharge canal.

No. 2 Fuel Oil Storage Tank

The diesel fuel tank at Units 1 and 2 has adequate containment capacity to contain a spill in the event of a leak or tank rupture. Stormwater that collects in the containment area is inspected, discharged to a sump, and then to the evaporation/percolation pond system.

Sulfuric Acid and Caustic Tanks

An 8,000 gallon acid bulk storage tank (sulfuric acid) and a 8,000 gallon bulk storage caustic tank (sodium hydroxide) are located south of Units 1 and 2, on the west side of the water management building. In the event of a leak or spill, adequate containment is available to prevent the discharge of acid or caustic to surface waters. Stormwater that collects in the containment area is pumped into the waste sump, monitored for pH, directed to either the waste neutralization tank or the low conductivity tank depending upon the need for treatment, and then discharged to the percolation pond.

Fuel Loading/Unloading Area

The No. 2 fuel oil unloading area at Units 1 and 2 has adequate containment curbs for leaks or spills which may occur during unloading operations. Additionally, tank truck operators monitor the unloading operations to ensure that a significant leak or spill does not occur. It should be noted that the storm water collection basin located adjacent to the truck unloading area discharges to the site evaporation/percolation pond, thereby eliminating the potential for a spill of oil to surface waters.

Bottom Ash Loading/Unloading

The bottom ash tanker truck ("scud" truck), used to collect bottom ash from the bottom ash system for transport to the site ash landfill, is also located west of Units 1 and 2 within a containment area near the wastewater drainage trench.

Bottom Ash Silo

The silo which drains residual fine bottom ash from Unit 2 into transport trucks is located north and west of Units 1 and 2 and adjacent to the discharge canal. There is containment and a collection sump for the discharge of wastewater to the evaporation/percolation pond system. Occasionally clogging of the system drain and sump occurs which may result in the discharge of ash to the discharge canal during rainfall events. Historically, containment has not been adequate to contain and minimize ash deposition, resulting in the discharge of ash to the discharge canal during high wind and/or rainfall events. In 2005 a road paving project installed a drainage swale on the north side of the road near the discharge canal. This improvement should help minimize and/or prevent future ash discharges.

Hazardous Waste Accumulation Area

Unit 3 has a hazardous waste accumulation area located on the southeast side of the berm. This area is used to temporarily store waste material until it is shipped off-site. Common waste materials are 55 gallon drums of used oil, empty 55 gallon drums of hydrazine and morpholine, and expired chemicals. This area is fenced off and in located in a low traffic area.

Chemical Addition Areas

Unit 3 performs monthly chemical injections to reduce the build-up of marine growth within the Raw Water System. This is known as Clamtrol®. The injection skid is located at the intake and has high risk of entering the water if a spill outside of the containment ever did occur. The skid has sufficient secondary containment to hold the contents of the chemical storage tank. A Haz Mat spill kit is located in close proximity to this skid.

Unit 3 also has a chemical addition station located on the north end of the berm. The chemical addition station consists of one 55 gallon drum of sulfuric acid and one 55 gallon drum of morpholine. These drums are strapped down and located in diked containment capable of holding the contents of both drums.

Old Steam Generator Storage Area

The two steam generators that will be replaced at the end of 2009 are going to be stored in a large concrete building. This building has reinforced concrete walls on all sides. Since these steam generators have come in contact with radioactive water there is some radioactive contamination of these generators. They will be permanently stored in this building and will not be exposed to stormwater.

Reactor Head Storage Building

There is a building located east of the warehouse area for Unit 3. This build contains the retired reactor head and has no adverse impact on stormwater.

5.3 History of Spills and Leaks (Past Three (3) Years)

08/18/08

Crystal River South's Helper Cooling Tower (HCT) - A puddle of oil was found on the asphalt in the HCT roadway just south of #2 Lift Station by mechanics working in the area. Upon investigation from the Plant Environmental Specialist the oil was determined to have come from a leak in the sealed lid of the oily water separator located underneath the roadway adjacent to and associated with #2 Lift Station and had migrated to a rainwater retention pond. ERC was called to come begin managing the control and clean-up of the spill. An oil absorbent boom was placed at the inlet and outlet of the pond and oil absorbent pads were being used to remove oil from the surface of the water. During this cleanup a torrential rainfall began causing the additional water and oil entering the retention pond to mix together well enough to bypass the oil absorbent booms and the oil separating weir, entering the discharge canal. Less than two gallons were estimated to have been released into the canal.

08/03/08

Crystal River Coal Yard - While discharging the Mickie Birdsall barge, the Crane Operator, was raising the bucket out of #2 hold when a hydraulic hose failed on the bucket. This failure caused hydraulic fluid to spray on the deck of the barge and some into the canal. Approximately 1 pint to 1 quart contacted the water (canal). The Emergency Response Coordinator was contacted to provide support in cleaning up the oil sheen. The Environmental Specialist made notifications to EHSS and Regulatory Authorities. All oil was contained, recovered, and cleaned up.

11/09/07

Crystal River South – Units 1 & 2
Unit 1 & 2 were receiving service water from units 4 & 5 to make up to treated water in preparation of the unit 1 start up. Facility security called and reported they could see a water leak on a pipe on the fishing bridge. Operators responded to the fishing bridge and found the line leaking. The line was identified as the service water line coming from units 4 & 5. The SSOD at 4 & 5 was contacted and asked to shut down the pump supplying service water to units 1 & 2 and the leak was isolated. A leak was found on the vacuum breaker were the pipe entered the flange. The FIn team was notified to repair the leak. An estimated 750 gallons of chlorine residual water was discharged to the canal. Verbal notification was made to Florida Department of Environmental Protection, action items assigned and completed.

5.4 Summary of Stormwater Data

Recent stormwater data has been obtained for outfall D-600 (see Appendix D for location). Iron is the only water quality parameter that is routinely monitored at outfall D-600. An outside contractor, Southern Analytical Laboratories, performs the iron analysis using EPA Method 200.7 with a detection limit of 0.02 mg/L. Table 5.1 lists the recent iron concentrations observed at D-600.

Table 5.2 Outfall D-600 Iron Concentration

Month	Iron Concentration (mg/L)
June 2009	3.3
May 2009	2.6
April 2009	3.0
March 2009	0.64
February 2009	0.64
January 2009	2.8
December 2008	4.6
September 2008	0.12
August 2008	1.8
July 2008	0.62
June 2008	1.3
April 2008	3.9
February 2008	7.8

6.0 Preventive Maintenance

Preventive maintenance is a periodic, formal inspection of plant equipment or stormwater devices to uncover conditions that could lead to breakdowns and to adjust or repair them while problems are still minor or manageable. The criteria for formal inspections are determined by analyzing the short-term and long-term effect equipment breakdowns will have on generation, personnel safety, regulatory requirements, economic and historical data.

The objectives of Progress Energy – Florida's Preventive Maintenance Program are to:

- Demonstrate acceptable system and equipment performance.
- Confirm system compliance with established procedures.
- Assess plant and system reliability improvements. If deficient propose new procedures and or preventive maintenance measures.

7.0 Inspections

Visual inspections of plant facilities, systems, tanks, pipelines, STPs, the wastewater system (including ponds) and storage areas are conducted on a regular basis. Plant operations personnel are required to make routine rounds or patrols of various areas of the power plant as part of their

job responsibility. While on these rounds, they look for any unusual conditions, faulty equipment operation, leaks, spills, or other problems that are or potentially could cause an environmental incident. If any deficiency is observed, a work request is generated.

7.1 Comprehensive Site Compliance Evaluation

Visual inspection of areas which contribute to stormwater discharges must be conducted quarterly and annually to determine if controls are adequate and properly implemented. A report which summarizes the scope, date, major observations or incidents of noncompliance must be maintained for three (3) years. Certification that the facility is in compliance with the SWP3 must be documented annually. See Appendix A and B for inspection forms used.

Field inspections of the Crystal River Power Plant ancillary systems and associated site support facilities should be conducted by members of the BMP Committee to determine areas of potential concern with respect to discharge of pollutants to waters of the United States. The BMP inspection should focus on material storage areas, plant site runoff, loading and unloading areas and waste disposal areas.

7.2 Quarterly Inspection

Site personnel will walk down the site to ensure no unauthorized pollutants are entering surface waters and that each pollutant control measure is working properly. An inspection form is used to document quarterly inspections. Separate inspection forms have been created for Units 1 and 2 and Unit 3 and are provided in Appendix A and Appendix B, respectively. Certain areas around the site have been delegated to Units 1 and 2 and Unit 3 (See Appendix F).

7.3 Annual Site Evaluation

Annual inspection required by June 30, 1996 (and each year thereafter).

The inspection of areas of concern should include the following:

- Evaluation of the effectiveness of BMPs and determine the necessity of implementing additional measures and controls.
- Evaluation of the drainage areas for evidence of pollutants entering the drainage system.

7.4 Monitoring and Record-Keeping

Steam electric generating facilities are required to monitor storm water discharges associated with industrial activity quarterly for total recoverable iron. Samples should be collected from a discharge resulting from a storm event greater than 0.1 inches magnitude each calendar month. Records of rain fall amounts must also be tabulated and kept on file.

Records for Units 1 and 2 are kept in the plant environmental file room. Rainfall and storm water sampling data is kept at file point 12520-B. Quarterly and annual

inspection records are kept at file point 12520-R-03-B. Records for Unit 3 will be kept on file in the office of the Unit 3 Environmental Specialist.

8.0 Spill Prevention, Notification and Response

OIL SPILLS

Refer to the Spill Prevention, Control and Countermeasure Plans in effect at these facilities.

ACID/CAUSTIC SPILLS

Caustic/Acid Bulk Storage Emergency Procedures. Crystal River Units 1 and 2 have the following acid and caustic bulk storage tanks on site:

Size (gallons)	Contents
8,000	Sulfuric Acid
8,000	Hydroxide (caustic)

These tanks are located immediately west of the water management building. Both tanks have secondary containment.

A Containment and Integrity Plan requires that the plant inspect the sulfuric acid tank area on a monthly basis and the secondary containment system at least once per year by personnel certified by SNT-TC-1A.

Units 1 and 2 personnel are trained to report any spill, no matter the location or quantity, to the control room by calling 311, their supervisor and /or the plant Environmental Specialist. Unit 3 personnel are trained to report any spill to the control room by calling 5555. Reporting guidance is available to all plant personnel in the Oil Spill and Chemical Release Notification Procedure EVC-SUBS 00018 and on the Progress Energy Web in the environmental guidance manual.

The Environmental Health and Safety Services Section (EHSS) shall be responsible for the reporting to all Local, State, and/or Federal agencies. Any written reports will be prepared by EHSS and the Plant Environmental Specialist, for the Plant Manager.

9.0 Measures and Controls

A description of pollution prevention, sediment and erosion control measures, BMPs and other controls that are (or will be) implemented to improve the prevention and control of the discharge of contaminated stormwater at Crystal River Units 1, 2, and 3 are presented in the following tables.

