



TECHNICAL MEMORANDUM

Date: April 1, 2010

Project No.: 083-82671.1

To: Mr. Steven Parrish

Company: Progress Energy Florida, Inc.
Crystal River Energy Complex
steven.parrish@pgnmail.com

From: Kenneth B. Karably, PE, PG
Samuel F. Stafford

cc: Robert Stafford
Michael Shrader
Cynthia Wilkinson

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**RE: FLUE GAS DESULFURIZATION PRODUCTS SAMPLING AND CHARACTERIZATION
COAL COMBUSTION PRODUCT (CCP) MANAGEMENT PLAN UPDATE
CRYSTAL RIVER ENERGY COMPLEX
CRYSTAL RIVER, FLORIDA**

Golder Associates Inc. (Golder) has prepared this Technical Memorandum for Progress Energy Florida, Inc. (PEF) to document the sampling and characterization procedures for the Flue Gas Desulfurization (FGD) products at Crystal River Energy Complex (CREC). This memorandum serves as a supplement to the Coal Combustion Product (CCP)/Solid Materials Sampling Report (ECT, March 2008). ECT prepared a sampling plan for the various coal combustion product (CCP) and solid waste materials at CREC, including fly ash, bottom ash, commingled materials, pyrite materials, ponded ash materials, etc.

On February 22, 2010, the FGD system associated with Units 4 and 5 became active including the FGD blowdown ponds, gypsum dewatering facility, and temporary gypsum storage pad. The Florida Department of Environmental Protection (FDEP) requested that PEF revise the Coal Combustion Product (CCP)/Solid Waste Materials Management Plan (CCP Management Plan) within 60 days of commencing operation of the FGD system and include the characterization and management of FGD settling pond solids and gypsum. This memorandum summarizes the sampling and characterization of those materials.

FGD Product Solid Materials Sampling

Golder mobilized to CREC on March 4, 2010 to collect samples of the FGD settling pond solids and stockpiled gypsum for synthetic precipitation leaching procedure (SPLP) analyses. A generally random sampling approach, similar to that employed by ECT, was used to collect the samples. Samples were analyzed by SPLP for aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chloride, chromium, copper, fluoride, gross alpha, iron, lead, manganese, mercury, molybdenum, nickel, nitrate, pH, selenium, silver, sodium, strontium, sulfate, thallium, total dissolved solids (TDS), vanadium, zinc, and percent solids.

The FGD system creates a liquid blowdown waste stream containing solids that is discharged to the FGD blowdown pond system that has been designed to settle out most of the suspended solids (see Figure 1). Given the recent startup of the pond system operation, only a very small amount of solids had accumulated in the pond. Therefore, using a 5-gallon bucket, samples were collected directly from the discharge pipe (see Photograph 1). The pond influent samples were then emptied into a field-filtering system consisting of new, 600 thread count cotton pillow cases lining a perforated 5-gallon bucket. Liquid draining through the filter system flowed down the LLDPE-lined slope into the pond. Over the course of about an hour, additional buckets were emptied into the field-filtering system until it was determined there was sufficient solids available to sample. When there was sufficient material, a stainless steel sampling scoop was used to fill the lab-provided sample containers. For each of the three (3) solids samples collected, approximately 50 to 100 gallons of influent liquid were field-filtered. The three samples were collected approximately two (2) hours apart from each other.



Photograph 1 – Discharge Pipe in Northwest Corner of Back-up Pond (March 4, 2010)

The FGD units at CREC produce synthetic gypsum which is conveyed to the temporary gypsum storage area (see Figure 1). The gypsum stockpile at the time of sampling contained approximately 2,000 cubic yards (see Photograph 2). Grab samples were collected from the north (from 3 locations, composited into sample Gypsum-1), east (from 3 locations, composited into sample Gypsum-2), and west (from 3 locations, composited into sample Gypsum-3) sides of the stockpile from depths of approximately one (1) foot below surface and then composited and sent to the laboratory for SPLP analysis.



Photograph 2 – Temporary Gypsum Storage Area (March 4, 2010)

FGD Product Solid Materials Characterization

Laboratory analysis of FGD pond solids and stockpiled gypsum samples were performed by Advanced Environmental Laboratories, Inc. (AEL) of Jacksonville, Florida. The results of the FGD product solids sampling are summarized in Table 1 and complete laboratory analytical results are presented in Attachment A.

The FGD pond solids samples had detections of the following constituents: aluminum, antimony, arsenic, barium, boron, cadmium, manganese, nickel, sodium, strontium, thallium, vanadium, zinc, gross alpha,

chloride, fluoride, nitrate, sulfate, and total dissolved solids. Except for fluoride (which has both a secondary drinking water standard (SDWS) of 2 milligrams per liter (mg/L) and a primary drinking water standard (PDWS) of 4 mg/L), no constituent was detected at concentrations exceeding its PDWS per Chapter 62-550, Florida Administrative Code (FAC). The other constituents in the FGD pond solids that had SPLP results in excess of groundwater standards and criteria included:

- Boron was detected in all of the samples at concentrations above its groundwater cleanup target level (GCTL)¹ of 1.4 mg/L;
- Manganese was detected in all of the samples at concentrations above the SDWS of 0.05 mg/L;
- Sulfate was detected in all of the samples at concentrations above the SDWS of 250 mg/L; and
- Total dissolved solids (TDS) were detected in each of the samples at concentrations exceeding the SDWS.

The gypsum stockpile samples had detections of the following constituents: aluminum, antimony, barium, boron, cadmium, manganese, sodium, strontium, vanadium, gross alpha, chloride, fluoride, nitrate, sulfate, and total dissolved solids. Except for fluoride (which as noted above has both a SDWS and a PDWS), no other constituent was detected at concentrations exceeding its PDWS. The other constituents in the gypsum stockpile that had SPLP results in excess of groundwater standards and criteria included:

- Aluminum was detected in all of the samples above the SDWS of 0.2 mg/L;
- Sulfate was detected in all of the samples at concentrations above the SDWS of 250 mg/L; and
- Total dissolved solids (TDS) were detected in each of the samples at concentrations exceeding the SDWS.

Employing the same methodology as was used in the Coal Combustion Product (CCP)/Solid Materials Sampling Report (ECT, March 2008), ninety-five percent upper confidence limit (95% UCL) calculations were performed for each detected constituent in the FGD pond solids and gypsum stockpile samples. The 95% UCL calculations were performed using the Student's t-statistic assuming a normal distribution of the data. It is noted that, technically, the sample size for the UCL calculations is not sufficient to provide meaningful or reliable test statistics. However, some CCP/Solid Wastes sampled in the original study (ECT, March 2008) had some similarly sized data sets with sample populations ranging from 3 to 16 depending on material type and quantity. Given the small standard deviation in the data, the 95% UCL varied only slightly from the mean concentration. The 95% UCL calculations are summarized in Table 1 and the calculations are provided in Attachment B.

¹ Per Chapter 62-777, FAC, which sets out cleanup criteria for certain FDEP cleanup rules.

Attachments: Table 1 - FGD Byproducts SPLP Results
Figure 1 - Site Plan
Attachment A - Laboratory Analytical Results
Attachment B - 95% UCL Calculations

SFS/KBK/ams

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TABLE 1
SUMMARY OF FGD BYPRODUCTS SPLP RESULTS
PROGRESS ENERGY FLORIDA
CRYSTAL RIVER ENERGY COMPLEX

