Effluent Quality Assessment of

Northside Generating Station and St. Johns River Power Park

Formerly Known as

Northside Generating Station

Duval County

NPDES # FL0001031

Sampled August 1, 3 and 5, 2016

February 2017

Biology Program

DEP Laboratory

Division of Environmental Assessment and Restoration

DEP Laboratory Quality Manual

NELAC Certification No. E31780

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Northside Generating Station and St. Johns River Power Park (Formerly Known as Northside Generating Station), 4277 Heckscher Drive, Jacksonville, Duval County, Florida, 32226. NPDES #FL0001031

Facility Overview

Northside Generating Station and St. Johns River Power Park has an industrial wastewater treatment facility which treats Once Through Cooling Water (OTCW) and industrial waste water from the electric power generating plants. See Appendix A for a description of the facility, summary of permit limits, Administrative Order (AO) and Discharge Monitoring Report (DMR) information.

Methods

Effluent composite and grab samples for toxicity testing were collected on August 1, 3 and 5, 2016. Effluent grab and composite samples for biological and chemical analyses for this facility were collected on August 1, 2016. All samples were collected from the EFF-1C NPDES sampling point for Outfall D-001 by Brian Davis, Amy Kalmbacher and Patrick O'Connor (FDEP Northeast Regional Operation Center) following DEP-SOP-001/01 FS 2400 Wastewater Sampling (see Appendix B).

The 7-day chronic definitive toxicity tests and algal growth potential test were performed following internal DEP SOPs TA07_14, TA07_15, and TA08_01 through TA08_09 (see Appendix B).

All field and laboratory methods followed DEP Standard Operating Procedures (see http://www.dep.state.fl.us/labs/library/lab_sops.htm and http://www.dep.state.fl.us/water/sas/sop/sops.htm for details) and met DEP quality assurance/quality control standards (see http://www.dep.state.fl.us/water/sas/qa/index.htm). Explanations of specific methods and measurements can be found in Appendix C.

Results

Chemistry Results (See Table 1, Table 2, Table 3 and Appendix C)

- Receiving waters for this facility fall within the Lower St. Johns and Tributaries Estuary Nutrient Region for Numeric Nutrient Criteria (NNC). This FYI event can only provide single sample results; therefore, compliance should be determined with additional sampling events. http://ca.dep.state.fl.us/mapdirect/?focus=nutrientcriteria
- The total ammonia concentration in the grab sample collected and preserved for chemical analysis was 0.018 mg N/L. Based on the pH, salinity, and temperature of the effluent as collected, the calculated unionized ammonia concentration was < 0.02 mg/L.
- Aluminum, arsenic, chromium, copper, fluoride, lead, mercury, and nickel were detected in the effluent at levels that comply with Class III Marine Water Quality Criteria (62-302.530, F.A.C.) and/or permit limits. The effluent's iron concentration exceeded the Class III Marine Water Quality Criterion (62-302.530(38), F.A.C.). Carbonaceous biochemical oxygen demand (CBOD) and zinc were detected between the laboratory method detection limits (MDL) and practical quantitation limits (PQL).

Algal Growth Potential (AGP)(See Table 4 and Appendix C)

- The effluent Algal Growth Potential (AGP) was 7.92 A (A -Value reported is the mean of two or more determinations) mg dry wt/L of the saltwater species *Dunaliella tertiolecta.* The ratio of total nitrogen to total phosphorus suggests that the effluent is nitrogen limited (Maloney et al. 1974).

Toxicity Test Results (See Table 2 and Appendix C)

- Tests were performed August 2 through 9, 2016.

  Americamysis bahia 7-day chronic definitive bioassay: (Twenty-Five Percent Inhibition Concentration) IC_{25} > 100% sample. (No Observed Effect Concentration) NOEC is 100% sample

Menidia beryllina 7-day chronic definitive bioassay: (Twenty-Five Percent Inhibition Concentration) IC_{25} > 100% sample. (No Observed Effect Concentration) NOEC is 100% sample

*NOTE: A 25% inhibition concentration (IC25) is the effluent concentration causing a 25% reduction in a biological response such as biomass or reproduction when compared to a control population. An IC25 of less than 100% in a chronic test may constitute exceedances of 62-302.530(20), 62-302.530(61) and/or facility permit limits. A no observed effect concentration (NOEC) less than 100% effluent in a chronic test may constitute an exceedance of 62-302.530(61) and/or facility permit limits (Rule 62-302.500(1)(a)4, F.A.C.).

- The bioassay samples were not chronically toxic to the test organisms.

Conclusion

The effluent samples collected from the EFF-1C NPDES sampling point for this facility on August 1, 3 and 5, 2016, were not chronically toxic to the *Americamysis bahia* or *Menidia beryllina* test organisms during the 7-day chronic definitive bioassays. Effluent nutrient chemistry suggests that the effluent is nitrogen-limited. The effluent's iron concentration exceeded the Class III Marine Criterion. Additional effluent water quality samples collected on August 1, 2016, did not exceed any applicable water quality criteria or any permit conditions.

For additional information concerning this sampling event, including bioassay bench sheets and SRT data, please contact Amelia.Rankin@dep.state.fl.us and/or Joseph.Faircloth@dep.state.fl.us.

Literature Cited

Maloney, T. E., W. E. Miller, and D. T. Specht. 1974. The Marine Algal Assay Procedure: Bottle Test. National Environmental Research Center Office of Research and Development. U. S. EPA, Corvallis, Oregon. 43 p.

USEPA. 2002. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms. 3rd edition. EPA-821-R-02-014.

Table 1. Effluent limits, Class III Marine Criteria and field parameters

JEA Northside Generating Station	Units	Class III Criteria	Effluent Permit Limits	Effluent Grab	Effluent Composite
Sample Depth	m	-	-	3.0	3.0
Temperature	C	-	-	37.8	37.8
pH	SU	6.5 - 8.5	6.5 - 8.5	7.9	7.9
Specific Conductance	µmhos/cm	-	Report	45,100	45,100
Salinity	ppt	-	-	28.7	28.7
Dissolved Oxygen	% saturation	≥ 42	-	61	61
Dissolved Oxygen	mg/L	-	-	3.5	3.5
Flow	MGD	-	Report	787 a	-
Total Residual Oxidants	mg/L	-	0.1	≤ 0.03 [1]	≤ 0.03 [1]

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.

a - Annual average

1 - measurement taken in the FDEP laboratory

Table 2. Effluent limits, Class III Marine Criteria and analytical water chemistry data

JEA Northside Generating Station	Units	Class III Criteria	Effluent Permit Limits	Effluent Grab	Effluent Composite
Ortho-phosphate	mg P/L	-	-	0.048	-
Total Phosphorus	mg P/L	-	-	0.072	0.080
Total Ammonia	mg N/L	-	-	0.018	0.019
Un-ionized Ammonia	mg N/L	-	-	< 0.02 c	< 0.02 c
Nitrate and Nitrite	mg N/L	-	-	0.042	0.032
Total Kjeldahl Nitrogen	mg N/L	-	-	0.52	0.41
Organic Nitrogen	mg N/L	-	-	0.5 c	0.39 c
Total Nitrogen	mg N/L	-	-	0.56 c	0.44 c
Total Organic Carbon	mg C/L	-	-	5.0 A	-
Chlorophyll *a* - Corrected	µg/L	-	-	2.4	-
Phaeophytin	µg/L	-	-	2.3	-
Chlorophyll *a* - uncorrected	µg/L	-	-	3.9	-
CBOD, 5 day, N - inhibited	mg/L	-	-	-	0.79 IJ
Hardness	mg/L	-	-	-	5190 c
Total Suspended Solids	mg/L	-	-	12	-
Total Dissolved Solids	mg/L	-	-	27,400	-
Turbidity	NTU	< 29 t s	-	4.8 A	-
Color (true)	PCU	-	-	15	-
Alkalinity	mg/L as CaCO3	-	-	108 A	-
Chloride	mg Cl/L	-	-	16,000 A	-
Fluoride	mg F/L	≤ 5.0 s	-	1.1	-
Sulfate	mg SO4/L	-	-	2,300 A	-
Oils and Greases [2]	mg/L	-	-	0.71 U	-
Toxicity (IC25 Chronic definitive, % Effluent)					
Bioassay - Shrimp *(Americamysis bahia)*	% Effluent	≥ 100	≥ 100	-	>100
Bioassay - Fish *(Menidia beryllina)*	% Effluent	≥ 100	≥ 100	-	>100

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.
c - Value is calculated
s - Single sample
t - Shall not exceed 29 NTUs above background
A - Value reported is the mean of two or more determinations
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
J - Estimated value
U - Material analyzed for but not detected; value reported is the method detection limit
2 – Oils and greases analysis performed by TestAmerica lab

Table 3. Effluent limits, Class III Marine Criteria and analytical metals data.

