FPL

L-2018-169
10 CFR 54.17

October 5, 2018

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

Re: Florida Power & Light Company
Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Turkey Point Units 3 and 4 Subsequent License Renewal Application
Environmental Review Requests for Additional Information (RAI) Set 3 Responses

References:

1. FPL Letter L-2018-082 to NRC dated April 10, 2018, Turkey Point Units 3 and 4 Subsequent License Renewal Application – Revision 1 (ADAMS Accession No. ML18113A134)
2. FPL Letter L-2018-086 to NRC dated April 10, 2018, Turkey Point Units 3 and 4 Subsequent License Renewal Application – Appendix E Environmental Report Supplemental Information (ADAMS Accession Nos. ML18102A521 and ML1811A132)
3. NRC RAI E-Mail to FPL dated September 17, 2018, Requests for Additional Information for the Environmental Review of the Turkey Point Subsequent License Renewal Application – Set 3 (EPID No. L-2018-LNE-0001) (ADAMS Accession No. ML18244A470)

On April 10, 2018, Florida Power & Light Company (FPL) submitted to the NRC the Revision 1 of the subsequent license renewal application (SLRA) for Turkey Point Units 3 and 4 (Reference 1), as well as supplemental information for the SLRA Environmental Report (ER) (Reference 2).

The purpose of this letter is to provide, as attachments to this letter, responses to environmental review RAI Set 3 issued by the NRC on September 17, 2018 (Reference 3). Each RAI response and its corresponding attachment and associated information enclosure are indexed on page 2 of this letter.

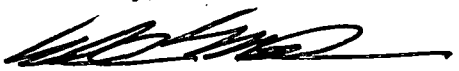
If you have any questions, or need additional information, please contact me at 561-691-2294.

A084
NRR

I declare under penalty of perjury that the foregoing is true and correct.

Executed on October 5, 2018.

Sincerely,



William Maher
Senior Licensing Director
Florida Power & Light Company

WDM/RFO

Attachments: 2 RAI Responses (refer to Letter Attachment Index)

Enclosures: 6 RAI Response Enclosures (refer to Letter Enclosures Index)

cc:

Senior Resident Inspector, USNRC, Turkey Point Plant
Regional Administrator, USNRC, Region II
Project Manager, USNRC, Turkey Point Plant
Plant Project Manager, USNRC, SLRA
Plant Project Manager, USNRC, SLRA Environmental
Ms. Cindy Becker, Florida Department of Health

LETTER ATTACHMENT INDEX			
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NRC RAI E-Mail Dated September 17, 2018

Historical and Cultural Resources

NRC RAI Number: HC-7-a

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 51.53(c)(3)(ii)(K) states that "[a]ll applicants shall identify any potentially affected historic or archaeological properties and assess whether any of these properties will be affected by future plant operations and any planned refurbishment activities in accordance with the National Historic Preservation Act."

In response to U. S. Nuclear Regulatory Commission staff's (NRC staff's) Request for Additional Information (RAI) HC-7 (RAIs: Agencywide Documents Access and Management System (ADAMS) Accession No. ML18190A499; Florida Power and Light's response: ADAMS Accession No. ML18247A507), Florida Power & Light Company (FPL) identified that within the 9,460-acre Turkey Point site exist three (3) wooden structures that were part of a Boy Scout Camp, and a cottage (known as the Ranger House or the McGregor Smith Cottage). The response states that there is no known historical significance of the three Boy Scout structures, and that they do not appear to meet the criteria for listing in the National Register of Historic Places (NRHP). However, the RAI response also states that these three structures have not been evaluated for NRHP eligibility and information about these structures has not been recorded by an architectural historian that meets the Secretary of Interior standards.

Regarding the McGregor Smith Cottage, the RAI response indicated that the cottage does not appear to have distinguishing features, and its association with McGregor Smith is unknown. The RAI response further indicated that although FPL initiated activities in 2012 to determine the eligibility of the cottage for historic landmark status and potential restoration, a NRHP determination has not been completed. The NRC staff subsequently identified the possible existence of a report prepared by David Baber, Architectural Historian, Historic Preservation Solutions, LLC, regarding the McGregor Smith Cottage Preservation Project that analyzes the historical context of the cottage. This report may provide insight as to the eligibility of the cottage for listing the in the NRHP. The NRC staff does not have a copy of this report.

According to Protection of Historic Properties regulations in 36 CFR 800.4(c), the NRC is required to determine whether the three Boy Scout structures and the McGregor Smith Cottage are historic properties eligible for listing in the NRHP in accordance with criteria in 36 CFR Part 63. In addition, regulations in 36 CFR 800.1(c), Timing, states, "The agency official must complete the section 106 process 'prior to the...issuance of any license.'"

1. On August 28, 2018 the NRC staff held a Category 1 public meeting with FPL to discuss the responses provided in HC-7. Provide the following information discussed during the meeting:

A. The association of McGregor Smith and the cottage (e.g., use of the cottage by McGregor Smith and lands as a communal retreat). Clarify if the use of the cottage by McGregor Smith was during construction of Units 1, 2, 3, or 4. Include the age of the cottage in the response.

B. The reason that FPL sought landmark status with Miami-Dade County for the McGregor Smith Cottage (e.g., tax credit status and building code accommodations, age of the cottage, association with a significant figure).

C. Provide a copy of the McGregor Smith Cottage Preservation Project report, if available.

D. Regarding the Boy Scout structures, provide a basis as to why the three structures do not appear to meet the criteria for listing in the National Register of Historic Places and how this determination was made. Include the age of the Boy Scout structures in the response.

2. To support NRC compliance with 36 CFR 800.4(c), provide any information you have (such as history, current and past use of the structures) regarding the potential eligibility of the three Boy Scout structures and the McGregor Smith Cottage for listing in the NRHP.

FPL Response:

The Boy Scout structures and the McGregor Smith Cottage will not be impacted by activities identified in the SLRA, regardless of historic designation status. The cottage and the Boy Scout structures are located within the owner-controlled area. The cottage is further located within the fenced and restricted portion of PTN and cannot be accessed without a security clearance. This controls public access to the cottage.

In response to Part 1:

A. Based on the Coastal Archaeology & History Research, Inc. and Historic Preservation Solutions, L.L.C. report on the cultural context of the McGregor Smith Cottage, the cottage was constructed to "provide living quarters and a work space for a full-time Florida board of Conservation Ranger" (Enclosure 1, page 12). There are no available records documenting McGregor Smith's association with the cottage. The building plans for the cottage were approved by the Miami-Dade County Building Department in August of 1965. Available documents do not explicitly state when the cottage was constructed, but it is assumed to have been completed in 1965 or 1966 (Enclosure 1, page 11), which would have the cottage constructed and present during the construction of PTN Units 3 and 4. Past FPL employees have reported that some meetings held at the cottage occurred during and were related to the construction of Units 3 and 4 and were led by McGregor Smith. Additionally, past employees reported that the cottage had been used as a communal retreat.

Current employees remember the cottage being used as a construction office and fish camp during the 1980s. During the 1990s the cottage was renovated to make it a habitable residence and it was used as temporary housing for senior FPL staff and for FPL meetings and team-building events. Due to difficult access, maintenance of the cottage has been minimal since the late 1990s.

B. FPL explored the possibility of local landmark status with Miami-Dade County for McGregor Smith Cottage for the purpose of utilizing flexibility in the application of the South Florida Building Code (building officials have discretion in applying the South Florida Building Code to properties that have been designated local historic landmarks) and preservation funding (Enclosure 2; page 2). The purpose in exploring local landmark status was to determine the feasibility of moving the McGregor Smith Cottage to a different location that was in an area that was accessible to the public. The Miami-Dade County Office of Historic Preservation indicated that the McGregor Smith Cottage is not of "exceptional significance" but that it "might qualify" due to the association with McGregor Smith after it has reached the 50 years old threshold (Enclosure 2). The Miami-Dade County Office of Historic Preservation indicated that based on the information provided by FPL, the McGregor Smith Cottage was built in 1968 (Enclosure 2). However, Enclosure 1 suggests that the McGregor Smith Cottage was constructed in 1965 or 1966 (Enclosure 1, page 2). FPL did not proceed with relocating the McGregor Smith Cottage and the application for county historic designation was not prepared.