Parameter	Standard		Units	FGD Blowdown Pond Solids					Gypsum Stockpile				
				Pond Solids-1	Pond Solids-2	Pond Solids-3	Mean Results	95% Upper Confidence Limit	Gypsum-1	Gypsum-2	Gypsum-3	Mean Results	95% Upper Confidence Limit
Aluminum	0.2	SDWS	mg/L	0.069 I	0.087 I	0.10 I	0.084	0.11	0.32	0.29	0.33	0.31	0.35
Antimony	0.006	PDWS	mg/L	0.00064	0.00060	0.00057 I	0.00060	0.00066	0.00019 I	0.00021 I	0.00024 I	0.00021	0.00026
Arsenic	0.010	PDWS	mg/L	0.0091 U	0.0091 U	0.0091 U	--	--	0.0091 U	0.0091 U	0.0091 U	--	--
Barium	2.0	PDWS	mg/L	0.15	0.14	0.14	0.14	0.15	0.095	0.086	0.074	0.08	0.10
Beryllium	0.004	PDWS	mg/L	0.000086 U	0.000086 U	0.000086 U	--	--	0.000086 U	0.000086 U	0.000086 U	--	--
Boron	1.4	GCTL	mg/L	3.1	2.9	3.0	3.0	3.2	0.084	0.20	0.37	0.2	0.46
Cadmium	0.005	PDWS	mg/L	0.00083	0.00079	0.00082	0.00081	0.00085	0.00046 I	0.00042 I	0.00044 I	0.00044	0.00047
Chromium	0.1	PDWS	mg/L	0.0024 U	0.0024 U	0.0024 U	--	--	0.0024 U	0.0024 U	0.0024 U	--	--
Copper	1.0	SDWS	mg/L	0.0022 U	0.0022 U	0.0022 U	--	--	0.0022 U	0.0022 U	0.0022 U	--	--
Iron	0.3	SDWS	mg/L	0.061 U	0.061 U	0.061 U	--	--	0.061 U	0.061 U	0.061 U	--	--
Lead	0.015	PDWS	mg/L	0.0020 U	0.0020 U	0.0020 U	--	--	0.0020 U	0.0020 U	0.0020 U	--	--
Manganese	0.05	SDWS	mg/L	0.14	0.13	0.13	0.13	0.14	0.0051	0.0090	0.014	0.009	0.017
Mercury	0.002	PDWS	mg/L	0.000014 U	0.000020 I	0.000014 U	0.000010	--	0.000014 U	0.000014 U	0.000014 U	--	--
Molybdenum	0.035	GCTL	mg/L	0.0031 U	0.0031 U	0.0031 U	--	--	0.0031 U	0.0031 U	0.0031 U	--	--
Nickel	0.1	PDWS	mg/L	0.0037 I	0.0038 I	0.0040 I	0.0038	0.0041	0.0019 U	0.0019 U	0.0019 U	--	--
Selenium	0.05	PDWS	mg/L	0.0075 U	0.0075 U	0.0075 U	--	--	0.0075 U	0.0075 U	0.0075 U	--	--
Silver	0.1	SDWS	mg/L	0.0012 U	0.0012 U	0.0012 U	--	--	0.0012 U	0.0012 U	0.0012 U	--	--
Sodium	160	PDWS	mg/L	7.3 V	5.8 V	6.2 V	6.4	7.7	3.9 V	4.6 V	3.7 V	4.0	4.9
Strontium	4.2	GCTL	mg/L	0.99	0.99	0.98	0.99	1.0	0.56	0.59	0.59	0.58	0.61
Thallium	0.002	PDWS	mg/L	0.000073 I	0.00025	0.00011 I	0.00013	0.0003	0.000067 U	0.000067 U	0.000067 U	--	--
Vanadium	0.049	GCTL	mg/L	0.0060	0.0061	0.0059	0.0060	0.0062	0.0025	0.0037	0.0040	0.0033	0.0047
Zinc	5.0	SDWS	mg/L	0.013	0.019	0.013	0.015	0.021	0.0075 U	0.0075 U	0.0075 U	--	--
Gross Alpha	15	PDWS	pCi/L	5.7±3.6	7.7±3.7	9.8±5.1	7.5	11.2	4.8±3.2 U	9.6±3.0	9.7±3.1	6.1	14.3
Chloride	250	SDWS	mg/L	190	180	170	180	197	2.3 U	4.0 I	10	3.6	13
Fluoride	4.0/2.0	P/SDWS	mg/L	6.2	6.1	6.1	6.1	6.2	5.7	5.1	5.3	5.4	5.9
Nitrate	10	PDWS	mg/L	0.39	0.37	0.37	0.38	0.4	0.050 U	0.050 U	0.058 I	--	--
Sulfate	250	SDWS	mg/L	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
pH	6.5-8.5	SDWS	S.U.	6.65	7.65	7.66	7.30	--	7.62	7.45	7.69	7.59	--
Total Dissolved Solids	500	SDWS	mg/L	2700	2800	2600	2699	2869	2200	2200	2200	2200	2200
Percent Solids	-	-	mg/L	58%	59%	58%	58%	--	65%	70%	79%	71%	--

Notes:

PDWS = Primary Drinking Water Standard per FAC 62-550

SDWS = Secondary Drinking Water Standard per FAC 62-550

GCTL = Groundwater Cleanup Target Level per FAC 62-777

Results in bold indicated laboratory detection

U = The compound was analyzed for but not detected above the laboratory method detection limit

I = The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

V = The compound was detected in the method blank

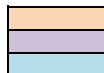
mg/L = milligrams per liter

pCi/L = picocuries per liter

S.U. = standard pH units

Average concentrations were calculated using one-half the method detection limit if the compound was not detected

Samples collected by Golder on March 4, 2010 and analyzed by Advanced Environmental Laboratories, Inc. (AEL) of Jacksonville, Florida



Exceedance of PDWS

Exceedance of SDWS

Exceedance of GGC

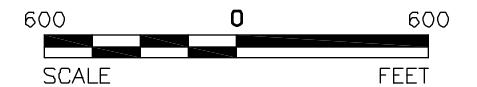
Created by: SFS
 Checked by: MMS
 Reviewed by: KBK

Drawing file: 083826711J001.dwg Apr 01, 2010 - 10:29am



REFERENCES

- 1.) AERIAL PHOTOGRAPH DATED OCTOBER 13, 2009 FROM SOUTHERN RESOURCE MAPPING, INC.



PROJECT PROGRESS ENERGY
CRYSTAL RIVER ENERGY COMPLEX
CITRUS COUNTY, FLORIDA

TITLE SITE PLAN



PROJECT No.	083-82671.1	FILE No.	083826711J001
DESIGN	SFS	03/30/10	SCALE AS SHOWN REV. 0
CADD	SFS	03/30/10	
CHECK	BTH	04/01/10	
REVIEW	KBK	04/01/10	

FIGURE 1

ATTACHMENT A

LABORATORY ANALYTICAL RESULTS



Advanced
Environmental Laboratories, Inc.

Advanced Environmental Laboratories, Inc
6601 Southpoint Parkway
Jacksonville, FL 32216
Phone: (904)363-9350
Fax: (904)363-9354

March 18, 2010

Ken Karably
Golder Associates
9428 Baymeadows Rd
Suite 400
Jacksonville, FL 32256

RE: Workorder: J1001913 CREC CCP / SW Man Plan

Dear Ken Karably:

Enclosed are the analytical results for sample(s) received by the laboratory on Friday, March 05, 2010. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report. The analytical results for the samples contained in this report were submitted for analysis as outlined by the Chain of Custody and results pertain only to these samples.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Andy Alvarez for
Bob Dempsey
bdempsey@aellab.com

Enclosures

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SAMPLE SUMMARY

Workorder: J1001913 CREC CCP / SW Man Plan

Lab ID	Sample ID	Matrix	Date Collected	Date Received
J1001913001	FGD Sludge - 1	Soil	3/4/2010 12:10	3/5/2010 08:25
J1001913002	FGD Sludge - 2	Soil	3/4/2010 14:45	3/5/2010 08:25
J1001913003	FGD Sludge - 3	Soil	3/4/2010 16:25	3/5/2010 08:25
J1001913004	Gypsum - 1	Soil	3/4/2010 12:35	3/5/2010 08:25
J1001913005	Gypsum - 2	Soil	3/4/2010 12:45	3/5/2010 08:25
J1001913006	Gypsum - 3	Soil	3/4/2010 12:50	3/5/2010 08:25

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ANALYTICAL RESULTS

Workorder: J1001913 CREC CCP / SW Man Plan

Lab ID: **J1001913001**

Date Received: 3/5/2010 08:25

Matrix: Soil

Sample ID: **FGD Sludge - 1**

Date Collected: 3/4/2010 12:10

Results for sample J1001913001 are reported on a dry weight basis.

Sample Description

Location

Parameters	Results	Units	Qual	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: Percent Solids, SM2540G, Soil		Analytical Method: SM 2540G						
Percent Solid	58	%		1	0.040	0.010	3/9/2010 08:00	J
METALS, SPLP								
Analysis Desc: SW846 6010B Analysis, SPLP		Preparation Method: SW-846 3010A Analytical Method: SW-846 6010						
Aluminum	0.069	mg/L	I	1	0.20	0.021	3/10/2010 19:51	J
Arsenic	0.0091	mg/L	U	1	0.010	0.0091	3/10/2010 19:51	J
Barium	0.15	mg/L		1	0.0020	0.0011	3/10/2010 19:51	J
Beryllium	0.000086	mg/L	U	1	0.00030	0.000086	3/10/2010 19:51	J
Boron	3.1	mg/L		1	0.015	0.0039	3/10/2010 19:51	J
Cadmium	0.00083	mg/L		1	0.00060	0.00013	3/10/2010 19:51	J
Chromium	0.0024	mg/L	U	1	0.0040	0.0024	3/10/2010 19:51	J
Copper	0.0022	mg/L	U	1	0.0040	0.0022	3/10/2010 19:51	J
Iron	0.061	mg/L	U	1	0.20	0.061	3/10/2010 19:51	J
Lead	0.0020	mg/L	U	1	0.0070	0.0020	3/10/2010 19:51	J
Manganese	0.14	mg/L		1	0.0050	0.0040	3/10/2010 19:51	J
Molybdenum	0.0031	mg/L	U	1	0.010	0.0031	3/10/2010 19:51	J
Nickel	0.0037	mg/L	I	1	0.0065	0.0019	3/10/2010 19:51	J
Selenium	0.0075	mg/L	U	1	0.020	0.0075	3/10/2010 19:51	J
Silver	0.0012	mg/L	U	1	0.0040	0.0012	3/10/2010 19:51	J
Sodium	7.3	mg/L	V	1	0.20	0.061	3/10/2010 19:51	J
Vanadium	0.0060	mg/L		1	0.0015	0.00034	3/10/2010 19:51	J
Zinc	0.013	mg/L		1	0.010	0.0075	3/10/2010 19:51	J
Analysis Desc: SW846 7470A Analysis, SPLP		Preparation Method: SW-846 7470A Analytical Method: SW-846 7470A						
Mercury	0.000014	mg/L	U	1	0.00010	0.000014	3/12/2010 13:41	J
Analysis Desc: SW846 6020 Analysis, SPLP		Preparation Method: SW-846 3010A Analytical Method: SW-846 6020						
Antimony	0.00064	mg/L		1	0.00060	0.000073	3/15/2010 19:46	J
Strontium	0.99	mg/L		1	0.0010	0.000061	3/12/2010 19:06	J
Thallium	0.000073	mg/L	I	1	0.00020	0.000067	3/12/2010 19:06	J
Analysis Desc: pH, E150.1, Water, SPLP		Analytical Method: EPA 150.1						

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ANALYTICAL RESULTS

Workorder: J1001913 CREC CCP / SW Man Plan

Lab ID: **J1001913001**

Date Received: 3/5/2010 08:25

Matrix: Soil

Sample ID: **FGD Sludge - 1**

Date Collected: 3/4/2010 12:10

Results for sample J1001913001 are reported on a dry weight basis.