Table 9.1 Measures and Controls

AREAS OF CONCERN	MEASURES	CONTROLS
Fuel Oil Unloading Vehicles	Runoff from fuel oil unloading areas.	Containment curbs or block off storm drains in unloading areas. Immediately clean up leaks/spills.
Chemical Loading/Unloading	Runoff from chemical loading/unloading areas.	Containment curbs or block off storm drains in unloading areas. Immediately clean up leaks/spills.
Liquid Storage Tanks	Runoff from aboveground liquid storage tanks.	Containment curbs. Dry cleanup methods.
Large Bulk Fuel Storage Tanks	Runoff from bulk storage tanks.	Comply with SPCC requirements. Secondary containment.
Oil and Chemical Spills	Reduce potential for spills.	Weekly inspection of tanks, pipelines, pumps and other equipment to reduce incidents of spills. Secondary containment.
Oil Bearing Equipment in Switchyards	Runoff from oil bearing equipment.	Inspection of oil bearing equipment.
Bottom Ash Loading Areas	Runoff from spills, deposition of bottom ash.	Reduce/control tracking of ash from loading areas. Cleanup spills, debris, excess water. Install wind curtains.
Coal Barge Unloading Area – Conveyor #5	Coal Runoff into intake canal	Installation of a short containment wall along coal barge unloading area. Inspection of canal annually and dredge as needed
Material Storage Areas	Runoff from areas used to store misc. products, construction materials, etc.	Store material indoors, cover material, etc. or use secondary containment.
Staging Areas for Used Oils	Reduce potential for leaks and spills.	Stage material on secondary containment pallets.

Table 9.2 Allowed Non-Storm Water Discharges[1]

Planned Activity	Allowed Action – CR 1&2[2]	Allowed Action – CR 3[3]
Discharges from fire-fighting activities	Route to storm water drain.	Route to storm water drain.
Fire hydrant flushing	Route to storm water drain.	Route to storm water drain.
Potable water, including water line flushing	Route to storm water drain.	Route to storm water drain.
Uncontaminated condensate from air conditioners, coolers, and other compressors	Route to storm water drain.	Route to storm water drain.
Uncontaminated condensate and from the outside storage of refrigerated gases or liquids.	Route to storm water drain.	Route to storm water drain.
Irrigation drainage	Route to storm water drain.	Route to storm water drain.
Landscape watering provided all pesticides, herbicides, and fertilizer have been applied in accordance with the approved labeling	Route to storm water drain.	Route to storm water drain.
Pavement wash waters where no detergents are used and no spills or leaks of toxic or hazardous materials have occurred (unless all spilled material has been removed)	Route to storm water drain.	Route to storm water drain.
Routine external building wash down that does not use detergents	Route to storm water drain.	Route to storm water drain.
Uncontaminated ground water or spring water	Route to storm water drain.	Route to storm water drain. Radiological analyses need to be performed before vaults or manholes are drained.
Foundation or footing drains where flows are not contaminated with process materials	Route to storm water drain.	Route to storm water drain.
Draining of secondary containment areas	Drain to adjacent area.	Only authorized personnel can perform discharges from secondary containments per WP-106.

Notes:

1. Most industrial stormwater general permits include a list of non-stormwater discharges that are "allowable" and do not need to be eliminated. Allowable non-stormwater discharges are those that while not stormwater discharges, are covered under the terms and conditions of the stormwater permit. These are often discharges that if not covered under a stormwater permit would require coverage under some other NPDES permit. All secondary containments should be checked for rain water accumulation on a daily basis and immediately after any rain event. Accumulated rain water should be checked for oil sheen before release. Oil sheen may be removed with oil absorbent pads or socks.
2. Actions which specifically apply to Crystal River Units 1 & 2.
3. Actions which specifically apply to Crystal River Unit 3.

Table 9.3 Requirements[1] for Spill Prevention

Planned Activity	Required Action[2,3]	Reference	Comments
Storage of petroleum based products in small containers (≤ 5 gallons).	• Containers must be stored inside a chemical cabinet designed to capture the contents of the largest container.	Procedure	Used in addition to any applicable plant procedures.
Storage of petroleum based products in large containers or tanks (> 5 gallons).	• Container must be stored inside a lined secondary containment, or • Tank must be constructed with an integral double wall. Note: even if double-walled; a plastic liner beneath the tank should be used to capture small spill resulting from transfer operations.	Regulatory	SPCC requirements. Caution: Use of and placement location of tanks on site are also subject to certain record keeping requirements, and special approvals (e.g., chemical control, fire protection, environmental) Used in addition to any applicable plant procedures.
Storage of petroleum based liquid waste materials (e.g., used oils, unusable gasoline, used antifreeze, etc.)	• All containers used for storage of waste materials must be U.S. DOT approved and in good condition. • Containers must be stored inside a lined secondary containment.	Regulatory BMP	RCRA rules EVC-SUBS-00016 Used in addition to any applicable plant procedures.
Operation of mobile equipment with hydraulic systems (eg., fork lift, man lift, mobile crane, heavy hauler)	• Each piece of equipment shall carry a "spill kit", suitable for an immediate response to a small leak. • Documented "pre-flight" checks for oil leaks, damaged hoses, proper connections, etc.	BMP	All mobile equipment must be checked prior to operation for obvious leaks, frayed hoses, ect. In accordance with: Used in addition to any applicable plant procedures.

Notes:

4. Requirements listed in this Table are a combination of regulatory requirements, corporate / plant procedures, and BMPs adopted by the site. A regulatory requirement or procedural requirement may not be waived. BMPs may be waived on a case by case determination made by the plant environmental specialist where a) implementation of the BMP is not practical or infeasible, or b) the BMP would be cost prohibitive. All waivers shall also be approved by the plant manager.
5. All secondary containments should be checked for rain water accumulation on a daily basis and immediately after any rain event. Accumulated rain water should be checked for oil sheen before release. Oil sheen may be removed with oil absorbent pads or socks.

6. In the event of a spill: 1) notify the appropriate plant control room or work control center, and 2) take appropriate immediate action to minimize the extent of the spill. If using oil dry or oil absorbent materials, clean it up and properly dispose. Do not leave it for someone else to handle.

10.0 Employee Training

Various documents and manuals developed for Units 1, 2, and 3 contain procedural guidelines to be followed in a variety of scenarios. Training in the use of the manuals and the implementation of proper procedures serve to reduce the likelihood of leaks, spills, or releases to surface waters of the United States.

MSDS Sheets: MSDS sheets for chemical substances, both hazardous and non-hazardous, are obtained by calling 3E at 1-800-451-8346 or by accessing the 3E web page via the Progress intranet under Business Units & Departments/Safety Department/MSDS. If the 800# is used the MSDS sheet will be promptly faxed to the fax number provided during the call. The MSDS can be printed directly to a local printer using the on-line option.

Environmental Compliance Manuals: These documents provide useful information and guidance regarding various environmental disciplines. The Environmental Compliance Manuals can be found by following the link below:

http://sharepoint/c3/C17/Crystal%20River%20Energy%20Complex/default.aspx?Mode=Edit&PageView=Shared

The Unit 3 Environmental Compliance Manual is titled "Crystal River Nuclear Plant Site-Specific Environmental Compliance Manual" and the Unit 1 and 2 manual is titled "Crystal River Fossil Plant Site-Specific Environmental Compliance Manual".

Acid and Caustic Procedures: To increase personnel safety and improve environmental protection, Acid and Caustic Procedures Manuals highlight information provided in the MSDS sheets concerning chemical and hazardous properties, precautions, exposure and first aid. Procedures for handling leaks and the associated emergency response are also documented in these manuals. A Containment and Integrity Plan (CIP) requires that the plant inspect the mineral acid tank area on a monthly basis and the secondary containment system must be inspected at least once per year by personnel certified by SNT-TC-1A.

Oil Spill Prevention and Response: Training in the use of the SPCC Plan and the Oil Spill Recovery Guide are coordinated by the Progress Energy - Florida Emergency Response Coordinator to ensure Response Team familiarity with spill containment and cleanup equipment and procedures. The training is in the form of actual oil spill simulation drills and improved knowledge of specific areas such as safety, notification, boom deployment, etc.

Violent Storm Emergency Procedures (CR 1&2 Procedure EP-2 and CR 3 Procedure EM-220): These documents were developed to identify areas which should be addressed prior to the onset of a potentially violent storm. Procedures are addressed to minimize the catastrophic release of pollutants during a storm event and emergency response notification.

BMP/SWP3 Requirements: A Plant View online training course, ENC0013G, has been developed for appropriate Unit 1 and 2 personnel and must be reviewed annually as part of their training matrix requirements. Computer Based Training (CBT) was developed for appropriate personnel at Unit 3. The course code is ENC0004C and is reviewed annually as part of their training matrix requirements. The training addresses topics such as good housekeeping, materials management, record keeping and reporting, spill prevention and response, as well as specific waste reduction practices to be employed.

11.0 SWPP and BMP Plan Certification

11.1 Units 1 and 2 Certification

I hereby certify that I have reviewed the Crystal River Units 1, 2, and 3 Storm Water Pollution Prevention and Best Management Practices Plan, as required by National Pollutant Discharge Elimination System Permit No. FL0000159 and agree with the recommended best management practices.

Larry E. Hatcher

Larry Hatcher
Manager, Crystal River Fossil Plant
& Fuel Operations

8/25/09
Date

11.2 Unit 3 Certification

I hereby certify that I have reviewed the Crystal River Units 1, 2, and 3 Storm Water Pollution Prevention and Best Management Practices Plan, as required by National Pollutant Discharge Elimination System Permit No. FL0000159 and agree with the recommended best management practices.

J. W. Holt

James W. Holt
Plant General Manager
Crystal River Nuclear Plant

8/4/09
Date

12.0 References

1.0 EPA Industrial SWPP Template
2.0 Developing Your Stormwater Pollution Prevention Plan: A Guide for Industrial Operators. EPA 833-B-09-002.