JEA Northside Generating Station	Units	Class III Criteria	Effluent Permit Limits	Effluent Composite
Aluminum	µg/L	≤ 1,500 s	Report p	763
Arsenic	µg/L	-	≤ 36 p	2.56
Cadmium	µg/L	≤ 8.8 s	-	0.060 U
Calcium	mg/L	-	-	329
Chromium, Total [3]	µg/L	≤ 50 s	Report p	0.91
Copper	µg/L	≤ 3.7 s	Report p	1.3
Iron	µg/L	≤ 300 s	Report p	660 [4]
Lead	µg/L	≤ 8.5 s	Report p	0.67
Magnesium	mg/L	-	-	1060
Mercury	ng/L	≤ 25.0 s	≤ 25.0 p	1.7
Nickel	µg/L	≤ 8.3 s	Report p	0.70
Potassium	mg/L	-	-	306
Selenium	µg/L	≤ 71 s	≤ 71 p	0.60 U
Silver	µg/L	≤ 2.3 s	Report p	0.015 U
Sodium	mg/L	-	-	8,680
Zinc	µg/L	≤ 86 s	Report p	3.2 I

A dash (-) indicates sample/measurement was not collected or criterion/limit does not exist.
3 - Class III Marine Water Quality Criterion (62-302.530(19)(b), F.A.C.) is for chromium-VI
4 - Value exceeds the Class III Water Quality Criteria or permit limits
c - Value is calculated
p – 24- hour flow proportioned composite
s - Single sample
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
U - Material analyzed for but not detected; value reported is the method detection limit

Table 4. Measured algal growth potential (AGP; mg dry weight/L) for total soluble inorganic nitrogen (TSIN), ortho-phosphate (OP), total nitrogen (TN) and total phosphorus (TP) limitation and ratios of nitrogen to phosphorus.

JEA Northside Generating Station								
Location	**Test Species**	**AGP (measured)**	**Predicted AGP (TSIN) ± 20%**	**Predicted AGP (OP) ± 20%**	**Predicted AGP (TN) ± 20%**	**Predicted AGP (TP) ± 20%**	**Inorganic N:P ratio**	**Total N:P ratio**
Effluent grab	*Dunaliella tertiolecta*	7.92 A	not applicable [5]	not applicable [5]	not applicable [5]	not applicable [5]	1.3	7.8

A - Value reported is the mean of two or more determinations

5 - predictions not applicable to marine matrix

Appendix A

Facility Summary

State of Florida
Department of Environmental Protection
Facility Introduction & Summary - JEA NGS/SJRPP – FL0001031

PART I: Information gathered prior to sampling event	
Prepared By: Edward Jamro	**Contact Number:** **904-256-1617**
Facility Name (as it appears on permit): **Northside generating Station and St. Johns River Power Park**	**Former Names:** **Northside Generating Station**
NPDES Permit Number: **FL0001031**	**Permit Expiration Date:** **May 8, 2017**
Physical Address: **4277 Heckscher Drive, Jacksonville, FL 32226**	
District: **Northeast**	**County:** **Duval**
Function of Facility: Facility treats industrial wastewater from power plant @ EFF-2 and EFF-3 (D-010 & D-011). Facility has Once Through Cooling Water (OTCW) discharge at EFF-1 (D-001). St. Johns River power park discharges cooling tower blowdown through the same outfall structure as NGS.	
Facility Type: **Industrial wastewater**	**Permitted Capacity (MGD):** **827**
Mean Flow for previous 12 months for all EXTERNAL outfalls listed in permit (list date range including months): **D001 (EFF-1C) - 06/01/2015 to 05/31/2016 – 683.3 MGD; 04/01/15 to 03/31/2016 – 5.3 MGD - D002**	
If applicable, Mean Flow for previous 12 months for REUSE outfall(s) (list date range including months): **R001 – 06/01/2015 to 05/31/2016 – 0.38 MGD**	
Description of type of Discharge: **X Continuous ☐ Intermittent ☐ Seasonal ☐ Rainfall Dependent** **☐ Other, please specify:**	
Description of Sampling Location(s) - actual permit designation of permitted sampling point(s): **EFF-1C** – Five foot stand pipe off of the discharge pipe, located on NGS property just south of the Heckscher Dr. bridge, before it goes into the St. Johns river. Note – at this point the pipe contains the "**Combined discharge of Units 1, 2, and 3, and co-mingled with the discharge from St. Johns River Power Park"**	
Description of Permitted Outfall(s): An existing Once Through Cooling water (OTCW) discharge with a maximum permitted discharge of 827 MGD to the St. John's River (Class III marine waters) through Outfall D-001 located approximately at latitude 30° 24' 54" N, longitude 81° 33' 15" W.	
Description of Treatment Process (if multiple discharge points, include a detailed map or diagram of facility): OTCW from the St. Johns River is treated with sodium hypochlorite or sodium bromide, and discharges at a maximum flow of 827 MGD back to the St. Johns River after circulating through the condensers as cooling water. LVW (including air preheater and boiler washwater, boiler blowdown, demineralizer regeneration waste, powerblock storm drains, boiler area drains, fly and bed ash management areas, lime slaker seals, carbon purifier backwash, equipment area floor drains, by-products area leachate stormwater runoff, fuel storage domes sump containing coal and petcoke condensate collection with equipment wash, and filter backwash), and other wastestreams are treated in the Chemical Waste Treatment System (CWTS) which has a maximum design capacity	

of 3 MGD.

The CWTS consists of two lined surge basins with oil/water separators, lime addition, rapid mixing basins, flocculation basins, lime settling ponds, recarbonation and acid injection evaporation/ percolation ponds, and a sludge drying area. A daily average of 0.2304 MGD of reclaimed water from the JEA District II Water Reclamation Facility is used as circulator pump seal water and is discharged to the cooling water discharge basin.

Make up water for the SJRPP natural draft cooling towers is withdrawn from the NGS discharge channel and the blowdown from the cooling towers is returned to the NGS discharge channel just downstream of the SJRPP intake structure.

The TMDL for this facility is covered under the JEA Aggregate permit # FL0620564.

PART I: Continued

List current Effluent Limits of Outfall(s) to be Sampled: This should include any AO or CO limits the facility may be under
(Leave cell blank if not applicable) - D001 – EFF-1 and EFF-1C

			Effluent Limitations				Monitoring Requirements			
Parameter	**Units**	**Max/Min**	**Annual Average**	**Monthly Average**	**Weekly Average**	**Single Sample**	**Monitoring Frequency**	**Sample Type**	**Monitoring Location Site Number**	**Notes**
Flow	MGD	Max		Report		Report	Hourly	Pump Logs	FLW-1	
Temperature (Intake)	Deg F	Max		Report		Report	Continuous	Recorder	INT-1	
Temperature (Intake)	Deg F	Min				Report	Continuous	Recorder	INT-1	
Temperature (discharge)	Deg F	Max		Report		104	Continuous	Recorder	EFF-1	
Temperature (discharge)	Deg F	Min				Report	Continuous	Recorder	EFF-1	
Temp. difference between Intake and discharge	Deg F Deg F	Max Min		Report		19 Report	Continuous Continuous	Calculated Calculated	EFF-1 EFF-1	
pH	s.u.	Min Max				6.5 8.5	Monthly	Grab	EFF-1C	
Oxidants, Total Residual (TRO)	Mg/L	Max.		0.1		0.1	Weekly	Recorder	EFF-1	See I.A.7. and I.A.8.
TRO discharge time	Minutes/day	Max		120		120	Daily, 24 hours	Calculated	EFF-1	
Aluminum, Total recoverable	µg/L	Max		Report		Report	Semi-annually	24-hr TPC	EFF-1C	
Arsenic, Total Recoverable	µg/L	Max		36		36	Semi-annually	24-hr TPC	EFF-1C	
Chromium, Total Recoverable	µg/L	Max		Report		Report	Semi-annually	24-hr TPC	EFF-1C	
Copper, Total Recoverable	µg/L	Max		Report		Report	Monthly	24-hr TPC	EFF-1C INT-1	

			Effluent Limitations				Monitoring Requirements			
Parameter	**Units**	**Max/Min**	**Annual Average**	**Monthly Average**	**Weekly Average**	**Single Sample**	**Monitoring Frequency**	**Sample Type**	**Monitoring Location Site Number**	**NOTES**
Iron, Total Recoverable	µg/L	Max		Report		Report	Monthly	24-hr TPC	EFF-1C INT-1	
Mercury, Total Recoverable	µg/L	Max		0.025		0.025	Monthly	24-hr TPC	EFF-1C INT-1	
Lead, Total Recoverable	µg/L	Max		Report		Report	Semi-annually	24-hr TPC	EFF-1C	
Nickel, Total Recoverable	µg/L	Max		Report		Report	Semi-annually	24-hr TPC	EFF-1C	
Selenium, Total Recoverable	µg/L	Max		71		71	Monthly	24-hr TPC	EFF-1C INT-1	
Silver, Total Recoverable	µg/L	Max		Report		Report	Semi-annually	24-hr TPC	EFF-1C	
Zinc, Total Recoverable	µg/L	Max		Report		Report	Semi-annually	24-hr TPC	EFF-1C	
Specific Conductance	µmhos/cm	Max		Report		Report	Monthly	24-hr TPC	EFF-1C	
Chronic Whole Effluent Toxicity, 7-Day IC25 (Mysidopsis bahia)	Percent	Min				100	Quarterly	24-hr TPC	EFF-1C	See I.A.14 on Pages 8 & 9
Chronic Whole Effluent Toxicity, 7-Day IC25 (Menidia beryllina)	Percent	Min				100	Quarterly	24-hr TPC	EFF-1C	See I.A.14 on pages 8 & 9

PART I: Continued

Receiving Waters:	**Classification (indicate whether fresh or marine):**
St. Johns River	**Class III Marine Waters (WBID 2213B).**

Toxicity Test Requirements (routine and/or additional test language, test species, salinity adjustment, etc.):
See excerpt from permit – Item 14, on pages 8 & 9 of this facility summary.

