I/A

98IHS113

Hart Exhibit 66
Docket No. E-2, Sub 1219

3/7/2011

DocumentID	NCD000830646
Site Name	CAROLINA P&L CO. SUTTON STEAM
DocumentType	REMEDIAL ACTION PLAN
RptSegment	1
DocDate	3/23/2009
DocRcvd	3/23/2009
Box	SF113
AccessLevel	PUBLIC
Division	WASTE MANAGEMENT
Section	SUPERFUND
Program	IHS
DocCat	FACILITY

Progress Energy

File: SUT 12520-Q

March 23, 2009

Mr. Charles F. Stehman, Ph.D, P.G.
NCDENR – Division of Water Quality
128 Cardinal Drive Extension
Wilmington, NC 28405

RE: L.V. Sutton Electric Plant
Work Plan for Assessment of Groundwater Quality Impacts from Ash Ponds

Dear Mr. Stehman:

Carolina Power & Light Company d/b/a Progress Energy Carolinas, Inc. representatives met with you and other Wilmington Regional Office personnel on July 21, 2008 to discuss groundwater impacts at the L.V. Sutton Electric Plant. At this meeting we proposed contracting with a consultant to develop a work plan to further investigate groundwater impacts. We partnered with Ish, Inc. and enclosed are three copies of the work plan for your review.

We will follow up with you to schedule a meeting to discuss this work plan. Based on your approval, we will commence field work immediately. Please contact Mr. Kent Tyndall, Environmental Specialist, at 910-343-3244 if you have any questions on the attached work plan.

Sincerely,

Teresa L. Wilson
Plant Manager
L.V. Sutton Electric Plant

TW:jrt

Attachments

Progress Energy Carolinas, Inc.
Sutton Steam Plant
801 Sutton Steam Plant Road
Wilmington, NC 28401

Work Plan for Assessment of Groundwater Quality Impacts from Ash Ponds at the L. V. Sutton Electric Plant Wilmington, North Carolina

March 2009

Prepared by:

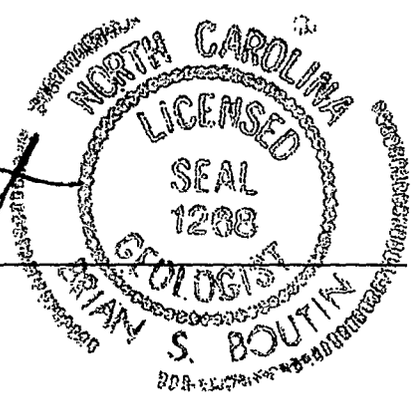
Ish Inc.
Raleigh, NC

Prepared for:

Progress Energy Carolinas, Inc.
Raleigh, NC

Work Plan for Assessment of Groundwater Quality Impacts from Ash Ponds at the L.V. Sutton Electric Plant Wilmington, North Carolina

Prepared By:



Brian S. Boutin, P.G.
Consulting Geologist

And

Ishwar P. Murarka, Ph.D.
Executive Scientist & Project Director
Ish Inc.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDIX A

Work Plan for Assessment of Groundwater Quality Impacts from Ash Ponds at the L. V. Sutton Electric Plant, Wilmington, North Carolina

1.0 INTRODUCTION

Carolina Power & Light Co. d/b/a Progress Energy Carolinas, Inc. (Progress Energy) owns and operates the L.V. Sutton Electric Plant (Sutton Plant), which is located on approximately 3,300 acres of land near Wilmington, New Hanover County, North Carolina. The Sutton Plant is located along the east bank of the Cape Fear River northwest of Wilmington, North Carolina. The location of the Sutton Plant site is shown on the USGS 7.5 minute topographic quadrangle maps for Castle Hayne and Leland, North Carolina and is presented in Figure 1.

The Sutton Plant site consists of three coal-fired boilers for generating electricity that primarily use bituminous coal as fuel. Ash generated from the combustion of coal is disposed on-site in ash pond(s) or utilized off-site. The Sutton Plant started operations in 1954. A site map, which includes pertinent site features in the portion of the Sutton Plant near the ash ponds is presented as Figure 2.

In late 2008, Progress Energy retained Ish, Inc., to review existing groundwater data for the ash ponds and former ash disposal area (FADA) and to develop and implement a comprehensive assessment program to evaluate groundwater quality and flow in the area. Presented below is a summary of site geologic and hydrogeologic conditions based on a review of existing data, and prior work performed by others for Progress Energy.

2.0 SUMMARY OF SITE CONDITIONS

2.1 Regional Geology and Hydrogeology

New Hanover County lies in the Atlantic Coastal Plain Physiographic Province in the southeast portion of North Carolina (Brown, 1985). The Sutton Plant site is located on the east side of the Cape Fear River within the alluvial plain between

the coastal dunes and the interior uplands (NUS Corporation, 1989). Local surface elevations range from approximately 15 to 30 feet above sea level. The site is underlain by up to 75 feet of unconsolidated sediments consisting primarily of well drained sands. The sand unit comprises a water table aquifer and provides drinking water in the area. The sand unit is underlain by a silt and clay aquiclude approximately 160 feet thick (Bain, 1970).

The surface of groundwater at the site is located at depths of less than 11 feet below grade. An average transmissivity value of 11,000 square feet per day (ft^2/day) was estimated by Heath (1989) for the surficial sand aquifer in the region. Based on the results of work conducted by others (BBL, 2004), the average linear groundwater flow velocity near the Sutton site area ranges from 109 to 339 feet per year.

2.2 Groundwater Elevation

Based on groundwater elevation data collected at the site in March 2008, groundwater flow in the surficial aquifer near the ash ponds is generally radial toward the north-northeast, east and southeast (Figure 3). However, additional data is needed to better define groundwater flow direction in the sand unit in the east and southeast areas.

3.0 CURRENT GROUNDWATER MONITORING NETWORK

Numerous groundwater wells have been installed near the ash ponds and FADA at various times for Progress Energy. Approximately 27 monitoring wells (both single and cluster) currently exist in the vicinity of the ash ponds and are identified as MW-1A, MW-1B, MW-2A, MW-2B, MW-2C, MW-3A, MW-3B, MW-4, MW-4A, MW-4B, MW-5A, MW-5B, MW-5C, MW-6A, MW-6B, MW-6C, MW-7A, MW-7B, MW-7C, MW-8, MW-9, MW-10, MW-11, MW-12 MW-17, MW-18 and MW-19. Wells MW-13, MW-13D, MW-14, MW-15, MW-15D, MW-16, MW-16D, MW-20 and MW-20D are all located near the FADA. Figure 2 shows the most recent survey map completed on December 23, 2008 for the Sutton Plant site with the monitoring wells and other features. Progress Energy provided to Ish Inc. boring logs for the wells, which are summarized in Table 1 below and provided a basis for the proposed work plan.

Table 1

Summary of Pertinent Data for the Existing Monitoring Wells at the Site

Well ID	Date Installed	Total Depth (ft.)	Screen Interval (ft.)
MW-1A	1984	17	12-17
MW-1B	1984	27	22-27
MW-2A	1984	17	12-17
MW-2B	1984	27	22-27
MW-3A	1984	17	12-17
MW-3B	1984	27	22-27
MW-2C	1986	45	40-45
MW-4	1984	27	22-27
MW-4A	1986	17	12-17
MW-4B	1986	45	40-45
MW-5A	1986	17	12-17
MW-5B	1986	27	22-27
MW-5C	1986	45	40-45
MW-6A	1986	17	12-17
MW-6B	1986	27	22-27
MW-6C	1986	45	40-45
MW-7A	1986	17	12-17
MW-7B	1986	27	22-27
MW-7C	1986	45	40-45
MW-8	1990	50	40-50
MW-9	1990	50	40-50
MW-10	1990	50	40-50
MW-11	1990	50	40-50
MW-12	1990	50	40-50
MW-13	2004	13	3-13
MW-13D	2005	43	33-38
MW-14	2004	11	1-11
MW-15	2004	11	1-11
MW-15D	2005	47.5	40-45
MW-16	2004	12	2-12
MW-16D	2005	50.5	42-47
MW-17	2004	50	45-50
MW-18	2004	50	45-50
MW-19	2004	50	45-50
MW-20	2005	14	4-14
MW-20D	2005	52	43-48

Note: Boring logs for these monitoring wells are presented in Appendix A

3.1 Voluntary Groundwater Evaluation Program

In 2006, Progress Energy implemented a voluntary groundwater action plan in accordance with the industry wide guidance by the Utility Solid Waste Activities Group (USWAG). Per 15A NCAC 2L .0107, a 250-foot review boundary is established down gradient of the ash ponds toe to capitalize on the opportunity to obtain an early warning on groundwater quality compliance status with the

applicable water quality standards so that compliance is always assured at the 500-foot compliance boundary. Figure 2 shows the monitoring wells, the toe of ash ponds and the two regulatory boundaries. Exiting monitoring wells MW-1A, MW-1B and MW-18 are located immediately hydraulically down gradient of the ash pond toe and monitoring wells MW-2A, MW-2B, MW-2C, MW-6A, MW-6B and MW-6C are located near the 250-foot review boundary. Monitoring wells MW-17, MW-3A and MW-3B are located between the 250-foot review boundary and the 500-foot compliance boundary, with MW-19 further down gradient beyond the 500-foot compliance boundary. All other ash pond wells are located outside the 500-foot compliance boundary. In fact monitoring wells MW-5A, MW-5B, MW-5C, MW-8 and MW-9 can be considered as ambient groundwater wells not impacted by potential ash pond leachate release and migration. Progress Energy has collected six rounds of monitoring data on a semi-annual basis in addition to the NPDES permit required annual sampling and provided the results to Ish Inc. for the further assessment work.

4.0 REVIEW OF EXISTING GROUNDWATER DATA

Ish Inc. has reviewed the available data from a subset of these wells and has prepared a groundwater flow map utilizing the recently completed survey of the Sutton Plant site for the ash ponds and FADA areas. Ish Inc. has also evaluated the groundwater quality data for a number of monitoring wells specifically for arsenic, boron, pH and Total Dissolved Solids (TDS). In the following subsection we present the preliminary groundwater flow depiction at the site, which will be refined and better defined after the proposed assessment work has been completed. Also we present in a separate subsection below a review and evaluation of the existing groundwater quality data, which has provided a basis for the proposed work plan for the groundwater assessment.

4.1 Groundwater Flow

Ish Inc. used the groundwater level data collected by Progress Energy in March 2008 for monitoring wells MW-2C, MW-6C, MW-7C, MW-8, MW-9, MW-10, MW-11, MW-12, MW-17, MW-18 and MW-19 to generate an approximate groundwater flow map (Figure 3). The data used are given in Table 2 below.

Table 2
Measured Groundwater Level Data and Calculated Elevations for the March 2008 Sampling Event

Well ID	Measured Water level (ft.)	Top of Casing Elevation (ft. above MSL)	Groundwater Elevation (MSL)
MW-19	21.70	31.38	9.68
MW-18	11.48	21.85	10.37
MW-17	22.61	30.61	8
MW-12	11.04	20.83	9.79
MW-11	16	25.37	9.37
MW-10	17.53	27.55	10.02
MW-9	17.8	27.46	9.66
MW-8	8.19	17.49	9.3
MW-7C	7.95	16.98	9.03
MW-6C	6.21	16.62	10.41
MW-2C	15.12	25.50	10.38

The groundwater flow map derived from the March 2008 data in Table 2 is presented in Figure 3 and shows generally a radial flow to the north-northeast, east and southeast away from the toe of the ash ponds. It is hypothesized that groundwater underneath the southeastern portion of the ash ponds has a southeastern radial flow direction where monitoring wells MW-17, MW-18 and MW-19 are located. In a later section it will be noted that the potential migration of ash leachate constituents has been observed in an east-southeast direction along the groundwater flow paths in this area. Therefore, the proposed assessment work plan is focused more on installing and monitoring new wells for water quality and water levels in the southeastern area down gradient of the old ash pond section along with the existing monitoring wells in the area identified as MW-1A, MW-1B, MW-2A, MW-2B, MW-2C, MW-3A, MW-3B, MW-17, MW-18 and MW-19. However, additional monitoring wells will be installed on the 250-foot review boundary throughout the entire ash pond area to get a better understanding of the migration of leachate from the entire ash pond complex. Fewer spatial locations will be used for installation of additional monitoring wells at the 500-foot compliance boundary or beyond.

According to the results of previous work conducted at the site (BBL report, 2004), the average linear groundwater flow velocity near the Sutton Plant site area ranges from 109 to 339 feet per year. After the completion of the proposed assessment work a better derivation of linear groundwater flow velocities will be

achieved. The more precise estimate of groundwater velocities will allow a better evaluation of migration potentials for dissolved phase constituents released from the ash ponds.

4.2 Existing Groundwater Quality at the Site

Progress Energy provided Ish Inc. groundwater monitoring data collected under the voluntary action plan and NPDES permit required monitoring from December 2006 through November 2008 for wells MW-2C, MW-6C, MW-8, MW-9, MW-10, MW-11, MW-12, MW-17, MW-18 and MW-19. Ish Inc. prepared time series plots for the six rounds of monitoring data for total dissolved solids (TDS), pH, arsenic and boron to evaluate the time trends and the potential migration of ash leachate to the down gradient groundwater. Ish Inc. also developed a spatial set of maps potentially depicting the presence of groundwater plumes for these four parameters based on the data from the March 2008 sampling event. Figure 4 shows the spatial distribution of arsenic concentrations above 10 ug/L with uncertainty in the definition of the extent of the plume. Similarly, Figure 5 shows the spatial extent of the boron plume above 0.9 mg/L concentration. Figure 6 shows the spatial distribution of measured pH values for groundwater in monitoring wells suggesting that near neutral pH exists in the area covered by the arsenic plume whereas acidic groundwater in the range of about 4.5 pH units can be found elsewhere to the southeast, east and north of the ash ponds. Figure 7 shows the spatial extent of the TDS plume.

Time series scatter plots have been prepared, wherever possible, to examine potential time trends in the concentration data for the groundwater samples. Figures 8 and 9 show the time series plots for arsenic in groundwater at wells MW-2C and MW-17. In both cases there appears to be an increasing time trend for arsenic concentrations. However, both of these wells are located within the 500-foot compliance boundary. Because of these elevated arsenic concentrations additional monitoring wells will be installed and sampled to define the extent of the arsenic plume and to determine the potential for future migration. Figures 10 through 13 show the time series plots for boron in groundwater at wells MW-2C, MW-6C, MW-17 and MW-19. The boron concentrations in groundwater at wells MW-2C and MW-6C are somewhat variable over time and there is no distinct increasing or decreasing time trend. However, boron concentrations in groundwater at wells MW-17 and MW-19 show somewhat of an increasing time trend suggesting that migration of dissolved

boron in groundwater is continuing to occur. Monitoring well MW-19 is beyond the 500-foot compliance boundary requiring additional installation of monitoring wells to determine the extent of the boron plume and to determine the potential for future migration.

Figures 14 through 17 show the time series plots for pH of groundwater at wells MW-2C, MW-6C, MW-17 and MW-19. For wells MW-2C and MW-6C, pH data are available since 1990 and are presented in these plots. There are some variabilities in the measured pH values with a minor discernable time trend. Figures 18 through 21 show the time series plots for TDS of groundwater at wells MW-2C, MW-6C, MW-17 and MW-19. For wells MW-2C and MW-6C, TDS data are available since 1990 and are presented in these plots. The TDS concentrations show an increasing time trend for wells MW-2C and MW-6C even though there is large variability in the data over the last 18 years of data collection. The TDS concentrations in groundwater at wells MW-17 and MW-19 are fairly constant over the last two years of available data with no discernable time trend.

Based on the time series and spatial distribution of arsenic, boron, TDS and pH, it is surmised that there is release and migration of ash constituents from the ash ponds at the site. However, the spatial extent of migration and assessment of potential for future migration have not been fully established. Therefore, Ish Inc. has designed and proposed a scope of work for installation and monitoring of additional wells to define the extent of groundwater impacts at the site. Included in the scope of work is collection of additional technical data that will allow an assessment of future migration potentials for the ash constituents of concern.

5.0 PROJECT OBJECTIVES

The objectives for this project are listed below:

- Install temporary points in the ash deposit in the ash ponds to collect water samples for leachate composition characterization. Also collect ash samples for further laboratory testing.
- Install and monitor piezometers/wells in the shallow and deep aquifer layers to better define groundwater flow in the east and southeast of the ash ponds area and to evaluate groundwater quality down gradient of the ash ponds.

- Analyze and evaluate groundwater quality and flow data to determine the nature and extent of impacts to groundwater in the ash ponds vicinity.
- Analyze and evaluate groundwater quality and flow data in the vicinity of the FADA to determine if this area is contributing to elevated dissolved-phase groundwater constituents on the opposite side of the discharge canal via wells MW-13, MW-13D, MW-16 and MW-16D.
- Obtain a sufficient amount of data to support the design of an abatement approach, if needed.

6.0 PROPOSED GROUNDWATER ASSESSMENT WORK

To accomplish the project objectives, Ish Inc. has proposed the following two-phased approach and the associated scope of work.

6.1 Phase I Geoprobe™ Borings

The first phase of assessment will consist of a rapid assessment effort using direct-push technology to sample ash, soil and groundwater at multiple locations in the areas to the east and south-southeast of the ash ponds. A Geoprobe™ 5410 direct-push unit will be used to collect the ash, soil and groundwater samples from up to 20 locations at the site. The Geoprobe™ uses push probe technology to rapidly access the subsurface, thereby allowing sampling at multiple locations in a short period of time without installing permanent sampling points such as monitoring wells. Proposed sampling locations are shown on Figure 22. Previous investigative work conducted at the site by others indicates that the aquifer material in the upper 50 feet of the subsurface consists principally of sand with some silt in the deeper depths and the surface of groundwater is located at depths of less than 11 feet below grade. Consequently, sampling with the Geoprobe™ unit will be restricted to depths of generally less than 25 feet below grade due to difficulties in keeping boreholes open at depth in aquifer material consisting principally of sandy material. The chemical analysis results of the grab groundwater samples collected in the first phase will be used to locate and install 2" ID monitoring wells during the second phase of assessment.

6.2 Soil Sampling During Phase I

During phase I, soil samples will be collected in continuous 4-foot intervals to the completion depth for approximately ten of the Geoprobe™ borings with 2-inch

inside diameter, steel coring tubes equipped with plastic liners. Upon collection, each soil sample will be logged (written description) by a geologist. Reusable sampling equipment will be thoroughly decontaminated after each use using the most recent version of the USEPA Region IV Science and Ecosystem Support Division (SESD) Standard Operation Procedure (SOP). Except for logging, no soil samples will be collected for laboratory analyses.

6.3 Groundwater Sampling During Phase I

One groundwater sample will be collected for laboratory analysis from each boring using the Geoprobe™ temporary well screen and groundwater sampling unit, which employs a peristaltic pump to evacuate the sample from the boring through PVC tubing. New PVC tubing will be used at each boring location. The groundwater samples will be preserved as required for laboratory analyses. The grab groundwater samples will be analyzed at a minimum for total arsenic, boron, calcium, iron, manganese, selenium, sulfate, and total dissolved solids (TDS) by a North Carolina certified laboratory using the EPA approved sample preparation and analytical methods. In addition, pH, temperature, specific conductance, dissolved oxygen (DO) concentration, oxidation-reduction potential (ORP) and turbidity will be measured in the field for the groundwater sampling locations in accordance with the most recent version of the USEPA Region IV SESD SOP to ensure collection of representative groundwater samples.

The Phase I soil and groundwater results will be summarized as a data package and will be used to propose revisions, as needed, to the proposed locations (figure 22) of the monitoring wells for Phase II. Progress Energy will submit the Phase I data package and proposed revisions to the spatial locations for monitoring wells installation in Phase II for review and concurrence by the Department prior to the implementation of Phase II scope of work.

6.4 Decontamination of Reusable Equipment

Downhole probing equipment will be decontaminated between each boring with a non-phosphate detergent wash, tap water rinse followed by a distilled water rinse. Reusable sampling equipment will be thoroughly decontaminated after each use using the most recent version of the USEPA Region IV SESD SOP.

6.5 Phase II Installation and Monitoring of Groundwater Wells

Based on the results of the Phase I assessment, 12 to 16 locations will be finalized to install monitoring wells. At each of the 12 to 16 locations a deep well screened at the approximate depth of 40 to 50 feet below grade will be installed. In addition, at 6 to 8 locations a shallow well screened at 15 to 25 feet below grade will also be installed. Preliminary locations for the wells are shown on Figure 22. Shallow wells will be installed to depths of 15 to 25 feet below grade with 10 feet of machine slotted well screen (0.010" slots). The shallow wells will be drilled using hollow stem augers. Deep wells will be installed to depths of 40 to 50 feet below grade with 10 feet of machine slotted well screen (0.010" slots). The deep wells will be installed using mud-rotary drilling. The groundwater monitoring wells will be constructed of threaded, flush-jointed, 2-inch ID, Schedule 40 PVC well casing and screen. A sand pack will be placed around the screen to a height of about 2-feet above the screen. A bentonite seal, a minimum of 2-feet thick, will be placed above the sand pack and permitted to hydrate. A cement-bentonite grout will be installed on top of the bentonite seal to the ground surface. Each well will be completed with a sealed locking cap on the PVC casing and a steel-stickup protective casing with a hinged, locking lid. An approximate 2-foot diameter concrete pad will be placed around the protective casing. All wells will be installed in accordance with North Carolina Department of Environment and Natural Resources (NCDENR) Well Construction Standards (15A NCAC 2C .0100).

6.6 Soil Sampling in Phase II

Soil samples will be collected from the monitoring well borings during drilling using decontaminated, 2-inch ID, steel split-spoon samplers. Upon collection, each soil sample will be logged (written description) by a geologist. The split-spoon samplers will be appropriately decontaminated between each use following the most recent version of the USEPA Region IV SESD SOP. At each drilling location, soil samples will be collected in 2-foot intervals on five-foot centers to the completion depth of drilling. The split-spoon samplers will be advanced using a 140-pound sliding hammer in accordance with Standard Penetration Test (SPT) protocol.

Approximately 10 to 12 soil samples will be collected for subsequent laboratory testing. The soil samples will be analyzed for pH, conductivity, particle size distribution and for extractable iron using appropriate analytical methods. As

indicated below about five of the collected soil samples will be used to conduct laboratory adsorption tests for arsenic and boron.

6.7 Ash Leachate Sampling in Phase II

In addition to the wells installed by drilling, two temporary shallow well points will be installed within the ash ponds to collect and analyze pore water samples from the stored ash to evaluate the geochemical characteristics of the leachate. At each sampling location, a temporary well point consisting of a 5-foot section of 1-inch ID Schedule 40 PVC well screen and 1-inch ID Schedule 40 PVC riser pipe will be manually driven into the ash. A sufficient length of riser will be attached to the well screen to allow the screen to be driven to approximately 5 feet below the static water level at each location.

6.8 Development of Installed Wells

After a minimum of 24 hours following installation, the monitoring wells will be developed using pumping and/or bailing techniques, as appropriate, based on groundwater yields and discharge characteristics, for a minimum of 1 hour and/or until the discharge stream appears free of suspended sediment. Dedicated pump tubing will be used to develop each well. The purpose of developing the wells is to remove excess sediments from within the well and the surrounding sand pack to allow groundwater to flow freely into the well from the surrounding aquifer.

6.9 Survey of Installed Wells

Subsequent to installation, the monitoring wells and well points will be surveyed by a North Carolina licensed professional surveyor for casing elevations and horizontal positions to provide control for static head measurements and delineations of groundwater flow direction. All survey measurements will be made relative to the site datum such that water level measurements from all monitoring wells can be directly compared. At each well location, the elevation of the top of the PVC casing will be measured to the nearest 0.01 foot. The points at which elevations were measured will be permanently marked for future reference. The horizontal positions of the monitoring wells will be measured to the nearest 0.1-foot relative to the site datum.

6.10 Groundwater Sampling and Analysis

For this assessment project Ish Inc. proposes to collect and analyze groundwater samples on two separate occasions. Within one week following development of the monitoring wells and then again approximately three months later, groundwater samples will be collected for laboratory analysis from the 18 to 24 newly installed monitoring wells and well points, as well as from select set of existing monitoring wells in the vicinity of the ash ponds and FADA. The existing wells include: MW-1A, MW-1B, MW-2A, MW-2B, MW-2C, MW-3A, MW-3B, MW-4, MW-4A, MW-4B, MW-5A, MW-5B, MW-5C, MW-6A, MW-6B, MW-6C, MW-7A, MW-7B, MW-7C, MW-8, MW-9, MW-10, MW-11, MW-12 MW-17, MW-18 and MW-19 in the vicinity of the ash ponds and wells MW-13, MW-13D, MW-16 and MW-16D near the FADA.

Prior to each round of sampling, groundwater levels in the monitoring wells and well points will be gauged to the nearest 0.01 ft. with an electronic water-level meter. The probe and any affected length of tape will be properly decontaminated in accordance with the most recent version of the USEPA Region IV SESD SOP prior to and after gauging each well. All measurements will be made from the permanently marked survey point on the top of each well PVC casing.

All monitoring wells and well points will be sampled utilizing a low-flow purging and sampling method. The low-flow purging and sampling will be conducted using a peristaltic pump equipped with dedicated silicone and Teflon®-lined polyethylene tubing. The polyethylene tubing will be positioned in each well such that the intake is located in the middle of the water column in the well screen. The purge rate will be adjusted such that the water level within the wells is not lowered more than 0.3 feet. The water level within each well will be monitored throughout the duration of purging to ensure the water level is maintained according to protocol. In addition, pH, temperature, specific conductance, dissolved oxygen (DO) concentration, oxidation-reduction potential (ORP) and turbidity of the purged water will be monitored continuously with a multi-parameter meter attached to a flow-through cell assembly. All field parameters will be recorded in the field at 5-minute intervals. Each monitoring well will be purged until three consecutive field measurements of pH, specific conductance, DO and ORP stabilize to within 1 standard unit, 3%, 10% and 10 millivolts, respectively. In addition, purging will continue until turbidity readings are below 10 nephelometric turbity units (NTU), or for one hour, whichever occurs first.

Groundwater samples will be collected into appropriate containers and preserved (as required) for shipment to the laboratory.

6.11 Chemical Analysis of Groundwater and Ash Pore Water Samples

All groundwater and ash pore water samples will be analyzed at a minimum for total arsenic, boron, calcium, iron, manganese, selenium, sulfate and total dissolved solids (TDS) to determine the horizontal and vertical extent of chemical constituents of interest in groundwater and the chemical characteristics of the ash leachate. All laboratory analyses will be conducted using USEPA-approved sample preparation and analytical methods at a North Carolina certified laboratory. Ish Inc. has chosen Environmental Chemists Inc. located in Wilmington, NC for analytical work for the project.

The following chemicals will be analyzed for most of the soil, ash and water samples collected in the project utilizing the EPA methods noted for the constituents.

Arsenic	EPA 200.9
Boron	EPA 200.7
Calcium	EPA 200.7
Iron	EPA 200.7
Manganese	EPA 200.7
Selenium	EPA 200.9
Sulfate	EPA SM426C
TDS	SM2540C
Conductivity	EPA 120.1

6.12 QA/QC Sampling for Groundwater

For Quality Assurance/Quality Control purposes, two blind field duplicate samples will be collected during each round of groundwater sampling. The duplicate samples will be collected and handled in the same way as the groundwater samples and will be analyzed at the laboratory for the same list of constituents. Inasmuch as low-flow sampling using dedicated polyethylene tubing will be used for groundwater sampling, no equipment rinsate blanks are warranted or proposed for this investigation.

6.13 Slug Testing for Hydraulic Conductivity

Subsequent to the first round of groundwater sampling and following reestablishment of static conditions, rising-head permeability (slug) tests will be conducted at half of the newly installed monitoring wells (9 to12 total) and for the existing wells MW-13, MW-13D, MW-16 and MW-16D to provide estimates of the aquifer hydraulic conductivity for evaluations of groundwater flow velocity. The slug tests will be conducted by placing a combined data recorder-pressure transducer (In-Situ Level Troll™) at the bottom of the well and rapidly removing a volume (slug) of water from the well using a centrifugal pump to lower the level of the water table below the level measured at static conditions. The data logger will be used to measure the rate of groundwater influx until the water level recovers to a minimum of 90% of static conditions. The measured rate of recovery of the water level is a function of the hydraulic conductivity of the aquifer material in the vicinity of the wells. The slug test data will be analyzed using the HydroSOLVE, Inc. AQTESOLV for Windows™ program according to the Bouwer-Rice procedure.

6.14 Investigation Derived Waste

The proposed locations of the soil borings and monitoring wells are located significant distances outside the areas of ash disposal such that it is highly unlikely that soil samples, drill cuttings, drilling mud or drilling equipment decontamination generated during drilling will contain any waste constituents at levels that would cause them to be classified as hazardous. Consequently, it is proposed that these materials be spread directly on the ground surface in the immediate vicinity of the respective boring or well locations from which they were generated. Inasmuch as groundwater sampling will be conducted using a low-flow purging and sampling technique, the quantity of groundwater generated at each well location from purging is anticipated to be less than five gallons at the maximum anticipated flow rate (300 ml/min), based on previous work conducted at the site by others. Therefore, it is proposed that purge water generated at each well location be disposed on the ground surface immediately down gradient of each well. Likewise, it is proposed that water generated during the slug tests be disposed on the ground surface down gradient of each well.

6.15 Decontamination of Drilling and Sampling Equipment

Downhole drilling equipment and casing will be decontaminated between each well using a pressure washer. Reusable sampling equipment will be thoroughly

decontaminated after each use using the most recent version of the USEPA Region IV SESD SOP.

7.0 LABORATORY TESTING FOR DISTRIBUTION COEFFICIENTS

Approximately five soil samples with varying textural composition will be used to conduct laboratory adsorption tests for arsenic and boron to obtain site-specific distribution coefficients (Kd) for use in subsequent groundwater fate and transport analysis.

8.0 DATA ANALYSIS AND EVALUATION

Data from this study will be used to evaluate groundwater flow and quality at the site. To support this evaluation, geologic cross-sections and groundwater flow maps will be prepared as well iso-concentration contours for select water quality parameters as appropriate. The slug test data will be evaluated using commercially available software, as appropriate. Once the data from the two rounds of sampling events have been received graphical and statistical analyses will be performed to determine the nature and extent of suspected groundwater impacts from the coal ash leachate migration. A report will be prepared to present the evaluations, findings, and conclusions. The report will be sealed by a North Carolina Licensed Geologist in accordance with state law.

9.0 SCHEDULE

Once the work plan has been approved by the NCDENR, Progress Energy will submit a detailed schedule for the implementation of the work plan to complete the assessment work in six to nine months time.

10.0 REFERENCES

Bain G.L. 1970. Geology and Ground Water Resources of New Hanover County, North Carolina, USGS Bulletin Number 17.

BBL, 2004. Phase I Remedial Investigation Report for the Former Ash Disposal Area, L.V. Sutton Steam Electric Plant, Wilmington, North Carolina.

Brown, P.M. 1985 Geologic Map of North Carolina, Department of Natural Resources and Community Development, North Carolina Geologic Survey.

Heath, R.C. 1989. Preliminary Summary of Hydrogeologic Conditions in Vicinity of Lake Sutton, New Hanover County, N.C.

NUS Corporation 1989. Screening Site Inspection Phase I, Carolina Power and Lighting, Sutton Steam Plant, Wilmington, New Hanover County, North Carolina, EPA I.D. NCD000830646.

FIGURES

REFERENCE:

BASE MAP USGA 7.5 MIN. QUADS., CASTLE HAYNE, NC, 1997 AND LELAND, NC, 1997.

0 2000' 4000' 6000'

1" = 2000'

ISH INC environmental consultants
804 SALEM WOODS DRIVE - SUITE 201B
RALEIGH, N.C. 27615-3313
919-844-8890 (OFFICE)
408-892-3233 (CELL)

SITE LOCATION MAP

PROGRESS ENERGY L. V. SUTTON ELECTRIC PLANT
WILMINGTON, NORTH CAROLINA

DRAWN BY:	REVIEWED BY:	PROJECT NO.	DRAWING NO.	FIGURE NO.
AWH		SCALE: 1"= 2000'	DATE: JAN. 2009	1

NOTES:

Boundary information prior boundary survey maps provided by Progress Energy.

This map is not prepared for recording.

Well coordinates in Elevation Table are NCGS Grid coordinates based on NAD '83.

Well elevations are based on Benchmark NCGS "Queensboro", NGVD 29.

250' review boundary and 500' compliance boundary are delineated using 4' green, steel, fence posts.

Drawing based on survey by Haines & Associates completed on December 23, 2008.

SCALE: 1" = 900'

0 900' 1800'

Cooling Pond

Cooling Pond

NC Wildlife Lake Access

approximate lake shore

road on dike

Pond

toe

fence

Pond water edge

POND

road

OLD ASH POND AREA

Pond water edge

ASH

NEW

toe

Canal

Canal

Canal

MW13D

MW13

fence

MW20

MW20D

Canal

AST

CC

road

C/L RR tracks

Plant Area

MW15

MW15D

MW14

AST

MW16

MW16D

Northern control

Canal

Southern control

L19

L14

L12

MW7C

MW7B

MW7A

PE-SW2

ECM

C/L RR tracks

SOLAR FIELD

PE-SW4

PE-SW3

L11

L15

soil road

MW4 MW4A MW4B

PE-SW5

L18 tie

ECM

L10

EIP

L9

NHC-SW

NHC-SW4

NHC-SW3

ECM

PE-SW6A

PE-SW6B

PE-SW6C

L17

L16

to Hyy #421

Sutton Steam Plant Rd

MW2A

MW2B

MW2C

MW1A

MW1B

MW3A

MW3B

MW17

MW19

MW18

Sutton Lake Road

MW12

ECM

ECM

L5

ECM

L6

ECM

L7

ECM

L8

to Hwy #421

Sutton Lake Rd

MW6A

MW6B

MW6C

250' Review boundary

500' compliance boundary

L4

MW10

MW11

ECM

L3

MW9

ECM

L2

MW8

ECM

L1

ECM

MW5B

MW5C

MW5A

NCGS FINA (NAD 83)
N = 204042.5313
E = 2307566.6490
El = 21.86' (NGVD 29)

S 33°14'46"E
11365.74' grid distance
HIGHWAY # 421

NC GRID NORTH (NAD 83)

NORTH rotated 90° from vertical

LEGEND

- ECM – Existing Concrete Marker (found)
- EIP – Existing Iron Pipe 1" (found)
- NCGS Monument
- SW – Water Supply Well
- Monitoring Well
- Edge of water (ash ponds)

FIGURE 2
SUTTON ELECTRIC PLANT
PROGRESS ENERGY

ISH INC. environmental consultants

SURVEY MAP FOR THE SITE PREPARED ON DECEMBER 23, 2008

WILMINGTON, NORTH CAROLINA

DATE: 02/25/09 FILE NAME: FIGURE 2

ISH INC.

NOTES:

Boundary information prior boundary survey maps provided by Progress Energy.

This map is not prepared for recording.

Well coordinates in Elevation Table are NCGS Grid coordinates based on NAD '83.

