From: PUBCOMMENT-OPA
To: PUBCOMMENT-OCC2
Date: 11/7/2011 1:09 PM
Subject: Fwd: Public comment on Permit Number WQ0002496000
Place: PUBCOMMENT-OCC2
Attachments: Sierra Club and Public Citizen Contested Case Request 11.4.20111.pdf

H

>>> PUBCOMMENT-OCC 11/7/2011 7:54 AM >>>

IWD / 75032

>>> <casey.roberts@sierraclub.org> 11/4/2011 4:57 PM >>>

REGULATED ENTY NAME AEP PIRKEY POWER PLANT
RN NUMBER: RN100214287
PERMIT NUMBER: WQ0002496000
DOCKET NUMBER:
COUNTY: HARRISON
PRINCIPAL NAME: SOUTHWESTERN ELECTRIC POWER COMPANY
CN NUMBER: CN600126767
FROM
NAME: Casey Roberts
E-MAIL: casey.roberts@sierraclub.org
COMPANY: Sierra Club
ADDRESS: 85 2ND ST Second Floor
SAN FRANCISCO CA 94105-3459
PHONE: 4159775710
FAX: 4159775793
COMMENTS: Please see attached.

mw

SIERRA CLUB
FOUNDED 1892

November 4, 2011

VIA EMAIL DELIVERY
Bridget C. Bohac
TCEQ Office of the Chief Clerk; MC 105
P.O. Box 13087
Austin, TX 78711-3087

RE: Request for a Contested Case Hearing on the Application of Henry W. Pirkey Power Plant for a Renewed Texas Pollutant Discharge Elimination System Permit

TPDES Permit No. WQ0002496000

Dear Ms. Bohac:

The Sierra Club and Public Citizen ("Requesters") together file this Request for a Contested Case Hearing regarding the application of the H.W. Pirkey Power Plant for a renewed Texas Pollutant Discharge Elimination System ("TPDES permit.") Requesters are affected persons with members that live, work and recreate in the area surrounding the Pirkey plant and who will be adversely affected by the plant's wastewater discharges and enormous cooling water intake.

All contact with these organizations should be through legal counsel:

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I. Sierra Club and Public Citizen Include Affected Persons With Standing to Challenge Pirkey's TPDES Permit

Both Sierra Club and Public Citizen have members that live, work and recreate in the area surrounding the Pirkey plant and who will be adversely affected by the plant's wastewater discharges and enormous cooling water intake. These organizations have members that live and recreate near the waterbodies affected by Pirkey's discharges and cooling water intake: Brandy Branch Reservoir, Lake O' the Pines, Hatley Creek, Brandy Branch Creek, the Sabine River and other unnamed tributaries of these streams. Members also use water from the Sabine River as drinking water for themselves and their livestock. These members will be adversely affected by the continued and potentially increased discharge of wastewater pollutants including those listed in the application materials submitted by Pirkey. *See* Technical Report Worksheet 7.0 (Exhibit A). Members will also be affected by Pirkey's cooling water system's adverse impact on the waterbodies and aquatic life.

The Sierra Club is one of the oldest and largest grassroots environmental organizations in the country, with approximately 24,000 members in Texas. Sierra Club's goals include the preservation and enhancement of the natural environment and the protection of public health. The Sierra Club has the specific goal of improving and protecting water quality, and in support of that goal the Sierra Club has a significant interest in ensuring that any wastewater permit issued to the Pirkey Plant ensures protection of water quality, the health of its members, and the affected environment. Sierra Club has a significant interest in ensuring that the Pirkey permit complies with all applicable statutory and regulatory requirements, which are created to protect human health and the environment.

Public Citizen is a nonprofit membership organization that works to ensure that citizen's voices are represented in all branches of government, both state and federal, and has long advocated on behalf of citizens on environmental and energy issues. Because of the likelihood of extended drought in the state, and the increasing importance of protecting the quality and quantity of the state's water, the organization is specifically focusing on protecting this resource from the harms posed by existing energy sources.

A key purpose of both organizations is to protect their respective memberships and the general public from the environmental harms caused by coal-fired power plants such as Pirkey, including the plant's impacts on water quality and quantity, as well as air quality, waste, and public health impacts. As such, the interests the Sierra Club and Public Citizen seek to protect through the requested contested case proceeding are germane to the organizations' purposes. Furthermore, neither the claim asserted nor the relief requested requires the participation of the Sierra Club's or Public Citizen's individual members in the case; and one or more members of these organizations would otherwise have standing to request a hearing in their own right. 30 TAC §55.205.

Richard LeTourneau is one example of a Sierra Club member affected by the proposed renewal of Pirkey's wastewater discharge permit. Mr. LeTourneau is a longtime resident of Hallsville, Texas, which is approximately six miles northwest of the Pirkey plant. He is also a lifetime member of the Sierra Club. For many years Mr. LeTourneau has regularly kayaked and fished in a section of the Sabine River approximately four miles downstream of Brandy Branch Reservoir, between State Highways 149 and 43. That section of the Sabine River receives inflow from Brandy Branch Creek and Hatley Creek, two discharge sinks for materials from the Pirkey Plant. Pirkely's wastewater and thermal discharges and cooling water intake system affects the

section of the river where Mr. LeTourneau kayaks and fishes, and the safety of the fish that he eats.

Mr. LeTourneau fishes and kayaks in the Sabine River at least eight times a year, and he eats the catfish that he catches. Mr. LeTourneau has long been concerned about the water quality in the Sabine River, and in particular, how industrial discharge from the Pirkey plant affects the water quality. He is concerned that Pirkey's wastewater makes the River unhealthy for contact while kayaking and fishing, and that the fish he eats are contaminated and unsafe to consume.. This ongoing anxiety affects his aesthetic and recreational enjoyment of the river, and may affect his health. In addition, the impoundment of nearly all of Brandy Branch Creek's water in Brandy Branch Reservoir, for use in Pirkey's once-through cooling system, affects water levels in Sabine River and Mr. LeTourneau's ability to navigate a kayak through the river.

The Sierra Club and Public Citizen raise the following issues that are relevant and material to the decision on the application.

II. Relevant and Material Disputed Issues

Requesters seek a contested case hearing on each issue raised in the comments submitted to TCEQ by Public Citizen on August 11, 2011 (Exhibit B), and the corresponding responses by the Executive Director, issued on October 7, 2011. Requesters hereby incorporate these two exhibits in full into this contested case request. The comments discussed numerous disputed factual issues that are relevant and material to whether the TPDES renewal permit should be issued that were not resolved by the Executive Director's responses. Without limiting the issues raised by Public Citizen in August 2011, each of which is incorporated by reference in to this request, listed below are some specific examples to illustrate a few of the factual issues in dispute.

1. The draft permit's technology-based limits are incomplete and inadequate. Most notably, the permit fails to include any technology-based limits for toxic pollutants, including selenium and barium, contained in the flue gas desulphurization waste, more commonly known as "scrubber sludge," that is ultimately discharged through Outfall 004. Technology-based effluent limits are mandatory in NPDES permits. *See, e.g.*, 33 U.S.C. §1311(b)(1)(A); 40 C.F.R. § 125.3(a) ("[p]ermits shall contain . . . technology-based treatment requirements"); 30 TAC §308.1 (incorporating federal regulations by reference); *PUD No. 1 of Jefferson County v. Washington Dept. of Ecology*, 511 U.S. 700, 704; *Am. Petroleum Inst. v. EPA*, 661 F.2d 340, 344 (5th Cir. 1981); *Texas Oil & Gas Ass'n v. EPA*, 161 F.3d 923, 928 (5th Cir. 1998). Permits must contain technology-based limits regardless of the effect of the discharge on the receiving waters—this requirement has been described as a "strict liability" standard because it "mandate[s] technological improvements and imposed stringent pollution restrictions even where the discharge caused no discernible harm to the environment." *API*, 661 F.2d at 344. TCEQ itself acknowledges that technology-based limits are "required," TCEQ Fact Sheet and Executive Director's Preliminary Decision (Exhibit C), at p.9, and establishes them for some pollutants, such as oil and grease, *see* TCEQ Fact Sheet App'x A, but the permit fails to establish technology-based limits for toxic constituents of scrubber sludge.

   EPA is in the process of updating its effluent limitation guidelines for steam electric power plants like Pirkey because the existing guidelines do not address the pollutants

generated in air pollution control systems like scrubbers.[1] In the meantime, EPA has issued interim guidance to remind permitting agencies with delegated authority, such as TCEQ, that they must set case-by-case limits for toxic pollutant contained in the discharge from these systems, based on their best professional judgment. *Id.* 40 C.F.R. § 125.3(c)(3) ("[w]here promulgated effluent limitations guidelines only apply to certain aspects of the discharger's operation, or to certain pollutants, other aspects or activities are subject to regulation on a case-by-case basis in order to carry out the provisions of the Act"). The June 2010 interim guidance provides "information on how to establish technology-based limitations" for the kinds of toxic materials contained in scrubber sludge, and notes that EPA's "strongly preferred" approach to treating these wastes includes a biological treatment stage. June 2010 Interim Guidance at 1, Appendix A at 6.

Public Citizen's comments pointed out the absence of technology-based limits, citing to the June 2010 interim guidance. The Executive Director rejected this comment and dismissed the requirement to impose technology-based limitations. *See* Response to Comments at 10-11. The Executive Director stated that EPA's interim guidance for establishing case-by-case technology-based limits for scrubber sludge wastes are not "applicable" to Pirkey's discharges at Outfall 004 because the scrubber sludge waste stream is modified and diluted with other waste streams at Pirkey. This reasoning ignores the Clean Water Act's fundamental requirement for technology-based effluent limitations on point source discharges, which is wholly separate from the interim guidance cited by Public Citizen. TCEQ also cannot avoid applying technology-based effluent limits because processing or dilution may change the character of the waste stream. The June 2010 interim guidance does provide "information on how to establish technology-based limitations" for the kinds of toxic materials contained in scrubber sludge, and notes that EPA's "strongly preferred" approach to treating these wastes includes a biological treatment stage. June 2010 Interim Guidance at 1, Appendix A at 6.[2]

TCEQ failed to conduct a best professional judgment analysis to determine what treatment system would constitute "best available treatment" for the Pirkey waste stream. The agency did not evaluate whether the Applicant's unspecified settling, precipitation and flocculation treatment is adequate to remove dissolved metals such as selenium. It appears that TCEQ did not have adequate information about the process details, such as the form of selenium in the water, the amount, timing, and location of reagent added, the water temperature, and residence time, to evaluate the effectiveness of this treatment method. In any case, EPA's June 2010 Interim Guidance, cited above, advises that "physical/chemical treatment systems are not effective at removing selenium, nitrogen compounds, and certain metals that contribute to high concentrations of total dissolved solids in FGD wastewater (e.g., calcium, magnesium, sodium)."[3]

[1] USEPA, National Pollutant Discharge Elimination System (NPDES) Permitting of Wastewater Discharges from Flue Gas Desulfurization (FGD) and Coal Combustion Residuals (CCR) Impoundments at Steam Electric Power Plants (June 7, 2010).

[2] EPA recently objected to the proposed TPDES permit for another coal-fired power plant in Texas based on TCEQ's failure to consider this interim guidance. *See* Letter from TCEQ to Claudia Hosch, EPA Region 6, Response to Interim Objection to Draft Permit and Request for Additional Information for TPDES Permit No. WQ0004882000 (May 13, 2011) (Exhibit D), at page 2.

[3] June 2010 Interim Guidance, Attachment A at 4.

Besides reflecting outdated technology, Pirkey's existing treatment for scrubber sludge waste has been proven ineffective, and the proposed permit fails to remedy the conditions that have led to violations in the past. There is at least one record of Pirkey violating its selenium discharge limit at Outfall 004 in August 2008. TCEQ Fact Sheet at 3. In addition, an email sent from a Pirkey representative to the TCEQ on April 27, 2011, indicates a separate violation in July 2007. *See* Exhibit E. This email explained that both of these selenium violations occurred "when the pond filled up too fast with storm water from heavy rains, and the facility had subsequent problems getting the TSS and selenium values treated down prior to discharge." *Id.* Requesters are concerned that the draft permit allows Pirkey to continue treating water in the Landfill Pond, including FGD wastewater, in an open pond system that is vulnerable to overflow in large storm events and therefore cannot ensure adequate residence time for treatment. The Response to Comments fails to address concerns about future overflow events. It only notes that there has not been a discharge from the Landfill Pond since April 2010. Response to Comments at 11 (quoting unidentified statements by permittee). Considering the historic drought that Texas is experiencing, this should not come as a surprise. However, when rainfall levels return to normal, the incidence of overflows in the Landfill Pond is likely to increase. The draft permit entirely fails to address the past selenium violations. By ignoring these violations, TCEQ failed to exercise best professional judgment. Requesters are also concerned that the revised permit seeks a reduction in the freeboard requirement for this pond during storm events, which actually increases the likelihood that there will be a spill or discharge during storms before the water in the pond has been adequately treated.

Selenium is of particular concern in Pirkey's waste stream and the discharge from Outfall 004. The Pirkey Plant has a history of problematic discharge of selenium. A study by the Texas Parks and Wildlife Department showing that selenium levels in fish in Brandy Branch Reservoir nearly tripled once Pirkey began discharging coal combustion waste lead to a 12-year fish advisory consumption by the Texas Department of Health.[4] This history is further reason that the permit should contain strong effluent limitations based on the best available technology.

2. The permit also does not contain adequate monitoring requirements to ensure enforcement of the effluent limitations. Public Citizen Comments, p. 4. For example, the TSS limit at Outfall 004 decreased from 100 mg/L to 50 mg/L, but at the same time, the monitoring frequency is being decreased from monthly to quarterly based on Pirkey's full compliance with the prior limit for the past 5 years. But full compliance with that higher limit provides no assurance that Pirkey can reliably comply with a permit limit that is 50% lower. If anything, monitoring frequency should be *increased* so that Pirkey's compliance with the stricter TSS limit can be assured.

   As another example, the frequency of monitoring for discharges from Outfall 004 is unclear. The permit states that monitoring is to occur weekly, when discharge is occurring (Renewal Permit at 2e), but considering the applicant's representation that discharges are intermittent, it isn't clear that this "weekly" requirement would even result in monitoring and testing at least once per discharge event. The permit simply fails to provide, in clear and enforceable terms, monitoring and reporting requirements of

[4] U.S. EPA. 2007c. Coal Combustion Waste Damage Case Assessments. Office of Solid Waste. (9 July). DCN 06393, available at http://www.publicintegrity.org/assets/pdf/CoalAsh-Doc1.pdf.

sufficient frequency and the proper type of monitoring to detect violations, and protect against degradation of the receiving waters.

3. TCEQ failed to exercise best professional judgment to determine the "best technology available" at Pirkey's two sets of cooling water structures. The Clean Water Act §316(b) requires cooling water intake structures to reflect the best technology available for minimizing adverse environmental impacts. EPA is currently developing rules for cooling water intake structures at facilities like Pirkey. *See* USEPA, Proposed Rule. National Pollutant Discharge Elimination System—Cooling Water Intake Structures at Existing Facilities and Phase I Facilities, 76 Fed. Reg. 22,174 (Apr. 20, 2011). In the meantime, EPA has advised permitting authorities that until a new rule is issued: "all permits for Phase II facilities should include conditions under section 316(b) of the Clean Water Act developed on a Best Professional Judgment basis. *See* 40 C.F.R. § 401.14."[5]

   TCEQ failed to evaluate any alternative technologies to reduce the harmful impacts of the cooling water system. Pirkey's main set of cooling water intake does not have any kind of fish collection and return system to help fish that are impinged upon, or trapped against, the screens, return to the reservoir. 2007 Impingement Monitoring Report (Exhibit F); TCEQ Fact Sheet at 29-30. EPA has recognized such systems as a key technology to reduce mortality at cooling water intake pumps. 76 Fed. Reg. at 22,198. Pirkey might be able to reduce mortality by reducing through-screen velocity to 0.5 feet per second (as recommended in EPA's proposed rule), installing closed-cycle cooling, or any of a number of technologies. None of these alternative technologies appears even to have been considered—despite the fact that an EPA Draft Fact Sheet upon which TCEQ purported to rely, *Development of BPJ-Based Section 316(b) NPDES Permit Conditions* (Dec. 2007) (Exhibit G), specifically states that "the permitting authority should explain why other available technologies do not represent BTA for minimizing [adverse environmental impact.]" *Id.* at 2.

   Rather than undertaking any such comparison, TCEQ summarily concludes that "based on BPJ the existing facility currently meets BTA for minimizing [adverse environmental impact]." TCEQ Fact Sheet at 30. TCEQ has a flawed and incomplete understanding of the environmental impacts of these cooling water pumps. The 2007 Impingement Monitoring Report submitted by Pirkey in support of its permit application completely fails to evaluate entrainment, which occurs when eggs, larvae, and juveniles too small to be trapped against the intake screens are instead drawn into the pumps. 76 Fed. Reg. at 22,197. The 2007 Impingement Monitoring Report ignores entrainment mortality, apparently because it was relying on an EPA regulation, 40 C.F.R. §125.94(b), that has since been invalidated. *See Riverkeeper Inc. v. EPA*, 475 F.3d 83 (2d Cir. 2007). This outdated mortality report, which fails to detail the entrainment mortality resulting at these pumps, cannot be the basis for "best professional judgment" about what kind of technology best minimizes the environmental impact. The Impingement Monitoring Report also says the plant was operating with an intake velocity of 1.31 – 1.42 feet per second during the study (Report at 11, Table 6), so the study was not representative of the

[5] Mar. 20, 2007 Implementation Memo, http://water.epa.gov/lawsregs/lawsguidance/cwa/316b/phase2/upload/2007_07_19_316b_phase2_implementation-200703.pdf.

impacts the permit conditions could cause if they operate at the max of 2.28 feet per second.

TCEQ also did not exercise best professional judgment with regard to the second pump station, at Lake O' the Pines. The permit and public documents contain no information whatsoever about any protections for aquatic life. The Executive Director's response to Public Citizen's comment on this issue was that the Lake O' the Pines pump station is "not considered part of the CWIS for the electric generating facility" on the ground that it provides "make-up water for Brandy Branch Reservoir." TCEQ Fact Sheet at 12. However, EPA defines "cooling water intake structure" very broadly—it is "the total physical structure and any associated constructed waterways used to withdraw cooling water from waters of the United States." 76 Fed. Reg. at 22,193. Cooling water is "water used for contact or noncontact cooling, including water used for equipment cooling, evaporative cooling tower makeup, and dilution of effluent heat content." *Id.* TCEQ has not provided any facts to support its position that the Lake O' the Pines pump is not part of the cooling water system, even though it transfers water to the reservoir established for the sole purpose of providing over 600 million gallons a day of cooling water to the Pirkey plant.

4. TCEQ has not performed a legally sufficient anti-degradation analysis. The Executive Director's Response to Comments refers to an anti-degradation review that TCEQ has ostensibly completed, although some of these references are to "preliminary determinations," suggesting that the review is not actually complete. Response to Comments at 12. The content of the anti-degradation analysis does not appear to have been made available to the public, so it is not possible to ascertain whether that review is complete, whether it complies with all of the statutory requirements, or whether the finding that there will be no lowering of water quality in fishable and swimmable waters is supportable. The Executive Director also responds that because the draft permit does not request an increase in pollution loading or discharge of new waste streams, there will be no degradation. But the permit does authorize several changes that increase the risk of unauthorized discharge and corresponding degradation. It allows Pirkey to increase the size of the Landfill Pond. The revised permit also reduces the freeboard requirement for these waste-containing ponds during heavy storm events—the time that discharge from the ponds is most likely to occur. Finally, the revised permit reduces the monitoring requirements for several pollutants at different outfalls.

5. The permit inadequately addresses threats to groundwater, and how discharges to groundwater through improperly lined discharge ponds might ultimately affect surface waters with which the groundwater is hydrologically connected.

III. Conclusion

Requesters reemphasize that they seek a contested case hearing on *all* issues raised in the comments submitted by Public Citizen in August 2011, and that the more detailed explanations provided above are only to illustrate a subset of the deficiencies in the TPDES permit that TCEQ proposes to renew for the Pirkey power plant.

For the reasons stated above, TCEQ should grant this request for a contested case hearing regarding the Pirkey TPDES permit, No. WQ0002496000. Sierra Club and Public Citizen have established that they should be granted party status and have raised numerous relevant and material disputes concerning the permit that require a contested case hearing to resolve. Thank you for your attention to this matter. Please let me know if you need any additional information.

Sincerely,

Casey Roberts

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Exhibit A –

Pirkey Technical Report Worksheet 7.0

TECHNICAL REPORT 1.0 - INDUSTRIAL

THE FOLLOWING IS REQUIRED FOR ALL APPLICATIONS, RENEWAL, NEW, AND AMENDMENT

1. FACILITY/SITE INFORMATION (Instructions, page 24)

a. Describe the type of activity and general nature of your business.

Steam Electric Power Generation

b. SIC Code(s) 4911 , _____ , _____ , _____
NAICS Code(s) 22111 , _____ , _____ , _____

c. Describe the wastewater generating processes.

Once-through Cooling Water from Condensers.
Non-contacting water for pumps and equipment.
Metal cleaning wastes from cleaning of metal equipment.
Domestic sewage effluent from treatment of domestic wastewater via sewage treatment plant.
Ash transport water from ash handling system.
Miscellaneous wastewater from plant equipment and floor drains.
Storm water runoff from coal piles.
Storm water runoff from various plant areas combined with other wastewater previously mentioned.

d. Provide a list of raw materials, major intermediates, and products handled at your facility.

Raw Materials	Intermediate Products	Final Products
Lignite	Steam	Electricty
Water		
Air		

5. **POLLUTANT ANALYSIS** (Instructions, pages 63-65)

a. **TABLE 1-SW:** Please complete the table as directed.

Outfall 003	MAXIMUM VALUES (mg/L)		AVERAGE VALUES (mg/L)			
Pollutant	Grab Sample Taken During First 30 Minutes	Flow Weighted Composite Sample	Grab Sample Taken During First 30 Minutes	Flow Weighted Composite Sample	Number of Storm Events Sampled	MAL (mg/L)
pH (Standard Units)	7.6 (min)	___(max)	7.6 (min)	___(max)	*	---
Total Suspended Solids	6	___	6	___	*	---
Chemical Oxygen Demand	14	___	14	___	*	---
Total Organic Carbon	4.96	___	4.96	___	*	---
Oil and Grease	< 5	___	< 5	___	*	---
Total Arsenic	< 0.005	___	< 0.005	___	*	0.010
Total Barium	0.215	___	0.215	___	*	0.010
Total Cadmium	< 0.001	___	< 0.001	___	*	0.001
Total Chromium	< 0.001	___	< 0.001	___	*	0.010
Trivalent Chromium	< 0.005	___	< 0.005	___	*	---
Hexavalent Chromium	0.006	___	0.006	___	*	0.010
Total Copper	< 0.001	___	< 0.001	___	*	0.010
Total Lead	< 0.005	___	< 0.005	___	*	0.005
Total Mercury	< 0.00025	___	< 0.00025	___	*	0.0002
Total Nickel	< 0.005	___	< 0.005	___	*	0.010
Total Selenium	0.0128	___	0.0128	___	*	0.010
Total Silver	< 0.001	___	< 0.001	___	*	0.002
Total Zinc	< 0.005	___	< 0.005	___	*	0.005

* Analyses are from one grab ample taken out of the stormwater collection pond. See Item No. 6 on page 7-5. Actual discharges are treated to precipitate metals prior to the discharge event.

b. **TABLE 2-SW:** Please complete the table as directed. (Instructions, Pages 63-65)

Outfall 003	MAXIMUM VALUES (mg/L)		AVERAGE VALUES (mg/L)		
Pollutant	Grab Sample Taken During First 30 Minutes	Flow Weighted Composite Sample	Grab Sample Taken During First 30 Minutes	Flow Weighted Composite Sample	Number of Storm Events Sampled
Iron	0.452	N/A	0.452	N/A	*see below

6. **STORM EVENT DATA** (Instructions, page 65)

Please provide the following data for the storm event(s) which resulted in the maximum values for the analytical data submitted:

a. Date of storm event: N/A*
b. Duration of storm event (in minutes): N/A*
c. Total rainfall during storm event (in inches): N/A*
d. Number of hours between beginning of storm measured and end of previous measurable rain event: N/A* hours
e. Maximum flow rate during rain event (gallons/minute): N/A*
f. Total storm water flow from rain event (in gallons): N/A*
g. Provide a description of the method of flow measurement or estimate:

***Outfall 003 is associated with a controlled-discharge storm water management pond that was not being discharged during the permit renewal sampling events. The analyses above were obtained from a grab sample of storm water collected directly from the pond, but not during a storm event (as per previous guidance from TCEQ).**

5. POLLUTANT ANALYSIS (Instructions, pages 63-65)

a. TABLE 1-SW: Please complete the table as directed.

Outfall 004	MAXIMUM VALUES (mg/L)		AVERAGE VALUES (mg/L)			
Pollutant	Grab Sample Taken During First 30 Minutes	Flow Weighted Composite Sample	Grab Sample Taken During First 30 Minutes	Flow Weighted Composite Sample	Number of Storm Events Sampled	MAL (mg/L)
pH (Standard Units)	6.8 (min)	___(max)	6.8 (min)	___(max)	*	---
Total Suspended Solids	3	___	3	___	*	---
Chemical Oxygen Demand	25	___	25	___	*	---
Total Organic Carbon	3.56	___	3.56	___	*	---
Oil and Grease	< 5	___	< 5	___	*	---
Total Arsenic	< 0.005	___	< 0.005	___	*	0.010
Total Barium	0.141	___	0.141	___	*	0.010
Total Cadmium	< 0.001	___	< 0.001	___	*	0.001
Total Chromium	< 0.001	___	< 0.001	___	*	0.010
Trivalent Chromium	< 0.001	___	< 0.001	___	*	---
Hexavalent Chromium	< 0.001	___	< 0.001	___	*	0.010
Total Copper	< 0.001	___	< 0.001	___	*	0.010
Total Lead	< 0.005	___	< 0.005	___	*	0.005
Total Mercury	< 0.025	___	< 0.025	___	*	0.0002
Total Nickel	<0.005	___	<0.005	___	*	0.010
Total Selenium	0.028	___	0.028	___	*	0.010
Total Silver	< 0.001	___	< 0.001	___	*	0.002
Total Zinc	< 0.005	___	< 0.005	___	*	0.005

*Analyses are from one grab sample taken out of the stormwater collection pond. See Item No. 6 on page 7-5. Actual discharges are treated to precipitate metals prior to the discharge event.

b. **TABLE 2-SW:** Please complete the table as directed. (Instructions, Pages 63-65)

Outfall 004	MAXIMUM VALUES (mg/L)		AVERAGE VALUES (mg/L)		
Pollutant	Grab Sample Taken During First 30 Minutes	Flow Weighted Composite Sample	Grab Sample Taken During First 30 Minutes	Flow Weighted Composite Sample	Number of Storm Events Sampled
Iron	0.209	N/A	0.209	N/A	*see below

6. **STORM EVENT DATA** (Instructions, page 65)

Please provide the following data for the storm event(s) which resulted in the maximum values for the analytical data submitted:

a. Date of storm event: N/A*
b. Duration of storm event (in minutes): N/A*
c. Total rainfall during storm event (in inches): N/A*
d. Number of hours between beginning of storm measured and end of previous measurable rain event: N/A* hours
e. Maximum flow rate during rain event (gallons/minute): N/A*
f. Total storm water flow from rain event (in gallons): N/A*
g. Provide a description of the method of flow measurement or estimate:

***Outfall 004 is associated with a controlled-discharge stormwater management pond that was not being discharged during the permit renewal sampling events. The analyses above were obtained from a grab sample of stormwater collected directly from the pond, but not during a storm event.**

5. POLLUTANT ANALYSIS (Instructions, pages 63-65)

a. TABLE 1-SW: Please complete the table as directed.

Outfall 005	MAXIMUM VALUES (mg/L)		AVERAGE VALUES (mg/L)			
Pollutant	Grab Sample Taken During First 30 Minutes	Flow Weighted Composite Sample	Grab Sample Taken During First 30 Minutes	Flow Weighted Composite Sample	Number of Storm Events Sampled	MAL (mg/L)
pH (Standard Units)	6.8 (min)	___(max)	6.8 (min)	___(max)	*	---
Total Suspended Solids	2	___	2	___	*	---
Chemical Oxygen Demand	11	___	11	___	*	---
Total Organic Carbon	5.40	___	5.40	___	*	---
Oil and Grease	< 5	___	< 5	___	*	---
Total Arsenic	< 0.005	___	<0.005	___	*	0.010
Total Barium	0.0885	___	0.0885	___	*	0.010
Total Cadmium	< 0.001	___	< 0.001	___	*	0.001
Total Chromium	< 0.001	___	< 0.001	___	*	0.010
Trivalent Chromium	< 0.001	___	< 0.001	___	*	---
Hexavalent Chromium	< 0.001	___	< 0.001	___	*	0.010
Total Copper	0.00135	___	0.00135	___	*	0.010
Total Lead	< 0.005	___	< 0.005	___	*	0.005
Total Mercury	< 0.000025	___	< 0.000025	___	*	0.0002
Total Nickel	< 0.005	___	< 0.005	___	*	0.010
Total Selenium	0.00646	___	0.00646	___	*	0.010
Total Silver	< 0.001	___	< 0.001	___	*	0.002
Total Zinc	< 0.005	___	< 0.005	___	*	0.005

*Analyses are from one grab sample taken out of the stormwater collection pond. See Item No. 6 on page 7-5.

b. **TABLE 2-SW:** Please complete the table as directed. (Instructions, Pages 63-65)

Outfall 005	MAXIMUM VALUES (mg/L)		AVERAGE VALUES (mg/L)		
Pollutant	Grab Sample Taken During First 30 Minutes	Flow Weighted Composite Sample	Grab Sample Taken During First 30 Minutes	Flow Weighted Composite Sample	Number of Storm Events Sampled
Iron	0.397	N/A	0.397	N/A	*see below

6. **STORM EVENT DATA** (Instructions, page 65)

Please provide the following data for the storm event(s) which resulted in the maximum values for the analytical data submitted:

a. Date of storm event: N/A*
b. Duration of storm event (in minutes): N/A*
c. Total rainfall during storm event (in inches): N/A*
d. Number of hours between beginning of storm measured and end of previous measurable rain event: N/A* hours
e. Maximum flow rate during rain event (gallons/minute): N/A*
f. Total storm water flow from rain event (in gallons): N/A*
g. Provide a description of the method of flow measurement or estimate:

*Outfall 005 is associated with a controlled-discharge stormwater management pond that was not being discharged during the permit renewal sampling events. The analyses above were obtained from a grab sample of stormwater collected directly from the pond, but not during a storm event.

Exhibit B –

08.11.11 Public Citizen Comments re Pirkey Amd-Renewal App

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August 11, 2011

Melissa Chao, Acting Chief Clerk
Office of the Chief Clerk, MC-105
Texas Commission on Environmental Quality
P.O. Box 13087, MC-105
Austin, Texas 78711-3087

via e-file and deposit in the U.S. mail

Re: Comments by Public Citizen regarding Southwest Electric Power Company's (SWEPCO) application for amendment and renewal of TCEQ TPDES Permit No. WQ0002496000.

Ms. Chao:

Public Citizen offers the following comments regarding the application of Southwestern Electric Power Company ("SWEPCO") to renew and amend TPDES Permit No. WQ0002496000. The draft permit does not ensure adequate protection of surface water quality.

New Source Determination

The proposed amendment seeks to authorize several changes at the facility, including an increase in the capacity of the existing Flue Gas Desulphurization & Fly Ash Landfill Retention Pond (Landfill Pond). To accomplish this increased capacity, the berms for the existing pond will be increased in lateral extent and height, and the bottom of the pond will be re-excavated. This newly constructed pond constitutes a "new source," properly subject to the new source performance standards (NSPS). The Executive Director's finding that the amendment does not involve the authorization of a new source is incorrect.

Flue Gas Desulphurization (FGD) Wastewater

Waste streams produced at the facility will include FGD wastewater. This wastewater will be discharged via outfall 004.[1] The sole treatment process for this wastewater prior to discharge is settling and unspecified precipitation/flocculation in the Landfill Pond.

[1] Technical Report Attachment D, Water Flow Diagram.

Sampling performed at the facility confirms that the wastewater contained in the Landfill Pond contains significant levels of Barium and Selenium.[2] Furthermore, in August of 2008 the plant discharged wastewater through Outfall 004 which had a selenium concentration of 0.057 mg/L, well in excess of the existing selenium effluent limitation of 0.036 mg/l at this outfall. Public Citizen is concerned that the draft permit does not contain adequate effluent limitations to control the discharge of these and similar contaminants.

TPDES permits must include technology-based effluent limitations consistent with the requirements of the federal Clean Water Act. Specifically, the permit must include effluent limitations consistent with the use of the best available technology economically achievable (BAT). The United States Environmental Protection Agency has issued guidance regarding BAT for FGD waste streams.[3] In that guidance, EPA noted that FGD wastewater contains pollutants such as selenium, boron and magnesium that are generally present in soluble form, and not effectively and reliably removed by wastewater settling ponds. The EPA further noted that while some methods of precipitation and flocculation can achieve the removal of certain metals, these treatment techniques are not effective at the removal of selenium and other metals that contribute to high concentrations of total dissolved solids in FGD wastewater.

The EPA has noted that biological treatment systems are available that are capable of removing selenium and other metals that settling ponds and physical/chemical treatment systems cannot effectively remove. Biologic treatment systems constitute BAT for FGD waste streams, and technology-based effluent limits should be established consistent with the use of this treatment technology.

The draft permit fails to include technology-based effluent limitations consistent with current EPA guidance for FGD waste streams. The Fact Sheet claims that the effluent limitations in the permit are consistent with EPA's guidance based solely on a consideration of observed groundwater impacts. This *media-based* discussion is wholly irrelevant to a determination of the proper *technology-based* effluent limitations to be imposed at the facility. The reasoning provided in the Fact Sheet provides no basis to conclude that the technology utilized at the facility for the treatment of FGD wastewater streams constitutes BAT for those waste streams.