13.0 Revisions Incorporated In Rev. 5

The title of the Plan was changed from Crystal River Units 1, 2, 3 Best Management Practices NPDES FL0000159 to Crystal River Units 1, 2, 3 Stormwater Pollution Prevention and Best Management Practices Plan

Section 3.0: BMP/Pollution Prevention Committee was revised to include current committee members

Section 4.0: Description of Crystal River Units 1,2, 3 Plant Facilities was revised to include a more detailed description

Section 5.2: Site Evaluation Summary was revised to include Oil Tank Storage Warehouses, Unit 3 Chemical Warehouse, Unit 3 Issue Warehouse, Unit 3 Receiving Warehouse, Hazardous Waste Accumulation Area, Chemical Addition Areas, and Old Steam Generator Storage Area

Section 5.3: History of Spills and Leaks (Past Three (3) Years) was revised to include current spills and leaks

Section 5.4: Summary of Stormwater Data was added

Section 6.0 Unit 1 and 2 SIDTEC maintenance procedure was removed

Section 7.2 Monthly Inspection was changed to Quarterly

Table 9.2: Allowed Non-Storm Water Discharges was added

Table 9.3: Requirements for Spill Prevention was added

Section 10.0: Employee Training was revised to include BMP/SWP3 Requirements for Unit 3

Former Section 11.0: Recommended Best Management Practices was removed

Former Section 12.0: Security Plan was removed

Section 11.0 was revised to include separate certifications for Units 1 and 2 and Unit 3

Appendix B: Crystal River Unit 3 Quarterly Inspection Form was added

Appendix C: Crystal River Energy Complex Vicinity Map was revised to include a more recent vicinity map

Appendix C: Crystal River Unit 3 Storm Water BMP Plan was removed and its applicable contents were added to the body of the current revision

Appendix F: Crystal River Units 1, 2, and 3 Designated Areas of Responsibility was added

Appendix G: Crystal River Units 1, 2, and 3 Storm Drains, Potential Sources of Pollutants was revised to include 4 separate drawings that better define storm drains and potential sources of pollutants

Appendix H: Crystal River Units 1, 2, and 3 NPDES Flow Diagram was added

Appendix A
Crystal River Units 1 and 2 Quarterly Inspection Form

Crystal River South - NPDES Storm Water Pollution Prevention Plan
Quarterly Site Evaluation

Date: _____

Issue/Concern	Specific Observations	East Side	South Side	West Side	North Side	SCY
Parking / drive areas	Is there evidence of spills of oil, fuels, greases, or antifreeze from vehicles or mobile equipment that has not been cleaned up?					
Lay down / storage	Is there staged or stored equipment/parts which are capable of rusting because they are not painted or covered, or they are capable of leaking lubricating oils/greases?					
Chemicals and containers	Are there orphan containers (jugs, bottles, cans, drums, etc.) of chemicals or oils (empty, full, or partially full)?					
Housekeeping	Does the area show good housekeeping, i.e., clean of trash and debris?					
Vegetation	Is there area neatly trimmed of vegetation growth?					
Erosion	Is there evidence of uncontrolled erosion?					
Rusting Structures	Are steel support structures adequately painted or coated to minimize corrosion and rusting?					
Oil containing equipment	Is there evidence of spills of oil from equipment that has not been cleaned up?					
Leaking pipes	Are there any leaking pipes containing water, waste water, or ash?					
Debris piles	Is there evidence of orphan piles of debris, ash, contaminated soil or other material?					
Ash	Is there evidence of uncontrolled or uncontained releases or spillage of ash material?					
Rainwater	Is there an accumulation of rainwater in a containment structure which has not been drained in accordance with operating procedures?					
Chemical Spills	Are there stains on soil or facility structures which might indicate leaks or spills of chemicals or oils?					

Notes:

Inspection Performed By:

File Point: 12520-R-03-B

See reverse side of form for area descriptions

Crystal River South - NPDES Storm Water Pollution Prevention Plan

Walk Down Area	Description
East Side	East side area of CRS. This area starts at the parking/drive area near the administration building at the north end to the warehouse area on the south end. Specific areas of note: • Parking/driving areas • Several storm drains that discharge either to the intake canal or discharge canal • Laydown areas along the eastern fence • Warehouse storage area next the Machine Shop building • Machine shop waste storage and chemical cabinet area
South Side	South side area of CRS. This area starts at the sewage treatment plant on the east end to the staging area west of the No. 2 fuel oil tank. Specific areas of note: • Vegetation/debris and housekeeping around sewage treatment plant • Potential piping leaks associated with water tanks • Water management building activities • Secondary containment around acid, caustic, and fuel oil tanks • Housekeeping around water front facilities, tanks, pump house, and staging area • Oil containing fan motors, no. 2 fuel oil tank and transfer pumps
West Side	West side area of CRS. This area starts at the staging area west of the Unit 2 precipitator at the south end to the bottom ash silo facility at the north end. It also includes the percolation pond system. Specific areas of note: • Housekeeping around the staging area, coal conversion warehouse, pipe trench, and Sidtec shed • Leaking water or ash pipe within pipe trench • Piles of ash around bottom ash silo • Vegetation management around percolation ponds
North Side	South side area of CRS. This area starts at the Sidtec capture system on the west end to the waterfront area just east of the cable bridge and catwalk. Specific areas of note: • Potential erosion issues along waterfront • Vegetation management along waterfront • Housekeeping in and around unit transformers and administration/electric shop offices • Secondary containment around spare transformer • Valve reduction pits for Unit 1 and Unit 2 • A couple of storm drains discharge directly to the canal
SCY (South Coal Yard)	South Coal Yard Areas adjacent to waterfront, wetland areas, and storm water retention areas. Specific areas of note: • Excessive coal buildup along barge un-loader dock area • Housekeeping in and around ancillary buildings near waterfront • Erosion issues along waterfront, storm retention areas, and wetlands areas • Adequate storage capacity in coal pile storm water retention areas

Appendix B
Crystal River Unit 3 Quarterly Inspection Form

CR3 NPDES Storm Water Pollution Prevention Plan Evaluation

Date:
Conducted By:
Signed:

Issue/Concern	Specific Observations	Berm	Warehouse	Paint Shack Area	Waterfront Area
Parking/Drive	Is there evidence of spills of oil, fuels, greases, or antifreeze from vehicles or mobile equipment that has not been cleaned up?				
Laydown/Storage	Is there staged or stored equipment/parts which are capable of rusting because they're not painted or covered, or they are capable of leaking lubricating oils/greases?				
Chemicals/ Containers	Are there orphan containers (jugs, bottles, cans, drums, etc.) of chemicals or oils (empty, full, or partially full)?				
Housekeeping	Does the area show good housekeeping, i.e., clean of trash and debris?				
Vegetation	Is the area neatly trimmed of vegetation growth?				
Erosion	Is there evidence of uncontrolled erosion?				
Rusting Structures	Are steel support structures adequately painted or coated to minimize corrosion and rusting?				
Oil Containing Equipment	Is there evidence of spills of oil from equipment that has not been cleaned up?				
Leaking Pipes	Are there any leaking pipes containing water or waste water?				
Debris Piles	Is there evidence of orphan piles of debris, contaminated soil or other material?				
Rainwater	Is there an accumulation of rainwater in a containment structure which has not been drained in accordance with operating procedures?				
Chemical Spills	Are there stains on soil or facility structures which might indicate leaks or spills of chemicals or oils?				

Comments:

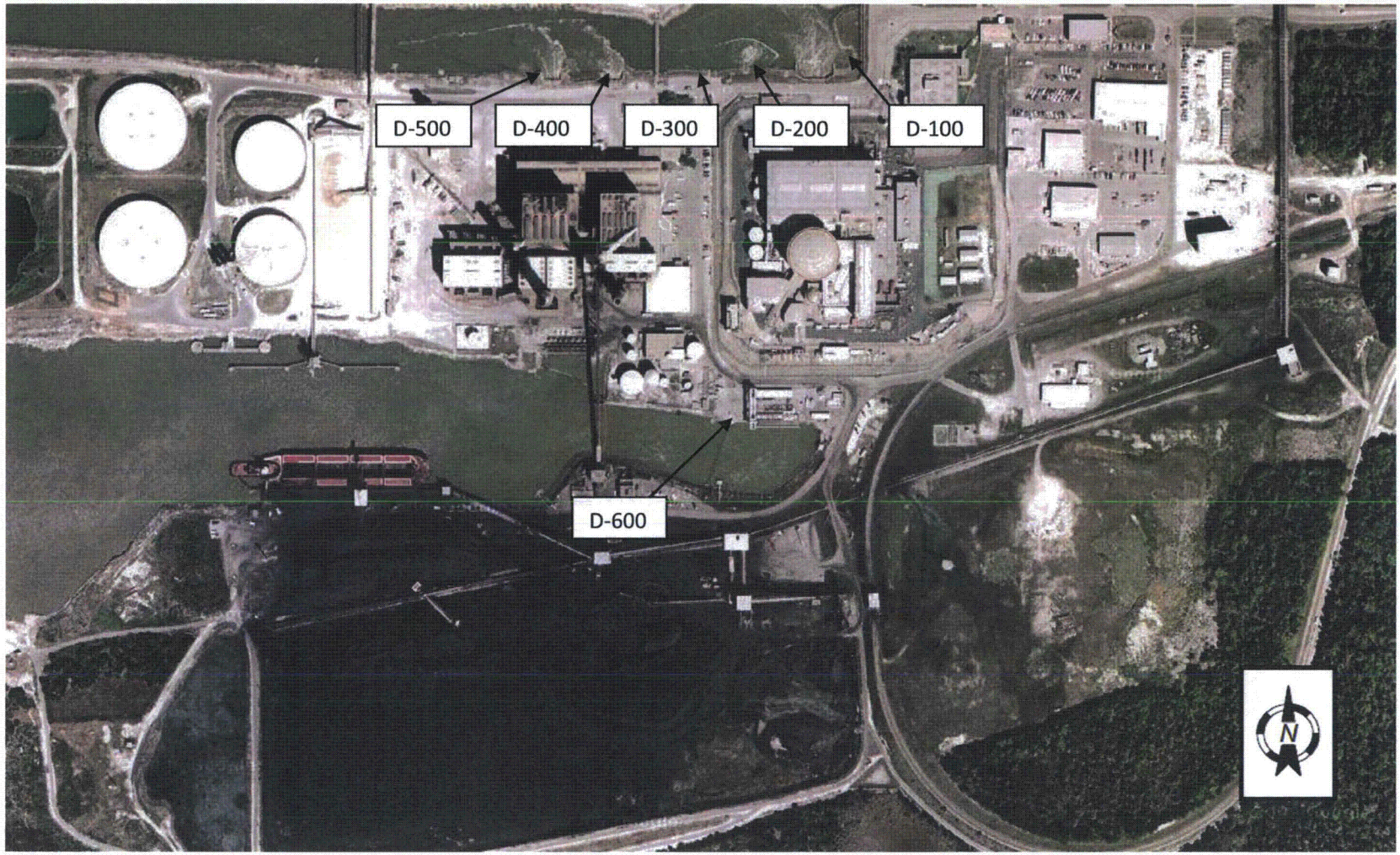
Crystal River Unit 3 Walk Down Areas and Descriptions

Walk Down Area	Description
Berm	This includes all areas inside the protected area of Unit 3. Specific areas of note: • Numerous storm drains discharge directly to the intake and discharge canals • Fuel transfer activities • Spare transformer on the northeast side of the berm • Chemical addition area on north side of the berm • Hazardous waste accumulation area on southeast side of berm.
Warehouse	This includes the issue, receiving, chemical, and oil storage tank warehouses for Unit 3. Areas in the general vicinity of these warehouses should also be walked down. Specific areas of note: • Lay-down areas east of issue and receiving warehouses • Chemical and material storage • Retention pond south of the issue warehouse
Paint Shack Area	This area includes the paint shack area that is located inside the rail loop. The area also includes the wetland area east of the issue and receiving warehouses. Specific areas of note: • Chemical and material storage • Housekeeping in the area • Condition of wetland area. Any land disturbing activities?
Waterfront Area	This includes the intake area on the south side of Unit 3 and the discharge canal area that stretches from the fishing platform to the end of the canal. The area also includes the new lay down area west of the percolation ponds. Specific areas of note: • Erosion issues along intake and discharge canals • Storm drains that discharge to the intake and discharge canals • Overflow parking on the north side of the discharge canal • Clamtrol injection skid at the intake • Land disturbing activities