Administrative or Consent Orders (date executed, specific requirements, interim limit dates-if applicable, etc.):
There are no active AO's or CO's.

Facility Mixing Zone Details (if applicable):
There are no mixing zones contained in the permit.
The temperature limits are however based on a thermal variance.

List Permit Violations (DMR data) and plant upsets that occurred at the plant within the last year:

Date	Parameter and Units	Limit	Result
1/31/2016 In internal Outfall -021-1	Oxidants, Total Residual In mg/L	0.01	2.73

Describe previous FYI and WQBEL study:
See excerpts from permit fact sheet on pages 9 to 13 of this facility summary.

Describe previous or current Enforcement Actions (including WLs):
There are none in past two years.

Describe any violations or problems noted in previous inspection:
JEA had an issue with the analytical method for mercury.
FDEP approved a more sensitive method for mercury analysis (EPA Method 1631E) that avoids the interferences affecting EPA Method 245.1.

Discuss whether DMR trends within previous five years are improving or declining:
There are no trends evident in the data.

Additional Comments (this should include a trend of the Effluent, i.e. if the facility is now Reuse):

No comments.

PART II: Sampling Event Information

Date(s) sample collected:	**Sampler(s):**
Planned – August 1, 2016 08/01/2016	**Pat O'Connor, Ben Piltz**
Temperature (Deg C): 37.8	**pH (SU): 7.9**
Dissolved Oxygen (mg/L): 3.5	**Conductivity (umhos/cm): 45,100**
Total Residual Chlorine (mg/L): N/A	**Total Residual Chlorine - after Disinfection (mg/L): N/A**
Method of Chlorination: NA	**Method of De-chlorination: NA**

Flow During Sample Collection for each outfall(MGD): 733 MGD

Mean Flow for each outfall for previous 12 months based on sampling date (If samples are taken on more than one day, indicate Mean Flow for each day):
D001 (EFF-1C) - 06/01/2015 to 05/31/2016 – 683.3 MGD

Describe Discharge during Sampling Event:
☒ **Continuous** ☐ **Intermittent** ☐ **Seasonal** ☐ **Rainfall Dependent**
☐ **Other, please specify:**

Describe any conditions, difficulties or abnormal events that occurred during the sample collection and any other additional comments here: None

Describe any conditions, difficulties or abnormal events that occurred during the sample collection and any other additional comments here:

Excerpts from NGS/SJRPP IW permit:

7. Total Residual Oxidants (TRO) means the value obtain using testing procedures for Total Residual Chlorine (TRC) found in 40 CFR 136.3.

8. If continuous monitoring equipment for TRO is not operable during any discharge period, the permittee shall collect multiple grab samples and analyze those samples by other means that meet the requirements of Permit Conditions I.D.1 and 2 and shall specify the method in the Discharge Monitoring Report. Multiple grab samples for TRO shall consist of grab samples collected at the beginning of the period of chlorination discharge, and once every 15 minutes, thereafter. In addition, one grab sample shall be collected at the end of the period of oxidant discharge.

14. The permittee shall comply with the following requirements to evaluate chronic whole effluent toxicity of the discharge from outfall D-00 1.
a. Effluent Limitation
(I) In any routine or additional follow-up test for chronic whole effluent toxicity, the 25 percent inhibition concentration (IC25) shall not be less than 100% effluent. *[Rules 62-302.530(61) and 62-4.241 (l)(b),F.A.C.}*
(2) For acute whole effluent toxicity, the 96-hour LC50 shall not be less than 100% effluent in any test. *[Rules 62-302.500(l)(a)4. and 62-4.241 (J)(a), F.A.C.]*
b. Monitoring Frequency
(1) Routine toxicity tests shall be conducted once every three months, the first starting within 60 days of the issuance date of this permit and lasting for the duration of this permit.
(2) Upon completion of four consecutive, valid routine tests that demonstrate compliance with the effluent limitation in 14.a.(l) above, the permittee may submit a written request to the Department for a reduction in monitoring frequency to once every six months. The request shall include a summary of the data and the complete bioassay laboratory reports for each test used to demonstrate compliance. The Department shall act on the request within 45 days of receipt. Reductions in monitoring shall only become effective upon the Department's written confirmation that the facility has completed four consecutive valid routine tests that demonstrate compliance with the effluent limitation in 14.a.(l) above.
(3) If a test within the sequence of the four is deemed invalid based on the acceptance criteria in EPA - 821-R-02-0 14, but is replaced by a repeat valid test initiated within 21 days after the last day of the invalid test, the invalid test will not be counted against the requirement for four consecutive valid tests for the purpose of evaluating the reduction of monitoring frequency.

c. Sampling Requirements
(I) For each routine test or additional follow-up test conducted, a total of three 24-hour composite samples of final effluent shall be collected and used in accordance with the sampling protocol discussed in EPA-821-R-02-014, Section 8.

(2) The first sample shall be used to initiate the test. The remaining two samples shall be collected according to the protocol and used as renewal solutions on Day 3 (48 hours) and Day 5 (96 hours) of the test.
(3) Samples for routine and additional follow-up tests shall not be collected on the same day.
d. Test Requirements
(1) Routine Tests: All routine tests shall be conducted using a control (0% effluent) and a minimum of five test dilutions: 100%, 50°/o, 25°/o, 12.5o/o, and 6.25o/o final effluent.
(2) The permittee shall conduct 7-day survival and growth chronic toxicity tests with a mysid shrimp, Americamysis (Mysidopsis) bahia, Method 1007.0, and an inland silverside, Menidia beryllina, Method 1006.0, concurrently.
(3) All test species, procedures and quality assurance criteria used shall be in accordance with Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms, 3rd Edition, EPA-821-R-02-014. Any deviation of the bioassay procedures outlined herein shall be submitted in writing to the Department for review and approval prior to use. In the event the above method is revised, the permittee shall conduct chronic toxicity testing in accordance with the revised method.

Describe previous FYI and WQBEL study:

The below descriptions were excerpted from the facility permit fact sheet from August 2010.
Reasonable Assurance
The facility has provided reasonable assurance that the discharge will not adversely affect the designated used of receiving water. Inspection data, as well as all other available data, have been evaluated in accordance with the Department's reasonable assurance procedures to ensure that no limits other than those included in this permit are needed to maintain Florida's water quality standards.
WQBEL Consideration A Level I WQBEL was performed for the discharge, and is embodied in this Fact Sheet based on historical discharge monitoring data, available inspection reports, and the effluent characterization provided with the application.
4. BASIS FOR SPECIFIC PERMIT CONDITIONS
a. The polychlorinated biphenyl compound prohibition was included in permit Condition I.D.9 as required by 40 CFR 423 .12(b)(2).
b. Total Residual Oxidants
The 0.1 mg/L D-00 1 effluent limit for the once-through non-contact cooing water discharge is retained from the previous permit. TRO is monitored at the head of the discharge canal before OTCW mixes with cooling tower blowdown from SJRPP in the discharge basin and enters the approximately 3,000 foot pipeline to its discharge point in the St. Johns River. JEA has provided documentation in a February 1988 Water Quality Monitoring Study by Environmental Science and Engineering Inc. that the combined discharge complies with the 0.01 mg/L water quality standard found in Rule 62-302.530, F.A.C., at the point of discharge to the St. Johns River. This documentation was determined to provide reasonable assurance for the permit issued by the Department on February 18, 2000, and was approved by USEPA in permits prior to that time. The permittee's current renewal application

demonstrates that the quality and flow of the current discharge are not different from discharge in previous permits.

c. 316(b) Demonstration

Section 316(b) of the Clean Water Act (CWA) requires that the location, design, construction, and capacity of cooling water intake structures (CWIS) reflect the best technology available (BTA) to protect aquatic organisms from physical, thermal, or chemical stresses from impingement (pinned against intake screens) or entrainment (drawn completely through cooling water systems from intake to discharge).