Cooling Water Intake Structures

The Pirkey Power Plant withdraws approximately 560 million gallons per day from the Brandy Branch Reservoir for cooling water purposes, and up to an additional 21.6 MGD from Lake O' the Pines as makeup water for the cooling water system at the plant.[4] Pursuant to the Clean Water Act, the location, design, construction and capacity of the associated intake structures

[2] Technical Report Worksheet 7.0, p. 7-4.
[3] June 7, 2010 Memorandum from James Hanlon, Office of Wastewater Management to Water Division Directors, Regions 1-10, re: NPDES permitting of Wastewater Discharges from Flue Gas Desulphurization (FGD) and Coal Combustion Residuals (CCR) Impoundments at Steam Electric Power Plants.
[4] Technical Report Attachment D, Water Flow Diagram.

must reflect the best technology available for minimizing adverse environmental impacts (BTA). It has not been shown that the intake structures for the Pirkey Plant meet this requirement.

The fact sheet presents no analysis for the intake structures located on Lake O' the Pines. These structures are used to withdraw over 10 million gallons per day, and so must be demonstrated to be compliant with § 316(b) of the CWA. It is improper to issue the permit without a determination that the CWIS at Lake O' the Pines comply with the requirements of CWA § 316(b). No such determination has been made. The existing intake structures located at Lake O' the Pines do not meet the requirements of CWA § 316(b).

Moreover, the intake structures at Brandy Branch Reservoir do not reflect BTA. For perspective, EPA has found that a through-screen velocity of 0.5 feet per second is equivalent to BTA at new facilities.[5] In comparison, the intake structures for the Pirkey Plant at Brandy Branch Reservoir demonstrate a through-screen velocity of 2.28 feet per second.[6] Intake structures with this type of a through-screen velocity do not constitute BTA for either a new or existing facility.

Protection of Attainable and Designated Uses

The draft permit does not include adequate protections for the attainable and designated uses of the receiving waters.

Faulty Anti-Degradation Analysis

A sufficient anti-degradation analysis has not been performed to justify issuance of the permit. The proposed discharge will result in a lowering of water quality in fishable/swimmable waters, including Brandy Branch Reservoir, by more than a de minimis extent, and yet no showing has been made that this lowering of water quality is necessary for important economic or social development.

Insufficient Solids Management Plan

The application proposes to dispose of facility wastes at the Lone Star POTW in Lone Star, Texas. No demonstration has been made that this plant has adequate capacity to properly treat the solids produced at the Pirkey Plant.

Insufficient Groundwater Protection

The draft permit does not include proper protections for groundwater in the vicinity of the plant. The Landfill Pond and other storage areas pose a danger to groundwater that has not been adequately addressed.

[5] 40 CFR § 125.84(b)(2).
[6] Fact Sheet and Executive Director's Preliminary Decision, p. 30.

Protection of Aquatic Life

Sufficient limitations and monitoring requirements have not been included in the permit adequate to ensure the protection of aquatic life in the receiving waters.

Conclusion

For these reasons, the application by SWEPCO to amend and renew TCEQ Permit No. 02496 for the H.W. Pirkey Power Plant should be denied.

Sincerely,

Eric Allmon

Eric Allmon

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Exhibit C –

Pirkey Fact Sheet and Prelim Decision--reduced

FACT SHEET AND EXECUTIVE DIRECTOR'S PRELIMINARY DECISION

For proposed Texas Pollutant Discharge Elimination System TPDES Permit No. WQ0002496000, EPA ID No. TX0087726 to discharge to water in the state.

Issuing Office:	Texas Commission on Environmental Quality (TCEQ) P.O. Box 13087 Austin, Texas 78711-3087
Applicant:	Southwestern Electric Power Company 2400 Farm-to-Market Road 3251 Hallsville, Texas, 75650-7634
Prepared By:	Satya Dwivedula, P.E. Wastewater Permitting Section Water Quality Division (512) 239-3548
Date:	June 13, 2011
Permit Action:	Major Amendment; TPDES Permit No. WQ0002496000

I. EXECUTIVE DIRECTOR RECOMMENDATION

The Executive Director has made a preliminary decision that this permit, if issued, meets all statutory and regulatory requirements. It is proposed the permit be issued to expire on April 1, 2016 following the requirements of Title 30 Texas Administrative Code (TAC) §305.71.

II. APPLICANT ACTIVITY

The applicant currently operates Henry W. Pirkey Power Plant.

III. DISCHARGE LOCATION

As described in the application, the plant site is located adjacent to Red Oak Road at a point approximately six miles southeast of the City of Hallsville, Harrison County, Texas. The effluent is discharged via Outfalls 002 and 003 to Brandy Branch Reservoir; thence to Brandy Branch Creek; via Outfalls 004, 005, and 006 to unnamed tributaries of Hatley Creek; thence to Hatley Creek; thence all to Sabine River Above Toledo Bend Reservoir in Segment No. 0505 of the Sabine River Basin.

IV. RECEIVING STREAM USES

The unclassified receiving waters have high aquatic life use for Brandy Branch Reservoir, no significant aquatic life use for Brandy Branch Creek and the unnamed tributaries of Hatley Creek, and high aquatic life use for Hatley Creek. The designated uses for Segment No. 0505 are high aquatic life use, contact recreation, and public water supply.

V. STREAM STANDARDS

The general criteria and numerical criteria that make up the stream standards are provided in 30 TAC §§307.1 - 307.10, effective August 17, 2000.

VI. DISCHARGE DESCRIPTION

The following is a quantitative description of the discharge described in the Monthly Effluent Report data for the period August 2005 through December 2010. The "Average of Daily Avg." values presented in the following table are the average of all daily average values for the reporting period for each parameter. The "Maximum of Daily Max." values presented in the following table are the individual maximum values for the reporting period for each parameter.

A. Flow

Outfall	Frequency	Average of Daily Avg., million gallons per day (MGD)	Maximum of Daily Max (MGD)
002	Continuous	424	633
102	Intermittent	23.51	33.13
202	Continuous	No Discharge	No Discharge
302	Continuous	0.002	0.009
003	Intermittent	0.05	0.1
004	Intermittent	1.0	5.0
005	Intermittent	0.45	2.0
006	Intermittent	1.72	4.0

B. Temperature (degrees F)

Outfall	Daily Avg.	Daily Max
002	92°F	115°F

C. Effluent Characteristics

Outfall	Parameter	Average of Daily Avg	Maximum of Daily Max
002	Total Residual Chlorine	N/A	0.2 mg/L 37.8 lbs/day
102	Total Suspended Solids	2 mg/L	4 mg/L
	Oil and Grease	< 5mg/L	< 5 mg/L
	Selenium, Total	0.006 mg/L	0.007 mg/L
	pH	6.1 standard units, min.	9.0 standard units, max.
202	Total Suspended Solids	No Discharge	No Discharge
	Oil and Grease	No Discharge	No Discharge
	Selenium, Total	No Discharge	No Discharge
	Iron, Total	No Discharge	No Discharge
	Copper, Total	No Discharge	No Discharge

Outfall	Parameter	Average of Daily Avg	Maximum of Daily Max
202	pH	No Discharge	No Discharge
302	Biochemical Oxygen Demand, 5-day	6.3 mg/L < 1.0 lbs/day	13 mg/L
	Total Suspended Solids	5 mg/L <1.0 lbs/day	14 mg/L
	Total Residual Chlorine	1.0 mg/L, min.	7.3 mg/L, max.
	pH	6.3 standard units, min.	8.1 standard units, max.
003	Total Suspended Solids	N/A	8 mg/L
	Oil and Grease	N/A	< 5 mg/L
	Selenium, Total	N/A	0.013 mg/L
	pH	7.2 standard units, min.	7.5 standard units, max.
004	Total Suspended Solids	N/A	18 mg/L
	Oil and Grease	N/A	< 5 mg/L
	Selenium, Total	N/A	0.057 mg/L
	pH	6.0 standard units, min.	8.5 standard units, max.
005	Total Suspended Solids	N/A	35 mg/L
	Oil and Grease	N/A	< 5 mg/L
	pH	6.4 standard units, min.	8.5 standard units, max.
006	Total Suspended Solids	7 mg/L	13 mg/L
	Oil and Grease	< 5 mg/L	< 5 mg/L
	Selenium, Total	0.0022 mg/L	0.0060 mg/L
	pH	6.4 standard units, min.	8.9 standard units, max.

A review of the Monthly Effluent Report data identified two self-reported effluent limitation violations - the daily maximum flow of 633 MGD at Outfall 002 in February 2006 exceeded its effluent limitation of 600 MGD, and the daily maximum total selenium concentration of 0.057 mg/L at Outfall 004 in August 2008 exceeded its effluent limitation of 0.036 mg/L. The permittee has clarified that the daily maximum flow Outfall 002 in February 2006 was recorded erroneously (as 633 MGD instead of 369 MGD) into the US Environmental Protection Agency's (EPA) database, and that there was no actual effluent limitation exceedance. No permit action is proposed for the single effluent limitation exceedance for total selenium.

In the past five years: (a) nineteen chronic biomonitoring tests were performed with no demonstrations of toxicity and (b) twenty 24-hour acute biomonitoring tests were performed with no demonstration of significant mortality. Therefore, no additional biomonitoring requirements are deemed necessary.

FACT SHEET AND EXECUTIVE DIRECTOR'S PRELIMINARY DECISION

VII. PROPOSED EFFLUENT LIMITATIONS

Final effluent limitations are established in the draft permit as follows:

Outfall No	Parameter	Daily Average	Daily Maximum
002	Flow	600 MGD	600 MGD
	Temperature	Report, °F	122°F
	Total Residual Chlorine	N/A	0.2 mg/L 75.6 lbs/day
	Dissolved Oxygen	Report, mg/L	Report, mg/L
102	Flow	Report, MGD	Report, MGD
	Total Suspended Solids	30 mg/L	100 mg/L
	Oil and Grease	15 mg/L	20 mg/L
	Selenium, Total	0.012 mg/L	0.025 mg/L
	pH	6.0 standard units, min.	9.0 standard units, max.
202	Flow	0.8, MGD	0.8, MGD
	Total Suspended Solids	30 mg/L	50 mg/L
	Oil and Grease	15 mg/L	20 mg/L
	Selenium, Total	0.016 mg/L	0.033 mg/L
	Iron, Total	1.0 mg/L	1.0 mg/L
	Copper, Total	0.5 mg/L	1.0 mg/L
	pH	6.0 standard units, min.	9.0 standard units, max.
302	Flow	0.015 MGD	0.030 MGD
	Biochemical Oxygen Demand, 5-day	20 mg/L 2.5 lbs/day	65 mg/L
	Total Suspended Solids	20 mg/L 2.5 lbs/day	65 mg/L
	Total Residual Chlorine	1.0 mg/L, min.	Report, max.
	pH	6.0 standard units, min.	9.0 standard units, max.
003	Flow	Report, MGD	Report, MGD
	Total Suspended Solids	N/A	50 mg/L
	Oil and Grease	N/A	20 mg/L
	Selenium, Total	N/A	0.033 mg/L
	pH	6.0 standard units, min.	9.0 standard units, max.
004	Flow	Report, MGD	Report, MGD
	Total Suspended Solids	N/A	50 mg/L
	Oil and Grease	N/A	20 mg/L
	Selenium, Total	N/A	0.036 mg/L
	pH	6.0 standard units, min.	9.0 standard units, max.

Outfall No	Parameter	Daily Average	Daily Maximum
104	Flow	Report, MGD	Report, MGD
	Total Suspended Solids	30 mg/L	100 mg/L
	Oil and Grease	15 mg/L	20 mg/L
005	Flow	Report, MGD	Report, MGD
	Total Suspended Solids	N/A	50 mg/L
	Oil and Grease	N/A	20 mg/L
	pH	6.0 standard units, min.	9.0 standard units, max.
006	Flow	Report, MGD	Report, MGD
	Total Suspended Solids	30 mg/L	100 mg/L
	Oil and Grease	15 mg/L	20 mg/L
	Selenium, Total	0.006 mg/L	0.013 mg/L
	pH	6.0 standard units, min.	9.0 standard units, max.

VIII. SUMMARY OF CHANGES FROM APPLICATION

The following changes have been made from the application that make the draft permit more stringent.

1. A reporting requirement for the daily average and the daily maximum dissolved oxygen concentration at Outfall 002 is included in the draft permit based on the recommendation of the Water Quality Assessment Team, for the following reason:

   The existing permit authorizes the discharge of once-through cooling water at a daily average flow of 600 MGD, and includes an effluent limitation for the daily maximum temperature at 122°F. Based on information provided in the permit application, the level of oxygen demanding constituents in discharges via Outfall 002 is low. However, temperatures at the daily maximum allowable levels have the potential to suppress attainable dissolved oxygen levels in the reservoir, in the immediate vicinity of Outfall 002. Based on limited dissolved oxygen information provided in the application, the effluent at Outfall 002 contains high levels of dissolved oxygen. Since the available data on dissolved oxygen is limited, for a more detailed analysis of dissolved oxygen levels, a dissolved oxygen monitoring requirement for a period close to the permit term is included in the draft permit.

2. The daily maximum effluent limitation for total suspended solids at Outfall 202 is made more stringent by reducing it from 100 mg/L to 50 mg/L because: (a) Outfall 202 discharges treated effluent from Plant "X," (b) Plant X is authorized to receive wastewater from the Lignite Runoff Pond (coal pile runoff) and (c) the daily maximum effluent limitation for total suspended solids for coal pile runoff is 50 mg/L, per 40 CFR §423.12.

3. The daily maximum effluent limitation for total suspended solids at Outfall 004 is made more stringent by reducing it from 100 mg/L to 50 mg/L because: (a) Outfall 004 discharges storm water from the Flue Gas Desulphurization & Fly Ash Landfill Retention Pond (Landfill Pond),

(b) the Landfill Pond is authorized to receive wastewater from the Lignite Runoff Pond (coal pile runoff) and (c) the daily maximum effluent limitation for total suspended solids for coal pile runoff is 50 mg/L, per 40 CFR §423.12.

4. Revised Other Requirement No. 5.d to include more stringent liner requirements for all newly-constructed ponds in accordance with rules provided in Title 30 Texas Administrative Code (TAC) Chapter 217.

5. Revised Other Requirement No. 7 to include the revised definitions of mixing zones provided by the Water Quality Assessment Team. This revision includes: (a) reduction in the mixing zone at Outfall 002 from 200-foot radius from the point of discharge to 100-foot radius from the point of discharge, (b) the definition of human health mixing zone at Outfall 002, and (c) the definition of mixing zone at Outfall 003.

6. Revised Other Requirement No. 12 to include: (a) specific requirements for operating the cooling water intake structure(s) and (b) a clause specifying that the permit may be reopened to include additional requirements, if it is later determined that the Cooling Water Intake Structure configuration is not representative of the Best Technology Available (BTA) for minimizing Adverse Environmental Impact (AEI).

7. Included a new Other Requirement No. 13 to require the permittee to analyze Outfall 006 effluent after the first qualifying discharge event. This requirement is included because analytical data for discharges via Outfall 006 was not provided in the permit application since no discharges were made via this outfall since May 2008.

8. A new Other Requirement No. 14 is included to restrict the allowable days of discharge via Outfalls 003 and 004.

See the next section for additional changes to the existing permit.

IX. SUMMARY OF CHANGES FROM EXISTING PERMIT

The permittee requested the following changes in their amendment request that the Executive Director has recommended granting.

1. An authorization to increase in the capacity of the existing Landfill Pond. This request is granted without additional conditions because it does not result in the discharge of any additional waste streams, pollutants, or flows than those authorized in the existing permit.

2. An authorization to divert wastewater from the Ash Pond into the Landfill Pond on an infrequent basis. This request is granted because: (a) it is anticipated to happen infrequently during periods of heavy precipitation events while the facility is offline due to extended emergency maintenance, or extended planned power outages, (b) a new internal Outfall 104 is included to ensure that the technology-based limits for total suspended solids and oil and grease for the Ash Pond effluent are met prior to their discharge into the Landfill Pond, (c) water quality-based effluent limitations for total selenium are included at the Landfill Pond, and (d) discharges from both the Ash Pond and the Landfill Pond are required to maintain their pH between 6.0 and 9.0 standard units.

3. A reduction in the monitoring frequency for total suspended solids at Outfalls 004 and 005 from once per month to once per quarter. This request is granted because the permittee has demonstrated full compliance with the effluent limitations for these parameters at Outfalls 004 and 005 in the past five-year period, with no reported effluent limitation violations.

4. A reduction in the monitoring frequency for oil and grease at Outfall 006 from once per month to once per quarter. This request is granted because the permittee has demonstrated full compliance with the effluent limitations for oil and grease at Outfall 006 in the past five-year period, with no reported detections or effluent limitation violations.

5. A reduction in the monitoring frequency for oil and grease at Outfall 102 from once per quarter to once per year. This request is granted because the permittee has demonstrated full compliance with the effluent limitations for oil and grease at Outfall 102 in the past five-year period, with no reported detections or effluent limitation violations.

6. A reduction in monitoring frequency for biochemical oxygen demand (5-day) at Outfall 302 from once per two months to once per quarter. This request is granted because the permittee has demonstrated full compliance with the effluent limitations for biochemical oxygen demand (5-day) at Outfall 302 in the past five-year period, with no reported effluent limitation violations.

7. A temporary reduction in two-foot freeboard requirement for ponds during storm events. This request is granted because: (a) freeboard reduction below two-foot is expected to happen intermittently during storm events and (b) Other Requirement No. 5.e. is revised to require the permittee to manage any pond level increases associated with storm water events promptly.

The following additional changes have been made to the draft permit.

1. On Page 2.e., clarified that wastewaters from Lignite Runoff Pond are also authorized at Outfall 004.

2. Other Requirement No. 2 is revised to accurately specify the condition related to polychlorinated biphenyls in Title 40 Code of Federal Regulations (CFR) Part 423.

3. Other Requirement No. 5.a. is revised specify that the Landfill Pond is authorized to receive wastewaters from the Ash Pond.

4. Included new Other Requirement No. 5.f. to: (a) authorize diversions of wastewaters from the Ash Pond into the Landfill Pond, and (b) to specify the conditions under which these diversions are authorized.

5. Removed Other Requirement No. 13 which required analytical data for discharges via Outfalls 004 and 005, because this data has been provided with the permit application.

X. DRAFT PERMIT RATIONALE

The following section sets forth the statutory and regulatory requirements considered in preparing the draft permit. Also set forth are any calculations or other necessary explanations of the derivation of specific effluent limitations and conditions, including a citation to the applicable effluent limitation guidelines and water quality standards.

FACT SHEET AND EXECUTIVE DIRECTOR'S PRELIMINARY DECISION

A. REASON FOR PERMIT ISSUANCE

The applicant has applied to the TCEQ for a major amendment to Permit No. WQ0002496000 to authorize: (a) an increase in the capacity of the existing Landfill Pond, (b) the diversion of wastewater from the Ash Pond into the Landfill Pond on an infrequent basis, (c) a reduction in the monitoring frequency for total suspended solids at Outfalls 004 and 005 from once per month to once per quarter, (c) a reduction in the monitoring frequency for oil and grease at Outfall 006 from once per month to once per quarter, (d) a reduction in the monitoring frequency for oil and grease at Outfall 102 from once per quarter to once per year, (e) a reduction in monitoring frequency for biochemical oxygen demand (5-day) at Outfall 302 from once per two months to once per quarter, and (f) a temporary reduction in two-foot freeboard requirement for ponds during storm events.

The current permit authorizes the discharge of once-through cooling water and previously monitored effluent (low volume wastewater on an intermittent and flow variable basis via Outfall 102; treated effluent from Plant "X" at a daily average flow not to exceed 800,000 gallons per day via Outfall 202; and domestic wastewater at a daily average flow not to exceed 15,000 gallons per day via Outfall 302) at a daily average flow not to exceed 600,000,000 gallons per day via Outfall 002 that will remain the same; storm water from the Lignite Runoff Pond on an intermittent and flow variable via Outfall 003 that will remain the same; storm water from the Landfill Pond and wastewaters from the Lignite Runoff Pond on an intermittent and flow variable via Outfall 004, which has been revised; storm water from the Limestone Runoff Pond on an intermittent and flow variable via Outfall 005 that will remain the same; and wastewater from the Ash Pond on an intermittent and flow variable basis via Outfall 006 that will remain the same.

B. WATER QUALITY SUMMARY

The discharge route is via Outfalls 002 and 003 to Brandy Branch Reservoir; thence to Brandy Branch Creek; via Outfalls 004, 005, and 006 to unnamed tributaries of Hatley Creek; thence to Hatley Creek; thence all to Sabine River Above Toledo Bend Reservoir in Segment No. 0505 of the Sabine River Basin. The unclassified receiving waters have high aquatic life use for Brandy Branch Reservoir, no significant aquatic life use for Brandy Branch Creek, no significant aquatic life use for the unnamed tributaries of Hatley Creek, and high aquatic life use for Hatley Creek. The designated uses for Segment No. 0505 are high aquatic life use, contact recreation, and public water supply. Effluent limitations and conditions established in the draft permit are in compliance with state water quality standards and the applicable water quality management plan. The effluent limits in the draft permit will maintain and protect the existing instream uses. Additional discussion of the water quality aspects of the draft permit will be found at Section X.D. of this fact sheet.

In accordance with 30 TAC §307.5 and the TCEQ implementation procedures (January 2003) for the Texas Surface Water Quality Standards, an antidegradation review of the receiving waters was performed. A Tier 1 antidegradation review has preliminarily determined that existing water quality uses will not be impaired by this permit action. Numerical and narrative criteria to protect existing uses will be maintained. A Tier 2 review has preliminarily determined that no significant degradation of water quality is expected in Brandy Branch Reservoir and Hatley Creek, which have been identified as having high aquatic life use. Existing uses will be maintained and protected. The preliminary determination can be reexamined and may be modified if new information is received.

The discharge from this permit action is not expected to have an effect on any federal endangered or threatened aquatic or aquatic dependent species or proposed species or their critical habitat. This determination is based on the United States Fish and Wildlife Service's (USFWS) biological opinion on the State of Texas authorization of the Texas Pollutant Discharge Elimination System (TPDES; September 14, 1998; October 21, 1998 update). To make this determination for TPDES permits, TCEQ and EPA only considered aquatic or aquatic dependent species occurring in watersheds of critical concern or high priority as listed in Appendix A of the USFWS biological opinion. The determination is subject to reevaluation due to subsequent updates or amendments to the biological opinion. The permit does not require EPA review with respect to the presence of endangered or threatened species.

Segment No. 0505 is currently listed on the State's inventory of impaired and threatened waters (the 2008 Clean Water Act Section 303(d) list. The listing is specifically for elevated levels of bacteria in a 22-mile reach near SH 149. Domestic wastewater discharges authorized via Outfall 002 can potentially impact bacteria levels in the receiving waters. However, discharges from the facility are not expected to cause or contribute to the elevated bacteria levels in the receiving waters because: (a) domestic wastewater discharges are controlled at internal Outfall No. 302 with effluent limitations for biochemical oxygen demand (5-day) and minimum total residual chlorine concentration limits, (b) the permittee met the effluent limitations for biochemical oxygen demand (5-day) and total residual chlorine concentration limits in the past five-year period, and (c) the discharge of once-through cooling water authorized via Outfall 002 at a daily average flow of 600 MGD is expected to rapidly dilute the domestic wastewaters that are authorized at a daily average flow of 0.015 MGD. Therefore, no additional permit conditions are proposed to address the inclusion of the receiving waters on 2008 Clean Water Act Section 303(d) list.

C. TECHNOLOGY-BASED EFFLUENT LIMITATIONS/CONDITIONS

1. GENERAL COMMENTS

Regulations promulgated in Title 40 of the Code of Federal Regulations (40 CFR) require technology-based limitations be placed in wastewater discharge permits based on effluent limitations guidelines, where applicable, on best professional judgment (BPJ) in the absence of guidelines, or both.

The proposed draft permit authorizes the discharge of once-through cooling water and previously monitored effluent (low volume wastewater on an intermittent and flow variable basis via Outfall 102; treated effluent from Plant 'X' at a daily average flow not to exceed 0.8 MGD via Outfall 202; domestic wastewater at a daily average flow not to exceed 0.015 MGD via Outfall 302) at a daily average flow not to exceed 600 million gallons per day (MGD) via Outfall 002; storm water from the Lignite Runoff Pond on an intermittent and flow variable via Outfall 003; storm water from the Landfill Pond and previously monitored effluent (wastewaters from the Ash Pond on an intermittent and flow variable basis via Outfall 104) on an intermittent and flow variable via Outfall 004; storm water from the Limestone Runoff Pond on an intermittent and flow variable via Outfall 005; and wastewater from the Ash Pond on an intermittent and flow variable basis via Outfall 006.

Discharges of once-through cooling water via Outfall 002; low volume wastewater via Outfall 102; treated effluent from Plant "X" via Outfall 202; wastewater from the Lignite Runoff Pond via Outfall 003; wastewater from the Landfill Pond via Outfall 004; wastewater from the Ash Pond via Outfall 104; and wastewater from the Ash Pond via Outfall 006 are subject to federal effluent limitation guidelines under 40 CFR Chapter 122, 40 CFR Chapter 423, or both.

A new source determination was performed and the above listed discharges are not new sources as defined at 40 CFR § 122.2. Therefore new source performance standards (NSPS) are not applicable to the discharges from this facility.

The discharge of wastewater from Limestone Runoff Pond via Outfall 005 is not subject to federal effluent limitation guidelines and any technology-based effluent limitations are based on best professional judgment.

The source water for cooling operations at the Pirkey Power Plant is obtained from Brandy Branch Reservoir. Outfalls 002, 102, 202, 302, and 003 discharge to Brandy Branch Reservoir. Outfalls 004, 104, 005, and 006 discharge to unnamed tributaries of Hatley Creek.

Once-through condenser cooling water and once-through miscellaneous cooling water (collectively referred to as "once-through cooling water" in the permit) receive no treatment prior to discharge at Outfall 002. Low volume wastes (demineralizer regenerant, floor drains, and yard drains) are routed to the Ecology Pit for settling, precipitation, and flocculation prior to discharge via Outfall 102.

Additionally, demineralizer regenerant is routed to a chemical sump and neutralization tank prior to being routed to the Ecology Pit. The permittee may route metal cleaning wastes, chemical metal cleaning wastes, wastewater from the Ash Pond, and wastewater from the Lignite Runoff Pond to Plant "X."

Plant "X" provides pH neutralization, filtration, settling, oil-water separation, and chemical wastewater treatment prior to discharge via Outfall 202. Additionally, metal cleaning wastes and chemical metal cleaning wastes are routed to the Metal Cleaning Waste Pond prior to being routed to Plant "X." Domestic sewage is subject to pH neutralization, filtration, settling and clarifier solids separation, chlorination, and chemical wastewater treatment prior to discharge via Outfall 302. Storm water from the lignite storage area is routed to the Lignite Runoff Pond where it is subject to settling and precipitation & flocculation prior to discharge via Outfall 003. Storm water runoff from the flue gas desulfurization & fly ash sludge landfill is routed to the Landfill Pond where it is subject to settling, precipitation, and flocculation prior to discharge via Outfall 004. The permittee may transfer wastewater from the Lignite Runoff Pond to the Landfill Pond for treatment and discharge via Outfall 004. The permittee may divert wastewater from the Ash Pond into the Landfill Pond on an infrequent basis, on compliance with the technology-based effluent limitations at internal Outfall 104. Storm water from the limestone storage area is routed to the Limestone Runoff Pond where it is subject to settling, precipitation, and flocculation prior to discharge via Outfall 005. Low volume wastes (boiler blowdown and demineralizer regenerant) and ash transport water are routed to the Ash Pond where they are subject to oil-water separation, pH adjustment, settling, precipitation, and flocculation prior to discharge via Outfall 006.

2. CALCULATIONS

See Appendix A of this fact sheet for calculations and further discussion of technology-based effluent limitations proposed in the draft permit.

Technology-based effluent limitations for total residual chlorine at Outfall 002; total suspended solids and oil and grease at Outfall102; total suspended solids, oil and grease, total iron and total copper at Outfall 202; total suspended solids and oil and grease at Outfalls 003, 004, 005, and 006 are continued from the existing permit.

A new internal Outfall 104 is established to provide technology-based effluent limitations for total suspended solids and oil and grease for wastewaters in the Ash Pond, when they are diverted to the Landfill Pond on an infrequent basis.

The following technology-based effluent limitations are proposed in the draft permit:

Outfall No.	Parameter	Daily Average	Daily Maximum
002	Total Residual Chlorine	N/A	0.2 mg/L
		N/A	75.6 lbs/day
102	Total Suspended Solids	30 mg/L	100 mg/L
	Oil and Grease	15 mg/L	20 mg/L
	Total Selenium	0.0125 mg/L	0.025 mg/L
	pH	Between 6.0 and 9.0 standard units	
202	Total Suspended Solids	30 mg/L	50 mg/L
	Oil and Grease	15 mg/L	20 mg/L
	Total Iron	1.0 mg/L	1.0 mg/L
	Total Copper	0.5 mg/L	1.0 mg/L
	Total Selenium	0.016 mg/L	0.033 mg/L
	pH	Between 6.0 and 9.0 standard units	
003	Total Suspended Solids	N/A	50 mg/L
	Oil and Grease	N/A	20 mg/L
	pH	Between 6.0 and 9.0 standard units	
004	Total Suspended Solids	N/A	50 mg/L
	Oil and Grease	N/A	20 mg/L
	pH	Between 6.0 and 9.0 standard units	
104	Total Suspended Solids	30 mg/L	100 mg/L
	Oil and Grease	15 mg/L	20 mg/L
005	Total Suspended Solids	N/A	50 mg/L
	Oil and Grease	N/A	20 mg/L
	pH	Between 6.0 and 9.0 standard units	
006	Total Suspended Solids	30 mg/L	100 mg/L
	Oil and Grease	15 mg/L	20 mg/L
	pH	Between 6.0 and 9.0 standard units	

D. WATER QUALITY-BASED EFFLUENT LIMITATIONS/CONDITIONS

1. GENERAL COMMENTS

The Texas Surface Water Quality Standards found at 30 TAC Chapter 307 state that "surface waters will not be toxic to man from ingestion of water, consumption of aquatic organisms, or contact with the skin, or to terrestrial or aquatic life." The methodology outlined in the "Procedures to Implement the Texas Surface Water Quality Standards" is designed to ensure compliance with 30 TAC Chapter 307. Specifically, the methodology is designed to ensure that no source will be allowed to discharge any wastewater that: (1) results in instream aquatic toxicity; (2) causes a violation of an applicable narrative or numerical state water quality standard; (3) results in the endangerment of a drinking water supply; or (4) results in aquatic bioaccumulation that threatens human health. Calculated water quality-based effluent limits can be found in Appendix B of this fact sheet.

Numerical temperature criteria are not applied for discharges via Outfall 002 into Brandy Branch Reservoir because: (a) Brandy Branch Reservoir is an industrial cooling lake impoundment and (b) temperature criteria have not been specifically established for industrial cooling lake impoundments, as provided in 30 TAC § 307.4(f).

Wastewater impoundments at this facility are determined to be compliant with the EPA's interim guidance *National Pollutant Discharge Elimination System (NPDES) Permitting of Wastewater Discharges from Flue Gas Desulfurization (FGD) and Coal Combustion Residuals (CCR) Impoundments at Steam Electric Power Plants* dated June 7, 2010. This determination is made based on the following information provided along with the permit application: (a) the FGD and CCR wastewater impoundments authorized in the permit are lined with clay, as specified in the permit application, (b) the permittee has been monitoring groundwater data since January 1985 as an internal control measure, to determine if the groundwater is impacted by the wastes in FGD and CCR wastewater impoundments, and (c) the groundwater monitoring data does not indicate any adverse impact to the groundwater quality from FGD and CCR wastewater impoundments.

TPDES permits contain technology-based effluent limits reflecting the best controls available. Where these technology-based permit limits do not protect water quality or the designated uses, additional water quality-based effluent limitations, conditions, or both are included. State narrative and numerical water quality standards are used in conjunction with EPA criteria and other toxicity databases to determine the adequacy of technology-based permit limits and the need for additional water quality-based controls. A comparison of technology-based effluent limits and calculated water quality-based effluent limits is provided in Appendix C of this fact sheet.

2. AQUATIC LIFE CRITERIA

a. SCREENING

Water quality-based effluent limitations are calculated from freshwater and marine aquatic life criteria found in Table 1 of the Texas Surface Water Quality Standards (30 TAC Chapter 307).

Outfalls 002: Acute freshwater criteria are applied at the edge of the zone of initial dilution (ZID) and chronic freshwater criteria are applied at the edge of the aquatic life mixing zone. The ZID is defined as radius of 25 feet from the point of discharge. The aquatic life mixing zone is defined as a radius of 100 feet from the point of discharge.

TCEQ uses the EPA horizontal jet plume model to estimate dilution at the edges of the ZID and aquatic life mixing zone for discharges greater than 10 MGD into lakes or reservoirs. General assumptions used in the horizontal jet plume model are: a non-buoyant discharge, a submersed pipe, and no cross flow. Based on this analysis, the following critical effluent percentages are calculated based on the permitted flow of > 100 MGD:

Acute Effluent %: 100 Chronic Effluent %: 100

Outfalls 003: Because Outfall 003 discharges on an intermittent and flow variable basis, the discharge is screened using acute freshwater criteria only. Acute freshwater criteria are applied at the edge of the zone of initial dilution (ZID). The ZID for discharges into lakes and reservoirs is defined as radius of 25 feet from the point where the discharge enters Brandy Branch Reservoir.

The TCEQ's practice is to establish minimum estimated effluent percentages at the edges of the ZID and aquatic life mixing zone for discharges that are 10 MGD or less into sections of lakes or reservoirs that are at least 200 feet wide. These critical effluent percentages are as follows:

Acute Effluent %: 60 Chronic Effluent %: N/A

Outfall 004: Because Outfall 004 discharges on an intermittent and flow variable basis, the discharge is screened using acute freshwater criteria only. There is no mixing zone or zone of initial dilution (ZID) for this discharge directly to an intermittent stream; acute freshwater criteria apply at the end of pipe. The following critical effluent percentages are being used:

Acute Effluent %: 100% Chronic Effluent %: N/A

Outfall 005: There is no mixing zone or zone of initial dilution (ZID) for this discharge directly to an intermittent stream; acute freshwater criteria apply at the end of pipe. Chronic freshwater criteria are applied in the perennial freshwater stream.