Well elevations are based on Benchmark NCGS "Queensboro", NGVD 29.

250' review boundary and 500' compliance boundary are delineated using 4' green, steel, fence posts.

SCALE: 1" = 900'

0 900' 1800'

Cooling Pond

Cooling Pond

NC Wildlife Lake Access

Pond

approximate lake shore

road on dike

Canal

fence

toe

Pond

water edge

POND

road

OLD ASH POND AREA

Pond

water edge

ASH

NEW

toe

MW13D

MW13

fence

MW20

Canal

MW20D

AST

CC

road

C/L RR tracks

Plant Area

MW15

MW15D

MW14

AST

MW16

MW16D

Northern control

Canal

Southern control

L19

L14

L12

PE–SW2

C/L RR tracks

ECM

MW7C

MW7B

MW7A

(9.03)

SOLAR FIELD

PE–SW4

PE–SW3

L11

L15

soil road

MW4 MW4A MW4B

PE–SW5

L18 tie

ECM

L10

EIP

L9

NHC–SW

ECM

L8

ECM

L7

ECM

L6

ECM

L5

ECM

L4

L17

ECM

L16

PE–SW6A

PE–SW6B

PE–SW6C

NHC–SW4

NHC–SW3

to Hyy #421

Sutton Steam Plant Rd

MW2A

MW2B

MW2C

MW1A

MW1B

(10.38)

MW3A

MW3B

MW17

(10.17)

MW19

(10.01)

MW18

(10.37)

Canal

Sutton Lake Road

Sutton Lake Rd

to Hwy #421

MW12

(9.79)

ECM

10.0

MW10

(10.02)

250' Review boundary

500' compliance boundary

MW6A

MW6B

MW6C

(10.62)

MW11

(9.37)

ECM

L3

MW5B

MW5C

MW5A

9.50

MW8

(9.30)

ECM

L1

MW9

(9.66)

ECM

L2

NCGS FINA (NAD 83)
N = 204042.5313
E = 2307566.6490
El = 21.86' (NGVD 29)

S 33°14'46"E
11365.74' grid distance
HIGHWAY # 421

NC GRID NORTH (NAD 83)

NORTH rotated 90° from vertical

LEGEND

- ECM – Existing Concrete Marker (found)
- EIP – Existing Iron Pipe 1" (found)
- NCGS Monument
- SW – Water Supply Well
- Monitoring Well
- 9.50 — Groundwater Countors
- (9.37) Groundwater Elevation (Feet MSL)

FIGURE 3
SUTTON ELECTRIC PLANT
PROGRESS ENERGY

ISH INC. environmental consultants

MEASURED GROUNDWATER ELEVATIONS (FEET) ON 3-11-08

WILMINGTON, NORTH CAROLINA

DATE: 02/25/09 FILE NAME: FIGURE 3

ISH INC.

NOTES:

Boundary information prior boundary survey maps provided by Progress Energy.

This map is not prepared for recording.

Well coordinates in Elevation Table are NCGS Grid coordinates based on NAD '83.

Well elevations are based on Benchmark NCGS "Queensboro", NGVD 29.

250' review boundary and 500' compliance boundary are delineated using 4' green, steel, fence posts.

SCALE: 1" = 900'

0 900' 1800'

Cooling Pond

Cooling Pond

NC Wildlife Lake Access

Pond

approximate lake shore

road on dike

fence

toe

Pond

water edge

POND

road

OLD ASH POND AREA

Pond

water edge

ASH

NEW

toe

Canal

MW5B

MW5C MW5A

MW10 (0)

MW9

ECM

L2

L3

MW11 (0)

ECM

MW20

MW20D

Canal

MW13D

MW13

fence

AST

CC

road

C/L RR tracks

Plant Area

MW15

MW15D

MW14

AST

MW16

MW16D

MW2A (78.6)

MW2B

MW2C

MW1A

MW1B

(186)

MW3A

MW3B

(0)

MW6A

MW6B

MW6C

250' Review boundary

500' compliance boundary

Northern control

Canal

Southern control

L19

MW7C (20)

(0)

MW7B

MW7A

MW17

MW19 (0)

MW18 (67)

Sutton Lake Road

MW12 (0)

ECM

L4

L5

L6

L7

L8

L9

L10

L11

L12

L14

L15

NCGS FINA (NAD 83)
N = 204042.5313
E = 2307566.6490
El = 21.86' (NGVD 29)

PE-SW2

C/L RR tracks

ECM

SOLAR FIELD

PE-SW4

PE-SW3

PE-SW5

EIP

NHC-SW

NHC-SW4

NHC-SW3

MW4 MW4A

MW4B

soil road

L18 tie

ECM

PE-SW6A

PE-SW6B

PE-SW6C

L16

L17

ECM
N = 193977.9318
E = 2309847.5447

to Hyy #421

Sutton Steam Plant Rd

Sutton Lake Rd to Hwy #421

S 33°14'46"E
11365.74' grid distance
HIGHWAY # 421

NC GRID NORTH (NAD 83)

NORTH rotated 90° from vertical

LEGEND

- ECM – Existing Concrete Marker (found)
- EIP – Existing Iron Pipe 1" (found)
- NCGS Monument
- SW – Water Supply Well
- Monitoring Well
- Edge of water (ash ponds)
- (20.0) Measured Arsenic Concentrations (ug/L)
- Potential Groundwater Plume

FIGURE 4
SUTTON ELECTRIC PLANT
PROGRESS ENERGY

ISH INC environmental consultants

MEASURED ARSENIC (ug/L)
CONCENTRATIONS IN GROUNDWATER
SAMPLES COLLECTED ON 03-11-08

WILMINGTON, NORTH CAROLINA

DATE: 02/25/09 FILE NAME: FIGURE 4

ISH INC.

NOTES:

Boundary information prior boundary survey maps provided by Progress Energy.

This map is not prepared for recording.

Well coordinates in Elevation Table are NCGS Grid coordinates based on NAD '83.

Well elevations are based on Benchmark NCGS "Queensboro", NGVD 29.

250' review boundary and 500' compliance boundary are delineated using 4' green, steel, fence posts.

SCALE: 1" = 900'

0 900' 1800'

Cooling Pond

Cooling Pond

Pond

approximate lake shore

road on dike

NC Wildlife Lake Access

MW5B
MW5C MW5A

MW10

MW9

ECM

L2

L3

L4

L5

L6

L7

L8

L9

L10

L11

L12

L13

L14

L15

L16

L17

L18 tie

L19

Canal

Canal

Canal

fence

toe

Pond

water edge

POND

road

OLD ASH POND AREA

Pond

water edge

ASH

NEW

toe

fence

MW13D

MW13

MW20

MW20D

AST

CC

road

C/L RR tracks

Plant Area

MW15

MW15D

MW14

AST

MW16

MW16D

Northern control

Canal

Southern control

MW2A

MW2B

MW2C

MW1A

MW1B

MW17

(2.44)

(2.16)

MW3A

MW3B

MW19

(1.76)

MW18

MW7C

MW7B

MW7A

PE–SW2

C/L RR tracks

ECM

SOLAR FIELD

PE–SW4

PE–SW3

PE–SW5

soil road

MW4

MW4A

MW4B

EIP

NHC–SW

NHC–SW4

NHC–SW3

PE–SW6A

PE–SW6B

PE–SW6C

to Hyy #421

Sutton Steam Plant Rd

Sutton Lake Road

Sutton Lake Rd

to Hwy #421

250' Review boundary

500' compliance boundary

(0.925)

MW6A

MW6B

MW6C

MW11

ECM

MW12

ECM

ECM

ECM

ECM

ECM

ECM

ECM

N = 193977.9318
E = 2309847.5447

S 33°14'46"E
11365.74' grid distance
HIGHWAY # 421

NC GRID NORTH (NAD 83)

NORTH rotated 90° from vertical

NCGS FINA (NAD 83)
N = 204042.5313
E = 2307566.6490
El = 21.86' (NGVD 29)

LEGEND

- ECM – Existing Concrete Marker (found)
- EIP – Existing Iron Pipe 1" (found)
- NCGS Monument
- SW – Water Supply Well
- Monitoring Well
- Edge of water (ash ponds)
- (1.76) Measured Boron Concentration (mg/L)
- Potential Groundwater Plume

FIGURE 5
SUTTON ELECTRIC PLANT
PROGRESS ENERGY

ISH INC. environmental consultants

MEASURED BORON (mg/L)
CONCENTRATIONS IN GROUNDWATER
COLLECTED ON 03-11-08

WILMINGTON, NORTH CAROLINA

DATE: 02/25/09 FILE NAME: FIGURE 5

ISH INC.

NOTES:

Boundary information prior boundary survey maps provided by Progress Energy.

This map is not prepared for recording.

Well coordinates in Elevation Table are NCGS Grid coordinates based on NAD '83.

Well elevations are based on Benchmark NCGS "Queensboro", NGVD 29.

250' review boundary and 500' compliance boundary are delineated using 4' green, steel, fence posts.

SCALE: 1" = 900'

0 900' 1800'

Cooling Pond

Cooling Pond

NC Wildlife Lake Access

approximate lake shore

Pond

road on dike

Canal

fence

toe

Pond

water edge

POND

road

OLD ASH POND AREA

Pond

water edge

ASH

NEW

toe

MW5B MW5C MW5A

MW10 (4.54)

MW9

ECM

L2

L3

MW13D MW13

fence

MW20

Canal

MW20D

AST

CC

road

C/L RR tracks

Plant Area

MW15

MW15D

MW14

AST

MW2A

MW2B

MW2C

MW1A

MW1B

MW17 (6.23)

MW16

MW16D

Northern control

Canal

Southern control

L19

MW7C

MW7B

MW7A

(4.86)

ECM

PE-SW2

L14

L12

L13

C/L RR tracks

SOLAR FIELD

6.0

5.0

4.5

MW19 (6.25)

MW18 (6.41)

(6.34)

MW3A

MW3B

Sutton Lake Road

MW12 (4.65)

ECM

L4

L5

L6

L7

L8

L9

L10

L11

L15

PE-SW4

PE-SW3

PE-SW5

EIP

NHC-SW

NHC-SW4

NHC-SW3

ECM

ECM

ECM

ECM

ECM

Sutton Lake Rd. to Hwy #421

250' Review boundary

500' compliance boundary

(4.32)

MW6A

MW6B

MW6C

MW11 (4.35)

ECM

MW4 MW4A MW4B

soil road

L18 tie

L17

L16

PE-SW6A

PE-SW6B

PE-SW6C

to Hyy #421

Sutton Steam Plant Rd

ECM

N = 193977.9318

E = 2309847.5447

S 33°14'46"E

11365.74' grid distance

HIGHWAY # 421

NC GRID NORTH (NAD 83)

NORTH rotated 90° from vertical

NCGS FINA (NAD 83)

N = 204042.5313

E = 2307566.6490

El = 21.86' (NGVD 29)

LEGEND

- ECM – Existing Concrete Marker (found)
- EIP – Existing Iron Pipe 1" (found)
- NCGS Monument
- SW – Water Supply Well
- Monitoring Well
- (4.65) Measured pH Values
- pH isopleth

FIGURE 6
SUTTON ELECTRIC PLANT
PROGRESS ENERGY

ISH INC. environmental consultants

MEASURED pH VALUES
IN GROUNDWATER SAMPLES
COLLECTED ON 03-11-08

WILMINGTON, NORTH CAROLINA

DATE: 02/25/09 FILE NAME: FIGURE 6

ISH INC.

NOTES:

Boundary information prior boundary survey maps provided by Progress Energy.

This map is not prepared for recording.

Well coordinates in Elevation Table are NCGS Grid coordinates based on NAD '83.

Well elevations are based on Benchmark NCGS "Queensboro", NGVD 29.

250' review boundary and 500' compliance boundary are delineated using 4' green, steel, fence posts.

SCALE: 1" = 900'

0 900' 1800'

Cooling Pond

Cooling Pond

NC Wildlife Lake Access

approximate lake shore

road on dike

Pond

Canal

toe

fence

Pond water edge

POND

road

OLD ASH POND AREA

Pond water edge

ASH

NEW

toe

MW5B MW5C MW5A

MW10 (33)

MW9

ECM

L2

L3

MW13D MW13

fence

MW20 MW20D

Canal

AST

CC

road

C/L RR tracks

Plant Area

MW15 MW15D

MW14

AST

MW2A MW2B MW2C

MW1A MW1B

MW17 (396)

MW16 MW16D

Northern control

Canal

Southern control

L19

MW7C

MW7B MW7A

(112)

PE-SW2

C/L RR tracks

ECM

SOLAR FIELD

PE-SW4

PE-SW3

L14

L12

L11

L15

soil road

MW4 MW4A MW4B

PE-SW5

L18 tie

ECM

L17

L16

PE-SW6A

PE-SW6B

PE-SW6C

to Hyy #421

Sutton Steam Plant Rd

ECM N = 193977.9318 E = 2309847.5447

EIP

NHC-SW

L9

L10

NHC-SW4

NHC-SW3

ECM

L8

ECM

L7

to Hwy #421

Sutton Lake Rd

Sutton Lake Road

(345)

MW6A

MW6C MW6B

(357)

MW3A

MW3B

MW19 (360)

MW18 (358)

250' Review boundary

500' compliance boundary

MW11 (29)

ECM

L4

MW12 (330)

ECM

ECM

L5

L6

NCGS FINA (NAD 83)
N = 204042.5313
E = 2307566.6490
El = 21.86' (NGVD 29)

S 33°14'46"E
11365.74' grid distance
HIGHWAY # 421

NC GRID NORTH (NAD 83)

NORTH rotated 90° from vertical

LEGEND

- □ ECM – Existing Concrete Marker (found)
- ○ EIP – Existing Iron Pipe 1" (found)
- ⊛ NCGS Monument
- ⊕ SW – Water Supply Well
- ● Monitoring Well
- (358) Measured TDS Values
- —— TDS ISO–Concentration

FIGURE 7
SUTTON ELECTRIC PLANT
PROGRESS ENERGY

ISH INC environmental consultants

MEASURED TDS (mg/L)
IN GROUNDWATER SAMPLES
COLLECTED ON 03-11-08

WILMINGTON, NORTH CAROLINA

DATE: 02/25/09 FILE NAME: FIGURE 7

ISH INC.

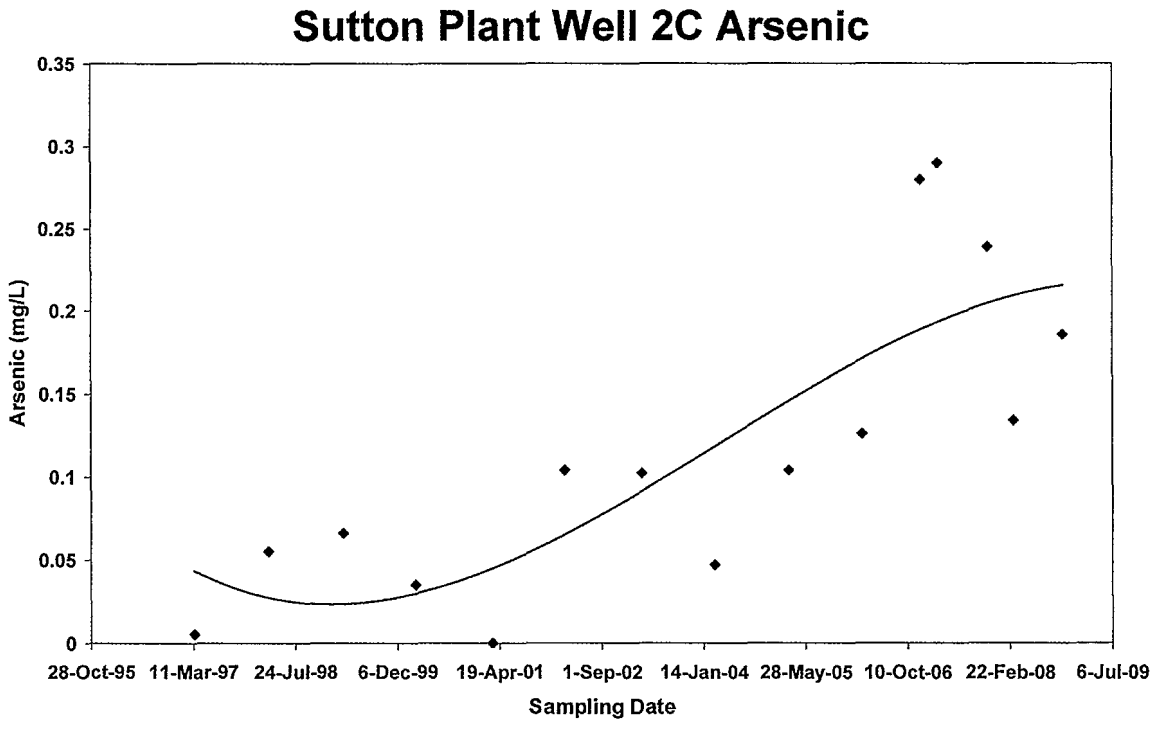


Figure 8: Time Series Scatter Plot for Arsenic Concentrations in Groundwater at Well MW-2C

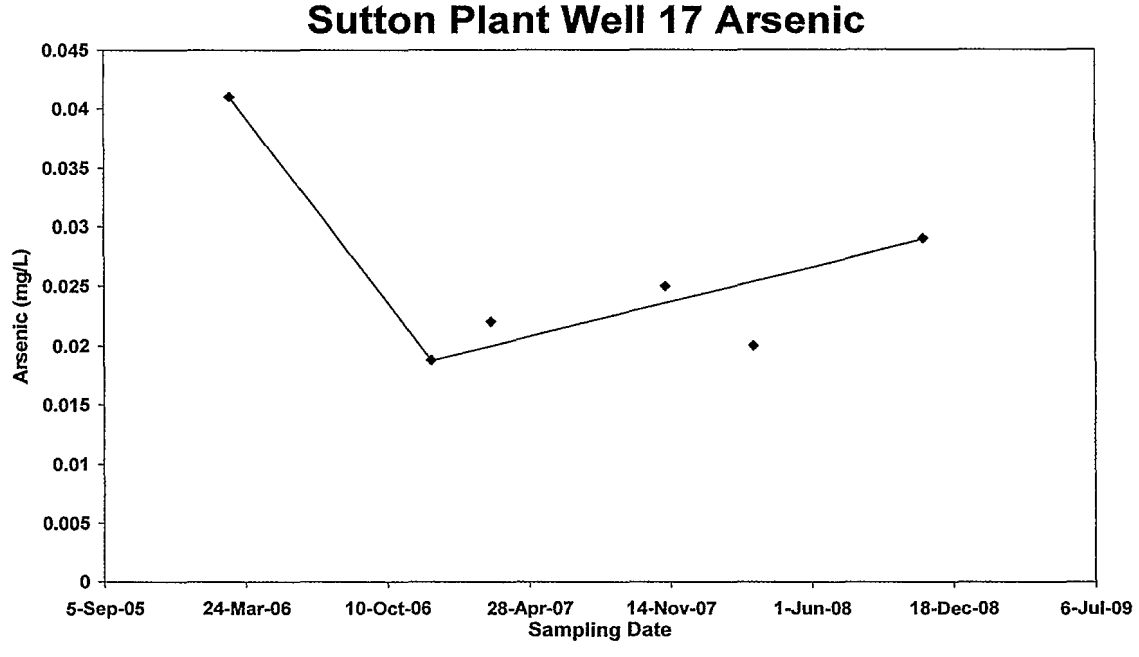


Figure 9: Time Series Scatter Plot for Arsenic Concentrations in Groundwater at Well MW-17

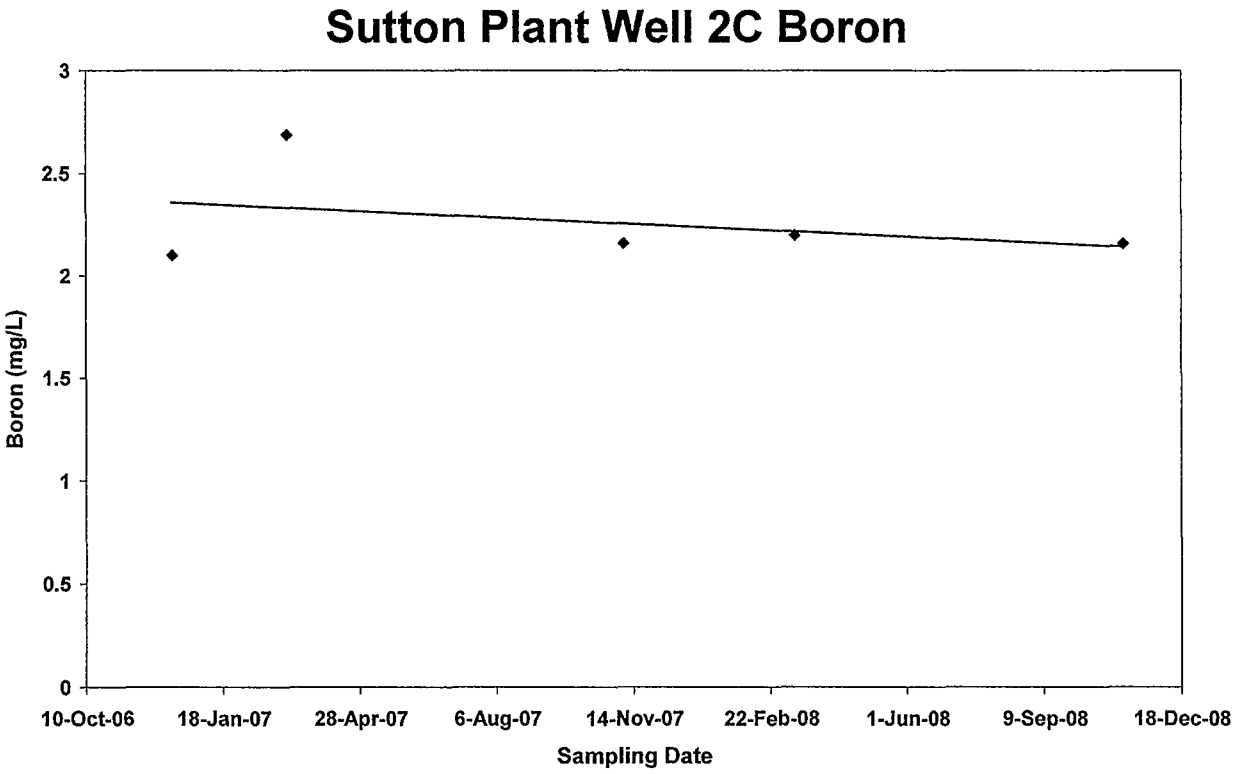


Figure 10: Time Series Scatter Plot for Boron Concentrations in Groundwater at Well MW-2C

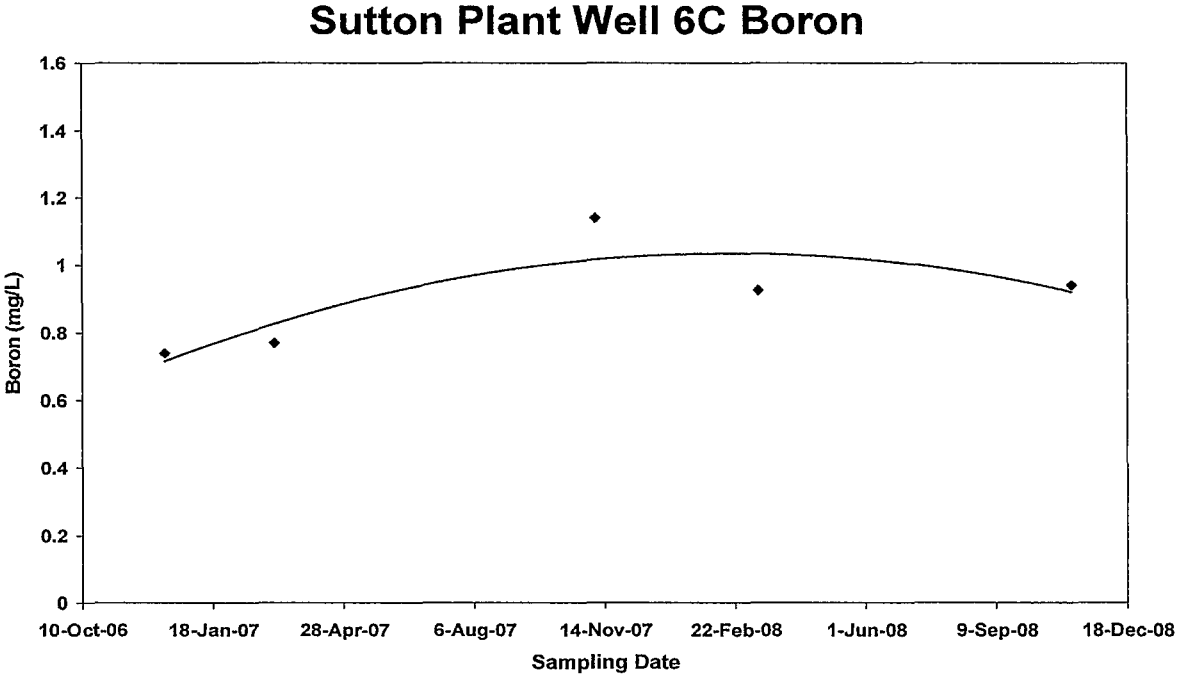


Figure 11: Time Series Scatter Plot for Boron Concentrations in Groundwater at Well MW-6C

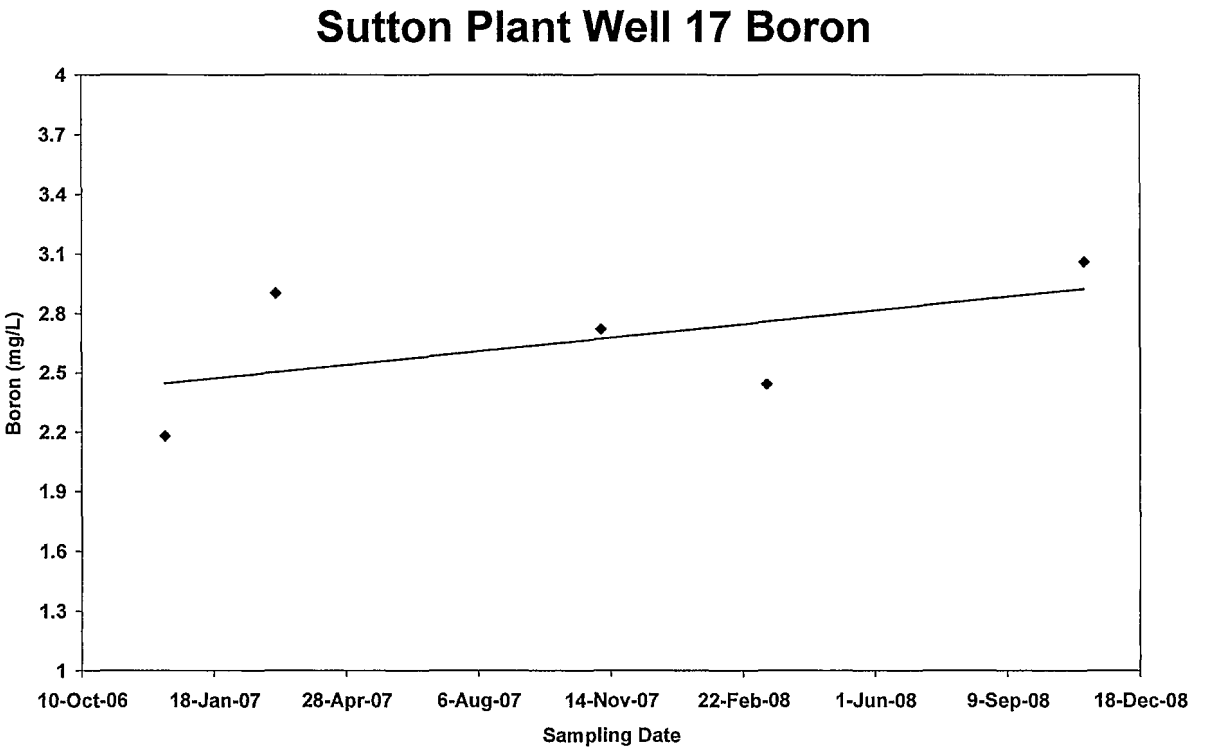


Figure 12: Time Series Scatter Plot for Boron Concentrations in Groundwater at Well MW-17

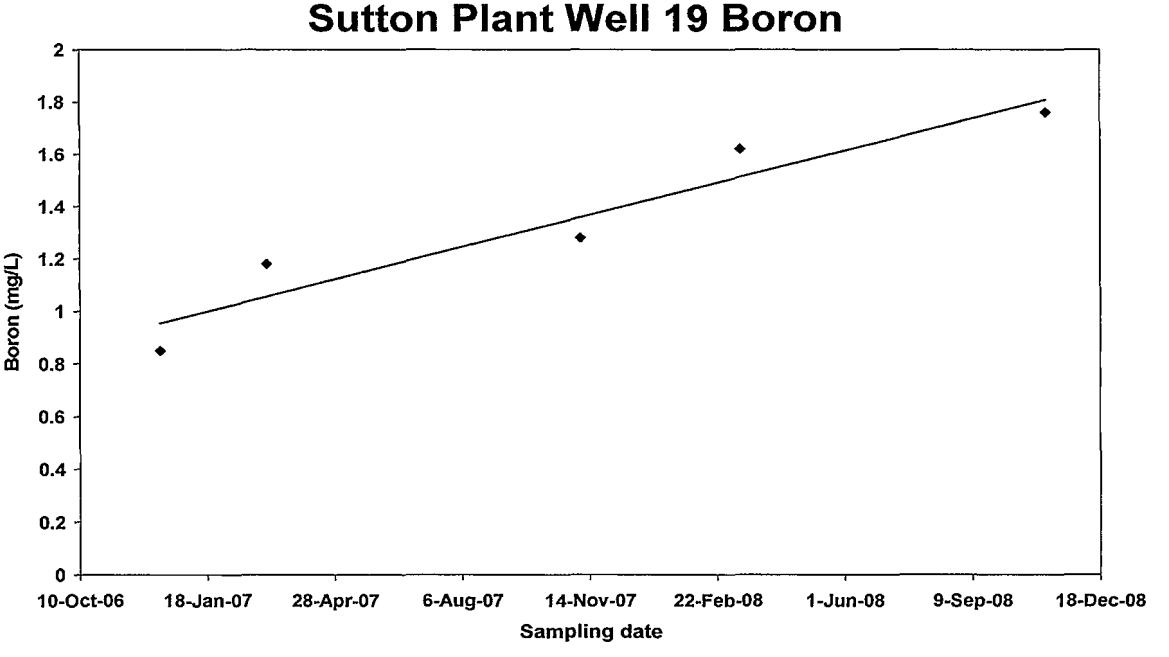


Figure 13: Time Series Scatter Plot for Boron Concentrations in Groundwater at Well MW-19

