GROUNDWATER MONITORING PROGRAM
SAMPLING AND ANALYSIS PLAN

MCGUIRE NUCLEAR STATION

LANDFILL #2 (SYNTHETICALLY LINED)
PERMIT NO. 6004-INDUS

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This document has been reviewed for accuracy and quality commensurate with the intended application.

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Section 1
Program Description

1.1 Scope of Work

The McGuire Nuclear Station (MNS) Landfill #2 (Synthetically Lined)[1] is located at the Duke Energy Carolinas, LLC (Duke Energy) McGuire Nuclear Station near Huntersville in Mecklenburg County, North Carolina. The North Carolina Department of Environment and Natural Resources (NCDENR) Division of Waste Management (DWM) requires groundwater monitoring to determine the effects of the facility on groundwater in the area. In addition to the groundwater monitoring requirements of the DWM, radiological sampling and analyses will be conducted in accordance with requirements of the current Radioactive Materials License No. 060-0379-7 issued by the North Carolina Department of Health and Human Services Radiation Protection Section.

This Groundwater Monitoring Program Sampling and Analysis Plan (SAP) is designed to address the Duke Energy Permit to Operate requirement for groundwater monitoring around MNS Landfill #2 (Synthetically Lined), Permit Number 6004-INDUS. Duke Energy previously submitted a SAP for this landfill in February 2009. This revised and updated SAP supersedes the previously submitted SAP.

This SAP has been prepared according to the guidelines set forth by the North Carolina Water Quality Guidance Document for Solid Waste Facilities (SW-1001-87) and by the EPA, Region IV, in "Environmental Investigations, Standard Operating Procedures and Quality Assurance Manual." It documents the methodologies of field sampling, record-keeping protocols, data quality objectives, and data validation procedures that will be used in the MNS groundwater monitoring program.

[1] In response to the North Carolina Division of Public Health, Radiation Protection Section, November 17, 2006 letter to Duke Energy, LLC, Duke Energy offered to indicate the McGuire Nuclear Station Landfill #2 as "(Synthetically Lined)" in reports.

1.2 Background and Site Hydrogeological Description

The MNS Landfill #2 is permitted by the NCDENR DWM under Permit No. 6004-INDUS. The landfill is permitted to accept waste generated by Duke Energy as specified by the Operations Plan. In general, these wastes are:

- Asbestos
- Insulation (non-asbestos)
- Conventional wastewater sludge
- Empty containers
- Petroleum product spill cleanup materials
- Oil contaminated materials (filters, rags, brush, shrubs)
- Fish waste
- Non-hazardous excess, obsolete, expired chemicals

The landfill was constructed with a high-density polyethylene (HDPE) synthetic liner and leachate collection and removal system. Leachate and contact stormwater are collected in a lined leachate collection basin and pumped to the MNS wastewater treatment system. The landfill first accepted waste in 1999.

The limit of waste for the landfill has an area of approximately 5 acres. The landfill and nearby area are portrayed on Figure 1. The approximate limit of waste is shown on Figure 2.

The landfill is located south of North Carolina Highway 73, north of Cashion Road, and to the west of Linderman Road. Cashion Road runs along a surface water divide with surface flow draining to the northwest and to the southeast. A surface water drainage feature is located to the northeast of the landfill. This feature drains to the northwest, to a perennial unnamed stream, and then to the Catawba River.

Based on the well construction and boring logs (see Appendix A), the subsurface conditions in the landfill area consist of residual soils and partially to fully weathered rock (saprolite) which have formed by the in-place weathering of the parent rock.

The landfill site is located in the Piedmont physiographic province (Piedmont). The following generalizations on the site hydrogeology are taken from "A Master Conceptual Model for Hydrogeological Site Characterization in the Piedmont and Mountain Region of North Carolina" (LeGrand 2004).

Piedmont bedrock primarily consists of igneous and metamorphic bedrock. The fractured bedrock is overlain by a mantle of unconsolidated material known as regolith. The regolith includes, where present, the soil zone, a zone of weathered decomposed bedrock known as saprolite, and alluvium. Saprolite, the product of chemical and mechanical weathering of the underlying bedrock, is typically composed of clay and coarser granular material up to boulder size, and may reflect the texture of the rock from which it was formed. The weathering product of granitic rocks may be quartz-rich and sandy-textured, whereas rocks poor in quartz and rich in feldspar and other soluble minerals form a more clayey saprolite. The regolith serves as the principal storage reservoir for the underlying bedrock. (LeGrand 2004)

A transition zone may occur at the base of the regolith between the soil-saprolite and the unweathered bedrock. This transition zone of partially weathered rock is a zone of relatively high permeability compared to the overlying soil-saprolite and the underlying bedrock. (LeGrand 2004)

Groundwater flow paths in the Piedmont are almost invariably restricted to the zone underlying the topographic slope extending from a topographic divide to an adjacent stream. LeGrand describes this as the local slope aquifer system. Under natural conditions, the topography of the water table is similar to that of the land surface. (LeGrand 2004)

Groundwater recharge in the Piedmont is derived entirely from infiltration of local precipitation. Groundwater recharge occurs in areas of higher topography (i.e., hilltops) and groundwater discharge occurs in lowland areas bordering surface water bodies, marshes, and floodplains. (LeGrand 2004)

Groundwater flow in the area of the landfill is generally from the southeast end of the landfill toward the northwest and toward the unnamed stream. Groundwater flow on the east side of the

landfill is towards the northeast, toward wells MW-6, MW-6A, and MW-10A, and the surface water drainage feature located northeast of the wells.

1.3 Well Locations and Installation

The groundwater in the vicinity of the landfill is monitored through a series of 11 monitoring wells installed to determine groundwater quality in the vicinity of the landfill. With the exception of monitoring well MW-10A, the wells are installed as well pairs with one shallow well and one deeper well adjacent to one another. The monitoring well designated with an "A" is the deeper well in each well pair. Monitoring wells MW-5 and MW-5A are located up-gradient of the landfill area and monitoring wells MW-6, MW-6A, MW-7, MW7-A, MW-8, MW-8A, MW-9, MW-9A, and MW-10A are located down-gradient or cross-gradient of the landfill (Figure 2). In addition, leachate is sampled from the end of the in-flow pipe to the leachate collection pond and surface water is monitored at locations SW-1 and SW-2 (Figure 2). Well elevations and North Carolina State Plane Coordinates are shown in Table 1.

Each of the shallow monitoring wells is screened to intercept the water table and the deep monitoring wells are screened to monitor groundwater deeper in the aquifer above the top of bedrock. These wells are constructed of 2-inch-diameter polyvinyl chloride (PVC) well screen and casing. All wells are Type II monitoring wells installed by a North Carolina registered driller in accordance with applicable NCDENR regulations. A typical monitoring well construction detail is included as Figure 3. The wells screen lengths are shown in Table 1. Well construction records for the monitoring wells are included in Appendix A (Note: With the exception of MW-10A, the monitoring wells at MNS Landfill #2 were re-numbered after the installation of the monitoring wells at MNS Landfill #1. The boring logs and well construction records for monitoring wells MW-5/5A, MW-6/6A, MW-7/7A, MW-8/8A, and MW-9/9A are identified as MW-1/1A, MW-2/2A, MW-3/3A, MW-4/4A, and MW-5/5A, respectively). All wells are equipped with dedicated pump systems.

A brief description of the monitoring locations and their monitoring function is provided below.

Monitoring Wells MW-5 and MW-5A

Monitoring wells MW-5 and MW-5A are located to the south/southeast of the landfill at the approximate limit of waste and inside the Review Boundary. Monitoring well MW-5 is screened to monitor groundwater in the saprolite layer. Monitoring well MW-5A is screened to monitor groundwater in the partially weathered rock/bedrock layer (transition zone).

Monitoring Wells MW-6 and MW-6A

These monitoring wells are located northeast of the landfill at the approximate Review Boundary and within the Compliance Boundary. Monitoring well MW-6 is screened to monitor groundwater in the saprolite layer. Monitoring well MW-6A is screened to monitor groundwater in the transition zone.

Monitoring Wells MW-7 and MW-7A

These monitoring wells are located west/northwest of the landfill, at the approximate Compliance Boundary. Monitoring well MW-7 is screened to monitor groundwater in the saprolite layer. Monitoring well MW-7A is screened to monitor groundwater in the transition zone.

Monitoring Wells MW-8 and MW-8A

These monitoring wells are located north of the landfill between the limit of waste and the Review Boundary. Monitoring well MW-8 is screened to monitor groundwater in the saprolite layer. Monitoring well MW-8A is screened to monitor groundwater in the transition zone.

Monitoring Wells MW-9 and MW-9A

These monitoring wells are located west of the landfill outside of the Compliance Boundary and adjacent to and downgradient from the leachate collection basin. Monitoring well MW-9 is screened to monitor groundwater in the saprolite layer. Monitoring well MW-9A is screened to monitor groundwater in the transition zone.

Monitoring Well MW-10A

This monitoring well is located east of the landfill between the Review Boundary and the Compliance Boundary. Monitoring well MW-10A is screened to monitor groundwater in the transition zone.

1.4 Surface Water Sample Locations

Surface water samples will be collected from two locations, SW-1 and SW-2, as shown on Figure 2. Surface water sample location SW-1 is located in the unnamed stream north of the landfill and will be used as the background surface water sample location for this monitoring program. Surface water sample location SW-2 is also located in this unnamed stream downstream from SW-1 and west of the landfill. The unnamed stream drains to the west to the Catawba River. Analytical results from these locations will be compared to Title 15A, North Carolina Administrative Code, Subchapter 2B Standards (2B Standard).

1.5 Leachate Sample Location

The leachate sample is collected from the outfall of the leachate pipe which conveys leachate from the landfill to the leachate collection basin (Figure 2).

1.6 Monitoring Frequency

The monitoring wells, surface water sample locations, and leachate will be sampled semiannually in June and December. Sampling results will be submitted to the State within 90 days of sampling.

1.7 Sample Parameters and Methods

The parameters to be sampled, units of measure, analytical methods, and NCDENR Solid Waste Section Limits (SWSLs) are presented in Table 2. Radiological analyses and units of measure are shown in Table 3.

1.8 Data Quality Objectives

The overall Quality Assurance (QA) objective is to ensure that reliable data of known and acceptable quality are provided. All measurements will be documented to yield results that are representative of the groundwater and surface water quality. Data will be calculated and reported in units as required by NCDENR.

The analytical QA objectives for precision, accuracy, and completeness have been established by the laboratory(s) in accordance with EPA or other accepted agencies for each measurement variable where possible. The objectives are outlined in the Duke Energy Analytical Laboratory Procedures Manual and are available upon request.

As required by the Solid Waste Section Memorandum Regarding New Guidelines for Electronic Submittal of Environmental Data, dated October 27, 2006, data will be reported to laboratory-specific method detection limits and will be quantifiable at or below the Solid Waste Section Limit (SWSL) for both groundwater and surface water. Appropriate methods have been selected to meet applicable standards for groundwater quality. Instances may occur, however, in which the condition of the sample will not allow detection of the desired limits for various parameters either because of matrix interference or high analyte concentrations requiring sample dilution. The laboratory(s) will provide sufficient documentation with each data package to notify reviewers about any analytical problems with the data, if needed.

Section 2

Sampling Procedures

2.1 Sampling Equipment

Development, purging, and sampling equipment shall be selected to ensure materials are compatible with the sample parameters and comply with state and federal regulatory requirements for sampling. Positive-gas-displacement fluorocarbon resin bladder pumps are installed in each monitoring well as dedicated purging and sampling systems.

2.1.1 Equipment Cleaning Procedures

Dedicated sampling equipment has been installed in each monitoring well. In the event non-dedicated equipment is used between monitoring wells, equipment will be cleaned before and after use in each well in accordance with standard EPA-approved cleaning procedures for field equipment. This standard is outlined in the "Standard Operating Procedures and Quality Assurance Manual," Engineering Support Branch, EPA Region IV, February 1, 1991.

2.2 Groundwater Sampling

2.2.1 Development of Monitoring Wells

All 11 monitoring wells addressed in this sampling plan have been developed.

If new monitoring wells are installed, they will be developed prior to initial sampling. Development removes silt that has settled into the bottom of the well following installation and removes fine silt and clay particles from the well screen and sand-pack surrounding the screen. Well development is necessary to eliminate potential clogging and enhance well performance. Development involves removing an estimated ten or more well volumes from the well using a positive-gas-displacement fluorocarbon resin bladder pump with up-and-down agitation to

loosen particles from the well screen. After development of a well, a true well depth is recorded referenced to the well top of well casing (TOC).

2.2.2 Groundwater Level and Total Depth Measurements

Water level measurements shall be collected and recorded to determine the groundwater elevations and groundwater flow direction and to calculate the volume of standing water in the well. All monitoring wells have been surveyed to determine the elevation of the TOC. All depth and water level measurements shall be referenced to the TOC and recorded to the nearest one-hundredth of a foot.

Water level measurements shall be made with an electronic measuring device consisting of a spool of dual-conductor wire and sensor. When the sensor comes in contact with water, the circuit is closed and a meter light and/or buzzer is attached to the spool to signal the contact. The sensor is lowered further until it rests on the bottom of the well to determine the total depth of the well reference to the TOC. The depth and water level measurements shall be used to verify that the well has not filled with silt and to calculate the volume of water in the well.

The volume of well water (in gallons) is calculated using the following equation:

$$V = h * \pi r^2 * (7.48052 \text{ gal/ft}^3)$$

Where:

V = volume of water in the well screen and casing (gallons)

h = height of standing water (feet) = total well depth - water level

r = radius of well casing (feet)

For example, a 2-inch-diameter casing will have a volume of 0.1631 gallons/foot.

In dedicated sampling systems, an accurate well depth is determined, as indicated above, after development of the well and prior to installation of the dedicated bladder pump. The well depth will be re-measured any time the dedicated sampling system is removed for repair or

replacement. The well depth, water level measurement, and calculated well volume shall be recorded on the Groundwater Monitoring Data Sheet (Figure 4).

2.2.3 Well Purging and Sampling

The selection of purging technique is dependent on the hydrogeologic properties of the aquifer and hydraulic characteristics of each well. Hydraulic conductivity, water column, well volume, screen length, and other information are evaluated to select the purging technique to acquire groundwater representative of the aquifer conditions. The Groundwater Monitoring Data Sheet (Figure 4) is used to record purging methods and measurements.

A multi-parameter water quality monitoring instrument is used to measure field stabilization or indicator parameters for determining representative groundwater during purging. These instruments measure pH, specific conductance, temperature, dissolved oxygen (DO), and oxidation-reduction potential (ORP). Instrument calibration must be performed and documented before and after each sampling event. The pH subsystem will be calibrated with two pH standards (pH 7.0 and 4.0) bracketing the expected groundwater pH. The specific conductance subsystem will be calibrated using two standards bracketing the expected groundwater conductivity. Calibration results will be recorded on a Field Sampling Calibration Form (Figure 5).

Various well purging techniques are described below. The purging method utilized at any particular well will be selected after considering the characteristics of the well and the purging method(s) used during previous sampling events.

<u>Conventional Purging</u>

This technique entails removing one equivalent well volume and measuring the indicator parameters (temperature, pH, and specific conductance). When the parameters have stabilized to within ±0.2 pH units and ±10 percent for temperature and conductivity over three to five well volumes, representative groundwater has been achieved for sampling. It is acceptable to begin sampling after five complete well volumes have been removed, even when indicator parameters have not stabilized. Groundwater is pumped into a graduated container to measure the volume of

water purged. Under normal rates of recovery, samples should be collected immediately after purging in accordance with EPA guidelines.

For low-yield wells incapable of yielding three to five well volumes in a reasonable amount of time (e.g., 2 hours or less), groundwater is purged to the elevation of the pump intake while measuring indicator parameters. Typically, low-yield wells are evacuated to dryness one time and sampled when sufficient water level recovery occurs.

Low-Flow Purging

Low-flow purging and sampling are appropriate when the recharge rate of the well approximates or equals the discharge rate of the pump with minimal drawdown of the water column (≤ 1 foot). During low-flow purging and sampling, groundwater is pumped into a flow-through chamber at flow rates that minimize or stabilize water level drawdown within the well. Indicator parameters are measured over time (usually at 5-minute intervals). When parameters have stabilized within ±0.2 pH units and ±10 percent for temperature, conductivity, and DO, and ±10 millivolts (mV) for ORP over three consecutive readings, representative groundwater has been achieved for sampling. Turbidity is not included as a stabilization parameter, but turbidity levels of 10 nephelometric turbidity units (NTU) or less should be targeted.