For the intermittent stream, the percent effluent for acute protection of aquatic life is 100% since the 7Q2 of the intermittent stream is 0.0 cfs. This effluent percentage also provides acute protection of aquatic life in the perennial stream. TCEQ uses the mass balance equation to estimate dilution in the perennial stream during critical conditions.

The estimated dilution for chronic protection of aquatic life is calculated using the two-year maximum monthly average flow of 0.85 MGD and the 7-day, 2-year (7Q2) flow of 0.36 cfs for Hatley Creek, the perennial stream. The following critical effluent percentages are being used:

Acute Effluent % 100% Chronic Effluent % 79%

Outfall 006: There is no mixing zone or zone of initial dilution (ZID) for this discharge directly to an intermittent stream; acute freshwater criteria apply at the end of pipe. Chronic freshwater criteria are applied in the perennial freshwater stream.

For the intermittent stream, the percent effluent for acute protection of aquatic life is 100% since the 7Q2 of the intermittent stream is 0.0 cfs. This effluent percentage also provides acute protection of aquatic life in the perennial stream. TCEQ uses the mass balance equation to estimate dilution in the perennial stream during critical conditions. The estimated dilution for chronic protection of aquatic life is calculated using the two-year maximum monthly average flow of 2.27 MGD and the 7-day, 2-year (7Q2) flow of 0.36 cfs for Hatley Creek, the perennial stream.

The following critical effluent percentages are being used:

Acute Effluent % 100% Chronic Effluent % 91%

Wasteload allocations (WLAs) are calculated using the above estimated effluent percentages, criteria outlined in the Texas Surface Water Quality Standards, and partitioning coefficients for metals (when appropriate and designated in the implementation procedures).

The WLA is the end-of-pipe effluent concentration that can be discharged when after mixing in the receiving stream, the instream numerical criteria will not be exceeded. From the WLA, a long term average (LTA) is calculated using a log normal probability distribution, a given coefficient of variation (0.6), and a 99th percentile confidence level, for discharges via Outfalls 002 and 003 into the Brandy Branch Reservoir.

For discharges via Outfalls 004, 005, and 006 to Hatley Creek, the lower of the two LTAs (acute and chronic) is used to calculate a daily average and daily maximum effluent limitation for the protection of aquatic life using the same statistical considerations with the 99th percentile confidence level and a standard number of monthly effluent samples collected (12).

Assumptions used in deriving the effluent limitations include segment values for hardness, chlorides, pH and total suspended solids (TSS) according to the segment-specific values contained in the TCEQ guidance document, *Procedures to Implement the Texas Surface Water Quality Standards (IPs).*

The segment values are 41 mg/L $CaCO_3$ for hardness, 42 mg/L Chlorides, 6.7 standard units for pH, and 16 mg/L for TSS. For additional details on the calculation of water quality-based effluent limitations, refer to the TCEQ guidance document.

TCEQ practice for determining significant potential is to compare the reported analytical data against percentages of the calculated daily average water quality-based effluent limitation. Permit limitations are required when analytical data reported in the application exceeds 85 percent of the calculated daily average water quality-based effluent limitation. Monitoring and reporting is required when analytical data reported in the application exceeds 70 percent of the calculated daily average water quality-based effluent limitation.

b. PERMIT ACTION

No analytical data is available for screening against water quality-based effluent limitations for discharges via Outfall 006 since no discharges were made after May 2008. As shown in Appendices B and C, effluent limitations calculated at Outfall 006 are the same as those in the existing permit and are continued in the draft permit. A new Other Requirement No. 13 is included to require the permittee to analyze Outfall 006 effluent after the first qualifying discharge event.

Analytical data reported at Outfalls 002 and 005 in the application was screened against calculated water quality-based effluent limitations for the protection of aquatic life. Reported analytical data does not exceed 70 percent of the calculated daily average water quality-based effluent limitation for aquatic life protection for all analytes at these outfalls.

The existing permit includes effluent limitations for total selenium at Outfalls 003 and 004. As shown in Appendices B and C, the calculated effluent limitations for total selenium at these outfalls are the same as those in the existing permit and are continued in the draft permit. Since effluent limitations at Outfalls 003 and 004 in the existing permit are calculated for intermittent discharges, the draft permit is made more stringent by including a new Other Requirement No. 14 to restrict continuous discharges.

3. AQUATIC ORGANISM TOXICITY CRITERIA (7-DAY CHRONIC)

a. SCREENING

The existing permit includes chronic freshwater biomonitoring requirements at Outfall 002. There have been no lethal or sublethal test failures reported in eleven tests performed in the last five years for the *Ceriodaphnia dubia* test species and no lethal or sublethal test failures reported in eight tests performed in the last five years for the *Pimephales promelas* test species. Analytical data submitted with the application does not indicate violation of any numerical water quality-based effluent limitation for aquatic life protection, therefore minimum chronic freshwater biomonitoring conditions required for EPA classified major facilities are proposed in the draft permit as outlined below.

b. PERMIT ACTION

The provisions of this section apply to Outfall 002.

Based on information contained in the permit application, TCEQ has determined that there may be pollutants present in the effluent(s) that may have the potential to cause toxic conditions in the receiving stream.

Whole effluent biomonitoring is the most direct measure of potential toxicity, which incorporates the effects of synergism of effluent components and receiving stream water quality characteristics. Biomonitoring of the effluent is, therefore, required as a condition of this permit to assess potential toxicity. The biomonitoring procedures stipulated as a condition of this permit are as follows:

CHRONIC FRESHWATER

i) Chronic static renewal 7-day survival and reproduction test using the water flea (*Ceriodaphnia dubia*). The frequency of the testing is once per quarter.

ii) Chronic static renewal 7-day larval survival and growth test using the fathead minnow (*Pimephales promelas*). The frequency of testing shall be once per quarter.

Toxicity tests shall be performed in accordance with protocols described in the latest revision of the *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fourth Edition*, EPA/600/4-90/027F. The stipulated test species are appropriate to measure the toxicity of the effluent consistent with the requirements of the state water quality standards. The biomonitoring frequency has been established to reflect the likelihood of ambient toxicity and to provide data representative of the toxic potential of the facility's discharge.

This permit may be reopened to require effluent limits, additional testing, and/or other appropriate actions to address toxicity if biomonitoring data show actual or potential ambient toxicity to be the result of the permittee's discharge to the receiving stream or water body.

If none of the first four consecutive quarterly tests demonstrates significant lethal or sub-lethal effects, the permittee may submit this information in writing and, upon approval, reduce the testing frequency to once per six months for the invertebrate test species and once per year for the vertebrate test species. If one or more of the first four consecutive quarterly tests demonstrates significant sub-lethal effects, the permittee shall continue quarterly testing for that species until four consecutive quarterly tests demonstrate no significant sub-lethal effects. At that time, the permittee may apply for the appropriate testing frequency reduction for that species. If one or more of the first four consecutive quarterly tests demonstrates significant lethal effects, the permittee shall continue quarterly testing for that species until the permit is reissued.

c. DILUTION SERIES

The permit requires five (5) dilutions in addition to the control (0% effluent) to be used in the toxicity tests. These additional effluent concentrations shall be 32%, 42%, 56%, 75%, and 100%. The low-flow effluent concentration (critical dilution) is defined as 100% effluent.

The dilution series outlined above was calculated using a 0.75 factor applied to the critical dilution. The critical dilution is the estimated effluent dilution at the edge of the aquatic life mixing zone, which is calculated in section X.D.2.a. of this fact sheet.

4. AQUATIC ORGANISM TOXICITY CRITERIA (24-HOUR ACUTE)

a. SCREENING

The existing permit includes 24-hour acute freshwater biomonitoring language for Outfall 002. In the past five years, the permittee has performed twenty 24-hour acute tests with no demonstrations of significant mortality; ten of these tests used *Daphnia pulex* as the test species and ten of these tests used *Pimephales promelas* as the test species. Minimum 24-hour acute freshwater biomonitoring requirements are proposed in the draft permit as outlined below.

b. PERMIT ACTION

24-hour 100% acute biomonitoring tests are required at Outfall 002 at a frequency of once per six months for the life of the permit.

The biomonitoring procedures stipulated as a condition of this permit are as follows:

FRESHWATER

i) Acute 24-hour static toxicity test using a water flea (*Ceriodaphnia dubia* or *Daphnia pulex*). A minimum of five (5) replicates with eight (8) organisms per replicate shall be used for this test.

ii) Acute 24-hour static toxicity test using the fathead minnow (*Pimephales promelas*). A minimum of five (5) replicates with eight (8) organisms per replicate shall be used for this test.

5. AQUATIC ORGANISM BIOACCUMULATION CRITERIA

a. SCREENING

Outfall 002: Water quality-based effluent limitations for the protection of human health are calculated using criteria for the consumption of freshwater fish tissue found in Table 3 of the Texas Surface Water Quality Standards (30 TAC Chapter 307). Freshwater fish tissue bioaccumulation criteria are applied at the edge of the human health mixing zone for discharges into lakes and reservoirs.

The human health mixing zone for this discharge is defined as a 200-foot radius from the point where the discharge enters Brandy Branch Reservoir. TCEQ uses the EPA horizontal jet plume model to estimate dilution at the edge of the human health mixing zone for discharges greater than 10 MGD into lakes or reservoirs, or discharges into sections of lakes or reservoirs that are less than 200 feet wide, or both.

General assumptions used in the horizontal jet plume model are: a non-buoyant discharge, a submersed pipe, and no cross flow. Based on this analysis, the following critical effluent percentage is calculated based on the permitted flow that is greater than 100 MGD:

Human health Effluent %: 100

Outfall 003: Water quality-based effluent limitations for the protection of human health are calculated using criteria for the consumption of freshwater fish tissue found in Table 3 of the Texas Surface Water Quality Standards (30 TAC Chapter 307). Freshwater fish tissue bioaccumulation criteria are applied at the edge of the human health mixing zone for discharges into lakes and reservoirs. The human health mixing zone for this discharge is defined as a 200-foot radius from the point where the discharge enters Brandy Branch Reservoir. TCEQ practice is to establish a minimum estimated effluent percentage at the edge of the human health mixing zone for discharges that are 10 MGD or less into sections of lakes or reservoirs that are at least 200 feet wide. This critical effluent percentage is:

Human Health Effluent %: 8

Outfalls 004, 005, and 006:

Water quality-based effluent limitations for the protection of human health are calculated using criteria for the consumption of freshwater fish tissue found in Table 3 of the Texas Surface Water Quality Standards (30 TAC Chapter 307). Freshwater fish tissue bioaccumulation criteria are applied for human health protection in the perennial stream. TCEQ uses the mass balance equation to estimate dilution in the perennial stream during average flow conditions.

The estimated dilution for human health protection is calculated using the two-year monthly average effluent flow of 0.82 MGD at Outfall 004, 0.41 MGD at Outfall 005, and 1.17 MGD at Outfall 006, and the harmonic mean flow of 0.53 cfs for unnamed tributaries of Hatley Creek. The following critical effluent percentages are being used:

Human Health Effluent % at Outfall 004: 71%
Human Health Effluent % at Outfall 005: 54%
Human Health Effluent % at Outfall 006: 77%

Water quality-based effluent limitations for human health protection against the consumption of fish tissue are calculated using the same procedure as outlined for calculation of water quality-based effluent limitations for aquatic life protection. A 99th percentile confidence level in the long-term average calculation is used with only one long-term average value being calculated.

Significant potential is again determined by comparing reported analytical data against 70 percent and 85 percent of the calculated daily average water quality-based effluent limitation.

b. PERMIT ACTION

Reported analytical data does not exceed 70 percent of the calculated daily average water quality-based effluent limitation for human health protection.

6. DRINKING WATER SUPPLY PROTECTION

a. SCREENING

Water Quality Segment No. 0505 which receives the discharges from this facility is designated as a public water supply. An identical screening procedure is used to calculate water quality-based effluent limitations and determine the need for effluent limitations or monitoring requirements as outlined in section X.D.5.a of this fact sheet. Criteria used in the calculation of water quality-based effluent limitations for the protection of a drinking water supply are outlined in Table 3 (Water and Fish) of the Texas Surface Water Quality Standards (30 TAC Chapter 307). These criteria are developed from either drinking water maximum contaminant level (MCL) criteria outlined in 30 TAC Chapter 290, or from the combined human health effects of exposure to consumption of fish tissue and ingestion of drinking water.

b. PERMIT ACTION

Criteria in the "Water and Fish" section of Table 3 do not distinguish if the criteria are based on a drinking water standard or the combined effects of ingestion of drinking water and fish tissue. Effluent limitations or monitoring requirements to protect the drinking water supply (and other human health effects) were previously calculated and outlined in section X.D.5.a of this fact sheet.

XI. PRETREATMENT REQUIREMENTS

This facility is not defined as a publicly owned treatment works (POTW). Pretreatment requirements are not proposed in the draft permit.

XII. VARIANCE REQUESTS

No variance requests have been received.

XIII. PROCEDURES FOR FINAL DECISION

When an application is declared administratively complete, the Chief Clerk sends a letter to the applicant advising the applicant to publish the Notice of Receipt of Application and Intent to Obtain Permit in the newspaper. In addition, the Chief Clerk instructs the applicant to place a copy of the application in a public place for review and copying in the county where the facility is or will be located. This application will be in a public place throughout the comment period. The Chief Clerk also mails this notice to any interested persons and, if required, to landowners identified in the permit application.
This notice informs the public about the application, and provides that an interested person may file comments on the application or request a contested case hearing or a public meeting.

Once a draft permit is completed, it is sent, along with the Executive Director's preliminary decision, as contained in the technical summary or fact sheet, to the Chief Clerk. At that time, Notice of Application and Preliminary Decision will be mailed to the same people and published in the same newspaper as the prior notice. This notice sets a deadline for making public comments. The applicant must place a copy of the Executive Director's preliminary decision and draft permit in the public place with the application.

Any interested person may request a public meeting on the application until the deadline for filing public comments. A public meeting is intended for the taking of public comment, and is not a contested case proceeding. After the public comment deadline, the Executive Director prepares a response to all significant public comments on the application or the draft permit raised during the public comment period. The Chief Clerk then mails the Executive Director's Response to Comments and Final Decision to people who have filed comments, requested a contested case hearing, or requested to be on the mailing list. This notice provides that if a person is not satisfied with the Executive Director's response and decision, they can request a contested case hearing or file a request to reconsider the Executive Director's decision within 30 days after the notice is mailed.

The Executive Director will issue the permit unless a written hearing request or request for reconsideration is filed within 30 days after the Executive Director's Response to Comments and Final Decision is mailed. If a hearing request or request for reconsideration is filed, the Executive Director will not issue the permit and will forward the application and request to the TCEQ Commissioners for their consideration at a scheduled Commission meeting. If a contested case hearing is held, it will be a legal proceeding similar to a civil trial in state district court.

If the Executive Director calls a public meeting or the Commission grants a contested case hearing as described above, the Commission will give notice of the date, time, and place of the meeting or hearing. If a hearing request or request for reconsideration is made, the Commission will consider all public comments in making its decision and shall either adopt the Executive Director's response to public comments or prepare its own response. For additional information about this application contact Satya Dwivedula, P.E. at (512) 239-3548.

XIV. ADMINISTRATIVE RECORD

The following section is a list of the fact sheet citations to applicable statutory or regulatory provisions and appropriate supporting references.

A PERMIT

TPDES Permit No. WQ0002496000 (TX0087726) issued on May 14, 2007.

B. APPLICATION

TPDES wastewater permit application received on August 31, 2010.

C. 40 CFR CITATIONS

40 CFR Part 122
40 CFR Part 125
40 CFR Part 423

D. LETTERS/MEMORANDA/RECORDS OF COMMUNICATION

Interoffice memorandum from Mr. Michael Pfeil, Water Quality Standards Implementation Team to the Industrial Permits Team, dated December 15, 2010.

Interoffice memorandum from Mr. Mark A Rudolph, P.E., Water Quality Assessment Team to the Industrial Permits Team, dated December 15, 2010.

Interoffice memorandum from Mr. Graham Webb, Water Quality Assessment Team to the Industrial Permits Team, dated December 7, 2010.

Interoffice memorandum from Ms. Brittany Lee, Water Quality Standards Implementation Team to the Industrial Permits Team, dated April 26, 2011.

E-mail from Ms. Brittany Lee, Water Quality Standards Implementation Team, March 16, 2011.

E-Mail from Mr. Robert Hansen, Water Quality Standards Implementation Team, May 6, 2011.

Information from Mr. Frank Mills, American Electric Power, via e-mails dated January 12, 2011, March 7, 2011, March 10, 2011, March 25, 2011, April 15, 2011, April 19, 2011, April 25, 2011, April 26, 2011, April 27, 2011, May 18, 2011, May 25, 2011, and June 13, 2011.

E. MISCELLANEOUS

Quality Criteria for Water (1986), EPA 440/5-86-001, 5/1/86.

The State of Texas Water Quality Inventory, 13th Edition, Publication No. SFR-50, Texas Commission on Environmental Quality, December 1996.

Texas Surface Water Quality Standards, 30 TAC §§307.1 - 307.10, effective August 17, 2000, and Appendix E, effective February 27, 2002.

Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fourth Edition, EPA/600/4-90/027F.

Procedures to Implement the Texas Surface Water Quality Standards, Texas Commission on Environmental Quality, January 2003.

Guidance Document for Establishing Monitoring Frequencies for Domestic and Industrial Wastewater Discharge Permits," TCEQ Document No. 98-001.000-OWR-WQ, May 1998.

Appendix A
Calculated Technology-Based Effluent Limits

Outfall 002

The discharge at Outfall 002 consists of once-through cooling water (once-through condenser water and once-through miscellaneous cooling water) and previously monitored effluent. Previously monitored effluent consists of low volume wastewater permitted at internal Outfall 102; treated effluent from Plant "X" permitted at internal Outfall 202; and domestic wastewater permitted at internal Outfall 302. Technology-based effluent limitations are applied to the discharges of low volume wastewater, treated effluent from Plant "X", and treated domestic wastewater at internal Outfalls 102, 202, and 302 respectively.

The discharge of once-through cooling water is subject to categorical guidelines in 40 CFR Part 423 (Steam Electric Power Generating Point Source Category). Because the discharge of once-through cooling water comprises over 99% of the discharge at Outfall 002, effluent limitations applicable to once-through cooling water are applied to the entire discharge at Outfall 002.

Technology-based effluent limitations are listed as follows:

Best practicable control technology currently available (BPT) at 40 CFR §423.12 and best available technology economically achievable (BAT) at 40 CFR §423.13.

Parameter	Daily Average	Daily Maximum
Total Residual Chlorine	N/A	0.2 mg/L

* Total residual chlorine may not be discharged from any single generating unit for more than two hours per day.

Mass-based effluent limitation is derived multiplying the concentration-based limit by a conversion factor of 8.345, using a two-year maximum daily average flow of 544.3 MGD, and dividing by twelve because the discharge is limited to two hours per day.

Total Residual Chlorine

Daily Maximum = [0.2 mg/L] * [8.345] * [544.3 MGD / 12] = 75.7 lbs/day

The daily average reporting requirement and the daily maximum limitation for temperature are continued from the existing permit, based on best professional judgment (BPJ).

The technology-based effluent limitations established at Outfall 002 are provided below.

Parameter	Daily Average	Daily Maximum
Total Residual Chlorine	N/A	0.2 mg/L
	N/A	75.7 lbs/day
Temperature (°F)	(Report)	(122)

Outfall 102

Discharges via Outfall 102 consist of low volume wastewater and are subject to categorical guidelines provided in 40 CFR Part 423 (Steam Electric Power Generating Point Source Category).

Technology-based effluent limitations are listed as follows:

BPT (40 CFR §423.12)

Parameter	Daily Average	Daily Maximum
Total Suspended Solids	30 mg/L	100 mg/L
Oil and Grease	15 mg/L	20 mg/L
pH	Between 6.0 and 9.0 standard units	

Effluent limitations and monitoring requirements for total selenium were established based on best professional judgment because of the use of lignite at the facility, and are continued from the existing permit.

The BPT limitations outlined above are the same as those in the existing permit, and are continued in the draft permit as follows:

Parameter	Daily Average	Daily Maximum
Total Suspended Solids	30 mg/L	100 mg/L
Oil and Grease	15 mg/L	20 mg/L
Selenium, total	0.012 mg/L	0.025 mg/L
pH	Between 6.0 and 9.0 standard units.	

Outfall 202

Discharges via Outfall 202 consists of Plant "X" treated effluent (treated metal cleaning wastes, treated chemical metal cleaning wastes, wastewater from the Lignite Runoff Pond, wastewater from the Flue Gas Desulfurization & Fly Ash Sludge Landfill Pond, and wastewaters from the Ash Pond. The discharges of metal cleaning wastes, chemical metal cleaning wastes, coal pile runoff (Lignite Runoff Pond), and ash transport water (Ash Pond) are subject to categorical guidelines in 40 CFR Part 423 (Steam Electric Power Generating Point Source Category).

Technology-based effluent limitations for metal cleaning wastes are as follows:

BPT (40 CFR §423.12)

Parameter	Daily Average	Daily Maximum
Total Suspended Solids	30 mg/L	100 mg/L
Oil and Grease	15 mg/L	20 mg/L
Copper, Total	1.0 mg/L	1.0 mg/L
Iron, Total	1.0 mg/L	1.0 mg/L
pH	Between 6.0 and 9.0 standard units	

Technology-based effluent limitations for chemical metal cleaning wastes are as follows:

BAT (40 CFR §423.13)

Parameter	Daily Average	Daily Maximum
Copper, Total	1.0 mg/L	1.0 mg/L
Iron, Total	1.0 mg/L	1.0 mg/L

Technology-based effluent limitations for coal pile run off are as follows:

BPT (40 CFR §423.12)

Parameter	Daily Average	Daily Maximum
Total Suspended Solids	N/A	50 mg/L
pH	Between 6.0 and 9.0 standard units	

Technology-based effluent limitations for ash transport water are as follows:

BPT (40 CFR §423.12)

Parameter	Daily Average	Daily Maximum
Total Suspended Solids	30 mg/L	100 mg/L
Oil and Grease	15 mg/L	20 mg/L
pH	Between 6.0 and 9.0 standard units	

Technology-based effluent limitations established based on rules provided at 30 Texas Administrative Code (TAC) 319.22 at Outfall 202 are continued from the existing permit as follows:

Parameter	Daily Average	Daily Maximum
Copper, Total	0.5 mg/L	1.0 mg/L

Contributions of metal cleaning waste, chemical metal cleaning waste, coal pile runoff, and ash transport water to Plant "X" are intermittent and flow variable. For this reason, the more stringent of the applicable technology-based effluent limitations from each categorical waste stream is applied at Outfall 202. Effluent limitations for total copper and total iron are applicable only when discharging metal cleaning wastes or chemical metal cleaning wastes. Effluent limitations for total selenium were established based upon best professional judgment, and were included in the existing permit as a result of the discharges of coal pile runoff and ash transport water; these limits are continued in the draft permit.

The following technology-based effluent limitations are established at Outfall 002 in the draft permit.

Parameter	Daily Average	Daily Maximum
Total Suspended Solids	30 mg/L	50 mg/L
Oil and Grease	15 mg/L	20 mg/L
Selenium, Total	0.016 mg/L	0.033 mg/L
Iron, Total	1.0 mg/L	1.0 mg/L
Copper, Total	0.5 mg/L	1.0 mg/L
pH	Between 6.0 and 9.0 standard units	

Outfall 302

The discharge at Outfall 302 consists of treated domestic wastewater. The discharge of treated domestic wastewater is not subject to categorical guidelines in 40 CFR Part 423 (Steam Electric Power Generating Point Source Category). However, effluent limitations provided in 30 Texas Administrative Code Chapter 309 were established as technology-based limits for discharges via this outfall, based on BPJ. These limits are continued in the draft permit.

30 TAC 309

Parameter	Daily Average	Daily Maximum
Total Suspended Solids	20 mg/L	65 mg/L
Biochemical Oxygen Demand (5-day)	20 mg/L	65 mg/L
Total Residual Chlorine	1.0 mg/L (minimum)	N/A
pH	Between 6.0 and 9.0 standard units	

The technology-based effluent limitations outlined above are equal to those included in the existing permit, and are continued in the draft permit as follows:

Parameter	Daily Average	Daily Maximum
Total Suspended Solids	20 mg/L	65 mg/L
	2.5 lbs/day	N/A
Biochemical Oxygen Demand (5-day)	20 mg/L	65 mg/L
	2.5 lbs/day	N/A
Total Residual Chlorine	1.0 mg/L (minimum)	Report mg/L (maximum)
pH	Between 6.0 and 9.0 standard units	

Mass-based effluent limitations are calculated by multiplying the concentration based effluent limitation by the permitted flow and a conversion factor of 8.345.

Outfall 003

Discharges via Outfall 003, which consist of wastewater from the Lignite Runoff Pond (coal pile runoff) are subject to categorical guidelines in 40 CFR Part 423 (Steam Electric Power Generating Point Source Category).

Technology-based effluent limitations are provided as follows:

BPT (40 CFR §423.12)

Parameter	Daily Average	Daily Maximum
Total Suspended Solids	N/A	50 mg/L
pH	Between 6.0 and 9.0 standard units	

Additionally, a daily maximum effluent limitation for oil and grease was established at 20 mg/L based on best professional judgment, and is continued in the draft permit.

The technology-based effluent limitations outlined above are equal to those included in the existing permit, and are continued in the draft permit as follows:

Parameter	Daily Average	Daily Maximum
Total Suspended Solids	N/A	50 mg/L
Oil and Grease	N/A	20 mg/L
pH	Between 6.0 and 9.0 standard units.	

Outfall 004

The discharges via Outfall 004 consist of storm water from the Landfill Pond, wastewater from the Lignite Runoff Pond, and previously monitored effluent (wastewaters from the Ash Pond monitored at the internal Outfall 104). Storm water discharges via Landfill Pond are not subject to categorical guidelines in 40 CFR Part 423 (Steam Electric Power Generating Point Source Category). Wastewaters from the Lignite runoff are subject to categorical guidelines provided at 40 CFR §423.12 (BPT). Wastewaters from the Ash Pond are controlled at internal Outfall 104.

The following effluent limitations apply for wastewater discharges from the Lignite Runoff Pond (coal pile runoff):

BPT (40 CFR §423.12)

Parameter	Daily Average	Daily Maximum
Total Suspended Solids	N/A	50 mg/L
pH	Between 6.0 and 9.0 standard units	

The final technology-based effluent limitations at Outfall 004 are established as follows:

Parameter	Daily Average	Daily Maximum
Total Suspended Solids	N/A	50 mg/L
Oil and Grease	N/A	20 mg/L
pH	Between 6.0 and 9.0 standard units.	

The daily maximum effluent limitation for oil and grease is continued from the existing permit based on BPJ. The daily maximum effluent limitation for total suspended solids is reduced from 100 mg/L to 50 mg/L because Discharges via Outfall 004 include storm water from coal pile runoff.

Outfall 104

Discharges via internal Outfall 104 consist of wastewaters from the Ash Pond. Wastewaters in the Ash Pond consist of ash transport waters and low volume wastewaters. Both ash transport waters and low volume wastewaters are subject to subject to categorical guidelines in 40 CFR Part 423 (Steam Electric Power Generating Point Source Category).

Technology-based effluent limitations for ash transport waters are as follows:

BPT (40 CFR §423.12)

Parameter	Daily Average	Daily Maximum
Total Suspended Solids	30 mg/L	100 mg/L
Oil and Grease	15 mg/L	20 mg/L
pH	Between 6.0 and 9.0 standard units	

Technology-based effluent limitations for low volume wastewaters are as follows:

BPT (40 CFR §423.12)

Parameter	Daily Average	Daily Maximum
Total Suspended Solids	30 mg/L	100 mg/L
Oil and Grease	15 mg/L	20 mg/L
pH	Between 6.0 and 9.0 standard units	

The final technology-based effluent limitations at internal Outfall 104 are established as follows:

Parameter	Daily Average	Daily Maximum
Total Suspended Solids	30 mg/L	100 mg/L
Oil and Grease	15 mg/L	20 mg/L

Effluent limitation for pH is not established at internal Outfall 104 because: (a) Outfall 104 is established to facilitate transfer of wastewaters from the Ash Pond into the Landfill Pond on an infrequent basis, (b) Outfall 104 does not discharge to waters in the state, and (c) technology-based effluent limitations for pH are established at both the Landfill Pond (Outfall 004) and the Ash Pond (Outfall 006) to require the permittee to maintain pH between 6.0 and 9.0 standard units.

Outfall 005

Discharges via Outfall 005 consist of storm water from the Limestone Runoff Pond. Discharges of storm water from the Limestone Runoff Pond are not subject to categorical guidelines in 40 CFR Part 423 (Steam Electric Power Generating Point Source Category), and the following effluent limitations are continued from the existing permit and based on best professional judgment:

Parameter	Daily Average	Daily Maximum
Total Suspended Solids	N/A	50 mg/L
Oil and Grease	N/A	20 mg/L
pH	Between 6.0 and 9.0 standard units.	

Outfall 006

Discharges via Outfall 006 consist of wastewater from the Ash Pond (low volume wastewaters including boiler blowdown and demineralizer regenerant and ash transport water). Discharges of low volume wastewaters and ash transport waters are subject to categorical guidelines in 40 CFR Part 423 (Steam Electric Power Generating Point Source Category).

Technology-based effluent limitations for low volume wastewaters and fly ash transport waters are provided as follows:

BPT (40 CFR §423.12)

Parameter	Daily Average	Daily Maximum
Total Suspended Solids	30 mg/L	100 mg/L
Oil and Grease	15 mg/L	20 mg/L
pH	Between 6.0 and 9.0 standard units	

The technology-based effluent limitations outlined above are equal to those included in the draft permit, and are continued in the draft permit.

Other Requirements

Definitions for 10-year, 24-hour rainfall event, total residual chlorine, ash transport water, low volume wastes, metal cleaning wastes, chemical metal cleaning wastes, once-through cooling water, and coal pile runoff, as defined by 40 CFR 423.11, are included in Other Requirement No. 3 of the draft permit.

Other Requirement No. 2 is continued from the existing permit to prohibit the discharge of polychlorinated biphenyl compounds is included in the draft permit, as required by 40 CFR 423.12(b)(2) and 423.13(a).

Other Requirement No. 3.b. prohibiting the discharged from any single generating unit for more than two hours per day (unless the discharger demonstrates to the TCEQ that discharge for more than two hours is required for macroinvertebrate control) is included in the draft permit as required in 40 CFR § 423.12(b)(8) and 40 CFR § 423.13(d)(2).

Outfall 002: Determination of BPJ-Based Section 316(b) Permit Conditions

On July 6, 2004, EPA promulgated Phase II regulations in accordance with section 316(b) of the CWA. On Jan. 25, 2007, the Second U.S. Circuit Court of Appeals remanded most provisions of the Phase II rule. On March 29, 2007, EPA issued a memo stating that the rule should be considered suspended. On July 9, 2007, EPA published a Federal Register notice suspending all parts of the Phase II regulations except 40 CFR 125.90 (b) which provides for regulating existing cooling water intake structures on a case-by-case basis using BPJ.

A TPDES permit for any new or existing facility operating a cooling water intake structure (CWIS) must contain permit conditions meeting the requirements applicable to CWISs under section 316(b) of the Clean Water Act (CWA). Section 316(b) of the CWA requires that the location, design, construction, and capacity of CWISs reflect the Best Technology Available (BTA) for minimizing Adverse Environmental Impact (AEI). In accordance with the *EPA Draft Fact Sheet for Development of BPJ-Based Section 316(b) NPDES Permit Conditions* (Draft Fact Sheet), existing facilities are subject to section 316(b) conditions that reflect BTA for minimizing AEI on a case-by-case, Best Professional Judgment (BPJ) basis.

Therefore, in accordance with the *EPA Draft Fact Sheet for Development of BPJ-Based Section 316(b) NPDES Permit Conditions* (Draft Fact Sheet, 12/07 EPA FS), this existing facility is subject to section 316(b) conditions. The permittee has submitted the document, titled *Pirkey Power Plant Impingement Monitoring Data Report* dated March 2007, as a supplement to the application received on August 31, 2010, in which a description of how the facility meets Best Technology Available (BTA) for minimizing Adverse Environmental Impact (AEI) is included.

The Pirkey Power Plant withdraws cooling water from Brandy Branch Reservoir (also referred to as Hallsville or Pirkey Lake) located on Brandy Branch Creek in Harrison County, Texas.

The Pirkey Power Plant has a total design withdrawal capacity (flow) of 390,000 gallons per minute (gpm)(1,476 cubic meters per minute). Cooling water is withdrawn through three vertical wet pit circulating-water pumps, each rated at 126,000 gpm (478 cubic meters per minute), which also provide service water. The circulating- water pumps are designed to operate between reservoir elevations ranging from 325.0 to 340.0 feet (99.0 to 103.6 meters) mean sea level (msl). Traveling water screens (screens) serve the circulating-water pumps and bar grills are located in front of the screens. Stop logs are in place that isolate each of the three crib-house bays.

The screens have 3/8-inch-square (9.5 millimeter) stainless steel mesh. Normal operating pool elevation of Brandy Branch Reservoir is 340 (104 meters) msl. Calculated maximum through-screen velocity for the screens at low reservoir operating levels is 2.28 feet per second (0.7 meters per second).

The screens stay stationary under normal operating conditions except for periodic cleaning. The screen-wash system is operated two times a day for approximately thirty minutes to remove accumulated debris. Wash water is flushed into a sluice which drains into the reservoir. All three circulating-water pumps are required to operate the unit efficiently for most of the year, although during cooler months only two circulating-water pumps may be used due to lower inlet water temperatures.

Impingement samples were collected once every two weeks beginning on October 6, 2005 and ending on September 21, 2006. A total of 4,832 fish were impinged during this period. Threadfin shad and bluegill constituted about 94% of the total impinged fish. Impingement of sport fish was low, with largemouth bass making up about 1% of the total fish impinged.

Based on BPJ the existing facility currently meets BTA for minimizing AEI. Based upon the final review of the *Impingement Characterization Study (IMECS)* or a revised 316(b) Phase II regulation, if it is later determined that the current CWIS configuration is not representative of BTA for minimizing AEI, the permit may be reopened to incorporate additional requirements.

