# PUTNAM COUNTY PROPERTY APPRAISER

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LARRY PRITCHETT, C.F.A.
Property Appraiser

TIMOTHY E. PARKER, C.F.E.
Chief Deputy

MARSHA DENTON, C.F.E.
Administrative Assistant




July 25, 2008

Mr. Hamilton Oven, P.E.
Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Rd.
Tallahassee, FL 32399

RE: Seminole Electric Acct #822601

Dear Mr. Oven:

Enclosed you will find the Return of Pollution Control Devices for the above referenced account in our county.

Would you please review this information and advise me as to what qualifies for assessment as pollution control devices under Section 193.621, Florida Statutes. If you need any additional information, let me know. Thank you for your assistance.

Sincerely,

Justin Edwards, CFE
Office Operations Supervisor

DR-492
R. 08/83

# Return of Pollution Control Devices For Ad Valorem Tax Purposes

**Florida Statutes Chapter 193.621**

To the Property Appraiser Honorable William L. (Larry) Pritchett, Jr.

Putnam County, Florida, as of January 1, 2008

**Return is hereby made for the assessment of the following described property under Florida Statutes as pollution control devices.**

## Description of Property

See attached reports and descriptions. Pollution Control Facilities include those items installed and those in spare parts inventory.

## Description of Facility

Seminole Generating Station, a coal-fired electric power plant consisting of Units 1 and 2 and Common Facilities, with a total capacity of approximately 1,300 megawatts, located 5 miles north of Palatka, on US Highway 17.

Name and address of owner:

SEMINOLE ELECTRIC COOPERATIVE, INC.
P.O. Box 272000
Tampa, FL 33688-2000
ATTN: Tax Accounting

**The undersigned taxpayer hereby agrees to furnish such other reasonable information as the Appraiser may request in regard to the assessment requested herein.**

Taxpayer's Signature

Timothy D. Rogers
Director of Treasury Services

**This form must be filed with the County Property Appraiser before April 1st.**

ORIGINAL TO BE RETAINED BY PROPERTY APPRAISER

COPY TO BE GIVEN TO TAXPAYER

SEMINOLE ELECTRIC COOPERATIVE, INC.
PUTNAM COUNTY PROPERTY TAX REPORT
ORIGINAL COST OF POLLUTION CONTROL IMPROVEMENTS (INCLUDING MOBILE)
01-2008



| CORP CODE / DET | LOCAT | ITEM NUMBER | BOOK ACQ DATE | FULL DESCRIPTION | ORIGINAL INST. COST | PURCH / WORK ORDER NUMBER | STATE CATEG |
|---|---|---|---|---|---|---|---|
| | COMFA | 3120718063B | 03-01-2006 | COMMON FAC - UPG ELECTRICAL TO PERIM SUMP PUMP #1 | 41,319.17 | WO 35656 | PC |
| | COMFA | 3120718073B | 03-01-2006 | COMMON FAC - REPL PERIMETER SUMP PUMP #1 | 21,853.53 | WO 35656 | PC |
| | COMFA | 3120718313B | 03-01-2006 | COMMON FAC - UPG ELECTRICAL TO PERIM SUMP PUMP #6 | 31,158.61 | WO 35656 | PC |
| | COMFA | 3120718323B | 03-01-2006 | COMMON FAC - REPL EPF PERIMETER SUMP PUMP #6 | 20,716.06 | WO 35656 | PC |
| | COMFA | 3120718333B | 11-01-2006 | COMMON FAC - FABRIFORM EPF AREA - EXPANSION | 8,000.00 | WO 35666 | PC |
| | COMFA | 3120719123D | 04-01-2006 | COMMON FAC - PWTS FILTER PRESS | 198,571.35 | WO 35652 | PC |
| | COMFA | 316300016347 | 10-01-2006 | SKID STEER LOADER, VOLVO | 28,700.00 | 0603744 | PC |
| | ** ACQ YEAR | | 2006 | | 496,873.00 | | |
| | COMFA | 3120718363A | 08-01-2007 | COMMON FAC - EPF PERIMETER PUMP TELEMETRY SYS. | 18,838.05 | WO 35671 | PC |
| | COMFA | 3120719123E | 02-01-2007 | COMMON FAC-PWTS FILTER 807 A&B AIR SCOURING SYSTEM | 29,521.19 | WO 35677 | PC |
| | COMFA | 3121401163C | 12-01-2007 | COMM FAC REPLACE DEMINERALIZATION CAUSTIC PUMPS | 65,856.45 | WO 35678 | PC |
| | COMFA | 3121401163D | 12-01-2007 | COMM FAC CAUSTIC PUMP VFD CONTROLLERS | 4,442.04 | WO 35678 | PC |
| | COMFA | 316300016439 | 05-01-2007 | DUMP TRUCK, VOLVO, 2006 A40D | 500,332.40 | 0702257 | PC |
| | COMFA | 316300016440 | 05-01-2007 | DUMP TRUCK, VOLVO, 2006 A40D | 500,341.01 | 0702257 | PC |
| | COMFA | 316300016447 | 05-01-2007 | TRACTOR BULLDOZER, CATERPILLAR D7 | 434,895.00 | 0607378 | PC |
| | COMFA | 316300017323 | 11-01-2007 | FRONT END LOADER, VOLVO | 590,990.00 | 0707490 | PC |
| | COMFA | 316300017354 | 12-01-2007 | VACUUM TRUCK, HONDA | 297,137.00 | 0705448 | PC |
| | COMFA | 316300216472 | 07-01-2007 | WATER TRUCK, DFT 4000 GAL | 139,960.24 | 0703814 | PC |
| | ** ACQ YEAR | | 2007 | | 2582,313.38 | | |
| | ** LOCATION | | COMFA | | 23468,350.85 | | |
| | SPARE | 312SP3573 | 05-01-2004 | MOTOR, 1250 HP FOR LIMESTONE BALL MILL | 120,026.67 | | PC |
| | ** ACQ YEAR | | 2004 | | 120,026.67 | | |
| | SPARE | 312SP0610051 | 07-01-2007 | GEARBOX, AGITATOR INCL. SHAFT & BEARINGS | 75,392.00 | 0701376 | PC |
| | ** ACQ YEAR | | 2007 | | 75,392.00 | | |