Modified Low-Flow Purging

This technique is considered a viable option particularly in the Piedmont region due to the likely presence of fine-grained soils where water level drawdown cannot be stabilized while pumping. When the well recharge rate is less than the pump discharge rate, excessive drawdown (> 1 foot) of the water column occurs and mixes with stagnant water located above the screened interval. One equivalent well volume is removed initially before measuring indicator parameters. Frequently, removal of the initial well volume reduces the hydraulic head and allows for matching of the recharge rate with the pumping rate providing stabilization of drawdown. Indicator parameters should be measured at 5-minute intervals using a flow-through chamber attached to a multi-parameter water quality instrument. When parameters have stabilized to within ±0.2 pH units, ±10 percent for temperature, conductivity, and DO, and ±10 mV for ORP over three consecutive readings, representative groundwater has been achieved for sampling.

Turbidity is not included as a stabilization parameter, but turbidity levels of 10 NTU or less should be targeted.

Very Low Yield Well Purging

This technique provides the best option for monitoring wells that historically purge to dryness and do not sufficiently recharge to provide adequate volume for sample collection. The volume of the pumping system (i.e., the pump bladder, tubing, and flow-through chamber) is calculated for removal. Wells that yield less than 100 milliliters per minute (mL/min) frequently incur significant drawdown during well purging. Therefore, if the well yield is less than 100 mL/min, the volume of the pumping system (i.e., the pump bladder, tubing, and flow-through chamber) shall be calculated and two pumping system volumes shall be removed. Indicator parameters will be measured and recorded initially, and then sample collection will begin.

2.3 Surface Water Sampling

Surface water samples will be collected using techniques and equipment that preserve characteristics of the water body being investigated and minimize the chance for sample contamination. Typically, samples shall be collected by grab or peristaltic pump.

When filling a sample container by grab, always use new, clean, non-powdered nitrile gloves. Grasp the sample container by the lower half and position the container opening to face upstream. When using a peristaltic pump to collect a surface water sample, position the intake opening above the stream bottom to minimize the potential for collecting sediment. Run the pump for several minutes to ensure representative water is being collected after positioning the intake opening.

2.4 Sample Collection

Groundwater samples are collected after representative groundwater has been determined by purging and stabilizing the indicator parameters.

Surface water samples are "grab" samples collected to the extent possible at mid-depth in the middle of the stream in an area that exhibits the greatest degree of cross-sectional homogeneity. The leachate sample is collected from the outfall of the leachate pipe which conveys leachate from the landfill to the leachate collection basin

Sampling personnel wear clean, disposable, non-powdered nitrile gloves at each location. Samples are collected in the order of the volatilization sensitivity of the parameters:

- Volatile Organic Compounds (VOCs) and TPH
- Metals
- Sulfate, Chloride
- Radiological (gross alpha and beta, gamma spectroscopy, and tritium)

After collection, samples will be preserved and stored according to parameter specific methods and delivered to the laboratory under proper Chain-of-Custody procedures. All pertinent notations, water-level measurements, removed well volumes, and indicator parameters shall be documented on the Groundwater Monitoring Data Sheet (Figure 4).

2.5 Sample Containers, Volume, Preservation, and Holding Time

All sample containers supplied by the laboratory for the collection of groundwater, surface water, and leachate samples shall be new and pre-cleaned as approved by EPA procedures appropriate for the parameters of interest. Table 4 summarizes the sample containers, sample volume, preservation procedures, and holding times required for each type of sample and parameter. Sample containers will be kept closed until used. All sample containers will be provided by Duke Energy or vendor laboratories.

2.6 Sample Tracking

The Chain-of-Custody (COC) procedures allow for tracing the possession and handling of individual samples from the time of field collection through laboratory analysis and report

preparation. Samples shall be pre-logged prior to sample collection. This process assigns a unique tracking number for each sample and generates corresponding labels. An example of the COC Record is provided as Figure 6.

2.7 Sample Labeling

Sample containers shall be pre-labeled and organized prior to field activities as part of the pre-sampling staging process. As samples are collected, the sampling personnel shall write the following information directly on the label: sampling date and time, and initials of sample collector. This information is also recorded on the Groundwater Monitoring Data Sheet (Figure 4) and the COC Record (Figure 6).

2.8 Field Documentation

Field documentation from each sampling event is recorded on the Groundwater Monitoring Data Sheets (Figure 4), the Field Sampling Calibration Form (Figure 5), and the Chain-of-Custody Record (Figure 6). Additionally, a Groundwater Sampling Site Checklist (Figure 7) is completed indicating information of the monitoring well such as proper identification (ID) tag and condition of protective casing and pad. Field notations shall be made during the course of the field work to document the following information:

- Identification of well
- Well depth
- Static water level depth and measurement technique
- Presence of immiscible layers and detection method
- Well yield – high or low
- Purge volume or pumping rate
- Sample identification numbers
- Well evacuation procedure/equipment
- Sample withdrawal procedure/equipment
- Date and time of collection

- Types of sample containers used
- Identification of replicates or blind samples
- Preservative(s) used
- Parameters requested for analysis
- Field analysis data and methods
- Sample distribution and transporter
- Field observations during sampling event
- Name of sample collector(s)
- Climatic conditions including estimate of air temperature

This information will be entered on the Groundwater Monitoring Data Sheets (Figure 4), the Field Sampling Calibration Form (Figure 5), or the Chain-of-Custody Record and Analysis Request Form (Figure 6) which are filled out for each sampling event. These documents will be arranged and filed by project and date. Recorded entries will be made on electronic forms or on paper forms in indelible ink. Errors on paper documents will be corrected by drawing a line through the error, initialing and dating the correction, and starting a new entry on the next line (if necessary).

2.9 Chain-of-Custody Record

The COC record (Figure 6) accompanies the sample(s), traces sample possession from time of collection to delivery to the laboratory(s), and clearly identifies which sample containers have been designated for each requested analysis. The record includes the following types of information:

- Sample identification number
- Signature of collector
- Date and time of collection
- Sample type (e.g., groundwater, immiscible layer)
- Identification of well
- Number of containers
- Parameters requested for analysis

- Preservative(s) used
- Signature of persons involved in the chain of possession
- Inclusive dates of possession

2.10 Sample Custody, Shipment, and Laboratory Receipt

For the purpose of these procedures, a sample is considered in custody if it is:

- In actual possession of the responsible person
- In view, after being in physical possession
- Locked or sealed in a manner so that no one can tamper with it after having been in physical custody or in a secured area restricted to authorized personnel

All samples shall be maintained in the custody of the sampling crew during the sampling event. At the end of each sampling day and prior to the transfer of the samples off site, entries shall be completed on the COC for all samples. Upon transfer of custody, the COC form is signed by a sampling crew member, including the date and time. If outside vendor laboratories are utilized, samples shall be delivered to these facilities by Duke Energy personnel or courier.

All COC forms received by the laboratory(s) shall be signed and dated by the respective supervising scientist(s) or their designee (at the Duke Energy lab) or the laboratory sample custodian (at vendor labs) immediately following receipt by the laboratory.

The analysts at the laboratory(s) maintain a sample-tracking record that will follow each sample through all stages of laboratory processing. The sample tracking records show the date of sample extraction or preparation and analysis. These records are used to determine compliance with holding time limits during lab audits and data validation.

Custody procedures followed by Duke Energy laboratory personnel are described in detail in the Duke Energy Laboratory Services Procedures Manual.

Section 3
Analytical Procedures

The main analytical laboratory used in this program is the Duke Energy Laboratory Services Laboratory: N.C. Drinking Water (NC37804) and Wastewater (#248) Certifications. The organizational structure and staff qualifications of the laboratory are discussed in its generic Quality Assurance Program (QAP). The QAP and the Analytical Laboratory Procedures Manual are available for review upon request.

Vendor laboratories that meet EPA and North Carolina certification requirements may be used for analyses with approval by Duke Energy.

The analytical procedures used for this Groundwater Monitoring Program are listed in Table 3. Specific conductance, field pH, and temperature are measured in the field according to the Duke Energy Groundwater Monitoring and Sample Collection Procedure or the instrument manufacturer instructions.

Section 4
Internal Quality Control Checks

Internal laboratory quality control (QC) checks used by the laboratories are described in each laboratory's generic QAP and procedures manual. Using the internal laboratory QC checks, the laboratories demonstrate the ability to produce acceptable results using the methods specified.

Internal quality control checks for sampling procedures and laboratory analyses will be conducted with each sampling event. These checks will consist of the preparation and submittal of field blanks, trip (travel) blanks, and/or field replicates for analysis of all parameters at frequencies described in the laboratory(s) procedures manuals.

The field QC blanks and replicates that may be included as internal QC checks are described below. The specific type and number of blanks used may vary depending on the sampling event and will be determined by the Duke Energy field sampling personnel:

- **Field Blanks**: A field blank consists of a sample container filled in the field with organic-free, deionized, or distilled water prepared and preserved in the same manner as the samples. The field blank is transported to the laboratory with the samples and analyzed along with the field samples for the constituents of interest to check for contamination imparted to the samples by the sample container, preservative, or other exogenous sources. Field blanks are typically utilized for each sampling event. The Field Blanks are typically analyzed for major anions and cations and metals.
- **Trip Blanks**: A trip (travel) blank is a sample container filled with organic-free water in the laboratory that travels unopened with the sample bottles. Trip blanks are typically utilized when sampling for volatile organic compounds. The Trip Blank is returned to the laboratory with the field samples and analyzed along with the field samples for parameters of interest.
- **Equipment Blanks**: If non-dedicated equipment is used between wells, it is recommended that equipment blanks be collected. The field equipment is cleaned following documented cleaning protocols. An aliquot of the final control rinse water is passed over the cleaned equipment directly into a sample container and submitted for analyses.

- **Field Replicates**: A field replicate is a duplicate sample prepared at the sampling locations from equal portions of all sample aliquots combined to make the sample. Both the field replicate and the sample are collected at the same time, in the same container type, preserved in the same way, and analyzed by the same laboratory as a measure of sampling and analytical precision.

Section 5
Validation of Field Data Package

The field data package includes all of the field records and measurements developed by the sampling team personnel. The field data package validation will be performed by Duke Energy personnel. The procedure for validation consists of the following:

- A review of field data contained on the Groundwater Monitoring Data Sheets for completeness.
- Verification that equipment blanks, field blanks, and trip blanks were properly prepared, identified, and analyzed.
- A check of the Field Sampling Calibration Form for equipment calibration and instrument conditions.
- A review of the Chain-Of-Custody Record for proper completion, signatures of field personnel and the laboratory sample custodian, dates and times, and for verification that the correct analyses were specified.

Section 6
Validation of Laboratory Data

The laboratory will perform a validation review of the submitted samples and analytical results to ensure that the laboratory QA/QC requirements are acceptable.

Section 7

Report Submittal

7.1 Report Submittal to DWM

A report of monitoring results will be submitted to the DWM within 90 days following the date of sampling. The report submittal will consist of the following:

- Environmental Monitoring Reporting Form (DENR Form)
- Table of results and discussion of Title 15A, North Carolina Administrative Code, Subchapter 2L Standards (2L Standard) and 2B Standard Exceedances
- Generalized Groundwater Contour Map
- Electronic Data Deliverable (EDD) in Excel Format

DWM will be notified in the event that vendor lab analyses have not been completed within this time frame. All Groundwater Monitoring Data Sheets, Field Calibration Forms, Chain-of-Custody Records, Laboratory QA data, and Data Validation Checklists shall be kept on file by Duke Energy and are available upon request.

7.2 Report Submittal to Health and Human Services Radiation Protection Section

As described in Section 1.1, radiological sampling and analyses will be conducted in accordance with requirements of the current Radioactive Materials License No. 060-0379-7 issued by the North Carolina Department of Health and Human Services Radiation Protection Section.

A copy of the report containing the monitoring results will be submitted to the North Carolina Department of Health and Human Services Radiation Protection Section within 90 days following the date of the sampling event.

Section 8
References

LeGrand Sr., Harry E. 2004. A Master Conceptual Model for Hydrogeological Site Characterization in the Piedmont and Mountain Region of North Carolina, a Guidance Manual.

FIGURES

NOTES:
SOURCE: USGS TOPOGRAPHIC MAP - LAKE NORMAN SOUTH QUADRANGLE. CREATED 2011.

SCALE (FEET)
1,000 0 1,000 2,000

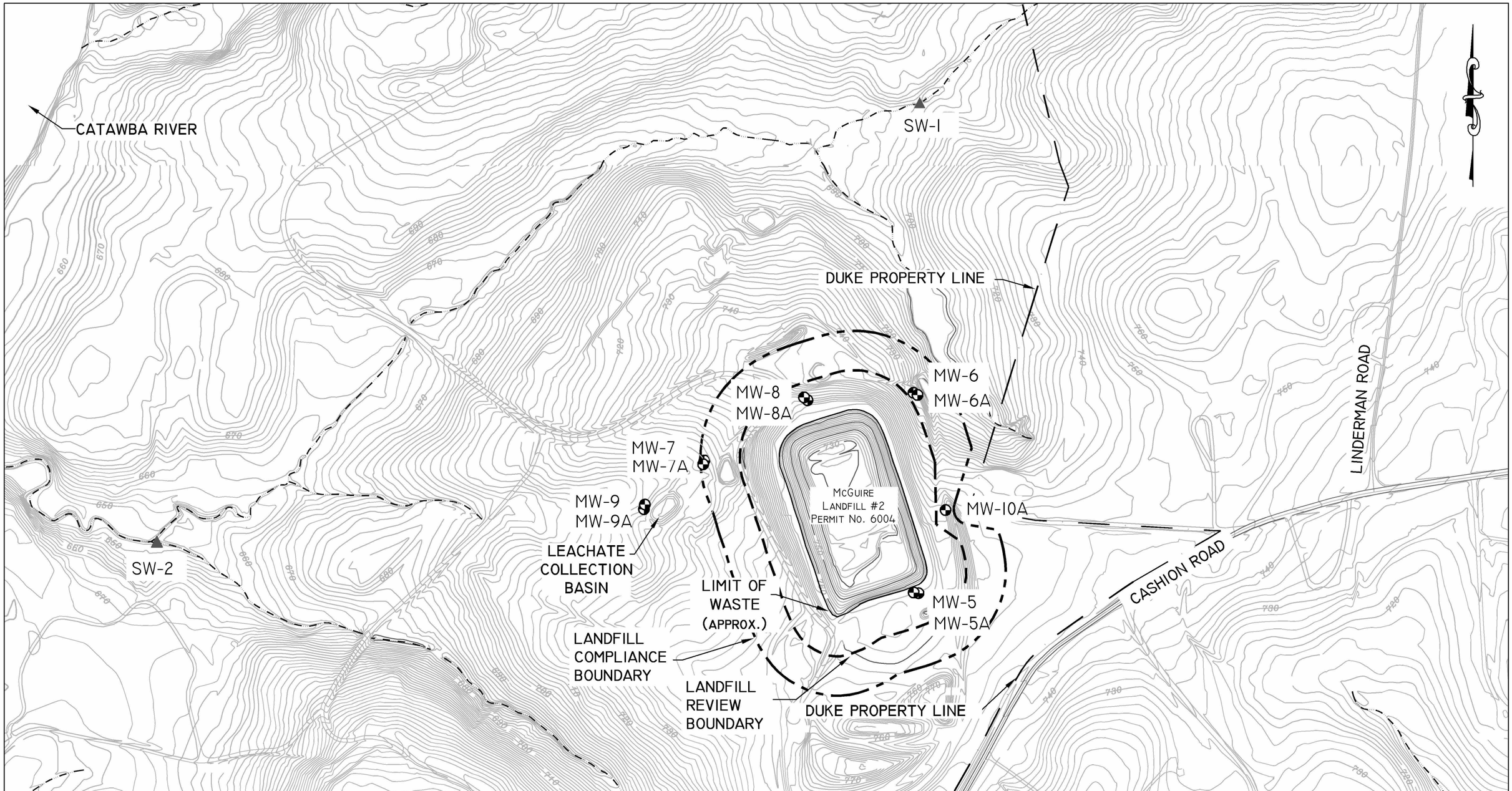
HDR
HDR Engineering, Inc. of the Carolinas
License Number: F-0116
440 South Church Street Charlotte, NC 28202

SITE LOCATION MAP
MCGUIRE NUCLEAR STATION
LANDFILL #2 (SYNTHETICALLY LINED)
PERMIT NO. 6004-INDUS

DATE
MARCH 28, 2014

FIGURE
1

C:\pwworking\tpa\d0388545\Site Location Map.dwg



BASE MAP AND STREAM DATA PROVIDED BY DUKE ENERGY CAROLINAS, LLC.