   As noted in Enclosure 1 (page 7), the initial phase of Coastal Archaeology & History Research, Inc. and Historic Preservation Solutions, L.L.C.'s preliminary feasibility study, included a proposal establishing the scope and costs associated with applying for historic designation, relocation, stabilization, rehabilitation, and interpretation of the cottage. The proposal, which is titled "McGregor Smith Cottage Preservation Project: Relocation, Rehabilitation, Historic Designation & Interpretation," details activities associated with potential relocation of the McGregor Smith Cottage.

C. Enclosure 1 provides an analysis of the historical context of the McGregor Smith Cottage. The requested document, "McGregor Smith Cottage Preservation Project," is not provided because it is a proposal document and does not provide the historical context.

D. The Boy Scout camp, based on information from current FPL staff and desktop searches, was constructed in 1962–1963 and included three bunk houses (structures), a totem pole, and a "lookout hill," as well as some landscaping. The camp was no longer used after the cooling canals were completed in the early 1970s. The three bunk houses have been converted to storage buildings and have been subjected to maintenance and repair, diminishing their integrity relative to NRHP eligibility.

The National Register Criteria were evaluated as follows:

a. **That are associated with events that have made a significant contribution to the broad patterns of our history; or**

   Based on discussions with FPL environmental staff and internet-based desktop searches, there are no events associated with the Boy Scout camp structures that have made a significant contribution to the broad patterns of our history. There is no information to suggest that the structures associated with the Boy Scout camp were any different than other camp structures associated with the Boy Scouts of America across the region and country.

b. **That are associated with the lives of significant persons in our past; or**

   There is no documentation known by FPL staff or from an internet-based desktop assessment that the Boy Scout camp structures are associated with significant persons in our past. Despite the lack of documentation, there is a strong probability that the Boy Scout camp structures are associated with McGregor Smith due to his association with PTN, the Boy Scouts of America, and environmental conservation. Even though McGregor Smith is likely associated with the Boy Scout camp structures, the lack of information on the degree and kind of association, and the lack of overall documentation of the association, suggests the Boy Scout camp structures are not eligible for listing based on Criteria B.

c. **That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or**

   As described in the RAI Set 1 HC-7 response, FPL staff believe the Boy Scout camp structures lack distinctive characteristics and do not possess high artistic value or individual distinction (FPL 2018). They were constructed in a common vernacular style without elaboration.

d. **That have yielded or may be likely to yield, information important in history or prehistory.**

   The Boy Scout camp structures have not yielded important information in history. Due to lack of distinctive characteristics, loss of integrity from maintenance and repair, and lack of association with events and individuals important to history, the Boy Scout camp structures are not likely to yield information important to history.

The Boy Scout camp structures, as detailed above, do not appear to meet any of the criteria to be listed on the NRHP.

In response to Part 2:

In January of 2018, FPL consulted with the Florida State Historic Preservation Office (Division of Historical Resources) regarding the application to renew the operating license for PTN Units 3 and 4. In a letter dated April 25, 2018, the State Historic Preservation Office concurred that based on the lack of ground-disturbing activities, license renewal is unlikely to affect historic properties at PTN. This letter is provided as Enclosure 3.

References:

FPL (Florida Power & Light). 2018. FPL Letter L-2018-136 to NRC dated August 8, 2018, Turkey Point Units 3 and 4, Environmental Report Request for Additional Information (RAI) Responses (ADAMS Accession No. ML18247A509).

Associated Enclosures:

1. Coastal Archaeology & History Research Inc. and Historic Preservation Solutions, LLC. 2014. A Cultural Context of the McGregor Smith Cottage, Florida Power and Light Company, Turkey Point. December 30, 2014.
2. Kauffman, Kathleen. 2012. Unpublished letter response: McGregor Smith Ranger House as a Potential Historic Site. August 24, 2012.
3. Aldridge, Jason (signing for Timothy Parsons). 2018. Unpublished letter response: DHR Project File No. 2018-0524. Received by DHR on January 31, 2018. Application to Renew the Operating License for the Turkey Point Nuclear Plant Units 3 and 4. April 25, 2018.

Enclosure 2

Unpublished Letter Response:

McGregor Smith Ranger House as a Potential Historic Site

(August 24, 2012)

Turkey Point Units 3 and 4

SLR Application

NRC RAI No. HC-7-a

MIAMI-DADE COUNTY
miamidade.gov

Regulatory and Economic Resources Department
Office of Historic Preservation
111 NW 1st Street • 12th Floor
Miami, Florida 33128
T 305-375-4958

August 24, 2012

Mr. Bob Bertelson
Land Utilization, Turkey Point
Florida Power and Light
9760 SW 344th Street, Florida City 33035

RE: McGregor Smith Ranger House as a potential historic site

Dear Mr. Bertelson:

Let me start by thanking you again for the wonderful hospitality shown by you and your staff, and for the amazing tour of your facility. The work you perform there within the Wildlife Conservation Area is so valuable to our community; it was especially amazing to have had the opportunity to see your administration of the American crocodile tracking and evaluation program.

On August 8, 2012, I visited the Turkey Point Power Plant to evaluate the potential of the McGregor Smith Ranger House as a historic site.

I observed a one-story wood frame elevated structure that was supported underneath by large cylindrical wooden posts. Thick support beams are possibly Dade County pine. The ground floor space is enclosed with screens, as is the second level wrap-around porch. The second floor living space, which includes a living/dining area, a bedroom (that has been converted into a conference room) and a bathroom, is accessed by a wooden exterior staircase.

The structure was built circa 1968 for the purposes of housing a full-time Florida Board of Conservation ranger. It is named after McGregor Smith, one of Florida Power and Light's first presidents (from 1939-1954) and who later served as Chief Executive Officer. The building had been used more recently as an employee retreat for business meetings and workshops, but has been sitting vacant and unused for the past couple of years.

Your company has expressed an interest in ascertaining whether or not the property would qualify for historic designation, and if it did, what are the benefits that would result from such distinction?

Is the Building Eligible for Designation?

To be eligible for designation, a building must qualify under at least one of the criteria as spelled out in the Historic Preservation Ordinance of Miami-Dade County Code (Chapter 16-A.) These

criteria include architectural significance, associations with significant persons, associations with a significant event, or the potential to yield important information (archaeological significance).

And generally, the building should be at least 50 years of age to even be considered, unless the property is of exceptional significance. Building plans provided to me by your staff indicate that the ranger house was built in 1968, making it 44 years old.

This building might qualify for designation because of its association with McGregor Smith, who was an important figure in the history of the Florida Power and Light Company, but because the building isn't of exceptional significance, and because it is less than 50 years old, it does not qualify for a few more years.

Benefits of Designation

Besides the obvious benefit of protecting a resource for future generations to enjoy, buildings that have been designation as historic also become eligible for any preservation funding that may be available through the County. Additionally, building officials have discretion when reviewing projects involving historic buildings and have flexibility when it comes to applying the South Florida Building Code (though life/safety requirements are always adhered to.)

Designated buildings also are eligible for Historic Preservation Ad Valorem tax exemptions, which give owners a 100% exemption of any additional taxes that would be incurred through restoration efforts.

Buildings that have been historically designated are required to go through a Historic Preservation review before any building permit may be pulled for work, however most HP reviews are done administratively by the County staff and can be completed in one or two days. Our office only reviews work that is being proposed to the exterior of a building. Generally, the interior of any building is not regulated by our code (unless the interiors were specifically designated, as they were for the mansion at Vizcaya Museum and Gardens.)

Potential to Move the Structure

The McGregor Smith Ranger House is wood frame construction and not very large. It would be a relatively easy structure to move. However, having seen the proposed site where this building could be moved to, I think it would be extremely cost prohibitive because of the environmental and accessibility issues found between the current site and the proposed site.

Conclusion

The McGregor Smith Ranger House played a significant role in the early history of the FPL power plant at Turkey Point and is worthy of saving for future staff use and as a vestige of the flurry of activity that once took place in and around the power plant during the 1960s.

Though the building does not qualify for designation at this time, I would encourage FPL to consider stabilizing the structure and performing some basic rehabilitation so that there is no further deterioration.

If you have any more questions, please do not hesitate to contact me at (305) 375-4958.