FACT SHEET AND EXECUTIVE DIRECTOR'S PRELIMINARY DECISION

Appendix B
Calculated Water Quality-Based Effluent Limits

TEXTOX MENU #4 - LAKE OR RESERVOIR

The water quality-based effluent limitations demonstrated below are calculated using:

Table 1, 2000 Texas Surface Water Quality Standards (30 TAC 307) for Freshwater Aquatic Life
Table 3, 2000 Texas Surface Water Quality Standards for Human Health
"Procedures to Implement the Texas Surface Water Quality Standards," Texas Commission on Environmental Quality, January 2003.

PERMITTEE INFORMATION:

Permittee Name:	Southwestern Electric Power Company
TPDES Permit No:	WQ0002496000
Outfall No:	002
Prepared by:	Lindsay Purifoy
Date:	January 10, 2011

DISCHARGE INFORMATION:

Receiving Waterbody:	Brandy Branch Reservoir
Segment No.:	0505
TSS (mg/L):	16
pH (Standard Units):	6.7
Hardness (mg/L as $CaCO_3$):	41
Chloride (mg/L):	42
Effluent Flow for Aquatic Life (MGD):	>100
Percent Effluent for Mixing Zone:	100
Percent Effluent for Zone of Initial Dilution:	100
Effluent Flow for Human Health (MGD):	>100
Percent Effluent for Human Health:	100
Public Water Supply Use?:	Yes

CALCULATE TOTAL/DISSOLVED RATIO:

Lake Metal	*Intercept (b)*	*Slope (m)*	*Partition Coefficien t (Kp)*	*Dissolved Fraction (Cd/Ct)*		*Water Effects Ratio (WER)*	
Aluminum	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Arsenic	5.68	-0.73	63240.08	0.50		1.00	Assumed
Cadmium	6.55	-0.92	276827.75	0.18		1.00	Assumed
Chromium (Total)	6.34	-0.27	1034874	0.06		1.00	Assumed
Chromium (+3)	6.34	-0.27	1034874	0.06		1.00	Assumed
Chromium (+6)	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Copper	6.45	-0.9	232429.91	0.21		1.00	Assumed
Lead	6.31	-0.53	469695.51	0.12		1.00	Assumed
Mercury	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Nickel	6.34	-0.76	265992.15	0.19		1.00	Assumed
Selenium	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Silver	6.38	-1.03	137961.03	0.31		1.00	Assumed
Zinc	6.52	-0.68	502572.14	0.11		1.00	Assumed

AQUATIC LIFE
CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS

Parameter	*Acute Standard (perennial) (ug/L)*	*Chronic Standard (ug/L)*	*WLAa*	*WLAc*	*LTAa*	*LTAc*	*Daily Avg. (ug/L)*	*Daily Max. (ug/L)*
Aldrin	3.000	N/A	3.00	N/A	0.96	N/A	1.41	2.99
Aluminum	991.000	N/A	991.00	N/A	317.12	N/A	466.17	986.24
Arsenic	360.000	190.000	724.26	382.25	231.76	233.17	340.69	720.79
Cadmium	11.991	0.512	65.10	2.78	20.83	1.70	2.49	5.27
Carbaryl	2.000	N/A	2.00	N/A	0.64	N/A	0.94	1.99
Chlordane	2.400	0.004	2.40	0.00	0.77	0.00	0.004	0.008
Chlorpyrifos	0.083	0.041	0.08	0.04	0.03	0.03	0.04	0.08
Chromium (+3)	264.384	85.763	4642.05	1505.83	1485.46	918.56	1350.28	2856.72
Chromium (+6)	15.700	10.600	15.70	10.60	5.02	6.47	7.39	15.62
Copper	7.954	5.734	37.54	27.06	12.01	16.51	17.66	37.35
Cyanide	45.780	10.690	45.78	10.69	14.65	6.52	9.59	20.28
4,4'-DDT	1.100	0.001	1.10	0.00	0.35	0.00	9.0E-04	2.0E-03
Dementon	N/A	0.100	N/A	0.10	N/A	0.06	0.09	0.19
Dicofol	59.300	19.800	59.30	19.80	18.98	12.08	17.75	37.56
Dieldrin	2.500	0.002	2.50	0.00	0.80	0.00	0.002	0.004
Diuron	210.000	70.000	210.00	70.00	67.20	42.70	62.77	132.80
Endosulfan I (alpha)	0.220	0.056	0.22	0.06	0.07	0.03	0.05	0.11
Endosulfan II (beta)	0.220	0.056	0.22	0.06	0.07	0.03	0.05	0.11
Endosulfan sulfate	0.220	0.056	0.22	0.06	0.07	0.03	0.05	0.11
Endrin	0.180	0.002	0.18	0.00	0.06	0.00	0.00	0.00
Guthion	N/A	0.010	N/A	0.01	N/A	0.01	0.01	0.02
Heptachlor	0.520	0.004	0.52	0.00	0.17	0.00	0.002	0.004
Hexachlorocyclohexane (Lindane)	2.000	0.080	2.00	0.08	0.64	0.05	0.07	0.15
Lead	23.330	0.810	198.65	6.90	63.57	4.21	6.18	13.08
Malathion	N/A	0.010	N/A	0.01	N/A	0.01	0.01	0.02
Mercury	2.400	1.300	2.40	1.30	0.77	0.79	1.13	2.39
Methoxychlor	N/A	0.030	N/A	0.03	N/A	0.02	0.03	0.06
Mirex	N/A	0.001	N/A	0.00	N/A	0.00	0.001	0.002
Nickel	665.727	73.934	3498.98	388.59	1119.67	237.04	348.45	737.19
Parathion (ethyl)	0.065	0.013	0.07	0.01	0.02	0.01	0.01	0.02
Pentachlorophenol	6.709	4.235	6.71	4.24	2.15	2.58	3.16	6.68
Phenanthrene	30.000	30.000	30.00	30.00	9.60	18.30	14.11	29.86
Polychlorinated Biphenyls (PCBs)	2.000	0.014	2.00	0.01	0.64	0.01	0.01	0.03
Selenium	20.000	5.000	20.00	5.00	6.40	3.05	4.48	9.49
Silver, (free ion)	0.800	N/A	9.60	N/A	3.07	N/A	4.52	9.56
Toxaphene	0.780	0.000	0.78	0.00	0.25	0.00	1.8E-04	3.8E-04
Tributlylin (TBT)	0.130	0.024	0.13	0.02	0.04	0.01	0.02	0.05
2,4,5 Trichlorophenol	136.000	64.000	136.00	64.00	43.52	39.04	57.39	121.41
Zinc	53.767	49.098	486.12	443.90	155.56	270.78	228.67	483.78

HUMAN HEALTH
CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS

Parameter	*Water and FW Fish (ug/L)*	*FW Fish Only (ug/L)*	*WLAh*	*LTAh*	*Daily Avg. (ug/L)*	*Daily Max. (ug/L)*
Acrylonitrile	1.280	10.900	1.28	1.19	1.75	3.70
Aldrin	0.004	0.004	0.00	0.00	0.01	0.01
Arsenic	50.000	N/A	100.59	93.55	137.52	290.94

Barium	2000.000	N/A	2000.00	1860.00	2734.20	5784.60
Benzene	5.000	106.000	5.00	4.65	6.84	14.46
Benzidine	0.001	0.003	0.00	0.00	0.001	0.003
Benzo(a)anthracene	0.099	0.810	0.10	0.09	0.14	0.29
Benzo(a)pyrene	0.099	0.810	0.10	0.09	0.14	0.29
Bis(chloromethyl)ether	0.005	0.019	0.00	0.00	0.01	0.01
Cadmium	5.000	N/A	27.15	25.25	37.11	78.52
Carbon Tetrachloride	3.760	8.400	3.76	3.50	5.14	10.88
Chlordane	0.021	0.021	0.02	0.02	0.03	0.06
Chlorobenzene	776.000	1380.000	776.00	721.68	1060.87	2244.42
Chloroform	100.000	1292.000	100.00	93.00	136.71	289.23
Chromiumd	100.000	3320.000	1755.80	1632.89	2400.35	5078
Chrysene	0.417	8.100	0.42	0.39	0.57	1.21
Cresols	3313.000	13116.000	3313.00	3081.09	4529.20	9582.19
Cyanide	200.000	N/A	200.00	186.00	273.42	578.46
4,4'-DDD	0.010	0.010	0.01	0.01	0.01	0.03
4,4'-DDE	0.007	0.007	0.01	0.01	0.01	0.02
4,4'-DDT	0.007	0.007	0.01	0.01	0.01	0.02
2,4'-D	70.000	N/A	70.00	65.10	95.70	202.46
Danitol	0.709	0.721	0.71	0.66	0.97	2.05
Dibromochloromethane	9.200	71.600	9.20	8.56	12.58	26.61
1,2-Dibromoethane	0.014	0.335	0.01	0.01	0.02	0.04
1,3-Dichloropropene (1,3- Dichloropropylene)	22.800	161.000	22.80	21.20	31.17	65.94
Dieldrin	0.002	0.002	0.00	0.00	0.002	0.005
p-Dichlorobenzene	75.000	N/A	75.00	69.75	102.53	216.92
1,2-Dichloroethane	5.000	73.900	5.00	4.65	6.84	14.46
1,1-Dichloroethylene	1.630	5.840	1.63	1.52	2.23	4.71
Dicofol	0.215	0.217	0.22	0.20	0.29	0.62
Dioxins/Furans (TCDD Equivalents)	1.34E-07	1.40E-07	1.34E-07	1.25E-07	1.83E-07	3.88E-07
Endrin	1.270	1.340	1.27	1.18	1.74	3.67
Fluoride	4000.000	N/A	4000.00	3720.00	5468.40	11569.20
Heptachlor	0.003	0.003	0.00	0.00	0.004	0.008
Heptachlor Epoxide	0.159	1.100	0.16	0.15	0.22	0.46
Hexachlorobenzene	0.019	0.020	0.02	0.02	0.03	0.06
Hexachlorobutadiene	2.990	3.600	2.99	2.78	4.09	8.65
Hexachlorocyclohexane (alpha)	0.163	0.413	0.16	0.15	0.22	0.47
Hexachlorocyclohexane (beta)	0.570	1.450	0.57	0.53	0.78	1.65
Hexachlorocyclohexane (gamma) (Lindane)	0.200	2.000	0.20	0.19	0.27	0.58
Hexachloroethane	84.200	278.000	84.20	78.31	115.11	243.53
Hexachlorophene	0.053	0.053	0.05	0.05	0.07	0.15
Lead	4.980	25.300	42.41	39.44	57.97	122.65
Mercury	0.012	0.012	0.01	0.01	0.02	0.04
Methoxyclor	2.210	2.220	2.21	2.06	3.02	6.39
Methyl Ethyl Ketone	5.29E+04	9.94E+06	5.29E+04	4.92E+04	7.23E+04	1.5E+05
Nitrate-Nitrogen (as Total Nitrogen)	10000.000	N/A	10000.00	9300.00	13671.00	28923.00
Nitrobenzene	37.300	233.000	37.30	34.69	50.99	107.88
N-Nitrosodiethylamine	0.038	7.680	0.04	0.04	0.05	0.11
N-Nitroso-di-n-Butylamine	1.840	13.500	1.84	1.71	2.52	5.32
PCB's (Polychlorinated Biphenyls)	0.001	0.001	0.00	0.00	0.002	0.004
Pentachlorobenzene	6.100	6.680	6.10	5.67	8.34	17.64
Pentachlorophenol	1.000	135.000	1.00	0.93	1.37	2.89
Pyridine	88.100	13333.000	88.10	81.93	120.44	254.81
Selenium	50.000	N/A	50.00	46.50	68.36	144.62
1,2,4,5-Tetrachlorobenzene	0.241	0.243	0.24	0.22	0.33	0.70
Tetrachloroethylene	5.000	323.000	5.00	4.65	6.84	14.46

Toxaphene	0.005	0.014	0.01	0.00	0.007	0.014
2,4,5-TP (Silvex)	47.000	50.300	47.00	43.71	64.25	135.94
2,4,5-Trichlorophenol	953.000	1069.000	953.00	886.29	1302.85	2756.36
Trichloroethylene	5.000	612.000	5.00	4.65	6.84	14.46
1,1,1-Trichloroethane	200.000	12586.000	200.00	186.00	273.42	578.46
TTHM (Sum of Total Trihalomethanes)	100.000	N/A	100.00	93.00	136.71	289.23
Vinyl Chloride	2.000	415.000	2.00	1.86	2.73	5.78

CALCULATE 70% AND 85% OF DAILY AVERAGE EFFLUENT LIMITATIONS

Parameter	*70%*	*85%*
Aquatic Life		
Aldrin	0.988	1.200
Aluminum	326.316	396.241
Arsenic	238.485	289.589
Cadmium	1.745	2.119
Carbaryl	0.659	0.800
Chlordane	2.7E-03	3.3E-03
Chlorpyrifos	0.026	0.031
Chromium (+3)	945.20	1147.74
Chromium (+6)	5.170	6.277
Copper	12.360	15.008
Cyanide	6.710	8.148
4,4'-DDT	6.3E-04	7.6E-4
Dementon	0.063	0.076
Dicofol	12.428	15.091
Dieldrin	1.2E-03	1.4E-03
Diuron	43.938	53.354
Endosulfan (alpha)	0.035	0.043
Endosulfan (beta)	0.035	0.043
Endosulfan sulfate	0.035	0.043
Endrin	0.001	0.002
Guthion	0.006	0.008
Heptachlor	0.002	0.003
Hexachlorocyclohexane (Lindane)	0.050	0.061
Lead	4.329	5.257
Malathion	0.006	0.008
Mercury	0.790	0.960
Methoxychlor	0.019	0.023
Mirex	6.3E-04	7.6E-04
Nickel	243.914	296.181
Parathion (ethyl)	0.008	0.010
Pentachlrophenol	2.209	2.683
Phenanthrene	9.878	11.995
Polychlorinated Biphenyls (PCBs)	0.009	0.011
Selenium	3.138	3.811
Silver, (free ion)	3.162	3.840
Toxaphene	1.3E-04	1.5E-04
Tributlytin (TBT)	0.015	0.018
2,4,5 Trichlorophenol	40.172	48.780
Zinc	160.069	194.369
Human Health		
Acrylonitrile	1.225	1.487
Aldrin	0.004	0.005
Arsenic	96.264	116.891

Barium	1913.940	2324.070
Benzene	4.785	5.810
Benzidine	1.0E-04	1.2E-03
Benzo(a)anthracene	0.095	0.115
Benzo(a)pyrene	0.095	0.115
Bis(chloromethyl)ether	0.004	0.005
Cadmium	25.978	31.545
Carbon Tetrachloride	3.598	4.369
Chlordane	0.020	0.024
Chlorobenzene	742.609	901.739
Chloroform	95.697	116.204
Chromium	1680.25	2040.30
Chrysene	0.399	0.485
Cresols	3170	3850
Cyanide	191.394	232.407
4,4'-DDD	0.010	0.012
4,4'-DDE	0.007	0.008
4,4'-DDT	0.007	0.008
2,4'-D	66.988	81.342
Danitol	0.678	0.824
Dibromochloromethane	8.804	10.691
1,2-Dibromoethane	0.013	0.016
1,3-Dichloropropene (1,3- Dichloropropylene)	21.819	26.494
Dieldrin	0.002	0.002
p-Dichlorobenzene	71.773	87.153
1,2-Dichloroethane	4.785	5.810
1,1-Dichloroethylene	1.560	1.894
Dicofol	0.206	0.250
Dioxins/Furans (TCDD Equivalents)	1.28E-07	1.56E-07
Endrin	1.215	1.476
Fluoride	3827.88	4648.14
Heptachlor	0.002	0.003
Heptachlor Epoxide	0.152	0.185
Hexachlorobenzene	0.019	0.023
Hexachlorobutadiene	2.861	3.474
Hexachlorocyclohexane (alpha)	0.156	0.189
Hexachlorocyclohexane (beta)	0.545	0.662
Hexachlorocyclohexane (gamma) (Lindane)	0.191	0.232
Hexachloroethane	80.577	97.843
Hexachlorophene	0.051	0.062
Lead	40.581	49.276
Mercury	0.012	0.014
Methoxyclor	2.115	2.568
Methyl Ethyl Ketone	5.06E+04	6.15E+04
Nitrate-Nitrogen (as Total Nitrogen)	9569.70	11620.35
Nitrobenzene	35.695	43.344
N-Nitrosodiethylamine	0.037	0.044
N-Nitroso-di-n-Butylamine	1.761	2.138
PCB's (Polychlorinated Biphenyls)	0.001	0.002
Pentachlorobenzene	5.838	7.088
Pentachlorophenol	0.957	1.162
Pyridine	84	102
Selenium	47.849	58.102
1,2,4,5-Tetrachlorobenzene	0.231	0.280
Tetrachloroethylene	4.785	5.810
Toxaphene	0.005	0.006

2,4,5-TP (Silvex)	44.978	54.616
2,4,5-Trichlorophenol	911.992	1107.419
Trichloroethylene	4.785	5.810
1,1,1-Trichloroethane	191	232
TTHM (Sum of Total Trihalomethanes)	95.697	116.204
Vinyl Chloride	1.914	2.324

The water quality-based effluent limitations demonstrated below are calculated using:

Table 1, 2000 Texas Surface Water Quality Standards (30 TAC 307) for Freshwater Aquatic Life
Table 3, 2000 Texas Surface Water Quality Standards for Human Health
"Procedures to Implement the Texas Surface Water Quality Standards," Texas Commission on Environmental Quality, January 2003.

PERMITTEE INFORMATION:

Permittee Name:	Southwestern Electric Power Company
TPDES Permit No:	WQ0002496000
Outfall No:	003
Prepared by:	Lindsay Purifoy
Date:	January 10, 2011

DISCHARGE INFORMATION:

Receiving Waterbody:	Brandy Branch Reservoir
Segment No.:	0505
TSS (mg/L):	16
pH (Standard Units):	6.7
Hardness (mg/L as $CaCO_3$):	41
Chloride (mg/L):	42
Effluent Flow for Aquatic Life (MGD):	<10
Percent Effluent for Mixing Zone:	15
Percent Effluent for Zone of Initial Dilution:	60
Effluent Flow for Human Health (MGD):	<10
Percent Effluent for Human Health:	8
Public Water Supply Use?:	yes

CALCULATE TOTAL/DISSOLVED RATIO:

Lake Metal	*Intercept (b)*	*Slope (m)*	*Partition Coefficient (Kp)*	*Dissolved Fraction (Cd/Ct)*		*Water Effects Ratio (WER)*	
Aluminum	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Arsenic	5.68	-0.73	63240.08	0.50		1.00	Assumed
Cadmium	6.55	-0.92	276827.75	0.18		1.00	Assumed
Chromium (Total)	6.34	-0.27	1034874	0.06		1.00	Assumed
Chromium (+3)	6.34	-0.27	1034874	0.06		1.00	Assumed
Chromium (+6)	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Copper	6.45	-0.9	232429.91	0.21		1.00	Assumed
Lead	6.31	-0.53	469695.51	0.12		1.00	Assumed
Mercury	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Nickel	6.34	-0.76	265992.15	0.19		1.00	Assumed
Selenium	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Silver	6.38	-1.03	137961.03	0.31		1.00	Assumed
Zinc	6.52	-0.68	502572.14	0.11		1.00	Assumed

FACT SHEET AND EXECUTIVE DIRECTOR'S PRELIMINARY DECISION

AQUATIC LIFE
CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS

Parameter	*Acute Standard (perennial) (ug/L)*	*WLAa*	*LTAa*	*Daily Avg. (ug/L)*	*Daily Max. (ug/L)*
Aldrin	3.000	5.00	1.60	2.35	4.98
Aluminum	991.000	1651.67	528.53	776.94	1643.74
Arsenic	360.000	1207.10	386.27	567.82	1201.31
Cadmium	11.991	108.50	34.72	51.04	107.98
Carbaryl	2.000	3.33	1.07	1.57	3.32
Chlordane	2.400	4.00	1.28	1.88	3.98
Chlorpyrifos	0.083	0.14	0.04	0.07	0.14
Chromium (+3)	264.384	7736.75	2475.76	3639.37	7699.61
Chromium (+6)	15.700	26.17	8.37	12.31	26.04
Copper	7.954	62.56	20.02	29.43	62.26
Cyanide	45.780	76.30	24.42	35.89	75.93
4,4'-DDT	1.100	1.83	0.59	0.862	1.825
Dementon	N/A	N/A	N/A	N/A	N/A
Dicofol	59.300	98.83	31.63	46.49	98.36
Dieldrin	2.500	4.17	1.33	1.96	4.15
Diuron	210.000	350.00	112.00	164.64	348.32
Endosulfan I (alpha)	0.220	0.37	0.12	0.17	0.36
Endosulfan II (beta)	0.220	0.37	0.12	0.17	0.36
Endosulfan sulfate	0.220	0.37	0.12	0.17	0.36
Endrin	0.180	0.30	0.10	0.14	0.30
Guthion	N/A	N/A	N/A	N/A	N/A
Heptachlor	0.520	0.87	0.28	0.41	0.86
Hexachlorocyclohexane (Lindane)	2.000	3.33	1.07	1.57	3.32
Lead	23.330	331.09	105.95	155.74	329.50
Malathion	N/A	N/A	N/A	N/A	N/A
Mercury	2.400	4.00	1.28	1.88	3.98
Methoxychlor	N/A	N/A	N/A	N/A	N/A
Mirex	N/A	N/A	N/A	N/A	N/A
Nickel	665.727	5831.63	1866.12	2743.20	5803.64
Parathion (ethyl)	0.065	0.11	0.03	0.05	0.11
Pentachlorophenol	6.709	11.18	3.58	5.26	11.13
Phenanthrene	30.000	50.00	16.00	23.52	49.76
Polychlorinated Biphenyls (PCBs)	2.000	3.33	1.07	1.57	3.32
Selenium	20.000	33.33	10.67	15.68	33.17
Silver, (free ion)	0.800	16.01	5.12	7.53	15.93
Toxaphene	0.780	1.30	0.42	0.612	1.294
Tributlytin (TBT)	0.130	0.22	0.07	0.10	0.22
2,4,5 Trichlorophenol	136.000	226.67	72.53	106.62	225.58
Zinc	53.767	810.20	259.26	381.12	806.31

HUMAN HEALTH
CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS

Parameter	*Water and FW Fish (ug/L)*	*FW Fish Only (ug/L)*	*WLAh*	*LTAh*	*Daily Avg. (ug/L)*	*Daily Max. (ug/L)*
Acrylonitrile	1.280	10.900	16.00	14.88	21.87	46.28
Aldrin	0.004	0.004	0.05	0.05	0.07	0.15
Arsenic	50.000	N/A	1257.40	1169.38	1718.99	3636.78

Barium	2000.000	N/A	25000.00	23250.00	34177.50	72307.50
Benzene	5.000	106.000	62.50	58.13	85.44	180.77
Benzidine	0.001	0.003	0.01	0.01	0.02	0.04
Benzo(a)anthracene	0.099	0.810	1.24	1.15	1.69	3.58
Benzo(a)pyrene	0.099	0.810	1.24	1.15	1.69	3.58
Bis(chloromethyl)ether	0.005	0.019	0.06	0.05	0.08	0.17
Cadmium	5.000	N/A	339.33	315.57	463.89	981.44
Carbon Tetrachloride	3.760	8.400	47.00	43.71	64.25	135.94
Chlordane	0.021	0.021	0.26	0.24	0.36	0.76
Chlorobenzene	776.0	1380.0	9700.0	9021.0	13260.9	28055.3
Chloroform	100.0	1292.0	1250.0	1162.5	1708.9	3615.4
Chromiumd	100.0	3320.0	21947.5	20411.2	30004.4	63478.7
Chrysene	0.417	8.100	5.21	4.85	7.13	15.08
Cresols	3313	13116	41413	38514	56615	119777
Cyanide	200	N/A	2500	2325	3418	7231
4,4'-DDD	0.010	0.010	0.13	0.12	0.18	0.37
4,4'-DDE	0.007	0.007	0.09	0.08	0.12	0.26
4,4'-DDT	0.007	0.007	0.09	0.08	0.12	0.26
2,4'-D	70.000	N/A	875.00	813.75	1196.21	2530.76
Danitol	0.709	0.721	8.86	8.24	12.12	25.63
Dibromochloromethane	9.200	71.600	115.00	106.95	157.22	332.61
1,2-Dibromoethane	0.014	0.335	0.18	0.16	0.24	0.51
1,3-Dichloropropene (1,3- Dichloropropylene)	22.800	161.000	285.00	265.05	389.62	824.31
Dieldrin	0.002	0.002	0.02	0.02	0.03	0.06
p-Dichlorobenzene	75.000	N/A	937.50	871.88	1281.66	2711.53
1,2-Dichloroethane	5.000	73.900	62.50	58.13	85.44	180.77
1,1-Dichloroethylene	1.630	5.840	20.38	18.95	27.85	58.93
Dicofol	0.215	0.217	2.69	2.50	3.67	7.77
Dioxins/Furans (TCDD Equivalents)	1.34E-07	1.40E-07	1.68E-06	1.56E-06	2.29E-06	4.84E-06
Endrin	1.270	1.340	15.88	14.76	21.70	45.92
Fluoride	4000	N/A	50000	46500	68355	144615
Heptachlor	0.003	0.003	0.03	0.03	0.04	0.09
Heptachlor Epoxide	0.159	1.100	1.99	1.85	2.72	5.75
Hexachlorobenzene	0.019	0.020	0.24	0.23	0.33	0.70
Hexachlorobutadiene	2.990	3.600	37.38	34.76	51.10	108.10
Hexachlorocyclohexane (alpha)	0.163	0.413	2.04	1.89	2.79	5.89
Hexachlorocyclohexane (beta)	0.570	1.450	7.13	6.63	9.74	20.61
Hexachlorocyclohexane (gamma) (Lindane)	0.200	2.000	2.50	2.33	3.42	7.23
Hexachloroethane	84.200	278.000	1052.50	978.83	1438.87	3044.15
Hexachlorophene	0.053	0.053	0.66	0.62	0.91	1.92
Lead	4.980	25.300	530.07	492.96	724.65	1533.11
Mercury	0.012	0.012	0.15	0.14	0.21	0.44
Methoxyclor	2.210	2.220	27.63	25.69	37.77	79.90
Methyl Ethyl Ketone	5.29E+04	9.94E+06	6.61E+05	6.15E+05	9.04E+05	1.91E+06
Nitrate-Nitrogen (as Total Nitrogen)	10000	N/A	125000.0	116250	170887.5	361537.5
Nitrobenzene	37.300	233.000	466.25	433.61	637.41	1348.53
N-Nitrosodiethylamine	0.038	7.680	0.48	0.44	0.65	1.38
N-Nitroso-di-n-Butylamine	1.840	13.500	23.00	21.39	31.44	66.52
PCB's (Polychlorinated Biphenyls)	0.001	0.001	0.02	0.02	0.02	0.05
Pentachlorobenzene	6.100	6.680	76.25	70.91	104.24	220.54
Pentachlorophenol	1.000	135.000	12.50	11.63	17.09	36.15
Pyridine	88.1	13333.0	1101.3	1024.2	1505.5	3185.1
Selenium	50.0	N/A	625.0	581.3	854.4	1807.7
1,2,4,5-Tetrachlorobenzene	0.241	0.243	3.01	2.80	4.12	8.71
Tetrachloroethylene	5.000	323.000	62.50	58.13	85.44	180.77

Toxaphene	0.005	0.014	0.06	0.06	0.09	0.18
2,4,5-TP (Silvex)	47.000	50.300	587.50	546.38	803.17	1699.23
2,4,5-Trichlorophenol	953.000	1069.000	11912.50	11078.63	16285.58	34454.52
Trichloroethylene	5.000	612.000	62.50	58.13	85.44	180.77
1,1,1-Trichloroethane	200.000	12586.000	2500.00	2325.00	3417.75	7230.75
TTHM (Sum of Total Trihalomethanes)	100.000	N/A	1250.00	1162.50	1708.88	3615.38
Vinyl Chloride	2.000	415.000	25.00	23.25	34.18	72.31

CALCULATE 70% AND 85% OF DAILY AVERAGE EFFLUENT LIMITATIONS

Parameter	*70%*	*85%*
Aquatic Life		
Aldrin	1.646	1.999
Aluminum	543.861	660.402
Arsenic	397.475	482.649
Cadmium	35.727	43.383
Carbaryl	1.098	1.333
Chlordane	1.317	1.599
Chlorpyrifos	0.046	0.055
Chromium (+3)	2547.56	3093.46
Chromium (+6)	8.616	10.462
Copper	20.599	25.013
Cyanide	25.124	30.508
4,4'-DDT	0.604	0.733
Dementon	N/A	N/A
Dicofol	32.544	39.518
Dieldrin	1.372	1.666
Diuron	115.248	139.944
Endosulfan (alpha)	0.121	0.147
Endosulfan (beta)	0.121	0.147
Endosulfan sulfate	0.121	0.147
Endrin	0.099	0.120
Guthion	N/A	N/A
Heptachlor	0.285	0.347
Hexachlorocyclohexane (Lindane)	1.098	1.333
Lead	109.021	132.383
Malathion	N/A	N/A
Mercury	1.317	1.599
Methoxychlor	N/A	N/A
Mirex	N/A	N/A
Nickel	1920.239	2331.719
Parathion (ethyl)	0.036	0.043
Pentachlrophenol	3.682	4.471
Phenanthrene	16.464	19.992
Polychlorinated Biphenyls (PCBs)	1.098	1.333
Selenium	10.976	13.328
Silver, (free ion)	5.270	6.400
Toxaphene	4.3E-01	5.2E-01
Tributlytin (TBT)	0.071	0.087
2,4,5 Trichlorophenol	74.637	90.630
Zinc	266.781	323.949
Human Health		
Acrylonitrile	15.312	18.593
Aldrin	0.049	0.059
Arsenic	1203.295	1461.144

Barium	23924.250	29050.875
Benzene	59.811	72.627
Benzidine	0.013	0.015
Benzo(a)anthracene	1.184	1.438
Benzo(a)pyrene	1.184	1.438
Bis(chloromethyl)ether	0.055	0.067
Cadmium	324.726	394.311
Carbon Tetrachloride	44.978	54.616
Chlordane	0.251	0.305
Chlorobenzene	9282.609	11271.740
Chloroform	1196.213	1452.544
Chromium	21003.09	25503.75
Chrysene	4.988	6.057
Cresols	39631	48123
Cyanide	2392.425	2905.088
4,4'-DDD	0.123	0.150
4,4'-DDE	0.087	0.106
4,4'-DDT	0.087	0.106
2,4'-D	837.349	1016.781
Danitol	8.481	10.299
Dibromochloromethane	110.052	133.634
1,2-Dibromoethane	0.167	0.203
1,3-Dichloropropene (1,3- Dichloropropylene)	272.736	331.180
Dieldrin	0.020	0.025
p-Dichlorobenzene	897.159	1089.408
1,2-Dichloroethane	59.811	72.627
1,1-Dichloroethylene	19.498	23.676
Dicofol	2.572	3.123
Dioxins/Furans (TCDD Equivalents)	1.60E-06	1.95E-06
Endrin	15.192	18.447
Fluoride	47848.50	58101.75
Heptachlor	0.031	0.038
Heptachlor Epoxide	1.902	2.310
Hexachlorobenzene	0.232	0.282
Hexachlorobutadiene	35.767	43.431
Hexachlorocyclohexane (alpha)	1.950	2.368
Hexachlorocyclohexane (beta)	6.818	8.279
Hexachlorocyclohexane (gamma) (Lindane)	2.392	2.905
Hexachloroethane	1007.211	1223.042
Hexachlorophene	0.635	0.771
Lead	507.258	615.956
Mercury	0.146	0.177
Methoxyclor	26.436	32.101
Methyl Ethyl Ketone	6.33E+05	7.68E+05
Nitrate-Nitrogen (as Total Nitrogen)	119621.25	145254.38
Nitrobenzene	446.187	541.799
N-Nitrosodiethylamine	0.457	0.555
N-Nitroso-di-n-Butylamine	22.010	26.727
PCB's (Polychlorinated Biphenyls)	0.016	0.019
Pentachlorobenzene	72.969	88.605
Pentachlorophenol	11.962	14.525
Pyridine	1054	1280
Selenium	598.106	726.272
1,2,4,5-Tetrachlorobenzene	2.883	3.501
Tetrachloroethylene	59.811	72.627
Toxaphene	0.060	0.073

2,4,5-TP (Silvex)	562.220	682.696
2,4,5-Trichlorophenol	11399.905	13842.742
Trichloroethylene	59.811	72.627
1,1,1-Trichloroethane	2392	2905
TTHM (Sum of Total Trihalomethanes)	1196.213	1452.544
Vinyl Chloride	23.924	29.051

TEXTOX MENU #2 - INTERMITTENT STREAM WITHIN 3 MILES OF A FRESHWATER PERENNIAL STREAM/RIVER

The water quality-based effluent limitations demonstrated below are calculated using:

Table 1, 2000 Texas Surface Water Quality Standards (30 TAC 307) for Freshwater Aquatic Life
Table 3, 2000 Texas Surface Water Quality Standards for Human Health
Procedures to Implement the Texas Surface Water Quality Standards, Texas Commission on Environmental Quality, January 2003

PERMITTEE INFORMATION

Permittee Name:	Southwestern Electric Power Company
TPDES Permit No.:	WQ0002496000
Outfall No.:	004
Prepared by:	Lindsay Purifoy
Date:	January 10, 2011

DISCHARGE INFORMATION

Intermittent Receiving Waterbody:	An unnamed tributary of Hatley Creek
Segment No.:	0505
TSS (mg/L):	16
pH (Standard Units):	6.7
Hardness (mg/L as $CaCO_3$):	41
Chloride (mg/L):	42
Effluent Flow for Aquatic Life (MGD):	1.67
Critical Low Flow [7Q2] (cfs) for intermittent:	0
Critical Low Flow [7Q2] (cfs) for perennial:	0.36
Percent Effluent for Mixing Zone:	88
Percent Effluent for Zone of Initial Dilution:	100
Effluent Flow for Human Health (MGD):	0.82
Harmonic Mean Flow (cfs) for perennial:	0.53
Percent Effluent for Human Health:	71
Public Water Supply Use?:	yes