LEGEND

- GROUNDWATER MONITORING WELLS
- SURFACE WATER SAMPLE LOCATION
- APPROXIMATE LIMIT OF WASTE
- LANDFILL REVIEW BOUNDARY
- LANDFILL COMPLIANCE BOUNDARY
- DUKE PROPERTY BOUNDARY
- STREAM

SCALE (FEET)

150 0 150 300

HDR

HDR Engineering, Inc.
of the Carolinas

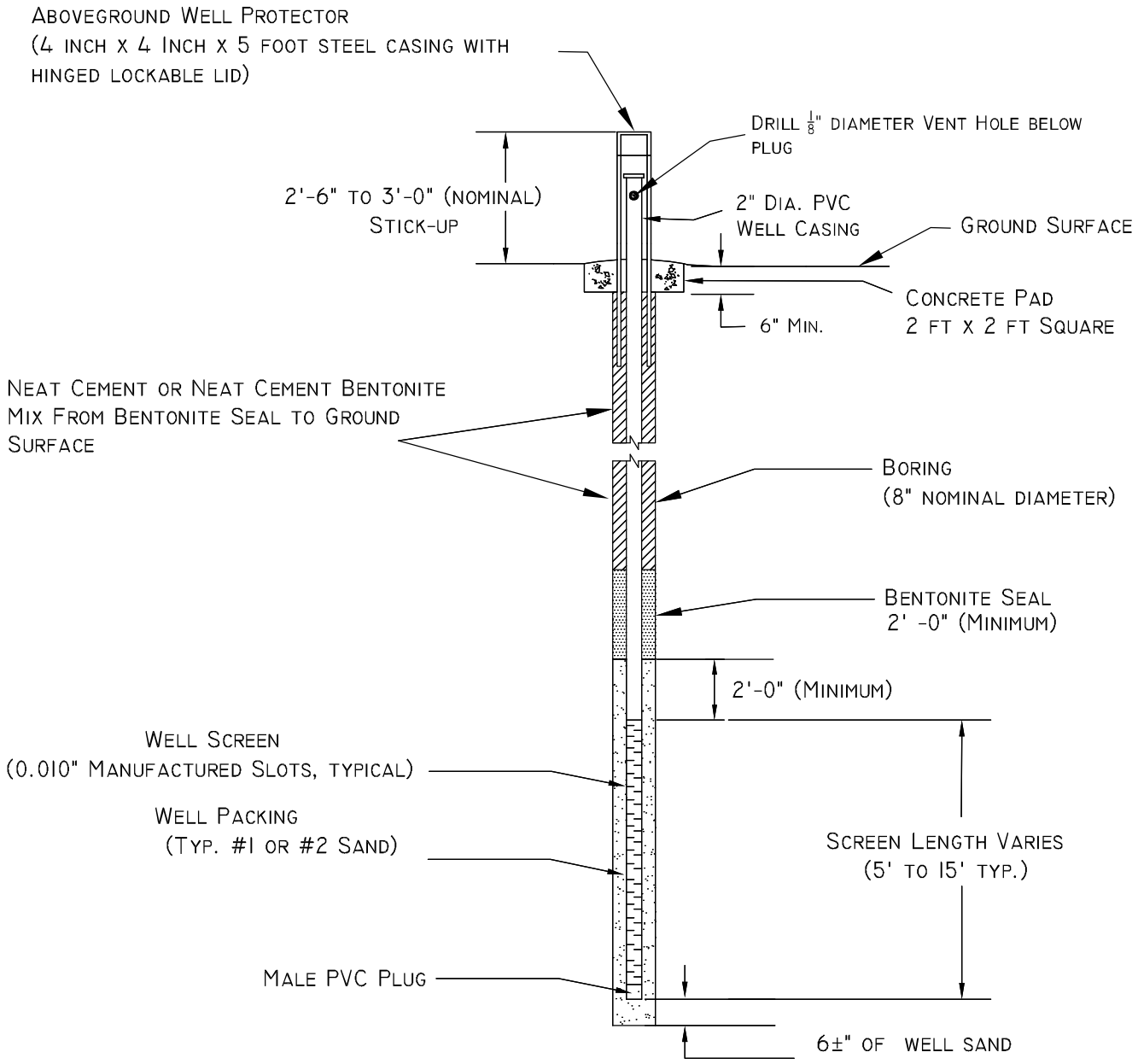
License Number: F-0116
440 S Church Street Charlotte, NC 28202

SAMPLE LOCATIONS
MCGUIRE NUCLEAR STATION
LANDFILL #2 (SYNTHETICALLY LINED)
PERMIT NO. 6004-INDUS

DATE
MARCH 28, 2014

FIGURE
2

C:\pwworking\tpa\d0388545\MNS LF #2.dwg



Typical Well Construction Details
(no scale)

INFORMATION PROVIDED BY DUKE ENERGY CAROLINAS, LLC

HDR

HDR Engineering, Inc.
of the Carolinas

License Number: F-0116
440 South Church Street Charlotte, NC 28202

TYPICAL MONITORING WELL CONSTRUCTION DETAILS

DATE
MARCH 28, 2014

FIGURE
3

C:\pwworking\tpa\d0548925\Figure 3 with HDR Title Block.dwg

DUKE ENERGY

GROUNDWATER MONITORING DATA SHEET
FOR CONVENTIONAL SAMPLING

PROCEDURE NO	3175.1

SITE NAME	McGUIRE NUCLEAR STATION	PERMIT #	6004-INDUS	SITE ID	N/A
PROJECT NAME	LANDFILL 2 GROUNDWATER MONITORING	FIELD CREW	LDC		
SAMPLING DATE(s)	☑ 11-Dec-2013 ☐ 12-Dec-2013 ☐ ☐	WELL/LOCATION NAME			

MONITORING WELL INFORMATION

WELL DIAMETER (in)	2	TOC ELEV (ft msl)	768.31	MIDDLE OF WETTED SCREEN (ft toc)	56.90
WELL DEPTH (ft TOC)	63.90	GS ELEV (ft msl)		PUMP INTAKE DEPTH (ft TOC)	62.90
SCREEN LENGTH (ft)	14.00	ELEV REF	NAVD 88	SCREEN INTERVAL (ft TOC)	49.90 TO 63.90

EQUIPMENT INFORMATION

LEVEL METER SERIAL#		SAMPLING EQUIPMENT	QED T1200	PURGE METHOD	
		TUBING DIAMETER (in)	1/2 OD	Conventional	

PUMP CONTROLLER SETTINGS								
PRESSURE	38	(psi)	RECHARGE	10	(sec)	DISCHARGE	5	(sec)

SAMPLING INFORMATION

INITIAL DEPTH TO WATER (ft TOC)		WATER COLUMN (ft)	
WATER ELEVATION (ft msl)		WELL VOLUME (gal)	
DETECTED ODOR	None	CONVERSION FACTOR	0.1631
APPEARANCE	Normal		

Well Volume = water column X conversion factor
(Conversion factor dependent on well diameter and selected well volume units)

PURGE VOLUME (gal)	WATER LEVEL AFTER PURGE * (ft)	COMPLETE EVACUATION (YES/NO)	☑ TEMP (deg C)	☑ SPECIFIC COND. (umho/cm)	☑ pH (SU)	☑ TURBIDITY (NTU)	☐ ORP (mV-NHE)	☐ DISSOLVED OXYGEN (mg/L)	☐ (gal) WELL VOL (recalculates on current water level)
							N/A	N/A	

TOTAL PURGE VOLUME	* Optional measurement to recalculate well volume when purging results in substantial drawdown of water column	SAMPLE COLLECTED BY	DATE	TIME	CHLORINE (mg/l)
0.00			12/11/2013	@	0

QC By:	

WELL CONDITION

PROTECTIVE CASING	Good Condition	
WELL PAD	Good Condition	
WELL CASING	Good Condition	
WELL TAG	Good Tag	

ADDITIONAL WELL CONDITION NOTES

SAMPLING NOTES

Figure 4: Example Groundwater Monitoring Data Sheet

FIELD SAMPLING CALIBRATION FORM

STUDY: McGUIRE NUCLEAR STATION - LANDFILL 2 GROUNDWATER MONITORING

DATE (s): | **SURFACE UNIT READER:**

COLLECTORS: | **SURFACE UNIT SERIAL #:**

ANALYZER MODEL#: | **ANALYZER SERIAL #:**

OTHER EQUIPMENT: TURBIDIMETER NO.1 - 3260.2 | **WEATHER CONDITIONS:**

PROCEDURE #: HYDROLAB 3210.5 **VALIDATED BY:**

Calibration Date / Time		DATE:		TIME:		DATE:		TIME:	
		BP (mmHg)				BP (mmHg)			
Parameter	**Calibation Standard**	**Instrument Value**		**Standard Value**	**Calibration Results**	**Instrument Value**		**Standard Value**	**Calibration Results**
SPEC. COND. (uS/cm)	SS SS SS	0.0	—/—▶ —▶ —/—▶	0.0 227 75	Instrument Zeroed	0.0	—/—▶ —▶ —/—▶	0.0 227 75	Zero Pass
pH (units)	B (7.00) B (4.00) B (10.00)		—▶ —▶ —/—▶ Buffer Temp.				—▶ —▶ —/—▶ Buffer Temp.		
Mid-Day Ck Time:	B (7.00)		—▶ Buffer Temp.						
☑ ORP (mV)	SS (7.00) SS (4.00)	N/A	—▶ —/—▶ ORP Temp.	285 462 25.00		N/A	—▶ —/—▶ ORP Temp.	285 462 25.00	
☑ DO (mg/L)	W W AW		—▶				—▶		
☑ TURB (ntu)	SS		—/—▶				—/—▶		
Temp Cert Device #									
TEMP (deg C)	NIST	N/A	—/—▶	N/A	Adjustment Not Available	N/A	—/—▶	N/A	Adjustment Not Available
AMMONIUM (mg/L)	SS SS	N/A N/A	—/—▶ —/—▶	N/A N/A		N/A N/A	—/—▶ —/—▶	N/A N/A	

INSTRUMENT MAINTENANCE	DATE / TIME
Conductance Subsystem	*pH Subsystem*
☐ Cleaned Electrodes ☐ Tested - OK ☐ See Notes	☐ Cleaned Electrodes ☐ Replaced ref Electrode KCL ☐ Replaced Ref. Electrode Tip ☐ Tested - OK ☐ See Notes
Dissolved Oxygen Subsystem	*Ammonium Subsystem*
☐ Replaced Teflon Membrane ☐ Replaced DO electrolyte ☐ Cleaned Electrode ☐ See Notes	☐ Cleaned Electrode Tip ☐ Installed New Electrode ☐ Removed Electrode / Installed Plug ☐ Tested - OK ☐ See Notes
Oxidation Reduction Subsystem	*Turbidity Subsystem*
☐ Cleaned Electrode ☐ Tested - OK ☐ See Notes	☐ Cleaned Electrode & Wiper ☐ Tested - OK ☐ See Notes
Temperature Subsystem	*Depth Subsystem*
☐ Cleaned Electrode ☐ Tested - OK ☐ See Notes	☐ Reset / Calibrated ☐ Tested - OK ☐ See Notes

KEY: B = Buffer; SS = Standard solution; W = Winkler; AW = Average Winkler; —▶ = Adjusted To; —/—▶ = Not Adjusted To; N/A = Not Applicable

NOTES:

FIGURE 5 - EXAMPLE FIELD SAMPLING CALIBRATION FORM

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Duke Energy

For Detailed Instructions, see:
http://dewww/essenv/coc/

Duke Energy Analytical Lab Services
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd
Huntersville, N. C. 28078
(704) 875-5245
Fax: (704) 875-5038

Analytical Laboratory Use Only

LIMS #		Samples Originating From NC_√_ SC___
Logged By	Date & Time	SAMPLE PROGRAM: Groundwater _√_ NPDES ____ Drinking Water ____ UST ____ RCRA Waste
Vendor	Cooler Temp (C)	
PO #	[15]Preserv.:1=HCL 2=H_2SO_4 3=HNO_3 4=Ice 5=None	
MR #		

[19]Page __1__ of __1__

DISTRIBUTION
ORIGINAL to LAB,
COPY to CLIENT

Customer must Complete

1)Project Name		2)Phone No:
3)Client		4)Fax No:
5)Business Unit: 20036	6)Process:	7)Resp. To:
8)Project ID:	9)Activity ID:	10)Mail Code:

Customer to complete all appropriate NON-SHADED areas.

Customer to complete appropriate columns to right

LAB USE ONLY [11]Lab ID	[12]Chem Desktop No.	[13]Sample Description or ID	[14]Collection Information Date	Time	Signature	[17]Comp.	[18]Grab	[16]Analyses Required	[20]Total # of Containers
									6

Customer to sign & date below

21)Relinquished By	Date/Time	Accepted By	Date/Time
Relinquished By	Date/Time	Accepted By	Date/Time
Relinquished By	Date/Time	Accepted By	Date/Time
23)Seal/Locked By	Date/Time	Sealed/Lock Opened By	Date/Time
24)Comments			

Customer, important please indicate desired turnaround

[22]Requested Turnaround

14 Days ____√____

*7 Days _____

* 48 Hr _____

*Other _____

* Add. Cost Will Apply

FIGURE 6

NORTH CAROLINA GROUNDWATER SAMPLING SITE CHECKLIST

LOCATION / SITE McGuire Nuclear Station - Landfill #2 Groundwater Monitoring PERMIT # 6004-INDUS **SAMPLE DATE**
SITE CONTACT Robert Sapp, Eric Shook **FIELD CREW**
WEATHER
PAGE 1 OF 1

		MW-5	MW-5A	MW-6	MW-6A	MW-7	MW-7A	MW-8	MW-8A	MW-9	MW-9A	MW-10A	SW-1	SW-2	Leachate Pond		
ACCESS TO WELLS																	
Access cleared into well																	
Access cleared around well																	
Tall grass or weeds - needs mowing																	
Road washing out / muddy / needs grading																	
Fallen tree blocking access																	
WELL SECURITY																	
Well found locked																	
Well found unlocked																	
WELL LOCK CONDITION																	
Lock in good condition																	
Lock rusted, difficult to open / needs replacing																	
Replaced damaged lock																	
WELL CASINGS																	
Casing in good condition																	
Damaged casing / still functional																	
Damaged casing / repair required																	
CONCRETE PADS																	
Pad in good condition																	
Minor cracks																	
Major cracks / broken / repair required																	
Undermined / washing out																	
Fire ants around concrete pad																	
WELL PROTECTIVE CASINGS																	
Casing in good condition																	
Damaged casing / still functional																	
Damaged casing / repair required																	
Broken hinge on protective lid																	
Wasp nest inside protective casing																	
Ants inside protective casing																	
WELL CAPS																	
Well cap in good conditon																	
Damaged / needs replacement																	
Replaced damaged well cap																	
FLUSH MOUNT WELLS																	
Vault in good condition																	
Water inside vault																	
Vault bolt holes broken or stripped																	
Bolts stripped																	
Vault lid cracked or broken																	
WELL ID TAGS																	
Well tag in good condition																	
Well tag missing																	
Well tag damaged / illegible																	
Lacks required information - Driller Reg #																	
Lacks required information - Completion date																	
Lacks required information - Total well depth																	
Lacks required information - Depth to screen																	
Lacks required information - Non potable tag																	

NOTE:

FIGURE 7

TABLES

Table 1
Monitoring Well Information
McGuire Nuclear Station, Landfill #2 (Synthetically Lined)

	MW-5	MW-5A	MW-6	MW-6A	MW-7	MW-7A	MW-8	MW-8A	MW-9	MW-9A	MW-10A
North (ft)	611,642.31	611,644.34	612,271.37	612,278.33	612,063.38	612,051.31	612,263.68	612,254.57	611,923.74	611,908.90	611,971.66
East (ft)	1,420,461.37	1,420,446.26	1,420,457.57	1,420,444.96	1,419,781.91	1,419,778.04	1,420,098.39	1,420,109.01	1,419,593.17	1,419,589.67	1,420,622.03
Top of PVC Casing Elevation (ft)	768.31	768.42	728.45	728.98	725.86	724.66	759.60	759.68	711.87	712.13	755.78
Well Diameter	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"
Well Stick-up (ft)	1.9	2.0	1.7	1.4	2.1	1.9	2.3	2.1	1.6	1.8	2.0
Type of Casing	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC	PVC
Total Depth below TOC (ft)	63.9	96.0	37.2	47.9	37.3	59.4	71.5	84.4	30.8	47.8	59.23
Screen Length (ft)	14	14	13.5	14	14	14	14	14	14	14	15
Screen Interval (ft below TOC)	49.9 to 63.9	82.0 to 96.0	23.7 to 37.2	33.9 to 47.9	23.3 to 37.3	45.4 to 59.4	57.5 to 71.5	70.4 to 84.4	16.8 to 30.8	33.8 to 47.8	44.23 to 59.23

Notes:

1. ft indicates feet.
2. TOC indicates top of casing.
3. As-built well coordinates (assumed to be NAD 27) and top of PVC casing elevations (assumed to be NVGD 29) provided by Duke Energy.
4. Well diameter and type of casing were obtained from Well Construction Records provided by Duke Energy.
5. Well stick-up length was calculated based on top of PVC casing and ground surface elevations provided by Duke Energy except monitoring well MW-10A which was obtained from the Well Construction Record for this well.
6. Well total depth below TOC measurements provided by Duke Energy.
7. Screen lengths and screen intervals provided by Duke Energy.