Sincerely,

Kathleen Kauffman

Kathleen Kauffman
Preservation Chief

Enclosure 3

Unpublished Letter Response:

DHR Project File No. 2018-0524:
Application to Renew the Operating License
for the Turkey Point Nuclear Plant Units 3 and 4

(April 25, 2018)

Turkey Point Units 3 and 4

SLR Application

NRC RAI No. HC-7-a

FLORIDA DEPARTMENT of STATE

RICK SCOTT
Governor

KEN DETZNER
Secretary of State

Matthew J. Raffenberg
Sr. Director of Environmental Licensing & Permitting
Florida Power & Light Company
700 Universe Boulevard
Juno Beach, FL 33408

April 25, 2018

RE: DHR Project File No.: 2018-0524, Received by DHR: January 31, 2018
Application to Renew the Operating License for the Turkey Point Nuclear Plant Units 3 and 4

Mr. Raffenberg:

Thank you for notifying our office of the application to renew the operating license for the Turkey Point Nuclear Plant Units 3 and 4. It is our understanding that the license renewal will not require any ground disturbing activities and is, therefore, unlikely to affect historic properties. If plans change and ground disturbing activities become necessary, please notify our office for further consultation. We look forward to consulting with the U.S. Nuclear Regulatory Commission pursuant to Section 106 of the National Historic Preservation Act.

If you have any questions, please contact me by email at Jason.Aldridge@dos.myflorida.com, or by telephone at 850-245-6344.

Sincerely,

Jason Aldridge
For
Timothy A Parsons, Ph.D.
Director, Division of Historical Resources
& State Historic Preservation Officer

NRC RAI E-Mail Dated September 17, 2018

Water Resources (WR)

NRC RAI Number: WR-2-a

Section 51.45(b)(1) of 10 CFR requires, in part,

> (a)...each applicant...shall submit with its application...one signed original of a separate document entitled "Applicant's...Environmental Report," as appropriate...
>
> (b)...The environmental report shall contain a description of the proposed action, a statement of its purposes, a description of the environment affected, and discuss the following considerations:
>
> (1) The impact of the proposed action on the environment. Impacts shall be discussed in proportion to their significance;

Specifically, relating to water resources, Section 51.53(c)(3)(ii)(C) requires:

> (c) *Operating license renewal stage.*
>
> (3) For those applicants seeking...renewed license and holding an operating license...the environmental report shall include the information required in paragraph (c)(2) of this section subject to the following conditions and considerations:
>
> (ii) The environmental report must contain analyses of the environmental impacts of the proposed action, including the impacts...of operation during the renewal term, for those issues identified as Category 2 [Groundwater use conflicts (plants that withdraw more than 100 gallons per minute [gpm])] issues in Appendix B to subpart A of this part. The required analyses are as follows:
>
> (C) If the applicant's plant pumps more than 100 gallons (total onsite) of groundwater per minute, an assessment of the impact of the proposed action on groundwater must be provided.

FPL's supporting response to NRC RAI No. WR-2, included in L-2018-136 Attachment 43, Enclosure 20 (ADAMS Accession No. ML18247A507) indicates that "Marine" wells SW-1, SW-2, and PW-1 located on the Turkey Point peninsula have been in use as recently as August 2017, presumably to support cooling canal system freshening. While the Environmental Report states that the wells were installed in 2015 and produce saline water, little additional information is included on the three wells. Other available information indicates that at least one of the wells, PW-1, was constructed to support aquifer performance testing in 2009. In order to assess the environmental impacts of these wells, the staff needs additional information and clarification. Specifically, the NRC staff requests additional information on the construction of these wells including:

verification of when each well was installed or converted for production purposes, well diameter, casing depth and type, total depth, open hole or screening interval (as applicable), and installed pump capacity.

FPL Response:

Marine wells PW-1, SW-1, and SW-2 are depicted on ER Figure 3.6-11 and discussed in ER Sections 3.6.3.2, 3.6.3.2.1, and 4.5.3.4. The information provided for the marine wells is the same type as provided for the other production wells (i.e., the well's location, aquifer, use, year placed into service, and production volume). ER Sections 3.6.3.2 and 3.6.3.2.1 include the wells' aquifer, use, and year installed. ER Section 4.5.3.4 provides the wells' (identified as the seawater wells) combined capacity.

The marine wells do not require a consumptive use permit and their use to supply groundwater to the CCS is limited to "extraordinary circumstances" (Consent Agreement Paragraph 17.a.2) or an "upset recovery" (Section 4.3 of the Thermal Efficiency Plan). Due to potential adverse impact to the measurement of the plant's ultimate heat sink temperature and its input into technical specification compliance, the maximum supplementary flow in the intake area (discharge location of the marine wells) is operationally limited as follows:

- Total flow from SW-1, SW-2, PW-1, must be less than or equal to 41,600 gpm (59.9 MGD) when both Units 3 & 4 are in power operation.
- Total flow from SW-1, SW-2, PW-1, must be less than or equal to 23,400 gpm (33.7 MGD) when only Unit 3 or Unit 4 is in power operation.

The marine wells are intended only for "extraordinary circumstances" or "upset recovery" to come into, or remain, compliant with regulatory requirements. In 2016/2017, as a result of previous hyper-saline conditions in the CCS and a drier than normal dry season (November – May), the wells were used March – August in 2017. The marine wells were employed to stabilize salinity in the system until significant rainfall returned in August 2017. The activity was necessary to assist in meeting an average annual salinity target of 34 PSU by November 2020, as required by the FPL – FDEP Consent Order of June 20, 2016.

Marine Well PW-1

The construction and testing for marine well PW-1 are detailed in the report *Turkey Point Exploration Drilling and Test Program*. The well construction diagram for PW-1 is presented in the reference as PDF page 100 of 351 (FPL 2009).

As detailed in the above-referenced report, marine well PW-1 was originally drilled in January 2009 as a test production well for evaluation of the use of radial collector wells as a source of cooling water for the proposed Turkey Point Units 6 and 7 (FPL 2009, PDF page 91 of 351); however, following the completion of testing in 2009, all pumping equipment was removed.

In late 2014 and early 2015, marine well PW-1 was converted to production use during "extraordinary conditions" or "upset recovery."

Marine well PW-1 is equipped with a single stage vertical turbine pump capable of pumping 7,000 gallons per minute (gpm) at an installed depth of 40 feet. The data sheet for the pump installed in marine well PW-1 is provided in Enclosure 1.

Marine Wells SW-1 and SW-2

A general construction diagram, well construction details, step drawdown test, water quality results, and lithologic logs for marine wells SW-1 and SW-2 are provided in Enclosure 2.

As detailed in Enclosure 2, marine wells SW-1 and SW-2 were installed in early 2015 with the current pump and piping arrangement.

Marine wells SW-1 and SW-2 are equipped with three stage axial flow pumps capable of pumping 12,500 gpm each at an installed depth of 75 feet. Marine well SW-1 is completed with an open borehole between 23 feet and 56 feet below land surface (bls). Marine well SW-2 is competed with an open borehole between 24 feet and 55 feet bls. Therefore, the pumps are installed at depths shallower than 75 feet bls. Based on the pump performance curve, the installed pumps are capable of pumping 15,000 gpm each at 45 feet bls.

The data sheet for the pumps installed in marine wells SW-1 and SW-2 is provided in Enclosure 3.

References:

FPL (Florida Power & Light). 2009. Turkey Point Exploration Drilling and Test Program, August 19, 2009, ADAMS accession number ML110820053, accessed August 24, 2018.

Associated Enclosures:

1. American-Marsh Pumps. 2014. Pump Data Sheet – American-Marsh Pumps. November 19, 2014.
2. JLA Geosciences, Inc. 2015. Excerpted from Turkey Point Power Plant Cooling Canal System Seawater Supply Wells SW-1 and SW-2. March 30, 2015.
3. All-Webb. 2015. Pump Data Sheet – FPI. FPL ALL 316L Seawater Pumps (3-Stage). April 2, 2015.