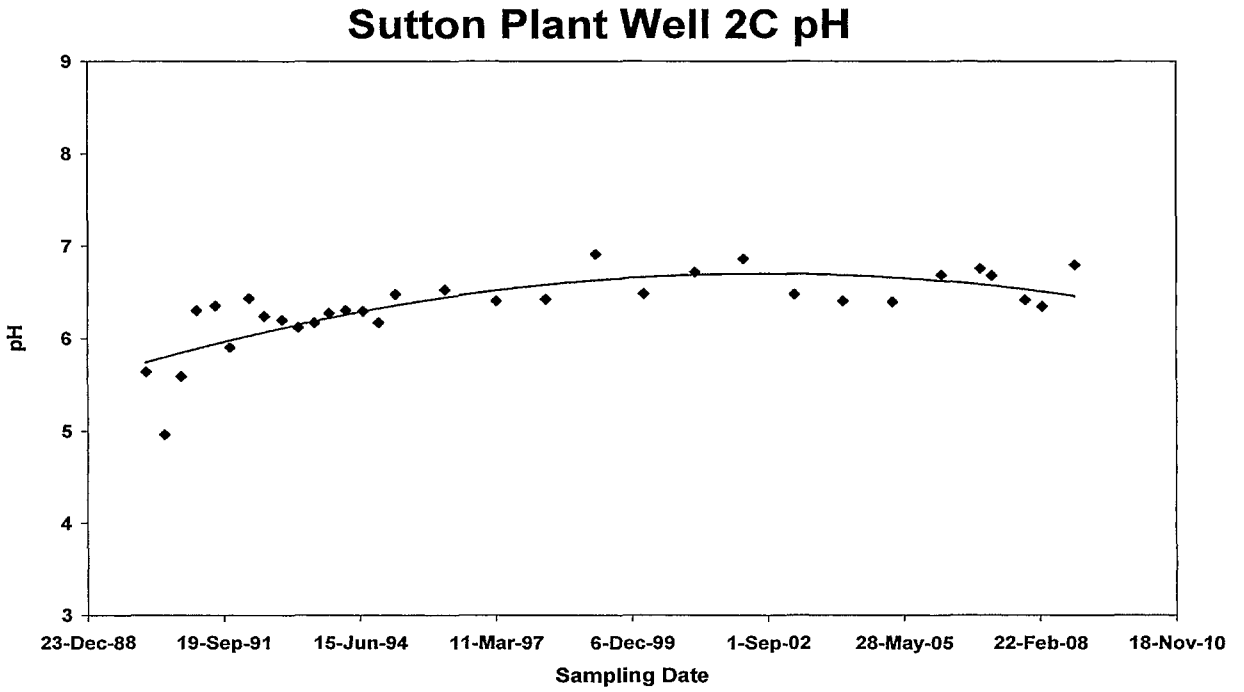


Figure 14: Time Series Scatter Plot of pH in Groundwater at Well MW-2C

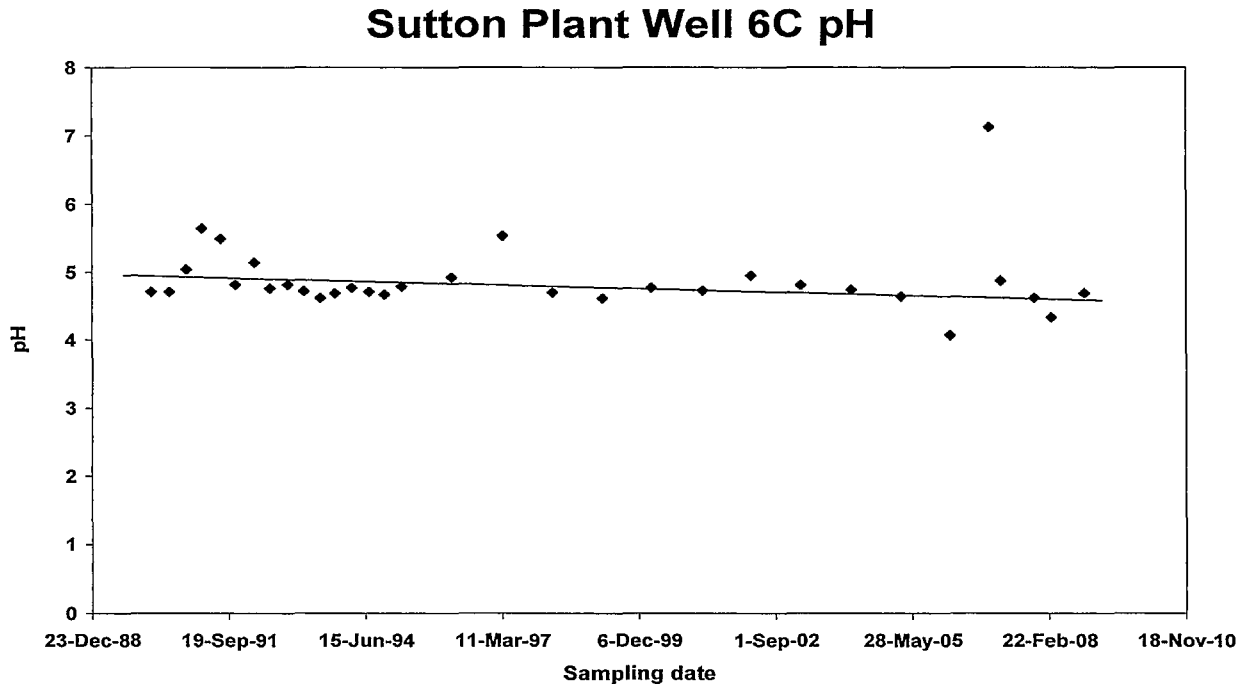


Figure 15: Time Series Scatter Plot of pH in Groundwater at Well MW-6C

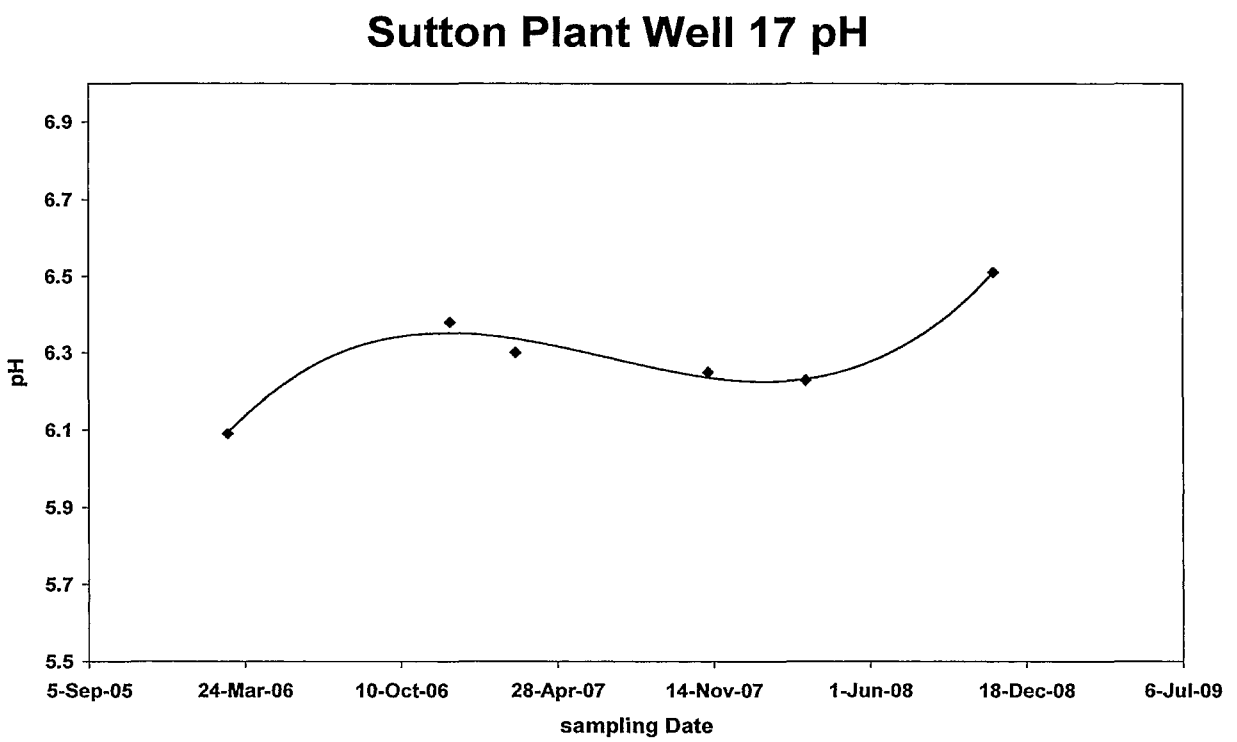


Figure 16: Time Series Scatter Plot of pH in Groundwater at Well MW-17

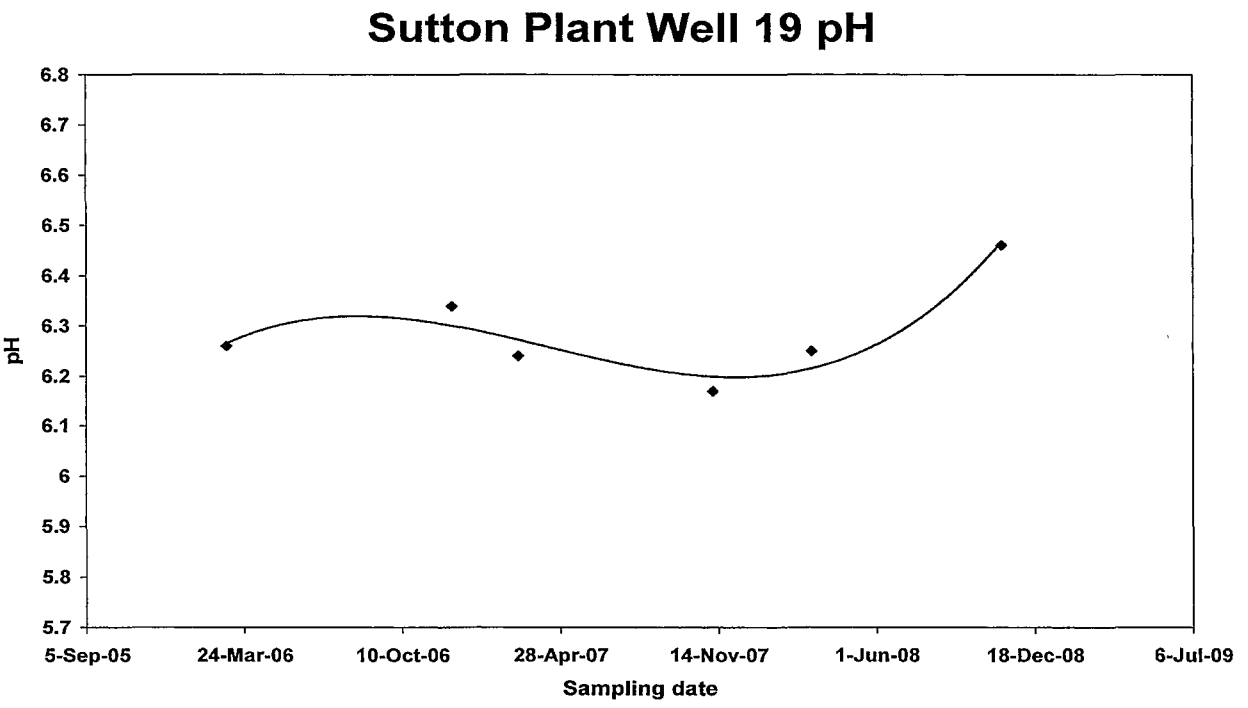


Figure 17: Time Series Scatter Plot of pH in Groundwater at Well MW-19

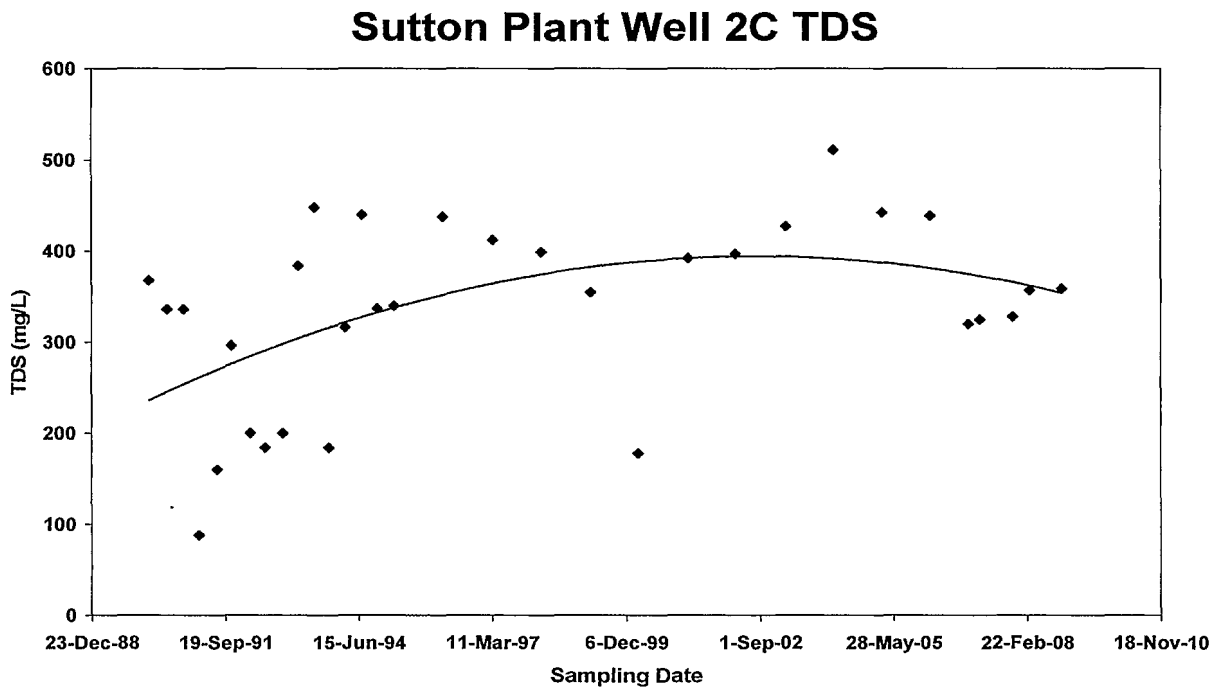


Figure 18: Time Series Scatter Plot of TDS in Groundwater at Well MW-2C

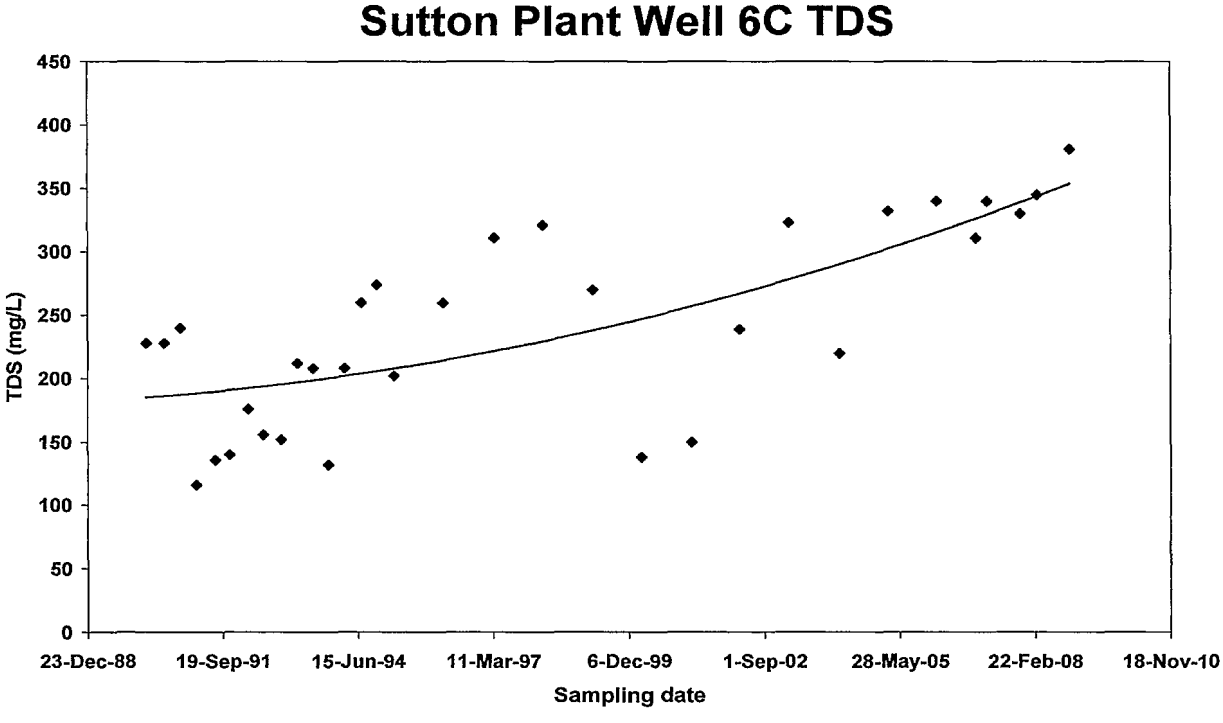


Figure 19: Time Series Plot of TDS in Groundwater at Well MW-6C

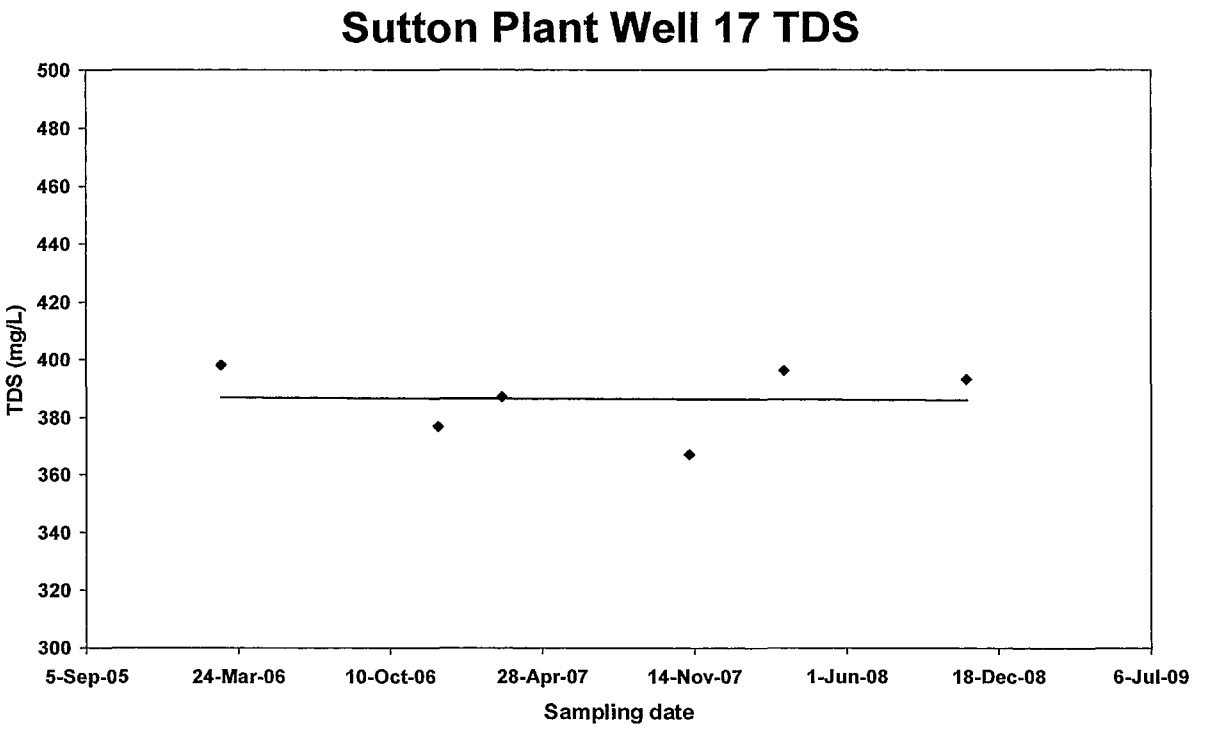


Figure 20: Time Series Plot of TDS in Groundwater at Well MW-17

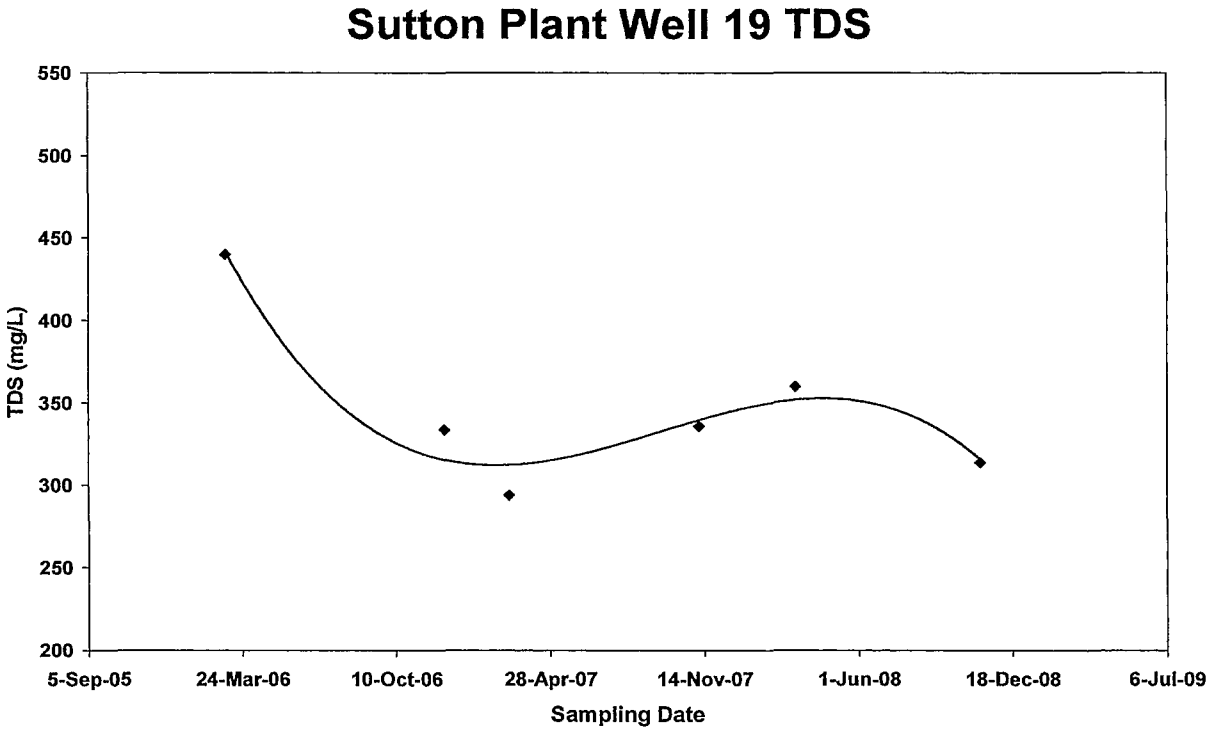


Figure 21: Time Series Plot of TDS in Groundwater at Well MW-19

NOTES:

Boundary information prior boundary survey maps provided by Progress Energy.

This map is not prepared for recording.

Well coordinates in Elevation Table are NCGS Grid coordinates based on NAD '83.

Well elevations are based on Benchmark NCGS "Queensboro", NGVD 29.

250' review boundary and 500' compliance boundary are delineated using 4" green, steel, fence posts.

Drawing based on survey by Haines & Associates completed on December 23, 2008.

SCALE: 1" = 900'

0 900' 1800'

Cooling Pond

Cooling Pond

NC Wildlife Lake Access

Pond

approximate lake shore

road on dike

Canal

toe

Pond

water edge

POND

fence

road

OLD ASH POND AREA

Pond

water edge

ASH

NEW

toe

MW5B

MW5C MW5A

ECM

MW8

ECM

L1

MW10

MW13D

MW13

fence

MW20

Canal

MW20D

AST

CC

road

C/L RR tracks

Plant Area

MW15

MW15D

MW14

AST

MW2A

MW2B

MW2C

MW1A

MW1B

MW17

MW16

MW16D

MW18

MW3A

MW3B

MW19

MW7C

MW7B

MW7A

Canal

250' Review boundary

500' compliance boundary

MW6A

MW6B

MW6C

MW9

ECM

L2

POND

ASH

NEW

L3

MW11

ECM

L4

Northern control

Canal

Southern control

L19

L14

L13

L12

PE-SW2

ECM

C/L RR tracks

SOLAR FIELD

Sutton Lake Road

MW12

ECM

ECM

L5

L6

ECM

L7

to Hwy #421

Sutton Lake Rd

ECM

L8

PE-SW4

PE-SW3

L11

L15

EIP

L9

NHC-SW

MW4 MW4A

MW4B

soil road

PE-SW5

L18 tie

ECM

L10

NHC-SW4

ECM

PE-SW6A

PE-SW6B

PE-SW6C

NHC-SW3

L17

L16

to Hyy #421

Sutton Steam Plant Rd

S 33°14'46"E

11365.74' grid distance

HIGHWAY # 421

NC GRID NORTH (NAD 83)

NORTH rotated 90° from vertical

NCGS FINA (NAD 83)
N = 204042.5313
E = 2307566.6490
El = 21.86' (NGVD 29)

LEGEND

- ECM – Existing Concrete Marker (found)
- EIP – Existing Iron Pipe 1" (found)
- NCGS Monument
- Existing SW – Water Supply Well
- Existing Monitoring Well
- Proposed Leachate Collection Points
- Proposed Geoprobe Borings
- Proposed Well Clusters

FIGURE 22

SUTTON ELECTRIC PLANT
PROGRESS ENERGY

ISH INC environmental consultants

POTENTIAL LOCATIONS FOR PROPOSED GEOPROBE AND WELL INSTALLATIONS

WILMINGTON, NORTH CAROLINA

DATE: 02/25/09 FILE NAME: FIGURE 22

ISH INC.

APPENDIX A

BORING LOGS FOR EXISTING WELLS

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT – GROUNDWATER SECTION
P.O. BOX 27687 – RALEIGH,N.C. 27611, PHONE (919) 733-5083

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____ Pc ___
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Ezra Meir Assoc Inc
DRILLER REGISTRATION NUMBER 446
STATE WELL CONSTRUCTION PERMIT NUMBER: _____

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Wilmington
L.V. Sutton Plant
(Road, Community, or Subdivision and Lot No.)
County: New Hanover

2. OWNER Carolina Power & Light
ADDRESS _____ (Street or Route No.)
City or Town State Zip Code

3. DATE DRILLED 12/4/84 USE OF WELL _____
4. TOTAL DEPTH 17' CUTTINGS COLLECTED ☐ Yes ☐ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: 11' FT. ☐ above ☒ below TOP OF CASING,
TOP OF CASING IS 1' FT. ABOVE LAND SURFACE.
7. YIELD (gpm): N/A METHOD OF TEST _____
8. WATER ZONES (depth): 10'

CHLORINATION: Type _____ Amount None

CASING:

	Depth From	To	Diameter	Wall Thickness or Weight/Ft.	Material
	0	12 Ft.	2"	Sch 40	PVC
	0	0 Ft.			
		Ft.			

11. GROUT:

	Depth From	To	Material	Method
	0	10 Ft.	Cement/Lime	
		Ft.		

12. SCREEN:

	Depth From	To	Diameter	Slot Size	Material
	12	17 Ft.	2" in.	.010 in.	PVC
		Ft.	in.	in.	
		Ft.	in.	in.	

13. GRAVEL PACK: *

	Depth From	To	Size	Material
		Ft.		
		Ft.		

14. REMARKS: [illegible]

Depth From	To	DRILLING LOG Formation Description
0	12"	Topsoil
12"	17'	Med to coarse Sand

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

Well 1A

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

[illegible]

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT – GROUNDWATER SECTION
P.O. BOX 27687 – RALEIGH, N.C. 27611, PHONE (919) 733-5083

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Ezra Mar Assoc Inc.
DRILLER REGISTRATION NUMBER 446
STATE WELL CONSTRUCTION PERMIT NUMBER: _____

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: WILMINGTON
L.V. SUTTON PLANT
(Road, Community, or Subdivision and Lot No.)
County: NEW HANOVER
2. OWNER CAROLINA POWER & LIGHT
ADDRESS _____ (Street or Route No.)
City or Town State Zip Code
3. DATE DRILLED 12-12-84 USE OF WELL _____
4. TOTAL DEPTH 27' CUTTINGS COLLECTED ☐ Yes ☐ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: 10' FT. ☐ above ☒ below TOP OF CASING,
TOP OF CASING IS 1' FT. ABOVE LAND SURFACE.
7. YIELD (gpm): N/A METHOD OF TEST _____
8. WATER ZONES (depth): 9'
9. CHLORINATION: Type _____ Amount None
10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From	0	To 22' Ft.	2"	SCH 40	PVC
From		To Ft.			
From		To Ft.			

11. GROUT:

	Depth		Material	Method
From	0	To 15' Ft.	CEMENT/LIME	
From		To Ft.		

12. SCREEN:

	Depth		Diameter	Slot Size	Material
From	22'	To 27' Ft.	2"	in. .010 in.	SCH 40
From		To Ft.		in. in.	
From		To Ft.		in. in.	

13. GRAVEL PACK:*

	Depth		Size	Material
From		To Ft.		
From		To Ft.		

14. REMARKS: * NATIVE SAND ALLOWED TO COLLAPSE AROUND THE SCREEN

Depth From	Depth To	DRILLING LOG Formation Description
0	12"	TOP SOIL
12"	27'	MED TO COURSE SAND

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

Well 1B

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Division of Environmental Management, Winston-Salem Regional Office

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT – GROUNDWATER SECTION
P.O. BOX 27687 – RALEIGH,N.C. 27611, PHONE (919) 733-5083

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____ Pc ___
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Ezra Meir Assoc Inc.
DRILLER REGISTRATION NUMBER 496
STATE WELL CONSTRUCTION PERMIT NUMBER: _____

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Wilmington
L.V. Sutton Plant
(Road, Community, or Subdivision and Lot No.)
County: New Hanover
2. OWNER Carolina Power & Light
ADDRESS _____
(Street or Route No.)
City or Town State Zip Code
3. DATE DRILLED 12-5-84 USE OF WELL _____
4. TOTAL DEPTH 17' CUTTINGS COLLECTED ☐ Yes ☐ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: 11' FT. ☐ above ☒ below TOP OF CASING,
TOP OF CASING IS 1' FT. ABOVE LAND SURFACE.
7. YIELD (gpm): N/A METHOD OF TEST _____
8. WATER ZONES (depth): 10'
CHLORINATION: Type _____ Amount None
CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From	0	To 12' Ft.	2"	SCH 40	PVC
From		To Ft.			
From		To Ft.			

11. GROUT:

	Depth		Material	Method
From	0	To 10' Ft.	CEMENT/LIME	
From		To Ft.		

12. SCREEN:

	Depth		Diameter	Slot Size	Material
From	12'	To 17' Ft.	2"	in. .010 in.	PVC
From		To Ft.		in. in.	
From		To Ft.		in. in.	

13. GRAVEL PACK: *

	Depth		Size	Material
From		To Ft.		
From		To Ft.		

14. REMARKS: * NATIVE SAND ALLOWED TO COLLAPSE AROUND THE SCREEN

Depth From	Depth To	DRILLING LOG Formation Description
0	12"	TOPSOIL
12"	17'	MED TO COURSE SAND

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

Well 2A

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Division of Environmental Management [illegible]

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT – GROUNDWATER SECTION
P.O. BOX 27687 – RALEIGH,N.C. 27611, PHONE (919) 733-5083

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Ezra Mear Assoc Inc.
DRILLER REGISTRATION NUMBER 446
STATE WELL CONSTRUCTION PERMIT NUMBER: _____

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Wilmington
L.V. Sutton Plant
(Road, Community, or Subdivision and Lot No.)
County: New Hanover
2. OWNER Carolina Power & Light
ADDRESS _____ (Street or Route No.)
City or Town State Zip Code
3. DATE DRILLED 12-12-84 USE OF WELL _____
4. TOTAL DEPTH 27' CUTTINGS COLLECTED ☐ Yes ☐ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: 11' FT. ☐ above ☒ below TOP OF CASING,
TOP OF CASING IS 1' FT. ABOVE LAND SURFACE.
7. YIELD (gpm): N/A METHOD OF TEST _____
8. WATER ZONES (depth): 10'
9. CHLORINATION: Type _____ Amount None
10. CASING:

	Depth From	To	Diameter	Wall Thickness or Weight/Ft.	Material
	0	22' Ft.	2"	Sch 40	PVC
		Ft.			
		Ft.			

11. GROUT:

	Depth From	To	Material	Method
	0	15 Ft.	Cement/Lime	
		Ft.		

12. SCREEN:

	Depth From	To	Diameter	Slot Size	Material
	22'	27' Ft.	2" in.	.010 in.	PVC
		Ft.	in.	in.	
		Ft.	in.	in.	

13. GRAVEL PACK:*

	Depth From	To	Size	Material
		Ft.		
		Ft.		

14. REMARKS: * NATIVE SAND ALLOWED TO COLLAPSE AROUND THE SCREEN

Depth From / To / DRILLING LOG Formation Description

From	To	Formation Description
0	12"	Topsoil
12"	27'	MED TO COARSE SAND

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

Well 2B

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Division of Environmental Management, P.O. Box 27687, Raleigh, N.C. 27611

2C

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH,N.C. 27611, PHONE (919) 733-5083

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____ Pc ___
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Dale Todd Well Drilling
DRILLER REGISTRATION NUMBER 639
STATE WELL CONSTRUCTION PERMIT NUMBER: 64-0036-WM-02

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Wilmington
Sutton Plant
(Road, Community, or Subdivision and Lot No.)
County: New Hanover

2. OWNER CP+L
ADDRESS hwy 421 (Street or Route No.)
Wilmington NC 28401
City or Town State Zip Code

3. DATE DRILLED 12-15-86 USE OF WELL monitor
4. TOTAL DEPTH 45 CUTTINGS COLLECTED ☐ Yes ☒ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL 14' 8" FT. ☐ above ☒ below TOP OF CASING,
TOP OF CASING IS 1' 2" FT. ABOVE LAND SURFACE.
7. YIELD (gpm): 50 METHOD OF TEST gas pump
8. WATER ZONES (depth): _____
_____
9. [redacted]INATION: Type _____ Amount _____
10. CASING:

	Depth From	To	Ft.	Diameter	Wall Thickness or Weight/Ft.	Material
	0	40		2	SCH40	PVC

GROUT:

	Depth From	To	Ft.	Material	Method
	0	38		NEAT	Pump

CREEN:

	Depth From	To	Ft.	Diameter	Slot Size	Material
	40	45		2 in.	010 in.	PVC
				in.	in.	
				in.	in.	

AVEL PACK:

	Depth From	To	Ft.	Size	Material
	39	45		MEDIUM	SAND

DRILLING LOG

Depth From	To	Formation Description
0	45	FINE TO MEDIUM SAND

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)
attached

CI 04 02 0046

[redacted] HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT

Revised 11/84

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT – GROUNDWATER SECTION
P.O. BOX 27687 – RALEIGH,N.C. 27611, PHONE (919) 733-5083

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Ezra Meir Assoc Inc.
DRILLER REGISTRATION NUMBER 446
STATE WELL CONSTRUCTION PERMIT NUMBER: _____

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Wilmington
(Road, Community, or Subdivision and Lot No.)
County: _____
2. OWNER Carolina Power & Light
ADDRESS _____
(Street or Route No.)
City or Town State Zip Code
3. DATE DRILLED 12-10-84 USE OF WELL _____
4. TOTAL DEPTH 17' CUTTINGS COLLECTED ☐ Yes ☐ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: 6' FT. ☐ above ☒ below TOP OF CASING,
TOP OF CASING IS 1' FT. ABOVE LAND SURFACE.
7. YIELD (gpm): N/A METHOD OF TEST _____
8. WATER ZONES (depth): 5'
9. CHLORINATION: Type _____ Amount None
10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 12'	Ft.	2"	SCH 40	PVC
From _____	To _____	Ft.			
From _____	To _____	Ft.			

11. GROUT:

	Depth		Material	Method
From 0	To 10'	Ft.	CEMENT/LIME	
From _____	To _____	Ft.		

12. SCREEN:

	Depth		Diameter	Slot Size	Material
From 12'	To 17'	Ft.	2"	in. .010	in. PVC
From _____	To _____	Ft.		in.	in.
From _____	To _____	Ft.		in.	in.

13. GRAVEL PACK:*

	Depth		Size	Material
From _____	To _____	Ft.		
From _____	To _____	Ft.		

14. REMARKS: [illegible] THE SCREEN)

DRILLING LOG

From	To	Formation Description
0	12"	TOPSOIL
12"	17'	MED TO COURSE SAND

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

Well 3A

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Division of Environmental Management [illegible]

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH,N.C. 27611, PHONE (919) 733-5083

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____ Pc ____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Ezra Meir Assoc. Inc.
DRILLER REGISTRATION NUMBER 496
STATE WELL CONSTRUCTION PERMIT NUMBER: _____

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Wilmington
(Road, Community, or Subdivision and Lot No.)
County: New Hanover
2. OWNER Carolina Power & Light
ADDRESS _____ (Street or Route No.)
City or Town. State Zip Code
3. DATE DRILLED 12-11-84 USE OF WELL _____
4. TOTAL DEPTH 27' CUTTINGS COLLECTED ☐ Yes ☐ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: 6' FT. ☐ above ☒ below TOP OF CASING,
TOP OF CASING IS 1' FT. ABOVE LAND SURFACE.
7. YIELD (gpm): n/a METHOD OF TEST _____
8. WATER ZONES (depth): 5'
9. CHLORINATION: Type _____ Amount None
10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From	0	To 22' Ft.	2"	SCH 40	PVC
From		To Ft.			
From		To Ft.			

11. GROUT:

	Depth		Material	Method
From	0	To 15' Ft.	CEMENT/LIME	
From		To Ft.		

12. SCREEN:

	Depth		Diameter	Slot Size	Material
From	22'	To 27' Ft.	2"	in. 0010 in.	PVC
From		To Ft.	in.	in.	
From		To Ft.	in.	in.	

13. GRAVEL PACK:*

	Depth		Size	Material
From		To Ft.		
From		To Ft.		

14. REMARKS: NATIVE SAND ALLOWED TO COLLAPSE AROUND THE SCREEN.

Depth From	To	DRILLING LOG Formation Description
0	12"	TOPSOIL
12"	27'	MED TO COARSE SAND

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

Well 3B

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Division of Environmental Management and copy to well owner

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT – GROUNDWATER SECTION
P.O. BOX 27687 – RALEIGH,N.C. 27611, PHONE (919) 733-5083

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Ezra Well Assoc Inc
DRILLER REGISTRATION NUMBER 496
STATE WELL CONSTRUCTION PERMIT NUMBER: _____

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Wilmington
(Road, Community, or Subdivision and Lot No.)
County: New Hanover
2. OWNER Carolina Power & Light
ADDRESS _____ (Street or Route No.)
City or Town _____ State _____ Zip Code _____
3. DATE DRILLED 12-13-94 USE OF WELL _____
4. TOTAL DEPTH 27' CUTTINGS COLLECTED ☐ Yes ☐ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: 9' FT. ☐ above ☒ below TOP OF CASING,
TOP OF CASING IS 1' FT. ABOVE LAND SURFACE.
7. YIELD (gpm): N/a METHOD OF TEST _____
8. WATER ZONES (depth): 8'
9. CHLORINATION: Type _____ Amount None
10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From	0	To 22' Ft.	2"	Sch 40	PVC
From		To Ft.			
From		To Ft.			