Table 2
Sample Parameters, Analytical Methods, and Detection Limits
McGuire Nuclear Station, Landfill #2 (Synthetically Lined)

PARAMETER	UNITS	ANALYTICAL METHOD	SWSL
In Situ Parameters			
Field pH	pH Units	Hydrolab	NE
Specific Conductance	µmhos/cm	Hydrolab	NE
Temperature	^{o}C	Hydrolab	NE
Water Level	ft	Water Level Meter	0.010 ft
Laboratory Analyses			
Arsenic	µg/L	TRM / EPA 200.8	10
Barium	µg/L	TRM / EPA 200.7	100
Cadmium	µg/L	TRM / EPA 200.8	1
Chromium	µg/L	TRM / EPA 200.8	10
Lead	µg/L	TRM / EPA 200.8	10
Mercury	µg/L	EPA 245.1	0.2
Selenium	µg/L	TRM / EPA 200.8	10
Silver	µg/L	TRM / EPA 200.8	10
Sulfate	µg/L	EPA 300.0	250,000
Chloride	µg/L	EPA 300.0	250,000
Volatile Organic Compounds	µg/L	EPA 8260	Varies
TPH (DRO)	µg/L	EPA 8015/3520	NE
Gross Alpha	pCi/l	EPA 900/SM7110B	NE
Gross Beta	pCi/l	EPA 900/SM7110B	NE
Tritium	pCi/l	EPA 906.0 Modified	NE

Notes:

1. µmhos/cm indicates micro-ohms per centimeter.
2. ft indicates feet.
3. µg/L indicates micrograms per liter.
4. pCi/L indicates picocuries per liter.
5. SWSL indicates Solid Waste Section Limit.
6. TRM indicates total recoverable metals.
7. NE indicates not established.
8. TPH (DRO) indicates total petroleum hydrocarbons diesel range organics.

Table 3
Radiological Sample Parameters
McGuire Nuclear Station, Landfill #2 (Synthetically Lined)

Parameter	Units
Gross Alpha	pCi/L
BaLa-140	pCi/L
Be-7	pCi/L
Gross Beta	pCi/L
Co-58	pCi/L
Co-60	pCi/L
Cs-134	pCi/L
Cs-137	pCi/L
Fe-59	pCi/L
H3GW (Tritium)	pCi/L
I-131	pCi/L
K-40	pCi/L
Mn-54	pCi/L
Nb-95	pCi/L
Zn-65	pCi/L
Zr-95	pCi/L

Notes:

1. pCi/L indicates picocuries per liter.
2. Radiological sampling and analyses will be conducted in accordance with requirements of current Radioactive Materials License No. 060-0379-7 and submitted to the North Carolina Department of Health and Human Services Radiation Protection Section.

Table 4
Sample Containers, Preservatives, and Holding Times
McGuire Nuclear Station, Landfill #2 (Synthetically Lined)

PARAMETER	CONTAINERS	PRESERVATIVES	HOLDING TIMES
In Situ Parameters			
Field pH	In Situ	None	Analyze Immediately
Specific Conductance	In Situ	None	Analyze Immediately
Temperature	In Situ	None	Analyze Immediately
Laboratory Analyses			
Arsenic	500 ml HDPE	pH<2 HNO_3	6 months
Barium	500 ml HDPE	pH<2 HNO_3	6 months
Cadmium	500 ml HDPE	pH<2 HNO_3	6 months
Chromium	500 ml HDPE	pH<2 HNO_3	6 months
Lead	500 ml HDPE	pH<2 HNO_3	6 months
Mercury	500 ml HDPE	pH<2 HNO_3	6 months
Selenium	500 ml HDPE	pH<2 HNO_3	6 months
Silver	500 ml HDPE	pH<2 HNO_3	6 months
Sulfate	500 ml HDPE	Cool 4°C	28 days
Chloride	500 ml HDPF	Cool 4°C	28 Days
Volatile Organic Compounds	40 ml Glass	HCL, Cool 4°C	14 days
TPH (DRO)	1000 ml Glass	H_2SO_4,Cool 4°C	7 days (Extraction)
Gross Alpha & Beta	4l cubitainer	10 ml 50%HNO_3	NA
Tritium	50 ml polybottle	None	NA

Notes:

1. ml HDPE indicates milliliter high density polyethylene.
2. HNO_3 indicates nitric acid.
3. NA indicates not applicable.
4. TPH (DRO) indicates total petroleum hydrocarbons diesel range organics.

APPENDICES

APPENDIX A

BORING LOGS AND MONITORING WELL CONSTRUCTION RECORDS

Duke Power Company
422 South Church Street
Charlotte, NC 28242-0001

(704)373-4011

New Landfill

DUKE POWER

March 30, 1992

North Carolina Department of Environment, Health
and Natural Resources
Attn: Brenda J. Smith, DEM Regional Supervisor
P.O. Box 950
Mooresville, NC 28115

Re: Duke Power Company, McGuire Nuclear Station
Sanitary Landfill
Driller's Records for Monitor Wells
Well Construction Permit # 59-1105-WM-0785
File: MG-LANDFILL/00, GAH-0401

Dear Ms. Smith:

Please find attached the well driller's records for the installation of the McGuire Sanitary Landfill groundwater monitoring wells. Installation was done by Duke Power Company's Geotechnical Center personnel in compliance with all conditions of the construction permit. The landfill is expected to be made operational in the early summer.

If you have any questions or need further information, please contact me at (704) 382-1580.

Sincerely,

Timothy L. Huffman

Timothy L. Huffman, Design Engineer
GS Environmental Division
Generation Services Department

cc w/att: P. R. Simpson, D. W. Phillips, P. A. Clawson

cc w/o att: J. S. Carter, J. R. Hendricks, J. T. Estridge
C. N. Davis, L. D. Evans, Central Records

RALPH SMITH 382-4266

MCGUIRE NUCLEAR STATION
LANDFILL MONITORING WELL LOCATIONS

WELL #	NORTH	EAST	GROUND EL.	METAL CASING	PVC CASING
MW-~~1~~5	611,642.31	1,420,461.37	766.42	768.92	768.31
MW-~~1A~~5A	611,644.34	1,420,446.26	766.45	768.88	768.42
MW-~~2~~6	612,271.37	1,420,457.57	726.79	728.94	728.45
MW-2~~A~~6A	612,278.33	1,420,444.96	727.54	729.64	728.98
MW-~~3~~7	612,063.38	1,419,781.91	723.72	726.36	725.86
MW-~~3A~~7A	612,051.31	1,419,778.04	722.74	725.22	724.66
MW-~~4~~8	612,263.68	1,420,098.39	757.30	760.22	759.60
MW-~~4A~~8A	612,254.57	1,420,109.01	757.61	760.24	759.68
MW-~~5~~9	611,923.74	1,419,593.17	710.27	712.30	711.87
MW-5A 9A	611,908.90	1,419,589.67	710.30	712.59	712.13
MW 10A	611,971.66	1,420,622.03			755.78

NRO 27

Bill: TALKED TO RALPH ON 9/9 - HE SAID HE WOULD MAKE CHANGES AND SEND US A COPY THIS WEEK

JK

MW-10A

MW-10A

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section
1636 Mail Service Center - Raleigh, N.C. 27699-1636-Phone (919) 733-3221

[redacted]L CONSTRUCTION RECORD

WELL CONTRACTOR: S+ME, Inc
WELL CONTRACTOR CERTIFICATION #: NC 2251
STATE WELL CONSTRUCTION PERMIT #: verbal

1. **WELL USE (Check Applicable Box):** Residential ____ Municipal ____ Industrial ____ Agricultural ____ Monitoring X
Recovery ____ Heat Pump Water Injection ____ Other ____ If Other, List Use: ____

2. WELL LOCATION: (Show sketch of the location below) County: Mecklenburg
Nearest Town: Charlotte
NC Route 73
(Road Name and Numbers, Community, or Subdivision and Lot No.)

3. OWNER Duke Power - Environment, Health, + Safety
Address P.O. Box 1006; Mail Code: EC12ZB
(Street or Route No.)
Charlotte NC 28201-1006
City or Town State Zip Code

4. DATE DRILLED 1/16/01
5. TOTAL DEPTH 57'
6. CUTTINGS COLLECTED YES ____ NO X
7. DOES WELL REPLACE EXISTING WELL? YES ____ NO X
8. STATIC WATER LEVEL Below Top of Casing: 50 FT
(Use "+" if Above Top of Casing)

9. TOP OF CASING IS 2 FT. Above Land Surface*
* Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C.0118

[redacted]ELD (gpm): ____ METHOD OF TEST ____
[redacted]ATER ZONES (depth): 50'

DEPTH From	To	DRILLING LOG Formation Description
0'	5'	Fill - dense, red, slightly micaceous, cl-si fn-med sand
5'	30'	Saprolite - medium dense, red, tan, + black, silty fn-med sand
30'	40'	Saprolite - medium dense, tan, red, black, + white mi, si, fn-med sand
40'	45'	Saprolite - medium dense, white, tan, + black, mi, fn-med sand
45'	57'	Saprolite - medium dense, white, black, + tan, mi, fn-med sand w/ some crs qtz sand

If additional space is needed use back of form

12. CHLORINATION: Type ____ Amount ____

13. CASING:

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

14. GROUT

Depth From	To	Material	Method
0	38 Ft.	Portland Cement	
	Ft.		

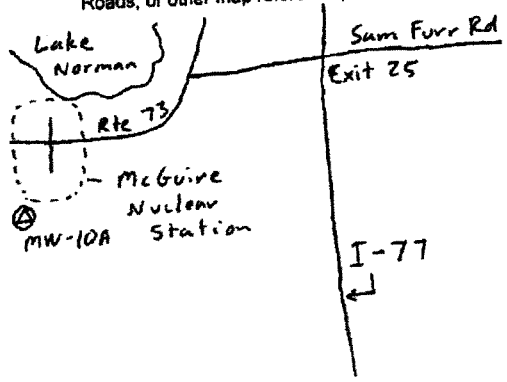
15. SCREEN:

Depth From	To	Diameter	Slot Size	Material
42	57 Ft.	2 in.	.01 in.	PVC
	Ft.	in.	in.	
	Ft.	in.	in.	

16. SAND/GRAVEL PACK:

Depth From	To	Size	Material
40	57 Ft.	#2	well sand
	Ft.		

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



17. REMARKS: ____

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.

Travis Cattle 3-16-01
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE
Submit original to Division of Water Quality, Groundwater Section within 30 days

FOR OFFICE USE ONLY
Quad No. ____
[redacted] No. ____

MW-10A

LOG OF BORING NO. MW-10A

PROJECT: McGuire Nuclear Station
PROJECT NO: 1264-00-715
PROJECT LOCATION: Charlotte, NC

DATE COMPLETED: 1/16/01
DRILLING CONTRACTOR: S&ME, Inc. (Cert. #1209)
DRILLER: Costello
DRILLING METHOD: Hollow Stem Augers
SAMPLING METHOD: Split Spoon

WATER LEVEL: Approximately 48' BLS at TOB
GROUND SURFACE ELEVATION: Not Measured
DATUM:
WEATHER: Sunny, cool
LOGGED BY: M. O'Connell

This log is part of the report prepared for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

SAMPLE NUMBER	SAMPLE ADVANCE (ft.)	SAMPLE RECOVERY (ft.)	N-VALUE (blows / foot)	% RQD	OVA (ppm)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
							0			Fill - dense, red, slightly micaceous, clayey silty fine to medium SAND	
1	1.5		34				5				
2	1.5		15				10			Saprolite - medium dense, red, tan and black, silty fine to medium SAND	
3	1.5		19				15				
4	1.5		20				20				
5	1.5		18				25				
6	1.5		19				30				
7	1.5		16				35			Saprolite - medium dense, tan, red, black and white, micaceous, silty fine to medium SAND	
8	1.5		23				40			Medium dense white, tan and black, micaceous fine to medium SAND	
9	1.5		11				45				
10	1.5		13				50			Saprolite - medium dense, white, black and tan, micaceous fine to medium SAND with some coarse quartz sand	
11	1.5		50/4"				55				
										Auger refusal at 57 feet.	

NOTES:

S&ME
ENGINEERING · TESTING
ENVIRONMENTAL SERVICES

LOG OF BORING MW-10A

ENV BORI... 6400715.GPJ S&ME GDT 1/29/01

MW-10A

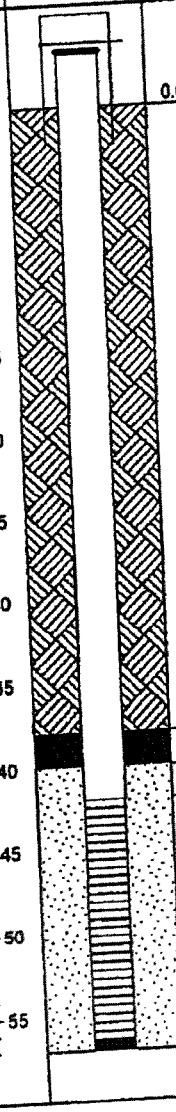
COMPLETION REPORT OF WELL No. MW-10A

PROJECT: McGuire Nuclear Station
PROJECT NO: 1264-00-715
PROJECT LOCATION: Charlotte, NC

WATER LEVEL: Approximately 48' BLS at TOB
LATITUDE: N 35° 25'
LONGITUDE: W 80° 56.5'
TOP OF CASING ELEVATION: Not Measured
DATUM:
LOGGED BY: M. O'Connell

DRILLING CONTRACTOR: S&ME, Inc. (Cert. #1209)
DRILLING METHOD: Hollow Stem Augers
DATE COMPLETED: 1/16/01

STRATA DESCRIPTION	SYMBOL	DEPTH (ft.)
Fill - dense, red, slightly micaceous, clayey silty fine to medium SAND		0 – 5
Saprolite - medium dense, red, tan and black, silty fine to medium SAND		5 – 30
Saprolite - medium dense, tan, red, black and white, micaceous, silty fine to medium SAND		30 – 40
Medium dense white, tan and black, micaceous fine to medium SAND		40 – 45
Saprolite - medium dense, white, black and tan, micaceous fine to medium SAND with some coarse quartz sand		45 – 55
Auger refusal at 57 feet.		