PUTNAM COUNTY PROPERTY TAX REPORT
ORIGINAL COST OF POLLUTION CONTROL IMPROVEMENTS (INCLUDING MOBILE)
01-2008

| CORP CODE / DNT LOCAT | ITEM NUMBER | BOOK ACQ DATE | FULL DESCRIPTION | ORIGINAL INST. COST | PURCH / WORK ORDER NUMBER | STATE CATEG |
|---|---|---|---|---|---|---|
| UNIT2 | 3111101032C | 11-01-2003 | LSD 03 REPLACE SUMP PUMP | 16,109.65 | WO 35590 | PC |
| UNIT2 | 3120603022D | 03-01-2003 | LSD 03 - SPRAY WASH MODIF, VALVES,INSTR & CONTROLS | 16,243.28 | WO 35587 | PC |
| UNIT2 | 3120603022E | 03-01-2003 | LSD 03 - SPRAY WASH MODIF - HEADERS | 160,628.04 | WO 35587 | PC |
| UNIT2 | 3120603032I | 12-01-2003 | LSD 03 - NEW MIST ELIMINATOR MODULES 2B & 2C | 135,285.56 | WO 35600 | PC |
| UNIT2 | 3120603052C | 03-01-2003 | LSD 03 - SPRAY WASH MODIFICATIONS - NOZZLES | 3,609.62 | WO 35587 | PC |
| ** ACQ YEAR | | 2003 | | 331,876.15 | | |
| UNIT2 | 3120501122B | 02-01-2004 | LSD 04 - T/R 480V MOLDED CASE BRKR GRD FAULT | 73,996.52 | WO 35599 | PC |
| UNIT2 | 3120501122C | 12-01-2004 | LSD 04 - T/R MOLDED CASE BRKR GROUND FAULT | 142,593.63 | WO 35619 | PC |
| UNIT2 | 3120603032J | 03-01-2004 | LSD 04 - NEW MIST ELIMNATOR MODULES 2B & 2C | 145,000.00 | WO 35600 | PC |
| UNIT2 | 3120612122B | 04-01-2004 | LSD 04 - ACCESS PLATFORMS | 5,119.48 | WO 35601 | PC |
| UNIT2 | 3141201032B | 06-01-2004 | LSD 04 - REPLACE COOLING TOWER FILL | 2631,873.25 | WO 35614 | PC |
| ** ACQ YEAR | | 2004 | | 2998,582.88 | | |
| UNIT2 | 3120115032B | 12-01-2005 | LSD 05 - AIR HEATER WASH WATER CONTAINMENT | 76,301.17 | WO 35642 | PC |
| ** ACQ YEAR | | 2005 | | 76,301.17 | | |
| UNIT2 | 3111101102B | 12-01-2006 | UNIT 2 OIL/WATER SEPARATOR | 22,359.12 | WO 35669 | PC |
| UNIT2 | 3120603072BD | 09-01-2006 | UNIT 2 RELINE RECYCLE TANK 2D | 101,174.40 | WO 35668 | PC |
| UNIT2 | 3120603072BE | 09-01-2006 | UNIT 2 RELINE RECYCLE TANK 2E | 103,274.40 | WO 35668 | PC |
| ** ACQ YEAR | | 2006 | | 226,807.92 | | |
| UNIT2 | 3120601082B | 12-01-2007 | UNIT 2- FGD SYS. OUTLET DUCT LINING-WALLS | 496,665.32 | WO 35686 | PC |
| UNIT2 | 3120603152BB | 12-01-2007 | UNIT 2 ABSORBER MODULE B LINER | 475,625.53 | WO 35690 | PC |
| UNIT2 | 3120614012D | 08-01-2007 | UNIT 2 - ACCESS PLATFORMS - OPACITY MONITOR | 89,081.22 | WO 35672 | PC |
| ** ACQ YEAR | | 2007 | | 1061,372.07 | | |
| ** LOCATION | | UNIT2 | | 17267,325.80 | | |