Sample Description

Location

Parameters	Results	Units	Qual	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
pH	6.65	pH unit		1	1.0	1.0	3/10/2010 09:30	J
Analysis Desc: Total Dissolved Solids,E160.1,Water, SPLP		Analytical Method: EPA 160.1						
Total Dissolved Solids	2700	mg/L		1	10	10	3/10/2010 07:29	J

WET CHEMISTRY

Analysis Desc: IC,E300.0,Water, SPLP		Analytical Method: EPA 300.0						
Chloride	190	mg/L		1	10	2.3	3/11/2010 08:33	T
Fluoride	6.2	mg/L		1	0.20	0.055	3/11/2010 08:33	T
Nitrate	0.39	mg/L		1	0.20	0.050	3/11/2010 08:33	T
Sulfate	1400	mg/L		100	1000	210	3/12/2010 11:50	T

Lab ID: **J1001913002**

Date Received: 3/5/2010 08:25

Matrix: Soil

Sample ID: **FGD Sludge - 2**

Date Collected: 3/4/2010 14:45

Results for sample J1001913002 are reported on a dry weight basis.

Sample Description

Location

Parameters	Results	Units	Qual	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: Percent Solids,SM2540G,Soil		Analytical Method: SM 2540G						
Percent Solid	59	%		1	0.040	0.010	3/9/2010 08:00	J

METALS, SPLP

Analysis Desc: SW846 6010B Analysis,SPLP		Preparation Method: SW-846 3010A Analytical Method: SW-846 6010						
Aluminum	0.087	mg/L	I	1	0.20	0.021	3/10/2010 20:36	J
Arsenic	0.0091	mg/L	U	1	0.010	0.0091	3/10/2010 20:36	J
Barium	0.14	mg/L		1	0.0020	0.0011	3/10/2010 20:36	J
Beryllium	0.000086	mg/L	U	1	0.00030	0.000086	3/10/2010 20:36	J
Boron	2.9	mg/L		1	0.015	0.0039	3/10/2010 20:36	J
Cadmium	0.00079	mg/L		1	0.00060	0.00013	3/10/2010 20:36	J
Chromium	0.0024	mg/L	U	1	0.0040	0.0024	3/10/2010 20:36	J
Copper	0.0022	mg/L	U	1	0.0040	0.0022	3/10/2010 20:36	J

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ANALYTICAL RESULTS

Workorder: J1001913 CREC CCP / SW Man Plan

Lab ID: **J1001913002**

Date Received: 3/5/2010 08:25

Matrix: Soil

Sample ID: **FGD Sludge - 2**

Date Collected: 3/4/2010 14:45

Results for sample J1001913002 are reported on a dry weight basis.

Sample Description

Location

Parameters	Results	Units	Qual	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Iron	0.061	mg/L	U	1	0.20	0.061	3/10/2010 20:36	J
Lead	0.0020	mg/L	U	1	0.0070	0.0020	3/10/2010 20:36	J
Manganese	0.13	mg/L		1	0.0050	0.0040	3/10/2010 20:36	J
Molybdenum	0.0031	mg/L	U	1	0.010	0.0031	3/10/2010 20:36	J
Nickel	0.0038	mg/L	I	1	0.0065	0.0019	3/10/2010 20:36	J
Selenium	0.0075	mg/L	U	1	0.020	0.0075	3/10/2010 20:36	J
Silver	0.0012	mg/L	U	1	0.0040	0.0012	3/10/2010 20:36	J
Sodium	5.8	mg/L	V	1	0.20	0.061	3/10/2010 20:36	J
Vanadium	0.0061	mg/L		1	0.0015	0.00034	3/10/2010 20:36	J
Zinc	0.019	mg/L		1	0.010	0.0075	3/10/2010 20:36	J

Analysis Desc: SW846 7470A
Analysis,SPLP

Preparation Method: SW-846 7470A
Analytical Method: SW-846 7470A

Mercury	0.000020	mg/L	I	1	0.00010	0.000014	3/12/2010 13:31	J
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Analysis Desc: SW846 6020
Analysis,SPLP

Preparation Method: SW-846 3010A
Analytical Method: SW-846 6020

Antimony	0.00060	mg/L		1	0.00060	0.000073	3/15/2010 19:53	J
Strontium	0.99	mg/L		1	0.0010	0.000061	3/12/2010 19:36	J
Thallium	0.00025	mg/L		1	0.00020	0.000067	3/12/2010 19:36	J

Analysis Desc: pH,E150.1,Water, SPLP

Analytical Method: EPA 150.1

pH	7.65	pH unit		1	1.0	1.0	3/10/2010 09:30	J
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Analysis Desc: Total Dissolved
Solids,E160.1,Water, SPLP

Analytical Method: EPA 160.1

Total Dissolved Solids	2800	mg/L		1	10	10	3/10/2010 07:29	J
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WET CHEMISTRY

Analysis Desc: IC,E300.0,Water, SPLP

Analytical Method: EPA 300.0

Chloride	180	mg/L		1	10	2.3	3/11/2010 08:33	T
Fluoride	6.1	mg/L		1	0.20	0.055	3/11/2010 08:33	T
Nitrate	0.37	mg/L		1	0.20	0.050	3/11/2010 08:33	T
Sulfate	1400	mg/L		100	1000	210	3/12/2010 11:50	T

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ANALYTICAL RESULTS

Workorder: J1001913 CREC CCP / SW Man Plan

Lab ID: **J1001913003**

Date Received: 3/5/2010 08:25

Matrix: Soil

Sample ID: **FGD Sludge - 3**

Date Collected: 3/4/2010 16:25

Results for sample J1001913003 are reported on a dry weight basis.

Sample Description

Location

Parameters	Results	Units	Qual	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: Percent Solids, SM2540G, Soil		Analytical Method: SM 2540G						
Percent Solid	58	%		1	0.040	0.010	3/9/2010 08:00	J
METALS, SPLP								
Analysis Desc: SW846 6010B Analysis, SPLP		Preparation Method: SW-846 3010A Analytical Method: SW-846 6010						
Aluminum	0.10	mg/L	I	1	0.20	0.021	3/10/2010 20:41	J
Arsenic	0.0091	mg/L	U	1	0.010	0.0091	3/10/2010 20:41	J
Barium	0.14	mg/L		1	0.0020	0.0011	3/10/2010 20:41	J
Beryllium	0.000086	mg/L	U	1	0.00030	0.000086	3/10/2010 20:41	J
Boron	3.0	mg/L		1	0.015	0.0039	3/10/2010 20:41	J
Cadmium	0.00082	mg/L		1	0.00060	0.00013	3/10/2010 20:41	J
Chromium	0.0024	mg/L	U	1	0.0040	0.0024	3/10/2010 20:41	J
Copper	0.0022	mg/L	U	1	0.0040	0.0022	3/10/2010 20:41	J
Iron	0.061	mg/L	U	1	0.20	0.061	3/10/2010 20:41	J
Lead	0.0020	mg/L	U	1	0.0070	0.0020	3/10/2010 20:41	J
Manganese	0.13	mg/L		1	0.0050	0.0040	3/10/2010 20:41	J
Molybdenum	0.0031	mg/L	U	1	0.010	0.0031	3/10/2010 20:41	J
Nickel	0.0040	mg/L	I	1	0.0065	0.0019	3/10/2010 20:41	J
Selenium	0.0075	mg/L	U	1	0.020	0.0075	3/10/2010 20:41	J
Silver	0.0012	mg/L	U	1	0.0040	0.0012	3/10/2010 20:41	J
Sodium	6.2	mg/L	V	1	0.20	0.061	3/10/2010 20:41	J
Vanadium	0.0059	mg/L		1	0.0015	0.00034	3/10/2010 20:41	J
Zinc	0.013	mg/L		1	0.010	0.0075	3/10/2010 20:41	J
Analysis Desc: SW846 7470A Analysis, SPLP		Preparation Method: SW-846 7470A Analytical Method: SW-846 7470A						
Mercury	0.000014	mg/L	U	1	0.00010	0.000014	3/12/2010 13:42	J
Analysis Desc: SW846 6020 Analysis, SPLP		Preparation Method: SW-846 3010A Analytical Method: SW-846 6020						
Antimony	0.00057	mg/L	I	1	0.00060	0.000073	3/15/2010 20:00	J
Strontium	0.98	mg/L		1	0.0010	0.000061	3/12/2010 19:43	J
Thallium	0.00011	mg/L	I	1	0.00020	0.000067	3/12/2010 19:43	J
Analysis Desc: pH, E150.1, Water, SPLP		Analytical Method: EPA 150.1						

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ANALYTICAL RESULTS

Workorder: J1001913 CREC CCP / SW Man Plan

Lab ID: **J1001913003**

Date Received: 3/5/2010 08:25

Matrix: Soil

Sample ID: **FGD Sludge - 3**

Date Collected: 3/4/2010 16:25

Results for sample J1001913003 are reported on a dry weight basis.