EPA published rules for existing large steam electric power plants that use surface waters in their cooling systems on July 9, 2004. However, in response to a rule challenge, the federal appellate court struck down the majority of the rule provisions for existing power plants in January 2007. On July 9, 2007, EPA suspended the parts of the rule affected by the court decision [see Federal register Volume 72 FR Page 37107]. This suspension provides a clear statement by EPA that the existing Phase II requirements (with the exception of one provision unaffected by the court decision that reaches beyond the Phase II rule), are suspended and are not legally applicable. In November 2007, the Department amended Rule 62-620.100(3)(z), Florida Administrative Code (F.A.C.), to mirror the EPA rule suspension and adopt by reference 40 CFR 125.90(b). As a result, the Department continues the longstanding practice of applying Section 316(b) of the CW A on a case-by-case basis to existing facilities using best professional judgment (BP J).

d. Thermal Considerations

The facility is required to comply with thermal discharge limitations pursuant to Department Rules 62-302.520(1) and (6)(a), F.A.C. and Section 316(a) of the Clean Water Act (CWA), as follows. Rule 62-302.520(l)(a), F.A.C., provides that heated water discharge existing on July 1, 1972, "shall not increase the temperature of the RBW (receiving body of water) so as to cause substantial damage or harm to the aquatic life or vegetation therein or interfere with beneficial uses assigned to the RBW". The facility began discharging heated water before 1972. Originally, the discharge entered San Carlos Creek, but was relocated to the adjacent St. Johns River in 1979, as required by the original facility permit issued in 1977.

Additionally the renewal application requested continuation of the facility's thermal variance under Section 316(a) CW A. In 1983 USEP A developed mixing zone requirements and temperature limitations as part of the 316(a) variance determination for the facility. Section 316(a) of the Clean Water Act allows USEPA to impose alternative thermal limitations when existing requirements are demonstrated to be more stringent than necessary to "assure the protection, propagation of a balanced, indigenous population of shellfish, fish and wildlife in and on the receiving body of water (RBW)." The determination was based on a biological evaluation of the relocated discharge point. The Department concurred with USEPA's 316(a) variance determination. USEPA and the Department have continued the 316(a) thermal variance and mixing zone in all subsequent permit renewals, based on the initial evaluation, certification by JEA at the time of permit renewal that discharge conditions are essentially unchanged, and on additional biological monitoring by JEA in 1998. The monitoring report concluded there were no adverse effects on AGP, algal or macro-invertebrate communities as a result of the thermal discharge. A subsequent biological study was completed in the previous permit cycle to confirm that no adverse impacts were present.

Additionally the renewal application requested continuation of the facility's 316(a) thermal variance. The Department concurs that it is appropriate to continue the thermal variance. However, the Department has concerns regarding the need for a more thorough examination of the potential thermal impacts of the discharge including the definition of a Balanced and Indigenous Population (BIP)(as defined in 40 CFR 125.71(c)), the identification of Representative Important Species (RIS), and a closer examination of whether the 316(a) variance is protective. These elements include: (1) a population typical characterized by diversity at all trophic level; (2) the capacity to sustain itself through cyclic seasonal changes; (3) presence of necessary food chain species; (4) non-domination of pollution tolerant species; and (5) indigenous. Each of these elements is discussed in more detail below:

(1) A population typically characterized by diversity at all trophic levels means that all of the major trophic levels present in the unaffected portion of the St. Johns River should be present in the heat affected portions. The Department recognizes that community structure differences will occur, however, the number of species represented in each trophic level in the unaffected portions should be reasonably similar in the heat affected portions of the St. Johns River. Sampling and analysis of fish and invertebrate communities, including the evaluation of mesoplankton, meroplankton, phytoplankton and zooplankton communities as to biomass by trophic level, speciation, cell viability, comparison percent viable cells vs. disrupted cells, within the Intake and Discharge Canals as well as the near-field environment immediately outside the Intake and Discharge Canals, should be done such that the major trophic levels are identified and represented by reasonably similar species distributions. Also, the Biological POS shall be expanded to include information on wildlife (i.e., water fowl, mammals, amphibians, etc.) both upstream and· immediately downstream of the discharge point that may be impacted by the thermal discharge based on observations and communications with the Florida Wildlife Commission.

(2) The capacity to sustain itself through cyclic seasonal changes means that any additional thermal stress will not cause significant community instability during times of natural extremes in environmental conditions.

Community data shall be collected during normal seasonal extremes as well as during optimal seasonal conditions. Data shall be compared between heat affected and unaffected portions of the St. Johns River to account for normal community changes corresponding with change in season.

(3) Presence of necessary food chain species means that the necessary food webs remain intact so that communities will be sustaining. Exhaustive food web studies are not necessary provided that planktonic invertebrate, fish and wildlife communities are otherwise healthy, i.e., represented by sufficiently high species diversity and abundance (appropriate for that portion of the St. Johns River) for the identified trophic levels and sustaining through normal seasonal changes.

(4) Non-domination of pollution-tolerant species means that in the case of a thermal effluent, community assemblages in heat affected portions of the St. Johns River dominated by heat tolerant species do not constitute a balanced, indigenous population. The Department recognizes that because all species have varying levels of thermal tolerance, communities in the heat affected portions of the St. Johns River may possess altered assemblages in terms of species present and abundance. All community data should be collected, analyzed and presented to clearly demonstrate that affected communities have not shifted to primarily heat tolerant assemblages. During this phase a transit time

study is to be conducted to determine the amount of time that cooling water is entrained in the cooling system. Also, the Biological Report shall be expanded to include information on which biota are either heat-sensitive or nuisance species both upstream and immediately downstream of the discharge point that may be impacted by the thermal plume.
(5) Indigenous means a community that may include historically non-native species introduced in connection with a program of wildlife management and species whose presence or abundance results from substantial, irreversible environmental modifications. Normally, however, such a community will not include species whose presence is attributable to the introduction of pollutants that will be eliminated by compliance by all sources with Section 301(b)(2) of the Clean Water Act, and may not include species whose presence or abundance is attributable to alternative effluent limitations imposed pursuant to section 316(a). The Department recognizes that nonindigenous species are present in aquatic systems in Florida. All community data shall be analyzed and presented to demonstrate that community assemblages in the heat affected portions of the St. Johns River are not significantly different from non-affected communities with regard to the number of non-indigenous species in the assemblages. Sampling of benthic invertebrate, fish and marine mammal populations shall be over the entire length of the Intake and Discharge Canals; including,. For the purposes of comparison, sampling of benthic invertebrate, fish and marine mammal populations from a background location that is most representative of the JEA area where the thermal discharge is absent.

e. Impaired Water Considerations
The JEA facilities are located in the Lower St. Johns River Basin in WBIDs 2213B and 2216. In the previous cycle, EPA issued a Federal Total Daily Maximum Load (TMDL) for the Lower St. Johns River. To provide JEA an opportunity to meet their allocations more efficiently, EPA allowed for the option to create an aggregate permit to cover all of the affected JEA facilities. In March 2009, EPA issued an aggregate permit FL0620564 to JEA to cover all nutrient discharges from the JEA facilities included in the TMDL. Because the St. Johns River Power Park is included in the Federal aggregate permit, the combined renewal permit incorporates and references the requirements of the aggregate permit.

Appendix B

Explanation of Measurements

(1) Quality Assurance and Quality Control

FDEP's quality assurance requirements for analytical laboratories and field activities are codified in Chapter 62-160, F.A.C., Quality Assurance (QA Rule) and in internal Standard Operating Procedures (FDEP SOPs). Methods for all analyses are on file at the FDEP Central Laboratory in Tallahassee and may be viewed on the web at http://www.dep.state.fl.us/labs/library/lab_sops.htm and/or http://www.dep.state.fl.us/water/sas/sop/sops.htm.

(2) Chemical Analyses of the Effluent

The effluent was analyzed for nutrients, metals, organic constituents (base, neutral, and acid extractables) and pesticides following FDEP SOPs. The results from these analyses were compared with Water Quality Criteria (62-302, F.A.C.) and facility permit limits.

(3) Toxicity Bioassays

Greater than 50% mortality in an acute toxicity test may constitute an exceedance of 62-302.500(1)a and/or facility permit limits. A 25% inhibition concentration (IC25) is the effluent concentration causing a 25% reduction in a biological response such as biomass or reproduction when compared to a control population. An IC25 of less than 100% in a chronic test may constitute exceedances of 62-302.530(20), 62-302.530(61) and/or facility permit limits. A no observed effect concentration (NOEC) less than 100% effluent in a chronic test may constitute an exceedance of 62-302.530(61) and/or facility permit limits. Standard reference toxicant (SRT) tests are conducted monthly to ensure quality in toxicity testing.