11. GROUT:

	Depth		Material	Method
From	0	To 15' Ft.	Cement/Lime	
From		To Ft.		

12. SCREEN:

	Depth		Diameter	Slot Size	Material
From	22	To 27' Ft.	2"	in. .010 in.	PVC
From		To Ft.		in. in.	
From		To Ft.		in. in.	

13. GRAVEL PACK: ✱

	Depth		Size	Material
From		To Ft.		
From		To Ft.		

14. REMARKS: [illegible] AROUND THE SCREEN

DRILLING LOG

From	To	Formation Description
0	12'	TOPSOIL
12"	27'	MED TO COARSE SAND

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

Well 4

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Division of Environmental Management [illegible]

4A

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT – GROUNDWATER SECTION
P.O. BOX 27687 – RALEIGH,N.C. 27611, PHONE (919) 733-5083

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____ Pc ____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Dale Todd Well Drilling
DRILLER REGISTRATION NUMBER 039
STATE WELL CONSTRUCTION PERMIT NUMBER: 64-0036-WM-02 2

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Wilmington
Sutton Plant
(Road, Community, or Subdivision and Lot No.)
County: New Hanover

2. OWNER CP+L
ADDRESS Hwy 421 (Street or Route No.)
Wilmington NC 28401
City or Town State Zip Code

3. DATE DRILLED 12-13-86 USE OF WELL monitor
4. TOTAL DEPTH 17 CUTTINGS COLLECTED ☐ Yes ☒ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: 8 FT. ☐ above ☒ below TOP OF CASING,
TOP OF CASING IS 0 FT. ABOVE LAND SURFACE.
7. YIELD (gpm): 55 METHOD OF TEST gas pump
8. WATER ZONES (depth): _____
_____
9. [redacted]INATION: Type _____ Amount _____
10. CASING:

	Depth From	To	Diameter	Wall Thickness or Weight/Ft.	Material
	0	12 Ft.	2	SCH40	PVC
		Ft.			
		Ft.			

GROUT:

	Depth From	To	Material	Method
	0	10 Ft.	NEAT	Pump
		Ft.		

SCREEN:

	Depth From	To	Diameter	Slot Size	Material
	12	17 Ft.	2 in.	010 in.	PVC
		Ft.	in.	in.	
		Ft.	in.	in.	

GRAVEL PACK:

	Depth From	To	Size	Material
	11	17 Ft.	MEDIUM	SAND
		Ft.		

Depth From	To	DRILLING LOG Formation Description
0	17	FINE TO MEDIUM SAND

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)
attached

CI 04 02 0050

[redacted]O HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT

Revised 11/84

4B

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT – GROUNDWATER SECTION
P.O. BOX 27687 – RALEIGH,N.C. 27611, PHONE (919) 733-5083

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Dale Todd Well Drilling
DRILLER REGISTRATION NUMBER 039
STATE WELL CONSTRUCTION PERMIT NUMBER: 64-0036-WM-022

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Wilmington
Sutton Plant
(Road, Community, or Subdivision and Lot No.)
County: New Hanover

2. OWNER CP+L
ADDRESS Hwy 421 (Street or Route No.)
Wilmington (City or Town) NC (State) 28401 (Zip Code)

3. DATE DRILLED 12-12-86 USE OF WELL monitor
4. TOTAL DEPTH 45 CUTTINGS COLLECTED ☐ Yes ☒ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: 10'8" FT. ☐ above ☑ below TOP OF CASING.
TOP OF CASING IS 10" ~~FT~~. ABOVE LAND SURFACE.
7. YIELD (gpm): 10 METHOD OF TEST GAS PUMP
8. WATER ZONES (depth): _____
9. CHLORINATION: Type _____ Amount _____
10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From	0	To 40 Ft.	2	SCH40	PVC
From		To Ft.			
From		To Ft.			

GROUT:

	Depth		Material	Method
From	0	To 38 Ft.	NEAT	PUMP
From		To Ft.		

SCREEN:

	Depth		Diameter	Slot Size	Material
From	40	To 45 Ft.	2 in.	.010 in.	PVC
From		To Ft.	in.	in.	
From		To Ft.	in.	in.	

GRAVEL PACK:

	Depth		Size	Material
From	39	To 45 Ft.	MEDIUM	SAND
From		To Ft.		

REMARKS: _____

DRILLING LOG

Depth From	Depth To	Formation Description
0	45	FINE TO MEDIUM SAND

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)
attached

CI 04 02 0051

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT

Revised 11/84

5A

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT – GROUNDWATER SECTION
P.O. BOX 27687 – RALEIGH,N.C. 27611, PHONE (919) 733-5083

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____ Pc _
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR DALE TODD WELL DRILLING
DRILLER REGISTRATION NUMBER 039
STATE WELL CONSTRUCTION PERMIT NUMBER: 64-0036-WM-022

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: WILMINGTON
SUTTON PLANT
(Road, Community, or Subdivision and Lot No.)
County: NEW HANOVER
2. OWNER CP&L
ADDRESS HWY 421 (Street or Route No.)
WILMINGTON NC 28401
City or Town State Zip Code
3. DATE DRILLED 12-16-86 USE OF WELL MONITOR
4. TOTAL DEPTH 17 CUTTINGS COLLECTED ☐ Yes ☒ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: 4'8" FT. ☐ above ☒ below TOP OF CASING,
TOP OF CASING IS 5" FT. ABOVE LAND SURFACE.
7. YIELD (gpm): — METHOD OF TEST —
8. WATER ZONES (depth): —
—
9. CHLORINATION: Type — Amount —
10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 12	Ft.	2	SCH40	PVC
From	To	Ft.			
From	To	Ft.			

GROUT:

	Depth		Material	Method
From 0	To 10	Ft.	NEAT	PUMP
From	To	Ft.		

SCREEN:

	Depth		Diameter	Slot Size	Material
From 12	To 17	Ft.	2 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

RAVEL PACK:

	Depth		Size	Material
From 11	To 17	Ft.	MEDIUM	SAND
From	To	Ft.		

PKS —

Depth From	Depth To	DRILLING LOG Formation Description
0	17	FINE TO MEDIUM SAND

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)
ATTACHED

CI 04 02 0040

I HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

GW-1 (08) 11-84 Submit original to D...

5B

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH,N.C. 27611, PHONE (919) 733-5083

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Dale Todd Well Drilling
DRILLER REGISTRATION NUMBER 039
STATE WELL CONSTRUCTION PERMIT NUMBER: 64-0036-WM-0229

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Wilmington
Sutton Plant
(Road, Community, or Subdivision and Lot No.)
County: New Hanover

2. OWNER CP+L
ADDRESS Hwy 421 (Street or Route No.)
Wilmington NC 28401
City or Town State Zip Code

3. DATE DRILLED 12-15-86 USE OF WELL monitor
4. TOTAL DEPTH 27 CUTTINGS COLLECTED ☐ Yes ☒ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: 5'6" FT. ☐ above ☑ below TOP OF CASING,
TOP OF CASING IS 9" FT. ABOVE LAND SURFACE.
7. YIELD (gpm): _____ METHOD OF TEST _____
WATER ZONES (depth): _____
_____
8. CHLORINATION: Type — Amount —

CASING:

	Depth From	To	Diameter	Wall Thickness or Weight/Ft.	Material
	0	22 Ft.	2	SCH40	PVC
		Ft.			
		Ft.			

GROUT:

	Depth From	To	Material	Method
	0	20 Ft.	NEAT	Pump
		Ft.		

SCREEN:

	Depth From	To	Diameter	Slot Size	Material
	22	27 Ft.	2 in.	010 in.	PVC
		Ft.	in.	in.	
		Ft.	in.	in.	

GRAVEL PACK:

	Depth From	To	Size	Material
	21	27 Ft.	MEDIUM	SAND
		Ft.		

REMARKS: _____

DRILLING LOG

Depth From	To	Formation Description
0	27	FINE TO MEDIUM SAND

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

attached

CI 04 02 0041

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

Revised 11/84

5C

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT – GROUNDWATER SECTION
P.O. BOX 27687 – RALEIGH,N.C. 27611, PHONE (919) 733-5083

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____ Pc ____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Dale Todd Well Drilling
DRILLER REGISTRATION NUMBER 039
STATE WELL CONSTRUCTION PERMIT NUMBER: 64-0036-WM-022

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Wilmington
Sutton Plant
(Road, Community, or Subdivision and Lot No.)
County: New Hanover

2. OWNER CP+L
ADDRESS Hwy 421 (Street or Route No.)
Wilmington NC 28401
City or Town State Zip Code

3. DATE DRILLED 12-15-86 USE OF WELL monitor
4. TOTAL DEPTH 45 ~~CUTTINGS~~ SPTS COLLECTED ☒ Yes ☐ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: 5 FT. ☐ above ☑ below TOP OF CASING,
TOP OF CASING IS 2" ~~ABOVE~~ BELOW LAND SURFACE.
7. YIELD (gpm): _____ METHOD OF TEST _____
8. WATER ZONES (depth): _____
9. ~~NATION~~: Type — Amount —
10. CASING:

	Depth From	To	Diameter	Wall Thickness or Weight/Ft.	Material
	0	40 Ft.	2	SCH40	PVC
		Ft.			
		Ft.			

GROUT:

	Depth From	To	Material	Method
	0	38 Ft.	NEAT	PUMP
		Ft.		

CREEN:

	Depth From	To	Diameter	Slot Size	Material
	40	45 Ft.	2 in.	010 in.	PVC
		Ft.	in.	in.	
		Ft.	in.	in.	

RAVEL PACK:

	Depth From	To	Size	Material
	39	45 Ft.	MEDIUM	SAND
		Ft.		

Depth From	To	DRILLING LOG Formation Description
		ATTACHED

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

attached

CI 04 02 0042

I HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

Revised 11/84

FILE CO

TEST BORING FIELD REPORT 830-21-D

DALE TODD WELL DRILLING

319 KEATON AVENUE
WILMINGTON, N.C. 28401
919-763-1261

CD PROJECT CP&L - SUTTON PLANT

CD PROJECT # _____ BORING # S-C DATE 12-[redacted]-G

CLIENT PROJECT # _____ SURFACE ELEVATION _____

DRILLER G. BRIDGER CREW R. FOWLER

DEPTH FROM	DEPTH TO	SOIL STRATA SOIL DESCRIPTION AND REMARKS	USCS	NO.	DEPTH FROM	DEPTH TO	1ST 6"	2ND 6"	3RD 6"	REC.
0	42	LOOSE TO FIRM TAN AND GRAY FINE TO MEDIUM SAND, MOIST TO WET	SP	1	3.5	5	3	3	4	
			SP	2	8.5	10	5	8	12	
42	45	DENSE GRAY FINE SAND - TRACE OF SILT, WET	SP	3	13.5	15	4	13	13	
			SP	4	18.5	20	5	7	9	
			SP	5	23.5	25	3	3	4	
			SP	6	28.5	30	9	12	12	
			SP	7	33.5	35	4	6	12	
			SP	8	38.5	40	8	9	12	
			SP-SM	9	43.5	45	17	18	20	

CI 04 02 0037

DRILLING TIME (Hrs.) _____ REMARKS: _____

LAYOUT _____ MOVING _____

EARING _____ STANDBY _____

:R LEVEL: @ _____ DATE _____ TIME _____

@ DATE _____ TIME _____

6M

A DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
I OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
. BOX 27687 - RALEIGH,N.C. 27611, PHONE (919) 733-5083

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____ Pc ____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

LL CONSTRUCTION RECORD

NTRACTOR Dale Todd Well Drilling
GISTRATION NUMBER 039
STATE WELL CONSTRUCTION PERMIT NUMBER: 64-0036-WM-0229

TION: (Show sketch of the location below)
n: Wilmington
Sutton Plant
unity, or Subdivision and Lot No.)
CP+L
Hwy 421
(Street or Route No.)
Wilmington NC 28401
City or Town State Zip Code
D 12-16-86 USE OF WELL monitor
H 17 CUTTINGS COLLECTED ☐ Yes ☒ No
REPLACE EXISTING WELL? ☐ Yes ☒ No
ER LEVEL: 6'6" FT. ☐ above ☒ below TOP OF CASING,
CASING IS 8" FT. ABOVE LAND SURFACE.
60 METHOD OF TEST GGS Pump
h): _____
N: Type — Amount —

County: New Hanover

Depth From	Depth To	DRILLING LOG Formation Description
0	17	FINE TO MEDIUM SAND

If additional space is needed use back of form.

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
0	To 12	Ft.	2	SCH40	PVC
	To	Ft.			
	To	Ft.			

	Depth		Material	Method
0	To 10	Ft.	NEAT	PUMP
	To	Ft.		

	Depth		Diameter		Slot Size		Material
12	To 17	Ft.	2	in.	010	in.	PVC
	To	Ft.		in.		in.	
	To	Ft.		in.		in.	

K:

	Depth		Size	Material
11	To 17	Ft.	MEDIUM	SAND
	To	Ft.		

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

attached

CI 04 02 0043

HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION DARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

...Division of Environmental Management and copy to well owner

6B

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH,N.C. 27611, PHONE (919) 733-5083

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Dale Todd Well Drilling
DRILLER REGISTRATION NUMBER 039
STATE WELL CONSTRUCTION PERMIT NUMBER: 64-0036-WM-0229

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Wilmington Sutton Plant
(Road, Community, or Subdivision and Lot No.)
County: New Hanover
2. OWNER CP+L
ADDRESS Hwy 421 (Street or Route No.)
Wilmington (City or Town) NC (State) 28401 (Zip Code)
3. DATE DRILLED 12-16-86 USE OF WELL monitor
4. TOTAL DEPTH 27 CUTTINGS COLLECTED ☐ Yes ☒ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: 6' 2" FT. ☐ above ☒ below TOP OF CASING.
TOP OF CASING IS 4" FT. ABOVE LAND SURFACE.
7. YIELD (gpm): 50 METHOD OF TEST gas pump
8. WATER ZONES (depth): _____
9. CHLORINATION: Type — Amount —
10. CASING:

	Depth From	Depth To	Diameter	Wall Thickness or Weight/Ft.	Material
	0	22 Ft.	2	SCH40	PVC
		Ft.			
		Ft.			

GROUT:

	Depth From	Depth To	Material	Method
	0	20 Ft.	NEAT	Pump
		Ft.		

SCREEN:

	Depth From	Depth To	Diameter	Slot Size	Material
	22	27 Ft.	2 in.	010 in.	PVC
		Ft.	in.	in.	
		Ft.	in.	in.	

RAVEL PACK:

	Depth From	Depth To	Size	Material
	21	27 Ft.	MEDIUM	SAND
		Ft.		

REMARKS: _____

Depth From	Depth To	DRILLING LOG Formation Description
0	27	FINE TO MEDIUM SAND

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)
attached

CI 04 02 0044

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT

Revised 11/84

6C

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT – GROUNDWATER SECTION
P.O. BOX 27687 – RALEIGH,N.C. 27611, PHONE (919) 733-5083

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____ Pc _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Dale Todd Well Drilling
DRILLER REGISTRATION NUMBER 039
STATE WELL CONSTRUCTION PERMIT NUMBER: 64-0036-WM-022

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Wilmington
Sutton Plant
(Road, Community, or Subdivision and Lot No.)
County: New Hanover
OWNER CP+L
ADDRESS Hwy 421 (Street or Route No.)
Wilmington (City or Town) NC (State) 28401 (Zip Code)
DATE DRILLED 12-16-86 USE OF WELL monitor
TOTAL DEPTH 45 ~~CUTTINGS~~ SPT'S COLLECTED ☒ Yes ☐ No
DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
STATIC WATER LEVEL: 5'7" FT. ☐ above ☐ below TOP OF CASING,
TOP OF CASING IS 0 FT. ABOVE LAND SURFACE.
YIELD (gpm): 20 METHOD OF TEST gas pump
WATER ZONES (depth): _____
_____
HOLE ENLARGEMENT: Type — Amount —

CASING:

	Depth From	To	Ft.	Diameter	Wall Thickness or Weight/Ft.	Material
	0	40		2	SCH40	PVC

GROUT:

	Depth From	To	Ft.	Material	Method
	0	38		NEAT	Pump

SCREEN:

	Depth From	To	Ft.	Diameter	in.	Slot Size	in.	Material
	40	45		2	in.	010	in.	PVC
					in.		in.	
					in.		in.	

GRAVEL PACK:

	Depth From	To	Ft.	Size	Material
	39	45		MEDIUM	SAND

DRILLING LOG

Depth From	To	Formation Description
		ATTACHED

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

attached

CI 04 02 0045

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS been PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT

Revised 11/84

DALE TODD WELL DRILLING

219 KEATON AVENUE
WILMINGTON, N.C. 28401
919-763-1261

TEST BORING FIELD REPORT

CD PROJECT CP&L - SUTTON PLANT

CD PROJECT # _____ BORING # 6-C DATE 12-16-9

CLIENT PROJECT # _____ SURFACE ELEVATION _____

DRILLER G. BRIDGER CREW R. FOWLER

DEPTH FROM	DEPTH TO	SOIL STRATA SOIL DESCRIPTION AND REMARKS	USCS	NO	DEPTH FROM	DEPTH TO	FIRST 6"	2ND 6"	3RD 6"	REC
0	27	LOOSE TO FIRM TAN AND GRAY FINE TO MEDIUM SAND, MOIST TO WET	SP	1	3.5	5	1	2	3	
			SP	2	8.5	10	8	13	15	
27	32	LOOSE BROWN FINE TO MEDIUM SAND - SOME CLAY AND ORGANICS, WET	SP	3	13.5	15	7	13	16	
			SP	4	18.5	20	5	14	16	
32	37	STIFF DARK GRAY CLAY - SOME SAND, MOIST	SP	5	23.5	25	5	11	12	
37	45	LOOSE TO FIRM TAN FINE TO MEDIUM SAND, WET	SC	6	28.5	30	3	3	6	
			CH	7	33.5	35	5	6	7	
			SP	8	38.5	40	3	4	6	
			SP	9	43.5	45	12	13	14	

CI 04 02 0038

DRILLING TIME (Hrs.) _____ REMARKS: _____

LAYOUT _____ MOVING _____

RING _____ STANDBY _____

LEVEL: @ _____ DATE _____ TIME _____

@ _____ DATE _____ TIME _____

7A

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH,N.C. 27611, PHONE (919) 733-5083

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____ Pc _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Dale Todd Well Drilling
DRILLER REGISTRATION NUMBER 039
STATE WELL CONSTRUCTION PERMIT NUMBER: 64-0036-WM-0229

WELL LOCATION: (Show sketch of the location below)
Nearest Town: Wilmington
Sutton Plant
(Road, Community, or Subdivision and Lot No.)
County: New Hanover

OWNER CP+L
ADDRESS ~~West~~ Hwy 421
(Street or Route No.)
Wilmington NC 28401
City or Town State Zip Code

DATE DRILLED 12-19-86 USE OF WELL monitor
TOTAL DEPTH 17 CUTTINGS COLLECTED ☐ Yes ☒ No
DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
STATIC WATER LEVEL: 8'4" FT. ☐ above ☐ below TOP OF CASING,
TOP OF CASING IS 1" FT. ABOVE LAND SURFACE.
YIELD (gpm): 60 METHOD OF TEST gas pump
WATER ZONES (depth): _____
CONSOLIDATION: Type — Amount —

CASING:

	Depth From	To	Diameter	Wall Thickness or Weight/Ft.	Material
From	0	To 12 Ft.	2	SCH40	PVC
From		To Ft.			
From		To Ft.			

GROUT:

	Depth From	To	Material	Method
From	0	To 10 Ft.	NEAT	PUMP
From		To Ft.		

SCREEN:

	Depth From	To	Diameter	Slot Size	Material
From	12	To 17 Ft.	2 in.	010 in.	PVC.
From		To Ft.	in.	in.	
From		To Ft.	in.	in.	

GRAVEL PACK:

	Depth From	To	Size	Material
From	11	To 17 Ft.	MEDIUM	SAND
		To Ft.		

DRILLING LOG

Depth From	To	Formation Description
0	17	FINE TO MEDIUM SAND

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

attached

CI 04 02 0047

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT

7B

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT – GROUNDWATER SECTION
P.O. BOX 27687 – RALEIGH,N.C. 27611, PHONE (919) 733-5083

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Dale Todd Well Drilling
DRILLER REGISTRATION NUMBER 039
STATE WELL CONSTRUCTION PERMIT NUMBER: 64-0036-WM-0229

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Wilmington
Sutton Plant
(Road, Community, or Subdivision and Lot No.)
County: New Hanover

2. OWNER CP+L
ADDRESS Hwy 421
(Street or Route No.)
Wilmington NC 28401
City or Town State Zip Code

DATE DRILLED 12-15-86 USE OF WELL monitor
TOTAL DEPTH 27 CUTTINGS COLLECTED ☐ Yes ☒ No
DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
STATIC WATER LEVEL: 8' 3" FT. ☐ above ☐ below TOP OF CASING,
TOP OF CASING IS 1" FT. ABOVE LAND SURFACE.
YIELD (gpm): 60 METHOD OF TEST GAS Pump
WATER ZONES (depth): _____

TREATMENT: Type _____ Amount _____

CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From	0	To 22 Ft.	2	SCH40	PVC
From		To Ft.			
From		To Ft.			

GROUT:

	Depth		Material	Method
From	0	To 20 Ft.	NEAT	Pump
From		To Ft.		

SCREEN:

	Depth		Diameter	Slot Size	Material
From	22	To 27 Ft.	2 in.	010 in.	PVC
From		To Ft.	in.	in.	
From		To Ft.	in.	in.	

GRAVEL PACK:

	Depth		Size	Material
From	21	To 27 Ft.	MEDIUM	SAND
From		To Ft.		

DRILLING LOG

Depth From	To	Formation Description

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

attached

CI 04 02 0048

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT

ed 11/84

7C

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT – GROUNDWATER SECTION
P.O. BOX 27687 – RALEIGH,N.C. 27611, PHONE (919) 733-5083

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____ Pc ____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Dale Todd Well Drilling
DRILLER REGISTRATION NUMBER 039
STATE WELL CONSTRUCTION PERMIT NUMBER: 64-0036-wm-022

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Wilmington
Sutton Plant
(Road, Community, or Subdivision and Lot No.)
County: New Hanover

2. OWNER CP+L
ADDRESS Hwy 421 (Street or Route No.)
Wilmington NC 28401
City or Town State Zip Code

3. DATE DRILLED 12-14-86 USE OF WELL monitor
4. TOTAL DEPTH 45 SPT'S CUTTINGS COLLECTED ☒ Yes ☐ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: 8' FT. ☐ above ☐ below TOP OF CASING,
TOP OF CASING IS 1'2" FT. ABOVE LAND SURFACE.
7. YIELD (gpm): 10 METHOD OF TEST GGS pump
8. WATER ZONES (depth): _____
9. CHLORINATION: Type _____ Amount _____
10. CASING:

	Depth From	To	Ft.	Diameter	Wall Thickness or Weight/Ft.	Material
	0	40		2	SCH40	PVC

GROUT:

	Depth From	To	Ft.	Material	Method
	0	38		NEAT	Pump

SCREEN:

	Depth From	To	Ft.	Diameter	in.	Slot Size	in.	Material
	40	45		2	in.	010	in.	PVC
					in.		in.	
					in.		in.	

GRAVEL PACK:

	Depth From	To	Ft.	Size	Material
	39	45		MEDIUM	SAND

REMARKS: _____

Depth From	To	DRILLING LOG Formation Description
		ATTACHED

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

attached

CI 04 02 0049

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT

DALE TODD WELL DRILLING

219 KEATON AVENUE
WILMINGTON, N.C. 28401
919-763-1261

TEST BORING FIELD REPORT

CO PROJECT CP&L - SUTTON PLANT

CD PROJECT # _____ BORING # 7-C DATE 12-14

CLIENT PROJECT # _____ SURFACE ELEVATION _____

DRILLER G. BRIDGER CREW R. FOWLER

DEPTH FROM	DEPTH TO	SOIL STRATA SOIL DESCRIPTION AND REMARKS	USCS	NO.	DEPTH FROM	DEPTH TO	FIRST 6"	2ND 6"	3RD 6"	REC
0	45	LOOSE TO FIRM DARK GRAY, GRAY	SP	1	3.5	5	4	4	6	
		AND TAN FINE TO MEDIUM SAND,								
		MOIST TO WET	SP	2	8.5	10	4	8	13	
			SP	3	13.5	15	1	5	12	
			SP	4	18.5	20	8	14	16	
			SP	5	23.5	25	3	4	5	
			SP	6	28.5	30	4	5	6	
			SP	7	33.5	35	5	3	4	
			SP	8	38.5	40	6	7	9	
			SP	9	43.5	45	3	6	9	

CI 04 02 0039

DRILLING TIME (Hrs.) _____ REMARKS: _____

LAYOUT _____ MOVING _____

EARING _____ STANDBY _____

ER LEVEL: @ _____ DATE _____ TIME _____

@ _____ DATE _____ TIME _____

...MENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, N.C. 27611, PHONE (919) 733-5083

WELL #8

WELL CONSTRUCTION RECORD

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____ Pc ___
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

DRILLING CONTRACTOR RICHARD CATLIN & ASSOCIATES, INC.

DRILLER REGISTRATION NUMBER 1142

STATE WELL CONSTRUCTION * PERMIT NUMBER: 64-0036-WM-0368

1. WELL LOCATION: (Show sketch of the location below)

Nearest Town: WILMINGTON
801 SUTTON STEAM PLANT ROAD
(Road, Community, or Subdivision and Lot No.)

County: NEW HANOVER

2. OWNER CAROLINA POWER AND LIGHT

ADDRESS P. O. BOX 327 (Street or Route No.)

NEW HILL, (City or Town) NC (State) 27562 (Zip Code)

3. DATE DRILLED 2/8/90 USE OF WELL MONITORING

4. TOTAL DEPTH 50' CUTTINGS COLLECTED ☒ Yes ☐ No

5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No

6. STATIC WATER LEVEL: ±10.5 FT. ☐ above ☒ below TOP OF CASING,
TOP OF CASING IS 2.5 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): N/A METHOD OF TEST _____

8. WATER ZONES (depth): SURFICIAL AQUIFER

CHLORINATION: Type N/A Amount _____

9. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From	+2.5	To 40 Ft.	2"	SCH 40	PVC
From		To Ft.			
From		To Ft.			

10. GROUT:

	Depth		Material	Method
From	0	To 35.5 Ft.	NEAT	IN PLACE
From		To Ft.		

11. SCREEN

	Depth		Diameter	Slot Size	Material
From	40	To 50 Ft.	2 in.	.010 in.	PVC
From		To Ft.	in.	in.	
From		To Ft.	in.	in.	

GRAVEL PACK:

	Depth		Size	Material
From	37	To 50 Ft.	COARSE	SAND
From		To Ft.		

REMARKS _____

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

Revised 11/84

Submit original to Division of Environmental Management and copy to well owner.

Depth From	Depth To	DRILLING LOG Formation Description
		SEE ATTACHED

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

SEE ATTACHED

BORING LOG

BORING NUMBER WELL #8 SITE LOCATION CP&L SUTTON DRILLED BY M. SAGE

TOTAL DEPTH 50' WILMINGTON, NORTH CAROLINA LOGGED BY R. GARRETT

DRILLING DATE 2/8/90

SAMPLE DEPTH (ft.) FROM	TO	SAMPLE DESCRIPTION	P.I.D. SURVEY	BLOW COUNT
0	5"	SAND - Tan, orange yellow, very fine grained to fine grained, subrounded, subangular, moderately well sorted (no sample).		
5.0	7.0	SAND - Tan, organge yellow, very fine grained to fine grained, subrounded, subangular, moderately well sorted. Saturated at 6'.		2,2,2,3
10.0	12.0	SAND - tan, medium grained, well sorted, subrounded unconsolidated, wet.		2,2,3,6
13.5	15.5	SAND - medium grained to coarse grained, poor to moderately sorted, subrounded, wet.		10,14,16,14
18.5	20.5	SAND - tan/orange yellow; well sorted, fine grained SAND with 1/2 to 1" stringers; coarse grained to very coarse grained subangular SAND. Wet.		2,4,4,6
23.5	25.5	SAND - tan, fine grained, very well sorted; wet.		10,7,10,12
28.5	30.5	SAND - tan with yellow orange fragments, medium grained, moderately well sorted, friable, subangular, wet.		10,8,10,10
33.5	35.5	SAND - tan changing to yellow orange with depth, fine grained to medium grained, moderately sorted, occasional 1/4 gravel fragment and some CLAY in sample shoe, wet.		
38.5	40.5	SAND - tan, pea gravel, very coarse grained SAND in upper 4", change to medium grained SAND with occasional 1/4 gravel fragemnt.		10,8,8,8

REMARKS

Richard Catlin & Associates, Inc.
CONSULTING ENGINEERS AND HYDROGEOLOGISTS
RC&A

BORING LOG

BORING NUMBER WELL #8
TOTAL DEPTH 50'

SITE LOCATION CP&L SUTTON
WILMINGTON, NORTH CAROLINA

DRILLED BY M. SAGE
LOGGED BY R. GARRETT
DRILLING DATE 2/8/90

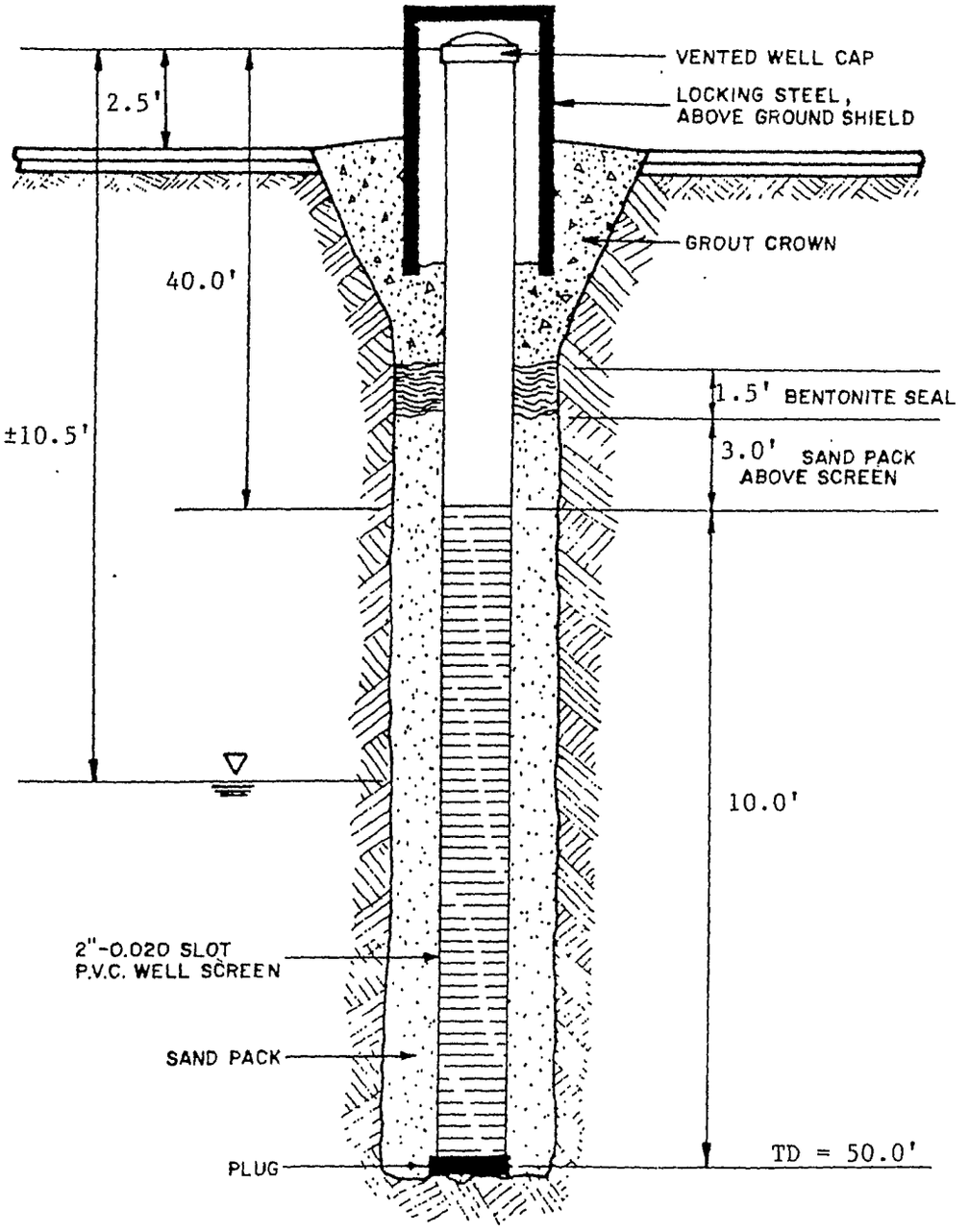
SAMPLE DEPTH (ft.) FROM	TO	SAMPLE DESCRIPTION	P.I.D. SURVEY	BLOW COUNT
43.5	45.5	SILT - very fine grained SAND - dark grey soft-firm wet.		2,2,4,6
50.0	52.0	SILT - very fine grained SAND, dark grey. Soft, firm, wet.		12,10,10,22

REMARKS

Richard Catlin & Associates, Inc.
CONSULTING ENGINEERS AND HYDROGEOLOGISTS
RC&A

AS BUILT
WELL DETAIL

WELL #8



NOT TO SCALE

Richard Catlin & Associates, Inc.

CONSULTING ENGINEERS AND HYDROGEOLOGISTS

RC&A

...RTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH,N.C. 27611, PHONE (919) 733-5083

WELL #9

WELL CONSTRUCTION RECORD

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long _____ Pc ___
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

DRILLING CONTRACTOR RICHARD CATLIN & ASSOCIATES, INC.

DRILLER REGISTRATION NUMBER 1142

STATE WELL CONSTRUCTION * PERMIT NUMBER: 64-0036-WM-0368

1. WELL LOCATION. (Show sketch of the location below)

Nearest Town: WILMINGTON
801 SUTTON STEAM PLANT ROAD
(Road, Community, or Subdivision and Lot No.)

County: NEW HANOVER

2. OWNER CAROLINA POWER AND LIGHT

ADDRESS P. O. BOX 327 (Street or Route No.)

NEW HILL, NC 27562
City or Town State Zip Code

3. DATE DRILLED 2/7/90 USE OF WELL MONITORING

4. TOTAL DEPTH 50' CUTTINGS COLLECTED ☒ Yes ☐ No

5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No

6. STATIC WATER LEVEL: ±18.5 FT. ☐ above ☒ below TOP OF CASING,
TOP OF CASING IS 2.5 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): N/A METHOD OF TEST _____

8. WATER ZONES (depth): SURFICIAL AQUIFER

9. CHLORINATION: Type N/A Amount _____

10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From	+2.5	To 40 Ft.	2"	SCH 40	PVC
From		To Ft.			
From		To Ft.			