Sample Description

Location

Parameters	Results	Units	Qual	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
pH	7.66	pH unit		1	1.0	1.0	3/10/2010 09:30	J
Analysis Desc: Total Dissolved Solids,E160.1,Water, SPLP		Analytical Method: EPA 160.1						
Total Dissolved Solids	2600	mg/L		1	10	10	3/10/2010 07:29	J

WET CHEMISTRY

Analysis Desc: IC,E300.0,Water, SPLP		Analytical Method: EPA 300.0						
Chloride	170	mg/L		1	10	2.3	3/11/2010 08:33	T
Fluoride	6.1	mg/L		1	0.20	0.055	3/11/2010 08:33	T
Nitrate	0.37	mg/L		1	0.20	0.050	3/11/2010 08:33	T
Sulfate	1400	mg/L		100	1000	210	3/12/2010 11:50	T

Lab ID: **J1001913004**

Date Received: 3/5/2010 08:25

Matrix: Soil

Sample ID: **Gypsum - 1**

Date Collected: 3/4/2010 12:35

Results for sample J1001913004 are reported on a dry weight basis.

Sample Description

Location

Parameters	Results	Units	Qual	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: Percent Solids,SM2540G,Soil		Analytical Method: SM 2540G						
Percent Solid	65	%		1	0.040	0.010	3/9/2010 08:00	J

METALS, SPLP

Analysis Desc: SW846 6010B Analysis,SPLP		Preparation Method: SW-846 3010A Analytical Method: SW-846 6010						
Aluminum	0.32	mg/L		1	0.20	0.021	3/10/2010 20:46	J
Arsenic	0.0091	mg/L	U	1	0.010	0.0091	3/10/2010 20:46	J
Barium	0.095	mg/L		1	0.0020	0.0011	3/10/2010 20:46	J
Beryllium	0.000086	mg/L	U	1	0.00030	0.000086	3/10/2010 20:46	J
Boron	0.084	mg/L		1	0.015	0.0039	3/10/2010 20:46	J
Cadmium	0.00046	mg/L	I	1	0.00060	0.00013	3/10/2010 20:46	J
Chromium	0.0024	mg/L	U	1	0.0040	0.0024	3/10/2010 20:46	J
Copper	0.0022	mg/L	U	1	0.0040	0.0022	3/10/2010 20:46	J

Report ID: 119053 - 2462204

Page 7 of 19

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ANALYTICAL RESULTS

Workorder: J1001913 CREC CCP / SW Man Plan

Lab ID: **J1001913004**

Date Received: 3/5/2010 08:25

Matrix: Soil

Sample ID: **Gypsum - 1**

Date Collected: 3/4/2010 12:35

Results for sample J1001913004 are reported on a dry weight basis.

Sample Description

Location

Parameters	Results	Units	Qual	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Iron	0.061	mg/L	U	1	0.20	0.061	3/10/2010 20:46	J
Lead	0.0020	mg/L	U	1	0.0070	0.0020	3/10/2010 20:46	J
Manganese	0.0051	mg/L		1	0.0050	0.0040	3/10/2010 20:46	J
Molybdenum	0.0031	mg/L	U	1	0.010	0.0031	3/10/2010 20:46	J
Nickel	0.0019	mg/L	U	1	0.0065	0.0019	3/10/2010 20:46	J
Selenium	0.0075	mg/L	U	1	0.020	0.0075	3/10/2010 20:46	J
Silver	0.0012	mg/L	U	1	0.0040	0.0012	3/10/2010 20:46	J
Sodium	3.9	mg/L	V	1	0.20	0.061	3/10/2010 20:46	J
Vanadium	0.0025	mg/L		1	0.0015	0.00034	3/10/2010 20:46	J
Zinc	0.0075	mg/L	U	1	0.010	0.0075	3/10/2010 20:46	J

Analysis Desc: SW846 7470A
Analysis,SPLP

Preparation Method: SW-846 7470A
Analytical Method: SW-846 7470A

Mercury	0.000014	mg/L	U	1	0.00010	0.000014	3/12/2010 13:44	J
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Analysis Desc: SW846 6020
Analysis,SPLP

Preparation Method: SW-846 3010A
Analytical Method: SW-846 6020

Antimony	0.00019	mg/L	I	1	0.00060	0.000073	3/15/2010 20:08	J
Strontium	0.56	mg/L		1	0.0010	0.000061	3/12/2010 20:06	J
Thallium	0.000067	mg/L	U	1	0.00020	0.000067	3/12/2010 20:06	J

Analysis Desc: pH,E150.1,Water, SPLP

Analytical Method: EPA 150.1

pH	7.62	pH unit		1	1.0	1.0	3/10/2010 09:30	J
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Analysis Desc: Total Dissolved
Solids,E160.1,Water, SPLP

Analytical Method: EPA 160.1

Total Dissolved Solids	2200	mg/L		1	10	10	3/10/2010 07:29	J
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WET CHEMISTRY

Analysis Desc: IC,E300.0,Water, SPLP

Analytical Method: EPA 300.0

Chloride	2.3	mg/L	U	1	10	2.3	3/11/2010 08:33	T
Fluoride	5.7	mg/L		1	0.20	0.055	3/11/2010 08:33	T
Nitrate	0.050	mg/L	U	1	0.20	0.050	3/11/2010 08:33	T
Sulfate	1400	mg/L		100	1000	210	3/12/2010 11:50	T

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ANALYTICAL RESULTS

Workorder: J1001913 CREC CCP / SW Man Plan

Lab ID: **J1001913005**

Date Received: 3/5/2010 08:25

Matrix: Soil

Sample ID: **Gypsum - 2**

Date Collected: 3/4/2010 12:45

Results for sample J1001913005 are reported on a dry weight basis.

Sample Description

Location

Parameters	Results	Units	Qual	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
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Analysis Desc: Percent Solids, SM2540G, Soil

Analytical Method: SM 2540G

Percent Solid	70 %			1	0.040	0.010	3/9/2010 08:00	J
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METALS, SPLP

Analysis Desc: SW846 6010B Analysis, SPLP

Preparation Method: SW-846 3010A

Analytical Method: SW-846 6010

Aluminum	0.29 mg/L			1	0.20	0.021	3/10/2010 20:51	J
Arsenic	0.0091 mg/L	U		1	0.010	0.0091	3/10/2010 20:51	J
Barium	0.086 mg/L			1	0.0020	0.0011	3/10/2010 20:51	J
Beryllium	0.000086 mg/L	U		1	0.00030	0.000086	3/10/2010 20:51	J
Boron	0.20 mg/L			1	0.015	0.0039	3/10/2010 20:51	J
Cadmium	0.00042 mg/L	I		1	0.00060	0.00013	3/10/2010 20:51	J
Chromium	0.0024 mg/L	U		1	0.0040	0.0024	3/10/2010 20:51	J
Copper	0.0022 mg/L	U		1	0.0040	0.0022	3/10/2010 20:51	J
Iron	0.061 mg/L	U		1	0.20	0.061	3/10/2010 20:51	J
Lead	0.0020 mg/L	U		1	0.0070	0.0020	3/10/2010 20:51	J
Manganese	0.0090 mg/L			1	0.0050	0.0040	3/10/2010 20:51	J
Molybdenum	0.0031 mg/L	U		1	0.010	0.0031	3/10/2010 20:51	J
Nickel	0.0019 mg/L	U		1	0.0065	0.0019	3/10/2010 20:51	J
Selenium	0.0075 mg/L	U		1	0.020	0.0075	3/10/2010 20:51	J
Silver	0.0012 mg/L	U		1	0.0040	0.0012	3/10/2010 20:51	J
Sodium	4.6 mg/L	V		1	0.20	0.061	3/10/2010 20:51	J
Vanadium	0.0037 mg/L			1	0.0015	0.00034	3/10/2010 20:51	J
Zinc	0.0075 mg/L	U		1	0.010	0.0075	3/10/2010 20:51	J

Analysis Desc: SW846 7470A Analysis, SPLP

Preparation Method: SW-846 7470A

Analytical Method: SW-846 7470A

Mercury	0.000014 mg/L	U		1	0.00010	0.000014	3/12/2010 13:46	J
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Analysis Desc: SW846 6020 Analysis, SPLP

Preparation Method: SW-846 3010A

Analytical Method: SW-846 6020

Antimony	0.00021 mg/L	I		1	0.00060	0.000073	3/15/2010 20:15	J
Strontium	0.59 mg/L			1	0.0010	0.000061	3/12/2010 20:14	J
Thallium	0.000067 mg/L	U		1	0.00020	0.000067	3/12/2010 20:14	J

WET CHEMISTRY

Report ID: 119053 - 2462204

Page 9 of 19

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ANALYTICAL RESULTS

Workorder: J1001913 CREC CCP / SW Man Plan

Lab ID: **J1001913005**

Date Received: 3/5/2010 08:25

Matrix: Soil

Sample ID: **Gypsum - 2**

Date Collected: 3/4/2010 12:45

Results for sample J1001913005 are reported on a dry weight basis.