SEMINOLE ELECTRIC COOPERATIVE, INC.
PUTNAM COUNTY PROPERTY TAX REPORT
ORIGINAL COST OF POLLUTION CONTROL IMPROVEMENTS (INCLUDING MOBILE)
01-2008



| CORP CCDE / DET LOCAT | ITEM NUMBER | BOOK ACQ DATE | FULL DESCRIPTION | ORIGINAL INST. COST | PURCH / WORK ORDER NUMBER | STATE CATEG |
|---|---|---|---|---|---|---|
| UNIT1 | 3120612121B | 04-01-2004 | UNIT 1 - ACCESS PLATFORMS | 5,119.48 | WO 35601 | PC |
| UNIT1 | 3141201031C | 10-01-2004 | UNIT 1 - COOLING TOWER FILL- SUBS CHARGES | 12,117.38 | WO 35596 | PC |
| ** ACQ YEAR | | 2004 | | 234,376.07 | | |
| UNIT1 | 3120115031B | 12-01-2005 | UNIT 1 - AIR HEATER WASH WATER CONTAINMENT | 76,338.22 | WO 35642 | PC |
| UNIT1 | 3120609011B | 06-01-2005 | UNIT 1 - REPLACE SUPERNATE RETURN TANK | 115,082.69 | WO 35640 | PC |
| ** ACQ YEAR | | 2005 | | 191,420.91 | | |
| UNIT1 | 3111101101B | 12-01-2006 | UNIT 1 OIL/WATER SEPARATOR | 22,359.12 | WO 35669 | PC |
| UNIT1 | 3120603071BA | 06-01-2006 | UNIT 1 RELINE RECYCLE TANK 1A | 124,211.40 | WO 35650 | PC |
| UNIT1 | 3120603071BE | 06-01-2006 | UNIT 1 RELINE RECYCLE TANK 1E | 104,746.40 | WO 35668 | PC |
| ** ACQ YEAR | | 2006 | | 251,316.92 | | |
| UNIT1 | 3120601081B | 02-01-2007 | UNIT 1 FGD SYS.OUTLET DUCT LINING-WALLS(15K SQ FT) | 703,420.00 | WO 35667 | PC |
| UNIT1 | 3120601081C | 12-01-2007 | UNIT 1-FGD SYS. OUTLET DUCT LINING-CEILING/FLOOR | 310,209.40 | WO 35686 | PC |
| UNIT1 | 3120603151BB | 12-01-2007 | UNIT 1 ABSORBER MODULE B LINER | 475,625.53 | WO 35690 | PC |
| UNIT1 | 3120614011D | 05-01-2007 | UNIT 1 ACCESS PLATFORMS - OPACITY MONITOR | 89,081.22 | WO 35672 | PC |
| UNIT1 | 3120616131B | 12-01-2007 | OXIDATION 480 SUSS TRANSFORMER OIL CONTAINMENT | 9,450.00 | WO 35715 | PC |
| ** ACQ YEAR | | 2007 | | 1587,786.15 | | |
| ** LOCATION | | UNIT1 | | 18075,257.95 | | |
| UNIT2 | 3120602052A | 03-01-1989 | UNIT 2 FGD DAMPER DRAIN COLLECTION SYS | 19,965.53 | WO 35157 | PC |
| ** ACQ YEAR | | 1989 | | 19,965.53 | | |
| UNIT2 | 3120620012A | 09-01-1990 | UNIT 2 FGD SERVICE WATER SYS-MIST ELIM. WASH STNS | 13,513.15 | WO 35222 | PC |
| UNIT2 | 3120620022A | 09-01-1990 | UNIT 2 FGD SERVICE WATER SYS-MIST ELIM. PUMPS/PIPE | 78,356.64 | WO 35222 | PC |

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

April 25, 2008

Honorable Larry Pritchett
Putnam County Property Appraiser
Honorable Tim Parker, Chief Deputy
P.O. Box 1920
Palatka, FL 32178-1920

RE: Certification of Pollution Control Facilities

Dear Messr Pritchett and Parker:

With respect to the equipment and facilities (collectively, "facilities") described on the attached pages concerning Seminole Electric Cooperative Inc.'s Seminole Generating Station located off U.S. Highway 17 North, of Palatka, Florida, I do hereby certify that all of these facilities qualify as pollution control facilities pursuant to Section 193.621, Florida Statutes, and that as such as they are used primarily for pollution control purposes pursuant to Florida Department of Environmental Protection Ad Valorem Tax Assessment Rules – Guidelines for Tax Assessors, Chapter 62-8. All of these facilities were constructed pursuant to Federal and/or state laws or regulations and in accordance with various permits.