CALCULATE TOTAL/DISSOLVED RATIO:

Stream/River Metal	*Intercept (b)*	*Slope (m)*	*Partitioning Coefficient (Kpo)*	*Dissolved Fraction (Cd/Ct)*		*Water Effects Ratio (WER)*	
Aluminum	N/A	N/A	N/A	1.00	Assumed	1	Assumed
Arsenic	5.68	-0.73	63240.08	0.50		1	Assumed
Cadmium	6.6	-1.13	173517.95	0.26		1	Assumed
Chromium (Total)	6.52	-0.93	251286.07	0.20		1	Assumed
Chromium (+3)	6.52	-0.93	251286.07	0.20		1	Assumed
Chromium (+6)	N/A	N/A	N/A	1.00	Assumed	1	Assumed
Copper	6.02	-0.74	134570.92	0.32		1	Assumed
Lead	6.45	-0.8	306693.11	0.17		1	Assumed
Mercury	N/A	N/A	N/A	1.00	Assumed	1	Assumed
Nickel	5.69	-0.57	100844.36	0.38		1	Assumed
Selenium	N/A	N/A	N/A	1.00	Assumed	1	Assumed
Silver	6.38	-1.03	137961.03	0.31		1	Assumed
Zinc	6.1	-0.7	180765.69	0.26		1	Assumed

AQUATIC LIFE

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS

Parameter	*Acute Standard (ug/L)*	*WLAa*	*LTAa*	*Daily Avg. (ug/L)*	*Daily Max. (ug/L)*
Aldrin	3	3.000	1.719	2.527	5.346
Aluminum	991	991.000	567.843	834.73	1765.99
Arsenic	360	724.263	415.003	610.05	1290.66
Cadmium	11.991	45.281	25.946	38.140	80.691
Carbaryl	2	2.000	1.146	1.685	3.564
Chlordane	2.4	2.400	1.375	2.022	4.277
Chlorpyrifos	0.083	0.083	0.048	0.070	0.148
Chromium (+3)	264.384	1327.36	760.577	1118.05	2365.40
Chromium (+6)	15.700	15.700	8.996	13.224	27.978
Copper	7.954	25.081	14.371	21.126	44.695
Cyanide	45.78	45.780	26.232	38.561	81.581
4,4'-DDT	1.1	1.100	0.630	0.927	1.960
Dementon	N/A	N/A	N/A	N/A	N/A
Dicofol	59.3	59.300	33.979	49.949	105.674
Dieldrin	2.5	2.500	1.433	2.106	4.455
Diuron	210	210.000	120.330	176.885	374.226
Endosulfan I (alpha)	0.22	0.220	0.126	0.185	0.392
Endosulfan II (beta)	0.22	0.220	0.126	0.185	0.392
Endosulfan sulfate	0.22	0.220	0.126	0.185	0.392
Endrin	0.18	0.180	0.103	0.152	0.321
Guthion	N/A	N/A	N/A	N/A	N/A
Heptachlor	0.52	0.520	0.298	0.438	0.927
Hexachlorocyclohexane (Lindane)	2	2.000	1.146	1.685	3.564
Lead	23.330	137.810	78.965	116.078	245.581
Malathion	N/A	N/A	N/A	N/A	N/A
Mercury	2.400	2.400	1.375	2.022	4.277
Methoxychlor	N/A	N/A	N/A	N/A	N/A
Mirex	N/A	N/A	N/A	N/A	N/A
Nickel	665.727	1739.89	996.954	1465.5	3100.5
Parathion (ethyl)	0.065	0.065	0.037	0.055	0.116
Pentachlorophenol	6.709	6.709	3.844	5.651	11.956
Phenanthrene	30	30.000	17.190	25.269	53.461
Polychlorinated Biphenyls (PCBs)	2	2.000	1.146	1.685	3.564
Selenium	20	20.000	11.460	16.846	35.641
Silver, (free ion)	0.8	9.603	5.503	8.089	17.113
Toxaphene	0.78	0.780	0.447	0.657	1.390
Tributlytin (TBT)	0.13	0.130	0.074	0.110	0.232
2,4,5 Trichlorophenol	136	136.000	77.928	114.6	242.4
Zinc	53.767	209.276	119.915	176.3	372.9

HUMAN HEALTH

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS

Parameter	*Water and FW Fish (ug/L)*	*FW Fish Only (ug/L)*	*WLAh*	*LTAh*	*Daily Avg. (ug/L)*	*Daily Max. (ug/L)*
Acrylonitrile	1.28	10.9	1.815	1.688	2.481	5.249
Aldrin	0.00408	0.00426	0.006	0.005	0.008	0.017
Arsenic	50	N/A	142.614	132.631	195.0	412.5
Barium	2000	N/A	2835.487	2637.003	3876.4	8201.1
Benzene	5	106	7.089	6.593	9.691	20.503

Benzidine	0.00106	0.00347	0.002	0.001	0.002	0.004
Benzo(a)anthracene	0.099	0.81	0.140	0.131	0.192	0.406
Benzo(a)pyrene	0.099	0.81	0.140	0.131	0.192	0.406
Bis(chloromethyl)ether	0.00462	0.0193	0.007	0.006	0.009	0.019
Cadmium	5	N/A	26.769	24.895	36.596	77.424
Carbon Tetrachloride	3.76	8.4	5.331	4.958	7.288	15.418
Chlordane	0.021	0.0213	0.030	0.028	0.041	0.086
Chlorobenzene	776	1380	1100.169	1023.157	1504.04	3182.018
Chloroform	100	1292	141.774	131.850	193.820	410.054
Chromiumd	100	3320	711.789	661.964	973.087	2058.707
Chrysene	0.417	8.1	0.591	0.550	0.808	1.710
Cresols	3313	13116	4696.984	4368.195	6421.2	13585.1
Cyanide	200	N/A	283.549	263.700	387.6	820.1
4,4'-DDD	0.0103	0.01	0.015	0.014	0.020	0.042
4,4'-DDE	0.0073	0.007	0.010	0.010	0.014	0.030
4,4'-DDT	0.0073	0.007	0.010	0.010	0.014	0.030
2,4'-D	70	N/A	99.242	92.295	135.674	287.038
Danitol	0.709	0.721	1.005	0.935	1.374	2.907
Dibromochloromethane	9.2	71.6	13.043	12.130	17.831	37.725
1,2-Dibromoethane	0.014	0.335	0.020	0.018	0.027	0.057
1,3-Dichloropropene (1,3- Dichloropropylene)	22.8	161	32.325	30.062	44.191	93.492
Dieldrin	0.00171	0.002	0.002	0.002	0.003	0.007
p-Dichlorobenzene	75	N/A	106.331	98.888	145.365	307.540
1,2-Dichloroethane	5	73.9	7.089	6.593	9.691	20.503
1,1-Dichloroethylene	1.63	5.84	2.311	2.149	3.159	6.684
Dicofol	0.215	0.217	0.305	0.283	0.417	0.882
Dioxins/Furans (TCDD Equivalents)	1.34E-07	1.4E-07	0.000	1.77E-07	2.6E-07	5.5E-07
Endrin	1.27	1.34	1.801	1.674	2.462	5.208
Fluoride	4000	N/A	5670.974	5274.01	7752.79	16402.16
Heptachlor	0.0026	0.00265	0.004	0.003	0.005	0.011
Heptachlor Epoxide	0.159	1.1	0.225	0.210	0.308	0.652
Hexachlorobenzene	0.0194	0.0198	0.028	0.026	0.038	0.080
Hexachlorobutadiene	2.99	3.6	4.239	3.942	5.795	12.261
Hexachlorocyclohexane (alpha)	0.163	0.413	0.231	0.215	0.316	0.668
Hexachlorocyclohexane (beta)	0.57	1.45	0.808	0.752	1.105	2.337
Hexachlorocyclohexane (gamma) (Lindane)	0.2	2	0.284	0.264	0.388	0.820
Hexachloroethane	84.2	278	119.374	111.018	163.196	345.265
Hexachlorophene	0.0531	0.053	0.075	0.070	0.103	0.218
Lead	4.98	25.3	41.706	38.787	57.017	120.627
Mercury	0.0122	0.0122	0.017	0.016	0.024	0.050
Methoxyclor	2.21	2.22	3.133	2.914	4.283	9.062
Methyl Ethyl Ketone	52917	9940000	75022.728	7.0E+04	1E+05	2E+05
Nitrate-Nitrogen (as Total Nitrogen)	10000	N/A	14177.434	13185.01	2E+04	4E+04
Nitrobenzene	37.3	233	52.882	49.180	72.295	152.950
N-Nitrosodiethylamine	0.0382	7.68	0.054	0.050	0.074	0.157
N-Nitroso-di-n-Butylamine	1.84	13.5	2.609	2.426	3.566	7.545
PCB's (Polychlorinated Biphenyls)	0.0013	0.0013	0.002	0.002	0.003	0.005
Pentachlorobenzene	6.1	6.68	8.648	8.043	11.823	25.013
Pentachlorophenol	1	135	1.418	1.319	1.938	4.101
Pyridine	88.1	13333	124.903	116.160	170.755	361.258
Selenium	50	N/A	70.887	65.925	96.910	205.027
1,2,4,5-Tetrachlorobenzene	0.241	0.243	0.342	0.318	0.467	0.988
Tetrachloroethylene	5	323	7.089	6.593	9.691	20.503
Toxaphene	0.005	0.014	0.007	0.007	0.010	0.021
2,4,5-TP (Silvex)	47	50.3	66.634	61.970	91.095	192.725
2,4,5-Trichlorophenol	953	1069	1351.109	1256.532	1847.1	3907.8

Trichloroethylene	5	612	7.089	6.593	9.691	20.503
1,1,1-Trichloroethane	200	12586	283.549	263.700	387.6	820.1
TTHM (Sum of Total Trihalomethanes)	100	N/A	141.774	131.850	193.8	410.1
Vinyl Chloride	2	415	2.835	2.637	3.876	8.201

CALCULATE 70% AND 85% OF DAILY AVERAGE EFFLUENT LIMITATIONS

Parameter	*70%*	*85%*
Aquatic Life		
Aldrin	1.769	2.148
Aluminum	584.3	709.5
Arsenic	427.0	518.5
Cadmium	26.698	32.419
Carbaryl	1.179	1.432
Chlordane	1.415	1.718
Chlorpyrifos	0.049	0.059
Chromium (+3)	782.634	950.341
Chromium (+6)	9.257	11.241
Copper	14.788	17.957
Cyanide	26.993	32.777
4,4'-DDT	0.649	0.788
Dementon	N/A	N/A
Dicofol	34.964	42.457
Dieldrin	1.474	1.790
Diuron	123.820	150.352
Endosulfan (alpha)	0.130	0.158
Endosulfan (beta)	0.130	0.158
Endosulfan sulfate	0.130	0.158
Endrin	0.106	0.129
Guthion	N/A	N/A
Heptachlor	0.307	0.372
Hexachlorocyclohexane (Lindane)	1.179	1.432
Lead	81.255	98.667
Malathion	N/A	N/A
Mercury	1.415	1.718
Methoxychlor	N/A	N/A
Mirex	N/A	N/A
Nickel	1025.9	1245.7
Parathion (ethyl)	0.038	0.047
Pentachlrophenol	4E+00	5E+00
Phenanthrene	17.689	21.479
Polychlorinated Biphenyls (PCBs)	1.179	1.432
Selenium	11.792	14.319
Silver, (free ion)	5.662	6.876
Toxaphene	0.460	0.558
Tributlytin (TBT)	0.077	0.093
2,4,5 Trichlorophenol	80.188	97.371
Zinc	123.4	149.8
Human Health		
Acrylonitrile	1.737	2.109
Aldrin	0.006	0.007
Arsenic	136.48	165.722
Barium	2713.48	3294.93
Benzene	6.784	8.237
Benzidine	0.001	0.002

Benzo(a)anthracene	0.134	0.163
Benzo(a)pyrene	0.134	0.163
Bis(chloromethyl)ether	0.006	0.008
Cadmium	25.617	31.107
Carbon Tetrachloride	5.101	6.194
Chlordane	0.028	0.035
Chlorobenzene	1052.829	1278.44
Chloroform	135.674	164.747
Chromiumd	681.161	827.124
Chrysene	0.566	0.687
Cresols	4494.9	5458.1
Cyanide	271.348	329.493
4,4'-DDD	0.014	0.017
4,4'-DDE	0.010	0.012
4,4'-DDT	0.010	0.012
2,4'-D	94.972	115.323
Danitol	0.962	1.168
Dibromochloromethane	12.482	15.157
1,2-Dibromoethane	0.019	0.023
1,3-Dichloropropene (1,3- Dichloropropylene)	30.934	37.562
Dieldrin	0.002	0.003
p-Dichlorobenzene	101.8	123.6
1,2-Dichloroethane	6.784	8.237
1,1-Dichloroethylene	2.211	2.685
Dicofol	0.292	0.354
Dioxins/Furans (TCDD Equivalents)	1.8E-07	2.2E-07
Endrin	1.723	2.092
Fluoride	5426.95	6589.87
Heptachlor	0.004	0.004
Heptachlor Epoxide	0.216	0.262
Hexachlorobenzene	0.026	0.032
Hexachlorobutadiene	4.057	4.926
Hexachlorocyclohexane (alpha)	0.221	0.269
Hexachlorocyclohexane (beta)	0.773	0.939
Hexachlorocyclohexane (gamma) (Lindane)	0.271	0.329
Hexachloroethane	114.237	138.717
Hexachlorophene	0.072	0.087
Lead	39.912	48.464
Mercury	0.017	0.020
Methoxyclor	2.998	3.641
Methyl Ethyl Ketone	7.2E+04	8.7E+04
Nitrate-Nitrogen (as Total Nitrogen)	1.4E+04	1.6E+04
Nitrobenzene	50.606	61.451
N-Nitrosodiethylamine	0.052	0.063
N-Nitroso-di-n-Butylamine	2.496	3.031
PCB's (Polychlorinated Biphenyls)	1.8E-03	2.1E-03
Pentachlorobenzene	8.276	10.050
Pentachlorophenol	1.357	1.647
Pyridine	119.529	145.142
Selenium	67.837	82.373
1,2,4,5-Tetrachlorobenzene	0.327	0.397
Tetrachloroethylene	6.784	8.237
Toxaphene	0.007	0.008
2,4,5-TP (Silvex)	63.767	77.431
2,4,5-Trichlorophenol	1293.0	1570.0
Trichloroethylene	6.784	8.237

1,1,1-Trichloroethane	271.3	329.5
TTHM (Sum of Total Trihalomethanes)	135.7	164.7
Vinyl Chloride	2.713	3.295

TEXTOX MENU #2 - INTERMITTENT STREAM WITHIN 3 MILES OF A FRESHWATER PERENNIAL STREAM/RIVER

The water quality-based effluent limitations demonstrated below are calculated using:

Table 1, 2000 Texas Surface Water Quality Standards (30 TAC 307) for Freshwater Aquatic Life
Table 3, 2000 Texas Surface Water Quality Standards for Human Health
Procedures to Implement the Texas Surface Water Quality Standards, Texas Commission on Environmental Quality, January 2003

PERMITTEE INFORMATION

Permittee Name:	Southwestern Electric Power Company
TPDES Permit No.:	WQ0002496000
Outfall No.:	005
Prepared by:	Lindsay Purifoy
Date:	January 10, 2011

DISCHARGE INFORMATION

Intermittent Receiving Waterbody:	An unnamed tributary of Hatley Creek
Segment No.:	0505
TSS (mg/L):	16
pH (Standard Units):	6.7
Hardness (mg/L as $CaCO_3$):	41
Chloride (mg/L):	42
Effluent Flow for Aquatic Life (MGD):	0.85
Critical Low Flow [7Q2] (cfs) for intermittent:	0
Critical Low Flow [7Q2] (cfs) for perennial:	0.36
Percent Effluent for Mixing Zone:	79
Percent Effluent for Zone of Initial Dilution:	100
Effluent Flow for Human Health (MGD):	0.41
Harmonic Mean Flow (cfs) for perennial:	0.53
Percent Effluent for Human Health:	54
Public Water Supply Use?:	yes

CALCULATE TOTAL/DISSOLVED RATIO:

Stream/River Metal	*Intercept (b)*	*Slope (m)*	*Partitioning Coefficient (Kpo)*	*Dissolved Fraction (Cd/Ct)*		*Water Effects Ratio (WER)*	
Aluminum	N/A	N/A	N/A	1.00	Assumed	1	Assumed
Arsenic	5.68	-0.73	63240.08	0.50		1	Assumed
Cadmium	6.6	-1.13	173517.95	0.26		1	Assumed
Chromium (Total)	6.52	-0.93	251286.07	0.20		1	Assumed
Chromium (+3)	6.52	-0.93	251286.07	0.20		1	Assumed
Chromium (+6)	N/A	N/A	N/A	1.00	Assumed	1	Assumed
Copper	6.02	-0.74	134570.92	0.32		1	Assumed
Lead	6.45	-0.8	306693.11	0.17		1	Assumed
Mercury	N/A	N/A	N/A	1.00	Assumed	1	Assumed
Nickel	5.69	-0.57	100844.36	0.38		1	Assumed
Selenium	N/A	N/A	N/A	1.00	Assumed	1	Assumed
Silver	6.38	-1.03	137961.03	0.31		1	Assumed
Zinc	6.1	-0.7	180765.69	0.26		1	Assumed

AQUATIC LIFE

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS

Parameter	*Acute Standard (ug/L)*	*Chronic Standard (ug/L)*	*WLAa*	*WLAc*	*LTAa*	*LTAc*	*Daily Avg. (ug/L)*	*Daily Max. (ug/L)*
Aldrin	3	N/A	3.000	N/A	1.719	N/A	2.527	5.346
Aluminum	991	N/A	991.000	N/A	567.843	N/A	834.729	1765.99
Arsenic	360	190	724.263	486.885	415.003	374.902	551.105	1165.94
Cadmium	11.991	0.512	45.281	2.463	25.946	1.896	2.787	5.897
Carbaryl	2	N/A	2.000	N/A	1.146	N/A	1.685	3.564
Chlordane	2.4	0.004	2.400	0.005	1.375	0.004	0.006	0.012
Chlorpyrifos	0.083	0.041	0.083	0.052	0.048	0.040	0.059	0.125
Chromium (+3)	264.384	85.763	1327.360	548.447	760.577	422.305	620.788	1313.37
Chromium (+6)	15.700	10.6	15.700	13.502	8.996	10.396	13.224	27.978
Copper	7.954	5.838	25.081	23.448	14.371	18.055	21.126	44.695
Cyanide	45.78	10.7	45.780	13.629	26.232	10.494	15.427	32.637
4,4'-DDT	1.1	0.001	1.100	0.001	0.630	0.001	0.001	0.003
Dementon	N/A	0.1	N/A	0.127	N/A	0.098	0.144	0.305
Dicofol	59.3	19.8	59.300	25.220	33.979	19.419	28.546	60.394
Dieldrin	2.5	0.002	2.500	0.003	1.433	0.002	0.003	0.006
Diuron	210	.70	210.000	89.161	120.330	68.654	100.922	213.515
Endosulfan I (alpha)	0.22	0.056	0.220	0.071	0.126	0.055	0.081	0.171
Endosulfan II (beta)	0.22	0.056	0.220	0.071	0.126	0.055	0.081	0.171
Endosulfan sulfate	0.22	0.056	0.220	0.071	0.126	0.055	0.081	0.171
Endrin	0.18	0.002	0.180	0.003	0.103	0.002	0.003	0.006
Guthion	N/A	0.01	N/A	0.013	N/A	0.010	0.014	0.031
Heptachlor	0.52	0.004	0.520	0.005	0.298	0.004	0.006	0.012
Hexachlorocyclohexane (Lindane)	.2	0.08	2.000	0.102	1.146	0.078	0.115	0.244
Lead	23.330	0.810	137.810	6.094	78.965	4.692	6.898	14.593
Malathion	N/A	0.01	N/A	0.013	N/A	0.010	0.014	0.031
Mercury	2.400	1.3	2.400	1.656	1.375	1.275	1.874	3.965
Methoxychlor	N/A	0.03	N/A	0.038	N/A	0.029	0.043	0.092
Mirex	N/A	0.001	N/A	0.001	N/A	0.001	0.001	0.003
Nickel	665.727	73.934	1739.885	246.122	996.954	189.514	278.585	589.387
Parathion (ethyl)	0.065	0.013	0.065	0.017	0.037	0.013	0.019	0.040
Pentachlorophenol	6.709	4.235	6.709	5.395	3.844	4.154	5.651	11.956
Phenanthrene	30	30	30.000	38.212	17.190	29.423	25.269	53.461
Polychlorinated Biphenyls (PCBs)	2	0.014	2.000	0.018	1.146	0.014	0.020	0.043
Selenium	20	5	20.000	6.369	11.460	4.904	7.209	15.251
Silver, (free ion)	0.8	N/A	9.603	N/A	5.503	N/A	8.089	17.113
Toxaphene	0.78	0.0002	0.780	0.000	0.447	0.000	2.9E-04	6.1E-04
Tributlytin (TBT)	0.13	0.024	0.130	0.031	0.074	0.024	0.035	0.073
2,4,5 Trichlorophenol	136	64	136.000	81.519	77.928	62.770	92.271	195.214
Zinc	53.767	49.098	209.276	243.411	119.915	187.427	176.275	372.935

HUMAN HEALTH

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS

Parameter	*Water and FW Fish (ug/L)*	*FW Fish Only (ug/L)*	*WLAh*	*LTAh*	*Daily Avg. (ug/L)*	*Daily Max. (ug/L)*
Acrylonitrile	1.28	10.9	2.349	2.185	3.212	6.795
Aldrin	0.00408	0.00426	0.007	0.007	0.010	0.022
Arsenic	50	N/A	184.635	171.711	252.415	534.021
Barium	2000	N/A	3670.974	3414.006	5018.588	10617.56
Benzene	5	106	9.177	8.535	12.546	26.544
Benzidine	0.00106	0.00347	0.002	0.002	0.003	0.006

Benzo(a)anthracene	0.099	0.81	0.182	0.169	0.248	0.526
Benzo(a)pyrene	0.099	0.81	0.182	0.169	0.248	0.526
Bis(chloromethyl)ether	0.00462	0.0193	0.008	0.008	0.012	0.025
Cadmium	5	N/A	34.657	32.231	47.379	100.237
Carbon Tetrachloride	3.76	8.4	6.901	6.418	9.435	19.961
Chlordane	0.021	0.0213	0.039	0.036	0.053	0.111
Chlorobenzene	776	1380	1424.338	1324.634	1947.212	4119.612
Chloroform	100	1292	183.549	170.700	250.929	530.878
Chromiumd	100	3320	921.520	857.014	1259.810	2665.313
Chrysene	0.417	8.1	0.765	0.712	1.046	2.214
Cresols	3313	13116	6080.968	5655.300	8313.291	17587.98
Cyanide	200	N/A	367.097	341.401	501.859	1061.756
4,4'-DDD	0.0103	0.01	0.019	0.018	0.026	0.055
4,4'-DDE	0.0073	0.007	0.013	0.012	0.018	0.039
4,4'-DDT	0.0073	0.007	0.013	0.012	0.018	0.039
2,4'-D	70	N/A	128.484	119.490	175.651	371.614
Danitol	0.709	0.721	1.301	1.210	1.779	3.764
Dibromochloromethane	9.2	71.6	16.886	15.704	23.086	48.841
1,2-Dibromoethane	0.014	0.335	0.026	0.024	0.035	0.074
1,3-Dichloropropene (1,3- Dichloropropylene)	22.8	161	41.849	38.920	57.212	121.040
Dieldrin	0.00171	0.002	0.003	0.003	0.004	0.009
p-Dichlorobenzene	75	N/A	137.662	128.025	188.197	398.158
1,2-Dichloroethane	5	73.9	9.177	8.535	12.546	26.544
1,1-Dichloroethylene	1.63	5.84	2.992	2.782	4.090	8.653
Dicofol	0.215	0.217	0.395	0.367	0.539	1.141
Dioxins/Furans (TCDD Equivalents)	1.34E-07	1.4E-07	0.000	2.29E-07	3.36E-07	7.11E-07
Endrin	1.27	1.34	2.331	2.168	3.187	6.742
Fluoride	4000	N/A	7341.947	6828.011	1.0E-04	2.1E-04
Heptachlor	0.0026	0.00265	0.005	0.004	0.007	0.014
Heptachlor Epoxide	0.159	1.1	0.292	0.271	0.399	0.844
Hexachlorobenzene	0.0194	0.0198	0.036	0.033	0.049	0.103
Hexachlorobutadiene	2.99	3.6	5.488	5.104	7.503	15.873
Hexachlorocyclohexane (alpha)	0.163	0.413	0.299	0.278	0.409	0.865
Hexachlorocyclohexane (beta)	0.57	1.45	1.046	0.973	1.430	3.026
Hexachlorocyclohexane (gamma) (Lindane)	0.2	2	0.367	0.341	0.502	1.062
Hexachloroethane	84.2	278	154.548	143.730	211.283	446.999
Hexachlorophene	0.0531	0.053	0.097	0.091	0.133	0.282
Lead	4.98	25.3	53.995	50.215	73.817	156.170
Mercury	0.0122	0.0122	0.022	0.021	0.031	0.065
Methoxyclor	2.21	2.22	4.056	3.772	5.546	11.732
Methyl Ethyl Ketone	52917	9940000	97128.457	9.03E+04	1.33E+05	2.81E+05
Nitrate-Nitrogen (as Total Nitrogen)	10000	N/A	18354.868	17070.03	25092.94	53087.79
Nitrobenzene	37.3	233	68.464	63.671	93.597	198.017
N-Nitrosodiethylamine	0.0382	7.68	0.070	0.065	0.096	0.203
N-Nitroso-di-n-Butylamine	1.84	13.5	3.377	3.141	4.617	9.768
PCB's (Polychlorinated Biphenyls)	0.0013	0.0013	0.002	0.002	0.003	0.007
Pentachlorobenzene	6.1	6.68	11.196	10.413	15.307	32.384
Pentachlorophenol	1	135	1.835	1.707	2.509	5.309
Pyridine	88.1	13333	161.706	150.387	221.069	467.703
Selenium	50	N/A	91.774	85.350	125.465	265.439
1,2,4,5-Tetrachlorobenzene	0.241	0.243	0.442	0.411	0.605	1.279
Tetrachloroethylene	5	323	9.177	8.535	12.546	26.544
Toxaphene	0.005	0.014	0.009	0.009	0.013	0.027
2,4,5-TP (Silvex)	47	50.3	86.268	80.229	117.937	249.513
2,4,5-Trichlorophenol	953	1069	1749.219	1626.774	2391.357	5059.266
Trichloroethylene	5	612	9.177	8.535	12.546	26.544

1,1,1-Trichloroethane	200	12586	367.097	341.401	501.859	1061.756
TTHM (Sum of Total Trihalomethanes)	100	N/A	183.549	170.700	250.929	530.878
Vinyl Chloride	2	415	3.671	3.414	5.019	10.618

CALCULATE 70% AND 85% OF DAILY AVERAGE EFFLUENT LIMITATIONS

Parameter	*70%*	*85%*
Aquatic Life		
Aldrin	1.769	2.148
Aluminum	584.310	709.520
Arsenic	385.774	468.440
Cadmium	1.951	2.369
Carbaryl	1.179	1.432
Chlordane	0.004	0.005
Chlorpyrifos	0.041	0.050
Chromium (+3)	434.551	527.670
Chromium (+6)	9.257	11.241
Copper	14.788	17.957
Cyanide	10.799	13.113
4,4'-DDT	0.001	0.001
Dementon	0.101	0.123
Dicofol	19.983	24.265
Dieldrin	0.002	0.002
Diuron	70.645	85.784
Endosulfan (alpha)	0.057	0.069
Endosulfan (beta)	0.057	0.069
Endosulfan sulfate	0.057	0.069
Endrin	0.002	0.002
Guthion	0.010	0.012
Heptachlor	0.004	0.005
Hexachlorocyclohexane (Lindane)	0.081	0.098
Lead	4.828	5.863
Malathion	0.010	0.012
Mercury	1.312	1.593
Methoxychlor	0.030	0.037
Mirex	1.0E-03	1.2E-03
Nickel	195.009	236.797
Parathion (ethyl)	0.013	0.016
Pentachlrophenol	3.96E+00	4.80E+00
Phenanthrene	17.689	21.479
Polychlorinated Biphenyls (PCBs)	0.014	0.017
Selenium	11.792	14.319
Silver, (free ion)	5.662	6.876
Toxaphene	2.0E-04	2.5E-04
Tributlytin (TBT)	0.024	0.029
2,4,5 Trichlorophenol	64.590	78.431
Zinc	123.392	149.834
Human Health		
Acrylonitrile	2.248	2.730
Aldrin	0.007	0.009
Arsenic	176.69	214.553
Barium	3513.01	4265.80
Benzene	8.783	10.664
Benzidine	0.002	0.002
Benzo(a)anthracene	0.174	0.211

Benzo(a)pyrene	0.174	0.211
Bis(chloromethyl)ether	0.008	0.010
Cadmium	33.17	40.272
Carbon Tetrachloride	6.604	8.020
Chlordane	0.037	0.045
Chlorobenzene	1363.049	1655.130
Chloroform	175.651	213.290
Chromiumd	881.867	1070.839
Chrysene	0.732	0.889
Cresols	5819.304	7066.297
Cyanide	351.301	426.580
4,4'-DDD	0.018	0.022
4,4'-DDE	0.013	0.016
4,4'-DDT	0.013	0.016
2,4'-D	122.96	149.303
Danitol	1.245	1.512
Dibromochloromethane	16.160	19.623
1,2-Dibromoethane	0.025	0.030
1,3-Dichloropropene (1,3- Dichloropropylene)	40.048	48.630
Dieldrin	0.003	0.004
p-Dichlorobenzene	131.74	159.967
1,2-Dichloroethane	8.783	10.664
1,1-Dichloroethylene	2.863	3.477
Dicofol	0.378	0.459
Dioxins/Furans (TCDD Equivalents)	2.35E-07	2.86E-07
Endrin	2.231	2.709
Fluoride	7026.02	8531.60
Heptachlor	0.005	0.006
Heptachlor Epoxide	0.279	0.339
Hexachlorobenzene	0.034	0.041
Hexachlorobutadiene	5.252	6.377
Hexachlorocyclohexane (alpha)	0.286	0.348
Hexachlorocyclohexane (beta)	1.001	1.216
Hexachlorocyclohexane (gamma) (Lindane)	0.351	0.427
Hexachloroethane	147.898	179.590
Hexachlorophene	0.093	0.113
Lead	51.672	62.744
Mercury	0.021	0.026
Methoxyclor	3.882	4.714
Methyl Ethyl Ketone	9.29E+04	1.13E+05
Nitrate-Nitrogen (as Total Nitrogen)	1.76E+04	2.1E+04
Nitrobenzene	65.518	79.557
N-Nitrosodiethylamine	0.067	0.081
N-Nitroso-di-n-Butylamine	3.232	3.925
PCB's (Polychlorinated Biphenyls)	2.28E-03	2.77E-03
Pentachlorobenzene	10.715	13.011
Pentachlorophenol	1.757	2.133
Pyridine	154.748	187.908
Selenium	87.83	106.645
1,2,4,5-Tetrachlorobenzene	0.423	0.514
Tetrachloroethylene	8.783	10.664
Toxaphene	0.009	0.011
2,4,5-TP (Silvex)	82.556	100.246
2,4,5-Trichlorophenol	1673.950	2032.654
Trichloroethylene	8.783	10.664
1,1,1-Trichloroethane	351.301	426.580

TTHM (Sum of Total Trihalomethanes)	175.65	213.290
Vinyl Chloride	3.513	4.266

FACT SHEET AND EXECUTIVE DIRECTOR'S PRELIMINARY DECISION

TEXTOX MENU #2 - INTERMITTENT STREAM WITHIN 3 MILES OF A FRESHWATER PERENNIAL STREAM/RIVER

The water quality-based effluent limitations demonstrated below are calculated using:

Table 1, 2000 Texas Surface Water Quality Standards (30 TAC 307) for Freshwater Aquatic Life
Table 3, 2000 Texas Surface Water Quality Standards for Human Health
Procedures to Implement the Texas Surface Water Quality Standards, Texas Commission on Environmental Quality, January 2003

PERMITTEE INFORMATION

Permittee Name:	Southwestern Electric Power Company
TPDES Permit No.:	WQ0002496000
Outfall No.:	006
Prepared by:	Lindsay Purifoy
Date:	January 10, 2011

DISCHARGE INFORMATION

Intermittent Receiving Waterbody:	An unnamed tributary of Hatley Creek
Segment No.:	505
TSS (mg/L):	16
pH (Standard Units):	6.7
Hardness (mg/L as $CaCO_3$):	41
Chloride (mg/L):	42
Effluent Flow for Aquatic Life (MGD):	2.27
Critical Low Flow [7Q2] (cfs) for intermittent:	0
Critical Low Flow [7Q2] (cfs) for perennial:	0.36
Percent Effluent for Mixing Zone:	91
Percent Effluent for Zone of Initial Dilution:	100
Effluent Flow for Human Health (MGD):	1.17
Harmonic Mean Flow (cfs) for perennial:	0.53
Percent Effluent for Human Health:	77
Public Water Supply Use?:	yes

CALCULATE TOTAL/DISSOLVED RATIO:

Stream/River Metal	*Intercept (b)*	*Slope (m)*	*Partitioning Coefficient (Kpo)*	*Dissolved Fraction (Cd/Ct)*		*Water Effects Ratio (WER)*	
Aluminum	N/A	N/A	N/A	1.00	Assumed	1	Assumed
Arsenic	5.68	-0.73	63240.08	0.50		1	Assumed
Cadmium	6.6	-1.13	173517.95	0.26		1	Assumed
Chromium (Total)	6.52	-0.93	251286.07	0.20		1	Assumed
Chromium (+3)	6.52	-0.93	251286.07	0.20		1	Assumed
Chromium (+6)	N/A	N/A	N/A	1.00	Assumed	1	Assumed
Copper	6.02	-0.74	134570.92	0.32		1	Assumed
Lead	6.45	-0.8	306693.11	0.17		1	Assumed
Mercury	N/A	N/A	N/A	1.00	Assumed	1	Assumed
Nickel	5.69	-0.57	100844.36	0.38		1	Assumed
Selenium	N/A	N/A	N/A	1.00	Assumed	1	Assumed
Silver	6.38	-1.03	137961.03	0.31		1	Assumed
Zinc	6.1	-0.7	180765.69	0.26		1	Assumed