(4) Bacteriological Testing

High levels of fecal coliform bacteria may constitute an exceedance of 62-302.530(6) and/or facility permit limits. Fecal coliform and enterococci results often are based on colony counts outside the acceptable range (B-qualifier). The dilutions performed on the sample did not yield results within the method acceptable range of 20- 60 colony forming units per plate. The B-qualifier does not affect data quality.

(5) Chlorophyll *a* Content

Chlorophyll *a* content is an estimate algal biomass. High algal biomass implies nutrient stress (Stevenson and Bahls 1999) and may constitute exceedances of 62-302.530(46), F.A.C., 62-302.530(47)(a), F.A.C., and/or 62-302.530(47)(b), F.A.C..

(6) Algal Growth Potential (AGP)

The algal growth potential (AGP) value is the peak growth of the alga within that 14-day period, recorded as mg dry weight/L. The AGP range of 6.10 to 20.0 mg dry wt/L is suggested to be representative of high productivity for freshwater (Miller et al. 1978). High AGP values may constitute exceedances of 62-302.530(46), F.A.C., 62-302.530(47)(a), F.A.C. and/or 62-302.530(47)(b), F.A.C..

The concentration of nutrients in a water sample may be used to calculate the expected yield of AGP in a low salinity sample under the assumption that other required nutrients (e.g. silicon, micronutrients) are present in excess (Miller *et al*. 1978). The expected amount of production is calculated as 38 times the total soluble inorganic nitrogen (nitrate and nitrite plus ammonia) under nitrogen limitation or 430 times the ortho-phosphate (OP) concentration under phosphorus limitation with an error of $\pm$ 20%. When the ratio of nitrogen to phosphorus (N:P) is less than 10:1, nitrogen limitation of algal production is likely. When the N:P ratio is 20:1 or greater, phosphorus limitation is likely (EPA-822-B-00-002). For ratios in-between, co-limitation may occur. Production of lower biomass than expected may be evidence of growth inhibition related to toxic compounds present in the water sample tested and may constitute an exceedance of 62-302.530(61) F.A.C. Expected AGP is not calculated for marine samples incubated with *Dunaliella*.

(7) Definition of Qualifiers

A - Value reported is the mean of two or more determinations
B - Results based on colony counts outside the acceptable range.
I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J - Estimated value
K - Actual value is known to be less than value given
L - Actual value is known to be greater than value given
N - Presumptive evidence of presence of material.
O - Sampled, but analysis lost or not performed.
Q - Sample held beyond normal holding time.
T - Value reported is less than the criterion of detection.
U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
V - Analyte was detected in both sample and method blank.
X - Too few individuals to calculate SCI value.
Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate
Z - Colonies were too numerous to count (TNTC)

Appendix C

Chemical analysis of effluent

Date Sampled	Field ID	Analysis Group	Component	Result	Units	MDL	PQL
8/1/2016	Effluent Grab	AGP/LN	Algal Growth Potential-Salinity Adjusted	7.92 A	mg DryWt/L	3	3
8/1/2016	Effluent Grab	Chlorophyll/Grain Size/BOD	Chlorophyll/Phaeophytin Ratio	1.4		0	0
8/1/2016	Effluent Grab	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Uncorrected	3.9	µg/L	0.45	1.4
8/1/2016	Effluent Grab	Chlorophyll/Grain Size/BOD	Phaeophytin-a	2.3	µg/L	0.45	1.4
8/1/2016	Effluent Grab	Chlorophyll/Grain Size/BOD	Chlorophyll-a, Corrected	2.4	µg/L	0.62	1.9
8/1/2016	Effluent Grab	Nutrients	O-Phosphate-P	0.048	mg P/L	0.004	0.01
8/1/2016	Effluent Grab	Nutrients	TSS	12	mg/L	3	10
8/1/2016	Effluent Grab	Nutrients	Total Alkalinity	108 A	mg CaCO3/L	0.65	2.5
8/1/2016	Effluent Grab	Nutrients	Color (true)	15	PCU	2.5	6
8/1/2016	Effluent Grab	Nutrients	NO2NO3-N	0.042	mg N/L	0.004	0.01
8/1/2016	Effluent Grab	Nutrients	Organic Carbon	5.0 A	mg C/L	0.5	1
8/1/2016	Effluent Grab	Nutrients	Sulfate	2.3E+03 A	mg SO4/L	40	100
8/1/2016	Effluent Grab	Nutrients	Kjeldahl Nitrogen	0.52	mg N/L	0.08	0.2
8/1/2016	Effluent Grab	Nutrients	Ammonia-N	0.018	mg N/L	0.002	0.005
8/1/2016	Effluent Grab	Nutrients	Turbidity	4.8 A	NTU	0.1	0.1
8/1/2016	Effluent Grab	Nutrients	Chloride	1.6E+04 A	mg Cl/L	40	100
8/1/2016	Effluent Grab	Nutrients	Total-P	0.072	mg P/L	0.005	0.05
8/1/2016	Effluent Grab	Nutrients	TDS	2.74E+04	mg/L	750	1200
8/1/2016	Effluent Grab	Nutrients	Fluoride	1.1	mg F/L	0.18	0.5
8/1/2016	Effluent Grab	Overflow	HEM	0.71 U	mg/L	0.71	2.5
8/1/2016	Effluent Grab	Pesticides	Atrazine Desethyl	0.0094 U	µg/L	0.0094	0.038
8/1/2016	Effluent Grab	Pesticides	Alachlor	0.056 U	µg/L	0.056	0.23
8/1/2016	Effluent Grab	Pesticides	Disulfoton	0.0047 U	µg/L	0.0047	0.019
8/1/2016	Effluent Grab	Pesticides	Hexazinone	0.028 U	µg/L	0.028	0.11
8/1/2016	Effluent Grab	Pesticides	Metalaxyl	0.038 U	µg/L	0.038	0.15
8/1/2016	Effluent Grab	Pesticides	Prometon	0.019 U	µg/L	0.019	0.075
8/1/2016	Effluent Grab	Pesticides	Simazine	0.0094 U	µg/L	0.0094	0.038
8/1/2016	Effluent Grab	Pesticides	Ethion	0.0094 U	µg/L	0.0094	0.038
8/1/2016	Effluent Grab	Pesticides	Metolachlor	0.056 U	µg/L	0.056	0.23
8/1/2016	Effluent Grab	Pesticides	Ametryn	0.0094 U	µg/L	0.0094	0.038
8/1/2016	Effluent Grab	Pesticides	Diazinon	0.0094 U	µg/L	0.0094	0.038
8/1/2016	Effluent Grab	Pesticides	Mevinphos	0.0094 U	µg/L	0.0094	0.038

Date Sampled	Field ID	Analysis Group	Component	Result	Units	MDL	PQL
8/1/2016	Effluent Grab	Pesticides	Naled	0.038 U	µg/L	0.038	0.15
8/1/2016	Effluent Grab	Pesticides	Parathion Ethyl	0.019 U	µg/L	0.019	0.075
8/1/2016	Effluent Grab	Pesticides	Phorate	0.0047 U	µg/L	0.0047	0.019
8/1/2016	Effluent Grab	Pesticides	Sucralose	0.17	µg/L	0.02	0.08
8/1/2016	Effluent Grab	Pesticides	Atrazine	0.017 I	µg/L	0.0094	0.038
8/1/2016	Effluent Grab	Pesticides	Fenamiphos	0.028 U	µg/L	0.028	0.11
8/1/2016	Effluent Grab	Pesticides	Metribuzin	0.019 U	µg/L	0.019	0.075
8/1/2016	Effluent Grab	Pesticides	Azinphos Methyl	0.019 U	µg/L	0.019	0.075
8/1/2016	Effluent Grab	Pesticides	Norflurazon	0.028 U	µg/L	0.028	0.11
8/1/2016	Effluent Grab	Pesticides	Parathion Methyl	0.0094 U	µg/L	0.0094	0.038
8/1/2016	Effluent Grab	Pesticides	Atrazine Desisopropyl	0.0094 U	µg/L	0.0094	0.038
8/1/2016	Effluent Grab	Pesticides	Chlorpyrifos Methyl	0.0094 U	µg/L	0.0094	0.038
8/1/2016	Effluent Grab	Pesticides	Fonofos	0.0094 U	µg/L	0.0094	0.038
8/1/2016	Effluent Grab	Pesticides	Bromacil	0.038 U	µg/L	0.038	0.15
8/1/2016	Effluent Grab	Pesticides	Butylate	0.019 U	µg/L	0.019	0.075
8/1/2016	Effluent Grab	Pesticides	Ethoprop	0.0047 U	µg/L	0.0047	0.019
8/1/2016	Effluent Grab	Pesticides	Malathion	0.0094 U	µg/L	0.0094	0.038
8/1/2016	Effluent Grab	Pesticides	Chlorpyrifos Ethyl	0.0094 U	µg/L	0.0094	0.038
8/1/2016	Effluent Grab	Pesticides	Demeton	0.023 U	µg/L	0.023	0.09
8/1/2016	Effluent Grab	Pesticides	Prometryn	0.019 U	µg/L	0.019	0.075
8/1/2016	Effluent Grab	Priority Organic Pollutants	Acenaphthene	0.19 U	µg/L	0.19	0.75
8/1/2016	Effluent Grab	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9 U	µg/L	1.9	7.5
8/1/2016	Effluent Grab	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.8 U	µg/L	2.8	11
8/1/2016	Effluent Grab	Priority Organic Pollutants	Butyl benzyl phthalate	0.94 U	µg/L	0.94	3.8
8/1/2016	Effluent Grab	Priority Organic Pollutants	Fluorene	0.19 U	µg/L	0.19	0.75
8/1/2016	Effluent Grab	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.94 U	µg/L	0.94	3.8
8/1/2016	Effluent Grab	Priority Organic Pollutants	Benzo(k)fluoranthene	0.19 U	µg/L	0.19	0.75
8/1/2016	Effluent Grab	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	1.9 U	µg/L	1.9	7.5
8/1/2016	Effluent Grab	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.19 U	µg/L	0.19	0.75
8/1/2016	Effluent Grab	Priority Organic Pollutants	Dimethyl phthalate	0.94 U	µg/L	0.94	3.8
8/1/2016	Effluent Grab	Priority Organic Pollutants	Hexachlorobutadiene	2.8 U	µg/L	2.8	11
8/1/2016	Effluent Grab	Priority Organic Pollutants	Hexachloroethane	2.8 U	µg/L	2.8	11
8/1/2016	Effluent Grab	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.19 U	µg/L	0.19	0.75
8/1/2016	Effluent Grab	Priority Organic Pollutants	Nitrobenzene	1.9 U	µg/L	1.9	7.5
8/1/2016	Effluent Grab	Priority Organic Pollutants	Phenanthrene	0.19 U	µg/L	0.19	0.75