Very Truly Yours,

Gary L Norman

Gary L. Norman, P.E.
Florida License Number 31404

16313 North Dale Mabry Highway P.O. Box 272000 Tampa, Florida 33688-2000
Telephone 813.933.0994 Fax 813.264.7906 www.seminole-electric.com

Seminole Generating Station
Combustion Systems Modification
Environmental System Descriptions

General

The replacement of the burners at Seminole Generating Station was done in order lower Nitrous Oxide Emissions ($NO_x$) for two purposes. First, to achieve an immediate reduction in $NO_x$ at low CO. Second, as part of the addition of the Selective Catalytic Reactor (SCR) to achieve a lower baseline for the SCR. The old burners were satisfactory for operation at the previous levels, however they were not adequate and could not be modified to achieve the lower levels. The successful performance of this work required their complete replacement as well as the replacement of the over fired air ports and the addition of new over fired air ports. New controls had to be added to control the new burners to hold a more precise air fuel mixture. According to section 193.621 the following are primarily for pollution control.

1.) Over Fire Air System

The over fire air system is used to complete the combustion and lower the combustion temperature as a pollution control methodology. It functions to keep the combustion temperature lower thus minimizing the formation of thermal nitrous oxides in the furnace. It also provides sufficient air to complete the combustion process and reduce the carbon monoxide.

2.) Process Control added to control the staged combustion.

The new burners are capable of staged combustion which will lower NOx, however, process control had to be added solely for this purpose. These controls consisted of input/output points and measurements as well as the active control of the burner sleeve damper with load. Previously the old burners had held the sleeve damper in one position which was set after construction and not changed. Under the new system this damper must change position as load changes in order to control pollution.

Report on Seminole Electric Cooperative, Inc.

Pollution Control Equipment in the

Flue Gas Desulfurization Oxidation System and

Waste Product Treatment System Modification Project

Seminole Generating Station Units 1 and 2

December 2000

In December, 2000, Seminole Electric Cooperative, Inc. completed modifications to the Seminole Plant flue gas desulfurization (FGD) systems for Units 1 and 2 which are used to remove sulfur dioxide from the flue gas of each unit. The modifications consisted of converting the chemical process within each unit from an unoxidized FGD system to an oxidized FGD system and modifying the FGD waste product treatment process to produce a usable by-product. Changing to an oxidized system reduces the maintenance and improves the operation of the SO2 removal system by reducing the amount of chemical scaling that occurs during the removal process. The reduced scaling will enable the plant to increase the removal efficiency of the chemical process without the potential of plugging the system. The new oxidized system produces a calcium sulfate material which, after proper washing and dewatering in the modified systems, can be used in the manufacturing of wallboard, the production of cement and in agriculture as a soil amendment. Waste material generated by the old unoxidized system was disposed of in the Seminole Plant's on-site landfill. Producing a usable by-product is in concert with the goals of the Florida Department of Environmental Regulation's pollution prevention policy program by reducing the amount of FGD waste material disposed of in the Seminole on-site landfill by over 500,000 tons per year.

The total cost of the modification was $16,677,392 and consisted of modifications to the FGD systems and waste product treatment system. The major components of the modification to the FGD systems to convert to an oxidized chemical process are:

1. Installation of an oxidation air system necessary for the conversion of the unoxidized material to an oxidized material.
2. Modifications to the ten FGD absorber modules to enable the oxidation reaction to occur.
3. Installation of two hydroclones in the limestone reagent system to produce a fine particle limestone slurry (the primary chemical reagent used to remove sulfur dioxide) which enhances the sulfur dioxide removal process.

The major components of the modification to the waste product treatment system are:

1. Modifications to two primary dewatering thickener tanks used to dewater the waste product to 60% solids.
2. Installation of a by-product washing system.
3. Modifications to the secondary dewatering system used to remove wash water and produce an 85-90% solids material.
4. Installation of a new treatment system to remove impurities from a wastewater stream prior to discharge to the St. Johns River.

All of the components listed above are integral parts of the modification to the FGD systems and waste product treatment system of both the Seminole units and are exclusively used for either the reduction of sulfur dioxide in the flue gas stream of each unit or the treatment of the by-product to avoid landfilling.

Therefore, I do hereby certify that all new equipment and modifications of existing equipment included in this Project qualify as pollution control facilities pursuant to Section 193.621, Florida Statutes, and that as such they are used primarily for pollution control purposes pursuant to Florida Department of Revenue Guidelines for Tax Assessors Chapter 62-8. Seminole performed all of the work under this Project pursuant to Department of Environmental Regulation Permit Number PA 78-10, as modified April 3, 2000, and Industrial Wastewater Facility Permit FL0036498-Major, issued January 7, 2000.