WELL DETAILS

DEPTH (ft.)	LEGEND	ELEVATION (ft.)
0.00	GS	
38.00	CG	
40.00	BS	
42.00	TSC	
57.00	TD	

WELL CONSTRUCTION DETAILS

PROTECTIVE CASING
Diameter: 4 inch
Type: Above Ground Steel Casing
Interval: 24" ALS to 12" BLS

RISER CASING
Diameter: 2 inch
Type: Sch 40 PVC
Interval: 2' ABS to 42' BLS

GROUT
Type: Portland Cement
Interval: 0 to 38' BLS

SEAL
Type: Bentonite
Interval: 38' BLS to 40' BLS

FILTERPACK
Type: #2 Well Sand
Interval: 40' BLS to 57' BLS

SCREEN
Diameter: 2 inch
Type: Sch 40 PVC, 0.01 Slot
Interval: 42' BLS to 57' BLS

LEGEND

- FILTER PACK
- BENTONITE
- CEMENT GROUT
- CUTTINGS / BACKFILL
- STATIC WATER LEVEL
- WATER LEVEL AT TOB

ALS	ABOVE LAND SURFACE
BLS	BELOW LAND SURFACE
TOC	TOP OF CASING
GS	GROUND SURFACE
BS	BENTONITE SEAL
BOC	BASE OF OUTER CASING
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH
CG	CEMENT GROUT

MONITORINGWELL 6400715.GPJ S&ME.GDT 1/29/01

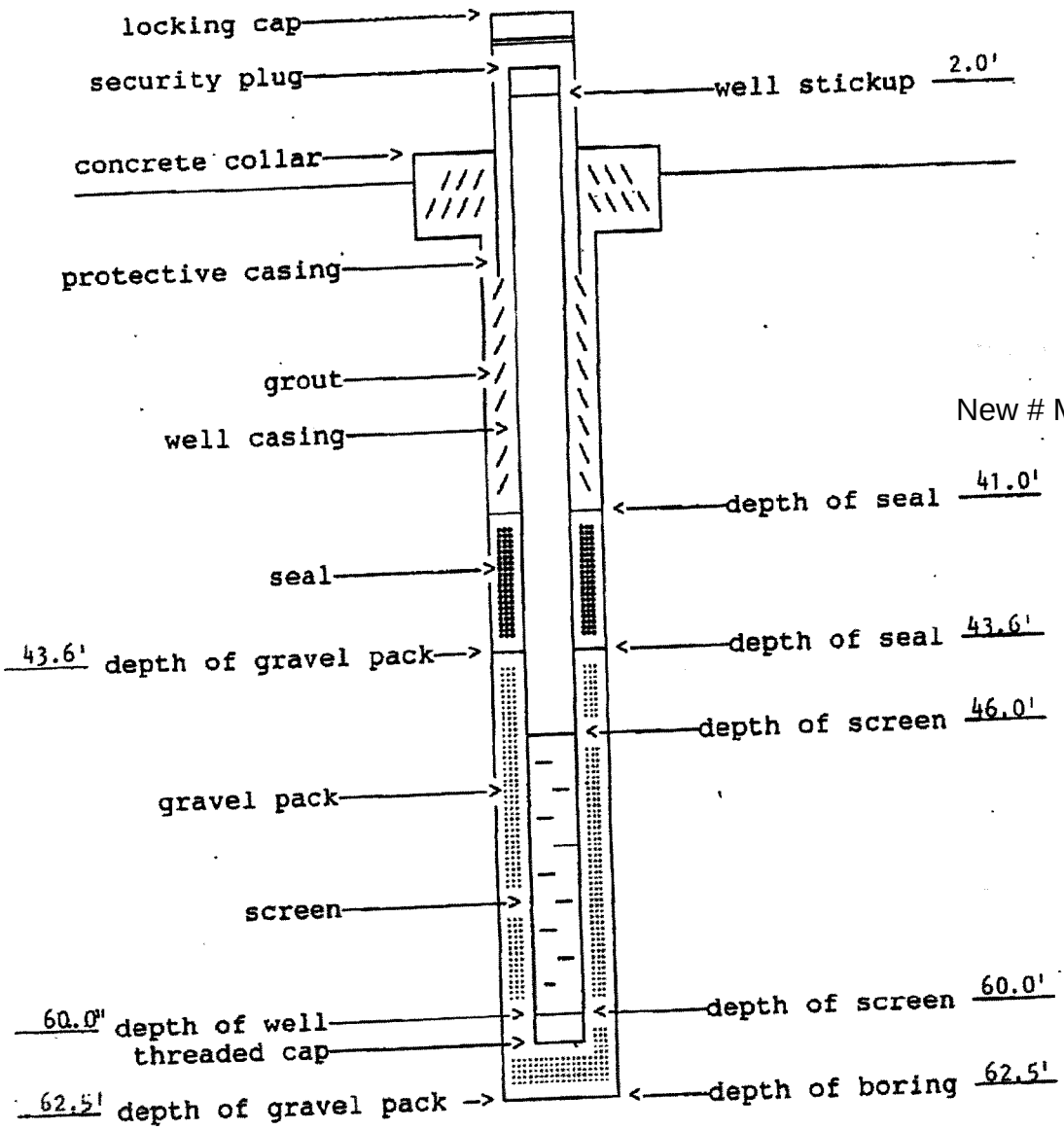
S&ME
ENGINEERING • TESTING
ENVIRONMENTAL SERVICES

COMPLETION REPORT OF WELL No. MW-10A

MW-5
(former MW-1)

MONITORING WELL INSTALLATION RECORD

JOB NAME: MNS LANDFILL



New # MW-5

DATE INSTALLED: 1-16-92 INSPECTOR: J Meaders	DUKE POWER COMPANY GEOTECHNICAL CENTER	MONITORING WELL NUMBER: MW-5

MW-5
(former MW-1)

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: DUKE POWER COMPANY
DRILLER REGISTRATION NUMBER: 921

STATE WELL CONSTRUCTION PERMIT NUMBER: 59-1105-wm-0785

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: CORNELIUS N.C.
(Road, Community, or Subdivision and Lot No.)

County: MECKLENBURG

2. OWNER: DUKE POWER COMPANY
ADDRESS: P.O. BOX 1006 (Street or Route No.)
CHARLOTTE (City or Town) N.C. (State) 28201 (Zip Code)

3. DATE DRILLED: 1-16-92 USE OF WELL: MONITORING
4. TOTAL DEPTH: 62.5' CUTTINGS COLLECTED: ☐ Yes ☒ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: 51.7 FT. ☐ above ☒ below TOP OF CASING.
TOP OF CASING IS 2.0 FT. ABOVE LAND SURFACE.
7. YIELD (gpm): N/A METHOD OF TEST: N/A
8. WATER ZONES (depth): N/A
9. DECONTAMINATION: Type N/A Amount N/A
10. CASING:

	Depth From	To	Diameter	Wall Thickness or Weight/Ft.	Material
	+2.0'	46.0'	2"	SCH.40	PVC

1. GROUT:

	Depth From	To	Material	Method
	0.0'	41.0	PORTLAND CEMENT	PUMP

2. SCREEN:

	Depth From	To	Diameter	Slot Size	Material
	46.0'	60.0'	2"	.010	PVC

3. GRAVEL PACK:

	Depth From	To	Size	Material
	43.6'	62.5	UC = 3.5 ES = .014	SAND

4. REMARKS: BENTONITE SEAL 41.0' - 43.6'

DRILLING LOG

Depth From	To	Formation Description
		SEE ATTACHED SOIL TEST BORING FIELD RECORD. ALSO WELL INSTALLATION RECORD.
		MW-5

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)

MW-5

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.

Jeff Mead 1-16-92
SIGNATURE OF CONTRACTOR OR AGENT DATE

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

W-1 Revised 11/84

MW-5
(former MW-1)

Form 25630 (R3-87)

FORM M-26C | REVISION 2
PAGE 1 OF 1

DUKE POWER COMPANY
CONSTRUCTION DEPARTMENT
PROJECT McGUIRE

SOIL TEST BORING FIELD REPORT

STARTING TIME N/A
GROUND SURFACE ELEV. 766.42
HRS. DRILLING N/A HRS. MOVING N/A
JOB NO. N/A
JOB NAME McGUIRE LANDFILL
DATE 1-16-92 WEATHER P.C. MILD INSPECTOR J.W. Meaders BORING NO. MW-5

SAMPLING	1ST 6"	2ND 6"	3RD 6"	SCALE	UD	SOIL CLASSIFICATION AND REMARKS
				0		NO SAMPLING REQUIRED
				5		
				0		
				5		BORING TERMINATED @ 62.5'
				0		
				5		
				0		
				5		
				0		

+ STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES

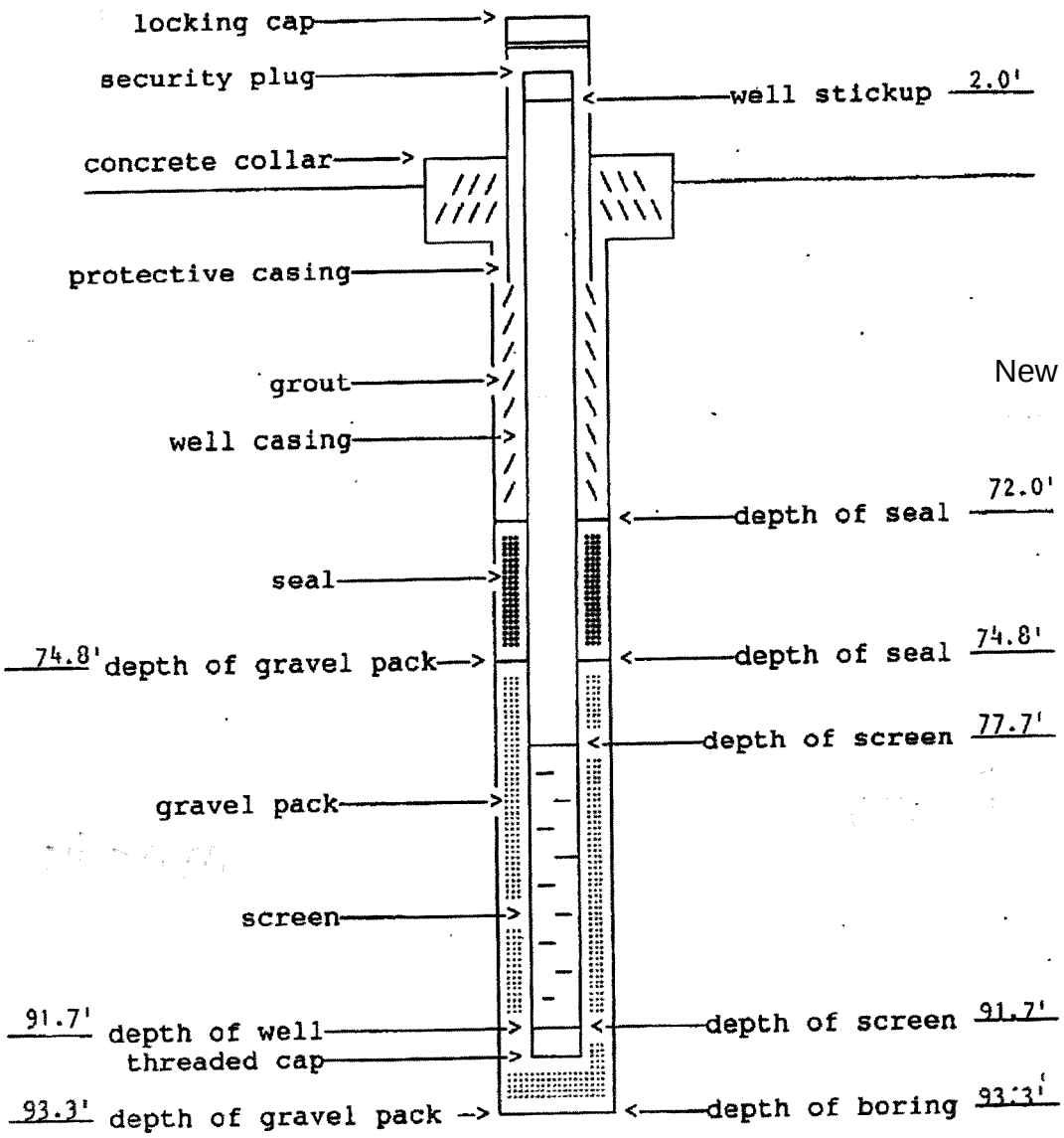
BORING TERMINATED 62.5
BORING REFUSAL N/A
WATER TOB DEPTH 50.6
WATER 24 HR: DEPTH 49.2'
WATER LOSSES N/A
CASING SIZE N/A LENGTH N/A

METHOD OF ADVANCING BORING	DEPTH
POWER AUGER	0 TO 62.5
HAND CHOP: W/MUD: W/WATER	TO
ROTARY DRILL: W/MUD: W/WATER	TO
DIAMOND CORE	TO

MW-5A
(former MW-1A)

MONITORING WELL INSTALLATION RECORD

JOB NAME: MNS LANDFILL



New # MW-5A

DATE INSTALLED: 1-14-92 INSPECTOR: J Meaders	DUKE POWER COMPANY GEOTECHNICAL CENTER	MONITORING WELL NUMBER: MW-5A

MW-5A
(former MW-1A)

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 DUKE POWER COMPANY
DRILLER REGISTRATION NUMBER 921

STATE WELL CONSTRUCTION PERMIT NUMBER: 59-1105-wm-0785

New # MW-5A

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: CORNELIUS N.C.
(Road, Community, or Subdivision and Lot No.)
County: MECKLENBURG

2. OWNER DUKE POWER COMPANY
ADDRESS P.O. BOX 1006 (Street or Route No.)
CHARLOTTE (City or Town) N.C. (State) 28201 (Zip Code)

3. DATE DRILLED 1-14-92 USE OF WELL MONITORING
4. TOTAL DEPTH 93.3' CUTTINGS COLLECTED ☐ Yes ☒ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: 53.9' FT. ☐ above ☒ below TOP OF CASING.
TOP OF CASING IS 2.0' FT. ABOVE LAND SURFACE.
7. YIELD (gpm): N/A METHOD OF TEST N/A
8. WATER ZONES (depth): N/A
9. DISINFECTANT: Type N/A Amount N/A

Depth From	To	Formation Description
		SEE ATTACHED SOILS TEST BORING FIELD REPORT ALSO INSTALLATI RECORD.
		MW-5A

If additional space is needed use back of form.

10. CASING:

	Depth From	To	Diameter	Wall Thickness or Weight/Ft.	Material
1	+2'	77.7' Ft.	2"	SCH 40	PVC
		Ft.			
		Ft.			

11. GROUT:

	Depth From	To	Material	Method
	0.0	72 Ft.	PORTLAND CEMENT W/BENTONITE	PUMP
		Ft.		

12. SCREEN:

	Depth From	To	Diameter	Slot Size	Material
	77.7	91.7 Ft.	2" in.	.010 in.	PVC
		Ft.	in.	in.	
		Ft.	in.	in.	

13. GRAVEL PACK:

	Depth From	To	Size	Material
	74.8	92.8 Ft.	JC 3.5 ES .014	SAND
		Ft.		

14. REMARKS: BENTONITE SEAL 72.0' - 74.8'

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

MW-5A

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.