Depth		Drilling Log
From	To	Formation Description
		SEE ATTACHED

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

11. GROUT:

	Depth		Material	Method
From	0	To 36.5 Ft.	NEAT	IN PLACE
From		To Ft.		

12. SCREEN

	Depth		Diameter	Slot Size	Material
From	40	To 50 Ft.	2 in.	.010 in.	PVC
From		To Ft.	in.	in.	
From		To Ft.	in.	in.	

SEE ATTACHED

13. GRAVEL PACK:

	Depth		Size	Material
From	38	To 50 Ft.	COARSE	SAND
From		To Ft.		

REMARKS _____

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

GW-1 Revised 11/84

Submit original to Division of Environmental Management and copy to well owner.

BORING LOG

BORING NUMBER WELL #9
TOTAL DEPTH 50'

SITE LOCATION CP&L SUTTON
WILMINGTON, NORTH CAROLINA

DRILLED BY M. SAGE
LOGGED BY J. CORNETTE
DRILLING DATE 2/6/90

SAMPLE DEPTH (ft.) FROM	TO	SAMPLE DESCRIPTION	P.I.D. SURVEY	BLOW COUNT
5.0	7.0	Well sorted and rounded, medium grained SAND. Low water content. Tan.		2,4,6,12
10.0	12.0	Well sorted and rounded, medium grained clean quartz SAND. Low water content. Tan.		3,4,4,6
15.0	17.0	Well sorted and rounded, medium grained SAND. Ground water table ± 16'		6,8,10,8
20.0	22.0	Medium grained, well rounded and sorted SAND. High water content.		4,6,12,18
23.5	25.5	Medium to fine grained, moderately sorted, well rounded SAND. Some iron staining. High water content. Light tan.		18,14,16,18
29.0	31.0	Fine to coarse grained, subrounded, poorly sorted SAND. Iron staining throughout sample. High water content. Tan.		8,6,6,4
34.0	36.0	Top 12" of sample fine to medium grained, moderately sorted, subrounded tan SAND. Coarsens downward to a meduim to coarse grained, subrounded SAND. Iron staining. High water content.		2,6,14,13
39.0	41.0	Fine grained, well sorted and rounded SAND. Sandy clay lense °6" up from bottom. High water content. Tan.		3,17,17,14
44.0	46.0	Dark grey, very fine grained, high plasticity CLAY in upper 12" of sample. Sharp contact with a coarse grained, poorly sorted SAND in lower 12". Sub-rounded. Tan. High water content.		WOR-18

REMARKS

Richard Catlin & Associates, Inc.
CONSULTING ENGINEERS AND HYDROGEOLOGISTS
RC&A

BORING LOG

BORING NUMBER WELL #9 SITE LOCATION CP&L SUTTON DRILLED BY M. SAGE

TOTAL DEPTH 50' WILMINGTON, NORTH CAROLINA LOGGED BY J. CORNETTE

DRILLING DATE 2/6/90

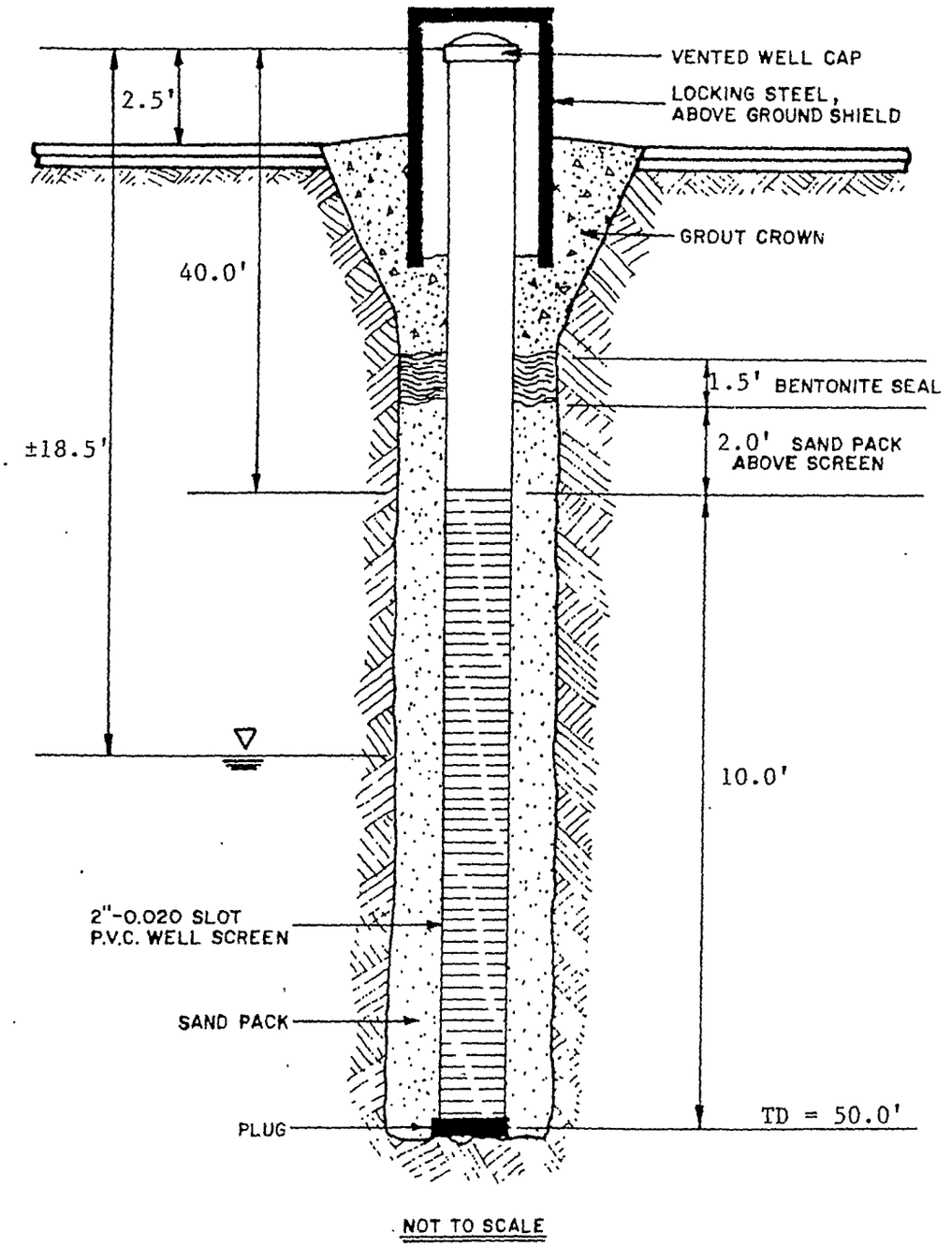
SAMPLE DEPTH (ft.) FROM	TO	SAMPLE DESCRIPTION	P.I.D. SURVEY	BLOW COUNT
49.0	51.0	Very coarse, poorly sorted, gravely, tan SAND.		8,12,14,12
		High water content.		

REMARKS

Richard Catlin & Associates, Inc.
CONSULTING ENGINEERS AND HYDROGEOLOGISTS
RC&A

AS BUILT
WELL DETAIL

WELL #9



NOT TO SCALE

Richard Catlin & Associates, Inc.

CONSULTING ENGINEERS AND HYDROGEOLOGISTS

RC&A

DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH,N.C. 27611, PHONE (919) 733-5083

WELL #10

WELL CONSTRUCTION RECORD

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____ Pc ___
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

DRILLING CONTRACTOR RICHARD CATLIN & ASSOCIATES, INC.

DRILLER REGISTRATION NUMBER 1142

STATE WELL CONSTRUCTION * PERMIT NUMBER: 64-0036-WM-0368

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: WILMINGTON
County: NEW HANOVER
801 SUTTON STEAM PLANT ROAD
(Road, Community, or Subdivision and Lot No.)

2. OWNER CAROLINA POWER AND LIGHT
ADDRESS P. O. BOX 327 (Street or Route No.)
NEW HILL, NC 27562
City or Town State Zip Code

3. DATE DRILLED 2/8/90 USE OF WELL MONITORING

4. TOTAL DEPTH 50' CUTTINGS COLLECTED ☒ Yes ☐ No

5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No

6. STATIC WATER LEVEL: ±15.5 FT. ☐ above ☒ below TOP OF CASING,
TOP OF CASING IS 2.5 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): N/A METHOD OF TEST _____

8. WATER ZONES (depth): SURFICIAL AQUIFER

CHLORINATION: Type N/A Amount _____

CASING:

	Depth			Diameter	Wall Thickness or Weight/Ft.	Material
From	+2.5	To	40 Ft.	2"	SCH 40	PVC
From		To	Ft.			
From		To	Ft.			

11. GROUT:

	Depth			Material	Method
From	0	To	35.5 Ft.	NEAT	IN PLACE
From		To	Ft.		

12. SCREEN:

	Depth			Diameter	Slot Size	Material
From	40	To	50 Ft.	2 in.	.010 in.	PVC
From		To	Ft.	in.	in.	
From		To	Ft.	in.	in.	

GRAVEL PACK:

	Depth			Size	Material
From	37	To	50 Ft.	COARSE	SAND
From		To	Ft.		

REMARKS: _____

DRILLING LOG	
From To	Formation Description
	SEE ATTACHED

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

SEE ATTACHED

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

GW-1 Revised 11/84

Submit original to Division of Environmental Management and copy to well owner

BORING LOG

BORING NUMBER WELL #10 SITE LOCATION CP&L SUTTON DRILLED BY M. SAGE

TOTAL DEPTH 50' WILMINGTON, NORTH CAROLINA LOGGED BY R. GARRETT

DRILLING DATE 2/8/90

SAMPLE DEPTH (ft.) FROM	TO	SAMPLE DESCRIPTION	P.I.D. SURVEY	BLOW COUNT
5.0	7.0	SAND - tan, fine grained, well sorted, unconsolidated, dry.		2,2,2,2
10.0	12.0	SAND - tan, fine grained, well sorted, unconsolidated, dry.		4,4,6,6
15.0	17.0	SAND, yellow orange grading to light tan, very fine grained, well sorted, wet.		8,12,12,14
20.0	22.0	SAND - tan, fine grained, well sorted, friable, water saturated.		6,8,12,14
23.5	25.5	SAND - tan very fine grained to fine grained, well sorted, wet.		12,18,18,26
28.5	30.5	SAND, tan, fine grained to coarse grained in upper 5", poorly sorted grading to well sorted, very fine grained SAND, wet.		6,6,6,6
33.5	35.5	SAND - tan, fine grained to medium grained, with occasional pea size grained fragments and iron stained band. Friable, wet.		5,6,7,5
38.5	40.5	CLAY - medium grey, soft-firm, high plasticity, greasy, some SILT in lower 3" of sample.		
43.5	45.5	SAND - tan-yellow, orange medium grained, grading to very gine grained, well sorted, friable, wet.		3,3,2,6
50.0	52.0	SAND - grey brown grading to tan, medium grained to coarse grained with occasional subrounded 1/4" fragments, friable CLAY plug in upper 2-3" of sample, orange, slightly sandy. Soft.		6,10,12,16

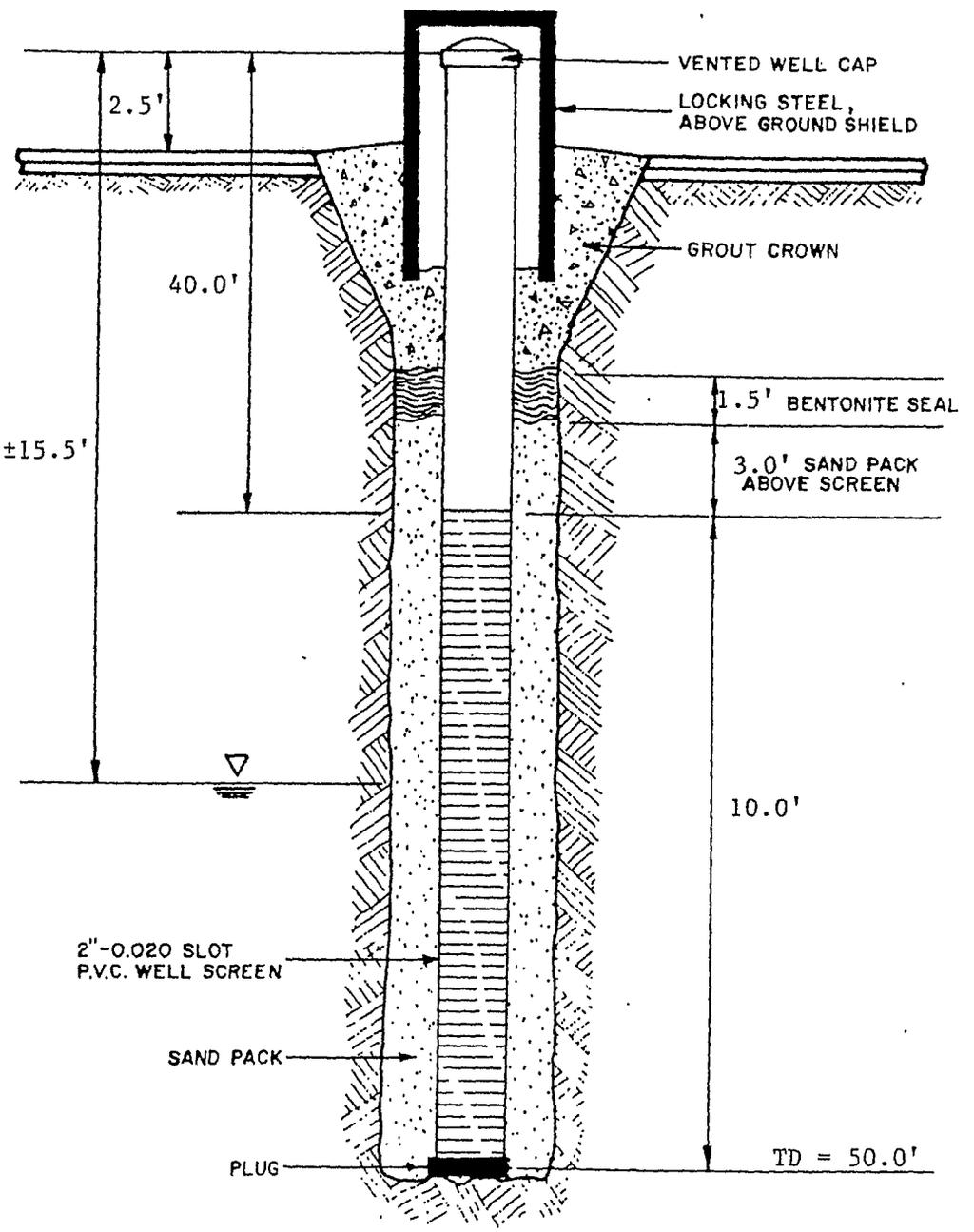
REMARKS

PAGE ___ OF ___

Richard Catlin & Associates, Inc.
CONSULTING ENGINEERS AND HYDROGEOLOGISTS
RC&A

AS BUILT
WELL DETAIL

WELL #10



NOT TO SCALE

Richard Catlin & Associates, Inc.

CONSULTING ENGINEERS AND HYDROGEOLOGISTS

RC&A

DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, N.C. 27611, PHONE (919) 733-5083

WELL #11

WELL CONSTRUCTION RECORD

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long _____ Pc _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

DRILLING CONTRACTOR RICHARD CATLIN & ASSOCIATES, INC.

DRILLER REGISTRATION NUMBER 1142

STATE WELL CONSTRUCTION * PERMIT NUMBER: 64-0036-WM-0368

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: WILMINGTON
801 SUTTON STEAM PLANT ROAD
(Road, Community, or Subdivision and Lot No.)
County: NEW HANOVER

2. OWNER CAROLINA POWER AND LIGHT
ADDRESS P. O. BOX 327 (Street or Route No.)
NEW HILL, NC 27562
City or Town State Zip Code

3. DATE DRILLED 2/6/90 USE OF WELL MONITORING

4. TOTAL DEPTH 50' CUTTINGS COLLECTED ☒ Yes ☐ No

5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No

6. STATIC WATER LEVEL: ±12.5 FT. ☐ above ☒ below TOP OF CASING,
TOP OF CASING IS 2.5 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): N/A METHOD OF TEST _____

8. WATER ZONES (depth): SURFICIAL AQUIFER

CHLORINATION: Type N/A Amount _____

10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From	+2.5	To 40 Ft.	2"	SCH 40	PVC
From		To Ft.			
From		To Ft.			

1. GROUT:

	Depth		Material	Method
From	0	To 36 Ft.	NEAT	IN PLACE
From		To Ft.		

SCREEN

	Depth		Diameter	Slot Size	Material
From	40	To 50 Ft.	2 in.	.010 in.	PVC
From		To Ft.	in.	in.	
From		To Ft.	in.	in.	

GRAVEL PACK:

	Depth		Size	Material
From	37	To 50 Ft.	COARSE	SAND
From		To Ft.		

REMARKS _____

Depth From	To	DRILLING LOG Formation Description
		SEE ATTACHED

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

SEE ATTACHED

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Division of Environmental Management and copy to well owner

Revised 11/84

BORING LOG

BORING NUMBER WELL #11 SITE LOCATION CP&L SUTTON DRILLED BY M. SAGE

TOTAL DEPTH 50' WILMINGTON, NORTH CAROLINA LOGGED BY J. CORNETTE

DRILLING DATE 2/6/90

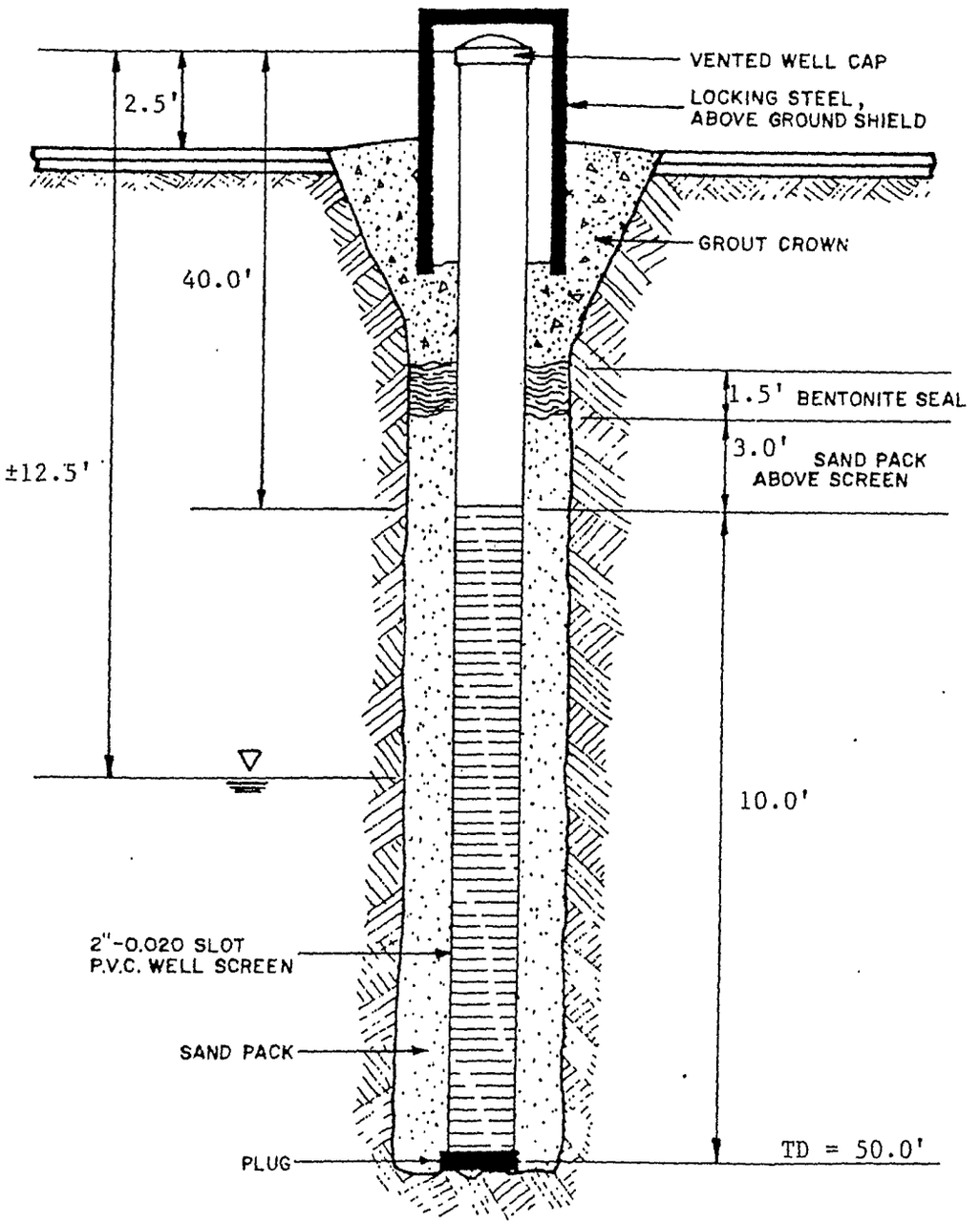
SAMPLE DEPTH (ft.) FROM	TO	SAMPLE DESCRIPTION	P.I.D. SURVEY	BLOW COUNT
5.0	7.0	Medium to fine, well sorted, brown SAND. Low water content.		3,3,2,2
10.0	12.0	Medium to fine, well sorted, subrounded, brown SAND. Moderate water content.		6,5,5,6
15.0	17.0	Fine to medium grained tan SAND. High water content. Well sorted and rounded.		6,12,16,18
20.0	22.0	Medium grained, well sorted, well rounded SAND. Tan. High water content.		8,12,18,26
25.0	27.0	Fine grained, well rounded, well sorted, tan SAND. High water content.		4,16,16,24
30.0	32.0	Medium to coarse grained, subrounded, moderately sorted SAND. High water content.		8,8,8,12
33.5	35.5	Fine grained, well sorted and rounded, light tan, SAND. High water content.		6,8,12,14
38.5	40.5	Medium grained, well rounded and sorted, light grey SAND. High water content.		12,14,16,14
43.5	45.5	Medium grained, well rounded, moderately sorted, slightly silty SAND. Light grey. Center 6" of sample brownish grey sandy, clayey, SILT. High water content.		WD 12,12,16
50.0	52.0	Very poorly sorted silty SAND. SAND is subrounded and ranges from very fine grained to very coarse grained. Brown. High water content.		12,16,17,22

REMARKS

Richard Catlin & Associates, Inc.
CONSULTING ENGINEERS AND HYDROGEOLOGISTS
RC&A

AS BUILT
WELL DETAIL

WELL #11



NOT TO SCALE

Richard Catlin & Associates, Inc.

CONSULTING ENGINEERS AND HYDROGEOLOGISTS

RC&A

...CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH,N.C. 27611, PHONE (919) 733-5083

WELL #12

WELL CONSTRUCTION RECORD

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long _____ Pc ___
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

DRILLING CONTRACTOR RICHARD CATLIN & ASSOCIATES, INC.

DRILLER REGISTRATION NUMBER 1142

STATE WELL CONSTRUCTION * PERMIT NUMBER: 64-0036-WM-0368

1. WELL LOCATION. (Show sketch of the location below)

Nearest Town: WILMINGTON County: NEW HANOVER

801 SUTTON STEAM PLANT ROAD
(Road, Community, or Subdivision and Lot No.)

2. OWNER CAROLINA POWER AND LIGHT

ADDRESS P. O. BOX 327 (Street or Route No.)

NEW HILL, NC 27562
City or Town State Zip Code

3. DATE DRILLED 2/6/90 USE OF WELL MONITORING

4. TOTAL DEPTH 50' CUTTINGS COLLECTED ☒ Yes ☐ No

5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No

6. STATIC WATER LEVEL: ±10.5 FT. ☐ above ☒ below TOP OF CASING,
TOP OF CASING IS 2.5 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): N/A METHOD OF TEST _____

8. WATER ZONES (depth): SURFICIAL AQUIFER

_____

CHLORINATION: Type N/A Amount _____

CASING:

	Depth			Diameter	Wall Thickness or Weight/Ft.	Material
From	±2.5	To	40 Ft.	2"	SCH 40	PVC
From		To	Ft.			
From		To	Ft.			

GROUT:

	Depth			Material	Method
From	0	To	35.5 Ft.	NEAT	IN PLACE
From		To	Ft.		

SCREEN

	Depth			Diameter	Slot Size		Material
From	40	To	50 Ft.	2	in. .010	in.	PVC
From		To	Ft.		in.	in.	
From		To	Ft.		in.	in.	

GRAVEL PACK:

	Depth			Size	Material
From	37	To	50 Ft.	COARSE	SAND
From		To	Ft.		

REMARKS _____

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Division of Environmental Management and copy to well owner

Revised 11/84

Depth From	Depth To	DRILLING LOG Formation Description
		SEE ATTACHED

If additional space is needed use back of form.

LOCATION SKETCH

(Show direction and distance from at least two State Roads, or other map reference points)

SEE ATTACHED

BORING LOG

BORING NUMBER WELL #12 SITE LOCATION CP&L SUTTON DRILLED BY M. SAGE

TOTAL DEPTH 50' WILMINGTON, NORTH CAROLINA LOGGED BY J. CORNETTE

DRILLING DATE 2/6/90

SAMPLE DEPTH (ft.) FROM	TO	SAMPLE DESCRIPTION	P.I.D. SURVEY	BLOW COUNT
5.0	7.0	Moderately sorted, subrounded, slightly silty medium grained SAND. Moist. Light tan. No odor.	-	3,4,4,4
10.0	12.0	Moderately sorted, subrounded, medium grained SAND. Light grey. High water content.		6,8,10,12
15.0	17.0	Upper one-half of spoon moderately sorted, medium grained, subrounded SAND. Clayey lense separates finer grained, subrounded, moderately sorted, SAND. High water content.		4,10,14,8
20.0	22.0	Medium to fine grained subrounded SAND. 6" from top, 3" zone of coarse grained, subrounded, moderately sorted SAND. High water content. Light tan to light grey.		8,12,18,20
25.0	27.0	Medium to coarse grained SAND. Subrounded, poorly sorted. High water content. Iron staining in upper 3" of sample. Light tan.		4,4,8,12
30.0	32.0	Medium grained, moderately sorted SAND. Tends to fine downward. High water content. Light tan to to light grey.		8,4,4,6
35.0	37.0	Fine to medium grained, well rounded SAND! Tan. High water content.		6,12,18,20
40.0	42.0	Coarse to very coarse, subrounded, moderately sorted SAND. High water content. Tan		2,2,1,2
45.0	47.0	Coarse, subrounded, moderately sorted SAND. Tends to fine downward. Tan. High water content. Bottom 1" of sample clayey SAND with trace of gravel. Some orange staining.		2,2,WH

REMARKS

Richard Catlin & Associates, Inc.
CONSULTING ENGINEERS AND HYDROGEOLOGISTS
RC&A

BORING LOG

BORING NUMBER WELL #12 SITE LOCATION CP&L SUTTON DRILLED BY M. SAGE

TOTAL DEPTH 50' WILMINGTON, NORTH CAROLINA LOGGED BY J. CORNETTE

DRILLING DATE 2/6/90

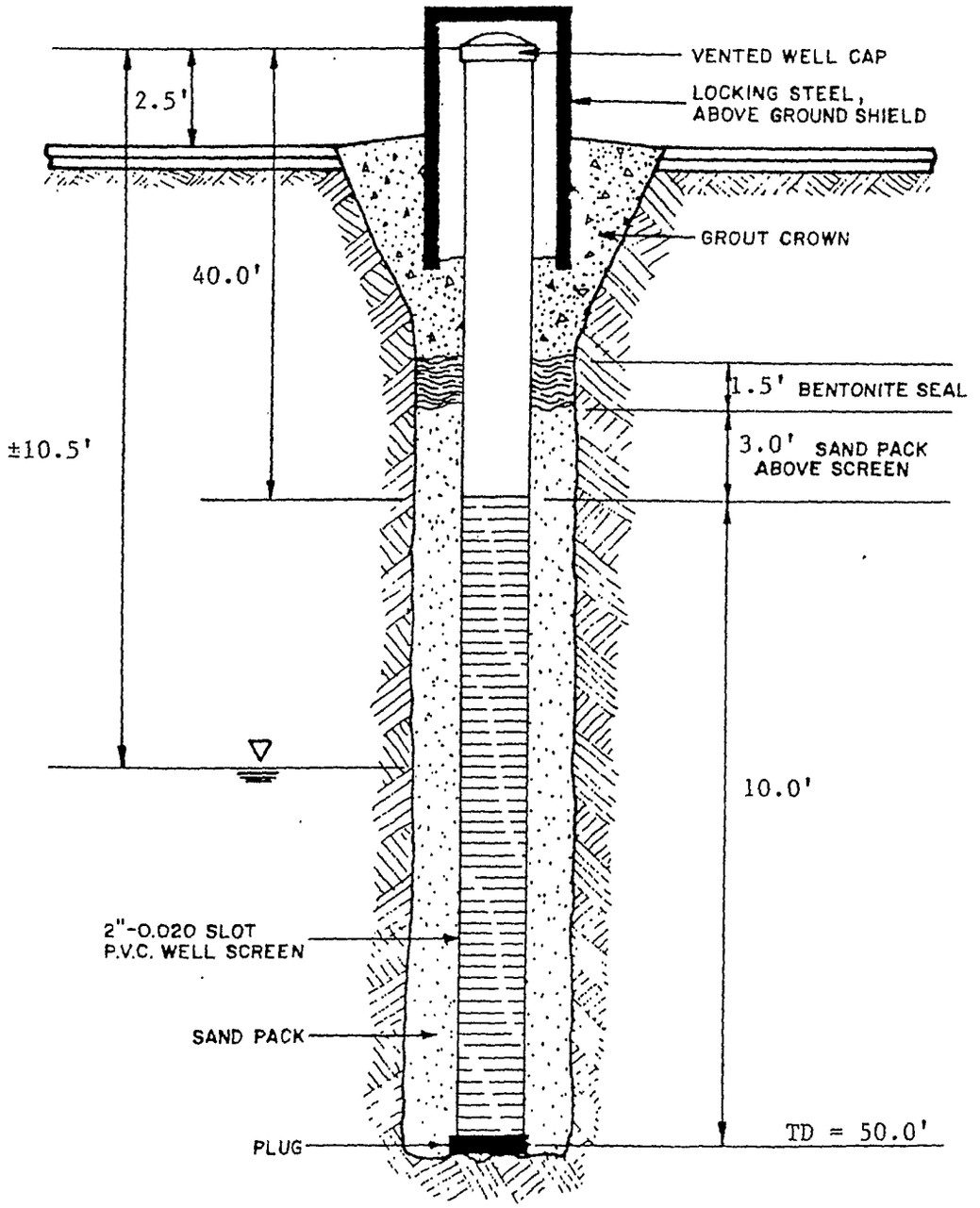
SAMPLE DEPTH(ft.) FROM	TO	SAMPLE DESCRIPTION	P.I.D. SURVEY	BLOW COUNT
50.0	52.0	Top 10" of sample represented by a very coarse subrounded, poorly sorted, gravelly, tan SAND. Sample fines downward to a medium to fine grained, moderately sorted, subrounded, clayey, grey, SAND. High water content throughout entire sample.		3,6,7,9

REMARKS

Richard Catlin & Associates, Inc.
CONSULTING ENGINEERS AND HYDROGEOLOGISTS
RC&A

AS BUILT
WELL DETAIL

WELL #12



NOT TO SCALE

Richard Catlin & Associates, Inc.

CONSULTING ENGINEERS AND HYDROGEOLOGISTS

RC&A

WELL CONSTRUCTION RECORD

North Carolina – Department of Environmental and Natural Resources – Division of Water Quality – Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) MIKE MCCONAHEY CERTIFICATION # 2402

WELL CONTRACTOR COMPANY NAME GEOLOGIC EXPLORATION, INC. PHONE # (704) 872-7686

STATE WELL CONSTRUCTION PERMIT# (if applicable) _____ ASSOCIATED WQ PERMIT# (if applicable) _____

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, list Use _____

2. WELL LOCATION:
Nearest Town: WILMINGTON County NEW HANOVER
HWY 421/801 SUTTON STEAM PLANT ROAD
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐ Ridge ☐ Slope ☐ Valley ☒ Flat
(check appropriate box)
Latitude/longitude of well location
_____
(degrees/minutes/seconds)
Latitude/longitude source: ☐ GPS ☐ Topographic map
(check box)

3. OWNER: PROGRESS ENERGY CAROLINAS, INC.
Address 801 SUTTON STEAM PLANT ROAD
(Street or Route No.)
WILMINGTON NC 28401
City or Town State Zip Code
( )
Area Code – Phone Number

4. DATE DRILLED 05/25/04
5. TOTAL DEPTH: 13.0 FEET
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 2.0 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): N/A METHOD OF TEST N/A
10. WATER ZONES (depth): N/A
11. DISINFECTION: Type N/A Amount _____
12. CASING:

	Depth			Diameter	Wall Thickness or Weight/Ft.	Material
From	0.0	To 3.0	Ft	2 INCH	SCH 40	PVC
From		To	Ft.			
From		To	Ft.			

13. Grout:

	Depth			Material	Method
From	0.0	To 1.0	Ft.	Portland Bentonite	Slurry
From		To	Ft.		

14. SCREEN:

	Depth			Diameter	Slot Size	Material
From	3.0	To 13.0	Ft.	2.0 in.	.010 in	PVC
From		To	Ft.	in.	in	

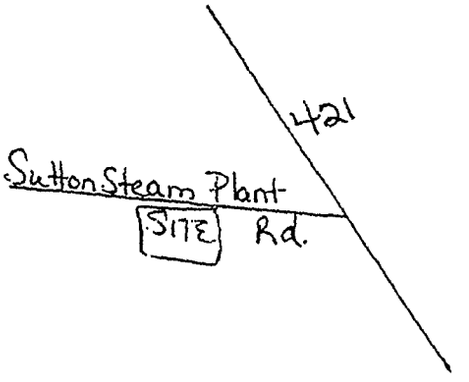
15. SAND/GRAVEL PACK:

	Depth			Size	Material
From	2.0	To 13.0	Ft.	20-40	FINE SILICA SAND
From		To	Ft.		

DRILLING LOG

DEPTH From	To	Formation Description
0.0	1.0	WEEDS/TOPSOIL
1.0	5.0	BROWN/BLACK SILTY SAND
5.0	13.0	WHITE/TAN SILTY SAND

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads, inculed the road numbers and common road names.



16. REMARKS: MW-13 BENTONITE SEAL FROM 1.0 TO 2.0 FEET

I DO HEARBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

Mike McConahey 5/31/04
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center – Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

Drilling Company: Geologic Exploration
Driller's Name: Mike McConahey
Drilling Method: HSA
Bit Size: NA
Auger Size: 4.25-inch I.D.
Rig Type: B-61 Mobile Rig
Sampling Method: 24-inch splitspoon

Northing: 197948.14
Easting: 2305008.16
Casing Elevation: 18.21 ft

Borehole Depth: 13 ft bls
Surface Elevation: 15.09 ft

Logged by: Daniel C.H. Peterman

Well/Boring ID: MW-13 (FADA)

Client: Progress Energy Carolinas Inc.