Appendix C
Crystal River Energy Complex Vicinity Map

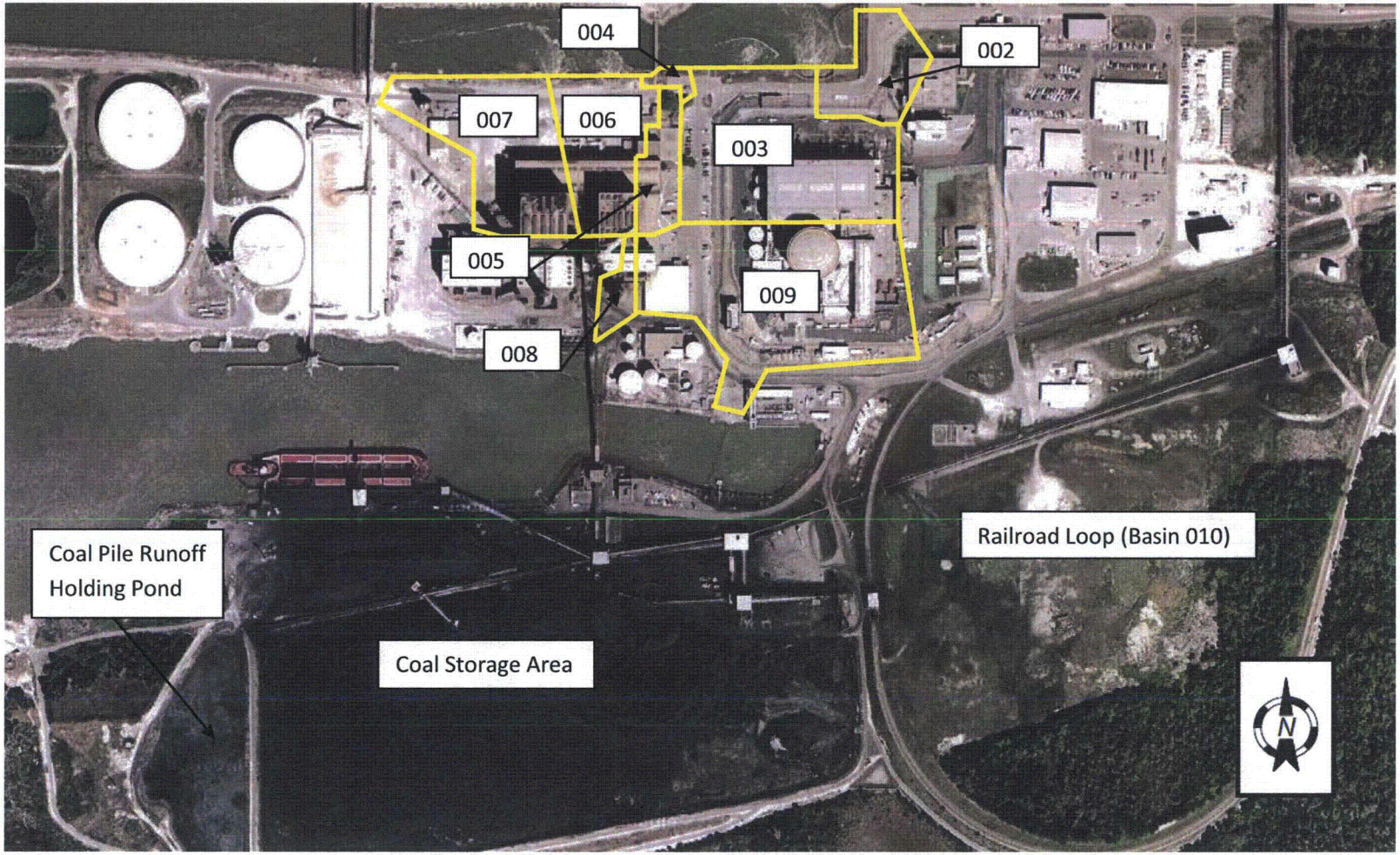
Crystal River Energy Complex Vicinity Map

Appendix D
Crystal River Units 1, 2, and 3 NPDES Storm Water Outfalls



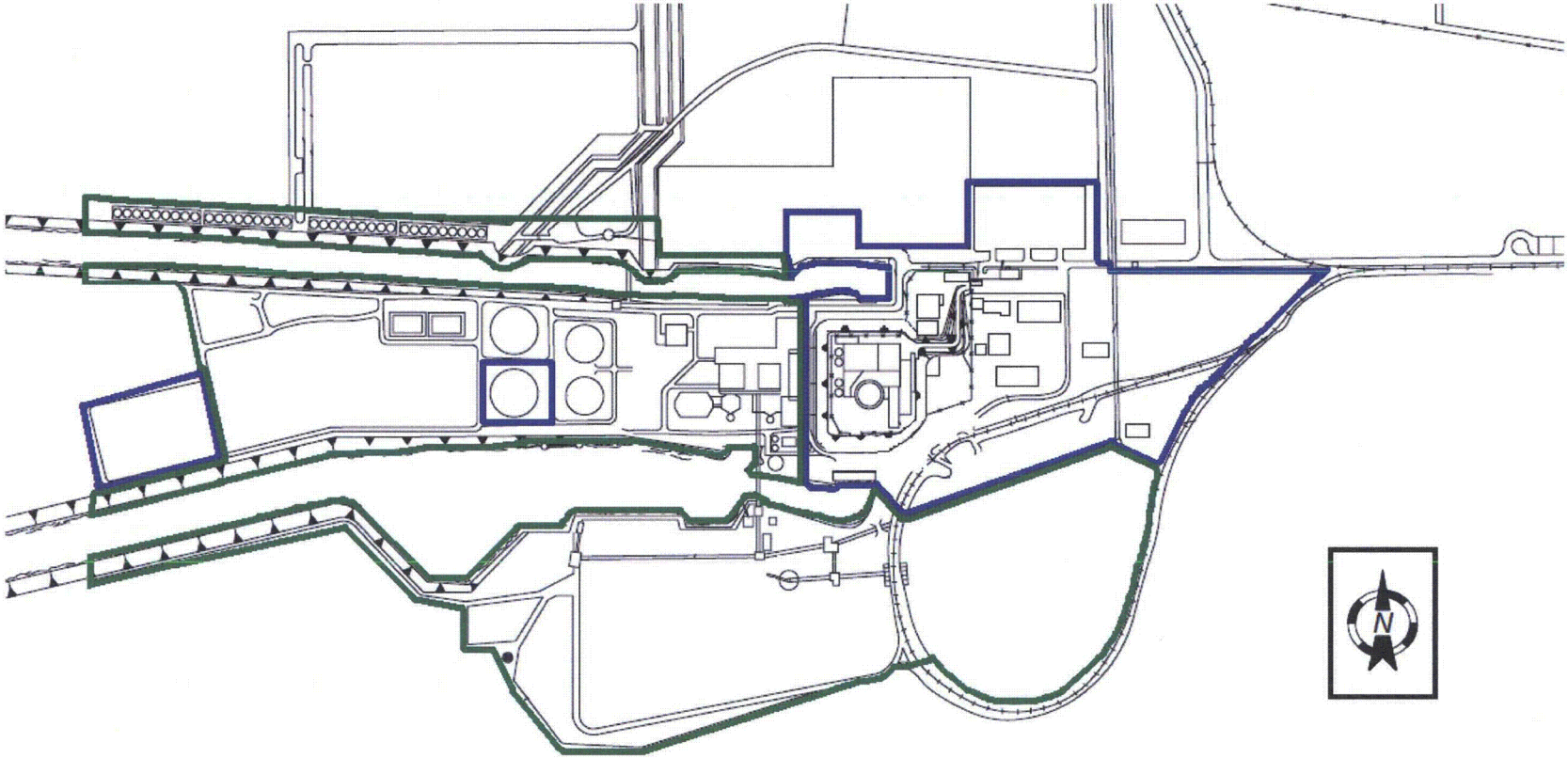
Crystal River Units 1, 2 and 3
NPDES Storm Water Outfalls
Permit No. FL0000159

Appendix E
Crystal River Units 1, 2, and 3 Storm Water Basins



Crystal River Units 1, 2, and 3
Storm Water Basins
Permit No. FL0000159

Appendix F
Crystal River Units 1, 2, and 3 Designated Areas of Responsibility

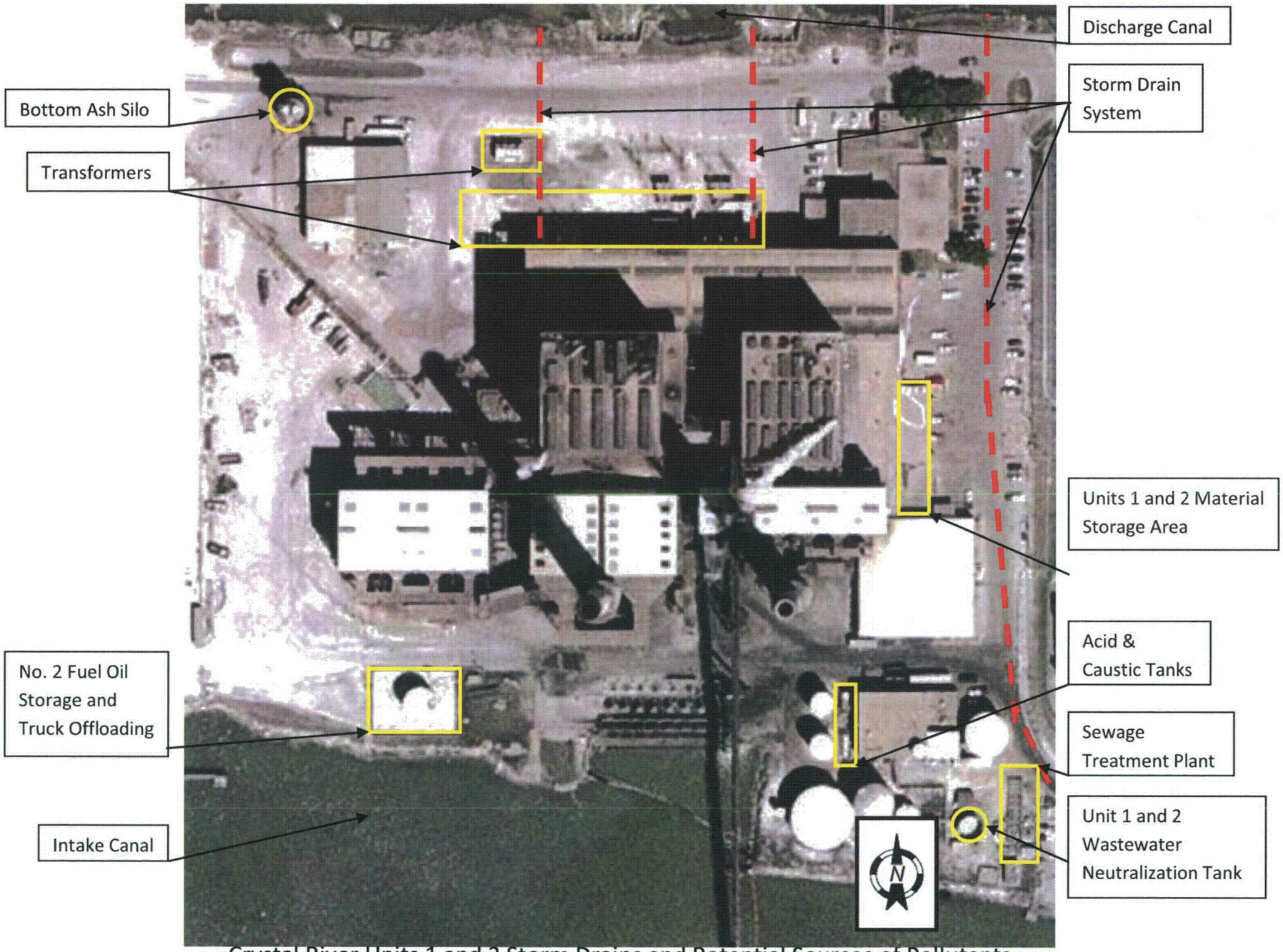


Areas outlined in blue are Unit 3 responsibility and areas outlined in green are Unit 1 and 2 responsibility