Jeff Reed 1-14-92
SIGNATURE OF CONTRACTOR OR AGENT DATE

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

GW-1 Revised 11/84

MW-5A
(former MW-1A)

FORM M-26C	REVISION 2
	PAGE 1 OF 1

Form 25630 (R3-87)

DUKE POWER COMPANY
CONSTRUCTION DEPARTMENT
PROJECT McGUIRE

SOIL TEST BORING FIELD REPORT

STARTING TIME N/A
GROUND SURFACE ELEV. 766.45
HRS. DRILLING N/A HRS. MOVING N/A
INSPECTOR J.W. Meadors BORING NO. MW-5A

JOB NO. N/A
JOB NAME McGUIRE LANDFILL
DATE 1-14-92 WEATHER P.C. Cool

SAMPLING					SCALE	UD	SOIL CLASSIFICATION AND REMARKS
		1ST 6"	2ND 6"	3RD 6"	N/A		NO SAMPLING REQUIRED.
					5		
					0		
					5		AUGER REFUSAL @ 93.3
							BORING TERMINATED @ 93.3
					0		
					5		
					0		
					5		
					0		

BORING TERMINATED 93.3
BORING REFUSAL 93.3
WATER TOB DEPTH 50.6'
WATER 24 HR: DEPTH 51.9
WATER LOSSES N/A
CASING SIZE N/A LENGTH N/A

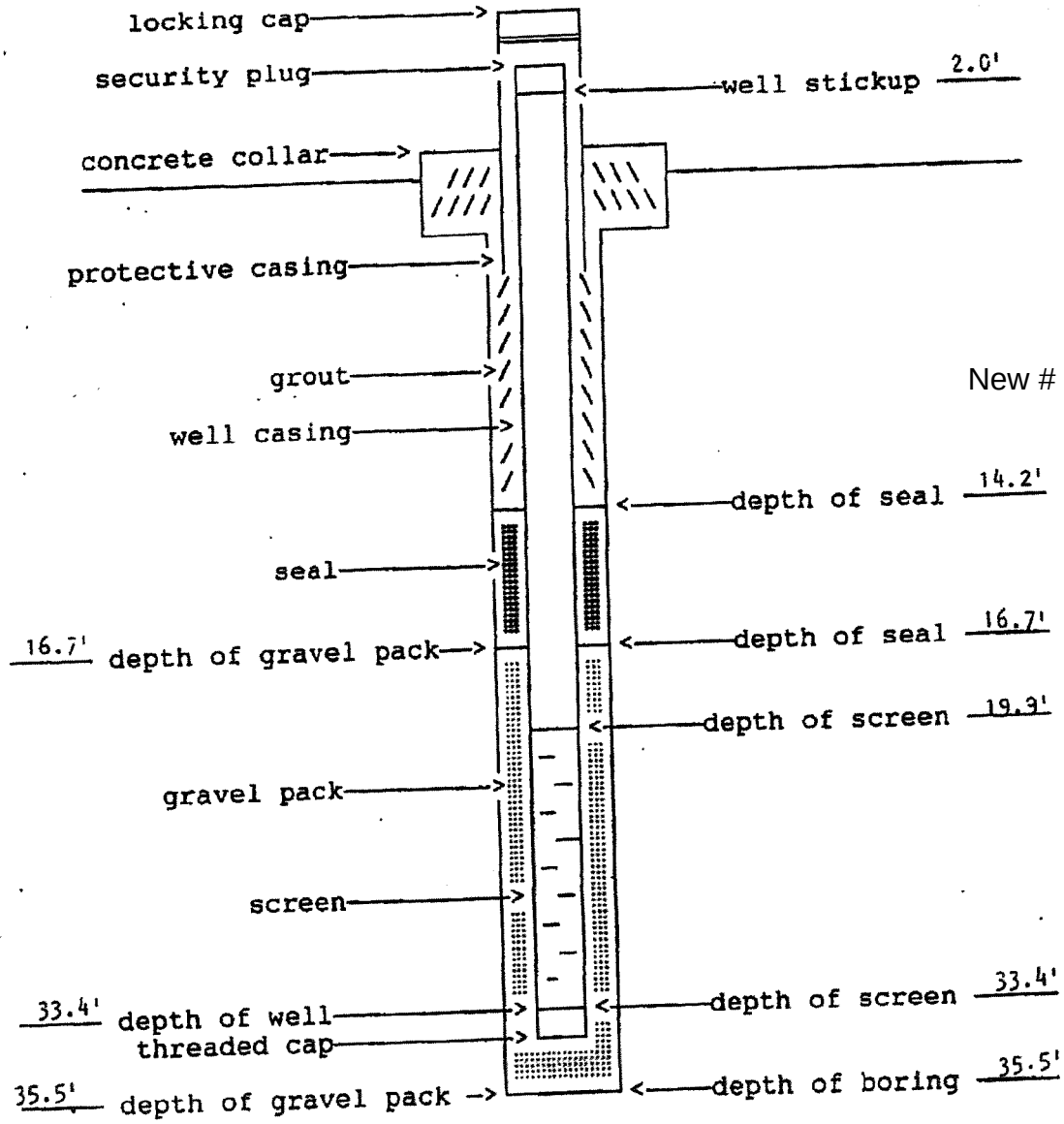
METHOD OF ADVANCING BORING	DEPTH
POWER AUGER	0 TO 93.3'
HAND CHOP: W/MUD: W/WATER	TO
ROTARY DRILL: W/MUD: W/WATER	TO
DIAMOND CORE	TO

+ STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES

MW-6
(former MM-2)

MONITORING WELL INSTALLATION RECORD

JOB NAME: MNS LANDFILL



New # MW-6

DATE INSTALLED: 2-21-92 INSPECTOR: J Meaders	DUKE POWER COMPANY GEOTECHNICAL CENTER	MONITORING WELL NUMBER: MW-6

MW-6
(former MW-2)

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 DUKE POWER COMPANY
DRILLER REGISTRATION NUMBER 921

STATE WELL CONSTRUCTION PERMIT NUMBER: 59-1105-wm-0785
New # MW-6

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: CORNELIUS N.C.
(Road, Community, or Subdivision and Lot No.)
County: MECKLENBURG

2. OWNER DUKE POWER COMPANY
ADDRESS P.O. BOX 1006 (Street or Route No.)
CHARLOTTE (City or Town) N.C. (State) 28201 (Zip Code)

3. DATE DRILLED 2-21-92 USE OF WELL MONITORING
4. TOTAL DEPTH 35.5' CUTTINGS COLLECTED ☐ Yes ☒ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: 25.4 FT. ☐ above ☒ below TOP OF CASING.
TOP OF CASING IS 2.0 FT. ABOVE LAND SURFACE.
7. YIELD (gpm): N/A METHOD OF TEST N/A
8. WATER ZONES (depth): N/A
9. DECONTAMINATION: Type N/A Amount N/A

Depth From	Depth To	DRILLING LOG Formation Description
		SEE ATTACHED ~~SOIL~~ SOIL TEST BORING FIELD REPORT. ALSO WELL INSTALLATI RECORD.
		MW-6

If additional space is needed use back of form.

10. CASING:

	Depth From	Depth To	Diameter	Wall Thickness or Weight/Ft.	Material
1	+2.0'	19.9'	2"	Sch 40	PVC

11. GROUT:

	Depth From	Depth To	Material	Method
	0.0	14.2	PORTLAND CEMENT W/BENTONITE	PUMP

12. SCREEN:

	Depth From	Depth To	Diameter	Slot Size	Material
	19.9'	33.4	2"	.010	PVC

13. GRAVEL PACK:

	Depth From	Depth To	Size	Material
	16.7	35.5	ES = .014 UC = 3.5	SAND

14. REMARKS: BENTONITE SEAL 14.2' - 16.7'

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

MW-6

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.

Jeff Meade — 2-21-92
SIGNATURE OF CONTRACTOR OR AGENT — DATE

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

GW-1 Revised 11/84

MW-6
(Former MW-2)

Form 25630 (R3-87)

FORM M-26C	REVISION 2
	PAGE 1 OF 1

DUKE POWER COMPANY
CONSTRUCTION DEPARTMENT
PROJECT McGUIRE LANDFILL

SOIL TEST BORING FIELD REPORT

STARTING TIME N/A
GROUND SURFACE ELEV. 726.79
HRS. DRILLING N/A HRS. MOVING N/A
JOB NO. N/A
JOB NAME LANDFILL MONITOR WELL
DATE 2-2092 WEATHER P.C. MILD INSPECTOR A.W. Meadors BORING NO. MW-6

	SAMPLING	1ST 6"	2ND 6"	3RD 6"	SCALE	UD	SOIL CLASSIFICATION AND REMARKS
					0		* NOTE: JAR SAMPLES TAKEN. NO S.P.T. TAKEN UNTIL 35.5
*	1 4.5	N/A	N/A	N/A	5		RED, MICA, CLAYEY, FINE SANDY SILT.
*	2 9.5	N/A	N/A	N/A	0		REDISH YELLOW MICA, SILTY FINE/MED. SAND.
*	3 14.5	N/A	N/A	N/A	5		YELISH BRN. MICA, SILTY, FINE/MED. SAND.
*	4 19.5	N/A	N/A	N/A	0		YELISH BRN/ST. BRN, MICA, SILTY, FINE/MED SAND
*	5 24.5	N/A	N/A	N/A	5		BRN/YELISH BRN, MICA, SILTY FINE/MED. SAND.
*	6 29.5	N/A	N/A	N/A	0		BRNISH YEL/YELLOW, MICA, SILTY, FINE/MED. SAND
	7 35.5 27.0	3	3	7	5		OLIVE/OLIVE BRN, MICA, VERY SILTY, FINE/MED. SAND. BORING TERMINATED @ 35.5
					0		

BORING TERMINATED 35.5
BORING REFUSAL N/A
WATER TOB DEPTH 30.3
WATER 24 HR: DEPTH 23.4
WATER LOSSES N/A
CASING SIZE N/A LENGTH N/A

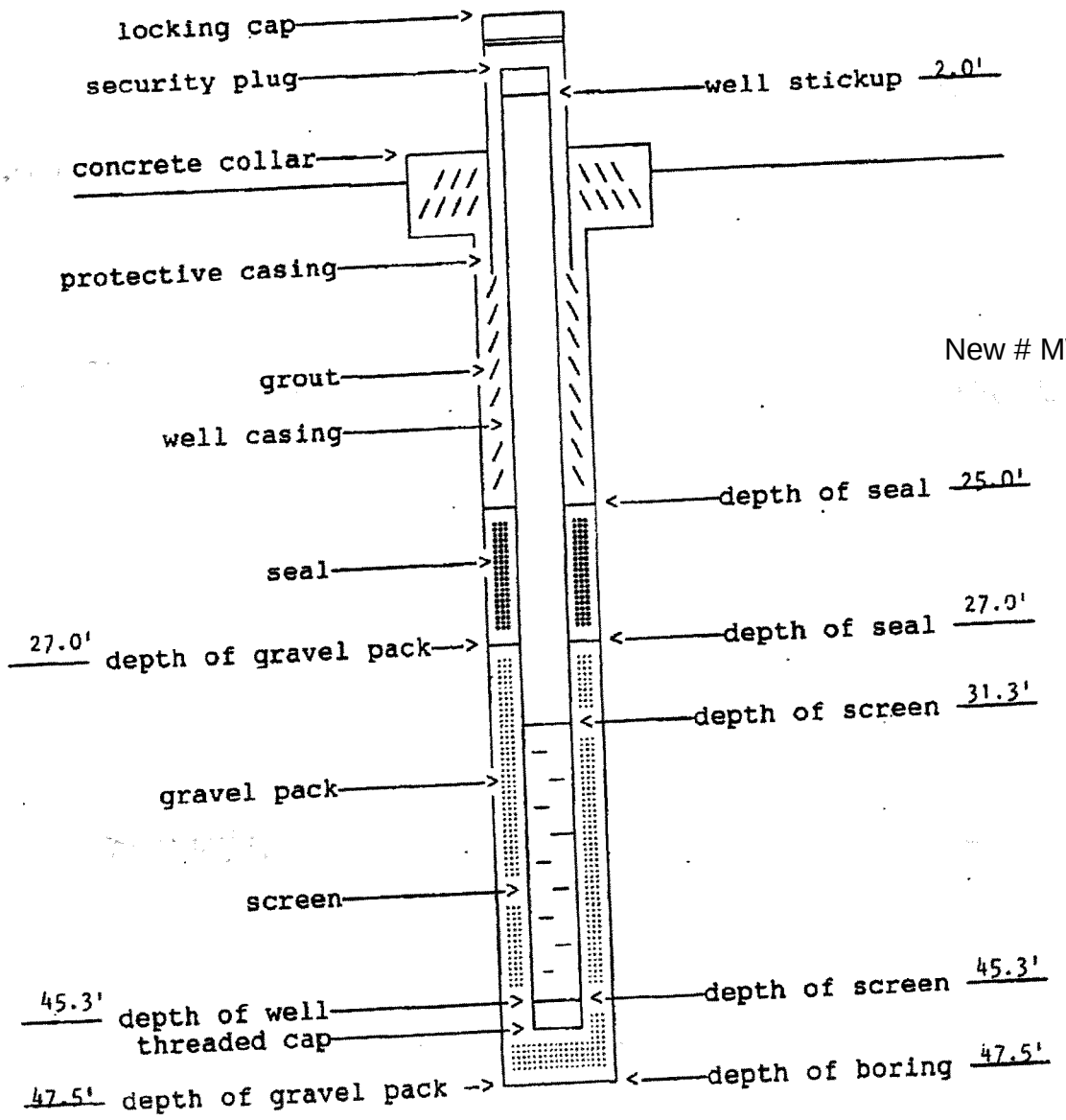
METHOD OF ADVANCING BORING	DEPTH
POWER AUGER	0 TO 35.5
HAND CHOP: W/MUD: W/WATER	TO
ROTARY DRILL: W/MUD: W/WATER	TO
DIAMOND CORE	TO

+ STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES

MW-6
(Former MW-2)

MONITORING WELL INSTALLATION RECORD

JOB NAME: MNS LANDFILL



New # MW-6A

DATE INSTALLED: 2-20-92 INSPECTOR: J Meaders	DUKE POWER COMPANY GEOTECHNICAL CENTER	MONITORING WELL NUMBER: MW-6A

MW-6A
(former MW-2A)

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 DUKE POWER COMPANY
DRILLER REGISTRATION NUMBER 921

STATE WELL CONSTRUCTION PERMIT NUMBER: 59-1105-wm-0785
New # MW-6A

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: CORNELIUS N.C.
(Road, Community, or Subdivision and Lot No.)
County: MECKLENBURG

2. OWNER DUKE POWER COMPANY
ADDRESS P.O. BOX 1006 (Street or Route No.)
CHARLOTTE (City or Town) N.C. (State) 28201 (Zip Code)

3. DATE DRILLED 2-20-92 USE OF WELL MONITORING
4. TOTAL DEPTH 47.5 CUTTINGS COLLECTED ☐ Yes ☒ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: 26.0 FT. ☐ above ☒ below TOP OF CASING.
TOP OF CASING IS 2.0 FT. ABOVE LAND SURFACE.
7. YIELD (gpm): N/A METHOD OF TEST N/A
8. WATER ZONES (depth): N/A
9. DISINFECTANT: Type N/A Amount N/A

Depth From	Depth To	DRILLING LOG Formation Description
		SEE ATTACHED SOILS TEST
		BORING FIELD REPORT, AL
		WELL INSTALLATION RECORD
		MW-6A

If additional space is needed use back of form.

10. CASING:

	Depth From	To	Diameter	Wall Thickness or Weight/Ft.	Material
	+2	31.3 Ft.	2"	SCH.40	PVC
		Ft.			
		Ft.			

11. GROUT:

	Depth From	To	Material	Method
	0.0	25.0' Ft.	PORTLAND CEMENT W/BENTONITE	PUMP
		Ft.		

12. SCREEN:

	Depth From	To	Diameter	Slot Size	Material
	31.3	45.3 Ft.	2" in.	.010 in.	PVC
		Ft.	in.	in.	
		Ft.	in.	in.	

13. GRAVEL PACK:

	Depth From	To	Size	Material
	27.0	47.5 Ft.	ESS .014 UC = 3.5	SAND
		Ft.		

14. REMARKS: BENTONITE SEAL 25.0' - 27.0'

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

MW-6A

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.