AQUATIC LIFE

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS

Parameter	*Acute Standard (ug/L)*	*Chronic Standard (ug/L)*	*WLAa*	*WLAc*	*LTAa*	*LTAc*	*Daily Avg. (ug/L)*	*Daily Max. (ug/L)*
Aldrin	3	N/A	3.000	N/A	1.719	N/A	2.527	5.346
Aluminum	991	N/A	991.000	N/A	567.843	N/A	834.729	1765.99
Arsenic	360	190	724.263	421.430	415.003	324.501	477.017	1009.20
Cadmium	11.991	0.512	45.281	2.131	25.946	1.641	2.413	5.104
Carbaryl	2	N/A	2.000	N/A	1.146	N/A	1.685	3.564
Chlordane	2.4	0.004	2.400	0.004	1.375	0.003	0.005	0.011
Chlorpyrifos	0.083	0.041	0.083	0.045	0.048	0.035	0.051	0.108
Chromium (+3)	264.384	85.763	1327.360	474.717	760.577	365.532	537.332	1136.80
Chromium (+6)	15.700	10.6	15.700	11.687	8.996	8.999	13.224	27.978
Copper	7.954	5.838	25.081	20.296	14.371	15.628	21.126	44.695
Cyanide	45.78	10.7	45.780	11.797	26.232	9.083	13.353	28.250
4,4'-DDT	1.1	0.001	1.100	0.001	0.630	0.001	0.001	0.003
Dementon	N/A	0.1	N/A	0.110	N/A	0.085	0.125	0.264
Dicofol	59.3	19.8	59.300	21.830	33.979	16.809	24.709	52.275
Dieldrin	2.5	0.002	2.500	0.002	1.433	0.002	0.002	0.005
Diuron	210	70	210.000	77.175	120.330	59.425	87.354	184.811
Endosulfan I (alpha)	0.22	0.056	0.220	0.062	0.126	0.048	0.070	0.148
Endosulfan II (beta)	0.22	0.056	0.220	0.062	0.126	0.048	0.070	0.148
Endosulfan sulfate	0.22	0.056	0.220	0.062	0.126	0.048	0.070	0.148
Endrin	0.18	0.002	0.180	0.002	0.103	0.002	0.002	0.005
Guthion	N/A	0.01	N/A	0.011	N/A	0.008	0.012	0.026
Heptachlor	0.52	0.004	0.520	0.004	0.298	0.003	0.005	0.011
Hexachlorocyclohexane (Lindane)	2	0.08	2.000	0.088	1.146	0.068	0.100	0.211
Lead	23.330	0.810	137.810	5.275	78.965	4.061	5.970	12.631
Malathion	N/A	0.01	N/A	0.011	N/A	0.008	0.012	0.026
Mercury	2.400	1.3	2.400	1.433	1.375	1.104	1.622	3.432
Methoxychlor	N/A	0.03	N/A	0.033	N/A	0.025	0.037	0.079
Mirex	N/A	0.001	N/A	0.001	N/A	0.001	0.001	0.003
Nickel	665.727	73.934	1739.885	213.034	996.954	164.036	241.133	510.153
Parathion (ethyl)	0.065	0.013	0.065	0.014	0.037	0.011	0.016	0.034
Pentachlorophenol	6.709	4.235	6.709	4.670	3.844	3.596	5.286	11.182
Phenanthrene	30	30	30.000	33.075	17.190	25.468	25.269	53.461
Polychlorinated Biphenyls (PCBs)	2	0.014	2.000	0.015	1.146	0.012	0.017	0.037
Selenium	20	5	20.000	5.513	11.460	4.245	6.240	13.201
Silver, (free ion)	0.8	N/A	9.603	N/A	5.503	N/A	8.089	17.113
Toxaphene	0.78	0.0002	0.780	0.000	0.447	0.000	0.000	0.001
Tributlytin (TBT)	0.13	0.024	0.130	0.026	0.074	0.020	0.030	0.063
2,4,5 Trichlorophenol	136	64	136.000	70.560	77.928	54.331	79.867	168.970
Zinc	53.767	49.098	209.276	210.688	119.915	162.230	176.275	372.935

HUMAN HEALTH

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS

Parameter	*Water and FW Fish (ug/L)*	*FW Fish Only (ug/L)*	*WLAh*	*LTAh*	*Daily Avg. (ug/L)*	*Daily Max. (ug/L)*
Acrylonitrile	1.28	10.9	1.655	1.539	2.262	4.786
Aldrin	0.00408	0.00426	0.005	0.005	0.007	0.015
Arsenic	50	N/A	130.043	120.940	177.782	376.124
Barium	2000	N/A	2585.555	2404.566	3534.71	7478.200
Benzene	5	106	6.464	6.011	8.837	18.696

Benzidine	0.00106	0.00347	0.001	0.001	0.002	0.004
Benzo(a)anthracene	0.099	0.81	0.128	0.119	0.175	0.370
Benzo(a)pyrene	0.099	0.81	0.128	0.119	0.175	0.370
Bis(chloromethyl)ether	0.00462	0.0193	0.006	0.006	0.008	0.017
Cadmium	5	N/A	24.409	22.701	33.370	70.600
Carbon Tetrachloride	3.76	8.4	4.861	4.521	6.645	14.059
Chlordane	0.021	0.0213	0.027	0.025	0.037	0.079
Chlorobenzene	776	1380	1003.195	932.972	1371.47	2901.542
Chloroform	100	1292	129.278	120.228	176.736	373.910
Chromiumd	100	3320	649.049	603.615	887.315	1877.244
Chrysene	0.417	8.1	0.539	0.501	0.737	1.559
Cresols	3313	13116	4282.972	3983.164	5855.25	12387.64
Cyanide	200	N/A	258.555	240.457	353.471	747.820
4,4'-DDD	0.0103	0.01	0.013	0.012	0.018	0.039
4,4'-DDE	0.0073	0.007	0.009	0.009	0.013	0.027
4,4'-DDT	0.0073	0.007	0.009	0.009	0.013	0.027
2,4'-D	70	N/A	90.494	84.160	123.715	261.737
Danitol	0.709	0.721	0.917	0.852	1.253	2.651
Dibromochloromethane	9.2	71.6	11.894	11.061	16.260	34.400
1,2-Dibromoethane	0.014	0.335	0.018	0.017	0.025	0.052
1,3-Dichloropropene (1,3- Dichloropropylene)	22.8	161	29.475	27.412	40.296	85.251
Dieldrin	0.00171	0.002	0.002	0.002	0.003	0.006
p-Dichlorobenzene	75	N/A	96.958	90.171	132.552	280.433
1,2-Dichloroethane	5	73.9	6.464	6.011	8.837	18.696
1,1-Dichloroethylene	1.63	5.84	2.107	1.960	2.881	6.095
Dicofol	0.215	0.217	0.278	0.258	0.380	0.804
Dioxins/Furans (TCDD Equivalents)	1.34E-07	1.4E-07	0.000	1.61E-07	2.37E-07	5.01E-07
Endrin	1.27	1.34	1.642	1.527	2.245	4.749
Fluoride	4000	N/A	5171.110	4809.132	7069.42	14956.40
Heptachlor	0.0026	0.00265	0.003	0.003	0.005	0.010
Heptachlor Epoxide	0.159	1.1	0.206	0.191	0.281	0.595
Hexachlorobenzene	0.0194	0.0198	0.025	0.023	0.034	0.073
Hexachlorobutadiene	2.99	3.6	3.865	3.595	5.284	11.180
Hexachlorocyclohexane (alpha)	0.163	0.413	0.211	0.196	0.288	0.609
Hexachlorocyclohexane (beta)	0.57	1.45	0.737	0.685	1.007	2.131
Hexachlorocyclohexane (gamma) (Lindane)	0.2	2	0.259	0.240	0.353	0.748
Hexachloroethane	84.2	278	108.852	101.232	148.811	314.832
Hexachlorophene	0.0531	0.053	0.069	0.064	0.094	0.199
Lead	4.98	25.3	38.030	35.368	51.991	109.994
Mercury	0.0122	0.0122	0.016	0.015	0.022	0.046
Methoxyclor	2.21	2.22	2.857	2.657	3.906	8.263
Methyl Ethyl Ketone	52917	9940000	68409.904	6.4E+04	9.3E+04	1.98E+05
Nitrate-Nitrogen (as Total Nitrogen)	10000	N/A	12927.774	12022.83	17673.6	37391.0
Nitrobenzene	37.3	233	48.221	44.845	65.922	139.468
N-Nitrosodiethylamine	0.0382	7.68	0.049	0.046	0.068	0.143
N-Nitroso-di-n-Butylamine	1.84	13.5	2.379	2.212	3.252	6.880
PCB's (Polychlorinated Biphenyls)	0.0013	0.0013	0.002	0.002	0.002	0.005
Pentachlorobenzene	6.1	6.68	7.886	7.334	10.781	22.809
Pentachlorophenol	1	135	1.293	1.202	1.767	3.739
Pyridine	88.1	13333	113.894	105.921	155.704	329.415
Selenium	50	N/A	64.639	60.114	88.368	186.955
1,2,4,5-Tetrachlorobenzene	0.241	0.243	0.312	0.290	0.426	0.901
Tetrachloroethylene	5	323	6.464	6.011	8.837	18.696
Toxaphene	0.005	0.014	0.006	0.006	0.009	0.019
2,4,5-TP (Silvex)	47	50.3	60.761	56.507	83.066	175.738
2,4,5-Trichlorophenol	953	1069	1232.017	1145.776	1684.29	3563.362

Trichloroethylene	5	612	6.464	6.011	8.837	18.696
1,1,1-Trichloroethane	200	12586	258.555	240.457	353.471	747.820
TTHM (Sum of Total Trihalomethanes)	100	N/A	129.278	120.228	176.736	373.910
Vinyl Chloride	2	415	2.586	2.405	3.535	7.478

CALCULATE 70% AND 85% OF DAILY AVERAGE EFFLUENT LIMITATIONS

Parameter	*70%*	*85%*
Aquatic Life		
Aldrin	1.769	2.148
Aluminum	584.310	709.520
Arsenic	333.912	405.465
Cadmium	1.689	2.051
Carbaryl	1.179	1.432
Chlordane	0.003	0.004
Chlorpyrifos	0.036	0.043
Chromium (+3)	376.132	456.732
Chromium (+6)	9.257	11.241
Copper	14.788	17.957
Cyanide	9.347	11.350
4,4'-DDT	0.001	0.001
Dementon	0.087	0.106
Dicofol	17.296	21.002
Dieldrin	0.002	0.002
Diuron	61.148	74.251
Endosulfan (alpha)	0.049	0.059
Endosulfan (beta)	0.049	0.059
Endosulfan sulfate	0.049	0.059
Endrin	0.002	0.002
Guthion	0.009	0.011
Heptachlor	0.003	0.004
Hexachlorocyclohexane (Lindane)	0.070	0.085
Lead	4.179	5.075
Malathion	0.009	0.011
Mercury	1.136	1.379
Methoxychlor	0.026	0.032
Mirex	0.001	0.001
Nickel	168.793	204.963
Parathion (ethyl)	0.011	0.014
Pentachlrophenol	3.70E+00	4.49E+0
Phenanthrene	17.689	21.479
Polychlorinated Biphenyls (PCBs)	0.012	0.015
Selenium	4.368	5.304
Silver, (free ion)	5.662	6.876
Toxaphene	1.7E-04	2.1E-04
Tributlytin (TBT)	0.021	0.025
2,4,5 Trichlorophenol	55.907	67.887
Zinc	123.392	149.834
Human Health		
Acrylonitrile	1.584	1.923
Aldrin	0.005	0.006
Arsenic	124.45	151.115
Barium	2474.25	3004.51
Benzene	6.186	7.511

Benzidine	0.001	0.002
Benzo(a)anthracene	0.122	0.149
Benzo(a)pyrene	0.122	0.149
Bis(chloromethyl)ether	0.006	0.007
Cadmium	23.36	28.365
Carbon Tetrachloride	4.652	5.648
Chlordane	0.026	0.032
Chlorobenzene	960.028	1165.75
Chloroform	123.715	150.225
Chromiumd	621.120	754.218
Chrysene	0.516	0.626
Cresols	4098.675	4976.96
Cyanide	247.430	300.451
4,4'-DDD	0.013	0.015
4,4'-DDE	0.009	0.011
4,4'-DDT	0.009	0.011
2,4'-D	86.60	105.158
Danitol	0.877	1.065
Dibromochloromethane	11.382	13.821
1,2-Dibromoethane	0.017	0.021
1,3-Dichloropropene (1,3- Dichloropropylene)	28.207	34.251
Dieldrin	0.002	0.003
p-Dichlorobenzene	92.79	112.669
1,2-Dichloroethane	6.186	7.511
1,1-Dichloroethylene	2.017	2.449
Dicofol	0.266	0.323
Dioxins/Furans (TCDD Equivalents)	1.66E-07	2.0E-07
Endrin	1.571	1.908
Fluoride	4948.60	6009.01
Heptachlor	0.003	0.004
Heptachlor Epoxide	0.197	0.239
Hexachlorobenzene	0.024	0.029
Hexachlorobutadiene	3.699	4.492
Hexachlorocyclohexane (alpha)	0.202	0.245
Hexachlorocyclohexane (beta)	0.705	0.856
Hexachlorocyclohexane (gamma) (Lindane)	0.247	0.300
Hexachloroethane	104.168	126.490
Hexachlorophene	0.066	0.080
Lead	36.394	44.192
Mercury	0.015	0.018
Methoxyclor	2.734	3.320
Methyl Ethyl Ketone	6.55E+04	7.9E+04
Nitrate-Nitrogen (as Total Nitrogen)	1.24E+04	1.5E+04
Nitrobenzene	46.146	56.034
N-Nitrosodiethylamine	0.047	0.057
N-Nitroso-di-n-Butylamine	2.276	2.764
PCB's (Polychlorinated Biphenyls)	1.61E-03	1.9E-03
Pentachlorobenzene	7.547	9.164
Pentachlorophenol	1.237	1.502
Pyridine	108.993	132.348
Selenium	61.86	75.113
1,2,4,5-Tetrachlorobenzene	0.298	0.362
Tetrachloroethylene	6.186	7.511
Toxaphene	0.006	0.008
2,4,5-TP (Silvex)	58.146	70.606
2,4,5-Trichlorophenol	1179.003	1431.65

Trichloroethylene	6.186	7.511
1,1,1-Trichloroethane	247.430	300.451
TTHM (Sum of Total Trihalomethanes)	123.71	150.225
Vinyl Chloride	2.474	3.005

Appendix C
Comparison of Technology-Based Effluent Limits and Water Quality-Based Effluent Limits

The following table is a summary of technology based effluent limitations calculated/assessed in the draft permit (Technology Based), effluent limitations from the existing permit (Existing Permit), and calculated/assessed water quality based effluent limitations (Water Quality). Effluent limitations appearing in bold are the most stringent of the three, and are included in the draft permit.

	Existing TPDES Permit Limits		Water Quality-Based Effluent Limits		Technology-Based Effluent Limits		Proposed TPDES Permit Limits		
Pollutant	Daily Avg.	Daily Max.	Daily Avg.	Daily Max.	Daily Avg.	Daily Max.	Daily Avg.	Daily Max.	Basis of Limit
Outfall 002									
Temperature (°F)	(Report)	(122)	N/A	N/A	N/A	N/A	**(Report)**	**(122)**	WQL[5]
TRC[1]	N/A	75.6 lb/day 0.2 mg/L	N/A	N/A	N//A	75.7 lb/d 0.2 mg/L	**N/A**	**75.6 lb/d 0.2 mg/L**	TBL[6]
Outfall 102									
TSS[2]	30 mg/L	100 mg/L	N/A	N/A	30 mg/L	100 mg/L	**30 mg/L**	**100 mg/L**	TBL
Oil and Grease	15 mg/L	20 mg/L	N/A	N/A	15 mg/L	20 mg/L	**15 mg/L**	**20 mg/L**	TBL
Selenium, Total	0.012 mg/L	0.025 mg/L	N/A	N/A	0.012 mg/L	0.025 mg/L	**0.012 mg/L**	**0.025 mg/L**	TBL
pH, s.u.	6.0, min.	9.0, max.	N/A	N/A	6.0, min.	9.0, max.	**6.0, min.**	**9.0, max.**	TBL
Outfall 202									
TSS	30 mg/L	100 mg/L	N/A	N/A	30 mg/L	50 mg/L	**30 mg/L**	**50 mg/L**	TBL
Oil and Grease	15 mg/L	20 mg/L	N/A	N/A	15 mg/L	20 mg/L	**15 mg/L**	**20 mg/L**	TBL
Selenium, Total	0.016 mg/L	0.033 mg/L	N/A	N/A	0.016 mg/L	0.033 mg/L	**0.016 mg/L**	**0.033 mg/L**	TBL
Iron, Total	1.0 mg/L	1.0 mg/L	N/A	N/A	1.0 mg/L	1.0mg/L	**1.0 mg/L**	**1.0 mg/L**	TBL
Copper, Total	0.5 mg/L	1.0 mg/L	N/A	N/A	0.5 mg/L	1.0 mg/L	**0.5 mg/L**	**1.0 mg/L**	TBL

	Existing TPDES Permit Limits		Water Quality-Based Effluent Limits		Technology-Based Effluent Limits		Proposed TPDES Permit Limits		
pH, s.u.	6.0, min.	9.0, max.	N/A	N/A	6.0, min.	9.0, max.	**6.0, min.**	**9.0, max.**	TBL
Outfall 302									
BOD_5[3]	2.5 lb/d[4] 20 mg/L	65 mg/L	N/A	N/A	2.5 lb/d[4] 20 mg/L	65 mg/L	**2.5 lb/d 20 mg/L**	**65 mg/L**	TBL
TSS	2.5 lb/d 20 mg/L	65 mg/L	N/A	N/A	2.5 lb/d 20 mg/L	65 mg/L	**2.5 lb/d 20 mg/L**	**65 mg/L**	TBL
TRC	1.0 mg/L (min)	Report (max)	N/A	N/A	1.0 mg/L (min)	Report (max)	**1.0 mg/L (min)**	**Report (max)**	TBL
pH, s.u.	6.0, min.	9.0, max.	N/A	N/A	6.0, min.	9.0, max.	**6.0, min.**	**9.0, max.**	TBL
Outfall 003									
TSS	N/A	50 mg/L	N/A	N/A	N/A	50 mg/L	**N/A**	**50 mg/L**	TBL
Oil and Grease	N/A	20 mg/L	N/A	N/A	N/A	20 mg/L	**N/A**	**20 mg/L**	TBL
Selenium, Total	N/A	0.033 mg/L	N/A	0.033 mg/L	N/A	N/A	**N/A**	**0.033 mg/L**	WQL
pH, s.u.	6.0, min.	9.0, max.	N/A	N/A	6.0, min.	9.0, max.	**6.0, min.**	**9.0, max.**	TBL
Outfall 004									
TSS	N/A	100 mg/L	N/A	N/A	N/A	50 mg/L	N/A	**50 mg/L**	TBL
Oil and Grease	N/A	20 mg/L	N/A	N/A	N/A	20 mg/L	N/A	**20 mg/L**	TBL
Selenium, Total	N/A	0.036 mg/L	N/A	0.036 mg/L	N/A	N/A	N/A	**0.036 mg/L**	WQL
pH, s.u.	6.0, min.	9.0, max.	N/A	N/A	6.0, min.	9.0, max.	**6.0, min.**	**9.0, max.**	TBL
Outfall 104									
TSS	N/A	N/A	N/A	N/A	30 mg/L	100 mg/L	**30 mg/L**	**100 mg/L**	TBL
Oil and Grease	N/A	N/A	N/A	N/A	15 mg/L	20 mg/L	**15 mg/L**	**20 mg/L**	TBL

	Existing TPDES Permit Limits		Water Quality-Based Effluent Limits		Technology-Based Effluent Limits		Proposed TPDES Permit Limits		
Outfall 005									
TSS	N/A	50 mg/L	N/A	N/A	N/A	50 mg/L	N/A	**50 mg/L**	TBL
Oil and Grease	N/A	20 mg/L	N/A	N/A	N/A	20 mg/L	N/A	**20 mg/L**	TBL
pH, s.u.	6.0, min.	9.0, max.	N/A	N/A	6.0, min.	9.0, max.	**6.0, min.**	**9.0, max.**	TBL
Outfall 006									
TSS	30 mg/L	100 mg/L	N/A	N/A	30 mg/L	100 mg/L	**30 mg/L**	**100 mg/L**	TBL
Oil and Grease	15 mg/L	20 mg/L	N/A	N/A	15 mg/L	20 mg/L	**15 mg/L**	**20 mg/L**	TBL
Selenium, Total	0.006 mg/L	0.013 mg/L	0.006 mg/L	0.013 mg/L	N/A	N/A	**0.006 mg/L**	**0.013 mg/L**	WQL
pH, s.u.	6.0, min.	9.0, max.	N/A	N/A	6.0, min.	9.0, max.	**6.0, min.**	**9.0, max.**	TBL

[1]TRC = Total Residual Chlorine
[2]TSS = Total Suspended Solids
[3]BOD_5 = Biochemical oxygen demand, 5-day
[4]lb/d = Pounds per day.
[5] WBL = Water Quality-Based Limit
[6] TBL = Technology-Based Limit

Exhibit D –

EPA Comments on White Stallion TPDES Permit

Walls, Steven E SWG

Ref 15

From: Randy Bird [rbird@whitestallionenergycenter.com]
Sent: Sunday, May 15, 2011 7:34 AM
To: Walls, Steven E SWG
Cc: Rotondi, Frank; Rikki Stanley; Molly Cagle; Sharon Mattox; 'Kathleen Alsup'; Scott Jecker
Subject: TPDES permit
Attachments: EPA Response letter 04882 Copy 5-13-11.pdf

Hi Steve,

Attached is the response by TCEQ to EPA concerns with our TPDES permit.

Take care,

Randy Bird, P.E.

Chief Operating Officer

White Stallion Energy Center, LLC

Phone 859-200-4752

1605 7th St.

Bay City, Tx 77414

www.whitestallionenergycenter.com <http://www.whitestallionenergycenter.com/>

15

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

May 13, 2011

91 7108 2133 3935 2010 1054

Ms. Claudia V. Hosch, Associate Director
Water Quality Protection Division
NPDES Permits and TMDLs Branch
1445 Ross Avenue
Dallas, Texas 75202-2733

Re: Response to Interim Objection to Draft Permit and Request for Additional Information for TPDES Permit No. WQ0004882000 (TX0131962)

Dear Ms. Hosch:

The Texas Commission on Environmental Quality (TCEQ) offers the following responses and associated draft permit and Statement of Basis (SoB) revisions to your July 29, 2010 Interim Objection and Request for Additional Information letter on the draft permit package referenced above.

Interim Objection 1

Outfall 001 is authorized to discharge cooling tower blowdown, commingled with low volume waste sources, air conditioning condensate, steam condensate, compressor condensate, previously monitored effluent (Outfall 101, treated domestic wastewater), and storm water. 40 CFR 423.15(n) required that in the event that waste streamed from various sources are combined for treatment or discharge, the quantity of each pollutant controlled by effluent limitation guidelines (ELGs) attributable to each controlled waste source shall not exceed the specified limitations for that waste source (i.e., must meet ELGs prior to dilution.) Please clarify and provide any appropriate revisions to the fact sheet and/or the draft permit.

Response 1

The draft permit has been revised with new internal outfalls to apply ELGs to each controlled water source. The ELGs for cooling tower blowdown are now applied at internal Outfall 201. The ELGs for low volume waste sources are now applied at internal Outfall 301. See revised draft permit and SoB.

Interim Objection 2

The Texas Surface Water Quality Standards contain a temperature criterion of 95°F for Segment 1401. The draft permit proposes only monitoring requirements for temperature at Outfall 001. Since the authorized discharge will go directly to the Colorado River Tidal it appears that a daily maximum limit of 95°F is required at Outfall 001. Please clarify this issue and provide any revisions to the fact sheet and/or the draft permit.

15

Response 2

A daily maximum temperature limit of 95°F has been placed in the draft permit at Outfall 001, in order to resolve Interim Objection 2. The draft permit also includes the additional following *Other Requirement No. 20.*

20. The permittee shall comply with the temperature requirements of 30 TAC §307.4(f) of the Texas Surface Water Quality Standards.

Interim Objection 3

Other Requirement No. 3, page 12 of the draft permit, states that "[t]here shall be no discharge of polychlorinated biphenyl (PCB) transformer fluid." For consistency with 40 CFR 423.12(b)(s), such requirement should specifically state that "[t]here shall be no discharge of polychlorinated biphenyl (PCB) transformer compounds such as those commonly used for transformer fluid." The latter statement prohibits the discharge of all PCB compounds. Please provide the appropriate revisions to the draft permit.

Response 3

Other Requirement No. 4, page 12 has been revised to be consistent with the language found at 40 CFR 423.12(b)(s).

Interim Objection 4

Storm water runoff from the fuel storage and limestone storage areas [i.e., includes coal pile and/or petroleum coke (pet coke) runoff] drains to the Coal Pile Sedimentation Basins which will have a capacity of 12.8 million gallons. Based on pages 4-5 of the Statement of Basis, it does not appear that TCEQ considered the guidance provided by the EPA Headquarters on June 7, 2010, *National Pollutant Discharge Elimination System Permitting of Wastewater Discharges from Flue Gas Desulfurization and Coal Combustion Residuals Impoundments at Steam Electric Power Plants.* Please provide any appropriate revisions to the fact sheet and/or the draft permit.

Response 4

The TCEQ did not consider the guidance document *National Pollutant Discharge Elimination System Permitting of Wastewater Discharges from Flue Gas Desulfurization and Coal Combustion Residuals Impoundments at Steam Electric Power Plants* during the drafting of this permit. The permit application was received and the draft permit was developed prior to the publication of the guidance.

The facility proposes to use a dry process to handle its coal combustion residuals. The facility does not propose to store the residuals in a pond system. The Coal Pile Sedimentation Basin proposed at the facility will store storm water runoff from the fuel storage and limestone storage areas prior to combustion. The facility then proposes to route the combustion residuals from its operation to an onsite landfill for disposal. The landfill and associated wastewaters are not a subject of this permit.

Revised pages of the proposed permit and SoB are attached with this letter. We hope this resolves the outstanding interim objection and EPA will issue an approval letter allowing this permit to be issued.

If you have any questions, please feel free to contact me at (512) 239-4515 or chris.linendoll@tceq.texas.gov.

Sincerely,

Chris Linendoll, E.I.T., Manager
Wastewater Permitting Section
Water Quality Division
Texas Commission on Environmental Quality

CL/TK/ms

Enclosures

Exhibit E –

04.27.11 Correspondence re Compliance History

Satya Dwivedula - Re: WQ02496 - Pirkey Power Plant. Compliance History

From: <flmills@aep.com>
To: "Satya Dwivedula" <Satya.Dwivedula@tceq.texas.gov>
Date: 4/27/2011 1:29 PM
Subject: Re: WQ02496 - Pirkey Power Plant. Compliance History

Satya,

EPA's database is always full of errors. I'm not showing any violations in our database for 2006. The one they have listed for flow at Outfall 002 in Feb 2006 is actually a key-data entry error made by their own people--I have already pointed that out to them previously, as they had erroneously juxtaposed two of the numbers reported for flow for that month, so instead of listing "368.58" they put something like "638.58". In any event, there were no violations for the facility that I am aware of in the year 2006. I don't know why they haven't corrected that.

Otherwise, on two previous occasions, the facility has had issues with selenium at Outfall 004 when the pond filled up too fast with storm water from heavy rains, and the facility had subsequent problems getting the TSS and selenium values treated down prior to discharge--I think the selenium violation in July, 2007 was related to that, as the pond was near overflowing from an event that exceeded (or nearly exceeded) the 10 year, 24 hour storm event total for the area (7 inches). In August, 2008 they had something similar happen except that there was also a problem with the analyses that one of our laboratories gave us prior to that event--which ultimately contributed to that particular "violation". As I recall, had the facility known that the pond water was not suitable to be discharged in August, 2008, they would not have opened the valve for the outfall. In both cases, however, the facility took appropriate corrective actions and limited the discharges as much as was possible.

The facility has since implemented several changes in operation that have ensured that they will not have similar events occur at Outfall 004. They are now limiting the size of the exposed portions of the landfill in order to limit the total amounts of run-off, and have also removed some drainage areas from being serviced by the Landfill Pond. They also have plans to enlarge the landfill pond in the future (will be essentially within the same footprint--just slightly larger and deeper) in order to ensure adequate capacity and corresponding residence/treatment time prior to discharge.

Please let me know if you have any additional questions. Thanks,

Frank

"Satya Dwivedula" <Satya.Dwivedula@tceq.texas.gov>

04/27/2011 12:53 PM

To <flmills@aep.com>

cc

Subject WQ02496 - Pirkey Power Plant. Compliance History

Frank,

When I queried the compliance history from our database for the past 5-yr period, I noticed that there were four self-reported effluent limitation violations (in DMRs dated 1/31/06, 2/28/06, 7/31/07, and 8/31/08); no other details are available in the compliance history database. However, EPA's database shows only two self-reported effluent limitation violations (for flow at Outfall 002 in Feb.2006 and Total selenium at Outfall 004 in August 2008) in the past 5-yr period.

Based on your records, could you please clarify if there were any self-reported violations in DMRs for 01/31/06 and 7/31/07? Thanks.

Satya

Exhibit F –

Pirkey Impingement Monitoring Data Report- 2007

Pirkey Power Plant
Impingement Monitoring Data Report
Harrison County, Texas

Document No. 070004
PBS&J Job No. 441550

PIRKEY POWER PLANT
IMPINGEMENT MONITORING DATA REPORT
HARRISON COUNTY, TEXAS

Prepared for:

American Electric Power
P.O. Box 660164
Dallas, Texas 75266

Prepared by:

PBS&J
6504 Bridge Point Parkway
Suite 200
Austin, Texas 78730

March 2007

Printed on recycled paper

Contents

Page

List of Figures iv
List of Tables v
Executive Summary vi
Acronyms and Abbreviations vi
BACKGROUND 1
FACILITY DESCRIPTION 1
RESERVOIR CHARACTERIZATION 2
FISHERIES RESOURCES 3
IMPINGEMENT STUDY METHODS 5
IMPINGEMENT MONITORING 5
WATER-QUALITY MONITORING 6
QUALITY ASSURANCE/QUALITY CONTROL 7
SITE INSPECTION AND COLLECTION-EFFICIENCY STUDIES 7
DATA MANAGEMENT 8
FISH IDENTIFICATION 8
WATER QUALITY METER CALIBRATION 9
DATA ANALYSIS 9
RESULTS 9
IMPINGEMENT TOTALS 9
IMPINGEMENT AND SEASON 12
IMPINGEMENT AND FACILITY OPERATIONS 12
Intake Flow 12
Screen Velocity ..... 13.
INTAKE LOCATION 13
RESERVOIR ELEVATION 13
IMPINGEMENT AND WATER QUALITY 14
Dissolved Oxygen 14
Temperature 14
Conductivity and pH 14
IMPINGEMENT AND WEATHER 15
Precipitation 15
Wind Speed 15
IMPINGEMENT AND DIURNAL VARIATION 15
MULTIVARIATE ANALYSIS 16
Impingement Analysis Methods 16
Multivariate Analysis Results 17
DISCUSSION 17
LITERATURE CITED 47

Appendices:

A Operator's Procedures, Pirkey Power Plant
B Field Data Sheets

Figures

		Page
1	Brandy Branch Reservoir and Pirkey Power Station, Harrison County, Texas	19
2	Pirkey Power Station, Harrison County, Texas	20
3	5-Year (2001–2006) 2-Week Means, Mean ±1 Standard Deviation, and Sample Event Flows, Pirkey Power Plant	21
4	Total Number of Fish Collected in Impingement Samples by Sample Event, Pirkey Power Plant	22
5	Total Number of Fish Collected in Impingement Samples by Species and Sample Event, Pirkey Power Plant	23
6	Length-Frequency Distribution of Bluegill Impinged at Pirkey Power Plant	24
7	Length-Frequency Distribution of Threadfin Shad Impinged at Pirkey Power Plant	25
8	Length-Frequency Distribution of Largemouth Bass Impinged at Pirkey Power Plant	26
9	Mean Number of Fish Collected in Impingement Samples by Season, Pirkey Power Plant	27
10	Total Daily Flow and Total Number of Fish Collected in Impingement Samples, Pirkey Power Plant	28
11	Scatterplot of Total Daily Flow and Total Number of Fish Collected in Impingement Samples, Pirkey Power Plant	29
12	Through-Screen Velocity and Total Number of Fish Collected in Impingement Samples, Pirkey Power Plant	30
13	Reservoir Elevation and Total Number of Fish Collected in Impingement Samples, Pirkey Power Plant	31
14	Mean Dissolved Oxygen and Total Number of Fish Collected in Impingement Samples by Sample Event, Pirkey Power Plant	32
15	Scatterplot of Mean Dissolved Oxygen and Total Number of Fish Collected in Impingement Samples, Pirkey Power Plant	33
16	Mean Water Temperature and Total Number of Fish Collected in Impingement Samples, Pirkey Power Plant	34
17	Scatterplot of Mean Water Temperature and Total Number of Fish Collected in Impingement Samples, Pirkey Power Plant	35
18	Average Daily Air Temperature and Number of Fish Collected in Impingement Samples by Sample Event, Pirkey Power Plant	36
19	Mean Conductivity and Total Number of Fish Collected in Impingement Samples, Pirkey Power Plant	37
20	Mean pH and Total Number of Fish Collected in Impingement Samples, Pirkey Power Plant	38
21	Long-Term (30-Year) Monthly Mean Precipitation Totals for Longview, Texas, and Study Period Observed Monthly Precipitation Totals, Pirkey Power Plant	39
22	Annual Precipitation Totals for Longview, Texas, and Pirkey Power Plant (Study Period)	40
23	Daily Precipitation Totals and Total Number of Fish Collected in Impingement Samples by Sample Event, Pirkey Power Plant	41
24	Daily Rainfall Totals and Total Number of Fish Collected in Impingement Samples, Pirkey Power Plant	42
25	Weekly Rainfall Totals and Total Number of Fish Collected in Impingement Samples, Pirkey Power Plant	43
26	Monthly Rainfall Totals and Total Number of Fish Collected in Impingement Samples, Pirkey Power Plant	44

Figures (cont'd)

		Page
27	Mean Daily Wind Speed and Total Number of Fish Collected in Impingement Samples, Pirkey Power Plant	45
28	Preceding Day Mean Wind Speed and Total Number of Fish Collected in Impingement Samples, Pirkey Power Plant	46

Tables

1	Number and Catch Rate (CPUE) by Fish Species Collected from all Gear Types, Brandy Branch Reservoir, Texas, 2003–2004	4
2	Number and Catch Rate (CPUE) by Fish Species Collected from Electrofishing, Brandy Branch Reservoir, Texas, 1999 and 2003	4
3	Pirkey Power Plant Impingement Sampling Dates and Times	5
4	Efficiency Study Results, Pirkey Power Plant	8
5	Species and Total Number of Aquatic Organisms Collected in Impingement Samples at Pirkey Power Plant	10
6	Impingement and Facility Sample Statistics, Pirkey Power Plant	11
7	Impingement Rate per Sample (Mean Number of Fish per Screen) by Season, Pirkey Power Plant	12
8	Diurnal Impingement Rate Measured as Number of Fish Impinged per Screen per Hour, Pirkey Power Plant	16
9	Best Models Predicting Species or Group Impingement for Pirkey Power Plant	17
10	Impingement and Variable Statistical Summary, Pirkey Power Plant	18

Executive Summary

Pirkey Power Plant is an American Electric Power facility located on Brandy Branch Reservoir in Harrison County in northeast Texas. Fish impinged on the facility's intake screens were sampled by PBS&J biologists biweekly on 26 dates from October 6, 2005, to September 21, 2006. Water temperature, pH, conductivity, and dissolved oxygen levels were measured when impingement samples were collected.