Enclosure 1

Pump Data Sheet – American-Marsh Pumps

(November 19, 2014)

Turkey Point Units 3 and 4

SLR Application

NRC RAI No. WR-2-a

Company: American-Marsh Pumps
Name:
Date: 11/19/2014

AMERICAN-MARSH PUMPS

Pump:

Size: 19HC (1 stage)

Type: 480_VRT-TURBINE/ENCL
Synch speed: 1800 rpm

Speed: 1760 rpm
Dia: 14.594 in

Curve: RS-31029

Impeller:

Specific Speeds:

Ns: ---
Nss: ---

Dimensions:

Suction: 21 in
Discharge: 16 in

Vertical Turbine:

Bowl size: 18.625 in
Max lateral: --- in
Thrust K factor: 32 lb/ft

Pump Limits:

Temperature: 150 °F
Pressure: 350 psi g
Sphere size: 1 in

Power: 800 hp
Eye area: --- in²

Search Criteria:

Flow: 7000 US gpm

Head: 40 ft

Fluid:

Water
Density: 62.25 lb/ft³
Viscosity: 1.105 cP

Temperature: 60 °F
Vapor pressure: 0.2563 psi a
Atm pressure: 14.7 psi a

NPSHa: --- ft

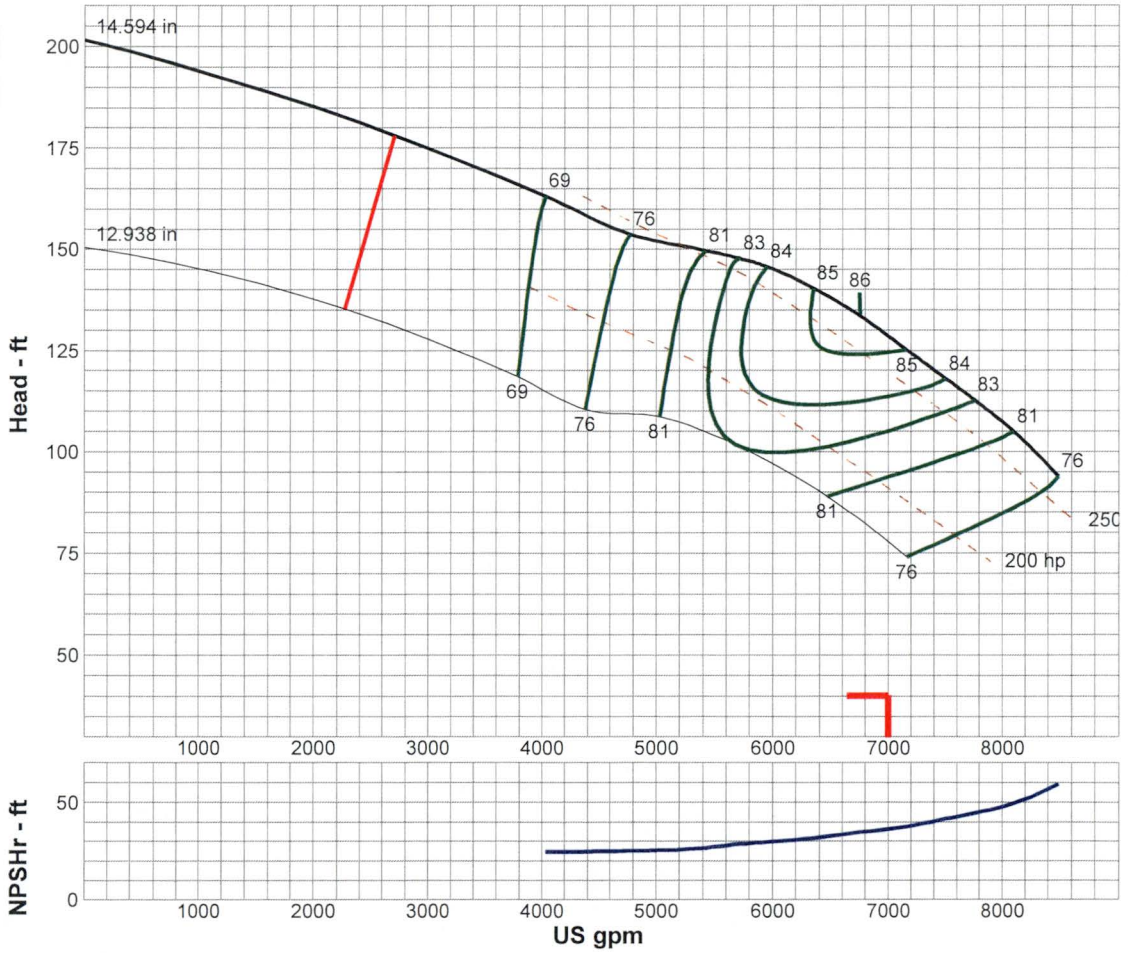
Motor:

Standard: NEMA
Enclosure: TEFC

Size: 300 hp
Speed: 1800
Frame: 449T

Sizing criteria: Max Power on Design Curve

---- Data Point ----	
Flow:	7000 US gpm
Head:	128 ft
Eff:	85%
Power:	266 hp
NPSHr:	36.5 ft
---- Design Curve ----	
Shutoff head:	202 ft
Shutoff dP:	87.2 psi
Min flow:	2701 US gpm
BEP:	86% @ 6751 US gpm
NOL power:	266 hp @ 6751 US gpm
-- Max Curve --	
Max power:	266 hp @ 6751 US gpm



Performance Evaluation:

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
8400	1760	96.3	77	265	57.3
7000	1760	128	85	266	36.5
5600	1760	148	82	255	28
4200	1760	161	71	241	24.9
2800	1760	175	57	235	24

Enclosure 2

Excerpted from JLA Geosciences, Inc. Report

Turkey Point Power Plant Cooling Canal System

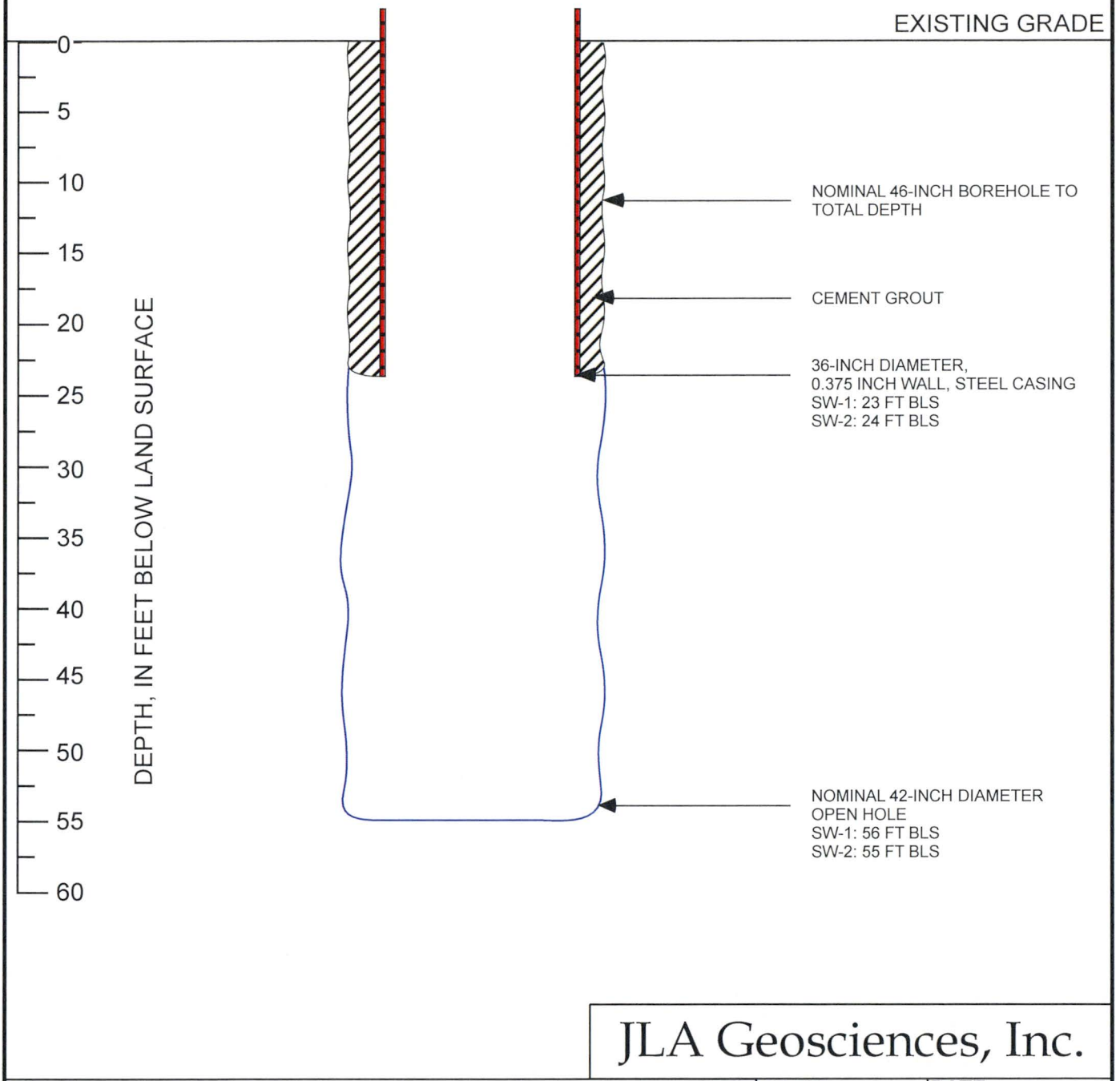
Seawater Supply Wells SW-1 and SW-2

(March 30, 2015)

Turkey Point Units 3 and 4

SLR Application

NRC RAI No. WR-2-a



JLA Geosciences, Inc.