Jeff Meade 2-20-92
SIGNATURE OF CONTRACTOR OR AGENT DATE

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

GW-1 Revised 11/84

mw-6A
(former mw-2A)

Form 25630 (R3-87)

FORM M-26C	REVISION 2
	PAGE 1 OF 2

DUKE POWER COMPANY
CONSTRUCTION DEPARTMENT
PROJECT McGUIRE

SOIL TEST BORING FIELD REPORT

STARTING TIME N/A
GROUND SURFACE ELEV. 727.54
New # MW-6A
HRS. DRILLING N/A HRS. MOVING
JOB NO. N/A
JOB NAME McGUIRE LANDFILL
DATE 2-20-91 WEATHER P.C. MILD INSPECTOR J. W. Murdock S BORING NO. MW-6A

SAMPLING		1ST 6"	2ND 6"	3RD 6"	SCALE	UD	SOIL CLASSIFICATION AND REMARKS
					0	X	NOTE: NO SPT TAKEN UNTIL 46.4' JAR SAMPLES TAKEN AS SHOWN BELOW.
* 1	5.5	N/A	N/A	N/A	5		RED/REDISH BRN, MICA, FINE SANDY SILT
* 2	10.5	N/A	N/A	N/A	0		REDDISH YELLOW, MICA, FINE SANDY SILT
* 3	15.5	N/A	N/A	N/A	5		REDDISH YELLOW/REDDISH BRN, MICA, SILTY FINE/MED. SAND.
* 4	20.5	N/A	N/A	N/A	0		STRONG BRN. MICA, FINE SANDY SILT.
* 5	25.5	N/A	N/A	N/A	5		ST. BRN/REDDISH YEL., MICA, FINE SANDY SILT
* 6	30.5	N/A	N/A	N/A	0		YELISH BRN./ST. BRN, MICA, SILTY, FINE/MED. SAND
* 7	35.5	N/A	N/A	N/A	5		BRN./REDISH BRN. MICA, SILTY, FINE/MED. SAND
* 8	40.5	N/A	N/A	N/A	0		OLIVE YELLOW, MICA, FINE SANDY SILT

BORING TERMINATED [redacted] 47.5
BORING REFUSAL ~~[redacted]~~ 47.5
WATER TOB DEPTH 26.3
WATER 24 HR: DEPTH 24.0
WATER LOSSES N/A
CASING SIZE N/A LENGTH N/A

METHOD OF ADVANCING BORING	DEPTH
POWER AUGER	0 TO 47.5
HAND CHOP: W/MUD: W/WATER	TO
ROTARY DRILL: W/MUD: W/WATER	TO
DIAMOND CORE	TO

+ STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES

MW-6A
(former MW-2A)

Form 25630 (R3-87)

FORM M-26C | REVISION 2

PAGE 2 OF 2

DUKE POWER COMPANY
CONSTRUCTION DEPARTMENT
PROJECT McGUIRE LANDFILL

SOIL TEST BORING FIELD REPORT

STARTING TIME N/A
GROUND SURFACE ELEV.
HRS. DRILLING N/A HRS. MOVING N/A
JOB NO. N/A
JOB NAME LANDFILL MONITOR WELLS
DATE 3-20-92 WEATHER P.C. MILD INSPECTOR J.W. Mauldrs BORING NO. MW-6A

SAMPLING		1ST 6"	2ND 6"	3RD 6"	SCALE	UD	SOIL CLASSIFICATION AND REMARKS
					40		
					45		PALE BRN, MICA, SILTY, FINE/MED. SAND.
* 9	45.5	N/A	N/A	N/A			DK. OLIVE, MICA, SILTY, FINE/MED. SAND.
10	47.5	21	31	33			AUGER REFUSAL @ 47.5
	49.0				50		
					55		
					60		
					65		
					70		
					75		
					80		

BORING TERMINATED [redacted] 47.5
BORING REFUSAL 47.5
WATER TOB DEPTH 26.3
WATER 24 HR: DEPTH 24.0
WATER LOSSES N/A
CASING SIZE N/A LENGTH N/A

METHOD OF ADVANCING BORING	DEPTH
POWER AUGER	0 TO 47.5
HAND CHOP: W/MUD: W/WATER	TO
ROTARY DRILL: W/MUD: W/WATER	TO
DIAMOND CORE	TO

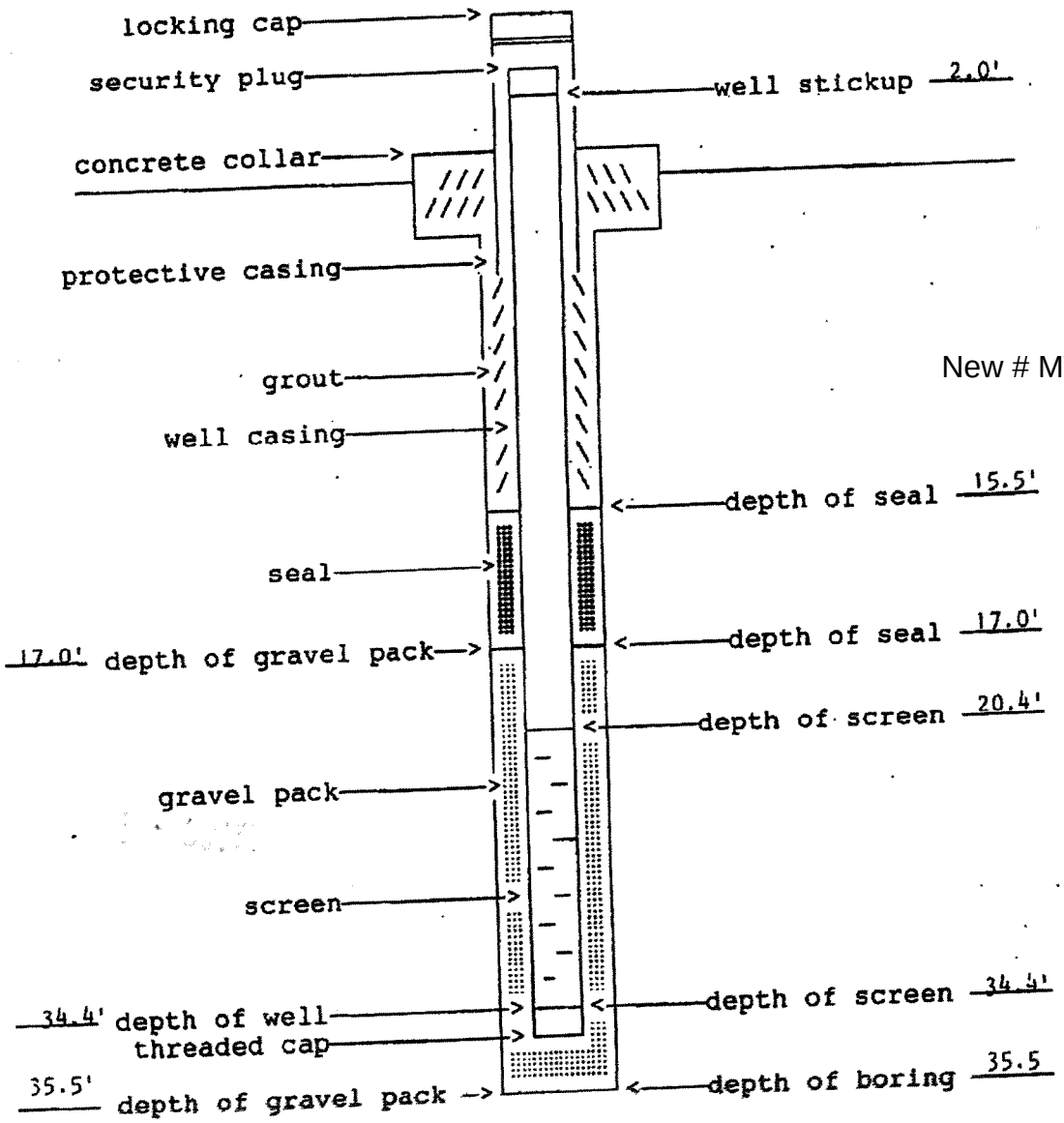
* STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES

New # MW-7

MW-7
(former MW-3)

MONITORING WELL INSTALLATION RECORD

JOB NAME: MNS LANDFILL



New # MW-7

DATE INSTALLED: 2-13-92 INSPECTOR: J Meaders	DUKE POWER COMPANY GEOTECHNICAL CENTER	MONITORING WELL NUMBER: MW-7

MW-7
(former MW-3)

DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT – GROUNDWATER SECTION
P.O. BOX 27687 – RALEIGH, N.C. 27611, PHONE (919) 733-6083

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: DUKE POWER COMPANY
DRILLER REGISTRATION NUMBER: 921

STATE WELL CONSTRUCTION PERMIT NUMBER: 59-1105-wm-0785
New # MW-7

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: CORNELIUS N.C.
(Road, Community, or Subdivision and Lot No.)
County: MECKLENBURG

2. OWNER: DUKE POWER COMPANY
ADDRESS: P.O. BOX 1006 (Street or Route No.)
CHARLOTTE (City or Town) N.C. (State) 28201 (Zip Code)

3. DATE DRILLED: 2-12-92 USE OF WELL: MONITORING
4. TOTAL DEPTH: 35.5' CUTTINGS COLLECTED: ☐ Yes ☒ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: 27.5 FT. ☐ above ☒ below TOP OF CASING.
TOP OF CASING IS 2.0 FT. ABOVE LAND SURFACE.
7. YIELD (gpm): N/A METHOD OF TEST: N/A
8. WATER ZONES (depth): N/A
9. CHLORINATION: Type N/A Amount N/A

DRILLING LOG

Depth From	Depth To	Formation Description
		SEE ATTACHED SOIL TEST BORING FIELD REPORT, ALSO WELL INSTALLATION REC
		MW-7

If additional space is needed use back of form.

10. CASING:

	Depth From	Depth To	Diameter	Wall Thickness or Weight/Ft.	Material
1	+2.0	20.4	2"	SCH. 40	PVC

11. GROUT:

	Depth From	Depth To	Material	Method
	0.0	15.5'	CEMENT W/BENTONITE	PUMP

12. SCREEN:

	Depth From	Depth To	Diameter	Slot Size	Material
	20.4	34.4	2"	.010	PVC

13. GRAVEL PACK:

	Depth From	Depth To	Size	Material
	17.0	35.5	ES: .014 UC: 3.5	SAND

14. REMARKS: BENTONITE SEAL 15.5'–17.0'

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

MW-7

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: [signature] DATE: 2-13-92

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

GW-1 Revised 11/84

MW-7
(former MW-3)

Form 25630 (R3-87)

FORM M-26C	REVISION 2
	PAGE 1 OF 1

DUKE POWER COMPANY
CONSTRUCTION DEPARTMENT
PROJECT McGUIRE

SOIL TEST BORING FIELD REPORT

STARTING TIME N/A
GROUND SURFACE ELEV. 723.72
JOB NO. N/A
HRS. DRILLING N/A HRS. MOVING N/A
JOB NAME McGUIRE LANDFILL
DATE 2-12-92 WEATHER PC MILD INSPECTOR Anil. Morders BORING NO. MW-7

	SAMPLING	1ST 6"	2ND 6"	3RD 6"	SCALE	UD	SOIL CLASSIFICATION AND REMARKS
					0	*	NOTE: NO S.P.T. TAKEN UNTIL 35.5', JAR SAMPLES TAKEN AS SHOWN BELOW.
*	1 4.5	N/A	N/A	N/A	5		RED, MICA, SILTY, FINE/MEDIUM SAND
*	2 9.5	N/A	N/A	N/A	10		RED, MICA, SILTY, CLAYEY, FINE/MEDIUM SAND.
*	3 14.5	N/A	N/A	N/A	15		REDDISH BRN, MICA, FINE SANDY SILT
*	4 19.5	N/A	N/A	N/A	20		REDDISH YELLOW, MICA, FINE SANDY SILT.
*	5 24.5	N/A	N/A	N/A	25		BRNISH YELLOW, MICA, SILTY, FINE/MED. SAND
*	6 29.5	N/A	N/A	N/A	30		BRNISH YELLOW MICA, SILTY, FINE/MED. SAND
	7 35.5 37.0	4	9	13	35		OLIVE BRN, MICA, SILTY, FINE/MEDIUM SAND BORING TERMINATED @ 35.5'
					40		

BORING TERMINATED 35.5
BORING REFUSAL N/A
WATER TOB DEPTH 33.2
WATER 24 HR: DEPTH 25.5
WATER LOSSES N/A
CASING SIZE N/A LENGTH N/A

METHOD OF ADVANCING BORING	DEPTH
POWER AUGER	0 TO 35
HAND CHOP: W/MUD: W/WATER	TO
ROTARY DRILL: W/MUD: W/WATER	TO
DIAMOND CORE	TO

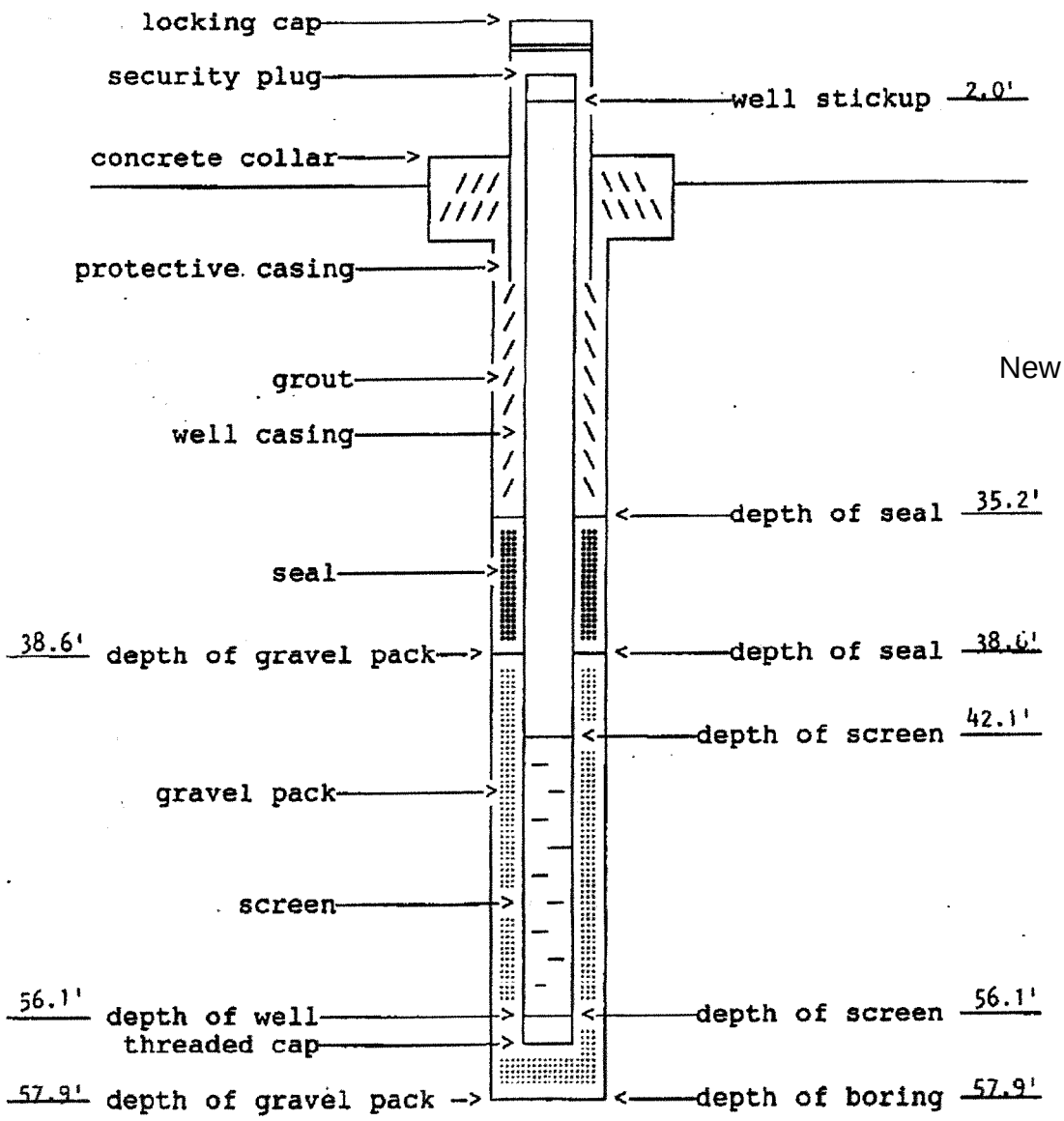
+ STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES

New # MW-7A

MW-7A
(former MW-3A)

MONITORING WELL INSTALLATION RECORD

JOB NAME: MNS LANDFILL



New # MW-7A

DATE INSTALLED: 2-12-92 INSPECTOR: J Meaders	DUKE POWER COMPANY GEOTECHNICAL CENTER	MONITORING WELL NUMBER: MW-7A

MW-7A
(former MW-3A)

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 DUKE POWER COMPANY
DRILLER REGISTRATION NUMBER 921

STATE WELL CONSTRUCTION PERMIT NUMBER: 59-1105-wm-0785

New # MW-7A

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: CORNELIUS N.C.
(Road, Community, or Subdivision and Lot No.)
County: MECKLENBURG

2. OWNER DUKE POWER COMPANY
ADDRESS P.O. BOX 1006 (Street or Route No.)
CHARLOTTE (City or Town) N.C. (State) 28201 (Zip Code)

3. DATE DRILLED 2-11-92 USE OF WELL MONITORING
4. TOTAL DEPTH 57.9 CUTTINGS COLLECTED ☐ Yes ☒ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: 28.3 FT. ☒ above ☒ below TOP OF CASING,
TOP OF CASING IS 2.0' FT. ABOVE LAND SURFACE.
7. YIELD (gpm): N/A METHOD OF TEST N/A
8. WATER ZONES (depth): N/A
9. CHEMICAL DISINFECTANT: Type N/A Amount N/A

10. CASING:

	Depth From	To	Diameter	Wall Thickness or Weight/Ft.	Material
	+2.0'	42.1 Ft.	2"	SCH 40	PVC
		Ft.			
		Ft.			