Kenneth L. Bachor, P. E.

31471

Florida License No.

# A REPORT ON POLLUTION CONTROL EQUIPMENT PURSUANT TO SUBSECTION 193.621(1) FLORIDA STATUTES - PROPERTY TAX ASSESSMENT

Prepared For

Seminole Electric Cooperative, Inc.

by

Burns and Roe, Inc.

March 1985

Prepared by: J. Whipple

J. Whipple
Project Manager

Approved by: J. J. Byrnes

J. J. Byrnes
Vice President
P.E. (Florida #29313)

TABLE OF CONTENTS

## 1.0 INTRODUCTION

At the request of Seminole Electric Cooperative, Inc., Burns and Roe, Inc., the Engineer of the power plant facility Seminole Plant Units 1 and 2, has provided this report on the pollution control facilities associated with the plant. This report contains a detailed list of pollution control devices being utilized by the facility and descriptions of the function of each device as it relates to pollution control and production.

No cost estimates are provided in this report. Seminole is presenting costs for these items in a separate report which is based upon property cost accounting data provided previously by Burns and Roe.

The information contained in this report is correct to the best of Burns and Roe's knowledge.

## 2.0 FACILITY DESCRIPTION

### 2.1 General

Seminole Plant Units 1 and 2 is a electric power plant rated at approximately 2x600 MW and is located near the town of Palatka, Florida on the St. Johns River. The plant burns coal and is equipped with all of the pollution control facilities required by the Federal, State, and local laws and regulations. Each of the two 600 MW units has certain pollution control devices dedicated to that unit and in addition the two units share certain other common pollution control facilities.

### 2.2 Pollution Control Facilities

A list of the pollution control facilities is provided in Table 1. The categories listed comply with those designated by Seminole on Schedule I of the Tangible Personal Property Account List.

In compiling this list Burns and Roe relied upon the information contained in certain documents provided by Seminole. These documents are listed in the Appendix to this report. In particular we relied upon the NUS report for guidance.

Note that item 311-12 Sewage Treatment Plant does not appear in Table 1 although it is listed in Seminole's Schedule I. Our review of the NUS report and F.S. 1979 Section 193.621(4) Assessment of Pollution Control Devices caused us to make this deletion. Paragraph (4) of the statute reads as follows: "but shall not include any public or private domestic sewerage system or treatment works".

We note however, that the DER in their letter of 2-27-85 to Mr. Mahaffey included item 311-12 Sewage Treatment Plant. Burns and Roe is not in a position to question the DER about this statement. If Seminole can provide further information then Burns and Roe could re-examine its position. It is possible that the key word is "domestic" and that in this case the sewage treatment plant at a power plant is not "domestic".

TABLE 1

POLLUTION CONTROL EQUIPMENT LIST

| | |
|---|---|
| 311-04 | Coal Handling Area |
| 311-11 | Waste Water Treatment Plant |
| 312-02 | Bottom Ash Removal System |
| 312-03 | Fly Ash System |
| 312-05 | Precipitator |
| 312-06 | Flue Gas Desulfurization* System |
| 312-07 | Flue Gas Desulfurization* Effluent Processing System |
| 312-09 | Stack |
| 314-12 | Circulating Water System |
| 314-13 | River Water System |
| 311-11 | Waste Water System Unit 2 |
| 312-02 | Bottom Ash Removal Unit 2 |
| 312-03 | Fly Ash System Unit 2 |
| 312-05 | Precipitator Unit 2 |
| 312-06 | Flue Gas Desulfurization Unit 2 |
| 312-09 | Stack Unit 2 |
| 314-12 | Circulating Water System Unit 2 |
| 314-13 | River Water System Unit 2 |
| 311-22 | Limestone Handling Area (runoff collection) |
| 312-04 | Coal Handling System (dust collection) |
| 312-14 | Boiler Makeup System (neutralization) |
| 312-08 | Limestone Handling System |

Note* Desulfurization is the proper term for what appears to be a typographical error on Schedule I

## 3.0 FUNCTIONAL DESCRIPTIONS

### 3.1 General

The functional descriptions which follow apply to both Unit 1 and Unit 2. In cases such as Wastewater System (311-11), Coal and Limestone Runoff Collection (311-04-22), Limestone Handling (312-08), FGD Effluent Processing (312-07), and River Water System (314-13) the systems are common to both units.

### 3.2 311-04 and 311-22 -- Coal Handling Area and Limestone Handling Area Run-off Collection System

Rainwater runoff from the coal and limestone storage areas is collected and the impurities removed so that this water may be discharged to the St. Johns River in accordance with environmental regulations.

The coal storage area is provided with a fabric reinforced, synthetic rubber liner. The purpose of this liner is to prevent any coal handling area runoff including coal conveyor washdown from passing into the ground or draining to the river. The liner diverts the runoff to various retention sumps from which it is pumped to the wastewater treatment facility.