LEGEND:
CEMENT GROUT
STEEL WELL CASING
OPEN HOLE

SCALE:	DATE:
AS SHOWN	03/30/2015
DRAWN BY:	FIGURE NO:
ASG	1

PROJECT SITE:
FLORIDA POWER AND LIGHT
TURKEY POINT POWER PLANT COOLING CANAL SYSTEM
SEAWATER SUPPLY WELLS SW-1 AND SW-2

FIGURE TITLE:
WELL CONSTRUCTION DIAGRAM

TABLE 1
FLORIDA POWER AND LIGHT
TURKEY POINT POWER PLANT COOLING CANAL SYSTEM
SEAWATER SUPPLY WELLS SW-1 AND SW-2
Well Construction Details

	SW-1	SW-2
Exploratory Core Hole Depth (feet BLS) *4-inch diameter borehole*	63	63
Total Depth (feet BLS)	56	55
Well Casing Depth (feet BLS) *36-inch diameter steel* *0.375-inch wall thickness*	23	24
Open Borehole Interval (feet BLS) *42-inch diameter*	23 – 56	24 – 55

feet BLS - feet below land surface

TABLE 2
FLORIDA POWER AND LIGHT
TURKEY POINT POWER PLANT COOLING CANAL SYSTEM
SEAWATER WELL SW-1 AND SW-2
SW-1 Step Drawdown Test And Water Quality Results

WELL: SW-1 TEST DATE: 04/23/2015

SPECIFIC CAPACITY DATA

Pumping Rate (gpm)	Pumping Duration (min)	Static Water Level (ft. BLS)	Water Level (ft. BLS)	Drawdown (feet)	Specific Capacity (gpm/ft)
1,400	120	4.50	5.21	0.71	1,971
2,000	120	5.05	5.52	1.18	1,695
2,390	120	5.26	4.91	1.53	1,562

WATER QUALITY DATA

Pumping Rate (gpm)	Sand Conc. (ppm)	Specific Cond. (mS/ cm)	Salinity (ppt)	Chloride (mg/L)	pH	Turbidity (NTU)	H_2S (ppm)	Fe^T (ppm)	Fe^S (ppm)
1,400	<1.0	53.6	35.4	19,850	7.3	0.09	6.0	<0.1	<0.1
2,000	<1.0	54.7	36.2	19,800	7.3	0.14	6.5	<0.1	<0.1
2,390	<1.0	55.3	36.6	19,900	7.3	0.36	6.0	<0.1	<0.1

Notes:

- gpm - gallons per minute
- gpm/ft - gallons per minute per foot of drawdown
- mg/L - milligrams per liter
- mS/cm - microseimens per cm
- ppm - parts per million
- BLS - Below land surface
- NTU - nephelometric turbidity units
- H_2S - Hydrogen Sulfide Concentration
- Fe^T - Total Iron Concentration
- Fe^S - Soluble Iron Concentration

TABLE 3
FLORIDA POWER AND LIGHT
TURKEY POINT POWER PLANT COOLING CANAL SYSTEM
SEAWATER WELL SW-1 AND SW-2
SW-2 Step Drawdown Test And Water Quality Results

WELL: SW-2 TEST DATE: 04/26/2015

SPECIFIC CAPACITY DATA

Pumping Rate (gpm)	Pumping Duration (min)	Static Water Level (ft. BLS)	Water Level (ft. BLS)	Drawdown (feet)	Specific Capacity (gpm/ft)
1,340	120	5.91	6.62	0.71	1,887
2,005	120	6.30	7.56	1.26	1,591
2,395	120	6.33	8.12	1.79	1,338

WATER QUALITY DATA

Pumping Rate (gpm)	Sand Conc. (ppm)	Specific Cond. (mS/ cm)	Salinity (ppt)	Chloride (mg/L)	pH	Turbidity (ntu)	H_2S (ppm)	Fe^T (ppm)	Fe^S (ppm)
1,340	<0.8	56.0	37.2	20,200	7.3	0.24	5.0	0.1	0.1
2,005	<0.8	56.6	37.6	--	7.2	0.35	6.0	0.1	0.1
2,395	2.6	55.3	36.6	19,850	7.2	0.51	7.0	0.1	0.1

Notes:

gpm	-	gallons per minute
mg/L	-	milligrams per liter
mS/cm	-	microseimens per cm
ppm	-	parts per million
BLS	-	Below land surface
ntu	-	nephelometric turbidity units
H_2S	-	Hydrogen Sulfide Concentration
Fe^T	-	Total Iron Concentration
Fe^S	-	Soluble Iron Concentration

FLORIDA POWER AND LIGHT
TURKEY POINT POWER PLANT COOLING CANAL SYSTEM
SEAWATER SUPPLY WELLS SW-1 AND SW-2
SW-1 Lithologic Log

Depth (Feet BLS)	Classification	Lithologic Description
0 – 5		Fill
5 – 8		No Recovery
8 – 9	*Lithofacies/Rock Type*	Wackestone/Mudstone
	Color	Yellowish Gray 5Y 7/2, Pale Yellowish Orange 10YR 8/6
	Texture/Matrix	Hard, carbonate cemented, carbonate mud
	Grains	Skeletal grains, pelloids
	Porosity	Matrix
	Sedimentary Structures	Thickly bedded
9 – 9.8	*Lithofacies/Rock Type*	Organics/Peat
	Color	Very Dark Red 5R 2/6, Very Dusky Red 10R 2/2
	Texture/Matrix	NA
	Grains	NA
	Porosity	NA
	Sedimentary Structures	NA
9.8 – 13	*Lithofacies/Rock Type*	Wackestone/Packstone
	Color	Yellowish Gray 5Y 7/2, Pale Yellowish Orange 10YR 8/6
	Texture/Matrix	Hard, carbonated cemented, micritic matrix supported
	Grains	Very fine to fine skeletal grains and carbonate grains
	Porosity	Matrix
	Sedimentary Structures	Thickly bedded
13 – 16	*Lithofacies/Rock Type*	Wackestone/Packstone
	Color	Yellowish Gray 5Y 7/2, Light Olive Gray 5Y 5/2, Very Pale Orange 10YR 8/2, Olive Gray 5Y 4/1, mottled color
	Texture/Matrix	Hard, well cemented, micritic matrix
	Grains	Abundant skeletal grains/shell fragments, sand size pelloidal carbonate grains
	Porosity	Highly dissolutioned rock, touching moldic/vuggy porosity, matrix porosity
	Sedimentary Structures	Thinly bedded, interbedded, erosional feature at 15.75 feet BLS
16 – 16.8	*Lithofacies/Rock Type*	Calcrete
	Color	White N9, Yellowish Gray 5Y 7/2
	Texture/Matrix	Soft, carbonate cemented
	Grains	Carbonate mud, very fine pelloidal carbonate grains
	Porosity	Matrix
	Sedimentary Structures	Root molds/ burrows, erosional feature (unconformity) at 16.25 feet BLS
16.8 – 18	*Lithofacies/Rock Type*	Wackestone/Packstone
	Color	Yellowish Gray 5Y 7/2
	Texture/Matrix	Carbonate cemented, grain supported, granular matrix
	Grains	Abundant skeletal grains/shell fragments, sand size pelloidal carbonate grains, intraclasts
	Porosity	Matrix
	Sedimentary Structures	Thickly bedded
18 – 21	*Lithofacies/Rock Type*	Grainstone/Packstone
	Color	Very Pale Orange 10YR 8/2, Yellowish Gray 5Y 7/2
	Texture/Matrix	Well cemented, granular texture, carbonate cemented, grain supported
	Grains	Abundant skeletal grains/shell fragments, fine to medium sand size pelloidal carbonate grains, intraclasts
	Porosity	Highly dissolutioned, gravel to medium sand size non-touching and touching vuggy dissolution, matrix porosity
	Sedimentary Structures	Thickly bedded