A total of 4,821 fish were collected in impingement samples at Pirkey Power Plant. Of these 61% were bluegill and 33% were threadfin shad. Thirty percent of the fish, mostly Age-I bluegill, were collected on one date, June 29, 2006. Most of the observed impingement was during the summer when 65% of the fish were sampled during four sample events in July and August 2006. An overwhelming majority of the bluegill and shad were less than 76 mm (3 inches) in length. Most of the fish were dead or moribund upon collection from the screens.

Largemouth bass are an important recreational species at Brandy Branch Reservoir. Impingement of this species was low and the total number of individuals collected during the study was 57. Almost all of these were Age-0 fish and were less than 85 mm (3.3 inches) in length. No other sport fish were observed in impingement samples. There are no known species of concern in Brandy Branch Reservoir, nor were any collected in impingement samples.

There appeared to be a significant, positive relationship between temperature and impingement of bluegill, threadfin shad, and largemouth bass. However, other environmental variables likely play an important role, and some may be more important than temperature. The presence of young-of-the-year individuals susceptible to impingement increases during the summer and is incidental to warmer temperatures. In addition, the density of hydrilla, a submerged aquatic plant, in the intake canal may also explain some of the impingement. This plant is dense in the reservoir and prevailing southerly winds aid in pushing floating mats of this plant into the intake canal. PBS&J staff observed a higher incidence of impinged fish associated with heavy hydrilla loading on the intake screens.

Impingement did not appear influenced by intake flow, through-screen velocity, water quality, or weather. Other than temperature, statistical analysis did not indicate any relationships between individual species (or groups of species) and combinations of environmental and facility variables. Observed water quality remained at normal levels during the study. Observations of impingement during this study were consistent with facility staff observations that impingement rates are generally low.

Acronyms and Abbreviations

°C	degrees Celsius
°F	degrees Fahrenheit
µmhos/cm	micro mho (unit of conductance equal to the reciprocal of an ohm) (1 mho is equal to 1 siemens)
AEP	American Electric Power
CDS	Comprehensive Demonstration Study
CFR	Code of Federal Regulations
cm	centimeters
CW	Circulating Water
CWIS	Cooling Water Intake Structure
DO	Dissolved Oxygen
DSHS	Texas Department of State Health Services
EPA	U.S. Environmental Protection Agency
FM	Farm-to-Market Road
ft	feet/foot
ft/s	feet per second
g	gram(s)
gpm	gallons per minute
I&E	Impingement Mortality and Entrainment
m	meters
m/s	meters per second
m^3/min	cubic meters per minute
m^3/s	cubic meters per second
mg	million gallons
mg/L	milligrams per liter
mgd	million gallons per day
mm	millimeter(s)
msl	mean sea level
NOAA	National Oceanic and Atmospheric Administration
pH	degree of acidity or alkalinity (0 to 14 scale)
PIC	Proposal for Information Collection
PPP	Pirkey Power Plant
QA/QC	quality assurance/quality control
TCEQ	Texas Commission on Environmental Quality
TDH	Texas Department of Health
TPWD	Texas Department of Parks and Wildlife
TSS	Total Suspended Solids

IMPINGEMENT MONITORING DATA REPORT
PIRKEY POWER PLANT

BACKGROUND

The new Clean Water Act Section 316 (b), Phase II requirements regulate impingement mortality and entrainment of aquatic life at power-generating facilities that withdraw from waters of the U.S. for cooling purposes. These requirements were promulgated in 2004 by the U.S. Environmental Protection Agency (EPA) and regulate existing facilities that withdraw 50 million gallons per day (mgd) or more of cooling water.

Pirkey Power Plant (PPP) withdraws cooling water from Brandy Branch Reservoir (also referred to as Hallsville or Pirkey Lake) located on Brandy Branch Creek and is an existing facility that meets all the criteria for regulation under the Phase II rule [40 CFR 125.91(a), (b),(c), and (d)]. Because PPP is located on a reservoir, it is subject to the impingement mortality reduction standard only [40 CFR 125.94(b)]. The impingement mortality reduction standard requires facilities to reduce impingement mortality from 80% to 95% of the calculation baseline (40 CFR 125.93). Calculation baselines can be determined from historic data or from data gathered by conducting an Impingement Mortality and/or Entrainment Characterization Study [40 CFR 125.95(b) (3)]. Historic impingement mortality data are not available for PPP; therefore, PBS&J was retained by American Electric Power (AEP) to conduct an impingement mortality characterization study.

This study was performed in accordance with the Proposal for Information Collection (PIC) prepared and submitted by (AEP) to the Texas Commission on Environmental Quality (TCEQ). The PIC was accepted with minor revisions requested by TCEQ. As described in the PIC, this study was conducted over the course of a year from October 6, 2005, to September 21, 2006. Data obtained from this study are presented in this report. Selected facility descriptions, study methods and Quality Assurance are also presented in this report and are covered in detail in the facility PIC and the Operator's Procedures (Appendix A).

Analysis of observed impingement, facility operations and environmental variables are also presented. Estimates of annual impingement in relation to predicted facility operations and important variables will be provided in the Comprehensive Demonstration Study (CDS).

FACILITY DESCRIPTION

A detailed description of PPP, source water physical data, CWIS, cooling-water-system, and site plans are provided in the PIC (AEP, 2005). PPP is a base-loaded, lignite-fired facility consisting of one generating unit that is rated at 720 gross megawatts. The facility annual capacity factor normally ranges from 75 to 90%. PPP is located between Marshall and Longview, Texas, approximately 8 miles (12.9 kilometers

[km]) southwest of Marshall, Texas, on Farm-to-Market Road (FM) 3251 in Harrison County, Texas (Figure 1). The facility's CWIS is located on the northern shore of the western arm of Brandy Branch Reservoir (Figure 2).

PPP has a total design withdrawal capacity (flow) of 390,000 gallons per minute (gpm) (1,478-m^3/min). Cooling water is withdrawn through three vertical wet pit circulating-water (CW) pumps, each rated at 126,000 gpm (478-m^3/min), which also provide service water. CW pumps are designed to operate between reservoir elevations ranging from 325.0 to 340.0 feet (ft) (99.0 to 103.6 meters [m]) mean sea level (msl). A 5-year flow history with 2-week mean (including ±1 standard deviation) flow is provided in Figure 3. Peak CW pump operations are during the summer and usually involve all three CW pumps, and lowest during the winter, when two CW pumps are usually in service.

Traveling-water screens (screens) serve the CW pumps and bar grills are located in front of the screens. Stop logs are in place that isolate each of the three crib-house bays.

The screens have ⅜-inch-square (9.5-millimeter [mm]) stainless steel mesh. Normal operating pool elevation of Brandy Branch Reservoir is 340 ft (104 m) msl. Calculated maximum through-screen velocity (velocity) for the screens at low reservoir operating levels is 2.28 feet per second (ft/s) (0.7 meters/second [m/s]).

The screens remain stationary under normal operating conditions except for periodic cleaning. The screen-wash system is operated twice per day for approximately thirty-minutes to remove accumulated debris. Wash water is flushed into a sluice which drains into the reservoir. All three CW pumps are required to operate the unit efficiently for much of the year, although during cooler months only two CW pumps are sometimes used due to lower inlet water temperatures.

RESERVOIR CHARACTERIZATION

Brandy Branch Reservoir is located on Brandy Branch Creek in the Sabine River Basin. The reservoir was constructed in 1983 by AEP as a cooling reservoir (Texas Parks and Wildlife Department [TPWD], 2003). The reservoir lies within the East Texas Timberlands Land Resource Area (Texas Forest Service, 2004). Brandy Branch Reservoir has a normal operating pool elevation of 340 ft (104 m) msl with a storage capacity of 29,512 acre-ft (3,642-hectare-meters [ha-m]) and a surface area of approximately 1,242 acres (503 ha) (TPWD, 2003). The reservoir has a drainage area approximately 4.1 square miles (10.6-kilometers squared [km^2]) and a shoreline length of 17 miles (27.4 km). Water levels are relatively stable; average annual fluctuation is less than 3 ft (0.9 m). Supplemental water is pumped from Big Cypress Bayou to maintain water levels during periods of low rainfall (AEP, 2005). AEP allows public access to the reservoir, which supports a recreational fishery for largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), and redear sunfish (*L. microlophus*). There are no known state or federally listed threatened or endangered species of fish in Brandy Branch Reservoir. According to TPWD (2003) vegetation surveys, native and nonnative aquatic vegetation cover 50 to 60% of the

reservoir's surface with hydrilla (*Hydrilla verticillata*), which is the dominant species. In 1992, the Texas Department of State Health Services (DSHS, formerly the Texas Department of Health [TDH]) issued an advisory restricting the consumption of fish from the reservoir because of elevated selenium concentrations. The DSHS rescinded the fish-consumption advisory for Brandy Branch Reservoir on October 14, 2004 (TCEQ, 2006).

FISHERIES RESOURCES

Fisheries data were acquired through TPWD, which are included in Performance Reports required by the Federal Aid in Sport Fish Restoration Act. The TPWD Performance Reports provide a summary of fisheries surveys, which are conducted approximately every 3 years. These reports include population indices, fishing regulations, habitat surveys, stocking records, species accounts, and management strategies. Information from the most recent TPWD Performance Report (TPWD, 2003) is included in this report. These data include gill netting (spring), trap netting, and electrofishing from 2003–2004 and comparative night electrofishing samples for bluegill, gizzard shad (*Dorosoma cepedianum*), redear sunfish, and largemouth bass from 1999 and 2003.

TPWD applies standard fisheries sample techniques, including shoreline boat electrofishing, open-water gill netting, and near-shore frame (trap) netting at randomly selected stations throughout the reservoir. In 2003–2004, TPWD sampled using electrofishing (1.0 hour at 12 stations), gill netting (5 net-nights), and trap netting (5 net-nights). Catch rate, commonly referred to as catch per unit effort (CPUE), is measured as number of fish per hour of electrofishing or number of fish caught each time a gill net or trap net is set.

Important sport fish in Brandy Branch Reservoir included largemouth bas, black crappie (*Pomoxis nigromaculatus*), bluegill, redear sunfish, channel catfish (*Ictalurus punctatus*), and flathead catfish (*Pylodictis olivaris*). Important prey species include gizzard shad, threadfin shad (*D. petenense*), redear, and bluegill (TPWD 2003).

Even though TPWD lists black crappie, channel, and flathead catfish as important sport fish in Brandy Branch Reservoir, these species have not been collected in routine sampling since 1993 (TPWD, 2000). All three species were stocked in the 1980s, but recruitment was insufficient to sustain a fishery and stocking was discontinued following the issuance of the fish-consumption advisory in 1992. In 2004 when, the fish-consumption advisory was rescinded, TPWD stocked over 75,000 channel catfish fingerling into Brandy Branch Reservoir to increase sport fish diversity and angling opportunities.

According to TPWD (2003), although a trend in declining catch rates of largemouth bass was observed in recent years, relative abundance of stock-size (≥8.0 inches (20 centimeters)[cm]) largemouth bass has remained consistent, suggesting stable levels of recruitment.

Bluegill and redear sunfish comprise the dominant prey base for piscivores. Clupeid densities (gizzard and threadfin shad) have been historically low. Elevated water temperatures and low natural fertility were factors thought to have repressed populations (TPWD, 2003). However, the 2003 electrofishing survey

indicated the gizzard shad CPUE was 33, indicating reproductive success (Table 1). According to (TPWD, 2003), the highest electrofishing CPUE for 2003 included bluegill (540), largemouth bass (55), gizzard shad, (33), and redear sunfish (25) (Table 2). Largemouth bass CPUE decreased from 81 in 1999 to 55 in 2003. Bluegill CPUE decreased from 1,085 in 1999 to 540 in 2003. Redear sunfish CPUE remained consistent from 24 in 1999 to 25 in 2003, while gizzard shad CPUE increased from 0 in 1999 to 33 in 2003 (TPWD, 2003). Tables 1 and 2 provide only target species collected by TPWD. TPWD did not report non-target species in their Performance Reports.

Recent creel data are not available for Brandy Branch Reservoir. The last creel survey was conducted in 1985. Commercial fishing is not allowed on the reservoir.

Table 1. Number and Catch Rate (CPUE) by Fish Species Collected from all Gear Types, Brandy Branch Reservoir, Texas, 2003–2004 (TPWD, 2003)

		Gill Netting Spring		Trap Netting		Electrofishing	
Common Name	Scientific Name	N	CPUE	N	CPUE	N	CPUE
Gizzard shad	*Dorosoma cepedianum*	23	4.6	–	–	33	33
Bluegill	*Lepomis macrochirus*	–	–	13	2.6	540	540
Redear sunfish	*L. microlophus*	1	0.2	–	–	25	25
Largemouth bass	*Micropterus salmoides*	26	5.2	–	–	55	55
Black crappie	*Pomoxis nigromaculatus*	3	0.6	–	–	–	–

Table 2. Number and Catch Rate (CPUE) by Fish Species Collected from Electrofishing, Brandy Branch Reservoir, Texas, 1999 and 2003 (TPWD, 2003)

		1999		2003	
Common Name	Scientific Name	N	CPUE	N	CPUE
Gizzard shad	*Dorosoma cepedianum*	–	–	33	33
Bluegill	*Lepomis macrochirus*	1,085	1,085	540	540
Redear sunfish	*L. microlophus*	24	24	25	25
Largemouth bass	*Micropterus salmoides*	81	81	55	55

Brandy Branch Reservoir has a number of environmental concerns. DSHS issued a fish-consumption advisory for all fish in 1992 due to elevated levels of selenium (TCEQ, 2006). Even though this advisory was later rescinded in fall 2004, TPWD discontinued stocking of recreational important game fish following the issuance of the fish-consumption advisory in 1992. This led to poor recruitment of crappie and catfish which were previously stocked. TPWD (2003) indicates that the thermal discharge from PPP may cause water-quality problems. However, there have not been any studies at Brandy Branch Reservoir that have documented problems associated with the thermal impacts of PPP. Lastly, due to excessive aquatic plant growth dominated by hydrilla, the aquatic ecosystem could be adversely impacted by shading out native aquatic plants, reducing plant biodiversity, increasing fish population imbalances, altering water chemistry by raising pH, causing wide oxygen fluctuations, and increasing water temperature (TPWD, 2000). Hydrilla also has been a problem at PPP by clogging intake screens.

IMPINGEMENT STUDY METHODS

IMPINGEMENT MONITORING

Impingement sampling was in accordance with the PPP PIC. A degreed fisheries taxonomist (PBS&J) conducted the impingement sampling and processed the organisms during each sample event. PPP staff operated the screen wash.

Since PPP is a base-loaded facility, sampling was performed under normal operating conditions. At times, facility operations were significantly reduced during cooler months resulting in drawing water from only one CW pump. Samples were collected once every 2 weeks starting October 6, 2005, and ending September 21, 2006. A total of 26 samples were collected over this period. Each sample period began with a prewash of all screens to be sampled. Only screens serving circulators that were running were sampled. Twelve hours after the initial screen wash, a second screen wash was conducted, and a sample was collected. A third screen wash was conducted 24 hours after the initial screen wash, and a final sample was collected for the sample event. As such, sample events included the collection of morning samples to represent fauna impinged during the night and evening samples to represent fauna impinged during the day. Sample times were established on a sliding scale to reflect changing day length and time changes, as shown in Table 3.

Table 3. Pirkey Power Plant Impingement Sampling Dates and Times

Date	Pre-wash times	Sample wash times	
Wednesday, October 05, 2005	7:00 PM		
Thursday, October 06, 2005		9:15 AM	7:00 PM
Wednesday, October 19, 2005	7:00 PM		
Thursday, October 20, 2005		9:30 AM	7:00 PM
Wednesday, November 02, 2005	5:30 PM		
Thursday, November 03, 2005		9:00 AM	5:30 PM
Wednesday, November 16, 2005	5:30 PM		
Thursday, November 17, 2005		9:00 AM	5:30 PM
Wednesday, November 30, 2005	5:30 PM		
Thursday, December 01, 2005		9:00 AM	5:30 PM
Wednesday, December 14, 2005	5:30 PM		
Thursday, December 15, 2005		9:15 AM	5:30 PM
Wednesday, December 28, 2005	5:30 PM		
Thursday, December 29, 2005		9:15 AM	5:30 PM
Wednesday, January 11, 2006	5:45 PM		
Thursday, January 12, 2006		9:15 AM	5:45 PM
Wednesday, January 25, 2006	6:00 PM		
Thursday, January 26, 2006		9:15 AM	6:00 PM
Wednesday, February 08, 2006	4:15 PM		
Thursday, February 09, 2006		7:00 AM	4:15 PM
Wednesday, February 22, 2006	4:15 PM		
Thursday, February 23, 2006		7:00 AM	4:15 PM
Wednesday, March 08, 2006	4:30 PM		
Thursday, March 09, 2006		6:45 AM	4:30 PM
Wednesday, March 22, 2006	4:30 PM		
Thursday, March 23, 2006		6:30 AM	4:30 PM
Wednesday, April 05, 2006	6:00 PM		
Thursday, April 06, 2006		7:15 AM	6:00 PM
Wednesday, April 19, 2006	6:00 PM		
Thursday, April 20, 2006		7:00 AM	6:00 PM
Wednesday, May 03, 2006	6:00 PM		
Thursday, May 04, 2006		6:45 AM	6:00 PM
Wednesday, May 17, 2006	6:00 PM		
Thursday, May 18, 2006		6:30 AM	6:00 PM
Wednesday, May 31, 2006	7:30 PM		
Thursday, June 01, 2006		7:30 AM	7:30 PM
Wednesday, June 14, 2006	7:30 PM		
Thursday, June 15, 2006		7:30 AM	7:30 PM
Wednesday, June 28, 2006	7:30 PM		
Thursday, June 29, 2006		7:30 AM	7:30 PM
Wednesday, July 12, 2006	7:30 PM		
Thursday, July 13, 2006		7:30 AM	7:30 PM
Wednesday, July 26, 2006	7:30 PM		
Thursday, July 27, 2006		7:45 AM	7:30 PM
Wednesday, August 09, 2006	7:15 PM		
Thursday, August 10, 2006		8:00 AM	7:15 PM
Wednesday, August 23, 2006	7:00 PM		
Thursday, August 24, 2006		8:00 AM	7:00 PM
Wednesday, September 06, 2006	6:45 PM		
Thursday, September 07, 2006		6:15 AM	6:45 PM
Wednesday, September 20, 2006	6:30 PM		
Thursday, September 21, 2006		6:15 AM	6:30 PM

Prior to the start of the study, a frame and net was custom built to fit into the debris-collection basket. The frames fit into the sluice channel with tolerances less than 1/16-inch (0.16 centimeters [cm]). The nets were sewn to the frames and were each 5 ft (1.5 m) long constructed of ¼-inch (0.6 cm) heavy delta mesh. Prior to sample collection, the collection nets were placed in the sluice.

All screens serving circulators in operation were washed in unison. The screens were washed for 10 minutes, which allowed the screens to make one complete revolution and ensure that all organisms had adequate time to reach the collection nets. The samples were sorted by species, fish measured to total length (mm), and weighed (±1 gram [g]) in the field. Any organism that was not easily identified in the field was preserved with 10% formalin and returned to the PBS&J laboratory for identification. When possible, an observation was made of the condition of the fish at the time of sampling. Individuals were characterized as alive, dead, moribund, or dead upon arrival. Fish that were possibly alive were placed in a bucket of water to help determine whether they were alive or moribund. Live fish exhibited normal reactions and active movement. Moribund fish had normal coloration but only slightly moved opercular flaps or fins and did not respond substantially to being touched. Dead fish had near normal coloration but no movement and no response to touch. Dead fish probably died minutes or hours earlier after becoming impinged. Dead-on-arrival fish have lost normal coloration and may have signs of injury not related to impingement. Dead-on-arrival fish died prior to impinging. During periods of high impingement, accurate determinations of the number of live or moribund fish were not always possible. During periods of high impingement rates, it was sometimes not possible to obtain an accurate determination of the number of live and moribund fish. During periods of high impingement rates, it was sometimes not possible to obtain an accurate determination of the number of live or moribund fish.

When possible, all fish were sorted according to species. If the number of individuals of any one species exceeded 100, then 100 individuals were randomly selected from the group and processed. The remainder of the individuals were either weighed or counted. During periods of high impingement and heavy debris loading, a sub-sample was removed from the entire sample. The fish in the sub-sample were separated from the debris and processed according to the above protocol. The weight of the debris in the sub-sample was also obtained. An estimate of impingement for the entire sample was obtained by weighing the remainder of the sample and extrapolating the results according to the proportion of fish (by species) and debris.

Impingement data included date, unique sample period code, wash times, unit number, screen number/ letter, field crew, weather observations, fish condition, and length and weight of the first 100 individuals of each species. Only lengths and weights for fish ≥3 inches (76 mm) were obtained. Fish <3 inches (76 mm) were measured and a bulk weight was obtained. Other aquatic organisms were identified and counted.

WATER-QUALITY MONITORING

During each sample period, temperature (Celsius [°C]), pH (standard units), conductivity (µmhos/cm), and dissolved oxygen (milligrams per liter [mg/L]) were measured with either a YSI Series 600XLM® or a Hydrolab Minisonde®. Water quality was obtained adjacent to the CWIS at the surface and mid-depth. In order to prevent damage to the meter, bottom readings were not taken during every sample event.

Mean intake water temperatures were provided by PPP. Water temperatures were obtained from the influent water prior to entering the condensers through routine monitoring. Due to the short residence time from the intake embayment to the condensers, these temperatures are believed to represent the mean temperatures at the CWIS.

Weather conditions were observed and recorded during each sample event. In addition, selected weather conditions for the study period were obtained from the Shreveport office of the National Oceanic and Atmospheric Administration (NOAA).

QUALITY ASSURANCE/QUALITY CONTROL

Quality Assurance and Quality Control (QA/QC) guidelines are described in the facility PIC and are not repeated in this document. However, some measures were added to help ensure quality data and are described in the sections below.

SITE INSPECTION AND COLLECTION-EFFICIENCY STUDIES

Prior to the beginning of the study, each of the screens was visually inspected, and the spray-wash systems were operated to identify any problems that might result in poor recovery of impinged fish. Actions were taken to adjust spray nozzles in the wash system, and debris was removed from the sluice to ensure unobstructed water flow and delivery of impinged fish into the collection nets.

Shortly after the start of the study, a collection-efficiency study (efficiency study) was conducted, as recommended by EPA (1977). The purpose of the efficiency study was to identify factors that might result in poor recovery of impinged fish, as described above. The general method for evaluating collection efficiency is to introduce marked or tagged dead fish immediately in front of the screens and then the normal sample process is followed. Marked or tagged fish are used to distinguish the difference between the study fish and those that are actually impinged. In the absence of scavenging of the introduced fish, the number of fish collected through sampling should be similar to the number of fish released in front of the screens.

For this study, three efficiency studies were conducted for each screen using groups of 19 to 40 dead, fin-clipped fish. The fish used during this study were comprised of sunfish and threadfin shad since these are the species normally impinged. The efficiency studies consisted of "long-term" and "instantaneous" tests. For the long-term test, the study fish were introduced approximately 12-h before sampling. For the instantaneous test, study fish were introduced immediately before sampling. The fish used during this study were comprised of sunfish and threadfin shad since these species are normally impinged. The first efficiency study was conducted on October 6, 2005, and included both long-term and instantaneous tests for screens B and C. The second efficiency study consisted of an instantaneous and a long-term test on March 8, 2006, with screen C only. The third efficiency study was conducted on September 27, 2006, with all screens and included instantaneous tests only.

The results of the efficiency studies are shown in Table 4. For the October 2006 study, mean collection efficiency was 76% for the long-term and 84% for the instantaneous. During March 2006, mean collection efficiency was 84% for the long-term and 85% for the instantaneous. On September 27, 2006, instantaneous mean collection efficiency was 97%.

Table 4. Efficiency Study Results, Pirkey Power Plant

Date	Long Term or Short Term	Unit	Screens Washed	# Fish Released	# Fish Recovered	% Efficiency
October 6, 2005*	Long term	1	B	25	21	84
		1	C	25	17	68
October 6, 2005*	Short term	1	B	25	25	100
		1	C	25	17	68
March 8, 2006**	Long term	1	C	19	16	84
	Short term	1	C	20	17	85
September 27, 2006	Short term	1	A and B	40	37	93
		1	C	20	20	100

* Screen A not in operation.
** Screens A and B not in operation.

No fish were observed remaining on the screens after washing during the studies. Therefore, the fate of the study fish not recovered was unclear. However, it is possible that the missing study fish either sank and did not make it to the screens after being released or were consumed by scavengers.

DATA MANAGEMENT

Field datasheets were used by field staff during each sample event (Appendix B). Data were transferred into a database and all datasheets were maintained by the QA/QC officer. Once entered into the database, data were checked for any errors made during data entry. This QA/QC check was conducted by the QA/QC officer after each sample event. The datasheets were signed by the QA/QC officer after each sample event, and a log recording any data discrepancies was kept by the QA/QC officer. A summary of the total number of fish by species was also maintained in a separate spreadsheet and was compared to the data base and field datasheets to check for gross errors.

FISH IDENTIFICATION

All fish identifications in the field were conducted by a degreed fisheries biologist knowledgeable in fish taxonomy. Fish not identified in the field were preserved and delivered to the PBS&J laboratory for identification. Dr. Bobby Whiteside (retired Director of the Aquatic Station, Texas State University) and Andrew Labay, Senior Fisheries Ecologist (PBS&J), verified identification of any species that were not identified in the field. A preserved voucher collection was retained.

WATER QUALITY METER CALIBRATION

Water quality meters used during the study were calibrated to the manufacturer's specifications prior to sampling and post-calibrated after sampling. Calibration information was recorded after each calibration in a calibration log. Calibration logs included date, time, staff, pre-calibration readings, post-calibration readings, and any maintenance or repairs.

DATA ANALYSIS

Impingement can be a function of facility operations, environmental conditions, and/or species-specific fish behavior. To screen the importance of each of these, a suite of variables was compared to the total number of fish collected in impingement samples. In some cases, data were not available and comparisons could not be made. The list below shows the variables for which data were available and comparisons were made. T-Test analysis was conducted for each of these variables and total impingement at the $p = 0.5$ level (unless otherwise specified). In addition, multivariate analysis was performed to identify possible relationships between various combinations of variables and impingement by groups of species (e.g., sunfish, shad, largemouth bass, and catfish). Methods for this analysis are provided in the corresponding section.

Air temperature	Reservoir elevation
Conductivity	Screen velocity
Daily precipitation	Season
Dissolved oxygen	Species Composition
Flow	Water temperature
Monthly precipitation	Weekly precipitation
pH	Wind speed

RESULTS

The following sections provide the results of impingement monitoring and variable analysis at PPP. The results are presented in a variety of ways, including observations and analysis of relationships between environmental and facility variables and impingement. During each sample event, the number of screens sampled ranged from one to three. Total impingement rates were normalized by adjusting for the number of screens that were serving CW pumps in operation. The normalized data were used for variable analysis. In some instances, impingement rates were expressed as the number of fish per screen per hour. For all other graphical representations, total impingement for the day (regardless of the number of screens in service) was used. A summary of the statistical results is provided in the discussion.

IMPINGEMENT TOTALS

A total of 4,821 fish, consisting of 10 species, were collected in impingement samples from PPP (Table 5). In addition to fish, two turtles and nine crawfish were collected from intake screens. The majority of fish collected were bluegill (61%) followed by threadfin shad (33%). Most fish were

collected in impingement samples during June and July 2006 (Figure 4). The lower observed impingement during the cooler months was partially due to fewer CW pumps in operation, resulting in fewer sampled screens than during the summer. Bluegill were collected during each impingement event whereas threadfin shad were present in 15 of the 26 samples.

A total of 50 largemouth bass were collected in impingement samples. With the exception of this species, there were no other sport fish observed in impingement samples. Other sport fish, such as channel catfish and crappie occur in low abundance in Brandy Branch Reservoir (see Tables 1 and 2). Warmouth (*L. gulosus*) and redear sunfish (*L. microlophus*) were common in impingement samples; however, the total number of individuals representing the remaining species was low (24) [Table 5]. There were not state or federally listed threatened, endangered, or species of concern collected in impingement samples.

Most impinged fish were dead upon collection. Thirty-eight fish [bluegill (23), threadfin shad (14), and gizzard shad (1)] were considered dead prior to impingement and were not included in the analysis.

Table 5. Species and Total Number of Impinged Aquatic Organisms Collected in Impingement Samples at Pirkey Power Plant

Common Name	Scientific Name	Number Impinged
Threadfin shad	*Dorosoma petenense*	1,613
Grass pickerel	*Esox niger*	1
Brook silverside	*Labidesthes sicculus*	1
Inland silverside	*Menidia beryllina*	8
Warmouth	*Lepomis gulosus*	173
Orangespotted sunfish	*L. humilis*	2
Bluegill	*L. macrochirus*	2,926
Longear sunfish	*L. megalotis*	1
Redear sunfish	*L. microlophus*	39
Largemouth bass	*Micropterus salmoides*	57
Crayfish	Cambaridae	9
Razor back musk turtle	*Sternotherus carinatus*	1
Smooth softshell turtle	*Apalone mutica*	1
Total		4,832

The majority (31%) of threadfin shad were collected on June 15 and 19, 2006, and July 13, 2006. The minimum number of fish collected per sample event was two, which was on February 23, 2006, when only one CW pump was in operation. The maximum number of fish collected per sample event was 1,452 on June 29, 2006, when all three CW pumps were in operation. The average number of fish collected per 24-hour period was 201. Impingement was notably low during February and March, where a combined total of 41 fish were collected. This was, in part, a result of only one CW pump in operation during these months. Figure 5 shows the total number of fish by species collected in impingement samples during each sample event. Thirty percent of all fish were impinged on June 29, 2006. Table 6

provides a summary of pump operations, flow, calculated screen velocity, and total number of fish collected in impingement samples.

Concurrent with PPP staff observations, PBS&J staff observed higher densities of floating hydrilla during the warmer months. During periods of heavy hydrilla loading on the screens, impingement of bluegill was higher. The relationship between floating mats of hydrilla and increased bluegill abundance on the screens is a result of the habitat utility of this plant. Hydrilla provides food and cover for bluegill and other cover-dependent species, which indirectly increases impingement through impingement of the hydrilla. While gross estimates can probably be made of hydrilla loading, there were no estimates of hydrilla volume or weight for impingement comparison.

Table 6. Impingement and Facility Sample Statistics, Pirkey Power Plant

Date	Screens Sampled		No. of Circulators Operating		Flow (mgd)	Screen Velocity (ft/s)	Total No. of Fish Collected	No. of Fish/Screen		Impingement Rate (No./ mgd)
	AM	PM	AM	PM				AM	PM	
10/6/2005	B,C	A,B,C	3	3	544	1.36	60	28.5	1.0	0.11
10/20/2005	B,C	A,B,C	3	3	544	1.41	39	17.5	2.0	0.07
11/3/2005	A,B,C**	A,B,C**	2	2	363	1.41	171	53.3	3.7	0.47
11/17/2005	A,B,C	A,B,C	2	2	363	1.42	103	10.0	21.5	0.28
12/1/2005	A,B,C**	A,B,C**	2	2	363	1.42	48	12.7	3.3	0.13
12/15/2005	A,B,C	A,B,C	2	2	363	1.42	12	1.0	5.0	0.03
12/29/2005	A,B,C**	A,B,C**	2	2	363	1.41	86	27.7	1.0	0.24
1/12/2006	A,B,C	A,B,C**	2	2	363	1.41	108	19.7	16.3	0.30
1/26/2006	*	A,B,C**	*	2	363	1.41	24	0.0	8.0	0.07
2/9/2006	B,C	A,B,C	2	2	363	1.41	7	1.5	2.0	0.02
2/23/2006	C	C	1	1	181	1.37	2	2.0	0.0	0.01
3/9/2006	B,C	A,B,C	2	2	363	1.36	15	7.0	0.5	0.04
3/23/2006	C	C	1	1	181	1.37	16	14.0	2.0	0.09
4/6/2006	B,C	A,B,C	2	2	363	1.41	21	11.0	0.5	0.06
4/20/2006	A,B,C**	A,B,C**	2	2	363	1.31	23	5.3	2.0	0.06
5/4/2006	A,B,C	A,B,C	3	3	544	1.32	211	25.7	1.0	0.20
5/18/2006	A,B,C	A,B,C	3	3	544	1.32	69	10.7	12.3	0.13
6/1/2006	A,B,C	A,B,C	3	3	544	1.33	206	50.7	13.3	0.18
6/15/2006	A,B,C	A,B,C	3	3	544	1.33	605	118.3	83.3	1.11
6/29/2006	A,B,C	A,B,C	3	3	544	1.32	1,415	324.7	1,500.0	2.66
7/13/2006	A,B,C	A,B,C	3	3	544	1.35	640	190.7	22.7	1.18
7/27/2006	A,B,C	A,B,C	3	3	544	1.36	430	66.7	744.7	0.79
8/10/2006	A,B,C	A,B,C	3	3	544	1.35	154	30.3	21.0	0.28
8/24/2006	A,B,C	A,B,C	3	3	544	1.36	109	6.3	30.7	0.20
9/6/2006	A,B,C	A,B,C	3	3	544	1.37	17	5.0	0.7	0.03
9/21/2006	A,B,C	A,B,C	3	3	544	1.37	65	19.3	2.3	0.12

* Data not available

** All screens were washed, but only two were serving circulators in operation

Bluegill collected in impingement samples ranged from 39 to 140 mm (1.5 to 5.5 inches) in length, with a majority of bluegill ranging from 55 mm (2.2 inches) to 75 mm (2.9 inches) in length (Figure 6). There were no noticeable changes in the length of bluegill over the course of the study. Based on the length-frequency data, it appeared that most bluegill were Age-0 and Age-I individuals.