Sample Description

Location

Parameters	Results	Units	Qual	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: pH,E150.1,Water, SPLP		Analytical Method: EPA 150.1						
pH	7.45	pH unit		1	1.0	1.0	3/10/2010 09:30	J
Analysis Desc: Total Dissolved Solids,E160.1,Water, SPLP		Analytical Method: EPA 160.1						
Total Dissolved Solids	2200	mg/L		1	10	10	3/10/2010 07:29	J
Analysis Desc: IC,E300.0,Water, SPLP		Analytical Method: EPA 300.0						
Chloride	4.0	mg/L	I	1	10	2.3	3/11/2010 08:33	T
Fluoride	5.1	mg/L		1	0.20	0.055	3/11/2010 08:33	T
Nitrate	0.050	mg/L	U	1	0.20	0.050	3/11/2010 08:33	T
Sulfate	1400	mg/L		100	1000	210	3/12/2010 11:50	T

Lab ID: **J1001913006**

Date Received: 3/5/2010 08:25

Matrix: Soil

Sample ID: **Gypsum - 3**

Date Collected: 3/4/2010 12:50

Results for sample J1001913006 are reported on a dry weight basis.

Sample Description

Location

Parameters	Results	Units	Qual	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: Percent Solids,SM2540G,Soil		Analytical Method: SM 2540G						
Percent Solid	79	%		1	0.040	0.010	3/9/2010 08:00	J

METALS, SPLP

Analysis Desc: SW846 6010B
Analysis,SPLP

Preparation Method: SW-846 3010A

Analytical Method: SW-846 6010

Aluminum	0.33	mg/L		1	0.20	0.021	3/10/2010 20:57	J
Arsenic	0.0091	mg/L	U	1	0.010	0.0091	3/10/2010 20:57	J
Barium	0.074	mg/L		1	0.0020	0.0011	3/10/2010 20:57	J
Beryllium	0.000086	mg/L	U	1	0.00030	0.000086	3/10/2010 20:57	J
Boron	0.37	mg/L		1	0.015	0.0039	3/10/2010 20:57	J
Cadmium	0.00044	mg/L	I	1	0.00060	0.00013	3/10/2010 20:57	J
Chromium	0.0024	mg/L	U	1	0.0040	0.0024	3/10/2010 20:57	J
Copper	0.0022	mg/L	U	1	0.0040	0.0022	3/10/2010 20:57	J

Report ID: 119053 - 2462204

Page 10 of 19

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ANALYTICAL RESULTS

Workorder: J1001913 CREC CCP / SW Man Plan

Lab ID: **J1001913006**

Date Received: 3/5/2010 08:25

Matrix: Soil

Sample ID: **Gypsum - 3**

Date Collected: 3/4/2010 12:50

Results for sample J1001913006 are reported on a dry weight basis.

Sample Description

Location

Parameters	Results	Units	Qual	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Iron	0.061	mg/L	U	1	0.20	0.061	3/10/2010 20:57	J
Lead	0.0020	mg/L	U	1	0.0070	0.0020	3/10/2010 20:57	J
Manganese	0.014	mg/L		1	0.0050	0.0040	3/10/2010 20:57	J
Molybdenum	0.0031	mg/L	U	1	0.010	0.0031	3/10/2010 20:57	J
Nickel	0.0019	mg/L	U	1	0.0065	0.0019	3/10/2010 20:57	J
Selenium	0.0075	mg/L	U	1	0.020	0.0075	3/10/2010 20:57	J
Silver	0.0012	mg/L	U	1	0.0040	0.0012	3/10/2010 20:57	J
Sodium	3.7	mg/L	V	1	0.20	0.061	3/10/2010 20:57	J
Vanadium	0.0040	mg/L		1	0.0015	0.00034	3/10/2010 20:57	J
Zinc	0.0075	mg/L	U	1	0.010	0.0075	3/10/2010 20:57	J

Analysis Desc: SW846 7470A
Analysis,SPLP

Preparation Method: SW-846 7470A
Analytical Method: SW-846 7470A

Mercury	0.000014	mg/L	U	1	0.00010	0.000014	3/12/2010 13:47	J
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Analysis Desc: SW846 6020
Analysis,SPLP

Preparation Method: SW-846 3010A
Analytical Method: SW-846 6020

Antimony	0.00024	mg/L	I	1	0.00060	0.000073	3/15/2010 20:22	J
Strontium	0.59	mg/L		1	0.0010	0.000061	3/12/2010 20:21	J
Thallium	0.000067	mg/L	U	1	0.00020	0.000067	3/12/2010 20:21	J

Analysis Desc: pH,E150.1,Water, SPLP

Analytical Method: EPA 150.1

pH	7.69	pH unit		1	1.0	1.0	3/10/2010 09:30	J
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Analysis Desc: Total Dissolved
Solids,E160.1,Water, SPLP

Analytical Method: EPA 160.1

Total Dissolved Solids	2200	mg/L		1	10	10	3/10/2010 07:29	J
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WET CHEMISTRY

Analysis Desc: IC,E300.0,Water, SPLP

Analytical Method: EPA 300.0

Chloride	10	mg/L		1	10	2.3	3/11/2010 08:33	T
Fluoride	5.3	mg/L		1	0.20	0.055	3/11/2010 08:33	T
Nitrate	0.058	mg/L	I	1	0.20	0.050	3/11/2010 08:33	T
Sulfate	1400	mg/L		100	1000	210	3/12/2010 11:50	T

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ANALYTICAL RESULTS QUALIFIERS

Workorder: J1001913 CREC CCP / SW Man Plan

PARAMETER QUALIFIERS

- U The compound was analyzed for but not detected.
- I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- V Method Blank Contamination

LAB QUALIFIERS

- J DOH Certification #E82574(AEL-JAX)(FL NELAC Certification)
- T DOH Certification #E84589(AEL-T)(FL NELAC Certification)

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QUALITY CONTROL DATA

Workorder: J1001913 CREC CCP / SW Man Plan

QC Batch:	WCAj/22757	Analysis Method:	SM 2540G			
QC Batch Method:	SM 2540G	Prepared:				
Associated Lab Samples:	J1001913001	J1001913002	J1001913003	J1001913004	J1001913005	J1001913006

QC Batch:	WCAj/22758	Analysis Method:	EPA 160.1			
QC Batch Method:	EPA 160.1	Prepared:				
Associated Lab Samples:	J1001913001	J1001913002	J1001913003	J1001913004	J1001913005	J1001913006
	J1001974001					

METHOD BLANK: 502626

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Total Dissolved Solids	mg/L	10U	10	

QC Batch:	DGMj/20845	Analysis Method:	SW-846 6010			
QC Batch Method:	SW-846 3010A	Prepared:	3/10/2010 09:00			
Associated Lab Samples:	J1001913001	J1001913002	J1001913003	J1001913004	J1001913005	J1001913006

METHOD BLANK: 502705

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Silver	mg/L	0.0012U	0.0012	
Aluminum	mg/L	0.021U	0.021	
Arsenic	mg/L	0.0091U	0.0091	
Boron	mg/L	0.0039U	0.0039	
Barium	mg/L	0.0011U	0.0011	
Beryllium	mg/L	0.000086U	0.000086	
Cadmium	mg/L	0.00013U	0.00013	
Chromium	mg/L	0.0024U	0.0024	
Copper	mg/L	0.0022U	0.0022	
Iron	mg/L	0.061U	0.061	
Manganese	mg/L	0.0040U	0.0040	
Molybdenum	mg/L	0.0031U	0.0031	
Sodium	mg/L	0.061U	0.061	V
Nickel	mg/L	0.0019U	0.0019	
Lead	mg/L	0.0020U	0.0020	
Selenium	mg/L	0.0075U	0.0075	
Vanadium	mg/L	0.00034U	0.00034	
Zinc	mg/L	0.0075U	0.0075	

QC Batch:	WCAj/22769	Analysis Method:	EPA 150.1
QC Batch Method:	EPA 150.1	Prepared:	

Report ID: 119053 - 2462204

Page 13 of 19

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QUALITY CONTROL DATA

Workorder: J1001913 CREC CCP / SW Man Plan

Associated Lab Samples:	J1001913001	J1001913002	J1001913003	J1001913004	J1001913005	J1001913006
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QC Batch: DGMj/20856

Analysis Method: SW-846 6020

QC Batch Method: SW-846 3010A

Prepared: 3/11/2010 08:30

Associated Lab Samples:	J1001913001	J1001913002	J1001913003	J1001913004	J1001913005	J1001913006
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METHOD BLANK: 503564

Parameter	Units	Blank Result	Reporting Limit Qualifiers
Strontium	mg/L	0.000061U	0.000061
Thallium	mg/L	0.000067U	0.000067

Parameter	Units	Blank Result	Reporting Limit Qualifiers
Antimony	mg/L	0.000073U	0.000073