Feet BLS – feet below land surface

FLORIDA POWER AND LIGHT TURKEY POINT POWER PLANT COOLING CANAL SYSTEM SEAWATER SUPPLY WELLS SW-1 AND SW-2 SW-1 Lithologic Log		
Depth (Feet BLS)	**Classification**	**Lithologic Description**
21 – 26	*Lithofacies/Rock Type*	Sparse Intraclastic & Bioclastic Mudstone/Wackestone
	Color	Yellowish Gray 5Y 7/2
	Texture/Matrix	Carbonate cemented, matrix supported, granular matrix
	Grains	Skeletal grains, pelloids, intraclasts
	Porosity	Minor dissolution, molds, matrix
	Sedimentary Structures	Thickly bedded
26 – 27	*Lithofacies/Rock Type*	Sandy Marl
	Color	White N9, Yellowish Gray 5Y 7/2
	Texture/Matrix	Soft, unconsolidated lime mud
	Grains	Fine sand to medium sand sized quartz and carbonate grains, skeletal grains
	Porosity	Matrix
	Sedimentary Structures	Thinly bedded
27 – 30.25	*Lithofacies/Rock Type*	Packstone/Grainstone
	Color	White N9, Yellowish Gray 5Y 7/2
	Texture/Matrix	Moderately hard to hard, carbonate cemented, well cemented
	Grains	Fine sand to medium sand sized quartz, carbonate grains, skeletal grains, trace phosphates
	Porosity	Matrix, minor non touching and touching vuggy dissolution, moldic
	Sedimentary Structures	Thickly bedded
30.25 – 32	*Lithofacies/Rock Type*	Boundstone
	Color	Yellowish Gray 5Y 7/2, Grayish Yellow 5Y 8/4, Light Bluish Gray 5B 7/1
	Texture/Matrix	Very hard, crystalline, microspar matrix to granular, skeletal supported, very well cemented
	Grains	Carbonate cemented fine sand to coarse sand sized quartz and carbonate grains, abundant skeletal grains/shell fragments
	Porosity	Massive, vuggy dissolution, casts and molds
	Sedimentary Structures	Bedded skeletal grains, thickly bedded
32 – 37	*Lithofacies/Rock Type*	Grainstone
	Color	Yellowish Gray 5Y 7/2, Pale Greenish Yellow 10Y 8/2, Grayish Yellow 5Y 8/4
	Texture/Matrix	Hard, granular texture, microcrystalline matrix, well cemented
	Grains	Fine sand to medium sand sized quartz grains, skeletal and carbonate grains
	Porosity	Minor non touching moldic dissolution
	Sedimentary Structures	Casts, bedded skeletal grains, thickly bedded
37 – 37.8	*Lithofacies/Rock Type*	Grainstone
	Color	Pale Green 5G 7/2, Pale Greenish Yellow 10Y 7/4
	Texture/Matrix	Hard, granular texture, microcrystalline matrix, well cemented
	Grains	Very fine sand to medium sand sized quartz and phosphate grains, trace skeletal grains
	Porosity	Intergranular
	Sedimentary Structures	Thinly bedded
37.8 – 40.5	*Lithofacies/Rock Type*	Grainstone/Packstone
	Color	Pale Greenish Yellow 10Y 7/4, Moderate Greenish Yellow 10Y 7/4, Yellowish Gray 5Y 7/2, Moderate Yellow 5Y 7/6
	Texture/Matrix	Moderately hard to moderately soft, granular texture, microcrystalline matrix, moderately well cemented
	Grains	Very fine sand to medium sand sized quartz and phosphate grains, skeletal grains, intraclastic
	Porosity	Intergranular, bedding planes, minor skeletal grain dissolution
	Sedimentary Structures	Thinly interbedded, lenticular bedding

Feet BLS – feet below land surface

FLORIDA POWER AND LIGHT TURKEY POINT POWER PLANT COOLING CANAL SYSTEM SEAWATER SUPPLY WELLS SW-1 AND SW-2 SW-1 Lithologic Log		
Depth (Feet BLS)	**Classification**	**Lithologic Description**
40.5 – 43	*Lithofacies/Rock Type*	Grainstone
	Color	Pale Greenish Yellow 10Y 7/4, Moderate Greenish Yellow 10Y 7/4
	Texture/Matrix	Moderately hard to semiconsolidated/unconsolidated, granular texture, microcrystalline matrix, well cemented
	Grains	Very fine sand to medium sand sized quartz grains and carbonate grains, phosphate grains, moderate skeletal fragments
	Porosity	Minor dissolution of skeletal material, matrix
	Sedimentary Structures	Thinly interbedded sand beds, lenticular bedding
43 – 47	*Lithofacies/Rock Type*	Coralline Floatstone/Rudstone
	Color	Grayish Yellow 5Y 8/4, Pale Greenish Yellow 10Y 7/4
	Texture/Matrix	Very hard, fossiliferous, well cemented, predominantly grain supported, crystalline/druzy texture
	Grains	Large skeletal grains, corral framework, molds, fine sand to medium sand sized carbonate grains, quartz sand, mollusks, gastropods
	Porosity	Highly dissolutioned, predominantly touching vuggy and moldic porosity, matrix porosity, recrystallized skeletal/shell fragments, dissolution features decrease with depth
	Sedimentary Structures	Thickly bedded, bedded skeletal grains
47 – 48.5	*Lithofacies/Rock Type*	Mudstone/Wackestone
	Color	Grayish Yellow 5Y 8/4, Pale Greenish Yellow 10Y 7/4
	Texture/Matrix	Carbonate cemented, matrix supported, granular matrix
	Grains	Skeletal grains, pelloids, intraclasts
	Porosity	Minor moldic dissolution
	Sedimentary Structures	Thickly bedded
48.5 – 54.5	*Lithofacies/Rock Type*	Coralline Floatstone/Rudstone
	Color	Grayish Yellow 5Y 8/4, Pale Greenish Yellow 10Y 7/4
	Texture/Matrix	Very hard, fossiliferous, well cemented, predominantly grain supported, crystalline/druzy texture
	Grains	Large skeletal grains, corral framework, molds, fine sand to medium sand sized carbonate grains, quartz sand, mollusks, gastropods
	Porosity	Highly dissolutioned, predominantly touching vuggy and moldic porosity, matrix porosity, recrystallized skeletal/shell fragments, dissolution features decrease with depth
	Sedimentary Structures	Thickly bedded, bedded skeletal grains
54.5 – 56.5	*Lithofacies/Rock Type*	Wackestone/Grainstone
	Color	Grayish Yellow 5Y 8/4, Pale Greenish Yellow 10Y 7/4
	Texture/Matrix	Moderately soft, moderately poor carbonate cementation, micritic matrix
	Grains	Lime mud, skeletal grains
	Porosity	Intergranular, moldic
	Sedimentary Structures	Medium bedded, interbedded marl
56.5 – 58	*Lithofacies/Rock Type*	Wackestone/Grainstone
	Color	Grayish Yellow 5Y 8/4, Pale Greenish Yellow 10Y 7/4
	Texture/Matrix	Moderately hard, moderately well carbonate cementation, micritic to microcrystalline matrix, druzy texture
	Grains	Fine sand to medium sand sized intraclasts, skeletal material
	Porosity	Intergranular, moldic
	Sedimentary Structures	Medium bedded, non-touching moldic and vuggy dissolution