The limestone storage area also has sumps, ditches and catch basins to collect rainwater runoff. The collected water is pumped to the wastewater treatment facility.

### 3.3 311-11 Waste Water System

The primary function of the Waste Water System is to process collected plant waste streams and rainwater runoff to remove any impurities. This is done so that the treated water may be discharged to the St. Johns River in accordance with environmental regulations and permits. The waste streams collected and treated include:

- Rain water run-off from coal and limestone storage piles including coal conveyor washdown.
- Boiler blowdown (if it is not recycled).
- Demineralizer and condensate polisher regeneration.
- Plant low volume wastes from drains.
- Sanitary sewage waste from the plant island.

There are two primary waste water processing systems. The sanitary sewage generated at the plant island is treated at the Sewage Treatment System. All other waste water flows, except for the intermittent washes, are processed in the Waste Water Treatment System. The intermittent washes including the stack wash, the air preheater wash and the boiler fireside wash are processed on an as-required basis in the percolation pond. (It is expected these washes will be processed on a bi-yearly schedule). All three systems serve both units.

Plant low volume waste water will be collected by floor drains located throughout the plant. These drains will collect the water in the equalization/collection basin where it is neutralized and oil and grease removed. The effluent of the equalization/collection basin is pumped to the waste water treatment clarifier. The clarifier removes the suspended solids, copper, iron and emulsified oil and grease using a flocculation/sedimentation process.

The waste water collected in the equalization/collection basin is designed to remove suspended solids, oil, grease, copper and iron using a flocculation and sedimentation process. The waste water is pumped into a clarifier where chemicals and flocculation aids are added and the impurities in the water are removed.

The effluent from the waste water treatment facility is pumped to a waste water surge tank where it is released to the St. Johns River and is monitored and regulated in accordance with the plant's National Pollutant Discharge Elimination System (NPDES) permit and DER's Florida Water Quality Standards, Chapter 17.3.

3.4* 311-12 Sewage Treatment Plant

The sanitary sewage is treated in an activated sludge system with extended aeration. The process will aerate the activated sludge-mixture and clarify the aerated mixture in a two section clarifier. The system is designed to remove 90% of influent $BOD_5$ and suspended solids to meet the discharge requirements outlined in Florida Department Environmental Regulations (DER), Chapter 17.3 (1975).

3.5 312-02 Bottom Ash Removal System (Dewatering System)

Bottom ash is one of the waste materials used to stabilize sludge from the FGD (Flue Gas Desulfurization) effluent processing system for site disposal. Facilities used to process bottom ash for mixing with FGD sludge ~~are~~ (Bottom Ash Dewatering System) are considered to be a part of the FGD system.

Bottom ash and boiler slag falls into a water-filled bin at the bottom of the boiler. A grinder in the bin reduces the chunks to small particles which are transported by water sluicing. This slurry is pumped to large dewatering bins where the ash is allowed to settle. After the water is drained off and recycled the moist ash is removed from the bins and trucked to the FGD effluent treatment faiclity for combination with FGD sludge.

The bottom ash dewatering system consists of the dewatering bin, the settling tank, the surge tank, and the settling/surge tank return pumps. The drained water is recycled for use to avoid the need for additional river water makeup and to avoid the necessity of discharging water from the system.

## 3.6 312-03 Fly Ash System

Fly ash resulting from the burning of coal will be removed from the flue gas with the use of electrostatic precipitators located downstream of the air heaters. The high collection efficient (99.6 percent) of the precipitators will maintain fly ash emissions below the Federal standards not to exceed 0.03 pounds of particulate per million BTU heat input and a 20 percent plume/opacity.

Flue gas is generated by the combustion of coal in the boiler. Upon leaving the boiler, the flue gas is hot and laden with fly ash. Some of this heat is recovered in the air preheaters. The flue gas stream is ducted from the discharge of the air heaters to the precipitators, where the fly ash is removed. The induced draft fans pull the cleaned flue gas from the precipitator and push it through the flue gas scrubber modules to the stack where it is discharged to teh atmosphere.

Fly ash is removed from the precipitator hoppers by a pressurized pneumatic conveying system. Fly ash will be introduced to the fly ash conveyor piping from the hoppers via air-lock pressure feeders. Blowers supply pressurized air to change the air-lock feeders and pneumatically transport the dry fly ash from each collection point to the fly ash silo located 2500 feet from the precipitators in the FGD effluent treatment facility area.

## 3.7 312-04 Coal Handling System (Dust Collection)

As coal is unloaded from the railroad cars, conveyed to temporary storage, reclaimed from storage and conveyed to the boiler, coal dust and particulates are introduced into the atmosphere. Air pollution control regulations require that a system of filters and collection devices be installed to minimize the fugitive dust released to the environment.

The coal handling system is shared by Units No. 1 and 2 except for the silo loading points. Therefore, all collection points prior to silo loading are included in the Unit 1 Dust Collection System. The dust collectors for each Unit's silo loading points are included in the respective Unit's system.