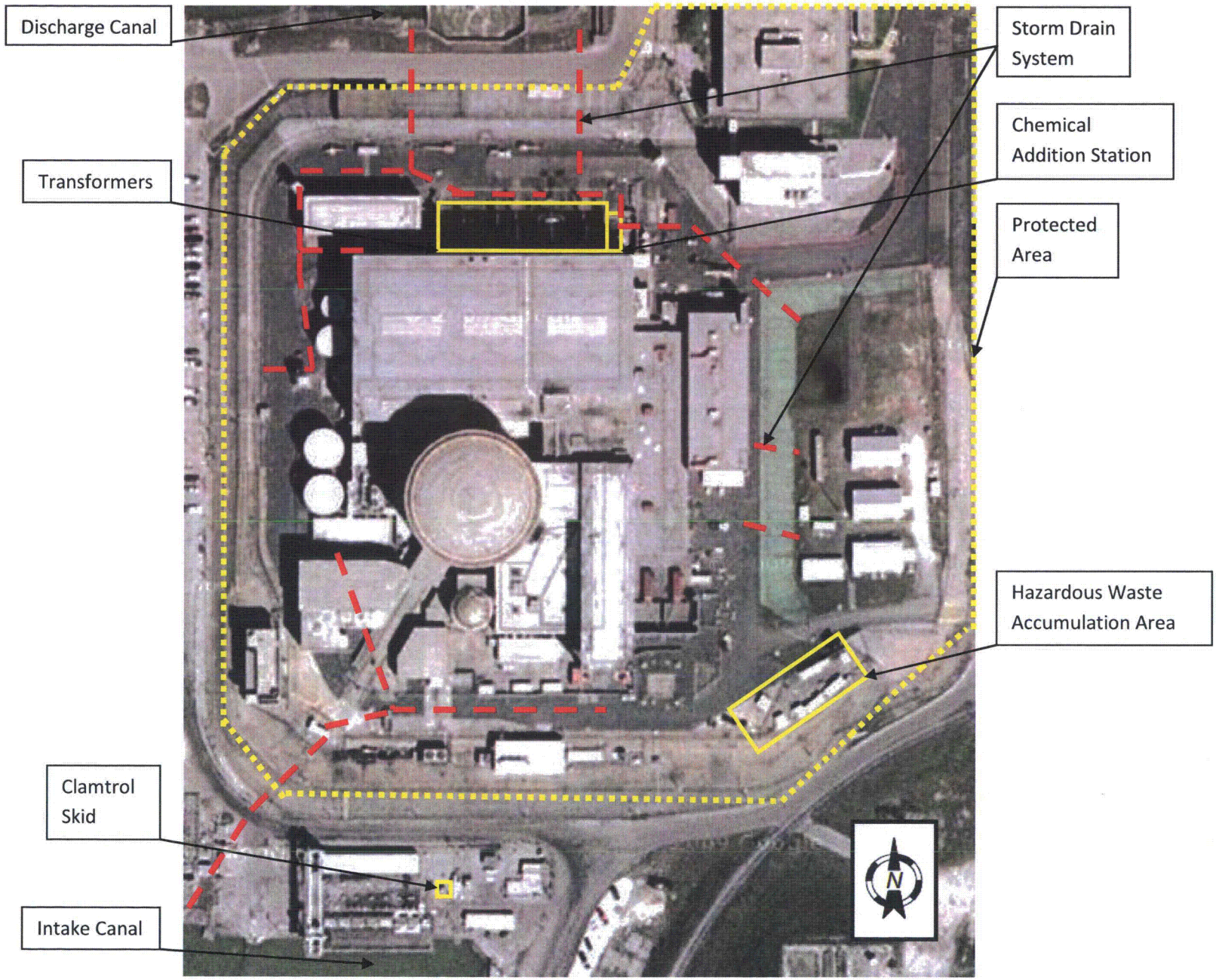
Designated Areas of Responsibility

Appendix G
Crystal River Units 1, 2, and 3 Storm Drains, Potential Sources of Pollutants

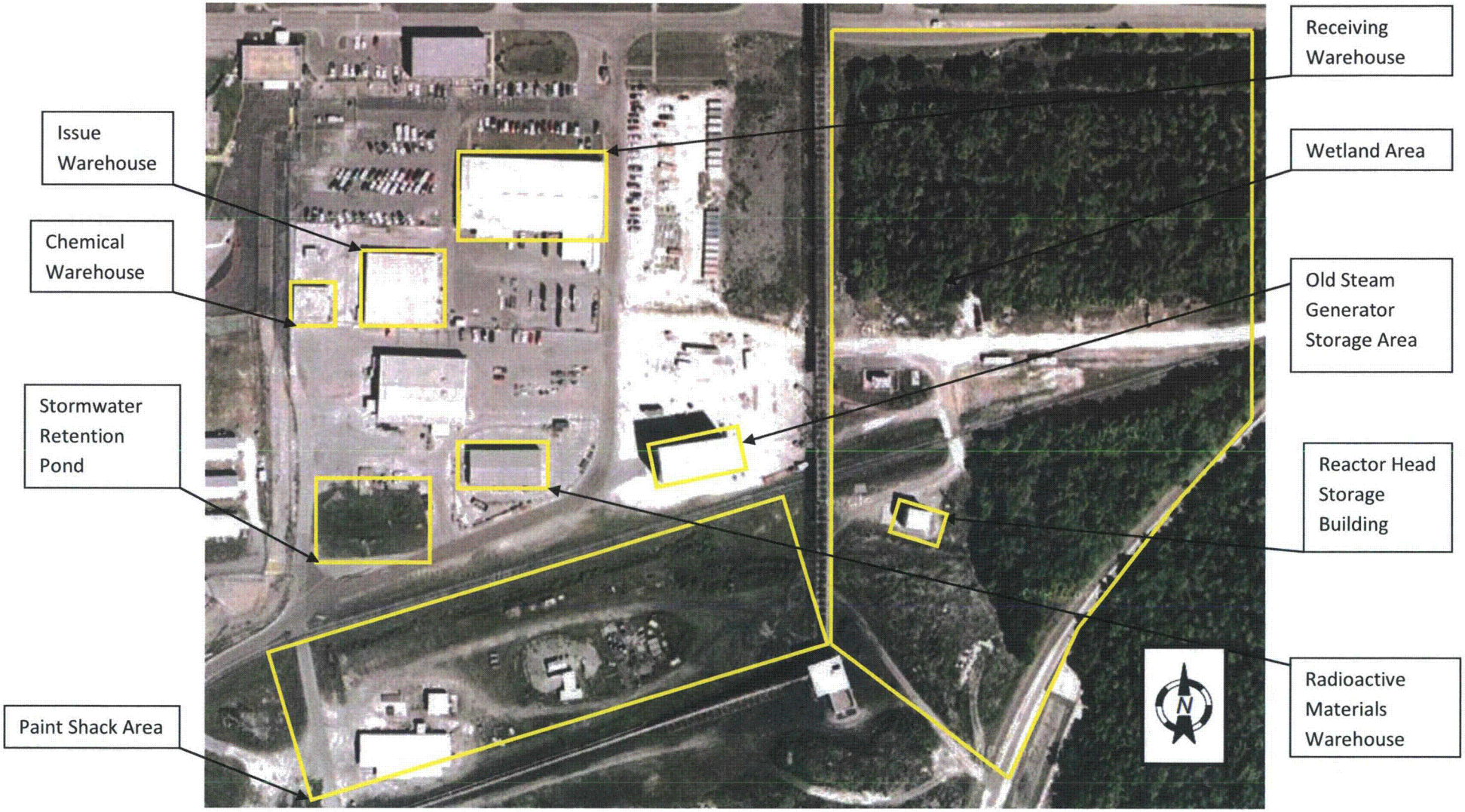
Crystal River Units 1, 2, and 3 Potential Sources of Pollutants



Crystal River Units 1 and 2 Storm Drains and Potential Sources of Pollutants



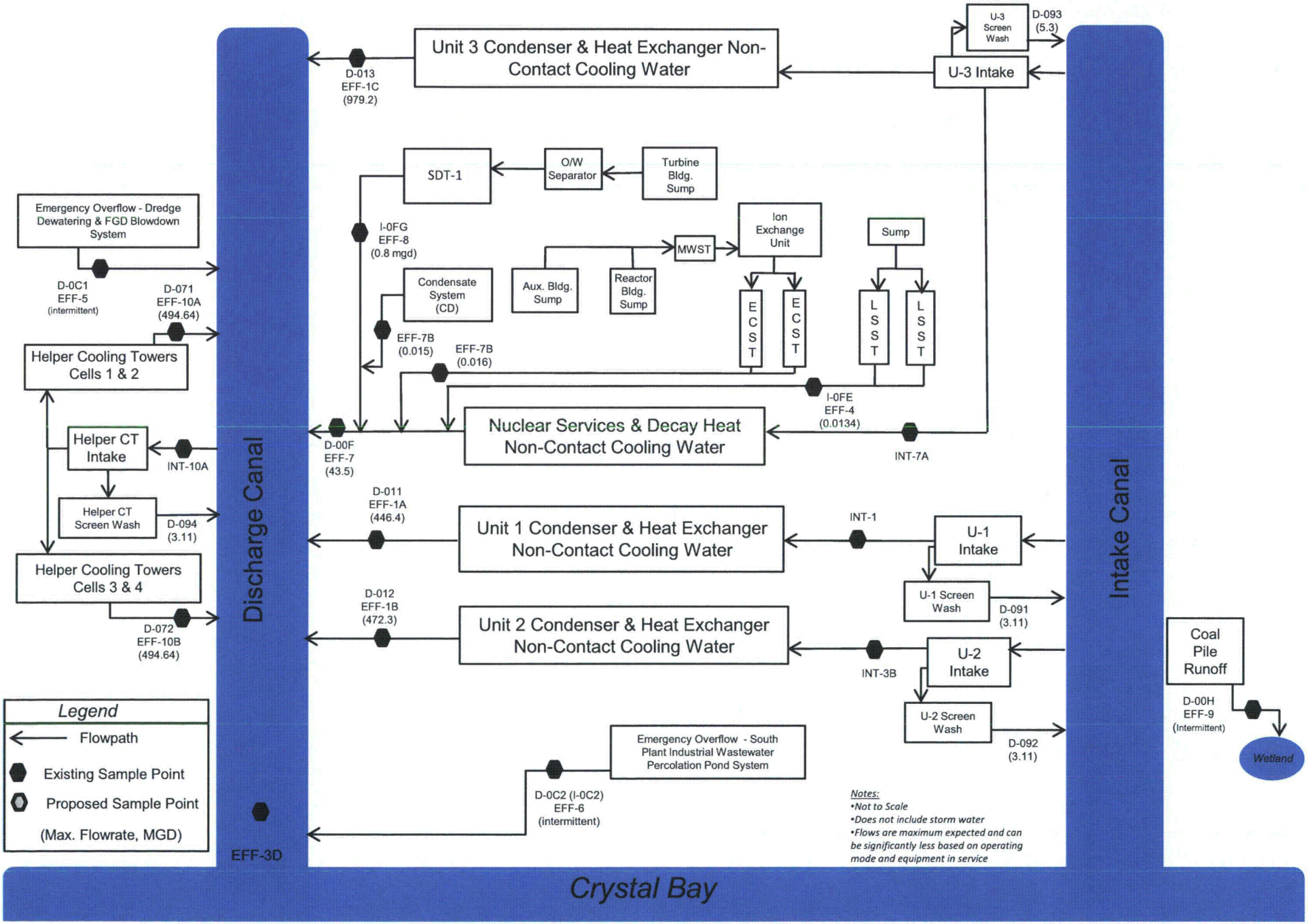
Crystal River Unit 3 Storm Drains and Potential Sources of Pollutants