Location: Progress Energy L.V. Sutton Steam Electric Plant
Wilmington, NC

DEPTH	ELEVATION	Samp. Interval (ft bgs)	Recovery (inches)	Blows / 6 Inches	N - Value	PID Headspace (ppm)	Iron Staining	Geologic Column	Stratigraphic Description
0	15								Topsoil, trace coarse gravel, low organic content, dry to slightly damp, no odors.
						0.0			SAND and ASH, dark grey, silt to fine grained, very loose, slightly damp to damp, no odor.
						0.0			
			19	2 2 1 3	3	0.0			SAND and ASH, dark grey, silt to fine grained, very loose, slightly damp to damp, no odor.
5	10								clayey SAND (SC), dark grey, fine grained, low plasticity, very soft, wet, no odor.
			24	3 1 4 5	5	0.0			clayey SAND (SC), dark grey, fine grained, low plasticity, medium soft, wet, no odor.
10	5								SAND (SM), grey, mottled tan, fine grained, loose, wet, no odor.
			19	5 4 5 4	9	0.0			SAND (SM), dark brown, fine grained, loose, saturated, organic sulphur odor.
									Boring terminated at 13.0 ft bls

Well/Boring Construction

- protective above ground steel casing (+3.0'-0.0')
- Cement pad (2'x2')
- Bentonite grout (1.0'-0.0')
- Bentonite chips (2.0'-1.0')
- 2-inch SCH 40 PVC riser (3.0' - +3.0')
- 8.25-inch nominal borehole (13.0'-0.0')
- Well Gravel Pack No. 2 (13.0' - 2.0')
- 2-inch 0.010 slot PVC screen (13.0' - 3.0')

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Remarks:
HSA: Hollow Stem Auger
NA: Not Applicable
ft bls: feet below land surface
Air Monitoring Equipment: PID, V-RAE, and PDR-1000
PID: Photolonization Detector
V-RAE: Multi-Gas meter
PDR-1000: Particulate meter

Water Level Data

Date	Depth	Elev.
6/22/04	8.96	9.25

Depth measured from top of casing

WELL CONSTRUCTION RECORD

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) ARNOLD CHAPEL CERTIFICATION # 2487

WELL CONTRACTOR COMPANY NAME PARRATT-WOLFF, INC. PHONE # (919) 644-2814

STATE WELL CONSTRUCTION PERMIT# (if applicable) _____ ASSOCIATED WQ PERMIT# (if applicable) _____

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐ Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use _____

2. WELL LOCATION:
Nearest Town: WILMINGTON County NEW HANOVER
801 SUTTON STEAM PLANT ROAD
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐Ridge ☐Slope ☐Valley ☐Flat
(check appropriate box)
Latitude/longitude of well location
N34 16.99'/W77 58.98'
(degrees/minutes/seconds)
Latitude/longitude source: ☐GPS ☒Topographic map
(check box)

3. OWNER: PROGRESS ENERGY
Address 801 SUTTON STEAM PLANT ROAD
(Street or Route No.)
WILMINGTON NC 28401
City or Town State Zip Code
( )-
Area code- Phone number

4. DATE DRILLED 1/27-1/28/05
5. TOTAL DEPTH: 43.0'
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 5.0 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): N/A METHOD OF TEST N/A
10. WATER ZONES (depth): N/A

DEPTH From	DEPTH To	DRILLING LOG Formation Description
0	14.0'	Black/brown, moist, medium dense, fine/coarse SAND; trace fine/coarse gravel

11. DISINFECTION: Type N/A Amount N/A
12. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 33.5	Ft.	2"	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

13. GROUT:

	Depth		Material	Method
From 0	To 27	Ft.	PORTLAND	TREMIE
From 27	To 30	Ft.	BENTONITE	TREMIE

14. SCREEN:

	Depth		Diameter		Slot Size		Material
From 33.5	To 38.5	Ft.	2	in.	.010	in.	PVC
From	To	Ft.		in.		in.	

15. SAND/GRAVEL PACK:

	Depth		Size	Material
From 30	To 43	Ft.	#1	SAND
From	To	Ft.		

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.

16. REMARKS: MW-13D SEE MAP ON BACK

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

Arnold L. Chapel 2/18/05

SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

Drilling Company: Parratt Wolffe
Driller's Name: Arnold Chapel
Drilling Method: Mud Rotary
Bit Size: 5.87-inch roller-bit
Auger Size:
Rig Type: B-61 Mobile Rig
`ampling Method: 24-inch splitspoon

Northing: 197965.38
Easting: 2305017.45
Casing Elevation: 18.16

Borehole Depth: 42 ft bgs
Surface Elevation: 15.53

Logged by: Brian Lovgren

Well/Boring ID: MW-13D (FADA)

Client: Progress Energy Carolinas Inc.

Location: Progress Energy L.V. Sutton Steam Electric Plant
Wilmington, NC

DEPTH	ELEVATION	Samp. Interval (ft bgs)	Recovery (inches)	Blows / 6 Inches	N - Value	PID (ppm)	Geologic Column	Stratigraphic Description
0	15							Topsoil, trace coarse gravel, low organic content, dry to slightly damp, no odors.
								SAND and ASH, dark grey, silt to fine grained, very loose, slightly damp to damp, no odor.
5	10		0.8'	2 2 1 3	3	0.0		SAND and ASH, dark grey, silt to fine grained, very loose, slightly damp to damp, no odor.
								clayey SAND (SC), dark grey, fine grained, low plasticity, very soft, wet, no odor.
10	5		2.0'	3 1 4 5 5	5	0.0		clayey SAND (SC), dark grey, fine grained, low plasticity, medium soft, wet, no odor.
			0.8'	5 4 5 4	9	0.0		SAND (SM), grey, mottled tan, fine grained, loose, wet, no odor.
								SAND (SM), dark brown, fine grained, loose, saturated, organic sulphur odor.
15	0		1.0'	2 3 3 7	6	0.0		SAND (SM), brown to dark brown, fine to medium grained, loose, wet, no odor.
20	-5		1.0'	6 7 7 9	14	0.0		SAND (SM), tan, fine to medium grained, medium dense, wet, no odor.

Well/Boring Construction

- protective above ground steel casing (+2.63'-0.0')
- Cement pad (2'x2')
- 2-inch SCH 40 PVC riser (33.0' - +2.6')
- Bentonite grout (27.0 - 0.0')
- 6-inch nominal borehole (42.0'-0.0')

BBL®
BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

Remarks:
NA: Not Applicable
ft bgs: feet below ground surface
PID: Photoionization Detector

Water Level Data

Date	Depth	Elev.
2/4/05	7.81	10.35

Depth measured from top of casing*

Client:
Progress Energy Carolinas Inc.

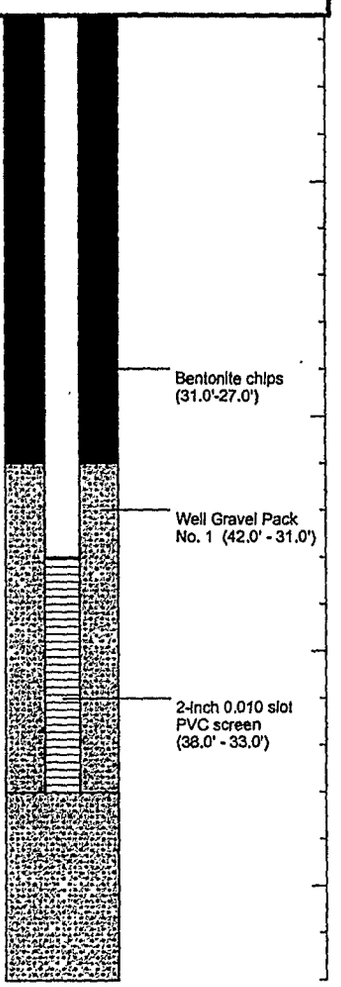
Site Location:
Progress Energy
L.V. Sutton Steam
Electric Plant

Well/Boring ID: MW-13D (FADA)

Borehole Depth: 42 ft bgs

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blows / 6 inches	N - Value	PID Headspace (ppm)	Iron Staining	Geologic Column	Stratigraphic Description
25 / -10			1.0'	4 11 20 20	31	0.0			SAND (SM), tan, fine to medium grained, dense, wet, no odor.
30 / -15			1.0'	8 10 12 13	22	0.0			SAND (SM), tan, fine to medium grained, medium dense, wet, no odor.
35 / -20			1.0'	9 6 4 6	10	0.0			SAND (SM), tan to light gray, fine to medium grained, medium dense, wet, no odor.
			2.0'	3 2 4 4	6	0.0			clayey SAND (SC), brown, mottled orange, low plasticity, medium dense, wet, no odor.
40 / -25									clayey SAND (SC), gray, low plasticity, medium dense, wet, no odor.
									CLAY (CL) observed on roller bit upon completion of drilling activities.

Well/Boring Construction



BBL®
BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

Remarks:
NA: Not Applicable
ft bgs: feet below ground surface
PID: Photoionization Detector

Water Level Data

Date	Depth	Elev.
2/4/05	7.81	10.35

Depth measured from top of casing*

WELL CONSTRUCTION RECORD

North Carolina – Department of Environmental and Natural Resources – Division of Water Quality – Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) MIKE MCCONAHEY CERTIFICATION # 2402

WELL CONTRACTOR COMPANY NAME GEOLOGIC EXPLORATION, INC. PHONE # (704) 872-7686

STATE WELL CONSTRUCTION PERMIT# (if applicable) _____ ASSOCIATED WQ PERMIT# (if applicable) _____

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, list Use _____

2. WELL LOCATION:
Nearest Town: WILMINGTON County NEW HANOVER
HWY 421/801 SUTTON STEAM PLANT ROAD
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐ Ridge ☐ Slope ☐ Valley ☒ Flat
(check appropriate box)
Latitude/longitude of well location
_____
(degrees/minutes/seconds)
Latitude/longitude source: ☐ GPS ☐ Topographic map
(check box)

3. OWNER: PROGRESS ENERGY CAROLINAS, INC.
Address 801 SUTTON STEAM PLANT ROAD
(Street or Route No.)
WILMINGTON NC 28401
City or Town State Zip Code
( )
Area Code – Phone Number

4. DATE DRILLED 05/25/04
5. TOTAL DEPTH: 11.0 FEET
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 2.0 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): N/A METHOD OF TEST N/A
10. WATER ZONES (depth): N/A

DEPTH From	DEPTH To	DRILLING LOG Formation Description
0.0	1.0	GRASS/TOPSOIL
1.0	5.0	GREY/BLACK SILTY SAND
5.0	11.0	GREY/TAN SILTY SAND

11. DISINFECTION: Type N/A Amount _____
12. CASING:

	Depth			Diameter	Wall Thickness or Weight/Ft.	Material
From	0.0	To 1.0	Ft	2 INCH	SCH 40	PVC
From		To	Ft.			
From		To	Ft.			

13. Grout:

	Depth			Material	Method
From		To	Ft.	Portland Bentonite	Slurry
From		To	Ft.		

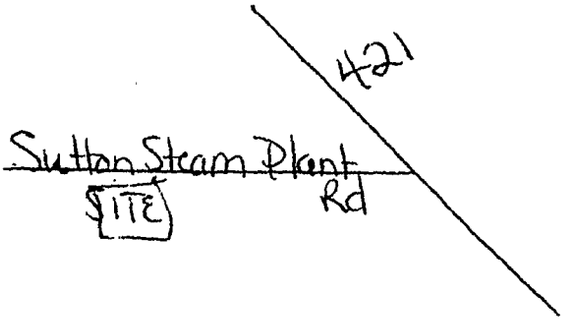
14. SCREEN:

	Depth			Diameter	Slot Size	Material
From	1.0	To 11.0	Ft.	2.0 in.	.010 in	PVC
From		To	Ft.	in.	in	

15. SAND/GRAVEL PACK:

	Depth			Size	Material
From	0.5	To 11.0	Ft.	20-40	FINE SILICA SAND
From		To	Ft.		

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads, inculed the road numbers and common road names.



16. REMARKS: MW-14 BENTONITE SEAL FROM 0.0 TO 0.5 FEET

I DO HEARBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

Mike McConahey 5/31/04
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center – Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

Drilling Company: Geologic Exploration
Driller's Name: Mike McConahey
Drilling Method: HSA
Bit Size: NA
Auger Size: 4.25-inch I.D.
Rig Type: B-61 Mobile Rig
Sampling Method: 24-inch splitspoon

Northing: 19725217
Easting: 230617843
Casing Elevation: 14.15 ft

Borehole Depth: 11.0 ft bls
Surface Elevation: 10.96 ft

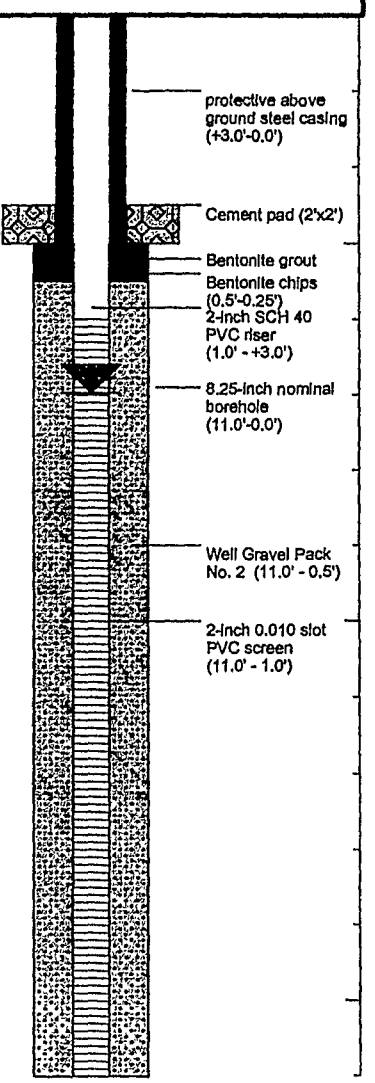
Logged by: Daniel C.H. Peterman

Well/Boring ID: MW-14 (FADA)

Client: Progress Energy Carolinas Inc.

Location: Progress Energy L.V. Sutton Steam Electric Plant
Wilmington, NC

DEPTH	ELEVATION	Samp. Interval (ft bgs)	Recovery (inches)	Blows / 6 inches	N - Value	PID Headspace (ppm)	Iron Staining	Geologic Column	Stratigraphic Description
0	10					0.0			Topsoil, high organic content, damp, no odor.
									SAND (SM), gray, mottled white, fine grained, loose, damp, no odor.
						0.0			SAND (SM), gray, mottled white, fine grained, loose, wet, no odor.
5	5		21	4 5 4 4	9	0.0			SAND (SM), light gray, mottled white, fine to medium grained, loose, wet, no odor.
									SAND (SM), light gray, mottled white, fine to medium grained, loose, wet, no odor.
10	0		24	5 4 6 4	10	0.0			SAND (SM), dark brown, fine to medium grained, medium dense, saturated, no odor. Boring terminated at 11.0 ft bls



BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Remarks:
HSA: Hollow Stem Auger
NA: Not Applicable
ft bls: feet below land surface
Air Monitoring Equipment: PID, V-RAE, and PDR-1000
PID: Photolonization Detector
V-RAE: Multi-Gas meter
PDR-1000: Particulate meter

Water Level Data

Date	Depth	Elev.
6/22/04	5.16 ft	8.99

Depth measured from top of casing

WELL CONSTRUCTION RECORD

North Carolina – Department of Environmental and Natural Resources – Division of Water Quality – Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) MIKE MCCONAHEY CERTIFICATION # 2402

WELL CONTRACTOR COMPANY NAME GEOLOGIC EXPLORATION, INC. PHONE # (704) 872-7686

STATE WELL CONSTRUCTION PERMIT# (if applicable) _____ ASSOCIATED WQ PERMIT# (if applicable) _____

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, list Use _____

2. WELL LOCATION:
Nearest Town: WILMINGTON County NEW HANOVER
HWY 421/801 SUTTON STEAM PLANT ROAD
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐ Ridge ☐ Slope ☐ Valley ☒ Flat
(check appropriate box)
Latitude/longitude of well location
_____
(degrees/minutes/seconds)
Latitude/longitude source: ☐ GPS ☐ Topographic map
(check box)

3. OWNER: PROGRESS ENERGY CAROLINAS, INC.
Address 801 SUTTON STEAM PLANT ROAD
(Street or Route No.)
WILMINGTON NC 28401
City or Town State Zip Code
( )
Area Code – Phone Number

4. DATE DRILLED 05/25/04
5. TOTAL DEPTH: 11.0 FEET
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 2.0 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): N/A METHOD OF TEST N/A
10. WATER ZONES (depth): N/A
11. DISINFECTION: Type N/A Amount _____

DEPTH / DRILLING LOG

From	To	Formation Description
0.0	1.0	GRASS/TOPSOIL
1.0	5.0	GREY/BLACK SILTY SAND
5.0	11.0	GREY/TAN SILTY SAND

12. CASING:

	Depth From	To	Ft	Diameter	Wall Thickness or Weight/Ft.	Material
	0.0	1.0	Ft	2 INCH	SCH 40	PVC
			Ft.			
			Ft.			

13. Grout:

	Depth From	To	Ft.	Material	Method
			Ft.	Portland Bentonite	Slurry
			Ft.		

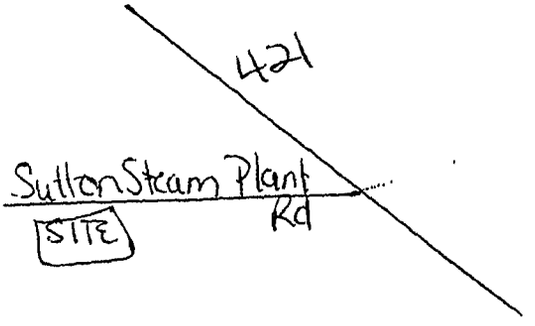
14. SCREEN:

	Depth From	To	Ft.	Diameter	Slot Size	Material
	1.0	11.0	Ft.	2.0 in.	.010 in	PVC
			Ft.	in.	in	

15. SAND/GRAVEL PACK:

	Depth From	To	Ft.	Size	Material
	0.5	11.0	Ft.	20-40	FINE SILICA SAND
			Ft.		

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads, inculed the road numbers and common road names.



16. REMARKS: MW-15 BENTONITE SEAL FROM 0.0 TO 0.5 FEET

I DO HEARBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

Mike McConahey 5/31/04
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center – Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

Date Started/Finish: 5/25/04
Drilling Company: Geologic Exploration
Driller's Name: Mike McConahey
Drilling Method: HSA
Bit Size: NA
Auger Size: 4.25 I.D.
Rig Type: B-61 Mobile Rig
Sampling Method: 24-inch splitspoon

Northing: 19647565
Easting: 230604401
Casing Elevation: 11.47 ft

Borehole Depth: 11.0 ft bls
Surface Elevation: 8.53 ft

Logged by: Daniel C.H. Peterman

Well/Boring ID: MW-15 (FADA)

Client: Progress Energy Carolinas Inc.

Location: Progress Energy L.V. Sutton Steam Electric Plant
Wilmington, NC

DEPTH	ELEVATION	Samp. Interval (ft bgs)	Recovery (inches)	Blows / 6 Inches	N - Value	PID Headspace (ppm)	Iron Staining	Geologic Column	Stratigraphic Description
	10								
0	0								Topsoil, high organic content, slightly damp to damp, no odor.
						0.0			SAND (SM), gray, fine to medium grained, loose, moist to wet, no odor.
						0.0			SAND (SM), gray, fine to medium grained, loose, saturated, no odor.
5	5		24	5 2 4 5	6	0.0			SAND (SM), light gray, mottled white, fine to medium grained, loose, saturated, no odor.
									SAND (SM), dark brown, fine grained, loose, saturated, no odor.
10	0		24	4 3 4 5	7	0.0			
									SAND (SM), tan, fine grained, loose, saturated, no odor.
									Boring terminated at 12.0 ft bls

Well/Boring Construction

- protective above ground steel casing (3.0'-0.0')
- Cement pad (2'x2')
- Bentonite grout
- Bentonite chips (0.5'-0.25')
- 2-inch SCH 40 PVC riser (1.0' - +3.0')
- 8.25-inch nominal borehole (11.0'-0.0')
- Well Gravel Pack No. 2 (11.0' - 0.5')
- 2-inch 0.010 slot PVC screen (11.0' - 1.0')

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Remarks:
HSA: Hollow Stem Auger
NA: Not Applicable
ft bls: feet below land surface
Air Monitoring Equipment: PID, V-RAE, and PDR-1000
PID: Photoionization Detector
V-RAE: Multi-Gas meter
PDR-1000: Particulate meter

Water Level Data

Date	Depth	Elev.
6/22/04	2.94	8.53

Depth measured from top of casing

WELL CONSTRUCTION RECORD

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) ARNOLD CHAPEL CERTIFICATION # 2487

WELL CONTRACTOR COMPANY NAME PARRATT-WOLFF, INC. PHONE # (919) 644-2814

STATE WELL CONSTRUCTION PERMIT# (if applicable) ASSOCIATED WQ PERMIT# (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
   Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use

2. WELL LOCATION:
   Nearest Town: WILMINGTON County NEW HANOVER
   801 SUTTON STEAM PLANT ROAD
   (Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

   Topographic/Land setting
   ☐Ridge ☐Slope ☐Valley ☐Flat
   (check appropriate box)
   Latitude/longitude of well location
   N34 16.99'/W77 58.98'
   (degrees/minutes/seconds)
   Latitude/longitude source: ☐GPS ☒Topographic map
   (check box)

3. OWNER: PROGRESS ENERGY
   Address 801 SUTTON STEAM PLANT ROAD
   (Street or Route No.)
   WILMINGTON NC 28401
   City or Town State Zip Code
   (___)-
   Area code- Phone number

4. DATE DRILLED 1/31/05
5. TOTAL DEPTH: 47.5'
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 2.0 FT.
   (Use "+" if Above Top of Casing)
8. TOP OF CASING IS 0 FT. Above Land Surface*
   ***Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.**
9. YIELD (gpm): N/A METHOD OF TEST N/A
10. WATER ZONES (depth): N/A

DEPTH From	DEPTH To	DRILLING LOG Formation Description
0	13.0'	White/brown/gray, wet, very loose/dense, fine/coarse SAND; trace silt
13.0	47.5	Green/gray, moist, hard SILT and fine SAND; trace clay

11. DISINFECTION: Type N/A Amount N/A
12. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 40	Ft.	2"	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

13. GROUT:

	Depth		Material	Method
From 0	To 35.5	Ft.	PORTLAND	TREMIE
From 35.5	To 37.5	Ft.	BENTONITE	TREMIE

14. SCREEN:

	Depth		Diameter		Slot Size		Material
From 40	To 45	Ft.	2	in.	.010	in.	PVC
From	To	Ft.		in.		in.	

15. SAND/GRAVEL PACK:

	Depth		Size	Material
From 37.5	To 47.5	Ft.	#1	SAND
From	To	Ft.		

LOCATION SKETCH

Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.

16. REMARKS: MW-15D SEE MAP ON BACK

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

Arnold Chapel 2/18/05

SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

Drilling Company: Parratt Wolffe
Driller's Name: Arnold Chapel
Drilling Method: Mud Rotary
Bit Size: 5.87-inch roller-bit
Auger Size:
Rig Type: B-61 Mobile Rig
Sampling Method: 24-inch splitspoon

Northing: 196476.98
Easting: 2306061.06
Casing Elevation: 11.21

Borehole Depth: 48 ft bgs
Surface Elevation: 8.61

Logged by: Brian Lovgren

Well/Boring ID: MW-15D (FADA)

Client: Progress Energy Carolinas Inc.

Location: Progress Energy L.V. Sutton Steam Electric Plant
Wilmington, NC

DEPTH ELEVATION	Samp. Interval (ft bgs)	Recovery (inches)	Blows / 6 Inches	N - Value	PID (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
10								protective above ground steel casing (+2.6'-0.0')
0								Cement pad (2'x2')
							Topsoil, high organic content, slightly damp to damp, no odor.	
							SAND (SM), gray, fine to medium grained, loose, moist to wet, no odor.	2-inch SCH 40 PVC riser (40.0' - +2.5')
5							SAND (SM), gray, fine to medium grained, loose, wet, no odor.	
		2.0'	5 2 4 5	6	0.0		SAND (SM), light gray, mottled white, fine to medium grained, loose, wet, no odor.	Bentonite grout (35.5' - 0.0')
-5							SAND (SM), dark brown, fine grained, loose, wet, no odor.	
0								
		2.0'	4 3 4 5	7	0.0			6-inch nominal borehole (45.0'-0.0')
10							SAND (SM), tan, fine grained, loose, wet, no odor.	
		1.0'	2 1 1 2	2	0.0		SAND (SM), tan, fine to medium grained, very loose, wet, no odor.	
-5								
15								
		1.2'	9 12 13 13	25	0.0		SAND (SM), tan, fine to medium grained, medium dense, wet, no odor.	
-10								
20								2-inch SCH 40 PVC riser (40.0' - +2.5')
		0.8'	4 3 3 3	6	0.0		SAND (SM), tan, fine to coarse grained, loose, wet, no odor.	
-15								

BBL®
BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

Remarks:
NA: Not Applicable
ft bgs: feet below ground surface
PID: Photolonization Detector
NR: No Recovery

Water Level Data

Date	Depth	Elev.
2/4/05	3.13	8.08

Depth measured from top of casing*

Client:
Progress Energy Carolinas Inc.

Site Location:
Progress Energy
L.V. Sutton Steam
Electric Plant

Well/Boring ID: MW-15D (FADA)

Borehole Depth: 48 ft bgs

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blows / 6 inches	N - Value	PID Headspace (ppm)	Iron Staining	Geologic Column	Stratigraphic Description
25									
-20			0.8'	3 3 3 4	6	0.0			
30									
-25			1.0'	5 8 11 13	19	0.0			SAND (SM), tan, fine to coarse grained, medium dense, wet, no odor.
35									
-30			1.0'	10 11 14 15	15	0.0			SAND (SM). brown, mottled orange, fine to coarse grained, medium dense, wet, no odor.
40									SAND (SM). brown, fine to coarse grained, medium dense, wet, no odor.
-35			1.2'	3 2 4 3	6	0.0			SAND (SM). brown, mottled orange, fine to coarse grained, loose, wet, no odor.
45									SAND (SM). dark gray, silt to fine fine grained, very dense, wet, no odor.
			1.2'	24 45 34 NR	79	0.0			

Well/Boring Construction

- Bentonite grout (35.5' - 0.0')
- 6-inch nominal borehole (45.0'-0.0')
- Bentonite chips (38.0'-35.5')
- Well Gravel Pack No. 2 (45.0' - 38.0')
- 2-inch 0.010 slot PVC screen (45.0' - 40.0')
- 1.5-inch nominal borehole (48.0'-45.0')
- Natural Collapse

BBL®
BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

Remarks:
NA: Not Applicable
ft bgs: feet below ground surface
PID: Photolonization Detector
NR: No Recovery

Water Level Data

Date	Depth	Elev.
2/4/05	3.13	8.08

Depth measured from top of casing*

Project: 04015
Data File:MW-15D

Template:boring_wellWL2005.ldf
Date: 3/16/05

WELL CONSTRUCTION RECORD

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Rich Lemire CERTIFICATION # 2593

WELL CONTRACTOR COMPANY NAME SAEDACCO PHONE # (803) 548-2180

STATE WELL CONSTRUCTION PERMIT# (if applicable) ASSOCIATED WQ PERMIT# (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐ Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use

2. WELL LOCATION:
Nearest Town: Wilmington County Brunswick
801 Sutton Electric Steam Plant Road
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐Ridge ☐Slope ☐Valley ☒Flat
(check appropriate box)
Latitude/longitude of well location
(degrees/minutes/seconds)
Latitude/longitude source: ☐GPS ☐Topographic map
(check box)

3. OWNER: Sutton Steam Plant
Address 801 Sutton Electric Steam Plant
(Street or Route No.)
Wilmington NC
City or Town State Zip Code
(___)-
Area code- Phone number

4. DATE DRILLED 6-7-2004
5. TOTAL DEPTH: 12
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 7.6' FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS ~3' FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): METHOD OF TEST
10. WATER ZONES (depth):
11. DISINFECTION: Type Amount

DEPTH From	To	DRILLING LOG Formation Description
0	12	Tan Sand

12. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 2	Ft.	2"	Sch 40	PVC
From	To	Ft.			
From	To	Ft.			

13. GROUT:

	Depth		Material	Method
From 0.5	To 0	Ft.	Portland Cement	Poured
From	To	Ft.		

14. SCREEN:

	Depth		Diameter		Slot Size		Material
From 2	To 12	Ft.	2"	in.	.010	in.	PVC
From	To	Ft.		in.		in.	

15. SAND/GRAVEL PACK:

	Depth		Size	Material
From 1.0	To 12	Ft.	#2	Sand
From	To	Ft.		

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.

16. REMARKS: Bentonite Seal fro 1.0' to 0.5' MW-16

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Rich LeMire 6-7-04
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

Drilling Company: SAEDACCO
Driller's Name: Rich Lemire
Drilling Method: HSA
Bit Size: NA
Auger Size: 4.25-inch I.D.
Rig Type: B-61 Mobile Rig
Sampling Method: 24-inch splitspoon

Northing: 1969793
Easting: 230675316
Casing Elevation: 16.91 ft

Borehole Depth: 12.0 ft bls
Surface Elevation: 14.11 ft

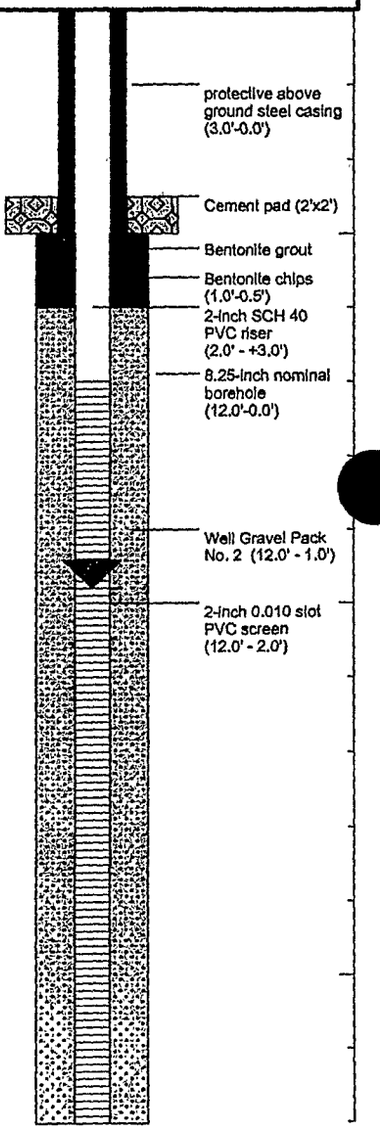
Logged by: Daniel C.H. Peterman

Well/Boring ID: MW-16 (FADA)

Client: Progress Energy Carolinas Inc.

Location: Progress Energy L.V. Sutton Steam Electric Plant
Wilmington, NC

DEPTH / ELEVATION	Samp. Interval (ft bgs)	Recovery (inches)	Blows / 6 Inches	N - Value	PID Headspace (ppm)	Iron Staining	Geologic Column	Stratigraphic Description
0					2.9			SAND (SM), brown, fine grained, very loose, trace organics, dry, no odor.
					0.0			SAND (SM), white, mottled tan, fine, very loose, dry, no odor.
5		24	1 2 2 1	4	0.0			SAND (SM), white, mottled tan, fine, very loose, wet to saturated, no odor.
10		24	1 6 6 7	12	0.0			SAND (SM), light gray, mottled white, fine to medium grained, medium dense, saturated, no odor.
15								Boring terminated at 12.0 ft bls



BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Remarks:
HSA: Hollow Stem Auger
NA: Not Applicable
ft bls: feet below land surface
Air Monitoring Equipment: PID, V-RAE, and PDR-1000
PID: Photolonization Detector
V-RAE: Multi-Gas meter
PDR-1000: Particulate meter

Water Level Data

Date	Depth	Elev.
06/22/04	7.60	9.31 ft

Depth measured from top of casing

WELL CONSTRUCTION RECORD

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) ARNOLD CHAPEL CERTIFICATION # 2487

WELL CONTRACTOR COMPANY NAME PARRATT-WOLFF, INC. PHONE # (919) 644-2814

STATE WELL CONSTRUCTION PERMIT# (if applicable) ASSOCIATED WQ PERMIT# (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
   Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use

2. WELL LOCATION:
   Nearest Town: WILMINGTON County NEW HANOVER
   801 SUTTON STEAM PLANT ROAD
   (Street Name, Numbers, Community, Subdivision, Lot No:, Zip Code)

3. OWNER: PROGRESS ENERGY
   Address 801 SUTTON STEAM PLANT ROAD
   (Street or Route No.)
   WILMINGTON NC 28401
   City or Town State Zip Code
   (___)-_____
   Area code- Phone number

4. DATE DRILLED 1/26-1/27/05
5. TOTAL DEPTH: 50.5'
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 4.5 FT.
   (Use "+" if Above Top of Casing)
8. TOP OF CASING IS 0 FT. Above Land Surface*
   ***Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.**
9. YIELD (gpm): N/A METHOD OF TEST N/A
10. WATER ZONES (depth): N/A
11. DISINFECTION: Type N/A Amount N/A
12. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 42	Ft.	2"	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

13. GROUT:

	Depth		Material	Method
From 0	To 36	Ft.	PORTLAND	TREMIE
From 36	To 40	Ft.	BENTONITE	TREMIE

14. SCREEN:

	Depth		Diameter		Slot Size		Material
From 42	To 47	Ft.	2	in.	.010	in.	PVC
From	To	Ft.		in.		in.	

15. SAND/GRAVEL PACK:

	Depth		Size	Material
From 40	To 50.5	Ft.	#1	SAND
From	To	Ft.		