Date Sampled	Field ID	Analysis Group	Component	Result	Units	MDL	PQL
8/1/2016	Effluent Grab	Priority Organic Pollutants	Phenol	0.94 U	µg/L	0.94	3.8
8/1/2016	Effluent Grab	Priority Organic Pollutants	Anthracene	0.19 U	µg/L	0.19	0.75
8/1/2016	Effluent Grab	Priority Organic Pollutants	Di-n-octyl phthalate	0.94 U	µg/L	0.94	3.8
8/1/2016	Effluent Grab	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.94 U	µg/L	0.94	3.8
8/1/2016	Effluent Grab	Priority Organic Pollutants	Benzo(b)fluoranthene	0.19 U	µg/L	0.19	0.75
8/1/2016	Effluent Grab	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.8 U	µg/L	2.8	11
8/1/2016	Effluent Grab	Priority Organic Pollutants	Hexachlorobenzene	0.94 U	µg/L	0.94	3.8
8/1/2016	Effluent Grab	Priority Organic Pollutants	Fluoranthene	0.19 U	µg/L	0.19	0.75
8/1/2016	Effluent Grab	Priority Organic Pollutants	2-Chlorophenol	0.94 U	µg/L	0.94	3.8
8/1/2016	Effluent Grab	Priority Organic Pollutants	3,3'-Dichlorobenzidine	38 U	µg/L	38	150
8/1/2016	Effluent Grab	Priority Organic Pollutants	Benzidine	94 UJ	µg/L	94	380
8/1/2016	Effluent Grab	Priority Organic Pollutants	Chrysene	0.19 U	µg/L	0.19	0.75
8/1/2016	Effluent Grab	Priority Organic Pollutants	Diethyl phthalate	0.94 U	µg/L	0.94	3.8
8/1/2016	Effluent Grab	Priority Organic Pollutants	Pentachlorophenol	0.94 U	µg/L	0.94	3.8
8/1/2016	Effluent Grab	Priority Organic Pollutants	Pyrene	0.19 UJ	µg/L	0.19	0.75
8/1/2016	Effluent Grab	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.94 U	µg/L	0.94	3.8
8/1/2016	Effluent Grab	Priority Organic Pollutants	2,4-Dimethylphenol	9.4 U	µg/L	9.4	38
8/1/2016	Effluent Grab	Priority Organic Pollutants	2-Chloronaphthalene	0.94 U	µg/L	0.94	3.8
8/1/2016	Effluent Grab	Priority Organic Pollutants	2-Nitrophenol	0.94 U	µg/L	0.94	3.8
8/1/2016	Effluent Grab	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9 U	µg/L	1.9	7.5
8/1/2016	Effluent Grab	Priority Organic Pollutants	Benzo(a)pyrene	0.19 U	µg/L	0.19	0.75
8/1/2016	Effluent Grab	Priority Organic Pollutants	Isophorone	0.94 U	µg/L	0.94	3.8
8/1/2016	Effluent Grab	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.8 U	µg/L	2.8	11
8/1/2016	Effluent Grab	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.8 U	µg/L	2.8	11
8/1/2016	Effluent Grab	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.94 U	µg/L	0.94	3.8
8/1/2016	Effluent Grab	Priority Organic Pollutants	4-Nitrophenol	14 U	µg/L	14	57
8/1/2016	Effluent Grab	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.19 U	µg/L	0.19	0.75
8/1/2016	Effluent Grab	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.94 U	µg/L	0.94	3.8
8/1/2016	Effluent Grab	Priority Organic Pollutants	Di-n-butyl phthalate	0.94 UJ	µg/L	0.94	3.8
8/1/2016	Effluent Grab	Priority Organic Pollutants	2,6-Dinitrotoluene	0.94 U	µg/L	0.94	3.8
8/1/2016	Effluent Grab	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.94 U	µg/L	0.94	3.8
8/1/2016	Effluent Grab	Priority Organic Pollutants	Acenaphthylene	0.19 U	µg/L	0.19	0.75
8/1/2016	Effluent Grab	Priority Organic Pollutants	Benzo(a)anthracene	0.19 U	µg/L	0.19	0.75
8/1/2016	Effluent Grab	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9 U	µg/L	1.9	7.5
8/1/2016	Effluent Grab	Priority Organic Pollutants	Naphthalene	0.19 U	µg/L	0.19	0.75

Date Sampled	Field ID	Analysis Group	Component	Result	Units	MDL	PQL
8/1/2016	Effluent Grab	Priority Organic Pollutants	2,4-Dichlorophenol	0.94 U	µg/L	0.94	3.8
8/1/2016	Effluent Grab	Priority Organic Pollutants	2,4-Dinitrophenol	14 U	µg/L	14	57
8/1/2016	Effluent Grab	Priority Organic Pollutants	2,4-Dinitrotoluene	0.94 U	µg/L	0.94	3.8
8/1/2016	Effluent Grab	Nutrients	Temperature	37.8	C		
8/1/2016	Effluent Grab	Nutrients	Specific Conductance	45100	umhos/cm		
8/1/2016	Effluent Grab	Nutrients	Dissolved Oxygen	3.5	mg/L		
8/1/2016	Effluent Grab	Nutrients	pH	7.9			
8/1/2016	Effluent Grab	Nutrients	Sample Depth	3.0	m		
8/1/2016	Effluent Comp	Chlorophyll/Grain Size/BOD	Biochemical Oxygen Dem-5 Day,N-Inhib	0.79 IJ	mg/L	0.2	2
8/1/2016	Effluent Comp	Toxicology	Bioassay-Chron-Def-SW-Mysid, NOEC	100	NOEC		
8/1/2016	Effluent Comp	Toxicology	Bioassay-Chron-Def-SW-Mysid, IC25	100 L	IC25		
8/1/2016	Effluent Comp	Toxicology	Bioassay-Chron-Def-SW-Fish, NOEC	100	NOEC		
8/1/2016	Effluent Comp	Toxicology	Bioassay-Chron-Def-SW-Fish, IC25	100 L	IC25		
8/1/2016	Effluent Comp	Metals	Lead	0.67	µg/L	0.15	0.6
8/1/2016	Effluent Comp	Metals	Sodium	8.68E+03	mg/L	25	100
8/1/2016	Effluent Comp	Metals	Zinc	3.2 I	µg/L	3	12
8/1/2016	Effluent Comp	Metals	Selenium	0.60 U	µg/L	0.6	2.4
8/1/2016	Effluent Comp	Metals	Arsenic	2.56	µg/L	0.15	0.6
8/1/2016	Effluent Comp	Metals	Magnesium	1.06E+03	mg/L	2	8
8/1/2016	Effluent Comp	Metals	Potassium	306	mg/L	15	60
8/1/2016	Effluent Comp	Metals	Nickel	0.70	µg/L	0.15	0.6
8/1/2016	Effluent Comp	Metals	Silver	0.015 U	µg/L	0.015	0.06
8/1/2016	Effluent Comp	Metals	Calcium	329	mg/L	0.22	0.9
8/1/2016	Effluent Comp	Metals	Chromium	0.91	µg/L	0.15	0.6
8/1/2016	Effluent Comp	Metals	Mercury	1.7	ng/L	0.1	0.4
8/1/2016	Effluent Comp	Metals	Copper	1.3	µg/L	0.3	1.2
8/1/2016	Effluent Comp	Metals	Cadmium	0.060 U	µg/L	0.06	0.24
8/1/2016	Effluent Comp	Metals	Iron	660	µg/L	90	360
8/1/2016	Effluent Comp	Metals	Aluminum	763	µg/L	6	24
8/1/2016	Effluent Comp	Nutrients	Ammonia-N	0.019	mg N/L	0.002	0.005
8/1/2016	Effluent Comp	Nutrients	NO2NO3-N	0.032	mg N/L	0.004	0.01
8/1/2016	Effluent Comp	Nutrients	Total-P	0.080	mg P/L	0.005	0.05
8/1/2016	Effluent Comp	Nutrients	Kjeldahl Nitrogen	0.41	mg N/L	0.08	0.2
8/1/2016	Effluent Comp	Nutrients	Dissolved Oxygen	3.5	mg/L		
8/1/2016	Effluent Comp	Nutrients	pH	7.9			