QC Batch: DGMj/20863

Analysis Method: SW-846 7470A

QC Batch Method: SW-846 7470A

Prepared: 3/12/2010 08:30

Associated Lab Samples:	J1001913001	J1001913002	J1001913003	J1001913004	J1001913005	J1001913006
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METHOD BLANK: 504569

Parameter	Units	Blank Result	Reporting Limit Qualifiers
Mercury	mg/L	0.000014U	0.000014

QC Batch: WCAI/29497

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Prepared:

Associated Lab Samples:	J1001913001	J1001913002	J1001913003	J1001913004	J1001913005	J1001913006
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METHOD BLANK: 506321

Parameter	Units	Blank Result	Reporting Limit Qualifiers
Fluoride	mg/L	0.055U	0.055
Chloride	mg/L	2.3U	2.3
Nitrate	mg/L	0.050U	0.050

QC Batch: WCAI/29498

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Prepared:

Associated Lab Samples:	J1001913001	J1001913002	J1001913003	J1001913004	J1001913005	J1001913006
-------------------------	-------------	-------------	-------------	-------------	-------------	-------------

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QUALITY CONTROL DATA

Workorder: J1001913 CREC CCP / SW Man Plan

METHOD BLANK: 506342

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Sulfate	mg/L	2.1U	2.1	

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Phone: (904)363-9350
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QUALITY CONTROL DATA QUALIFIERS

Workorder: J1001913 CREC CCP / SW Man Plan

QUALITY CONTROL PARAMETER QUALIFIERS

V Method Blank Contamination

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: J1001913 CREC CCP / SW Man Plan

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
J1001913001	FGD Sludge - 1	SM 2540G	WCAj/22757		
J1001913002	FGD Sludge - 2	SM 2540G	WCAj/22757		
J1001913003	FGD Sludge - 3	SM 2540G	WCAj/22757		
J1001913004	Gypsum - 1	SM 2540G	WCAj/22757		
J1001913005	Gypsum - 2	SM 2540G	WCAj/22757		
J1001913006	Gypsum - 3	SM 2540G	WCAj/22757		
J1001913001	FGD Sludge - 1	EPA 160.1	WCAj/22758		
J1001913002	FGD Sludge - 2	EPA 160.1	WCAj/22758		
J1001913003	FGD Sludge - 3	EPA 160.1	WCAj/22758		
J1001913004	Gypsum - 1	EPA 160.1	WCAj/22758		
J1001913005	Gypsum - 2	EPA 160.1	WCAj/22758		
J1001913006	Gypsum - 3	EPA 160.1	WCAj/22758		
J1001913001	FGD Sludge - 1	SW-846 3010A	DGMj/20845	SW-846 6010	ICPj/20241
J1001913002	FGD Sludge - 2	SW-846 3010A	DGMj/20845	SW-846 6010	ICPj/20241
J1001913003	FGD Sludge - 3	SW-846 3010A	DGMj/20845	SW-846 6010	ICPj/20241
J1001913004	Gypsum - 1	SW-846 3010A	DGMj/20845	SW-846 6010	ICPj/20241
J1001913005	Gypsum - 2	SW-846 3010A	DGMj/20845	SW-846 6010	ICPj/20241
J1001913006	Gypsum - 3	SW-846 3010A	DGMj/20845	SW-846 6010	ICPj/20241
J1001913001	FGD Sludge - 1	EPA 150.1	WCAj/22769		
J1001913002	FGD Sludge - 2	EPA 150.1	WCAj/22769		
J1001913003	FGD Sludge - 3	EPA 150.1	WCAj/22769		
J1001913004	Gypsum - 1	EPA 150.1	WCAj/22769		
J1001913005	Gypsum - 2	EPA 150.1	WCAj/22769		
J1001913006	Gypsum - 3	EPA 150.1	WCAj/22769		
J1001913001	FGD Sludge - 1	SW-846 3010A	DGMj/20856	SW-846 6020	ICMj/16944
J1001913002	FGD Sludge - 2	SW-846 3010A	DGMj/20856	SW-846 6020	ICMj/16944
J1001913003	FGD Sludge - 3	SW-846 3010A	DGMj/20856	SW-846 6020	ICMj/16944
J1001913004	Gypsum - 1	SW-846 3010A	DGMj/20856	SW-846 6020	ICMj/16944
J1001913005	Gypsum - 2	SW-846 3010A	DGMj/20856	SW-846 6020	ICMj/16944

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: J1001913 CREC CCP / SW Man Plan

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
J1001913006	Gypsum - 3	SW-846 3010A	DGMj/20856	SW-846 6020	ICMj/16944
J1001913001	FGD Sludge - 1	SW-846 3010A	DGMj/20856	SW-846 6020	ICMj/16945
J1001913002	FGD Sludge - 2	SW-846 3010A	DGMj/20856	SW-846 6020	ICMj/16945
J1001913003	FGD Sludge - 3	SW-846 3010A	DGMj/20856	SW-846 6020	ICMj/16945
J1001913004	Gypsum - 1	SW-846 3010A	DGMj/20856	SW-846 6020	ICMj/16945
J1001913005	Gypsum - 2	SW-846 3010A	DGMj/20856	SW-846 6020	ICMj/16945
J1001913006	Gypsum - 3	SW-846 3010A	DGMj/20856	SW-846 6020	ICMj/16945
J1001913001	FGD Sludge - 1	SW-846 7470A	DGMj/20863	SW-846 7470A	CVAj/16660
J1001913002	FGD Sludge - 2	SW-846 7470A	DGMj/20863	SW-846 7470A	CVAj/16660
J1001913003	FGD Sludge - 3	SW-846 7470A	DGMj/20863	SW-846 7470A	CVAj/16660
J1001913004	Gypsum - 1	SW-846 7470A	DGMj/20863	SW-846 7470A	CVAj/16660
J1001913005	Gypsum - 2	SW-846 7470A	DGMj/20863	SW-846 7470A	CVAj/16660
J1001913006	Gypsum - 3	SW-846 7470A	DGMj/20863	SW-846 7470A	CVAj/16660
J1001913001	FGD Sludge - 1	EPA 300.0	WCAj/29497		
J1001913002	FGD Sludge - 2	EPA 300.0	WCAj/29497		
J1001913003	FGD Sludge - 3	EPA 300.0	WCAj/29497		
J1001913004	Gypsum - 1	EPA 300.0	WCAj/29497		
J1001913005	Gypsum - 2	EPA 300.0	WCAj/29497		
J1001913006	Gypsum - 3	EPA 300.0	WCAj/29497		
J1001913001	FGD Sludge - 1	EPA 300.0	WCAj/29498		
J1001913002	FGD Sludge - 2	EPA 300.0	WCAj/29498		
J1001913003	FGD Sludge - 3	EPA 300.0	WCAj/29498		
J1001913004	Gypsum - 1	EPA 300.0	WCAj/29498		
J1001913005	Gypsum - 2	EPA 300.0	WCAj/29498		
J1001913006	Gypsum - 3	EPA 300.0	WCAj/29498		

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Page 1 of 1

LAB NUMBER

J1001913

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☐ 9610 Princess Palm Ave. • Tampa, FL 33619 • 813.630.8616 • Fax 813.630.4327 • E84589
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☐ 528 S. North Lake Blvd., Ste. 1016 • Altamonte Springs, FL 32701 • 407.937.1594 • Fax 407.937.1597 • E53076

CLIENT NAME: <u>PERFECT GOLDER</u>		PROJECT NAME: <u>CREC CUP/SW MAN. PLAN</u>		BOTTLE SIZE & TYPE: <u>CA</u>												LABORATORY I.D. NUMBER
ADDRESS: <u>9428 BAYMEADOWS ROAD, SUITE 400</u>		P.O. NUMBER/PROJECT NUMBER: <u>003-82671.1</u>														
<u>SAF, FL 32256</u>		PROJECT LOCATION: <u>CRYSTAL RIVER, FL</u>														
PHONE: <u>904.363.3430</u>		REMARKS/SPECIAL INSTRUCTIONS:														
FAX:																
CONTACT: <u>S. STAFFORD / K. KARABLY</u>																
SAMPLED BY: <u>S. STAFFORD</u>																
TURN AROUND TIME:																
☐ STANDARD ☐ RUSH																

SAMPLE ID	SAMPLE DESCRIPTION	Grab Comp	SAMPLING		MATRIX	NO. COUNT	PRESERVATION	ANALYSIS REQUIRED										LABORATORY I.D. NUMBER	
			DATE	TIME				SPLP METALS 6010 As, Ba, Be, Cd, Pb, Mg, Ni Se, Na, Al, Cu, Fe, Mn, B, Mo, Sn, V	SPLP METALS 6020 - Sb, Ti	SPLP FLOWPIPE	SPLP GROSS ALPHA	SPLP NITRATE	SPLP CHLORIDE	SPLP SULFATE	SPLP TDS	SPLP PH	% SOLIDS		
FLD SLUDGE-1		Comp	3/4/10	1210	SL	1	✓	1											001
FLD SLUDGE-2				1235	SL	1		1											002
FLD SLUDGE-3				1625	SL	1		1											003
GYP SUM - 1				1235	SO	1		1											004
GYP SUM - 2				1245	SO	1		1											005
GYP SUM - 3				1250	SO	1		1											006

Matrix Code: WW = wastewater SW = surface water GW = ground water DW = drinking water O = oil A = air SO = soil SL = sludge Preservation Code: I = ice H = (HCl) S = (H2SO4) N = (HNO3) T = (Sodium Thiosulfate)

Received on Ice ☒ Yes ☐ No ☒ Temp taken from sample ☐ Temp from blank

☐ Where required, pH checked Temperature when received _____ (in degrees Celsius)

Form revised 2/8/08

Device used for measuring Temp by unique identifier (circle IR temp gun used) J: 9A GT: LT-1 LT-2 T: 10A A: 3A

Relinquished by:	Date	Time	Received by:	Date	Time
1 <u>[Signature]</u>	3/5/10	0825	<u>[Signature]</u>	3-5-10	08:25
2					
3					
4					

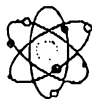
FOR DRINKING WATER USE:

(When PWS Information not otherwise supplied) PWS ID: _____

Contact Person: _____ Phone: _____

Supplier of Water: _____

Site Address: _____



Florida Radiochemistry Services, Inc.