Crystal River Unit 3 Storm Drains and Potential Sources of Pollutants

Appendix H
Crystal River Units 1, 2, and 3 NPDES Flow Diagram

Crystal River Units 1, 2, & 3 NPDES Flow Diagram – FL0000159



Progress Energy Florida, Inc. –Crystal River Units 1, 2, & 3

DEP File No. FL0000159-013-IW1S/NR

Attachment 9

Historical DMR Results for D-00H and D-0C1

DEPARTMENT OF ENVIRONMENTAL PROTECTION DISCHARGE MONITORING REPORT - PART A

WHEN COMPLETED MAIL THIS REPORT TO: Department of Environmental Protection, Wastewater Facilities Regulation Section, MS 3550, 2600 Blair Stone Road, Tallahassee, FL 32399-2400

COAL PILE RUNOFF

PERMITTEE NAME: Progress Energy Florida

MAILING: P.O. Box 14042, MAC CN77
St. Petersburg, FL 33733
ATTN: Michael Olive

FACILITY: Crystal River South Plant - Units 1, 2
LOCATION: 15760 W. Powerline St., Crystal River, FL 34428
COUNTY: Citrus

PERMIT NUMBER: FL0000159-001-1W1S
LIMIT: Final
CLASS SIZE: Major
DISCHARGE POINT NUMBER: D-0H
PLANT SIZE/TREATMENT TYPE:
NO DISCHARGE FROM SITE: ☐

WAFR Site No.:
GMS ID No.: 1037M25518
GMS Test Site No.:
REPORT: Monthly
GROUP: Industrial

MONITORING PERIOD--From: 2004/09/01 To: 2004/09/30

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX.	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM	UNITS			
Flow	Sample Measurement	****	0.5	MGD	****	****	****	****	0	1/Day of Discharge	Calculation
STORET No. 50050 1 Mon. Site No. EFF-9	Permit Requirement	****	Report DAILY MAX		****	****	****			1/Day of Discharge	Calculation
Total Suspended Solids	Sample Measurement	****	****	****	****	****	17.0	mg/L	0	1/Day of Discharge	Grab
STORET No. 00530 1 Mon. Site No. EFF-9	Permit Requirement	****	****		****	****	60.0 DAILY MAX			1/Day of Discharge	Grab
Arsenic, Total Recoverable	Sample Measurement	****	****	****	****	****	1.6	ug/L	0	1/Day of Discharge	Grab
STORET No. 00978 1 Mon. Site No. EFF-9	Permit Requirement	****	****		****	****	50.0 DAILY MAX			1/Day of Discharge	Grab
Cadmium, Total Recoverable	Sample Measurement	****	****	****	****	****	3.6	ug/L	0	1/Day of Discharge	Grab
STORET No. 01113 1 Mon. Site No. EFF-9	Permit Requirement	****	****		****	****	9.3 DAILY MAX			1/Day of Discharge	Grab
Chromium, Total Recoverable	Sample Measurement	****	****	****	****	****	13.0	ug/L	0	1/Day of Discharge	Grab
STORET No. 01118 1 Mon. Site No. EFF-9	Permit Requirement	****	****		****	****	50.0 DAILY MAX			1/Day of Discharge	Grab
Copper, Total Recoverable	Sample Measurement	****	****	****	****	****	260.0	ug/L	1	1/Day of Discharge	Grab
STORET No. 01119 1 Mon. Site No. EFF-9	Permit Requirement	****	****		****	****	2.9 DAILY MAX			1/Day of Discharge	Grab
Iron, Total Recoverable	Sample Measurement	****	****	****	****	****	77,000.0	ug/L	1	1/Day of Discharge	Grab
STORET No. 00980 1 Mon. Site No. EFF-9	Permit Requirement	****	****		****	****	3,300.0 DAILY MAX			1/Day of Discharge	Grab

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitt information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Name/Title of Principal Executive Officer or Authorized Agent (Type or Print)	Signature of Principal Executive Officer or Authorized Agent	Telephone No. (incl. area code)	Date (yy/mm/dd)
Michael Olive Manager Crystal River Fossil Plant	Michael Olive	(352) 563-4484	04/10/25

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

See Addendum

DEP Form 62-620.910(10), Effective November 29, 1994

DEPARTMENT OF ENVIRONMENTAL PROTECTION DISCHARGE MONITORING REPORT - PART A

WHEN COMPLETED MAIL THIS REPORT TO: Department of Environmental Protection, Wastewater Facilities Regulation Section, MS 3550, 2600 Blair Stone Road, Tallahassee, FL 32399-2400

COAL PILE RUNOFF

PERMITTEE NAME: Progress Energy Florida

MAILING: P.O. Box 14042, MAC CN77
St. Petersburg, FL 33733
ATTN: Michael Olive

FACILITY: Crystal River South Plant - Units 1, 2
LOCATION: 15760 W. Powerline St., Crystal River, FL 34428
COUNTY: Citrus

PERMIT NUMBER: FL0000159-001-1W1S
LIMIT: Final
CLASS SIZE: Major
DISCHARGE POINT NUMBER: D-0H
PLANT SIZE/TREATMENT TYPE:
NO DISCHARGE FROM SITE: ☐

WAFR Site No.:
GMS ID No.: 1037M25518
GMS Test Site No.:
REPORT: Monthly
GROUP: Industrial

MONITORING PERIOD--From: 2004/09/01 To: 2004/09/30

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX.	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM	UNITS			
Lead, Total Recoverable	Sample Measurement	****	****	****	****	****	2.2	ug/L	0	1/Day of Discharge	Grab
STORET No. 01114 1 Mon. Site No. EFF-9	Permit Requirement	****	****		****	****	15.6 DAILY MAX			1/Day of Discharge	Grab
Mercury, Total Recoverable	Sample Measurement	****	****	****	****	****	0.1 U	ug/L	0	1/Day of Discharge	Grab
STORET No. 71901 1 Mon. Site No. EFF-9	Permit Requirement	****	****		****	****	0.0125 DAILY MAX			1/Day of Discharge	Grab
Nickel, Total Recoverable	Sample Measurement	****	****	****	****	****	360.0	ug/L	1	1/Day of Discharge	Grab
STORET No. 01074 1 Mon. Site No. EFF-9	Permit Requirement	****	****		****	****	8.3 DAILY MAX			1/Day of Discharge	Grab
Selenium, Total Recoverable	Sample Measurement	****	****	****	****	****	1.5	ug/L	0	1/Day of Discharge	Grab
STORET No. 00981 1 Mon. Site No. EFF-9	Permit Requirement	****	****		****	****	71.0 DAILY MAX			1/Day of Discharge	Grab
Zinc, Total Recoverable	Sample Measurement	****	****	****	****	****	820.0	ug/L	0	1/Day of Discharge	Grab
STORET No. 01094 1 Mon. Site No. EFF-9	Permit Requirement	****	****		****	****	86.0 DAILY MAX			1/Day of Discharge	Grab
Vanadium, total Recoverable	Sample Measurement	****	****	****	****	****	10 U	ug/L	0	1/Day of Discharge	Grab
STORET No. 01128 1 Mon. Site No. EFF-9	Permit Requirement	****	****		****	****	Report DAILY MAX			1/Day of Discharge	Grab
pH (Background)	Sample Measurement	****	****	****	8.0	****	8.0	SU	0	1/Day of Discharge	Grab
STORET No. 00400 7 Mon. Site No. INT-3D	Permit Requirement	****	****		Report DAILY MIN	****	Report DAILY MAX			1/Day of Discharge	Grab

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

See Addendum

DEP Form 62-620.910(10), Effective November 29, 1994

DEPARTMENT OF ENVIRONMENTAL PROTECTION DISCHARGE MONITORING REPORT - PART A

WHEN COMPLETED MAIL THIS REPORT TO: Department of Environmental Protection, Wastewater Facilities Regulation Section, MS 3550, 2600 Blair Stone Road, Tallahassee, FL 32399-2400

COAL PILE RUNOFF

PERMITTEE NAME: Progress Energy Florida

MAILING: P.O. Box 14042, MAC CN77
St. Petersburg, FL 33733
ATTN: Michael Olive

FACILITY: Crystal River South Plant - Units 1, 2
LOCATION: 15760 W. Powerline St., Crystal River, FL 34428
COUNTY: Citrus

PERMIT NUMBER: FL0000159-001-1W1S
LIMIT: Final
CLASS SIZE: Major
DISCHARGE POINT NUMBER: D-0H
PLANT SIZE/TREATMENT TYPE:
NO DISCHARGE FROM SITE: ☐

WAFR Site No.:
GMS ID No.: 1037M25518
GMS Test Site No.:
REPORT: Monthly
GROUP: Industrial

MONITORING PERIOD--From: 2004/09/01 To: 2004/09/30

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX.	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM	UNITS			
pH (Effluent)	Sample Measurement	****	****	****	2.7	****	2.7	SU	0	1/Day of Discharge	Grab
STORET No. 00400 P Mon. Site No. EFF-9	Permit Requirement	****	****		Report DAILY MIN	****	Report DAILY MAX			1/Day of Discharge	Grab
pH (Calculated Limit)	Sample Measurement	****	****	****	7.0	****	8.5	SU	0	1/Day of Discharge	Grab
STORET No. 00400 Q Mon. Site No. EFF-9	Permit Requirement	****	****		Report DAILY MIN	****	Report DAILY MAX			1/Day of Discharge	Grab
pH (Exceedance of Calculated Limit)	Sample Measurement	****	****	****	-4.3	****	-5.8	SU	1	1/Day of Discharge	Grab
STORET No. 00400 R Mon. Site No. EFF-9	Permit Requirement	****	****		0.0 DAILY MIN	****	0.0 DAILY MAX			1/Day of Discharge	Grab

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

See Addendum

DEP Form 62-620.910(10), Effective November 29, 1994

Progress Energy

Larry E. Hatcher
Manager, Crystal River
Fossil Plant & Fuel Operations

October 22, 2008

Florida Department of Environmental Protection
Wastewater Facilities Regulation Section
Twin Towers Office Buildings
2600 Blair Stone Road, Mail Station 3550
Tallahassee, FL 32399-2400

Dear Sir:

Re: Progress Energy Florida
Crystal River Units 1, 2
Permit ID# NPDES FL0000159-001-IW1S

Enclosed are the monitoring reports for the month of September 2008 in accordance with the requirements of the above-cited permits.