Dust emissions are controlled with high efficiency bag filters. These filters are provided at several centralized locations throughout the conveying system to collect coal dust generated while moving and transferring the coal. Each of the 3 bag filters has a fan to draw air from the collection point, through the hood and ducting and into the bag filter. Each bag filter services from 8 to 12 collection points. the recovered coal dust is returned to the coal stream.

## 3.8 312-05 Electrostatic Precipitator

An electrostatic precipitator removes fly ash particles from the flue gas by applying four fundamental steps: (1) electrical charging of suspended fly ash particles, (2) collection of the charged particle in an electric field, (3) removal of the precipitated ash from the collecting field (electrodes) and (4) disposal. The main components of the electrostatic precipitator required to accomplish these four steps are: The discharge electrode system, the collector electrode system, the rapping system and the dust hoppers. Other important components include the gas distribution system and the precipitator shell.

The discharge electrode system consists of an assembly of wires mounted in a rectangular, tubular frame in the gas stream and suspended from insulators. These wires are connected to the negative pole of the high-voltage rectifier equipment and produce a high-voltage direct-current corona. This charges the suspended fly ash particles. The particles, under the influence of the strong electrical field, then migrate to the collecting electrodes (positive polarity).

The collector electrode system consists of an assembly of plates on which the dust is precipitated. The collecting plates and discharge electrodes are alternately spaced and provide both charging and collection of particcles in a single stage.

The removal of the precipitated particles from the collection plates is performed by a system of impact rappers. The rappers strike the plates setting up oscillations taht shake the collected material loose. It then falls into the dust hoppers. The dust hoppers store the collected ash for removal from the precipitator prior to transfer to the fly ash silo that feeds into the sludge mixing pug mill.

The precipitator includes inlet and outlet gas distribution systems to permit uniform distribution of the gas through the precipitator. Gas distribution devices include perforated plates and turning vanes as required.

The precipitator shell is constructed of reinforced steel plate. Insulation and lagging is applied to maintain internal temperatures.

3.9 312-06 Flue Gas Desulfurization (FGD) System

Seminole has installed a wet-scrubbing system for each unit designed to keep sulfur dioxide emissions below the State and Federal standards. There are several functionally related and subordinate systems required for the operation of the FGD system. These subordinate systems are shared by each unit's FGD System and include: (1) Limestone Handling and Preparation System and (2) FGD Effluent Processing System.

The FGD system consists of five parallel absorber modules to treat the flue gas from one coal-fired steam generating boiler. At "design" conditions, four modules are in operation and the fifth is an installed spare. Each module consists of a spray tower absorber, recycle tank, hydroclone system, recycle pumping system, insolation dampers, and other associated equipment.

The flue gas enters this system at the outlet of the induced draft fans via a header duct system common to all modules. The gs is then split into two streams. The first is a startup bypass, sized for 30% of the total gas flow, which is not used during normal operation; the second stream is the absorber feed.

The gas to be scrubbed passes through the isolation damper located at the inlet duct of the absorber. The internal walls of this duct are continuously sprayed with jets of process slurry in the vicinity of the absorber inlet to prevent the build-up of any solids that might form at the wet/dry interface. Partial quenching of the gas occurs in this inlet section.

The gas then enters the body of the absorber where quenching to the saturation temperatures is completed. The gas travels upwards and contacts a continuous downward curtain of process slurry spray produced by multiple spray banks. The slurry is an aqueous suspension of calcium sulfite, calcium sulfate, unreacted calcium carbonate, inert material, fly ash, and various dissolved species. The action of the gas and liquid interface extracts the sulfur dioxide from the gas and transfers it into the liquid phase where it partially reacts with dissolved calcium carbonate to form calcium sulfite. Five spray banks are provided, each fed by

its own, dedicated, slurry recycle pump. Four spray banks are needed to provide the maximum specified (secondary) efficiency (90%); three spray banks are needed to provide the primary specified effiency (86%). The fifth spray bank is an installed spare.

After leaving the absorber, the cleaned gas is discharged to the stack. Since this system does not include reheat, the saturated gases are expected to condense moisture on the innter surfaces of the absorber outlet ductwork and the stack.

The waste slurry, which continuously overflows from a baffled section of the recycle tank, flows over a constant level weir to the waste slurry sump from which it is pumped to the FGD effluent processing system. The reclaimed water (supernate) is returned from the dewatering system collected in a supernate storage surge tank, blended with the various makeup water, and is distributed to the various parts of the process.

## 3.10 312-07 FGD Effluent Processing System

The FGD effluent processing system takes thickened sludge laden with $SO_2$ products and combines it with bottom ash, fly ash, central waste dewatered sludge and lime to create a cement-like material for on-site disposal. This final product is a stabilized material with low permeability and is environmentally acceptable as a landfill material. Mobile equipment (trucks, dozers and earth moving equipment) are required to place the material in the landfill.