Contact: Michael J. Naumann

5456 Hoffner Ave., Suite 201 Orlando, FL 32812

Phone: (407) 382-7733 Fax: (407) 382-7744

Certification I. D. # E83033

Work Order #: 1003061

Report Date: 03/18/10

Report to:

Advanced Environmental Laboratories, Inc.

6601 Southpoint Parkway

Jacksonville, FL 32216

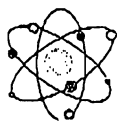
Attn: Bob Dempsey

I do hereby affirm that this record contains no willful misrepresentations and that this information given by me is true to the best of my knowledge and belief. I further certify that the methods and quality control measures used to produce these laboratory results were implemented in accordance with the requirements of this laboratory's certification and NELAC Standards. The test results in this report relate only to the samples received.

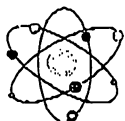
Signed


Michael J. Naumann - President

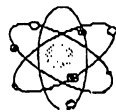
Date 3-18-10

**Florida Radiochemistry Services, Inc.****Sample Login**

Client:	Advanced Environmental Laboratories, Inc.	Date / Time Received	Work order #
Client Contact:	Bob Dempsey	03/10/10 11:28	1003061
Client P.O.			
Project I.D.	J1001913		
Lab Sample I.D.	Client Sample I.D.	Sample Date/Time	Analysis Requested
1003061-01	J1001913-001	03/09/10 09:00	Gross Alpha
1003061-02	J1001913-002	03/09/10 09:00	Gross Alpha
1003061-03	J1001913-003	03/09/10 09:00	Gross Alpha
1003061-04	J1001913-004	03/09/10 09:00	Gross Alpha
1003061-05	J1001913-005	03/09/10 09:00	Gross Alpha
1003061-06	J1001913-006	03/09/10 09:00	Gross Alpha

**Florida Radiochemistry Services, Inc.****Analysis Report**

Lab Sample I.D.	1003061-01	1003061-02	1003061-03	1003061-04	1003061-05	1003061-06
Client I.D.	J1001913-001	J1001913-002	J1001913-003	J1001913-004	J1001913-005	J1001913-006
Gross Alpha	5.7 **	7.7 **	9.8 **	4.8U **	9.6	5.7 **
Error +/-	3.6	3.7	5.1	3.2	3.0	3.1
MDL	5.1	5.0	6.8	4.8	3.2	4.2
EPA Method	900.0	900.0	900.0	900.0	900.0	900.0
Prep Date	03/16/10	03/16/10	03/16/10	03/16/10	03/16/10	03/16/10
Prep Time	06:37	06:37	06:37	06:37	06:37	06:37
Analysis Date	03/17/10	03/17/10	03/17/10	03/17/10	03/17/10	03/17/10
Analysis Time	10:47	10:47	13:52	13:52	13:52	13:52
Analyst	MJN	MJN	MJN	MJN	MJN	MJN
Units	pCi/l	pCi/l	pCi/l	pCi/l	pCi/l	pCi/l



Florida Radiochemistry Services, Inc.

QA Page

Analyte	Sample #	Date Analyzed	Sample Result	Amount Spiked	Spike Result	Spike /Dup Result	Spike % Rec.	Spike Dup % Rpd
Gross Alpha	1003049-01	03/17/10	<0.6	10.2	9.8	9.6	96	2.1

Quality	Control	Limits
---------	---------	--------

% RPD		% Rec.
-------	--	--------

Gross Alpha	25.0	60-125
-------------	------	--------

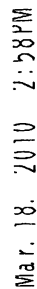


Florida Radiochemistry Services, Inc.

Case Narrative

NOTE: * Gross Alpha:

Samples 1003061-01, 02, 03, 04 and 06 had elevated detection limits and/or counting errors due to a low volume of sample used. The samples had high TDS (Total Dissolved Solids). The high TDS interferes with the sample counting efficiency. This is caused by the solids absorbing the sample activity (Sample self-absorption). The sample counting efficiency is decreased because of this. Therefore, the counting time was increased (the sample was counted over night or as long as possible) to help reduce the detection limit and counting error.



LAB NUMBER:

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☐ 528 S. North Lake Blvd., Ste. 1016 • Attamone Springs, FL 32701 • 407.937.1594 • Fax 407.937.1997 • E53078

[illegible]

Received on ice ☐ Yes ☐ No ☐ Temp taken from sample ☐ Temp from blank

☐ Where required, pH checked Temperature when received _____ (in degrees Celsius)

Form revised 2/8/08

Device used for measuring Temp by unique Identifier (circle IR temp gun used) J: 9A G: LT-1 LT-2 T: 10A A: 3A

Relinquished by:		Date	Time	Received by:		Date	Time
1	<i>[Signature]</i>	09-10	16:00	WPS			
2				Blundo		3/10/10	11:25
3							
4							

FOR DRINKING WATER USE:

(When PWS information not otherwise supplied) PWS ID: _____

Contact Person: _____ Phone: _____

Supplier of Water: _____

Site Address: _____

ATTACHMENT B

95% UPPER CONFIDENCE LIMIT CALCULATIONS

**95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Aluminum Detections in FGD Blowdown Pond Solids**

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
0.07		0.000133
0.09		0.000001
0.10		0.000108
Std. Deviation (s) = Sq. Root of SUM =		0.0156
s / Mean (x_i) =		0.18
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Aluminum is = 0.11 mg/L		

Created by: SFS
 Checked by: MMS
 Reviewed by: KBK

95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Barium Detections in FGD Blowdown Pond Solids

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
0.15		0.000022
0.14		0.000006
0.14		0.000006
Std. Deviation (s) = Sq. Root of SUM =		0.0058
s / Mean (x_i) =		0.04
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Barium is = 0.15 mg/L		

Created by: SFS

Checked by: MMS

Reviewed by: KBK

**95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Boron Detections in FGD Blowdown Pond Solids**

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
3.10		0.005000
2.90		0.005000
3.00		0.000000
Std. Deviation (s) = Sq. Root of SUM =		0.1000
s / Mean (x_i) =		0.03
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Boron is = 3.2 mg/L		

Created by: SFS
 Checked by: MMS
 Reviewed by: KBK

**95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Cadmium Detections in FGD Blowdown Pond Solids**

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
0.00083		1.39E-10
0.00079		2.72E-10
0.00082		2.22E-11
Std. Deviation (s) = Sq. Root of SUM =		0.000021
s / Mean (x_i) =		0.03
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Cadmium is = 0.00085 mg/L		

Created by: SFS
 Checked by: MMS
 Reviewed by: KBK

**95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Manganese Detections in FGD Blowdown Pond Solids**

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
0.14		0.000022
0.13		0.000006
0.13		0.000006
Std. Deviation (s) = Sq. Root of SUM =		0.0058
s / Mean (x_i) =		0.04
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Manganese is = 0.14 mg/L		

Created by: SFS

Checked by: MMS

Reviewed by: KBK

95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Nickel Detections in FGD Blowdown Pond Solids

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
0.0037		8.89E-09
0.0038		5.56E-10
0.0040		1.39E-08
Std. Deviation (s) = Sq. Root of SUM =		0.00015
s / Mean (x_i) =		0.040
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Nickel is = 0.0041 mg/L		

Created by: SFS
 Checked by: MMS
 Reviewed by: KBK

95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Sodium Detections in FGD Blowdown Pond Solids

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
7.30		0.375556
5.80		0.200556
6.20		0.027222
Std. Deviation (s) = Sq. Root of SUM =		0.7767
s / Mean (x_i) =		0.12
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Sodium is = 7.7 mg/L		

Created by: SFS
 Checked by: MMS
 Reviewed by: KBK

**95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Vanadium Detections in FGD Blowdown Pond Solids**

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean}(x))^2}{n-1}$
0.0060		0.00000
0.0061		5.00E-09
0.0059		5.00E-09
Std. Deviation (s) = Sq. Root of SUM =		0.00010
s / Mean (x_i) =		0.0167
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Vanadium is = 0.0062 mg/L		

Created by: SFS
 Checked by: MMS
 Reviewed by: KBK

**95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Zinc Detections in FGD Blowdown Pond Solids**

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
0.013		0.000002
0.019		0.000008
0.013		0.000002
Std. Deviation (s) = Sq. Root of SUM =		0.0035
s / Mean (x_i) =		0.231
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Zinc is = 0.021 mg/L		