Storm water sampling of outfall D-600 was performed on the first available storm event during the reporting month producing at least 0.10 inches of rain in a half hour's time. Discharge flow during the sampling of outfall D-600 was calculated using the established square footage of the storm water basin multiplied by the total rainfall during the half hour the sample was collected to produce the total cubic feet of storm water discharged. The total cubic feet of storm water was converted into units of MGD (million gallons per day) of discharge.

Additionally, on September 11, 2008 construction personnel working on the lined FGD blowdown pond project needed to perform some dewatering in order to continue working in the area of the old CRS ash storage area (where the FGD blowdown ponds are being constructed). They bermed off a small area within the larger pond area with the intent to pump water to that area. From this location, our intent was to sample prior discharge through the NPDES outfall (outfall no. D-0C1 of CRS NPDES permit), to ensure we would meet the limits prior to discharge.

This small bermed area was located next to a weir and stop logs that prevent water from entering the permitted outfall (D-0C1). During this dewatering operation, it was noted that water went over the weir and that the stop logs were leaking such that flow was proceeding out through the permitted outfall. Subsequently, permit-required sampling was performed at sample point EFF-5 prior to stopping the discharge. Results showed that all parameters were within the permit limits except for arsenic and iron. The arsenic value was 0.082 mg/L (permit limit = 0.05 mg/L) and the iron value was 0.42 mg/L (permit limit = 0.3 mg/L). As a result, the intent is to direct further discharges from this area to the CRS percolation ponds rather than the NPDES outfall.

Progress Energy Florida, Inc.
Crystal River Steam Plant
15760 W. Powerline Street
CN77
Crystal River, FL 34428

If you should have any questions concerning these reports, please contact Erika Tuchbaum-Biro of my staff at (352) 563-4396 or Doug Yowell at (727) 820-5228.

Sincerely,

Larry E. Hatcher

Larry E. Hatcher
Manager, Crystal River
Fossil Plant & Fuel Operations

Enclosures

Cc: FDEP Southwest District Office

DEPARTMENT OF ENVIRONMENTAL PROTECTION DISCHARGE MONITORING REPORT - PART A

WHEN COMPLETED MAIL THIS REPORT TO: Department of Environmental Protection, Wastewater Facilities Regulation Section MS 3550, 2600 Blair Stone Road, Tallahassee, FL 32399-2400

PERMITTEE NAME: Progress Energy Florida
MAILING: P.O. Box 14042 MAC CN77, St. Petersburg FL 33733-4042, ATTN: Larry E. Hatcher

FACILITY: Crystal River South Plant - Units 1, 2
LOCATION: 15760 W. Powerline St Crystal River, FL 34428
COUNTY: Citrus

PERMIT NUMBER: FL0000159
MONITORING PERIOD: From: 2008/09/01 To: 2008/09/30
LIMIT: Final
CLASS SIZE: Major

REPORT: Monthly
GROUP: Industrial

GMS ID No.: 1037M25518
DISCHARGE POINT NUMBER: D-0C1
PLANT SIZE/TREATMENT TYPE:

GMS Test Site No.:
NO DISCHARGE FROM SITE: ☐

PARAMETER		QUANTITY OR LOADING AVERAGE	QUANTITY OR LOADING MAXIMUM	UNITS	QUALITY OR CONCENTRATION MINIMUM	QUALITY OR CONCENTRATION AVERAGE	QUALITY OR CONCENTRATION MAXIMUM	UNITS	NO. EX.	FREQUENCY OF ANALYSIS	SAMPLE TYPE
Flow	Sample Measurement	0.9	0.9	MGD	****	****	****	****	0	1/Day of Discharge	Calculation
STORET No. 50050 1, Mon. Site No. EFF-5	Permit Requirement	Report DAILY AVG	Report DAILY MAX		****	****	****			1/Day of Discharge	Calculation
Oil and Grease	Sample Measurement	****	****	****	****	****	1.3	mg/L	0	1/Week	Grab
STORET No. 00556 1, Mon. Site No. EFF-5	Permit Requirement	****	****		****	****	5.0 DAILY MAX			1/Week	Grab
Total Suspended Solids	Sample Measurement	****	****	****	****	21.0	21.0	mg/L	0	3/Week	Grab
STORET No. 00530 1, Mon. Site No. EFF-5	Permit Requirement	****	****		****	30.0 DAILY AVG	100.0 DAILY MAX			3/Week	Grab
Total Recoverable Arsenic	Sample Measurement	****	****	****	****	****	82.0	ug/L	1	1/Month	Grab
STORET No. 00978 1, Mon. Site No. EFF-5	Permit Requirement	****	****		****	****	50.0 DAILY MAX			1/Month	Grab
Total Recoverable Cadmium	Sample Measurement	****	****	****	****	****	1.0	ug/L	0	1/Month	Grab
STORET No. 01113 1, Mon. Site No. EFF-5	Permit Requirement	****	****		****	****	9.3 DAILY MAX			1/Month	Grab

Comments:
Q = Limit calculated from background/effluent limits. R = Exceedance of the calculated limit. 7 = Background or upstream sample point. P = Effluent sample point. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): discharge from each ash pond effluent prior to mixing with any other waste stream EFF-5, EFF-6, EFF-9, EFF-10A & EFF-10B) and pH samples for the purposes of determining background shall be taken at the canal intake (INT-3D). If any line not used, enter "MNR".
Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): at the outlet corresponding to an individual condenser (4 condensers per unit) (EFF-1A, EFF-1B, EFF-1C); flow from the combined circulating water pumps (EFF-2); intake temperature at unit 1 (INT-1); and discharge temperature at the intercession of the site discharge canal and the original bulkhead line (EFF-3D). (1) Combined condenser flow from Units 1,2 and 3 shall not exceed 1897.9 MGD during period May 1st through October 31st of each year, nor 1613.2 MGD during the remainder of the year. If any line not used, enter "MNR".

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Name/Title of Principal Executive Officer or Authorized Agent (Type or Print)	Signature of Principal Executive Officer or Authorized Agent	Telephone No. (incl. area code)	Date (yy/mm/dd)
Larry E. Hatcher Manager, Crystal River Fossil Plant & Fuel Operations	Larry E. Hatch	(352) 563-4484	10/25/08

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

On 9/11/08 construction personnel working on the lined FGD blowdown pond project inadvertantly dewatered through the NPDES outfall. Dewatering will be directed to the IWW perc. pond system.

DEP Form 62-620.910(10), Effective November 29, 1994

DEPARTMENT OF ENVIRONMENTAL PROTECTION DISCHARGE MONITORING REPORT - PART A

WHEN COMPLETED MAIL THIS REPORT TO: Department of Environmental Protection, Wastewater Facilities Regulation Section MS 3550, 2600 Blair Stone Road, Tallahassee, FL 32399-2400

PERMITTEE NAME: Progress Energy Florida
MAILING: P.O. Box 14042 MAC CN77
St. Petersburg FL 33733-4042
ATTN: Larry E. Hatcher

FACILITY: Crystal River South Plant - Units 1, 2
LOCATION: 15760 W. Powerline St. Crystal River FL 34428
COUNTY: Citrus

PERMIT NUMBER: FL0000159
MONITORING PERIOD: From: 2008/09/01 To: 2008/09/30
LIMIT: Final
CLASS SIZE: Major

REPORT: Monthly
GROUP: Industrial

GMS ID No.: 1037M25518
DISCHARGE POINT NUMBER: D-0C1
PLANT SIZE/TREATMENT TYPE:

GMS Test Site No.:
NO DISCHARGE FROM SITE:

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX.	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM	UNITS			
Total Recoverable Chromium	Sample Measurement	****	****	****	****	****	<4	ug/L	0	1/Month	Grab
STORET No. 01118 1 Mon. Site No. EFF-5	Permit Requirement	****	****		****	****	50.0 DAILY MAX			1/Month	Grab
Total Recoverable Copper	Sample Measurement	****	****	****	****	****	2.2	ug/L	0	1/Month	Grab
STORET No. 01119 1 Mon. Site No. EFF-5	Permit Requirement	****	****		****	****	3.7 DAILY MAX			1/Month	Grab
Total Recoverable Iron	Sample Measurement	****	****	****	****	****	0.4	mg/L	1	1/Month	Grab
STORET No. 00980 1 Mon. Site No. EFF-5	Permit Requirement	****	****		****	****	0.3 DAILY MAX			1/Month	Grab
Total Recoverable Lead	Sample Measurement	****	****	****	****	****	<1	ug/L	0	1/Month	Grab
STORET No. 01114 1 Mon. Site No. EFF-5	Permit Requirement	****	****		****	****	8.5 DAILY MAX			1/Month	Grab
Total Recoverable Mercury	Sample Measurement	****	****	****	****	****	<0.1	ug/L	0	1/Month	Grab
STORET No. 71901 1 Mon. Site No. EFF-5	Permit Requirement	****	****		****	****	0.025 DAILY MAX			1/Month	Grab

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

On 9/11/08 construction personnel working on the lined FGD blowdown pond project inadvertantly dewatered through the NPDES outfall. Dewatering will be directed to the IWW perc. pond system.