Date Sampled	Field ID	Analysis Group	Component	Result	Units	MDL	PQL
8/1/2016	Effluent Comp	Nutrients	Specific Conductance	45100	umhos/cm		
8/1/2016	Effluent Comp	Nutrients	Sample Depth	3.0	m		
8/1/2016	Effluent Comp	Nutrients	Temperature	37.8	C		
8/1/2016	Field Blank	Metals	Mercury	0.10 U	ng/L	0.1	0.4
8/1/2016	Field Blank	Nutrients	Color (true)	2.5 U	PCU	2.5	6
8/1/2016	Field Blank	Nutrients	NO2NO3-N	0.004 U	mg N/L	0.004	0.01
8/1/2016	Field Blank	Nutrients	O-Phosphate-P	0.004 U	mg P/L	0.004	0.01
8/1/2016	Field Blank	Nutrients	Sulfate	0.20 U	mg SO4/L	0.2	0.5
8/1/2016	Field Blank	Nutrients	Chloride	0.20 U	mg Cl/L	0.2	0.5
8/1/2016	Field Blank	Nutrients	Total Alkalinity	0.65 U	mg CaCO3/L	0.65	2.5
8/1/2016	Field Blank	Nutrients	Ammonia-N	0.002 U	mg N/L	0.002	0.005
8/1/2016	Field Blank	Nutrients	Kjeldahl Nitrogen	0.080 U	mg N/L	0.08	0.2
8/1/2016	Field Blank	Nutrients	Turbidity	0.10 U	NTU	0.1	0.1
8/1/2016	Field Blank	Nutrients	Organic Carbon	0.50 U	mg C/L	0.5	1
8/1/2016	Field Blank	Nutrients	Total-P	0.002 U	mg P/L	0.002	0.005
8/1/2016	Field Blank	Nutrients	Fluoride	0.035 U	mg F/L	0.035	0.1
8/1/2016	Field Blank	Overflow	HEM	0.76 U	mg/L	0.76	2.7
8/1/2016	Field Blank	Pesticides	Ametryn	0.0095 U	µg/L	0.0095	0.038
8/1/2016	Field Blank	Pesticides	Naled	0.038 U	µg/L	0.038	0.15
8/1/2016	Field Blank	Pesticides	Parathion Ethyl	0.019 U	µg/L	0.019	0.076
8/1/2016	Field Blank	Pesticides	Sucralose	0.010 U	µg/L	0.01	0.04
8/1/2016	Field Blank	Pesticides	Demeton	0.023 U	µg/L	0.023	0.091
8/1/2016	Field Blank	Pesticides	Diazinon	0.0095 U	µg/L	0.0095	0.038
8/1/2016	Field Blank	Pesticides	Mevinphos	0.0095 U	µg/L	0.0095	0.038
8/1/2016	Field Blank	Pesticides	Phorate	0.0047 U	µg/L	0.0047	0.019
8/1/2016	Field Blank	Pesticides	Prometryn	0.019 U	µg/L	0.019	0.076
8/1/2016	Field Blank	Pesticides	Atrazine Desisopropyl	0.0095 U	µg/L	0.0095	0.038
8/1/2016	Field Blank	Pesticides	Butylate	0.019 U	µg/L	0.019	0.076
8/1/2016	Field Blank	Pesticides	Metalaxyl	0.038 U	µg/L	0.038	0.15
8/1/2016	Field Blank	Pesticides	Parathion Methyl	0.0095 U	µg/L	0.0095	0.038
8/1/2016	Field Blank	Pesticides	Atrazine	0.0095 U	µg/L	0.0095	0.038
8/1/2016	Field Blank	Pesticides	Azinphos Methyl	0.019 U	µg/L	0.019	0.076
8/1/2016	Field Blank	Pesticides	Chlorpyrifos Ethyl	0.0095 U	µg/L	0.0095	0.038
8/1/2016	Field Blank	Pesticides	Chlorpyrifos Methyl	0.0095 U	µg/L	0.0095	0.038
8/1/2016	Field Blank	Pesticides	Malathion	0.0095 U	µg/L	0.0095	0.038

Date Sampled	Field ID	Analysis Group	Component	Result	Units	MDL	PQL
8/1/2016	Field Blank	Pesticides	Metribuzin	0.019 U	µg/L	0.019	0.076
8/1/2016	Field Blank	Pesticides	Alachlor	0.057 U	µg/L	0.057	0.23
8/1/2016	Field Blank	Pesticides	Bromacil	0.038 U	µg/L	0.038	0.15
8/1/2016	Field Blank	Pesticides	Fenamiphos	0.028 U	µg/L	0.028	0.11
8/1/2016	Field Blank	Pesticides	Prometon	0.019 U	µg/L	0.019	0.076
8/1/2016	Field Blank	Pesticides	Metolachlor	0.057 U	µg/L	0.057	0.23
8/1/2016	Field Blank	Pesticides	Atrazine Desethyl	0.0095 U	µg/L	0.0095	0.038
8/1/2016	Field Blank	Pesticides	Disulfoton	0.0047 U	µg/L	0.0047	0.019
8/1/2016	Field Blank	Pesticides	Ethoprop	0.0047 U	µg/L	0.0047	0.019
8/1/2016	Field Blank	Pesticides	Fonofos	0.0095 U	µg/L	0.0095	0.038
8/1/2016	Field Blank	Pesticides	Ethion	0.0095 U	µg/L	0.0095	0.038
8/1/2016	Field Blank	Pesticides	Hexazinone	0.028 U	µg/L	0.028	0.11
8/1/2016	Field Blank	Pesticides	Norflurazon	0.028 U	µg/L	0.028	0.11
8/1/2016	Field Blank	Pesticides	Simazine	0.0095 U	µg/L	0.0095	0.038
8/1/2016	Field Blank	Priority Organic Pollutants	2,4,6-Trichlorophenol	0.95 U	µg/L	0.95	3.8
8/1/2016	Field Blank	Priority Organic Pollutants	2,4-Dinitrotoluene	0.95 U	µg/L	0.95	3.8
8/1/2016	Field Blank	Priority Organic Pollutants	Dimethyl phthalate	0.95 U	µg/L	0.95	3.8
8/1/2016	Field Blank	Priority Organic Pollutants	Diethyl phthalate	0.95 U	µg/L	0.95	3.8
8/1/2016	Field Blank	Priority Organic Pollutants	Acenaphthene	0.19 U	µg/L	0.19	0.76
8/1/2016	Field Blank	Priority Organic Pollutants	4-Chlorophenyl phenyl ether	1.9 U	µg/L	1.9	7.6
8/1/2016	Field Blank	Priority Organic Pollutants	2-Chlorophenol	0.95 U	µg/L	0.95	3.8
8/1/2016	Field Blank	Priority Organic Pollutants	1,2,4-Trichlorobenzene	0.95 U	µg/L	0.95	3.8
8/1/2016	Field Blank	Priority Organic Pollutants	2,6-Dinitrotoluene	0.95 U	µg/L	0.95	3.8
8/1/2016	Field Blank	Priority Organic Pollutants	Benzo(a)pyrene	0.19 U	µg/L	0.19	0.76
8/1/2016	Field Blank	Priority Organic Pollutants	Benzo(k)fluoranthene	0.19 U	µg/L	0.19	0.76
8/1/2016	Field Blank	Priority Organic Pollutants	Di-n-octyl phthalate	0.95 U	µg/L	0.95	3.8
8/1/2016	Field Blank	Priority Organic Pollutants	Naphthalene	0.19 U	µg/L	0.19	0.76
8/1/2016	Field Blank	Priority Organic Pollutants	Pyrene	0.19 UJ	µg/L	0.19	0.76
8/1/2016	Field Blank	Priority Organic Pollutants	4-Bromophenyl phenyl ether	0.95 U	µg/L	0.95	3.8
8/1/2016	Field Blank	Priority Organic Pollutants	Benzo(a)anthracene	0.19 U	µg/L	0.19	0.76
8/1/2016	Field Blank	Priority Organic Pollutants	Benzo(b)fluoranthene	0.19 U	µg/L	0.19	0.76
8/1/2016	Field Blank	Priority Organic Pollutants	Benzo(g,h,i)perylene	0.19 U	µg/L	0.19	0.76
8/1/2016	Field Blank	Priority Organic Pollutants	Bis(2-chloroethoxy)methane	0.95 U	µg/L	0.95	3.8
8/1/2016	Field Blank	Priority Organic Pollutants	Bis(2-chloroethyl)ether	0.95 U	µg/L	0.95	3.8
8/1/2016	Field Blank	Priority Organic Pollutants	Chrysene	0.19 U	µg/L	0.19	0.76