Created by: SFS
 Checked by: MMS
 Reviewed by: KBK

95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Antimony Detections in FGD Blowdown Pond Solids

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
0.00064		6.72E-10
0.00060		5.56E-12
0.00057		5.56E-10
Std. Deviation (s) = Sq. Root of SUM =		0.000035
s / Mean (x_i) =		0.058
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Antimony is = 0.00066 mg/L		

Created by: SFS
Checked by: MMS
Reviewed by: KBK

**95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Strontium Detections in FGD Blowdown Pond Solids**

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
0.99		0.000006
0.99		0.000006
0.98		0.000022
Std. Deviation (s) = Sq. Root of SUM =		0.00577
s / Mean (x_i) =		0.006
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Strontium is = 1.00 mg/L		

Created by: SFS
 Checked by: MMS
 Reviewed by: KBK

**95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Thallium Detections in FGD Blowdown Pond Solids**

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
0.000073		2.54E-09
0.00025		5.58E-09
0.00011		5.89E-10
Std. Deviation (s) = Sq. Root of SUM =		0.000093
s / Mean (x_i) =		0.647
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Thallium is		
=		
0.00030 mg/L		

Created by: SFS

Checked by: MMS

Reviewed by: KBK

95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Total Dissolved Solids Detections in FGD Blowdown Pond Solids

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
2700		0.0
2800		5000
2600		5000
Std. Deviation (s) = Sq. Root of SUM =		100
s / Mean (x_i) =		0.037
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for TDS is = 2869 mg/L		

Created by: SFS
 Checked by: MMS
 Reviewed by: KBK

95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Chloride Detections in FGD Blowdown Pond Solids

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
190		50
180		0
170		50
Std. Deviation (s) = Sq. Root of SUM =		10.0000
s / Mean (x_i) =		0.056
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Chloride is = 197 mg/L		

Created by: SFS

Checked by: MMS

Reviewed by: KBK

**95% Confidence Limit Calculations
FGD Product Solid Materials
Fluoride Detections in FGD Blowdown Pond Solids**

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
6.20		0.002222
6.10		0.000556
6.10		0.000556
Std. Deviation (s) = Sq. Root of SUM =		0.0577
s / Mean (x_i) =		0.0094
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Fluoride is		
=		
6.2 mg/L		

Created by: SFS

Checked by: MMS

Reviewed by: KBK

**95% Confidence Limit Calculations
FGD Product Solid Materials
Nitrate Detections in FGD Blowdown Pond Solids**

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
0.39		0.000089
0.37		0.000022
0.37		0.000022
Std. Deviation (s) = Sq. Root of SUM =		0.0115
s / Mean (x_i) =		0.031
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Nitrate is = 0.40 mg/L		

Created by: SFS

Checked by: MMS

Reviewed by: KBK

95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Gross Alpha Detections in FGD Blowdown Pond Solids

Normal Distribution - Student's <i>t</i> -statistic		
		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
x_i		
5.70		2.067222
7.70		0.000556
9.80		2.135556
Std. Deviation (s) = Sq. Root of SUM =		2.0502
s / Mean (x_i) =		0.265
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Gross Alpha is = 11.2 mg/L		

Created by: SFS
 Checked by: MMS
 Reviewed by: KBK

**95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Sulfate Detections in FGD Blowdown Pond Solids**

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
1400		0
1400		0
1400		0
Std. Deviation (s) = Sq. Root of SUM =		0.0000
s / Mean (x_i) =		0.0
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Sulfate is = 1400 mg/L		

Created by: SFS
 Checked by: MMS
 Reviewed by: KBK

**95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Aluminum Detections in Gypsum Stockpile**

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
0.32		0.000022
0.29		0.000272
0.33		0.000139
Std. Deviation (s) = Sq. Root of SUM =		0.0208
s / Mean (x_i) =		0.07
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Aluminum is =		
0.35 mg/L		

Created by: SFS

Checked by: MMS

Reviewed by: KBK

95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Barium Detections in Gypsum Stockpile

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
0.095		0.000050
0.086		0.000000
0.074		0.000061
Std. Deviation (s) = Sq. Root of SUM =		0.0105
s / Mean (x_i) =		0.12
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Barium is = 0.10 mg/L		

Created by: SFS
 Checked by: MMS
 Reviewed by: KBK

**95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Boron Detections in Gypsum Stockpile**

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
0.084		0.008978
0.20		0.000162
0.37		0.011552
Std. Deviation (s) = Sq. Root of SUM =		0.1438
s / Mean (x_i) =		0.66
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Boron is =		
0.46 mg/L		

Created by: SFS
Checked by: MMS
Reviewed by: KBK

**95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Cadmium Detections in Gypsum Stockpile**

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean}(x))^2}{n-1}$
0.00046		2.00E-10
0.00042		2.00E-10
0.00044		0.00E+00
Std. Deviation (s) = Sq. Root of SUM =		0.000020
s / Mean (x_i) =		0.05
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Cadmium is = 0.00047 mg/L		

Created by: SFS
 Checked by: MMS
 Reviewed by: KBK

**95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Manganese Detections in Gypsum Stockpile**

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
0.0051		9.10E-06
0.0090		6.72E-08
0.014		1.07E-05
Std. Deviation (s) = Sq. Root of SUM =		0.0045
s / Mean (x_i) =		0.48
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Manganese is = 0.017 mg/L		

Created by: SFS
 Checked by: MMS
 Reviewed by: KBK

**95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Sodium Detections in Gypsum Stockpile**

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
3.9		0.013889
4.6		0.142222
3.7		0.067222
Std. Deviation (s) = Sq. Root of SUM =		0.4726
s / Mean (x_i) =		0.12
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Sodium is =		
4.9 mg/L		

Created by: SFS
Checked by: MMS
Reviewed by: KBK

**95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Vanadium Detections in Gypsum Stockpile**

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
0.0025		4.05E-07
0.0037		4.50E-08
0.0040		1.80E-07
Std. Deviation (s) = Sq. Root of SUM =		0.00079
s / Mean (x_i) =		0.2334
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Vanadium is = 0.0047 mg/L		

Created by: SFS
 Checked by: MMS
 Reviewed by: KBK

**95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Antimony Detections in Gypsum Stockpile**

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean}(x))^2}{n-1}$
0.00019		2.72E-10
0.00021		5.56E-12
0.00024		3.56E-10
Std. Deviation (s) = Sq. Root of SUM = 0.000025		
s / Mean (x_i) = 0.118		
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Antimony is = 0.00026 mg/L		

Created by: SFS
Checked by: MMS
Reviewed by: KBK

**95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Strontium Detections in Gypsum Stockpile**

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
0.56		0.000200
0.59		0.000050
0.59		0.000050
Std. Deviation (s) = Sq. Root of SUM =		0.01732
s / Mean (x_i) =		0.030
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Strontium is = 0.61 mg/L		

Created by: SFS
 Checked by: MMS
 Reviewed by: KBK

95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Total Dissolved Solids Detections in Gypsum Stockpile

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
2200		0
2200		0
2200		0
Std. Deviation (s) = Sq. Root of SUM =		0
s / Mean (x_i) =		0.000
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for TDS is = 2200 mg/L		

Created by: SFS
 Checked by: MMS
 Reviewed by: KBK

**95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Chloride Detections in Gypsum Stockpile**

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
4.00		0.55
10.0		12.25
1.15	(1/2 MDL)	7.61
Std. Deviation (s) = Sq. Root of SUM =		4.5175
s / Mean (x_i) =		0.895
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Chloride is = 13 mg/L		

Created by: SFS
 Checked by: MMS
 Reviewed by: KBK

**95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Flouride Detections in Gypsum Stockpile**

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
5.70		0.055556
5.10		0.035556
5.30		0.002222
Std. Deviation (s) = Sq. Root of SUM =		0.3055
s / Mean (x_i) =		0.0569
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Fluoride is =		
5.9 mg/L		

Created by: SFS
Checked by: MMS
Reviewed by: KBK

**95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Gross Alpha Detections in Gypsum Stockpile**

Normal Distribution - Student's <i>t</i> -statistic		
		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
x_i	(1/2 MDL)	n-1
2.4		11.7
9.6		2.8
9.7		3.0
		Std. Deviation (s) = Sq. Root of SUM = 4.1861
		s / Mean (x_i) = 0.6
		If <1, Data is normally distributed
		One-Sided 95% Upper Confidence Limit for Gross Alpha is = 14.3 mg/L

Created by: SFS
 Checked by: MMS
 Reviewed by: KBK

**95% Upper Confidence Limit Calculations
FGD Product Solid Materials
Sulfate Detections in Gypsum Stockpile**

Normal Distribution - Student's <i>t</i> -statistic		
x_i		$\frac{(x_i - \text{Mean } (x))^2}{n-1}$
1400		0
1400		0
1400		0
Std. Deviation (s) = Sq. Root of SUM =		0.0000
s / Mean (x_i) =		0.0
If <1, Data is normally distributed		
One-Sided 95% Upper Confidence Limit for Sulfate is = 1400 mg/L		

Created by: SFS
 Checked by: MMS
 Reviewed by: KBK