DEP Form 62-620.910(10), Effective November 29, 1994

DEPARTMENT OF ENVIRONMENTAL PROTECTION DISCHARGE MONITORING REPORT - PART A

WHEN COMPLETED MAIL THIS REPORT TO: Department of Environmental Protection, Wastewater Facilities Regulation Section MS 3550, 2600 Blair Stone Road, Tallahassee, FL 32399-2400

PERMITTEE NAME: Progress Energy Florida
MAILING: P.O. Box 14042 MAC CN77
St. Petersburg FL 33733-4042
ATTN: Larry E. Hatcher

PERMIT NUMBER: FL0000159
MONITORING PERIOD--From: 2008/09/01 To: 2008/09/30
LIMIT: Final
CLASS SIZE: Major

REPORT: Monthly
GROUP: Industrial

FACILITY: Crystal River South Plant - Units 1, 2
LOCATION: 15760 W. Powerline St Crystal River, FL 34428
COUNTY: Citrus

GMS ID No.: 1037M25518
DISCHARGE POINT NUMBER: D-0C1
PLANT SIZE/TREATMENT TYPE:

GMS Test Site No.:
NO DISCHARGE FROM SITE:

PARAMETER		QUANTITY OR LOADING AVERAGE	QUANTITY OR LOADING MAXIMUM	UNITS	QUALITY OR CONCENTRATION MINIMUM	QUALITY OR CONCENTRATION AVERAGE	QUALITY OR CONCENTRATION MAXIMUM	UNITS	NO. EX.	FREQUENCY OF ANALYSIS	SAMPLE TYPE
Total Recoverable Nickel	Sample Measurement	****	****	****	****	****	<1.0	ug/L	0	1/Month	Grab
STORET No. 01074 1 Mon. Site No EFF-5	Permit Requirement	****	****		****	****	8.3 DAILY MAX			1/Month	Grab
Total Recoverable Selenium	Sample Measurement	****	****	****	****	****	1.0	ug/L	0	1/Month	Grab
STORET No. 00981 1 Mon. Site No EFF-5	Permit Requirement	****	****		****	****	71.0 DAILY MAX			1/Month	Grab
Total Recoverable Zinc	Sample Measurement	****	****	****	****	****	5.9	ug/L	0	1/Month	Grab
STORET No. 01094 1 Mon. Site No EFF-5	Permit Requirement	****	****		****	****	86.0 DAILY MAX			1/Month	Grab
pH (Background)	Sample Measurement	****	****	****	8.3	****	8.3	SU	0	1/Month	Grab
STORET No. 00400 7 Mon. Site No INT-1	Permit Requirement	****	****		Report DAILY MIN	****	Report DAILY MAX			1/Month	Grab
pH (Effluent)	Sample Measurement	****	****	****	7.9	****	7.9	SU	0	1/Month	Grab
STORET No. 00400 P Mon. Site No EFF-5	Permit Requirement	****	****		6.5 DAILY MIN	****	8.5 DAILY MAX			1/Month	Grab

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

On 9/11/08 construction personnel working on the lined FGD blowdown pond project inadvertantly dewatered through the NPDES outfall. Dewatering will be directed to the IWW perc. pond system.

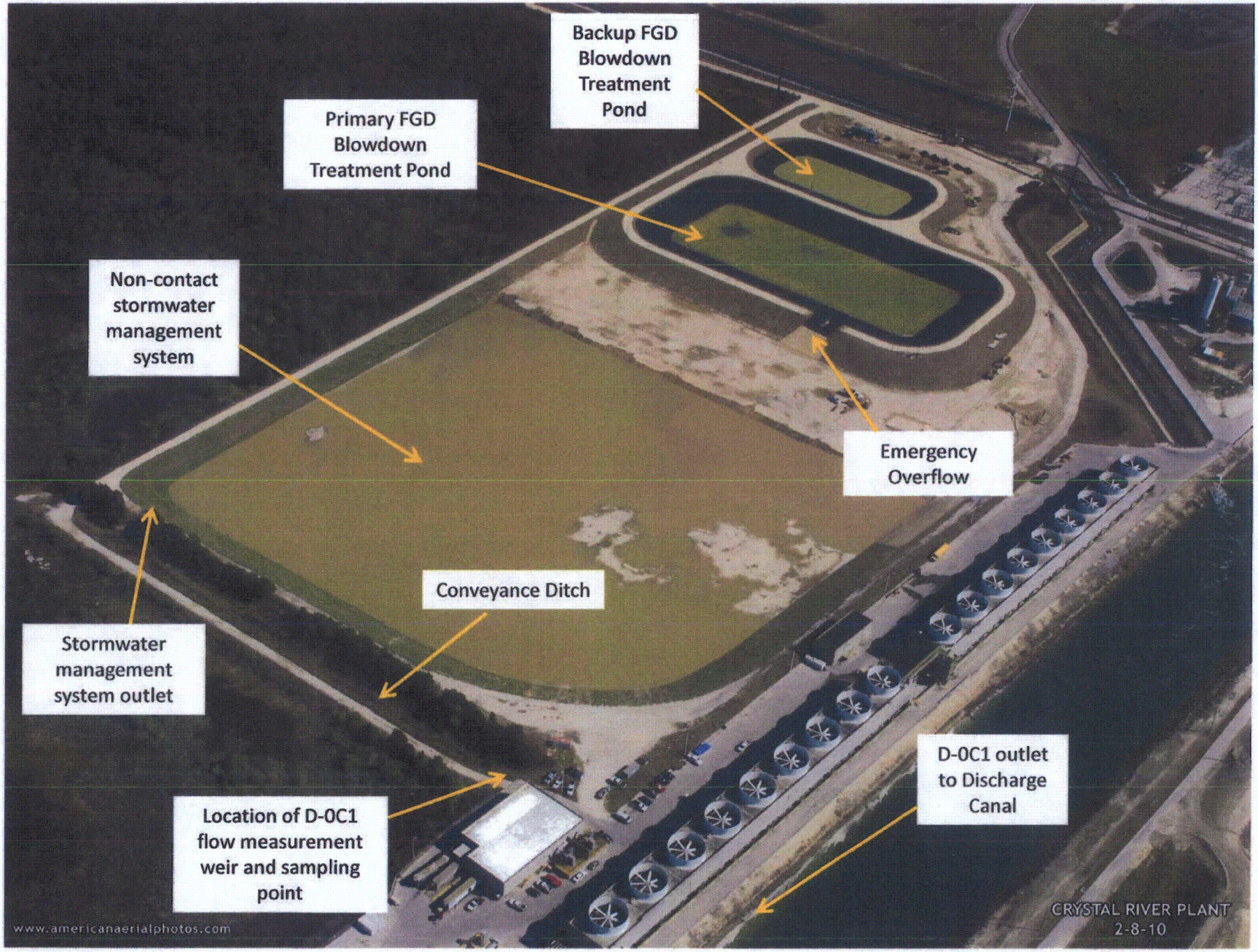
DEP Form 62-620.910(10), Effective November 29, 1994

Progress Energy Florida, Inc. –Crystal River Units 1, 2, & 3

DEP File No. FL0000159-013-IW1S/NR

Attachment 10

Aerial Photo of FGD Blowdown Treatment Ponds and Associated Non-Contact Stormwater Management System


Backup FGD Blowdown Treatment Pond
Primary FGD Blowdown Treatment Pond
Non-contact stormwater management system
Emergency Overflow
Conveyance Ditch
Stormwater management system outlet
D-0C1 outlet to Discharge Canal
Location of D-0C1 flow measurement weir and sampling point
www.americanaerialphotos.com
CRYSTAL RIVER PLANT
2-8-10

Progress Energy Florida, Inc. –Crystal River Units 1, 2, & 3

DEP File No. FL0000159-013-IW1S/NR

Attachment 11

Page From NPDES Permit IL0048321

Showing Example Bypass Provision Special Condition Language

NPDES Permit No. IL0046321

Special Conditions

Illinois Environmental Protection Agency
Division of Water Pollution Control
Compliance Assurance Section
Annual Inspection Report
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

If the facility performs inspections more frequently than required by this permit, the results shall be included as additional information in the annual report.

SPECIAL CONDITION 9. Discharge of station cooling pond water to adjacent impoundments owned by the permittee, to replace water which is withdrawn from these impoundments for station operations during periods of low flows in the Kankakee River when the station must decouple its operations from the river, is hereby permitted for these emergency periods. No monitoring is required for this permitted activity. The IEPA shall be promptly notified during such operations.

SPECIAL CONDITION 10. The permittee shall record monitoring results on Discharge Monitoring Report Forms using one such form for each discharge each month.

The completed Discharge Monitoring Report forms shall be submitted to IEPA no later than the 28th of the following month, unless otherwise specified by the the permitting authority.

Discharge Monitoring Reports shall be mailed to the IEPA at the following address:

Illinois Environmental Protection Agency
Division of Water Pollution Control
1021 North Grand Avenue East
Springfield, Illinois 62706

Attention: Compliance Assurance Section

SPECIAL CONDITION 11. The "upset" defense provisions of Title 40, Section 122.41(n) of the Federal Regulations are hereby incorporated into this permit by reference.

SPECIAL CONDITION 12. An emergency cooling pond overflow exists tributary to an unnamed drainage ditch which is tributary to the Mazon River. Discharges from this overflow shall be subject to the bypass provisions of 40 CFR 122.41(m).

SPECIAL CONDITION 13. The permittee shall submit a completed Form 2F as soon as conditions allow, for Outfall 002 and Outfall 003. Based on the new information the Agency may choose to modify the permit after public notice and opportunity for hearing.

SPECIAL CONDITION 14. For Discharge No. 001(b), any use of chlorine to control slime growths, odors or as an operational control, etc. shall not exceed the limit of 0.05 mg/l (daily maximum) total residual chlorine in the effluent. Sampling is required on a daily grab basis during the chlorination process. Reporting shall be submitted on the (DMR's) on a monthly basis.

SPECIAL CONDITION 15. Flow shall be reported as a daily maximum and a monthly average, and shall be reported in Million Gallons per Day.

Progress Energy Florida, Inc. –Crystal River Units 1, 2, & 3

DEP File No. FL0000159-013-IW1S/NR

Attachment 12

Mariculture Center Release Summary

1992 - 2009

PROGRESS ENERGY
CRYSTAL RIVER MARICULTURE CENTER
FINGERLING/JUVENILE RELEASE SUMMARY

YEAR	RED DRUM	RED DRUM LARVAE	SPOTTED SEATROUT	SPOTTED SEATROUT LARVAE	PINK SHRIMP	STRIPED MULLET	PIGFISH	SILVER PERCH	STONE CRAB	BLUE CRAB
1992	17,519	0	0	0	0	0	0	0	0	0
1993	169,165	0	6,908	0	0	0	0	0	0	0
1994	12,204	0	55,304	0	0	0	0	0	0	0
1995	26,900	0	60,189	0	12,000	0	0	0	0	0
1996	50,795	0	32,994	0	7,750	0	0	0	0	0
1997	0	0	0	0	0	pond trials	0	0	0	0
1998	157,833	800,000	171,350	425,000	0	pond trials	0	0	0	0
1999	67,227	575,500	40,536	290,000	34,541	25,000 first feeding larvae	0	0	0	0
2000	285,366	0	11,000	0	9,839	0	controlled spawning/1,300,000 first feeding larvae/pond trial (none released)	0	0	0
2001	16,251	0	130	0	91,079	indoor culture	0	0	0	0
2002	4,070	0	250,054	0	36,934	indoor culture	0	controlled spawning/pond trial (none released)	0	0
2003	125,064	0	163,200	0	49,755	500,000 first feeding larvae	0	39,942 first feeding larvae	692,000 zoea stage I	controlled spawning and pond trial (none released)
2004	15,000	0	16,500	0	0	0	0	0	4,000,000 Zoea I	35,000,000 Zoea I
2005	0	0	4,768	0	87,374	0	0	0	8,767,055 Zoea I	31,447,656 Zoea I
2006	0	0	81,700	0	42,830	0	0	0	14,851,847 Zoea 1	15,475,245 Zoea 1
2007	0	0	70,000	0	43,000	0	0	0	4,729,060 Zoea 1	11,823,380 Zoea 1
2008	0	0	75,180	0	0	0	0	0	0	0
2009	0	0	92,000	0	0	0	0	0	0	0
Totals	947,394	1,375,500	1,131,813	715,000	415,102	525,000 first feeding larvae	0	39,942 first feeding larvae	32,347,962 zoea stage 1	93,746,281 ZI