16. REMARKS: MW-16D SEE MAP ON BACK

Topographic/Land setting
☐Ridge ☐Slope ☐Valley ☐Flat
(check appropriate box)
Latitude/longitude of well location
N34 16.99'/W77 58.98'
(degrees/minutes/seconds)
Latitude/longitude source: ☐GPS ☒Topographic map
(check box)

DEPTH From	DEPTH To	DRILLING LOG Formation Description
0	16.0'	White/brown/gray, wet, loose/ medium dense, fine/coarse SAND; some fine gravel; trace silt
16.0	49.0	Green, wet, very dense fine/ medium SAND; trace silt

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

Arnold M. Chapel 2/18/05

SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

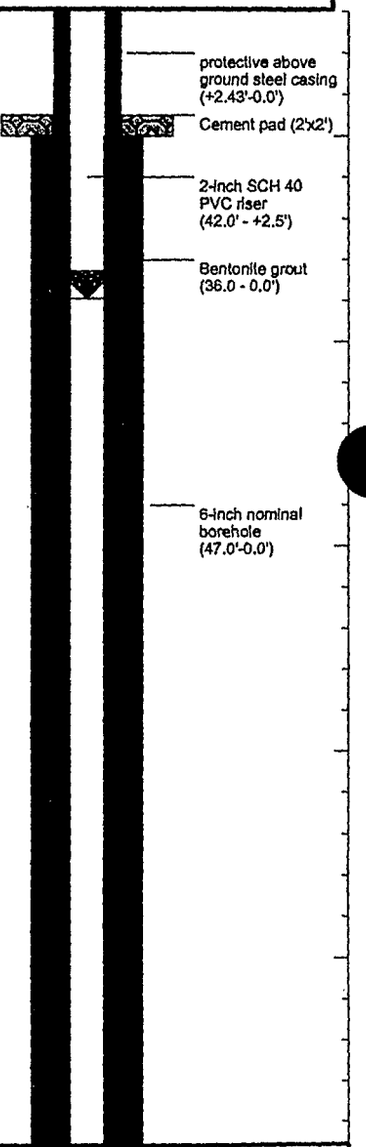
Date Start/Finish: 1/26/05
Drilling Company: Parratt Wolffe
Driller's Name: Arnold Chapel
Drilling Method: Mud Rotary
Bit Size: 5.87-inch roller-bit
Auger Size:
Rig Type: B-61 Mobile Rig
Sampling Method: 24-inch splitspoon

Northing: 196962.70
Easting: 2306758.11
Casing Elevation: 16.43
Borehole Depth: 47 ft bgs
Surface Elevation: 14.00
Logged by: Brian Lovgren

Well/Boring ID: MW-16D (FADA)
Client: Progress Energy Carolinas Inc.
Location: Progress Energy L.V. Sutton Steam Electric Plant
Wilmington, NC

DEPTH	ELEVATION	Samp. Interval (ft bgs)	Recovery (inches)	Blows / 6 inches	N - Value	PID (ppm)	Geologic Column	Stratigraphic Description
0	15							
5	10					2.9		SAND (SM), brown, fine grained, very loose, trace organics, dry, no odor.
10	5					0.0		SAND (SM), white, mottled tan, fine, very loose, dry, no odor.
15	0		2.0'	1 2 2 1	4	0.0		SAND (SM), white, mottled tan, fine, very loose, wet , no odor.
20	-5		2.0'	1 6 6 7	12	0.0		SAND (SM), light gray, mottled white, fine to medium grained, medium dense, wet, no odor.
	-10		1.0'	4 10 16 13	26	0.0		
			1.0'	5 5 4 4	9	0.0		SAND (SM), tan, fine, loose, wet, no odor.
			1.2'	5 5 4	9	0.0		SAND (SM), tan, fine to coarse grained, loose, wet, no odor.

Well/Boring Construction



BBL®
BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

Remarks:
NA: Not Applicable
ft bgs: feet below ground surface
PID: Photoionization Detector

Water Level Data

Date	Depth	Elev.
2/4/05	6.38	10.05

Depth measured from top of casing*

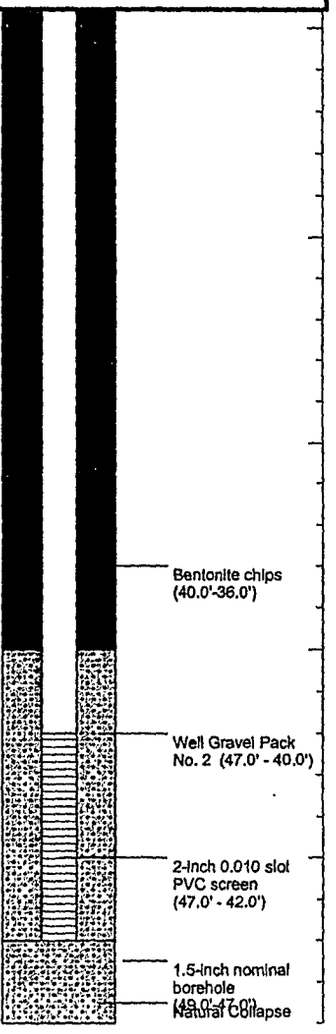
Client:
Progress Energy Carolinas Inc.

Site Location:
Progress Energy
L.V. Sutton Steam
Electric Plant

Well/Boring ID: MW-16D (FADA)

Borehole Depth: 47 ft bgs

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blows / 6 Inches	N - Value	PID Headspace (ppm)	Iron Staining	Geologic Column	Stratigraphic Description
25				8					
-15 / 30			1.0'	2 1 2 2	3	0.0			
-20 / 35			1.0'	2 2 3 2	5	0.0			
-25 / 40			1.0'	1 2 3 3	5	0.0			SAND (SM), tan, mottled orange, fine to coarse grained, loose, wet, no odor.
-30 / 45			1.0'	9 11 8 6	19	0.0			
-35			1.5'	10 19 16 24	35	0.0			SAND (SM), gray, fine, dense, wet, no odor. Boring terminated at 49.0 ft bls



Well/Boring Construction

BBL®
BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

Remarks:
NA: Not Applicable
ft bgs: feet below ground surface
PID: Photoionization Detector

Water Level Data

Date	Depth	Elev.
2/4/05	6.38	10.05

Depth measured from top of casing*

Project: 04015
Data File:MW-16D

Template:boring_wellWL2005.ldf
Date: 3/15/05

WELL CONSTRUCTION RECORD

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Robert Miller CERTIFICATION # 2675

WELL CONTRACTOR COMPANY NAME SAEDACCO, Inc. PHONE # (803) 548-2180

STATE WELL CONSTRUCTION PERMIT# (if applicable) _____ ASSOCIATED WQ PERMIT# (if applicable) _____

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐ Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use _____

2. WELL LOCATION:
Nearest Town: WILMINGTON County BRUNSWICK
801 SUTTON STEAM PLANT RD.
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐Ridge ☒Slope ☐Valley ☐Flat
(check appropriate box)
Latitude/longitude of well location (degrees/minutes/seconds) _____
Latitude/longitude source: ☐GPS ☐Topographic map
(check box)

3. OWNER: Progress Energy / Sutton Electric Steam Plant
Address 801 Sutton Steam Plant RD.
(Street or Route No.)
WILMINGTON NC
City or Town State Zip Code
( )- _____
Area code- Phone number

4. DATE DRILLED 6-14-04
5. TOTAL DEPTH: 50'
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: [redacted] 20'
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 3' FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): _____ METHOD OF TEST _____
10. WATER ZONES (depth): _____

DEPTH From	To	DRILLING LOG Formation Description
0	50'	TN medium TO FINE SAND

11. DISINFECTION: Type _____ Amount _____
12. CASING:

	Depth To	Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 45' Ft.	2"	SCH 40	PVC
From _____	To _____ Ft.			
From _____	To _____ Ft.			

13. GROUT:

	Depth To	Material	Method
From 0	To 41' Ft.	PORTLAND	Trimi
From _____	To _____ Ft.		

14. SCREEN:

	Depth To	Diameter	Slot Size	Material
From 45'	To 50' Ft.	2" in.	.010 in.	PVC
From _____	To _____ Ft.	_____ in.	_____ in.	

15. SAND/GRAVEL PACK:

	Depth To	Size	Material
From 43'	To 50' Ft.	20/30	SILICA SAND
From _____	To _____ Ft.		

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.

See site MAP MW-17

16. REMARKS: 2' Bentonite seal 41' to 43'

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

Robert L. Miller 6-16-04
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

Well/Boring ID: MW-17 (OAP)

Driller's Name: Rich Lemire/Robert Miller
Drilling Method: HSA and Mud Rotary
Bit Size: 5.87-inch
Auger Size: 4.25-inch I.D.
Rig Type: Diedrich D-50 Track Mounted Rig
Sampling Method: 24-inch splitspoon

Easting: 230671803
Casing Elevation: 30.76 ft
Borehole Depth: 50 ft bls
Surface Elevation: 27.94 ft
Logged by: Daniel C.H. Peterman

Client: Progress Energy Carolinas Inc.

Location: Progress Energy L.V. Sutton Steam Electric Plant
Wilmington, NC

DEPTH	ELEVATION	Samp. Interval (ft bgs)	Recovery (inches)	Blows / 6 Inches	N - Value	PID Headspace (ppm)	Iron Staining	Geologic Column	Stratigraphic Description
						0.0			SAND (SM), brown, mottled tan, fine grained, very loose, dry, no odor.
						0.0			SAND (SM), tan, mottled gray, fine grained, very loose, dry, no odor.
			19	3 3 3 5	6	0.0			SAND (SM), tan, mottled white, fine grained, loose, dry, no odor.
			20	2 3 3 4	6	0.0			
			19	2 4 5 5	9	0.0			

Well/Boring Construction

- protective above ground steel casing (+3.0' - 0.5')
- Cement pad (2'x2')
- 2-inch SCH 40 PVC riser (45' - +3')

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Remarks:
HSA: Hollow Stem Auger
ft bls: feet below land surface
Air Monitoring Equipment: PID, V-RAE, and PDR-1000
PID: Photoionization Detector
V-RAE: Multi-Gas meter
PDR-1000: Particulate meter

Water Level Data

Date	Depth	Elev.
06/22/04	20.30	10.46

Depth measured from top of casing*

Progress Energy Carolinas Inc.

Site Location:
Progress Energy
L.V. Sutton Steam
Electric Plant

Well/Boring ID: MW-17 (OAP)

Borehole Depth: 50 ft bls

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blows / 6 Inches	N - Value	PID Headspace (ppm)	Iron Staining	Geologic Column	Stratigraphic Description
				15	4 5 4 5	9	0.0			SAND (SM), brown, fine grained, loose, moist, no odor.
				18	4 5 5 6	10	0.0			SAND (SM), tan, mottled brown, fine grained, loose, moist, no odor.
15				24	3 5 6 5	11	27.4			SAND (SM), brown, mottled white, fine grained, loose, moist, no odor.
				19	4 4 5 5	9	0.0			SAND (SM), tan, mottled white, fine grained, loose, moist to wet, no odor.
10				24	3 4 6 6	10	1.6			
20				10	2 4 5 5	9	0.0			
				19	5 10 10 15	20	0.0			
5										

Well/Boring Construction

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Remarks:
HSA: Hollow Stem Auger
ft bls: feet below land surface
Air Monitoring Equipment: PID, V-RAE, and PDR-1000
PID: Photoionization Detector
V-RAE: Multi-Gas meter
PDR-1000: Particulate meter

Water Level Data

Date	Depth	Elev.
06/22/04	20.30	10.46

Depth measured from top of casing*

Progress Energy Carolinas Inc.

Site Location:
Progress Energy
L.V. Sutton Steam
Electric Plant

Well/Boring ID: MW-17 (OAP)

Borehole Depth: 50 ft bls

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blows / 6 Inches	N - Value	PID Headspace (ppm)	Iron Staining	Geologic Column	Stratigraphic Description	Well/Boring Construction
				16	9 6 12 11	18	0.0			SAND (SM), tan to white, fine grained, medium dense, saturated, no odor.	
25											
				19	15 15 17 21	32	0.0			SAND (SM), tan, mottled white, fine to medium grained, dense, saturated, no odor.	
	0			23	14 14 18 17	32	2.2			SAND and GRAVEL (GM), tan, mottled white, fine to medium grained (90%), trace fine gravel (10%), dense, saturated, no odor.	
30				16	10 13 20 20	33	1.5			SAND and GRAVEL (GM), tan, fine grained (50%), fine gravel (50%), dense, saturated, no odor.	
										SAND (SM), light gray, silt to fine grained, medium dense, saturated, no odor.	
				12	5 10 14 15	24	0.0				
	-5									SAND and GRAVEL (GM), tan, mottled white, fine to medium grained (50%), fine gravel (50%), medium dense, saturated, no odor.	
				16	7 10 9 9	19	0.0			SAND and GRAVEL (GM), white, mottled tan, fine to medium grained (90%), fine gravel (10%), medium dense, saturated, no odor.	
35											
				15	9 15 15 14	30	0.0			SAND (SM), light gray, fine grained, trace coarse grains (10%), medium dense to dense, saturated, no odor.	

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Remarks:
HSA: Hollow Stem Auger
ft bls: feet below land surface
Air Monitoring Equipment: PID, V-RAE, and PDR-1000
PID: Photoionization Detector
V-RAE: Multi-Gas meter
PDR-1000: Particulate meter

Water Level Data

Date	Depth	Elev.
06/22/04	20.30	10.46

Depth measured from top of casing*

Progress Energy Carolinas Inc.

Site Location:
Progress Energy
L.V. Sutton Steam
Electric Plant

Well/Boring ID: MW-17 (OAP)

Borehole Depth: 50 ft bls

DEPTH ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blows / 6 Inches	N - Value	PID Headspace (ppm)	Iron Staining	Geologic Column	Stratigraphic Description
-10			14	6 6 5 6	11	0.0			SAND and GRAVEL (GM), light gray, fine to coarse grained (95%), trace fine gravel (5%), medium dense, saturated, no odor.
40			11	4 6 12 12	18	0.0			
			13	6 10 10 14	20	0.0			SAND, GRAVEL and CLAY (GC), light gray, mottled white, fine to coarse grained (70%), fine gravel (29%), medium dense, saturated, no odor.
-15									CLAY stringer (CL) (43.1' - 43.2'), gray, silty, medium plasticity, very soft, wet, no odor.
			11	7 9 12 12	21	0.0			SAND, GRAVEL, and CLAY (GC), light gray, mottled white, fine to medium grained (89%), fine gravel (10%), medium dense, trace clay, saturated, no odor.
45			12	7 9 11 6	20	0.0			SAND and GRAVEL (GM), light gray, mottled white, fine to medium grained (95%), trace fine gravel (5%), medium dense, wet, no odor.
-20			12	11 13 13 14	26	0.0			SAND (SM), light gray, fine to medium grained, medium dense, saturated, no odor.
									Boring terminated at 50.0 ft bls
50									

Well/Boring Construction

- Bentonite chips (43' - 41')
- Well Gravel Pack No. 2 (50.0' - 43.0')
- 2-inch 0.010 slot PVC screen (45.0' - 50.0')

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Remarks:
HSA: Hollow Stem Auger
ft bls: feet below land surface
Air Monitoring Equipment: PID, V-RAE, and PDR-1000
PID: Photoionization Detector
V-RAE: Multi-Gas meter
PDR-1000: Particulate meter

Water Level Data

Date	Depth	Elev.
06/22/04	20.30	10.46

Depth measured from top of casing*

Project: 04010
Data File:MW-17 (OAP)
Template:boring_wellWL2003.ldf
Date: 07/01/04

WELL CONSTRUCTION RECORD

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Rich Lemire CERTIFICATION # 2593

WELL CONTRACTOR COMPANY NAME SAEDACCO PHONE # (803) 548-2180

STATE WELL CONSTRUCTION PERMIT# (if applicable) _____ ASSOCIATED WQ PERMIT# (if applicable) _____

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐ Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use _____

2. WELL LOCATION:
Nearest Town: Wilmington County Brunswick
801 Sutton Electric Steam Plant Road
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐Ridge ☒Slope ☐Valley ☐Flat
(check appropriate box)
Latitude/longitude of well location
_____
(degrees/minutes/seconds)
Latitude/longitude source: ☐GPS ☐Topographic map
(check box)

3. OWNER: Sutton Steam Plant
Address 801 Sutton Electric Steam Plant
(Street or Route No.)
Wilmington NC
City or Town State Zip Code
(___)-_____
Area code- Phone number

4. DATE DRILLED 6-10-2004
5. TOTAL DEPTH: 50'
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 10.6' FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 3' FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): _____ METHOD OF TEST _____
10. WATER ZONES (depth): _____
11. DISINFECTION: Type _____ Amount _____

DEPTH From	To	DRILLING LOG Formation Description
0	50	Tan Sand w/Quartz Stone Mix

12. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 45	Ft.	2"	Sch 40	PVC
From	To	Ft.			
From	To	Ft.			

13. GROUT:

	Depth		Material	Method
From 0	To 39	Ft.	Portland Cement	Tremmie
From	To	Ft.		

14. SCREEN:

	Depth		Diameter	Slot Size	Material
From 45	To 50	Ft.	2" in.	.010 in.	PVC
From	To	Ft.	in.	in.	

15. SAND/GRAVEL PACK:

	Depth		Size	Material
From 43	To 50	Ft.	# 2	Sand
From	To	Ft.		

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.

16. REMARKS: Bentonite Seal fro 43' to 39' MW-18

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Rich Lemire 6-10-04
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

Driller's Name: Rich Lemire
Drilling Method: HSA and Mud Rotary
Bit Size: 2.87-inch & 5.87-inch
Auger Size: 4.25-inch I.D.
Rig Type: B-61 Mobile Rig
Sampling Method: 24-inch splitspoon

Easting: 230658818
Casing Elevation: 22.01 ft

Borehole Depth: 50 ft bls
Surface Elevation: 19.27 ft

Logged by: Daniel C.H. Peterman

Well/Boring ID: MW-18 (OAP)

Client: Progress Energy Carolinas Inc.

Location: Progress Energy L.V. Sutton Steam Electric Plant
Wilmington, NC

DEPTH	ELEVATION	Samp. Interval (ft bgs)	Recovery (inches)	Blows / 6 Inches	N - Value	PID Headspace (ppm)	Iron Staining	Geologic Column	Stratigraphic Description
0	20								
						1.1			SAND (SM), gray, mottled brown, fine grained, very loose, dry, no odor.
						1.8			SAND (SM), white, mottled gray, fine grained, very loose, dry, no odor.
5	15		17	3 3 4 5	7	1.1			SAND (SM), brown, mottled white, fine grained, loose, damp, no odor.
			14	3 4 4 5	8	3.4			SAND (SM), tan, fine grained, loose, damp to wet, no odor.
10	10		15	3 4 5 5	9	1.9			

Well/Boring Construction

- protective above ground steel casing (+3.0' - 0.5')
- Cement pad (2'x2')
- 2-inch SCH 40 PVC riser (45' - +3')

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Remarks:
HSA: Hollow Stem Auger
ft bls: feet below land surface
Air Monitoring Equipment: PID, V-RAE, and PDR-1000
PID: Photoionization Detector
V-RAE: Multi-Gas meter
PDR-1000: Particulate meter

Water Level Data

Date	Depth	Elev.
06/22/04	10.64	11.37

Depth measured from top of casing*

Project: 04010
Data File:MW-18 (OAP)
Template:boring_wellWL2003.ldf
Date: 07/01/04

Progress Energy Carolinas Inc.

Site Location:
Progress Energy
L.V. Sutton Steam
Electric Plant

Well/Boring ID: MW-18 (OAP)

Borehole Depth: 50 ft bls

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blows / 6 Inches	N - Value	PID Headspace (ppm)	Iron Staining	Geologic Column	Stratigraphic Description	Well/Boring Construction
			15	4 8 15 20	23	3.6			SAND (SM), tan, fine grained, medium dense, wet, no odor.	5.87-inch nominal borehole (50.0' - 0.0')
			20	5 15 24 25	39	4.8			SAND (SM), tan, mottled white, fine grained, dense, wet, no odor.	
5			15	1 5 10 14	15	3.7			SAND (SM), tan, mottled white, fine grained, medium dense, wet, no odor.	
15										Bentonite grout (39' - 0')
			18	8 21 25 29	46	0.0			SAND (SM), light gray, fine to medium grained, dense, wet, no odor.	
			12	9 12 23 30	35	3.1			SAND (SM), tan, fine to medium grained, dense, wet, no odor.	
0										
20			12	17 19 24 22	43	0.5			SAND and GRAVEL (GM), tan, mottled white, fine to medium grained (50%), fine gravel (50%), dense, wet, no odor.	
			13	8 10 12 10	22	0.0			SAND and GRAVEL (GM), tan, mottled white, fine to medium grained (80%), fine gravel (20%), medium dense, wet, no odor.	

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Remarks:
HSA: Hollow Stem Auger
ft bls: feet below land surface
Air Monitoring Equipment: PID, V-RAE, and PDR-1000
PID: Photoionization Detector
V-RAE: Multi-Gas meter
PDR-1000: Particulate meter

Water Level Data

Date	Depth	Elev.
06/22/04	10.64	11.37

Depth measured from top of casing*

Progress Energy Carolinas Inc.

Site Location:
Progress Energy
L.V. Sutton Steam
Electric Plant

Well/Boring ID: MW-18 (OAP)

Borehole Depth: 50 ft bls

DEPTH ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blows / 6 Inches	N - Value	PID Headspace (ppm)	Iron Staining	Geologic Column	Stratigraphic Description	Well/Boring Construction
-5 / 25			11	5 7 7 8	14	2.5			SAND (SM), tan, mottled white, fine to medium grained, medium dense, wet, no odor.	
			8	7 6 6 4	12	2.8			SAND and GRAVEL (GM), light gray, mottled white, fine to medium grained (95%), trace fine gravel (5%), medium dense, visibe iron staining at 28', wet, no odor.	
-10 / 30			0	1 1 2 1	3	1.8			SAND and GRAVEL (GM), white, mottled tan, fine to medium grained (90%), fine gravel (10%), very loose , black staining at 30', saturated, no odor.	
			0						No recovery due to apparent void. Continuous spoon drop and significant lose of drilling fluids from 30' to 38'.	
			0							
-15 / 35			0							
			0							

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Remarks:
HSA: Hollow Stem Auger
ft bls: feet below land surface
Air Monitoring Equipment: PID, V-RAE, and PDR-1000
PID: Photoionization Detector
V-RAE: Multi-Gas meter
PDR-1000: Particulate meter

Water Level Data

Date	Depth	Elev.
06/22/04	10.64	11.37

Depth measured from top of casing*

Progress Energy Carolinas Inc.

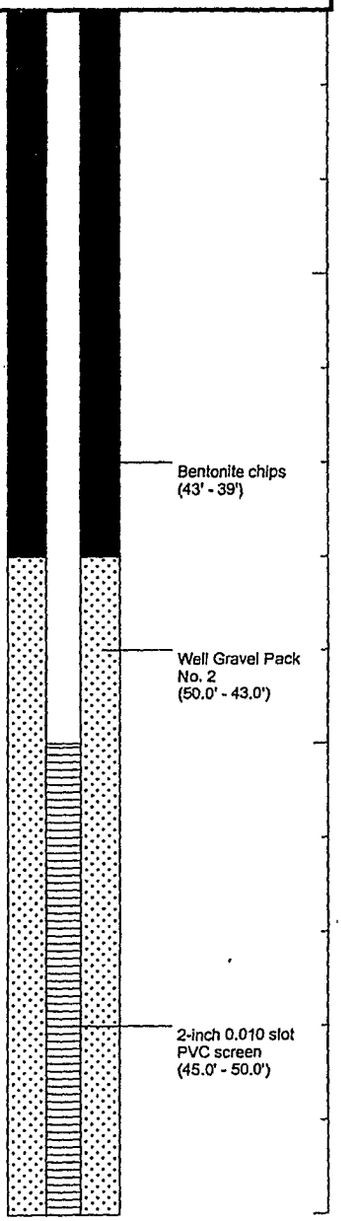
Site Location:
Progress Energy
L.V. Sutton Steam
Electric Plant

Well/Boring ID: MW-18 (OAP)

Borehole Depth: 50 ft bls

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blows / 6 Inches	N - Value	PID Headspace (ppm)	Iron Staining	Geologic Column	Stratigraphic Description
			20	2 7 7 2	14	2.6			SAND and GRAVEL (GM), tan, mottled white, fine to medium grained (50%), fine gravel (50%), medium dense, saturated, no odor.
									CLAY stringer (CL), gray, mottled reddish brown, silty, medium plasticity, very soft, wet, no odor, 39.1' to 39.3'.
-20									SAND and GRAVEL (GM), tan, mottled white, fine to medium grained (40%), fine gravel (60%), medium dense to dense, visible iron staining, saturated, no odor.
40			15	9 13 18 19	31	0.2			
									SAND (SM), white, fine grained, dense, wet, no odor.
			2	5 10 16 13	26	0.0			SAND and GRAVEL (GM), white, fine to medium grained (95%), fine gravel (5%), medium dense, wet, no odor.
-25									
45			12	3 5 8 14	13	0.0			SAND and GRAVEL (GM), white, fine to coarse grained (90%), fine gravel (10%), medium dense, visible iron staining, wet, no odor.
			16	10 13 17 9	30	0.0			SAND and GRAVEL (GM), reddish brown, mottled white, fine to medium grained (80%), fine gravel (20%), dense, wet, no odor.
-30									Boring terminated at 50.0 ft bls
50									

Well/Boring Construction



BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Remarks:
HSA: Hollow Stem Auger
ft bls: feet below land surface
Air Monitoring Equipment: PID, V-RAE, and PDR-1000
PID: Photoionization Detector
V-RAE: Multi-Gas meter
PDR-1000: Particulate meter

Water Level Data

Date	Depth	Elev.
06/22/04	10.64	11.37

Depth measured from top of casing*

WELL CONSTRUCTION RECORD

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) Robert Miller CERTIFICATION # 2675

WELL CONTRACTOR COMPANY NAME SAEDACCO PHONE # (803) 548-2180

STATE WELL CONSTRUCTION PERMIT# (if applicable) ASSOCIATED WQ PERMIT# (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐ Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use

2. WELL LOCATION:
Nearest Town: Wilmington County Brunswick
801 Sutton Electric Steam Plant Road
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐Ridge ☐Slope ☐Valley ☐Flat
(check appropriate box)
Latitude/longitude of well location
(degrees/minutes/seconds)
Latitude/longitude source: ☐GPS ☐Topographic map
(check box)

3. OWNER: Sutton Steam Plant
Address 801 Sutton Electric Steam Plant
(Street or Route No.)
Wilmington NC
City or Town State Zip Code
( )-
Area code- Phone number

4. DATE DRILLED 6-15-2004
5. TOTAL DEPTH: 50'
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 20.6' FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 3' FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): METHOD OF TEST
10. WATER ZONES (depth):

DEPTH From	DEPTH To	DRILLING LOG Formation Description
0	32	Sand (Fine to Medium)
32'	50'	Sand / Gravel

11. DISINFECTION: Type Amount
12. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 45	Ft.	2"	Sch 40	PVC
From	To	Ft.			
From	To	Ft.			

13. GROUT:

	Depth		Material	Method
From 0	To 41	Ft.	Portland Cement	Tremmie
From	To	Ft.		

14. SCREEN:

	Depth		Diameter	Slot Size	Material
From 45	To 50	Ft.	2" in.	.010 in.	PVC
From	To	Ft.	in.	in.	

15. SAND/GRAVEL PACK:

	Depth		Size	Material
From 43	To 50	Ft.	#2	Sand
From	To	Ft.		

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.
See site map MW-19

16. REMARKS: Bentonite Seal fro 41' to 43' MW-19

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

Robert L. Miller 6-16-04
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

Drilling Company: SAEDACCO
Driller's Name: Robert Miller
Drilling Method: Mud Rotary
Bit Size: 2.87-inch & 5.87-inch
Auger Size: NA
Rig Type: Diedrich D-50 Track Mounted Rig
Sampling Method: 24-inch splitspoon

Easting: 230704138
Casing Elevation: 31.50 ft

Borehole Depth: 50 ft bls
Surface Elevation: 28.73 ft

Logged by: Daniel C.H. Peterman

Well/Boring ID: MW-19 (OAP)

Client: Progress Energy Carolinas Inc.

Location: Progress Energy L.V. Sutton Steam Electric Plant
Wilmington, NC

DEPTH ELEVATION	Samp. Interval (ft bgs)	Recovery (inches)	Blows / 6 Inches	N - Value	PID Headspace (ppm)	Iron Staining	Geologic Column	Stratigraphic Description
30								
0					0.0			SAND (SM), light gray to dark brown, fine grained, very loose, dry, no odor.
					0.0			SAND (SM), tan, mottled brown, fine grained, very loose, dry, no odor.
25		17	1 1 2 4	3	0.0			
-5								
		18	2 2 2 3	4	0.0			SAND (SM), tan, fine grained, very loose, dry, no odor.
		10	3 5 6 0	11	0.0			SAND (SM), tan, fine grained, medium dense, damp to moist, no odor.
20								
-10								

Well/Boring Construction

protective above ground steel casing (+3.0' - 0.5')

Cement pad (2'x2')

2-inch SCH 40 PVC riser (45' - +3')

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Remarks:
HSA: Hollow Stem Auger
ft bls: feet below land surface
Air Monitoring Equipment: PID, V-RAE, and PDR-1000
PID: Photoionization Detector
V-RAE: Multi-Gas meter
PDR-1000: Particulate meter

Water Level Data

Date	Depth	Elev.
06/22/04	20.62	10.88

Depth measured from top of casing*

Client:
Progress Energy Carolinas Inc.

Site Location:
Progress Energy
L.V. Sutton Steam
Electric Plant

Well/Boring ID: MW-19 (OAP)

Borehole Depth: 50 ft bls

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blows / 6 Inches	N - Value	PID Headspace (ppm)	Iron Staining	Geologic Column	Stratigraphic Description	Well/Boring Construction
			12	5 6 10 11	16	0.0			SAND (SM), tan, fine grained, medium dense, damp to moist, no odor.	5.87-inch nominal borehole (50.0' - 0.0')
			15	8 12 15 15	27	0.0				
15			15	8 10 11 12	21	0.0				Bentonite grout (41' - 0')
			14	4 6 6 8	12	0.0			SAND (SM), tan, mottled white, fine grained, dense, moist, no odor.	
10			16	6 7 10 12	17	0.0			SAND (SM), tan, mottled brown, fine to medium grained, medium dense, moist, no odor.	
20			17	2 4 7 11	11	0.0			Clayey SAND (SC), tan, fine to medium grained, medium dense, visible iron staining, wet, no odor.	
			17	7 10 12 12	22	0.0				

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Remarks:
HSA: Hollow Stem Auger
ft bls: feet below land surface
Air Monitoring Equipment: PID, V-RAE, and PDR-1000
PID: Photoionization Detector
V-RAE: Multi-Gas meter
PDR-1000: Particulate meter

Water Level Data

Date	Depth	Elev.
06/22/04	20.62	10.88

Depth measured from top of casing*

Client:
Progress Energy Carolinas Inc.

Site Location:
Progress Energy
L.V. Sutton Steam
Electric Plant

Well/Boring ID: MW-19 (OAP)

Borehole Depth: 50 ft bls

DEPTH ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blows / 6 Inches	N - Value	PID Headspace (ppm)	Iron Staining	Geologic Column	Stratigraphic Description	Well/Boring Construction
5			15	12 17 20 27	37	0.0			SAND (SM), tan, mottled white, fine to medium grained, dense, wet, no odor.	
25			16	14 18 20 22	38	0.0				
			16	13 18 19 20	37	0.0			SAND (SM), tan, mottled white, fine to medium grained, dense, wet, no odor.	
0										
0			15	11 18 24 22	42	0.0				
									SAND (SM), light gray, mottled white, fine grained, dense, wet, no odor.	
			13	12 14 12 14	26	0.0			SAND and GRAVEL (GM), tan, mottled white, fine to medium grained (98%), trace fine gravel (2%), medium dense, visibe iron staining, wet, no odor.	
-5			15	11 15 12 11	27	0.0			SAND and GRAVEL (GM), light gray, mottled tan, fine to medium grained (90%), fine gravel (10%), medium dense, visibe iron staining, wet, no odor.	
35									Clayey SAND (SC), light gray, low plasticity, very soft, fine grained, wet, no odor.	
			16	8 9 10 14	19	0.0			SAND and GRAVEL (GM), light gray, mottled tan and white, fine to medium grained (95%), trace fine gravel (5%), medium dense, wet, no odor.	

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Remarks:
HSA: Hollow Stem Auger
ft bls: feet below land surface
Air Monitoring Equipment: PID, V-RAE, and PDR-1000
PID: Photoionization Detector
V-RAE: Multi-Gas meter
PDR-1000: Particulate meter

Water Level Data

Date	Depth	Elev.
06/22/04	20.62	10.88

Depth measured from top of casing*

Client:
Progress Energy Carolinas Inc.

Site Location:
Progress Energy
L.V. Sutton Steam
Electric Plant

Well/Boring ID: MW-19 (OAP)

Borehole Depth: 50 ft bls

DEPTH ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blows / 6 Inches	N - Value	PID Headspace (ppm)	Iron Staining	Geologic Column	Stratigraphic Description
			16	11 12 14 14	26	0.0			SAND and GRAVEL (GM), tan, mottled light gray, medium grained (95%), trace fine sand and gravel (5%), medium dense, saturated, no odor.
-10									
40			15	7 7 6 8	13	0.0			
			15	8 9 8 7	17	0.0			
-15									
			12	2 4 5 10	9	0.0			SAND and GRAVEL (GM), light gray, mottled tan, coarse grained (90%), fine gravel (10%), loose, saturated, no odor.
45									
			15	9 11 12 10	23	0.0			SAND (SM), light gray to tan, fine to medium grained, medium dense, visible iron staining, wet, no odor.
			15	10 12 12 11	24	0.0			SAND (SM), light grey to tan, fine grained, medium dense, wet, no odor.
-20									Boring terminated at 50.0 ft bls
50									

Well/Boring Construction

- Bentonite Slurry (42' - 41')
- Bentonite chips (43' - 42')
- Well Gravel Pack No. 2 (50.0' - 43.0')
- 2-inch 0.010 slot PVC screen (45.0' - 50.0')

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Remarks:
HSA: Hollow Stem Auger
ft bls: feet below land surface
Air Monitoring Equipment: PID, V-RAE, and PDR-1000
PID: Photoionization Detector
V-RAE: Multi-Gas meter
PDR-1000: Particulate meter

Water Level Data

Date	Depth	Elev.
06/22/04	20.62	10.88

Depth measured from top of casing*

WELL CONSTRUCTION RECORD

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) ARNOLD CHAPEL CERTIFICATION # 2487

WELL CONTRACTOR COMPANY NAME PARRATT-WOLFF, INC. PHONE # (919) 644-2814

STATE WELL CONSTRUCTION PERMIT# (if applicable) ASSOCIATED WQ PERMIT# (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐ Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use

2. WELL LOCATION:
Nearest Town: WILMINGTON County NEW HANOVER
801 SUTTON STEAM PLANT ROAD
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐Ridge ☐Slope ☐Valley ☐Flat
(check appropriate box)
Latitude/longitude of well location
N34 16.99'/W77 58.98'
(degrees/minutes/seconds)
Latitude/longitude source: ☐GPS ☒Topographic map
(check box)

3. OWNER: PROGRESS ENERGY
Address 801 SUTTON STEAM PLANT ROAD
(Street or Route No.)
WILMINGTON NC 28401
City or Town State Zip Code
(___)-
Area code- Phone number

4. DATE DRILLED 2/2/05
5. TOTAL DEPTH: 14.0'
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 5.5 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): N/A METHOD OF TEST N/A
10. WATER ZONES (depth): N/A
11. DISINFECTION: Type N/A Amount N/A
12. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 4	Ft.	2"	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

13. GROUT:

	Depth		Material	Method
From 0	To 1	Ft.	PORTLAND	TREMIE
From 1	To 3	Ft.	BENTONITE	TREMIE

14. SCREEN:

	Depth		Diameter		Slot Size		Material
From 4	To 14	Ft.	2	in.	.010	in.	PVC
From	To	Ft.		in.		in.	

15. SAND/GRAVEL PACK:

	Depth		Size	Material
From 3	To 14	Ft.	#1	SAND
From	To	Ft.		