Date Sampled	Field ID	Analysis Group	Component	Result	Units	MDL	PQL
8/1/2016	Field Blank	Priority Organic Pollutants	Pentachlorophenol	0.95 U	µg/L	0.95	3.8
8/1/2016	Field Blank	Priority Organic Pollutants	2-Chloronaphthalene	0.95 U	µg/L	0.95	3.8
8/1/2016	Field Blank	Priority Organic Pollutants	2-Methyl-4,6-dinitrophenol	2.9 U	µg/L	2.9	11
8/1/2016	Field Blank	Priority Organic Pollutants	Dibenzo(a,h)anthracene	0.19 U	µg/L	0.19	0.76
8/1/2016	Field Blank	Priority Organic Pollutants	Isophorone	0.95 U	µg/L	0.95	3.8
8/1/2016	Field Blank	Priority Organic Pollutants	Nitrobenzene	1.9 U	µg/L	1.9	7.6
8/1/2016	Field Blank	Priority Organic Pollutants	4-Chloro-3-methylphenol	0.95 U	µg/L	0.95	3.8
8/1/2016	Field Blank	Priority Organic Pollutants	Acenaphthylene	0.19 U	µg/L	0.19	0.76
8/1/2016	Field Blank	Priority Organic Pollutants	Di-n-butyl phthalate	0.95 UJ	µg/L	0.95	3.8
8/1/2016	Field Blank	Priority Organic Pollutants	Fluoranthene	0.19 U	µg/L	0.19	0.76
8/1/2016	Field Blank	Priority Organic Pollutants	Hexachlorocyclopentadiene	2.9 U	µg/L	2.9	11
8/1/2016	Field Blank	Priority Organic Pollutants	2,4-Dimethylphenol	9.5 U	µg/L	9.5	38
8/1/2016	Field Blank	Priority Organic Pollutants	Anthracene	0.19 U	µg/L	0.19	0.76
8/1/2016	Field Blank	Priority Organic Pollutants	Benzidine	95 UJ	µg/L	95	380
8/1/2016	Field Blank	Priority Organic Pollutants	Butyl benzyl phthalate	0.95 U	µg/L	0.95	3.8
8/1/2016	Field Blank	Priority Organic Pollutants	Fluorene	0.19 U	µg/L	0.19	0.76
8/1/2016	Field Blank	Priority Organic Pollutants	Hexachlorobutadiene	2.9 U	µg/L	2.9	11
8/1/2016	Field Blank	Priority Organic Pollutants	N-Nitrosodimethylamine	1.9 U	µg/L	1.9	7.6
8/1/2016	Field Blank	Priority Organic Pollutants	N-Nitrosodiphenylamine/ Diphenylamine	2.9 U	µg/L	2.9	11
8/1/2016	Field Blank	Priority Organic Pollutants	Phenanthrene	0.19 U	µg/L	0.19	0.76
8/1/2016	Field Blank	Priority Organic Pollutants	Phenol	0.95 U	µg/L	0.95	3.8
8/1/2016	Field Blank	Priority Organic Pollutants	4-Nitrophenol	14 U	µg/L	14	57
8/1/2016	Field Blank	Priority Organic Pollutants	Bis(2-chloroisopropyl)ether	2.9 U	µg/L	2.9	11
8/1/2016	Field Blank	Priority Organic Pollutants	Hexachlorobenzene	0.95 U	µg/L	0.95	3.8
8/1/2016	Field Blank	Priority Organic Pollutants	Indeno(1,2,3-cd)pyrene	0.19 U	µg/L	0.19	0.76
8/1/2016	Field Blank	Priority Organic Pollutants	N-Nitrosodi-n-propylamine	1.9 U	µg/L	1.9	7.6
8/1/2016	Field Blank	Priority Organic Pollutants	2,4-Dichlorophenol	0.95 U	µg/L	0.95	3.8
8/1/2016	Field Blank	Priority Organic Pollutants	2,4-Dinitrophenol	14 U	µg/L	14	57
8/1/2016	Field Blank	Priority Organic Pollutants	2-Nitrophenol	0.95 U	µg/L	0.95	3.8
8/1/2016	Field Blank	Priority Organic Pollutants	3,3'-Dichlorobenzidine	38 U	µg/L	38	150
8/1/2016	Field Blank	Priority Organic Pollutants	Bis(2-ethylhexyl)phthalate	1.9 U	µg/L	1.9	7.6
8/1/2016	Field Blank	Priority Organic Pollutants	Hexachloroethane	2.9 U	µg/L	2.9	11
7/31/2016	Equip Blank	Metals	Aluminum	2.0 U	µg/L	2	8
7/31/2016	Equip Blank	Metals	Mercury	0.18 I	ng/L	0.1	0.4
7/31/2016	Equip Blank	Metals	Calcium	0.075 U	mg/L	0.075	0.3

Date Sampled	Field ID	Analysis Group	Component	Result	Units	MDL	PQL
7/31/2016	Equip Blank	Metals	Selenium	0.20 U	µg/L	0.2	0.8
7/31/2016	Equip Blank	Metals	Iron	30 U	µg/L	30	120
7/31/2016	Equip Blank	Metals	Magnesium	0.040 U	mg/L	0.04	0.16
7/31/2016	Equip Blank	Metals	Nickel	0.050 U	µg/L	0.05	0.2
7/31/2016	Equip Blank	Metals	Arsenic	0.050 U	µg/L	0.05	0.2
7/31/2016	Equip Blank	Metals	Chromium	0.050 U	µg/L	0.05	0.2
7/31/2016	Equip Blank	Metals	Copper	0.10 U	µg/L	0.1	0.4
7/31/2016	Equip Blank	Metals	Silver	0.0050 U	µg/L	0.005	0.02
7/31/2016	Equip Blank	Metals	Zinc	1.0 U	µg/L	1	4
7/31/2016	Equip Blank	Metals	Sodium	0.50 U	mg/L	0.5	2
7/31/2016	Equip Blank	Metals	Potassium	0.30 U	mg/L	0.3	1.2
7/31/2016	Equip Blank	Metals	Cadmium	0.020 U	µg/L	0.02	0.08
7/31/2016	Equip Blank	Metals	Lead	0.050 U	µg/L	0.05	0.2
7/31/2016	Equip Blank	Nutrients	Ammonia-N	0.002 U	mg N/L	0.002	0.005
7/31/2016	Equip Blank	Nutrients	Kjeldahl Nitrogen	0.080 U	mg N/L	0.08	0.2
7/31/2016	Equip Blank	Nutrients	Total-P	0.003 I	mg P/L	0.002	0.005
7/31/2016	Equip Blank	Nutrients	NO2NO3-N	0.004 U	mg N/L	0.004	0.01

EPA End Sheet

The Bioassay of Northside Generating Station effluent sampled on August 1, 3 and 5, 2016. NPDES #FL0001031.

Fill Out This Section For All Surface Water Discharger Inspections (CEI, CSI, CBI, PAI, XSI-RI Optional)

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 F L 0 0 0 1 0 3 1	1 1 1 2 1 6 0 8 0 1	1 8 **B**	1 9 **S**	2 0 2

Remarks

6 6

The Priority Pollutants Analysis of Northside Generating Station effluent sampled on August 1, 2016. NPDES #FL0001031.

Fill Out This Section For All Surface Water Discharger Inspections (CEI, CSI, CBI, PAI, XSI-RI Optional)

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 F L 0 0 0 1 0 3 1	1 1 1 2 1 6 0 8 0 1	1 8 **X**	1 9 **S**	2 0 2

Remarks

6 6

Biological Analyses of Northside Generating Station effluent sampled on August 1, 2016. NPDES #FL0001031.

Fill Out This Section For All Surface Water Discharger Inspections (CEI, CSI, CBI, PAI, XSI-RI Optional)

Transaction Code	NPDES NUMBER	YR/MO/DA	Insp Type	Inspector	Fac Type
1 N 2 5	3 F L 0 0 0 1 0 3 1	1 1 1 2 1 6 0 8 0 1	1 8 **S**	1 9 **S**	2 0 2

Remarks

6 6