Feet BLS – feet below land surface

FLORIDA POWER AND LIGHT TURKEY POINT POWER PLANT COOLING CANAL SYSTEM SEAWATER SUPPLY WELLS SW-1 AND SW-2 SW-1 Lithologic Log		
Depth (Feet BLS)	Classification	Lithologic Description
58 – 60.5	*Lithofacies/Rock Type*	Packstone/Wackestone
	Color	Grayish Yellow 5Y 8/4, Pale Greenish Yellow 10Y 7/4
	Texture/Matrix	Moderately hard, moderately well carbonate cementation, micritic to microcrystalline matrix, druzy texture
	Grains	Fine sand to medium sand sized intraclasts, skeletal material
	Porosity	Intergranular, moldic
	Sedimentary Structures	Medium bedded, non-touching moldic and vuggy dissolution
60.5 – 61.1	*Lithofacies/Rock Type*	Packstone/Grainstone
	Color	Grayish Yellow 5Y 8/4, Yellowish Gray 5Y 7/2,
	Texture/Matrix	Moderately hard, moderately well carbonate cemented, micritic matrix, grain supported
	Grains	Fine sand to medium sand sized intraclasts, quartz sand and carbonate grains
	Porosity	Intergranular, trace to minor moldic dissolution
	Sedimentary Structures	Lenticular bedding, thinly bedded
61.1 – 62	*Lithofacies/Rock Type*	Packstone/Grainstone
	Color	Yellowish Gray 5Y 7/2, Grayish Yellow 5Y 8/4, Olive Gray 5Y 3/2
	Texture/Matrix	Moderately hard, well cemented, carbonate cementation, micritic matrix, druzy texture, grain supported
	Grains	Fine sand to medium sand sized intraclasts, skeletal material
	Porosity	Intergranular, touching moldic, skeletal dissolution, matrix porosity, contact porosity on erosional surface
	Sedimentary Structures	Erosional surface at 61.1 feet BLS, skeletal molds and casts, thinly bedded
62 – 63	*Lithofacies/Rock Type*	Marl/Packstone
	Color	Yellowish Gray 5Y 7/2, Grayish Yellow 5Y 8/4, White N9
	Texture/Matrix	Lime mud/micritic matrix, fossiliferous
	Grains	Lime mud, silt, skeletal/fossil fragments
	Porosity	Moldic dissolution, intergranular, matrix porosity
	Sedimentary Structures	Thickly bedded, skeletal molds and casts

Feet BLS – feet below land surface

FLORIDA POWER AND LIGHT
TURKEY POINT POWER PLANT COOLING CANAL SYSTEM
SEAWATER SUPPLY WELLS SW-1 AND SW-2
SW-2 Lithologic Log

Depth (Feet BLS)	Classification	Lithologic Description
0 – 5		Fill
5 – 8		No Recovery
8 – 11		Fill
11 – 12.5	*Lithofacies/Rock Type*	Organics/Peat/Fill
	Color	Very Dark Red 5R 2/6, Very Dusky Red 10R 2/2
	Texture/Matrix	NA
	Grains	NA
	Porosity	NA
	Sedimentary Structures	NA
12.5 – 16.5	*Lithofacies/Rock Type*	Wackestone/Packstone
	Color	Yellowish Gray 5Y 7/2, Pale Yellowish Orange 10YR 8/6
	Texture/Matrix	Hard, carbonated cemented, micritic matrix supported
	Grains	Very fine to fine skeletal grains and carbonate grains
	Porosity	Matrix
	Sedimentary Structures	Thickly bedded
16.5 – 17.5	*Lithofacies/Rock Type*	Wackestone/Packstone
	Color	Yellowish Gray 5Y 7/2, Light Olive Gray 5Y 5/2, Olive Gray 5Y 4/1, mottled
	Texture/Matrix	Hard, well cemented, micritic matrix
	Grains	Abundant skeletal grains/shell fragments, sand size pelloidal carbonate grains
	Porosity	Highly dissolutioned, touching moldic/vuggy porosity, matrix porosity
	Sedimentary Structures	Thinly bedded, interbedded, erosional feature at 16.5 feet BLS
20 – 27.6	*Lithofacies/Rock Type*	Calcrete/Sandy Marl/Mudstone
	Color	White N9, Yellowish Gray 5Y 7/2
	Texture/Matrix	Moderately soft, semiconsolidated lime mud, moderately cemented
	Grains	Very fine sand to fine sand sized quartz and carbonate grains, skeletal grains
	Porosity	Matrix
	Sedimentary Structures	Thickly bedded
27.6 – 31	*Lithofacies/Rock Type*	Packstone/Grainstone
	Color	White N9, Yellowish Gray 5Y 7/2
	Texture/Matrix	Moderately hard to hard, carbonate cemented, well cemented
	Grains	Very fine sand to fine sand sized quartz, carbonate grains, skeletal grains, trace phosphates, lime mud
	Porosity	Matrix, minor non touching and touching vuggy dissolution, moldic
	Sedimentary Structures	Thickly bedded
31 – 33	*Lithofacies/Rock Type*	Grainstone
	Color	Yellowish Gray 5Y 7/2, Grayish Yellow 5Y 8/4, Light Bluish Gray 5B 7/1
	Texture/Matrix	Very hard, microspar matrix, skeletal supported, very well cemented
	Grains	Carbonate cemented fine sand to coarse sand sized quartz and carbonate grains, abundant skeletal grains/shell fragments
	Porosity	Massive, vuggy dissolution, casts and molds
	Sedimentary Structures	Bedded skeletal grains, thickly bedded
33 – 35	*Lithofacies/Rock Type*	Grainstone
	Color	Pale Green 5G 7/2, Pale Greenish Yellow 10Y 7/4
	Texture/Matrix	Hard, granular texture, microcrystalline matrix, well cemented
	Grains	Very fine sand to medium sand sized quartz and phosphate grains, trace skeletal grains
	Porosity	Intergranular
	Sedimentary Structures	Thinly bedded

Feet BLS – feet below land surface

FLORIDA POWER AND LIGHT TURKEY POINT POWER PLANT COOLING CANAL SYSTEM SEAWATER SUPPLY WELLS SW-1 AND SW-2 SW-2 Lithologic Log		
Depth (Feet BLS)	**Classification**	**Lithologic Description**
35 – 36.75	*Lithofacies/Rock Type*	Grainstone/Packstone
	Color	Pale Greenish Yellow 10Y 7/4, Moderate Greenish Yellow 10Y 7/4, Yellowish Gray 5Y 7/2
	Texture/Matrix	Moderately hard to hard, granular texture, microcrystalline matrix, well cemented
	Grains	Very fine sand to fine sand sized quartz and phosphate grains, abundant skeletal grains, intraclastic
	Porosity	Intergranular, bedding planes, highly dissolutioned skeletal grains, vuggy
	Sedimentary Structures	Thinly interbedded unconsolidated sand lenses
36.75 – 39.7	*Lithofacies/Rock Type*	Grainstone
	Color	Pale Green 5G 7/2, Pale Greenish Yellow 10Y 7/4
	Texture/Matrix	Hard, granular texture, microcrystalline matrix, well cemented
	Grains	Very fine sand to medium sand sized quartz and phosphate grains, trace skeletal grains
	Porosity	Intergranular
	Sedimentary Structures	Thinly bedded
39.7 – 41	*Lithofacies/Rock Type*	Grainstone/Packstone
	Color	Pale Greenish Yellow 10Y 7/4, Moderate Greenish Yellow 10Y 7/4, Yellowish Gray 5Y 7/2
	Texture/Matrix	Moderately hard to hard, granular texture, microcrystalline matrix, well cemented
	Grains	Very fine sand to fine sand sized quartz and phosphate grains, abundant skeletal grains, intraclastic
	Porosity	Intergranular, bedding planes, highly dissolutioned skeletal grains, vuggy
	Sedimentary Structures	Thinly interbedded unconsolidated sand lenses
41 – 43	*Lithofacies/Rock Type*	Grainstone
	Color	Pale Green 5G 7/2, Pale Greenish Yellow 10Y 7/4
	Texture/Matrix	Hard, granular texture, microcrystalline matrix, well cemented
	Grains	Very fine sand to medium sand sized quartz and phosphate grains, trace skeletal grains
	Porosity	Intergranular
	Sedimentary Structures	Thickly bedded
43 – 48	*Lithofacies/Rock Type*	Grainstone (Sandstone)
	Color	Yellowish Gray 5Y 7/2, White N9,
	Texture/Matrix	Soft to moderately soft, semiconsolidated to unconsolidated, carbonated cemented, poorly cemented, friable
	Grains	Very fine sand to fine sand sized quartz and carbonate grains, phosphates
	Porosity	Intergranular
	Sedimentary Structures	Thickly bedded
48 – 54	*Lithofacies/Rock Type*	Coralline Floatstone
	Color	Grayish Yellow 5Y 8/4, Pale Greenish Yellow 10Y 7/4
	Texture/Matrix	Very hard, fossiliferous, well cemented, predominantly grain supported, crystalline/druzy texture
	Grains	Large skeletal grains, corral framework, molds
	Porosity	Highly dissolutioned, predominantly touching vuggy/moldic porosity, matrix porosity, recrystallized skeletal/shell fragments
	Sedimentary Structures	Thickly bedded, bedded skeletal grains