Threadfin shad collected in impingement samples ranged from 39 mm (1.5 inches) to 95 mm (3.7 inches), with most of these ranging from 68 mm (2.6 inches) to 76 mm (2.9 inches) (Figure 7). During the June and July 2006 sample events, 68% of impinged fish consisted of threadfin shad, averaging approximately

70 mm (2.7 inches) in length. Based on the time of year and the length of these fish, it appears that Age-0 (spawned in spring 2006) was the most common age-class collected.

Largemouth bass collected in impingement samples ranged from 35 mm (1.3 inches) to 520 mm (20.4 inches) in length (Figure 8). Sixty-eight percent of largemouth bass were collected during the three June sample events. With the exception of eight individuals, all of the largemouth bass were Age-0, which were likely spawned in the early spring. Only four Age-0 largemouth bass were collected after the June 28, 2006, event.

CW pump operations changed on October 6 and October 20, 2005, and screen A was not sampled during the morning sample period. On January 26, 2006, the morning impingement sample and water quality measurements were not collected because the screens were washed before PBS&J staff arrived at the facility. On February 2, 2006, CW pumps B and C were not operating. On March 8 and 23, 2006, the plant was shut down and only CW pump C was operating. On April 6, 2006, CW pump B was not operating.

IMPINGEMENT AND SEASON

A comparison of observed impingement was made between seasons (calendar season). The dates that define seasons are presented in Table 7. Impingement was higher in the summer than any other season. The mean number of fish collected during the summer sample events was 470 compared to 91 for the fall, 54 for the winter, and 191 for the spring (Figure 9). Despite the apparent difference between summer and the rest of the seasons, the differences were not significant ($p \leq 0.05$) between any of the seasons due to the variability of observed total impingement within each season.

Table 7. Impingement Rate per Sample (Mean Number of Fish per Screen) by Season, Pirkey Power Plant

Season	Mean Fish per Screen per Sample
Fall (October 6, 2005–December 15, 2005)	91
Winter (December 29, 2005–March 08, 2006)	54
Spring (March 22, 2006–June 14, 2006)	191
Summer (June 28, 2006–September 20, 2006)	470

IMPINGEMENT AND FACILITY OPERATIONS

Intake Flow

Intake flows (flow) are generally lower during cooler months when the facility withdraws less than design capacity due to cooler temperatures and higher during the summer when more cooling water is needed (see Figure 3). With the exception of February 9, 2006, to March 23, 2006, samples were taken within or

above normal operating flows. During this period, the facility was performing maintenance and only one CW pump was in operation. Total daily flow and the number of fish collected in impingement samples by sample event are shown on Figure 10.

Flow-weighted impingement was compared to daily flows. Flow-weighted impingement was calculated by dividing the total number of fish collected in impingement samples by the total flow for the sample period. Mean flow-weighted impingement was 0.37 fish/million gallons (1.4/million L). The highest impingement rates were observed during periods of maximum flows and impingement rates were consistently low during periods of low flow. However, there were five sample events in which <100 fish were impinged during maximum flows. The incremental reductions in flow also correspond to incremental reductions in the number of screens in service (and samples) (see Table 6). There was only a weak, but insignificant positive correlation between flow and observed impingement (Figure 11).

Screen Velocity

Screen velocities were calculated based on the CW pump operations (flow), screen dimensions, and wetted screen area (reservoir pool elevation) for each sample event. Observed reservoir elevation during the sample dates ranged from 336.5 ft (102.5 m) msl to 338.8 ft (103.3 m) msl. Screen velocities are listed in Table 6, which were adjusted for reservoir elevation. Over the course of the study, screen velocity varied only marginally, ranging from 1.31 (ft/s) (0.40 m/s) to 1.42 (ft/s) (0.43 m/s), which was reflective of the relatively stable reservoir elevation. As such, there was no difference in impingement rates between events in relation to screen velocity (Figure 12).

INTAKE LOCATION

There were no obvious indications that the location of the intake influenced impingement rates. In addition, there did not appear to be any notable differences between flows through each of the screens that would affect fish movement or behavior. As previously discussed, most of the impinged fish were bluegill, which are shoreline species generally associated with physical habitats such as aquatic vegetation. Submerged aquatic plants, including hydrilla and coontail (*Ceratophyllum demersum*), were abundant along the shoreline. In addition, the flow in the intake canal draws floating mats of hydrilla and other plants into the screens. These plants are habitat for bluegill, largemouth bass, and other sunfish, which increases their densities in the intake canal, possibly increasing the chance of interaction between these fish and the intake screens.

RESERVOIR ELEVATION

Brandy Branch Reservoir pool elevation fluctuated 2.3 ft (0.70 m) over the course of the study. The lowest reservoir levels observed during the study were on November 17, December 1, and December 29, 2005, which was approximately 3.5 feet (1.1 m) below normal pool elevation. The highest reservoir pool elevation was observed on April 6, 2006. During the course of the study reservoir elevation did not rise above normal pool elevation. Increases in reservoir pool elevation typically follow precipitation events,

although no rapid increases in pool elevation were observed during the study. Observed impingement did not appear to be related to reservoir pool elevation (Figure 13).

IMPINGEMENT AND WATER QUALITY

Dissolved oxygen (DO), temperature, conductivity, and pH data applied in analysis were collected by field staff during impingement collections. Observed water quality parameters remained within expected ranges throughout the study.

Dissolved Oxygen

Mean (surface and mid-depth) DO concentrations measured during impingement sampling are shown in Figure 14. Mean DO ranged from 5.22 mg/L (mid-depth) on October 20, 2005 (surface), to 10.60 mg/L on February 23, 2006. DO was generally lower during the morning, particularly during warmer periods and slightly higher during the evening samples. There was no relationship between observed impingement and DO (Figure 15). However, critically low DO (e.g., < 2.0 mg/L) that might have stressed fish, possibly increasing impingement was not observed during the sample events.

Temperature

Water temperature measured during sample events ranged from 11.33°C (52.39°F) on February 23, 2006, to 35.25°C (95.45°F) on August 24, 2006. Mean temperatures (surface and mid-depth) and total observed impingement for each sample event are shown on Figure 16. There was a positive correlation ($r^2 = 0.35$) between increasing water temperature and increasing impingement rates, which appeared to be significant ($p = 0.025$) (Figure 17). Daily mean air temperature (NOAA, 2006a) and total number of fish collected in impingement samples by sample event is shown on Figure 18.

Conductivity and pH

Conductivity observed during impingement sampling ranged from approximately 275 µmhos/cm to 326 µmhos/cm. All measurements (morning and evening; surface, and mid-depth) were averaged and compared to total observed impingement. There was no relationship between conductivity and impingement (Figure 19). However, the lowest conductivity was observed when the reservoir was near its highest pool elevation and the highest conductivity occurred when the reservoir was at its lowest pool elevation.

Observed pH ranged from 7.7 to 8.9 standard units during the study. There appeared to be a weak ($r^2 = 0.18$), but significant ($p = 0.031$) relationship between increasing pH and increasing impingement (Figure 20). The change in pH probably had little influence on impingement. pH remained within normal ranges, unlikely affecting fish health, behavior, or movement. Instead, the increased pH was associated with higher primary productivity due to warmer water temperature and increased day length

during the summer. As previously discussed, impingement was more likely related to increased temperatures and higher density of hydrilla in the intake canal during the summer.

IMPINGEMENT AND WEATHER

Precipitation

The annual precipitation total was below average during the study. The 30-year mean annual precipitation total for Longview, Texas was 47.5 inches (120.7 cm) (Figure 21) (NOAA, 2006b) and the precipitation total observed at PPP for the study period was 28.6 inches (72.6 cm) (Figure 22) (NOAA, 2006b). While precipitation for most months was below normal, precipitation for January, March, and August 2006 were above normal, as shown on Figure 21 (NOAA, 2006b). Daily rainfall totals and total observed impingement for each sample event are shown on Figure 23. Measurable rainfall occurred during two sample events (December 15, 2005, and June 1, 2006). Rainfall during those events did not appear to influence impingement rates (Figures 23 and 24). In addition, there appeared to be no relationship between weekly and monthly precipitation totals and observed impingement (Figures 25 and 26).

Wind Speed

Wind speed can be an indicator of changing weather and alter reservoir stratification and water quality, each of which can potentially alter fish behavior and movement. Daily wind speeds were obtained for Shreveport, Louisiana (NOAA, 2006a). Daily mean wind speed for each sample event and daily mean wind speed for each day preceding the sample events were compared to total observed impingement. There was no apparent relationship between wind speed and observed impingement (Figures 27 and 28). The largest number of fish were collected in impingement samples during relatively calm conditions and some of the lowest impingement rates occurred over a range of wind speeds (see Figure 27).

IMPINGEMENT AND DIURNAL VARIATION

Fish were impinged at much higher rate during the night and early morning hours than during the day, and this diurnal difference was the same during each season except winter (Table 8).

Morning impingement samples were collected between 0645 and 0915 hours with most samples collected near 0800 hours. Morning sample collection took 10 minutes to 1 hour depending on the number of fish collected. Screens were prewashed the evening before the morning sample at times ranging from 1815 hours (Central Standard Time) to 2000 hours (Daylight Savings Central Standard Time). The average time from prewash to the morning sample was about 12 hours and the average time for nighttime sampling was 9.5 hours

The highest night-time rate of impingement was 1.2 fish/screen/hour during the summer. The lowest night-time rate of impingement was 0.15 fish/screen/hour observed during the winter. The highest day-

time impingement rate was 0.54 fish/screen/hour observed during the summer and the lowest daytime impingement rate observed was 0.07 fish/screen/hour observed during the fall. Night-time impingement rates were higher throughout the study except during the winter season when the day-time impingement rate was 0.16 fish/screen/hour compared to 0.15 fish/screen/hour.

Table 8. Diurnal Impingement Rate Measured as Number of Fish Impinged per Screen per Hour, Pirkey Power Plant

Facility Unit	Night	Day
Entire Sample Period Mean	0.14	0.08
Fall (December 15, 2005–September 9, 2005)	0.22	0.07
Winter (December 29, 2005–March 08, 2006)	0.15	0.16
Spring (March 23, 2006–June 15, 2006)	0.50	0.28
Summer (June 29, 2006–September 9, 2006)	1.16	0.54

MULTIVARIATE ANALYSIS

Impingement Analysis Methods

Impingement can be an artifact of the sudden presence of numerous individuals of one or several species, potentially responding to an environmental or biological stimulus or facility operations. As such, predictive modeling of impingement by species (or similar grouping) was performed to distinguish potentially different responses to predictive factors by each species or grouping. These groupings included a combination of sunfish, threadfin shad, and largemouth bass.

Linear multiple regression was used to assess correlations of predictor variables in relation to the response variable and species (or similar grouping) impingement. Stepwise model selection methods were employed to generate and assess best models. Each individual analysis consisted of an initial set of predictor variables forming a global model that attempted to accurately predict impingement. Next, a stepwise model selection approach generated numerous additional models (i.e., competing models) from all possible combinations of predictor variables based on the initial global model predictor variables. The stepwise model selection approach only includes variables that are statistically important and excludes variables that do not contribute any predictive power. An approach was used during model building in which variables were included in the model at $p = 0.10$ and excluded if $p \geq 0.25$ with the stepwise method. All analyses were performed with SPSS 12.0 (SPSS Inc, Chicago, Illinois).

Other techniques to refine the statistical approach included the elimination of certain variables for reasons of potentially confounded analyses. For example, multicollinearity of predictor variables were addressed by elimination of the "less ecologically meaningful" variable of a pair that were correlated at $r^2 \geq 0.60$ via Pearson correlation tests. Multicollinearity refers to predictor variables that are highly correlated and this dynamic leads to erroneous modeling results with respect to the response variable (e.g., species or group impingement). Additionally, best models were assessed for overfitting and associated spurious effects by examining various indicative statistics (e.g., R values [i.e., proportion of impingement variability

accounted for by a predictive model] in relation to number of predictor variables, change in r^2 values in each model in relation to an added or removed variable, *t*-statistic of an added variable, ratio of regression and residual values, etc.). Overfitting refers to the generation of highly accurate predictive models (i.e., high r^2 values) with numerous predictor variables; more variables in a model almost always increases predictive power, but are usually erroneous and coincidental. The best predictive models consist of few variables, not more (i.e., ideally, better predictive models have few predictor variables, but a high R or r^2 values).

Multivariate Analysis Results

Three response variables (largemouth bass, threadfin shad, and sunfish) were analyzed against the suite of predictor variables and each was best predicted by water temperature, which is consistent with the observation of higher impingement rates during the summer and the results of individual variable analysis using the entire impinged population. However, in all instances, model fit and variance accountability was statistically poor (Table 9).

Table 9. Best Models Predicting Species or Group Impingement for Pirkey Power Plant

Species/Group	Model	Parameters	R value	r^2	Δr^2	ΔF *p* value
Threadfin shad	1	- constant + Water temperature	0.348	0.121	0.121	0.088
Largemouth bass	1	- constant + Water temperature	0.358	0.128	0.128	0.073
Sunfish spp.	1	- constant + Water temperature	0.515	0.266	0.266	0.007

DISCUSSION

Observed impingement was generally low at PPP, totaling 4,821 fish. An overwhelming majority of impinged fish consisted of bluegill, followed by threadfin shad. Impingement was generally reflective of the fish community in Brandy Branch Reservoir. Bluegill and other sunfish are abundant in the reservoir due to dense coverage of submerged aquatic vegetation. Threadfin shad are generally less abundant due to poor fertility in the water column. Bluegill were present in impingement samples throughout the year and were generally small, consisting of Age-0 and Age-1 individuals. Threadfin shad were less abundant and were collected in impingement samples during the summer. Largemouth bass are an important sport fish in Brandy Branch Reservoir, but they were generally scarce in impingement samples. Almost all of the largemouth bass collected were Age-0 individuals and were collected during a short period during the summer. No other sport fish were observed in impingement samples. There are no species of concern known to exist in Brandy Branch Reservoir, nor were any collected in impingement samples.

Table 10 provides a summary of the statistics associated with the variable analysis. Impingement was generally higher during the summer when 59% of impingement occurred during the summer and was higher during the night. The highest impingement (1,452 fish or 30%) occurred on one day, June 29, 2006, and the lowest impingement (2 fish) occurred on February 23, 2006. Low total impingement observed during the cooler periods was partially a result of reduced facility operations. However, when

adjusted for flow and operational screens, impingement remained lower during the winter, spring, and fall than during the summer.

The accumulation of hydrilla and other aquatic vegetation in the intake canal during the summer probably explains some of the impingement, although this relationship was not specifically studied. While wind speed did not appear to directly influence impingement rates, wind speed and direction is important to consider. During periods of the growing season (summer), hydrilla can cover up to 50% or 60% of the reservoir (TPWD, 2003). In turn, southerly winds transport floating mats of hydrilla from the main body of the reservoir into the intake canal, which increases hydrilla loading on the screens.

Table 10. Impingement and Variable Statistical Summary, Pirkey Power Plant

Variable	Figure	p	r^2	Significant Relationship ($p \leq 0.05$)
Daily flow	11	0.052	0.163	No
Through-screen velocity	12	--	0.104	--
Reservoir elevation	13	0.137	0.098	No
Dissolved oxygen	15	0.319	0.043	No
Water temperature	**17**	**0.025**	**0.356**	**Yes**
Conductivity	19	0.691	0.007	No
pH	**20**	**0.031**	**0.180**	**Yes**
Daily rainfall	24	0.928	0.000	No
Weekly rainfall	25	0.374	0.333	No
Monthly rainfall	26	0.300	0.045	No
Daily wind speed	27	0.631	0.010	No
Preceding wind speed	28	0.417	0.028	No

Exhibit G –

EPA 316(b) Draft Fact Sheet.Dec.07

United States
Environmental Protection Agency

DECEMBER 2007

DRAFT Fact Sheet

Development of BPJ-Based Section 316(b) NPDES Permit Conditions1

A National Pollutant Discharge Elimination System (NPDES) permit for any new or existing facility (see special definitions at 40 C.F.R. §§ 125.83 and 125.133) operating a cooling water intake structure (CWIS) must contain permit conditions meeting the requirements applicable to CWISs under section 316(b) of the Clean Water Act (CWA). Section 316(b) of the CWA requires that the location, design, construction, and capacity of CWISs reflect the best technology available (BTA) for minimizing adverse environmental impact (AEI). Under current regulations, existing facilities are subject to section 316(b) conditions that reflect BTA for minimizing AEI on a case-by-case, best professional judgment (BPJ) basis. 40 C.F.R. §§ 125.90(b) and 401.14. In addition, the fact sheet for the permit needs to reflect the rationale for the determination that CWISs reflect the BTA for minimizing AEI.

EPA's Phase II Section 316(b) Existing Facilities Rule was remanded to the Agency in *Riverkeeper, Inc, et al. v. EPA*, 475 F.3d 83 (2d Cir. 2007). EPA has begun work to address the remand. Until EPA has issued the final rule, EPA has not definitively spoken to what controls represent BTA for minimizing AEI for those facilities. The rulemaking record for the Phase II Rule is, however, a useful source of information concerning potential technologies for minimizing AEI at CWISs that the permitting authority may wish to evaluate in order to establish controls that represent BTA for minimizing AEI at a particular facility. This fact sheet discusses information in the Phase II record that permit writers may consider when establishing BPJ 316(b) permit conditions or when reviewing 316(b) conditions for reissued permits to ensure that they continue to reflect BTA for minimizing AEI.

Examples of Information From the Phase II Record That May Be Useful to Consider When Developing BPJ Permit Requirements Reflecting BTA for Minimizing AEI

Information on intake flows

Information in the record for EPA's Phase II Section 316(b) Existing Facilities Rule showed that closed-cycle recirculating cooling systems can reduce cooling water flow by up to 98 percent and can correspondingly reduce mortality from impingement and entrainment by up to 98 percent when compared with conventional once-through systems.

One approach for the permit writer would be to determine that BTA for minimizing AEI at a particular facility represents some prescribed flow level. This might mean that the permit writer would develop permit conditions requiring achievement of the BTA flow level or achievement of BTA impingement mortality and entrainment (IM&E) reduction standards associated with the BTA flow level. Under this approach, the permit writer would need information from the facility demonstrating that it has reduced (or will reduce) the volume of its intake flow to a level that is commensurate with the BTA flow level. The permit writer should consider including conditions in the permit that require proper operation and maintenance of the system in order to meet the BTA intake flow.

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1 The discussion in this document is intended solely as a tool. The statutory provisions and EPA regulations described in this document contain legally binding requirements. This document is not a regulation itself, nor does it change or substitute for those provisions and regulations. Thus, it does not impose legally binding requirements on EPA, States, or the regulated community. This tool does not confer legal rights or impose legal obligations upon any member of the public. While EPA has made every effort to ensure the accuracy of the discussion in this tool, the obligations of the regulated community are determined by statutes, regulations, or other legally binding requirements. In the event of a conflict between the discussion in this document and any statute or regulation, this document would not be controlling.

Information on performance ranges

The record for the Phase II rule also included information on the performance ranges of technology other than closed-cycle recirculating systems. The data showed that current technologies other than closed-cycle cooling can meet a performance standard range of 80-95% reduction in impingement mortality and 60-90% reduction in entrainment. These ranges were representative of the efficacies that can be expected from the use of intake technologies at most facilities.

Another approach for the permit writer would be to determine that an IM&E performance level represents BTA for minimizing AEI for a particular facility. Under this approach, the permitting authority may consider requiring the facility to submit data to demonstrate the IM&E performance level that the technology or suite of technologies they currently employ (or will install) will achieve. Data collection may include, among other things, engineering data, operational information, source waterbody information, and IM&E characterization studies. Historical data may also be useful where the conditions at the facility and in the waterbody from which the facility withdraws have not changed substantially over time.

The permit writer may consider requiring the facility to characterize adverse environmental impact (AEI), e.g., impingement and entrainment, describe its expected CWIS operation, and to develop a technological or operational response to reduce AEI based on the site-specific details of the facility to minimize impacts.

Under this approach, the permit writer would include a condition in the permit requiring achievement of the IM&E performance level that the permit writer determines is BTA for minimizing AEI for the facility as well as conditions requiring operation and maintenance of the facility in a manner consistent with the information submitted to establish the BTA performance for the facility.

What if the Permit Writer Determines that the Facility's Current Technology is BTA for Minimizing AEI?

In circumstances where the permit writer determines that technology or a suite of technologies in-place at the CWIS currently reflect BTA for minimizing AEI, the permit writer may base the section 316(b) permit conditions on the current technologies at the CWIS. Under this approach, the permitting authority should explain why other available technologies do not represent BTA for minimizing AEI. Examples of why technologies are not available could include considerations such as costs or energy penalty and would support the determination that the current technology represents BTA for minimizing AEI.

For a facility where current technology is BTA for minimizing AEI, permit conditions could include, for example, operation and maintenance conditions or the achievement of a required flow or IM&E performance level as BTA for minimizing AEI.

In addition, the permitting authority may want to include a permit reopener provision and the requirement for the facility to submit additional data. This data would allow the permit writer to compare AEI associated with the existing technology with that identified for other technologies. Data submission requirements may address engineering data, operational information, source waterbody information, and IM&E characterization studies. As noted above, in certain circumstances, historical data may be useful.

The permitting authority could also consider requiring the facility to evaluate AEI, e.g., impingement and entrainment, resulting from its current CWIS operation and develop additional technological or operational solutions if necessary based on the site-specific details of the facility. If studies indicate the current CWIS configuration is not representative of BTA for minimizing AEI, the permitting authority should consider modifying its determination of BTA either by reopening the permit under the reopener provision or during the next permit cycle .

Useful Resources

The materials in the 316(b) Phase I, II, and III rulemaking records offer a substantial amount of information on intake technology performance. EPA has identified the following documents as especially helpful:

American Society of Civil Engineers (ASCE). *Design of Water Intake Structures for Fish Protection*. 1982. DCN 6-5057 and OW-2002-0049-2769 in the 316(b) Phase II record.

Electric Power Research Institute (EPRI). *Fish Protection at Cooling Water Intakes: Status Report*. 1999. DCN 4-4002B in the 316(b) Phase II record.

U.S. EPA. *Technical Development Document for the Proposed Section 316(b) Phase II Existing Facilities Rule* (EPA 821-R-02-003). Chapter 3. April 2002. DCN 4-0004 in the 316(b) record. http://www.epa.gov/waterscience/316b/phase2/devdoc/

U.S. EPA. *Technical Development Document for the Final Section 316(b) Phase II Existing Facilities Rule* (EPA 821-R-04-007). Chapter 4. February 2004. DCN 6-0004 and OW-2002-0049-1462 in the 316(b) record. http://www.epa.gov/waterscience/316b/phase2/devdoc/final.htm

U.S. EPA. *Draft Guidance for Evaluating the Adverse Impact of Cooling Water Intake Structures on the Aquatic Environment: Section 316 (b)* P.L. 92-500. 1977. DCN 1-5045-PR in the 316(b) record. http://www.epa.gov/waterscience/316b/files/1977AEIguid.pdf

U.S. EPA. *U.S. EPA NPDES Permit Writers' Manual.* Chapter 5.1.4. December 1996. EPA-833-B-96-003 http://www.epa.gov/npdes/pubs/owm0243.pdf

For More Information

Contact Jamie Hurley at the EPA Office of Water; Office of Wastewater Management (4203M), 1200 Pennsylvania Avenue, NW Washington, D.C. 20460 (e-mail: hurley.jamie@epa.gov).

Proposed Strategy for Issuing Permits Subject to 316(b) Requirements

Have permittees review and select a strategy or strategies from EPA's draft fact sheet, "*Development of BPJ-Based 316(b) NPDES Permit Conditions* (DRAFT Fact Sheet)."

Permittees will submit all background information to support the strategy they selected to meet EPA requirements related to 316(b) to the TCEQ.

Water Quality Division staff will review and evaluate all information submitted, and develop permit conditions and fact sheet language using the guidance under EPA's DRAFT Fact Sheet.

If the biological data the permittee collected as required in the remanded regulation is not available, the permit will contain a deadline for submittal of this data.

Current EPA requirements related to 316b Issues:

New or existing facilities operating a cooling water intake structure (CWIS) must contain permit conditions meeting the requirements applicable to CWIS under 316(b) of the Clean Water Act. The 316(b) provisions require that CWIS's reflect the Best Technology Available (BTA) for minimizing Adverse Environmental Impact (AEI). The current EPA regulations for existing facilities require this on a case-by-case, best professional judgment (BPJ) basis.

Also, the fact sheet for the permit needs to reflect the rationale for the determination that the CWIS reflects BTA for minimizing BPJ.

General Summary of the Guidance from EPA's DRAFT Fact Sheet on 316(b) Requirments

Determine that the system is a closed-cycle recirculating cooling system as discussed in the record for EPA's Phase II 316(b) Existing Facilities Rule (Record)..

Determine that a prescribed flow level at the facility meets BTA for minimizing AEI and develop permit conditions requiring achievement of the BTA flow level or achievement of impingement, mortality, and entrainment (IM&E) reduction standards associated with the BTA flow level.

Use technologies that are discussed in the Record that have performance ranges that could meet the BTA for minimizing AEI.

Determine an IM&E performance level that represents BTA for minimizing AEI for a particular facility, and place a condition in the permit requiring achievement of this level.

Determine that the technologies in-place at a facility reflect BTA for minimizing AEI. The permit writer should explain why other available technologies do not represent BTA for minimizing AEI. Permit requirements could include operation and maintenance conditions, achievement of required flows, or IM&E performance level, and also require additional data collection to support this determination or need to reopen the permit.

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August 11, 2011

IWD
#5032

via e-file and deposit in the U.S. mail

Melissa Chao, Acting Chief Clerk
Office of the Chief Clerk, MC-105
Texas Commission on Environmental Quality
P.O. Box 13087, MC-105
Austin, Texas 78711-3087

Re: Comments by Public Citizen regarding Southwest Electric Power Company's (SWEPCO) application for amendment and renewal of TCEQ TPDES Permit No. WQ0002496000.

Ms. Chao:

Public Citizen offers the following comments regarding the application of Southwestern Electric Power Company ("SWEPCO") to renew and amend TPDES Permit No. WQ0002496000. The draft permit does not ensure adequate protection of surface water quality.

New Source Determination

The proposed amendment seeks to authorize several changes at the facility, including an increase in the capacity of the existing Flue Gas Desulphurization & Fly Ash Landfill Retention Pond (Landfill Pond). To accomplish this increased capacity, the berms for the existing pond will be increased in lateral extent and height, and the bottom of the pond will be re-excavated. This newly constructed pond constitutes a "new source," properly subject to the new source performance standards (NSPS). The Executive Director's finding that the amendment does not involve the authorization of a new source is incorrect.

Flue Gas Desulphurization (FGD) Wastewater

Waste streams produced at the facility will include FGD wastewater. This wastewater will be discharged via outfall 004.[1] The sole treatment process for this wastewater prior to discharge is settling and unspecified precipitation/flocculation in the Landfill Pond.

[1] Technical Report Attachment D, Water Flow Diagram.

Sampling performed at the facility confirms that the wastewater contained in the Landfill Pond contains significant levels of Barium and Selenium.[2] Furthermore, in August of 2008 the plant discharged wastewater through Outfall 004 which had a selenium concentration of 0.057 mg/L, well in excess of the existing selenium effluent limitation of 0.036 mg/l at this outfall. Public Citizen is concerned that the draft permit does not contain adequate effluent limitations to control the discharge of these and similar contaminants.

TPDES permits must include technology-based effluent limitations consistent with the requirements of the federal Clean Water Act. Specifically, the permit must include effluent limitations consistent with the use of the best available technology economically achievable (BAT). The United States Environmental Protection Agency has issued guidance regarding BAT for FGD waste streams.[3] In that guidance, EPA noted that FGD wastewater contains pollutants such as selenium, boron and magnesium that are generally present in soluble form, and not effectively and reliably removed by wastewater settling ponds. The EPA further noted that while some methods of precipitation and flocculation can achieve the removal of certain metals, these treatment techniques are not effective at the removal of selenium and other metals that contribute to high concentrations of total dissolved solids in FGD wastewater.

The EPA has noted that biological treatment systems are available that are capable of removing selenium and other metals that settling ponds and physical/chemical treatment systems cannot effectively remove. Biologic treatment systems constitute BAT for FGD waste streams, and technology-based effluent limits should be established consistent with the use of this treatment technology.

The draft permit fails to include technology-based effluent limitations consistent with current EPA guidance for FGD waste streams. The Fact Sheet claims that the effluent limitations in the permit are consistent with EPA's guidance based solely on a consideration of observed groundwater impacts. This *media-based* discussion is wholly irrelevant to a determination of the proper *technology-based* effluent limitations to be imposed at the facility. The reasoning provided in the Fact Sheet provides no basis to conclude that the technology utilized at the facility for the treatment of FGD wastewater streams constitutes BAT for those waste streams.

Cooling Water Intake Structures

The Pirkey Power Plant withdraws approximately 560 million gallons per day from the Brandy Branch Reservoir for cooling water purposes, and up to an additional 21.6 MGD from Lake O' the Pines as makeup water for the cooling water system at the plant.[4] Pursuant to the Clean Water Act, the location, design, construction and capacity of the associated intake structures

[2] Technical Report Worksheet 7.0, p. 7-4.
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must reflect the best technology available for minimizing adverse environmental impacts (BTA). It has not been shown that the intake structures for the Pirkey Plant meet this requirement.

The fact sheet presents no analysis for the intake structures located on Lake O' the Pines. These structures are used to withdraw over 10 million gallons per day, and so must be demonstrated to be compliant with § 316(b) of the CWA. It is improper to issue the permit without a determination that the CWIS at Lake O' the Pines comply with the requirements of CWA § 316(b). No such determination has been made. The existing intake structures located at Lake O' the Pines do not meet the requirements of CWA § 316(b).

Moreover, the intake structures at Brandy Branch Reservoir do not reflect BTA. For perspective, EPA has found that a through-screen velocity of 0.5 feet per second is equivalent to BTA at new facilities.[5] In comparison, the intake structures for the Pirkey Plant at Brandy Branch Reservoir demonstrate a through-screen velocity of 2.28 feet per second.[6] Intake structures with this type of a through-screen velocity do not constitute BTA for either a new or existing facility.

Protection of Attainable and Designated Uses

The draft permit does not include adequate protections for the attainable and designated uses of the receiving waters.

Faulty Anti-Degradation Analysis

A sufficient anti-degradation analysis has not been performed to justify issuance of the permit. The proposed discharge will result in a lowering of water quality in fishable/swimmable waters, including Brandy Branch Reservoir, by more than a de minimis extent, and yet no showing has been made that this lowering of water quality is necessary for important economic or social development.

Insufficient Solids Management Plan

The application proposes to dispose of facility wastes at the Lone Star POTW in Lone Star, Texas. No demonstration has been made that this plant has adequate capacity to properly treat the solids produced at the Pirkey Plant.

Insufficient Groundwater Protection

The draft permit does not include proper protections for groundwater in the vicinity of the plant. The Landfill Pond and other storage areas pose a danger to groundwater that has not been adequately addressed.

---

[5] 40 CFR § 125.84(b)(2).

[6] Fact Sheet and Executive Director's Preliminary Decision, p. 30.

Protection of Aquatic Life

Sufficient limitations and monitoring requirements have not been included in the permit adequate to ensure the protection of aquatic life in the receiving waters.

Conclusion

For these reasons, the application by SWEPCO to amend and renew TCEQ Permit No. 02496 for the H.W. Pirkey Power Plant should be denied.

Sincerely,

Eric Allmon

Eric Allmon

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CHIEF CLERKS OFFICE

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Ms. Melissa Cino
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Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

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From: PUBCOMMENT-OPA
To: PUBCOMMENT-OCC2
Date: 8/12/2011 10:12 AM
Subject: Fwd: Public comment on Permit Number WQ0002496000
Place: PUBCOMMENT-OCC2
Attachments: 08.11.11 Public Citizen Comments re Pirkey Amd-Renewal App.pdf

>>> PUBCOMMENT-OCC 8/11/2011 4:36 PM >>>

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75032

>>> <sam@lf-lawfirm.com> 8/11/2011 4:38 PM >>>

REGULATED ENTY NAME AEP PIRKEY POWER PLANT
RN NUMBER: RN100214287
PERMIT NUMBER: WQ0002496000
DOCKET NUMBER:
COUNTY: HARRISON
PRINCIPAL NAME: SOUTHWESTERN ELECTRIC POWER COMPANY
CN NUMBER: CN600126767
FROM
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ADDRESS: 707 RIO GRANDE ST Suite 200
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PHONE: 5124696000
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COMMENTS: Please see attached comments on behalf of Public Citizen.

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August 11, 2011

Melissa Chao, Acting Chief Clerk
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Texas Commission on Environmental Quality
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via e-file and deposit in the U.S. mail

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