DEPTH From	To	DRILLING LOG Formation Description
NO SAMPLES TAKEN		

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.

16. REMARKS: MW-20 SEE MAP ON BACK

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

Arnold L. Chapel 2/18/05
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days. GW-1 REV. 07/2001

Date Start/Finish: 2/2/05
Drilling Company: Parratt Wolffe
Driller's Name: Arnold Chapel
Drilling Method: HSA
Bit Size: NA
Auger Size: 3.25-inch (ID)
Rig Type: B-61 Mobile Rig
Sampling Method:

Northing: 196257.98
Easting: 2305318.10
Casing Elevation: 13.70

Borehole Depth: 14 ft bgs
Surface Elevation: 10.78

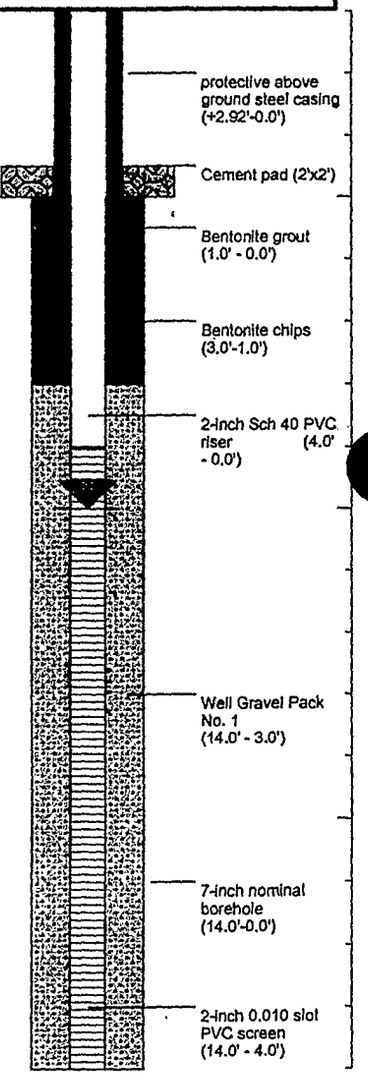
Logged by: Brian Lovgren

Well/Boring ID: MW-20 (FADA)

Client: Progress Energy Carolinas Inc.

Location: Progress Energy L.V. Sutton Steam Electric Plant
Wilmington, NC

DEPTH	ELEVATION	Samp. Interval (ft bgs)	Recovery (inches)	Blows / 6 inches	N - Value	PID (ppm)	Geologic Column	Stratigraphic Description
0	10		1.0'	3 2 3 2	5	0.0		SAND (SM), black, fine to medium grained, loose, damp, no odor.
5								SAND (SM), brown, mottled orange, fine to medium grained, loose, wet, no odor.
10	0		1.0'	5 5 5 7	10	0.0		SAND (SM), brown to light gray, fine to medium grained, loose to medium dense, wet, no odor.



BBL®
BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

Remarks:
HSA: Hollow-Stem Auger
NA: Not Applicable
ft bgs: feet below ground surface
PID: Photoionization Detector

Water Level Data

Date	Depth	Elev.
2/4/05	7.92	5.78

Depth measured from top of casing*

Project: 04015
Data File:MW-20
Template:boring_wellWL2005.ldf
Date: 3/16/05

WELL CONSTRUCTION RECORD

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section

WELL CONTRACTOR (INDIVIDUAL) NAME (print) ARNOLD CHAPEL CERTIFICATION # 2487

WELL CONTRACTOR COMPANY NAME PARRATT-WOLFF, INC. PHONE # (919) 644-2814

STATE WELL CONSTRUCTION PERMIT# (if applicable) ASSOCIATED WQ PERMIT# (if applicable)

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐ Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use

2. WELL LOCATION:
Nearest Town: WILMINGTON County NEW HANOVER
801 SUTTON STEAM PLANT ROAD
(Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)

Topographic/Land setting
☐Ridge ☐Slope ☐Valley ☐Flat
(check appropriate box)
Latitude/longitude of well location
N34 16.99'/W77 58.98'
(degrees/minutes/seconds)
Latitude/longitude source: ☐GPS ☒Topographic map
(check box)

3. OWNER: PROGRESS ENERGY
Address 801 SUTTON STEAM PLANT ROAD
(Street or Route No.)
WILMINGTON NC 28401
City or Town State Zip Code
( )-
Area code- Phone number

4. DATE DRILLED 2/1/05
5. TOTAL DEPTH: 52.0'
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing: 5.5 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C .0118.
9. YIELD (gpm): N/A METHOD OF TEST N/A
10. WATER ZONES (depth): N/A

DEPTH From	DEPTH To	DRILLING LOG Formation Description
0	5.0'	Black/brown, wet, dense/loose, fine/coarse SAND; trace fine/coarse gravel and silt
5.0	25.0	Gray, wet, dense/loose, fine/coarse SAND
25.0	42.0	Gray, wet, very loose, fine SAND
42.0	52.0	Green, wet, very dense, fine SAND; trace clay and silt

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads. Include the road numbers and common road names.

11. DISINFECTION: Type N/A Amount N/A
12. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 43	Ft.	2"	SCH 40	PVC
From	To	Ft.			
From	To	Ft.			

13. GROUT:

	Depth		Material	Method
From 0	To 37	Ft.	PORTLAND	TREMIE
From 37	To 41	Ft.	BENTONITE	TREMIE

14. SCREEN:

	Depth		Diameter		Slot Size		Material
From 43	To 48	Ft.	2	in.	.010	in.	PVC
From	To	Ft.		in.		in.	

15. SAND/GRAVEL PACK:

	Depth		Size	Material
From 41	To 52	Ft.	#1	SAND
From	To	Ft.		

16. REMARKS: MW-20D SEE MAP ON BACK

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

Arnold L. Chapel 2/18/05

SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 7699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

Drilling Company: Parratt Wolffe
Driller's Name: Arnold Chapel
Drilling Method: Mud Rotary
Bit Size: 5.87-inch roller-bit
Auger Size:
Rig Type: B-61 Mobile Rig
Sampling Method: 24-inch splitspoon

Northing: 196256.89
Easting: 2305326.09
Casing Elevation: 13.66

Borehole Depth: 52 ft bgs
Surface Elevation: 10.73

Logged by: Brian Lovgren

Well/Boring ID: MW-20D (FADA)

Client: Progress Energy Carolinas Inc.

Location: Progress Energy L.V. Sutton Steam Electric Plant
Wilmington, NC

DEPTH	ELEVATION	Samp. Interval (ft bgs)	Recovery (inches)	Blows / 6 inches	N - Value	PID (ppm)	Geologic Column	Stratigraphic Description
0	10							
5	5		1.0'	3 2 3 2	5	0.0		SAND (SM), black, fine to medium grained, loose, damp, no odor.
								SAND (SM), brown, mottled orange, fine to medium grained, loose, wet, no odor.
10	0		1.0'	5 5 5 7	10	0.0		SAND (SM), brown to light gray, fine to medium grained, loose to medium dense, wet, no odor.
15	-5		1.0'	6 7 8 6	15	0.0		SAND (SM), brown to tan, fine to medium grained, medium dense, wet, no odor.
20	-10		1.5'	13 17 17 18	34	0.0		SAND (SM), tan, fine to medium grained, dense, wet, no odor.

Well/Boring Construction:
- protective above ground steel casing (+2.93'-0.0')
- Cement pad (2'x2')
- 2-inch SCH 40 PVC riser (43.0' - +2.9')
- Bentonite grout (37.0' - 0.0')
- 6-inch nominal borehole (48.0'-0.0')
- 2-inch SCH 40 PVC riser (43.0' - +2.9')

BBL®
BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

Remarks:
NA: Not Applicable
ft bgs: feet below ground surface
PID: Photolonization Detector
NR: No Recovery

Water Level Data

Date	Depth	Elev.
2/4/05	7.90	5.76

Depth measured from top of casing

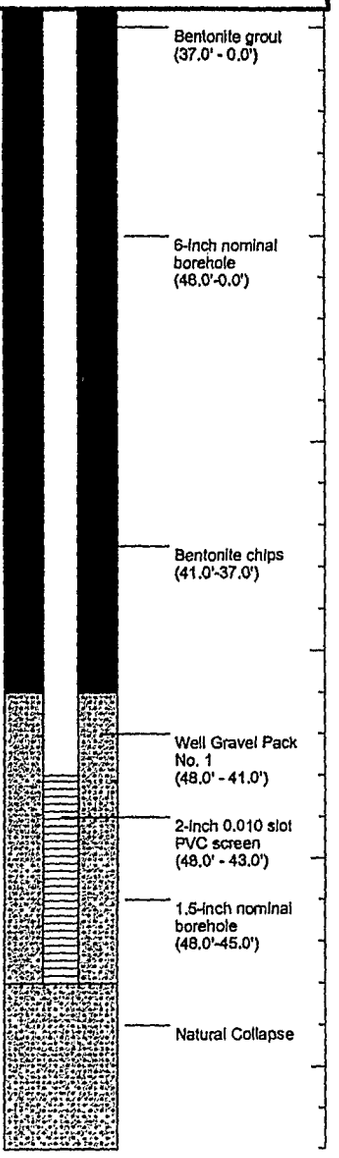
Client:
Progress Energy Carolinas Inc.

Site Location:
Progress Energy
L.V. Sutton Steam
Electric Plant

Well/Boring ID: MW-20D (FADA)

Borehole Depth: 52 ft bgs

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blows / 6 Inches	N - Value	PID Headspace (ppm)	Iron Staining	Geologic Column	Stratigraphic Description
25 / -15			1.5'	4 10 8 13	18	0.0			SAND (SM), tan, fine to medium grained, medium dense, wet, no odor.
30 / -20			1.0'	3 3 3 4	6	0.0			SAND (SM), tan, fine to medium grained, loose, wet, no odor.
35 / -25			1.0'	1 1 1 1	2	0.0			SAND (SM), dark brown, fine to medium grained, very loose, wet, no odor.
40 / -30			1.0'	1 1 1 1	2	0.0			
45 / -35			0.8'	4 7 7 8	14	0.0			SAND (SM), dark brown, fine to medium grained, medium dense, wet, no odor.
50 / -40			1.5'	14 26 24 19	50	0.0			SAND (SM), green to dark gray, silt to fine grained, very dense, wet, no odor. Boring terminated at 52.0 ft bls



BBL®
BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

Remarks:
NA: Not Applicable
ft bgs: feet below ground surface
PID: Photoionization Detector
NR: No Recovery

Water Level Data

Date	Depth	Elev.
2/4/05	7.90	5.76

Depth measured from top of casing*

Jesneck, Charlotte

From: Culpepper, Linda
Sent: Tuesday, December 20, 2016 5:57 PM
To: Lyon, Henry
Cc: Kegley, Geoff; Zimmerman, Jay; Risgaard, Jon; King, Morella s; Gregson, Jim; Scott, Michael; Bateson, James; Jesneck, Charlotte; Lorscheider, Ellen
Subject: RE: Carolina P & L -Sutton Steam, Wilmington, New Hanover County, NCD000830646

After discussing the below request, this is to confirm that the Division of Water Resources (DWR) will oversee the remedial activities for the
Former Ash Disposal Area (FADA) unit at the Sutton facility which is currently in the inventory of Inactive Hazardous Sites.

It is my understanding that Duke Energy has included information related to the FADA in submittals to the DWR regarding coal ash remediation
at the facility. Information submitted to the Superfund Section in the Division of Waste Management can be found online:

Laserfiche Weblink is http://edocs.deq.nc.gov/WasteManagement/Search.aspx
Search using: Template = WM
Subdivision = Superfund
Doc_Category= Facility
ID = NCD000830646

If Duke Energy has additional information regarding the FADA, please provide that information to Geoff Kegley (geoff.kegley@ncdenr.gov).
Thank you,

Linda Culpepper
Deputy Director
Division of Water Resources
North Carolina Department of Environmental Quality

1611 Mail Service Center
Phone: 919-707-9014

From: Lyon, Henry [mailto:Henry.Lyon@duke-energy.com]
Sent: Monday, December 19, 2016 2:02 PM
To: Culpepper, Linda <linda.culpepper@ncdenr.gov>
Cc: Jesneck, Charlotte <charlotte.jesneck@ncdenr.gov>
Subject: Carolina P & L -Sutton Steam, Wilmington, New Hanover County, NCD000830646

Good Afternoon Ms. Culpepper,

I'm following up on the recent communication with Charlotte Jesneck regarding the delisting request for the Former Ash Disposal Area IHSB site at our Sutton facility. I would like to speak with you about the option that Ms. Jesneck has identified below and wanted to see if you, or perhaps someone in your organization, would have availability to discuss this in more detail? Any direction you can provide would be greatly appreciated.

I hope you have a joyful holiday and new year and I look forward to catching up in 2017.

Thank you,

Hank Lyon, PG
Principal Environmental Specialist
Duke Energy - Remediation
1451 Military Cutoff Road, ERO
Wilmington, North Carolina 28403
ph 910.256.7211, mob 919.632.1517

From: Jesneck, Charlotte [mailto:charlotte.jesneck@ncdenr.gov]
Sent: Monday, December 05, 2016 11:34 AM
To: Lyon, Henry
Cc: Culpepper, Linda
Subject: RE: Carolina P & L -Sutton Steam, Wilmington, New Hanover County, NCD000830646

As you know, several years ago we took the CP&L sites in the Inactive Hazardous Sites Inventory that only had coal ash discharges related to permits under the Division of Water Resources and no other contaminant issues off the Inactive Hazardous Sites Inventory.

With Sutton only having the one non-permitted coal ash disposal in the same area as the DWR permitted units, we need assurance the contaminant issues will be addressed. Sounds like the ash will be completely removed. So the only remaining question is how will groundwater contamination be addressed until standards are met.

There are 2 options for you for the Sutton site. If DWR determines that they can oversee groundwater remediation for the non-permitted unit, they take jurisdiction for the IHSB portion. If they cannot, you can still decide to address the contamination and then when it meets standards, request a No Further Action determination from our Branch.

I am copying Linda Culpepper on this email so she knows of your request.

Linda, Ellen may be contacting you further on this. Linda/Henry, call me if you have any questions.

Charlotte Jesneck, LG
Branch Head
Inactive Hazardous Sites Branch
NC Department of Environmental Quality

919-707-8327 office
charlotte.jesneck@ncdenr.gov

Office Location: 217 W Jones Street, Raleigh, NC
Mail: 1646 Mail Service Center
Raleigh, NC 27699

From: Jesneck, Charlotte
Sent: Tuesday, November 29, 2016 10:46 AM
To: 'Lyon, Henry' <Henry.Lyon@duke-energy.com>
Subject: RE: Carolina P & L -Sutton Steam, Wilmington, New Hanover County, NCD000830646

Update: I am checking with some folks over here. Will get back with you soon.

Charlotte Jesneck, LG
Branch Head
Inactive Hazardous Sites Branch
NC Department of Environmental Quality

919-707-8327 office
charlotte.jesneck@ncdenr.gov

Office Location: 217 W Jones Street, Raleigh, NC
Mail: 1646 Mail Service Center
Raleigh, NC 27699

From: Lyon, Henry [mailto:Henry.Lyon@duke-energy.com]
Sent: Monday, November 21, 2016 7:43 AM
To: Jesneck, Charlotte <charlotte.jesneck@ncdenr.gov>
Subject: Carolina P & L -Sutton Steam, Wilmington, New Hanover County, NCD000830646

Good Morning Ms. Jesneck,

I'm following up on our earlier telephone conversation regarding the subject Inactive Hazardous Waste Sites Priority Listing and the opportunity to address the incident under our on-going ash basin closure efforts at the former L.V. Sutton plant site. Since our last conversation, Duke Energy Progress (Duke) has received the June 1, 2016 Order Granting Motion for Partial Summary Judgment (Order), attached, which requires Duke, per paragraph 48(a), page 23 of the PDF, to "*excavate and remove all CCR and CCP from the Sutton Impoundments and the Inactive Ash Areas ("Sutton Removed Ash") to lined locations for disposal*…" As established in the Order and further defined in our various, historical reports to the IHSB regarding Incident NCD000830646, this includes the Former Ash Disposal Area (FADA, aka LOLA or Lay of Land Area) as shown in Exhibit G of the Order. The Order further requires in paragraph 48(b) that Duke shall "…*ensure that the Sutton Removed Ash transferred for disposal is transferred to a lined CCR landfill, industrial landfill, or municipal solid waste landfill meeting applicable permitting, siting, construction and engineering requirements established by applicable law, statute or Regulation*..." Given the findings in the historical FADA reports, site work has not identified any waste characterization conditions that would preclude disposal of the FADA materials in the pending on-site landfill at Sutton.

Duke is currently engaged with DEQ on the various regulatory aspects of the Sutton ash basin closure. With the issuance of the Order and specifically with regard to the inclusion of the FADA within the overall scope of the basin closure, Duke is respectfully requesting that DEQ remove, or delist, the FADA incident from the IHSB's current Inactive Hazardous Waste Sites Priority List. We believe this would allow the Division of Waste Management's interest in the FADA to be adequately addressed through the on-going basin closure effort and would provide an opportunity to decrease unnecessary administrative burden for both DEQ and Duke.

Please contact me at 910.256.7211 if I can be of assistance and thank you for your consideration of this request.

Hank Lyon, PG
Principal Environmental Specialist
Duke Energy - Remediation
1451 Military Cutoff Road, ERO
Wilmington, North Carolina 28403
ph 910.256.7211, mob 919.632.1517

Hart Exhibit 68
Docket No. E-2, Sub 1219

STATE OF NORTH CAROLINA

COUNTY OF NEW HANOVER

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

IN THE MATTER OF ASSESSMENT OF CIVIL PENALTIES AGAINST Duke Energy Progress, Inc. FOR VIOLATIONS OF: NCGS 143-215.1 15A NCAC 2L .0103 (d) 15A NCAC 2L .0202	)	FINDINGS AND DECISIONS AND ASSESSMENT OF CIVIL PENALTIES FILE NO. LV-2015-0035

The Rules under the North Carolina Administrative Code Subchapter 2L (15A NCAC 02L) were established to maintain and preserve the quality of the groundwaters, prevent and abate pollution and contamination of the waters of the state, protect public health, and permit management of the groundwaters for their best usage by the citizens of North Carolina. It is the policy of the Environment Management Commission that the best usage of the groundwaters of the state is a source of drinking water. Therefore the intent of these Rules (15A NCAC 02L) is to protect the overall high quality of North Carolina's groundwater to the level established by the standards. With this intention and pursuant to North Carolina General Statutes (N.C.G.S.) 143-215.6(A) and the delegation provided by the Secretary of the Department of Environment and Natural Resources, I, Jay Zimmerman, Director of the Division of Water Resources (hereafter the Division), make the following:

I. FINDINGS OF FACT:

A. Duke Energy Progress, Inc. (hereinafter Duke Energy) is a corporation organized and existing under the laws of the State of North Carolina and is in the business of electric power generation.

B. Duke Energy owns and operates the L.V. Sutton Energy Complex, located at 801 Sutton Steam Plant Road, Wilmington, N.C. in New Hanover County (hereafter the facility).

C. The groundwater in the area of the facility is classified as Class GA waters in accordance with the rules of the Environmental Management Commission, codified at Title 15A, North Carolina Administrative Code (NCAC), Subchapter 2L (15A NCAC 2L).

D. The Compliance Boundary, as defined at 15A NCAC 2L .0102 (3), means a boundary around a disposal system at and beyond which groundwater quality standards may not be exceeded and only applies to facilities which have received a permit issued under authority of G.S. 143-215.1 or G.S. 130A.

E. The Waste Boundary, as defined at 15A NCAC 2L .0102 (26), means the perimeter of the permitted waste disposal area.

F. The Rules at 15A NCAC 2L .0103(d) prohibit any person from conducting, or causing to be conducted, any activity which causes the concentration of any substance to exceed that specified in 15A NCAC 2L .0202.

G. The compliance boundary for disposal systems individually permitted prior to December 30, 1983, is established at a horizontal distance of 500 feet from the waste boundary or at the property boundary, whichever is closer to the source, pursuant to 15A NCAC 2L .0107(a).

H. Permit No. NC0001422 was originally issued on June 30, 1977. On December 2, 2011, Carolina Power & Light d/b/a Progress Energy Carolinas, Inc. was issued the most recent NPDES permit No. NC0001422 for discharge of wastewater from the L.V. Sutton Energy Complex.

I. By letter dated June 10, 2013, Duke Energy requested that all permits listed under Carolina Power & Light d/b/a Progress Energy Carolinas, Inc. be changed to Duke Energy Progress, Inc. This letter included an attachment listing all permits necessitating name changes, which included Permit No. NC0001422.

J. Permit No. NC0001422 is required under North Carolina General Statute 143-215.1.

K. Fly Ash and bottom Ash generated from coal combustion was stored in on-site Ash management areas. The Ash basin system consists of two Ash basins (built in approximately 1971 and 1984). This system is part of the Plant's wastewater treatment and disposal system covered under Permit No. NC0001422.

L. Permit Condition A. (8) requires Groundwater Monitoring, well construction, and sampling in accordance with the Sampling Plan approved by the Division. The approved Groundwater Monitoring Plan for Permit No. NC0001422 established a Compliance Boundary around the permitted facility in accordance with the requirements of 15A NCAC 2L .0107(a).

M. This disposal system was individually permitted prior to December 30, 1983; therefore the Compliance Boundary is established at either 500 feet from the effluent disposal area, or at the property boundary, whichever is closest to the effluent disposal area. Duke Energy does not meet the Rules in 15A NCAC 2L .0106(e)(2), and therefore, an exceedance of Groundwater Quality Standards at or beyond the Compliance Boundary is a violation subject to corrective action according to 15A NCAC 02L .0106(c).

N. The approved Groundwater Monitoring Plan for Permit No. NC0001422 required monitoring for select groundwater parameters from monitor wells. The Groundwater Monitoring Plan was revised on March 17, 2011 and again on October 24, 2012.

O. The Groundwater Quality Standards established in 15A NCAC 2L .0202 in Class GA waters for the following parameters are summarized in the following table:

Arsenic	10 *ug*/l
Boron	700 *ug*/l
Iron	300 *ug*/l

Manganese	50 *ug*/l
Selenium	20 *ug*/l
Thallium	0.2 *ug*/l
Total Dissolved Solids (TDS)	500 mg/l

P. The Division received groundwater monitoring reports from Duke Energy beginning in 1995. Monitoring reports confirm that violations of the Groundwater Quality Standards have occurred at or beyond the compliance boundary at this facility.

Q. Groundwater monitoring wells MW-4 and MW-5 represent background ambient conditions.

R. The violations of Groundwater Quality Standards for Arsenic occurred in monitor well MW-21C, located at or beyond the Compliance Boundary. Concentrations of Arsenic were determined to be below detection levels in background wells. The concentrations of Arsenic in monitoring well(s) exceeded the Groundwater Quality Standards for the time period from October 2, 2013 through October 2, 2014, representing 365 days of continuous violation.

S. The violations of Groundwater Quality Standards for Boron occurred in monitor wells MW-12, MW-19, MW-21C, MW-22C, MW-23B, MW-23C, MW-24B, MW-24C, and MW-31C located at or beyond the compliance boundary. Concentrations of Boron were determined to be below detection levels in background wells. The concentrations of Boron in monitoring well(s) exceeded the Groundwater Quality Standards for the time period from October 6, 2009 through October 2, 2014, representing 1,822 days of continuous violation.

T. The violations of Groundwater Quality Standards for Iron occurred in monitor wells MW-21C, MW-24C, and MW-31C located at or beyond the compliance boundary. The concentrations of Iron in monitoring well(s) indicate a statistically significant difference when compared to the concentrations of Iron in the background wells, indicating an exceedance of the Groundwater Quality Standards for the time period from October 2, 2012 through October 2, 2014, representing 730 days of continuous violation.

U. The violations of Groundwater Quality Standards for Manganese occurred in monitor wells MW-19, MW-21C, MW-22C, MW-23C, MW-24C, and MW-31C located at or beyond the compliance boundary. The concentrations of Manganese in monitoring well(s) indicate a statistically significant difference when compared to the concentrations of Manganese in the background wells, indicating an exceedance of the Groundwater Quality Standards for the time period from October 2, 2012 through October 2, 2014, representing 730 days of continuous violation.

V. The violations of Groundwater Quality Standards for Selenium occurred in monitor well MW-27B, located at or beyond the compliance boundary. Concentrations of Selenium were determined to be below detection levels in background wells. The concentrations of Selenium in monitoring well(s) exceeded the Groundwater Quality Standards for the time period from October 2, 2012 through October 1, 2014, representing 729 days of continuous violation.

W. The violations of Groundwater Quality Standards for Thallium occurred in monitor wells MW-19 and MW-24B located at or beyond the compliance boundary. Concentrations of

Thallium were determined to be below detection levels in background wells. The concentrations of Thallium in monitoring well(s) exceeded the Groundwater Quality Standards for the time period from March 9, 2010 through October 2, 2014, representing 1,668 days of continuous violation.

X. The violations of Groundwater Quality Standards for Total Dissolved Solids (TDS) occurred in monitor well MW-24C located at or beyond the compliance boundary. Concentrations of TDS were determined to be below detection levels in background wells. The concentrations of TDS in monitoring well(s) exceeded the Groundwater Quality Standards for the time period from October 3, 2012 through October 1, 2014, representing 728 days of continuous violation.

Y. On August 26, 2014, a Notice of Violation (NOV) and Notice of Intent to Enforce was issued to Duke Energy for conducting or controlling an activity that caused the concentration of contaminants in groundwater to exceed the groundwater standards adopted pursuant to N.C.G.S. 143-214.1 and set forth in 15A NCAC 2L .0202. The NOV was sent by Certified Mail, Return Receipt Requested and received on August 29, 2014.

Z. The cost to the State of the enforcement procedures in this matter totaled $8,883.61.

Based upon the above Findings of Fact, I make the following:

II. CONCLUSIONS OF LAW:

A. Duke Energy Progress, Inc. is a "person" within the meaning of G.S. 143-215.6A pursuant to N.C.G.S. 143-212(4).

B. Permit No. NC0001422 is required by N.C.G.S. 143-215.1.

C. Permit No NC0001422 was originally issued on June 30, 1977.

D. Compliance with all conditions set forth in Permit No. NC0001422 is required for wastewater treatment and disposal operations pursuant to G.S. 143-215.6A(a)(2).

E. The Waste Boundary, as defined at 15A NCAC 2L .0102 (26), means the perimeter of the permitted waste disposal area.

F. The Compliance Boundary, as defined at 15A NCAC 2L .0102 (3), means a boundary around a disposal system at and beyond which groundwater quality standards may not be exceeded and only applies to facilities which have received a permit issued under authority of G.S. 143-215.1 or G.S. 130A.

G. Duke Energy violated 15A NCAC 2L .0103(d) by conducting an activity causing the concentration of contaminants in groundwater to exceed the groundwater standards adopted pursuant to N.C.G.S. 143-214.1 and set forth in 15A NCAC 2L .0202.

H. Duke Energy violated N.C.G.S. 143-215.1. The Compliance Boundary for the disposal system is specified by regulations in 15A NCAC 2L, Groundwater Classifications and Standards. The Compliance Boundary for the disposal system constructed prior to December 30, 1983 is established at either (1) 500 feet from the waste disposal area, or (2) at the property boundary, whichever is closest to the waste disposal area. An exceedance of Groundwater Quality Standards at or beyond the Compliance Boundary is subject to Corrective Action in addition to the penalty provisions applicable under General Statute 143-215.6A(a)(1). The violations are a result from the sampling of the site's monitoring wells demonstrating the facility to be in violation of the Groundwater Quality Standards.

I. Duke Energy violated 15A NCAC 2L .0202 and -.0103 on 365 days by exceeding the standard referenced in 15A NCAC 2L .0202 for Arsenic at or beyond the compliance boundary in monitor well(s) MW-21C, from October 2, 2013 through October 2, 2014.

J. Duke Energy violated 15A NCAC 2L .0202 and -.0103 on 1,822 days by exceeding the standard referenced in 15A NCAC 2L .0202 for Boron at or beyond the compliance boundary in monitor well(s) MW-12, MW-19, MW-21C, MW-22C, MW-23B, MW-23C, MW-24B, MW-24C, and MW-31C, from October 6, 2009 through October 2, 2014.

K. Duke Energy violated 15A NCAC 2L .0202 and -.0103 on 730 days by exceeding a statistically-established concentration that is higher than the standard referenced in 15A NCAC 2L .0202 for Iron, at or beyond the compliance boundary in monitor well(s) MW-21C, MW-24C, and MW-31C, from October 2, 2012 through October 2, 2014.

L. Duke Energy violated 15A NCAC 2L .0202 and -.0103 on 730 days by exceeding a statistically-established concentration that is higher than the standard referenced in 15A NCAC 2L .0202 for Manganese, at or beyond the compliance boundary in monitor well(s) MW-19, MW-21C, MW-22C, MW-23C, MW-24C, and MW-31C, from October 2, 2012 through October 2, 2014.

M. Duke Energy violated 15A NCAC 2L .0202 and -.0103 on 729 days by exceeding the standard referenced in 15A NCAC 2L .0202 for Selenium at or beyond the compliance boundary in monitor well(s) MW-27B, from October 2, 2012 through October 1, 2014.

N. Duke Energy violated 15A NCAC 2L .0202 and -.0103 on 1,668 days by exceeding the standard referenced in 15A NCAC 2L .0202 for Thallium at or beyond the compliance boundary in monitor well(s) MW-19 and MW-24B, March 9, 2010 through October 2, 2014.

O. Duke Energy violated 15A NCAC 2L .0202 and -.0103 on 728 days by exceeding the standard referenced in 15A NCAC 2L .0202 for Total Dissolved Solids (TDS) at or beyond the compliance boundary in monitor well(s) MW-24C, October 3, 2012 through October 1, 2014.

P. N.C.G.S. 143-215.6A(a)(1) provides that the Secretary of the Department of Environment and Natural Resources may assess a civil penalty of not more than $25,000.00 against any person who violates any classification, standard, limitation or management practice established pursuant to N.C.G.S. 143-214.1, 143-214.2 or 143-215.

Q. N.C.G.S. 143-215.6A(b) provides that if any action or failure to act for which a penalty may be assessed under this section is continuous, the Secretary may assess a penalty not to exceed twenty-five thousand dollars ($25,000) per day for so long as the violation continues, unless otherwise stipulated.

R. N.C.G.S. 143-215.3(a)(9) provides that the reasonable costs of any investigation, inspection, or monitoring survey may be assessed against a person who violates any regulation, standards or limitations adopted by the Environmental Management Commission.

III. DECISION:

Pursuant to N.C.G.S. 143-215.6A, in determining the amount of the penalty, I have taken into account the Findings of Fact and Conclusions of Law and considered all the factors listed in N.C.G.S. 143B-282.1. Accordingly, Duke Energy shall be, and hereby is assessed a civil penalty of:

$1,825,000.00 For violation of N.C.G.S. 143-215.1, 15A NCAC 2L .0202 and -.0103 on 365 days by exceeding the standard referenced in 15A NCAC 2L .0202 for Arsenic at or beyond the compliance boundary in monitor well(s) MW-21C, from October 2, 2013 through October 2, 2014 for a period of **365** days.

$9,110,000.00 For violation of N.C.G.S. 143-215.1, 15A NCAC 2L .0202 and -.0103 on 1,822 days by exceeding the standard referenced in 15A NCAC 2L .0202 for Boron at or beyond the compliance boundary in monitor well(s) MW-12, MW-19, MW-21C, MW-22C, MW-23B, MW-23C, MW-24B, MW-24C, and MW-31C, from October 6, 2009 through October 2, 2014 for a period of **1,822** days.

$730,000.00 For violation of N.C.G.S. 143-215.1, 15A NCAC 2L .0202 and -.0103 on 730 days by exceeding a statistically-established concentration that is higher than the standard referenced in 15A NCAC 2L .0202 for Iron, at or beyond the compliance boundary in monitor well(s) MW-21C, MW-24C, and MW-31C, from October 2, 2012 through October 2, 2014, for a period of **730** days.

$730,000.00 For violation of N.C.G.S. 143-215.1, 15A NCAC 2L .0202 and -.0103 on 730 days by exceeding a statistically-established concentration that is higher than the standard referenced in 15A NCAC 2L .0202 for Manganese, at or beyond the compliance boundary in monitor well(s) MW-19, MW-21C, MW-22C, MW-23C, MW-24C, and MW-31C, from October 2, 2012 through October 2, 2014, for a period of **730** days.

$3,645,000.00 For violation of N.C.G.S. 143-215.1, 15A NCAC 2L .0202 and -.0103 on 729 days by exceeding the standard referenced in 15A NCAC 2L .0202 for Selenium at or beyond the compliance boundary in monitor well(s) MW-27B, from October 2, 2012 through October 1, 2014, for a period of **729** days.

$8,340,000.00 For violation of N.C.G.S. 143-215.1, 15A NCAC 2L .0202 and -.0103 on 1,668 days by exceeding the standard referenced in 15A NCAC 2L .0202 for Thallium

at or beyond the compliance boundary in monitor well(s) MW-19 and MW-24B, from March 9, 2010 through October 2, 2014, for a period of **1,668** days.

$ 728,000.00 For violation of N.C.G.S. 143-215.1, 15A NCAC 2L .0202 and -.0103 on 728 days by exceeding the standard referenced in 15A NCAC 2L .0202 for Total Dissolved Solids (TDS) at or beyond the compliance boundary in monitor well(s) MW-24C, from October 3, 2012 through October 1, 2014, for a period of **728** days.

$ 25,108,000.00 **TOTAL CIVIL PENALTY** which is 20 percent of the maximum penalty authorized by N.C.G.S. 143-215.6A; and

$ $8,883.61 Enforcement costs

$ 25,116,883.61 **TOTAL AMOUNT DUE**

Pursuant to N.C.G.S. 143-215.6A(c), in determining the amount of the penalty I have taken into account the Findings of Fact and Conclusions of Law and the factors set forth at N.C.G.S. 143B-282.1(b), which are:

(1) The degree and extent of harm to the natural resources of the State, to the public health, or to private property resulting from the violation;
(2) The duration and gravity of the violation;
(3) The effect on ground or surface water quantity or quality or on air quality;
(4) The cost of rectifying the damage;
(5) The amount of money saved by noncompliance;
(6) Whether the violation was committed willfully or intentionally;
(7) The prior record of the violator in complying or failing to comply with programs over which the Environmental Management Commission has regulatory authority; and
(8) The cost to the State of the enforcement procedures.

IV. NOTICE:

I reserve the right to assess civil penalties and investigative costs for any continuing violations occurring after the assessment period indicated above. Each day of a continuing violation may be considered a separate violation subject to a maximum $25,000.00 per day penalty. Civil penalties and investigative cost may be assessed for any other rules and statutes for which penalties have not yet been assessed.

V. TRANSMITTAL:

This Civil Penalty Assessment is directed to be transmitted to Duke Energy , in accordance with N.C.G.S. 143-215.6A(d).

3/10/2015
Date

S. Jay Zimmerman, P.G.
Director, Division of Water Resources