Feet BLS – feet below land surface

FLORIDA POWER AND LIGHT TURKEY POINT POWER PLANT COOLING CANAL SYSTEM SEAWATER SUPPLY WELLS SW-1 AND SW-2 SW-2 Lithologic Log		
Depth (Feet BLS)	**Classification**	**Lithologic Description**
54– 54.5	*Lithofacies/Rock Type*	Void
	Color	NA
	Texture/Matrix	NA
	Grains	NA
	Porosity	NA
	Sedimentary Structures	NA
54.5 – 57.5	*Lithofacies/Rock Type*	Packstone/Grainstone
	Color	Grayish Yellow 5Y 8/4, Pale Greenish Yellow 10Y 7/4
	Texture/Matrix	Moderately hard, moderately well carbonate cementation, micritic to microcrystalline matrix, druzy texture
	Grains	Fine sand to medium sand sized intraclasts, skeletal material
	Porosity	Intergranular, moldic
	Sedimentary Structures	Medium bedded, non-touching moldic and vuggy dissolution
57.5 – 59.6	*Lithofacies/Rock Type*	Packstone/Grainstone
	Color	Grayish Yellow 5Y 8/4, Yellowish Gray 5Y 7/2,
	Texture/Matrix	Moderately hard, moderately well carbonate cemented, micritic matrix, grain supported
	Grains	Fine sand to medium sand sized intraclasts, quartz sand and carbonate grains, lime mud
	Porosity	Matrix
	Sedimentary Structures	Thinly bedded
59.6 – 62.5	*Lithofacies/Rock Type*	Rudstone/Floatstone
	Color	Yellowish Gray 5Y 7/2, Grayish Yellow 5Y 8/4, Olive Gray 5Y 3/2
	Texture/Matrix	Moderately hard, well cemented, carbonate cementation, micritic matrix, druzy texture, grain supported
	Grains	Fine sand to medium sand sized intraclasts, skeletal material, coral
	Porosity	Intergranular, touching moldic, skeletal dissolution, matrix porosity, contact porosity on erosional surface
	Sedimentary Structures	Erosional surface at 61.1 feet BLS, skeletal molds and casts, thinly bedded
62.5 – 63	*Lithofacies/Rock Type*	Marl/Packstone
	Color	Yellowish Gray 5Y 7/2, Grayish Yellow 5Y 8/4, White N9
	Texture/Matrix	Lime mud/micritic matrix, fossiliferous
	Grains	Lime mud, silt, skeletal/fossil fragments
	Porosity	Moldic dissolution, intergranular, matrix porosity
	Sedimentary Structures	Thickly bedded, skeletal molds and casts

Feet BLS – feet below land surface

Enclosure 3

All Webb Pump Data Sheet – FPI

FPL ALL 316L Seawater Pumps (3-Stage)

(April 2, 2015)

Turkey Point Units 3 and 4

SLR Application

NRC RAI No. WR-2-a

Pump Data Sheet - FPI

Company: All Webb
Name: FPL ALL 316L SEAWATER PUMPS (3-STAGE)
Date: 4/2/2015

MAXIMUM OPERATING SPEED FOR UTILIZING FULL MOTOR 300HP
12,500GPM @ 75 FEET

Compensation For 1.03 Sp.Gr & 2% Belt Loss Included

FPI Propeller Pumps Since 1937

Pump:

Size: AF24-18-880 (3 stage)

Type: AXIAL FLOW
Synch speed: 900 rpm

Speed: 1101 rpm
Line: A (20)

Curve:

Impeller:

Specific Speeds:

Ns: ---
Nss: ---

Dimensions:

Suction: ---
Discharge: ---

Pump Limits:

Temperature: ---
Pressure: ---
Sphere size: ---

Power: ---
Eye area: ---

Search Criteria:

Flow: 12500 US gpm

Head: 75 ft

Fluid:

Seawater
SG: 1.03
Viscosity: 1.105 cP

Temperature: 60 °F
Vapor pressure: 0.2563 psi a
Atm pressure: 14.7 psi a

NPSHa: ---

Motor:

Size: 300 hp
Standard: NEMA
Speed: 1800 Belt Drive
Enclosure: TEFC
Frame: 449T
Sizing criteria: Max Power on Design Curve

---- Data Point ----

Flow:	12500 US gpm
Head:	75 ft
Eff:	83.6%
Power:	284.1 hp
NPSHr:	32.7 ft

---- Design Curve ----

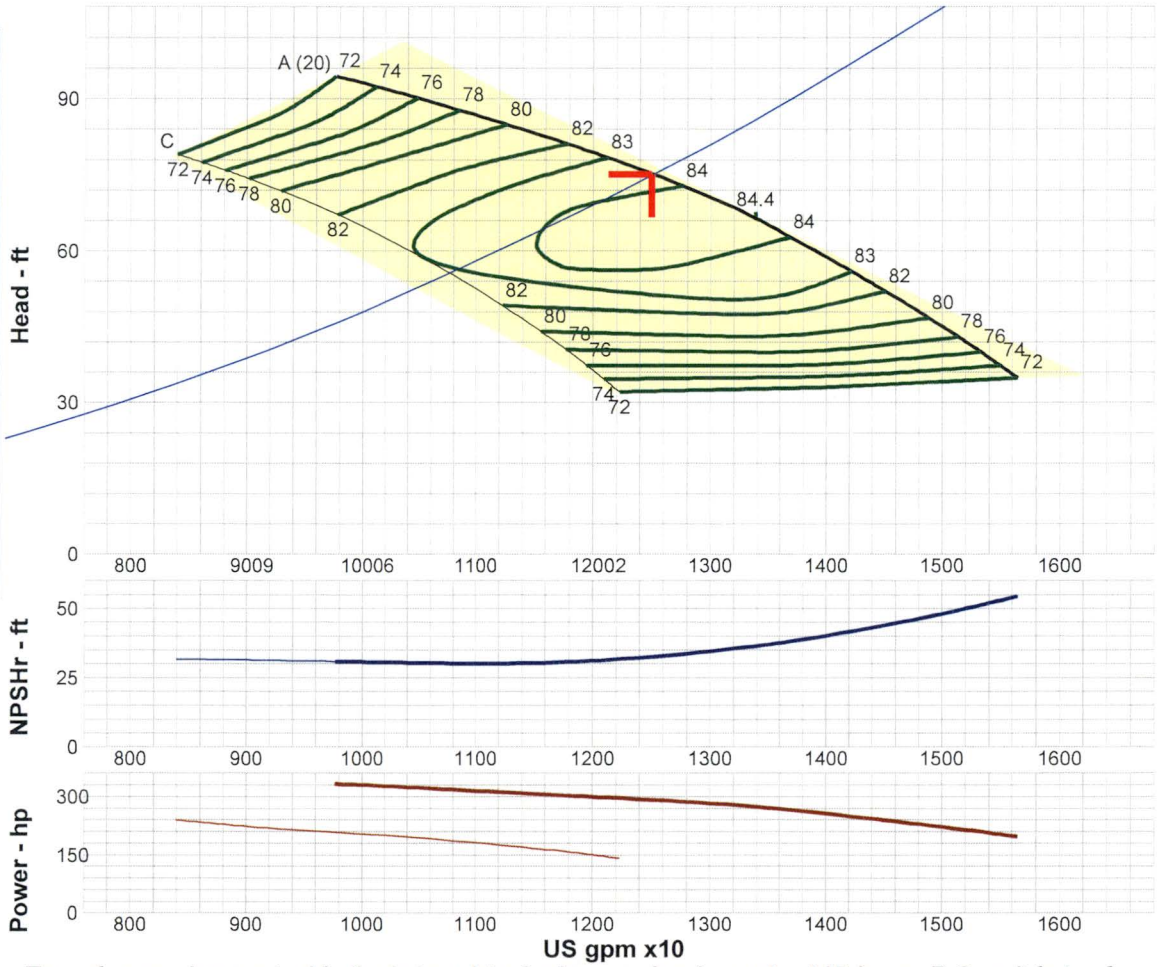
Shutoff head:	89.7 ft
Shutoff dP:	38.7 psi
Min flow:	---

BEP: 84.4% @ 13387 US gpm

NOL power:
324 hp @ 9764 US gpm

-- Max Curve --

Max power:
324 hp @ 9764 US gpm



The performance is guaranteed for the design point only when pumping clean water at 85 degrees F. Consult factory for certified performance curve.

Performance Evaluation:

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
15000	1101	45	79.1	216	48.2
12500	1101	75	83.6	284.1	32.7
10000	1101	93	73.3	321	30.7
7500	1101	---	---	---	---
5000	1101	---	---	---	---