The FGD effluent disposal system is located near the landfill area necessitating the transportation of constituents to that central point. This requires several different transport systems including bottom ash trucking, fly ash pipeline, FGD sludge pipeline, lime rail delivery and thickened central waste dewatered sludge trucking.

The FGD effluent disposal system includes dewatering and process mixing equipment, storage bins and associated feed equipment for the constituents, conveyor equipment for the movement of materials within the system limits, related instrumentation and control equipment, and the constituent transportation systems mentioned above. The system receives the FGD sludge from the FGD absorber modules and dewaters it using thickeners and vacuum filters. The dewatered sludge is mixed with fly ash and a lime additive in a pug mill. This mixture is trucked to the landfill area where it is used to encapsulate the bottom ash and central waste dewatered sludge to form a stabilized landfill.

## 3.11 312-08 Limestone Handling System

Facilities to unload, crush, store, convey and prepare limestone for use in the absorbers are included in this system. The limestone handling system includes an unloading hopper, conveyors, crushers, a portal scraper, covered active storage, and weigh scales. The preparation system includes limestone ball mills, slurry tanks and pumps, and a limestone classifier.

Limestone from the Ocala limestone formation is unloaded from trucks into an unloading hopper and conveyed to a limestone crusher and then into a covered active storage pile. A portal scraper reclaims the limestone from teh active pile onto conveyors which transport the limestone to a surge bin. From the surge bin, the limestone is fed into the ball mills where it is pulverized and ground to a size to pass 80% through a 100 mesh. The limestone is pulverized in a ball mill in a closed loop wet grinding facility. FGD supernate water is used in this grinding operation to prepare a 35 weight percent limestone slurry which is stored in the limestone slurry storage tank. Limestone is added to the process at the recycle tank in response to changes in pH. A recirculating feed loop is provided to prevent solids deposition in the feed lines.

## 3.12 312-09 Stack

The combustion of coal produces stack gases and ash. The majority of the ash is removed by other systems previously described.

The purpose of the stack is to discharge the products of combustion at an elevation sufficiently above grade to avoid plume impact on plant components and operating staff and to enhance dispersion of the pollutant constituents of the flue gas ($SO_2$, $NO_x$, particulates).

The Seminole plant has a single concrete chimney with two independent, self supporting brick liners. The stack is 2.5 times the height of the steam generator to ensure sufficient dispersion of gases. As the FGD system is a wet scrubber type, the flue gas is saturated and condenses moisture on the stack liner. This moisture is highly acidic so the liner is constructed of acid resistant brick and mortar. The liners are wider than for a conventional chimney to create a lower gas velocity. This prevents the acidic droplets from being blown out of the stack and allows them to drop to the bottom. This condensate is collected and recycled into the FGD system.

3.13 312-14 Boiler Make-up System (Neutralization System)

The equipment which chemically treats water for boiler make-up produce various liquid waste by-products. These liquids are too acidic or caustic to be discharged and so must be neutralized first.

A neutralization system has been provided at the local collection basin for demineralization and condensate polisher regeneration waste streams. This system is required to neutralize the highly acidic and caustic wastes produced in the regeneration cycle before the waste is pumped to the equalization/collection basin.

Once the pH of these wastes is neutralized it can be treated as described in section 3.2. The neutralization system consists of a lined basin, piping, pumps, and chemical injection equipment.

3.14 314-12 Circulating Water System

The cooling tower system will minimize the release of warm water (thermal pollution) to the St. Johns River.

The heat gained in the circulating water from the condensation of steam in the condenser will be dissipated to the atmosphere through the cooling tower and a negligible amount of heat will be released to the water.

Cooling water is used to remove heat from the exhaust section of the turbine generators. Water is continuously circulated through the condenser to the cooling towers by vertical pumps located in a concrete structure adjacent to the cooling tower. A system of large diameter piping connects the cooling tower, the pump structure and the turbine condenser. Water lost from the cooling loop by blowdown, drift and evaporation is replaced with makeup water supplied from the St. Johns River.

3.15 314-13 River Water System

Seminole Units 1 and 2 share a common river water system for circulating water makeup including river water pumps, pump house structure and ancillary equipment. Each unit has a separate 24 inch water makeup pipe to the respective cooling tower. Equipment in the cooling loop is identical for each unit.

The river water makeup to the cooling tower is pumped from the river to the cooling tower without treatment. The water quality of the circulating water is controlled by chemical injection and blowdown. The chemical injection system includes chlorination for bacteria control and acid injection for pH control. The blowdown controls the concentration of suspended and dissolved solids and is monitored for release to the river. The blowdown is piped to the surge tank. (The surge tank is discussed in the Waste Water Treatment section of this report).

Fresh river water makeup to the cooling towers is required to replace evaporation losses and to maintain proper system water chemistry by replacement of system blowdown.