11. GROUT:

	Depth From	To	Material	Method
	0.0	35.2 Ft.	CEMENT/BENTONITE	PUMP
		Ft.		

12. SCREEN:

	Depth From	To	Diameter	Slot Size	Material
	42.1	56.1 Ft.	2" in.	.010 in.	PVC
		Ft.	in.	in.	
		Ft.	in.	in.	

13. GRAVEL PACK:

	Depth From	To	Size	Material
	38.6	57.9 Ft.	ES: .014 UC: 3.5	SAND
		Ft.		

14. REMARKS: BENTONITE SEAL: 35.2' - 38.6'

DRILLING LOG

Depth From	To	Formation Description
		SEE ATTACHED SOIL TEST BORING FIELD REPORT, ALL WELL INSTALLATION RECORDS
		MW-7A

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)

MW-7A

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 2-12-92

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

GW-1 Revised 11/84

MW-7A
(former MW-3A)

Form 25630 (R3-87)

FORM M-26C	REVISION 2
	PAGE 1 OF 2

DUKE POWER COMPANY
CONSTRUCTION DEPARTMENT
PROJECT McGUIRE

SOIL TEST BORING FIELD REPORT

STARTING TIME N/A
GROUND SURFACE ELEV. 722.72
New # MW-7A

JOB NO. N/A
JOB NAME McGUIRE LANDFILL
HRS. DRILLING N/A HRS. MOVING
DATE 2-11-92 WEATHER P.C. MILD INSPECTOR A.W. Masters BORING NO. MW-7A

SAMPLING		1ST 6"	2ND 6"	3RD 6"	SCALE	UD	SOIL CLASSIFICATION AND REMARKS
					0	*	NOTE: NO S.P.T. TAKEN UNTIL 48.4', JAR SAMPLES TAKEN AS SHOWN BELOW
* 1	4.8	N/A	N/A	N/A	5		RED / DARK RED MICA, CLAYEY, SILTY, FINE/MEDIUM SAND.
* 2	9.8	N/A	N/A	N/A	10		RED / DARK RED, MICA., CLAYEY, SILTY, FINE/MEDIUM SAND.
* 3	14.8	N/A	N/A	N/A	15		DARK RED / REDDISH BROWN, MICA, SILTY, FINE/MEDIUM SAND.
* 4	19.8	N/A	N/A	N/A	20		STRONG BROWN, MICA, SILTY, FINE/MEDIUM SAND.
* 5	24.8	N/A	N/A	N/A	25		YELLOW-BROWN, MICA, FINE SANDY SILT.
* 6	29.8	N/A	N/A	N/A	30		YELLOW. BRN, MICA, FINE SANDY SILT.
* 7	34.8	N/A	N/A	N/A	35		STRONG BROWN, MICA, FINE SANDY SILT
* 8	39.8	N/A	N/A	N/A	40		STRONG BROWN, MICA, FINE SANDY SILT

BORING TERMINATED 57.4
BORING REFUSAL 57.4
WATER TOB DEPTH 28.7
WATER 24 HR: DEPTH 26.3
WATER LOSSES N/A
CASING SIZE N/A LENGTH N/A

METHOD OF ADVANCING BORING	DEPTH
POWER AUGER	0 TO 57.4
HAND CHOP: W/MUD: W/WATER	TO
ROTARY DRILL: W/MUD: W/WATER	TO
DIAMOND CORE	TO

+ STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES

MW-7A
(former MW-3A)

Form 25630 (R3-87)

FORM M-26C | REVISION 2
PAGE 2 OF 2

DUKE POWER COMPANY
CONSTRUCTION DEPARTMENT
PROJECT McGUIRE

SOIL TEST BORING FIELD REPORT

STARTING TIME N/A
GROUND SURFACE ELEV.
JOB NO. N/A
HRS. DRILLING N/A HRS. MOVING N/A
JOB NAME McGUIRE LANDFILL
DATE 2-11-92 WEATHER P.C. MILD INSPECTOR A.W. Meadows BORING NO. MW-7A.

SAMPLING		1ST 6"	2ND 6"	3RD 6"	SCALE	UD	SOIL CLASSIFICATION AND REMARKS
					40		
9	44.8 43.6	4	10	11	45		WHITE/OLIVE, MICA, SILTY, FINE/MEDIUM SAND
10	50.5 52.0	9	14	22	50		WHITE/ DARK OLIVE, MICA, SILTY, FINE/MEDIUM SAND.
#11	55.5 57.0	9	16	30	55		WHITE/OLIVE BROWN, MICA, SILTY, FINE/MEDIUM SAND
							AUGER REFUSAL @ ~~57.4~~ 57.9'
							BORING TERMINATED @ 57.9
					60		
					65		
					70		
					75		
					80		

+ STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES

BORING TERMINATED 57.9
BORING REFUSAL 57.9
WATER TOB DEPTH 28.7
WATER 24 HR: DEPTH 26.3 TOP
WATER LOSSES N/A
CASING SIZE N/A LENGTH N/A

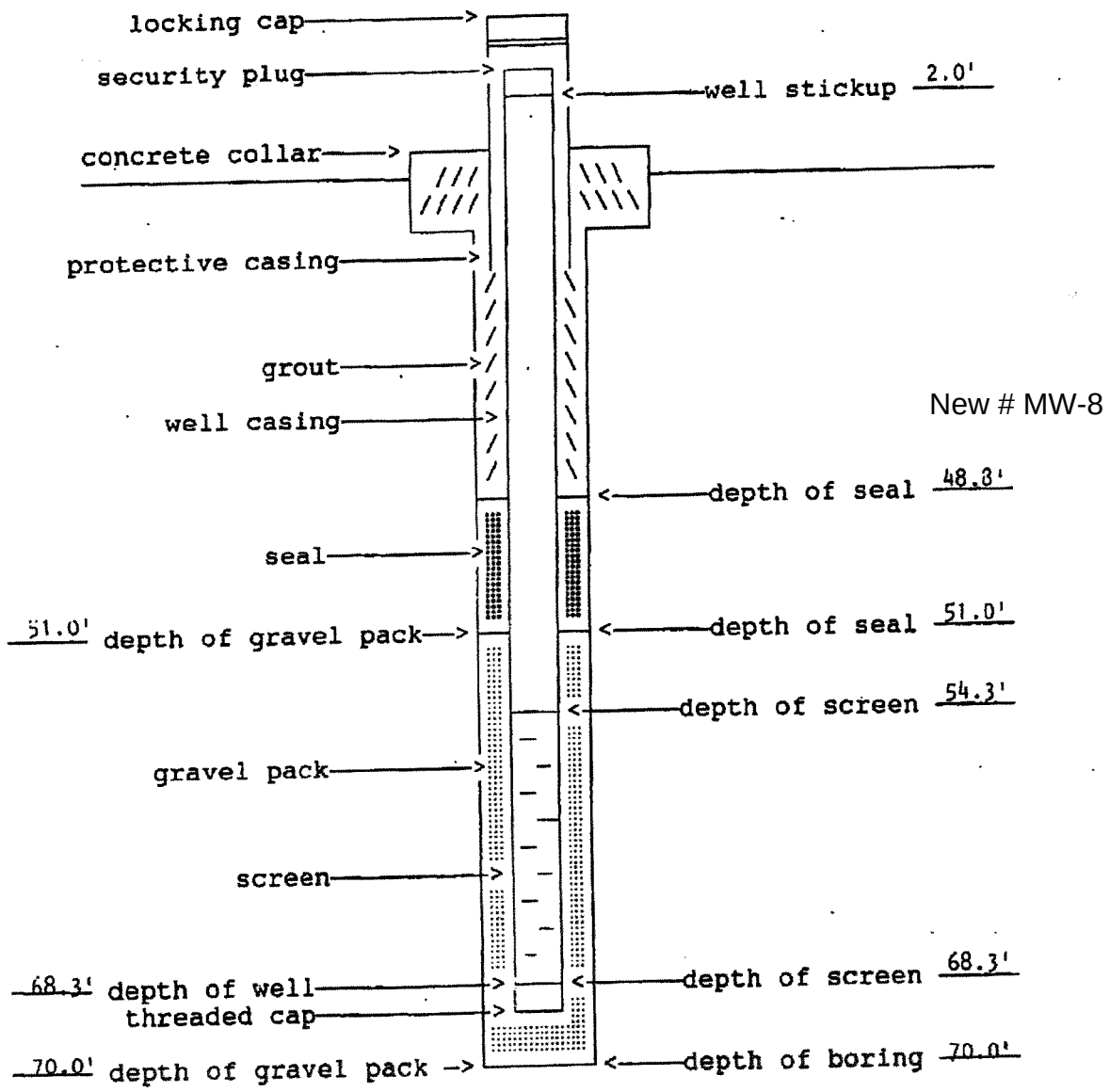
METHOD OF ADVANCING BORING	DEPTH
POWER AUGER	0 TO 57.9
HAND CHOP: W/MUD: W/WATER	TO
ROTARY DRILL: W/MUD: W/WATER	TO
DIAMOND CORE	TO

New # MW-8

mw-8
(former mw-4)

MONITORING WELL INSTALLATION RECORD

JOB NAME: MNS LANDFILL



DATE INSTALLED: 2-3-92 INSPECTOR: J Meaders	DUKE POWER COMPANY GEOTECHNICAL CENTER	MONITORING WELL NUMBER: MW-8

MW-8
(Former MW-4)

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: DUKE POWER COMPANY
DRILLER REGISTRATION NUMBER: 921

STATE WELL CONSTRUCTION PERMIT NUMBER: 53-1105-wm-0785

New # MW-8

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: CORNELIUS N.C.
(Road, Community, or Subdivision and Lot No.)
County: MECKLENBURG

2. OWNER: DUKE POWER COMPANY
ADDRESS: P.O. BOX 1006 (Street or Route No.)
CHARLOTTE (City or Town) N.C. (State) 28201 (Zip Code)

3. DATE DRILLED: 1-29-92 USE OF WELL: MONITORING
4. TOTAL DEPTH: 70.0' CUTTINGS COLLECTED: ☐ Yes ☒ No.
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: 57.0 FT. ☐ above ☒ below TOP OF CASING.
TOP OF CASING IS 2.0 FT. ABOVE LAND SURFACE.
7. YIELD (gpm): N/A METHOD OF TEST: N/A
8. WATER ZONES (depth): N/A
9. DISINFECTANT: Type N/A Amount N/A

DRILLING LOG

Depth From	Depth To	Formation Description
		SEE ATTACHED SOIL TEST BORING FIELD REPORT, ALSO WELL INSTALLATI RECORD
		MW-8

If additional space is needed use back of form.

10. CASING:

	Depth From	Depth To	Diameter	Wall Thickness or Weight/Ft.	Material
1	+2.0	54.3 Ft.	2"	SCH. 40	PVC
		Ft.			
		Ft.			

11. GROUT:

	Depth From	Depth To	Material	Method
	0.0	48.8 Ft.	CEMENT W/BENTONITE,	PUMP
		Ft.		

12. SCREEN:

	Depth From	Depth To	Diameter	Slot Size	Material
	54.3	68.3 Ft.	2" in.	.010 in.	PVC
		Ft.	in.	in.	
		Ft.	in.	in.	

13. GRAVEL PACK:

	Depth From	Depth To	Size	Material
	51.0	70.0 Ft.	ES: .014 UC: 3.5	SAND
		Ft.		

14. REMARKS: BENTONITE SEAL 48.8'-51.0'

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

MW-8

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: [signature] DATE: 2-3-92

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

GW-1 Revised 11/84

MW-8
(former MW-4)

Form 25630 (R3-87)

FORM M-26C | REVISION 2 | PAGE 1 OF 2

DUKE POWER COMPANY
CONSTRUCTION DEPARTMENT
PROJECT McGUIRE LANDFILL

SOIL TEST BORING FIELD REPORT

STARTING TIME N/A
GROUND SURFACE ELEV. 757.3 New # MW-8
HRS. DRILLING N/A HRS. MOVING N/A
JOB NO. N/A
JOB NAME LANDFILL MONITOR WELLS
INSPECTOR J.W. Mueller BORING NO. MW-8
DATE 1-29-92 WEATHER P.C. cool

	SAMPLING	1ST 6"	2ND 6"	3RD 6"	SCALE	UD	SOIL CLASSIFICATION AND REMARKS
					0	*	NOTE: NO SPT TAKEN UNTIL 62.5' JAR SAMPLES TAKEN AS SHOWN BELOW
*	1 4.5	N/A	N/A	N/A	5		RED/REDDISH YELLOW. MICA, CLAYEY, FINE SANDY SILT
*	2 9.5	N/A	N/A	N/A	10		REDDISH YELLOW, MICA. SILTY, FINE/MED. SAND
*	3 14.5	N/A	N/A	N/A	15		ST. BRN./DK. YELLSH. BRN, MICA, SILTY, GRAVELY. FINE/COARSE SAND.
*	4 19.5	N/A	N/A	N/A	20		BRN/YELLOW, MICA, SILTY, FINE/MED. SAND.
*	5 24.5	N/A	N/A	N/A	25		ST. BRN, MICA, FINE SANDY SILT.
*	6 29.5	N/A	N/A	N/A	30		YELLSH BRN, MICA VERY SILTY FINE/MED. SAND
*	7 34.5	N/A	N/A	N/A	35		YELLSH BRN, MICA, FINE SANDY SILT.
*	8 39.5	N/A	N/A	N/A	40		YELLSH BRN, MICA, SILTY, FINE/MED. SAND

BORING TERMINATED 70.0
BORING REFUSAL N/A
WATER TOB DEPTH Stolen 59.5
WATER 24 HR: DEPTH 55.0
WATER LOSSES N/A
CASING SIZE N/A LENGTH N/A

METHOD OF ADVANCING BORING	DEPTH
POWER AUGER	0 TO 70.0
HAND CHOP: W/MUD: W/WATER	TO
ROTARY DRILL: W/MUD: W/WATER	TO
DIAMOND CORE	TO

+ STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES

MW-8
(former MW-4)

Form 25630 (R3-87)

FORM M-26C | REVISION 2 | PAGE 2 OF 2

DUKE POWER COMPANY
CONSTRUCTION DEPARTMENT
PROJECT MCGUIRE LANDFILL

SOIL TEST BORING FIELD REPORT

STARTING TIME N/A
GROUND SURFACE ELEV.
HRS. DRILLING N/A HRS. MOVING N/A
JOB NO. N/A
JOB NAME LANDFILL MONITOR WELLS
DATE 1-29-92 WEATHER P.C. MILD INSPECTOR J.W. Mauldin BORING NO. MW-8

	SAMPLING		1ST 6"	2ND 6"	3RD 6"	SCALE	UD	SOIL CLASSIFICATION AND REMARKS
						40		
*	9	44.5	N/A	N/A	N/A	45		BRNISH YEL., MICA, VERY SILTY, FINE/MEDIUM SAND.
*	10	49.5	N/A	N/A	N/A	50		YELISH BRN. MICA, SILTY, GRAVELY, FINE/COARSE SAND
*	11	54.5	N/A	N/A	N/A	55		OLIVE BRN., MICA, SILTY, FINE/COARSE SAND.
*	12	59.5	N/A	N/A	N/A	60		OLIVE BRN. MICA, SILTY, FINE/COARSE SAND.
	13	62.5 64.0	28	21	22	65		OLIVE/OLIVE BRN, MICA, SILTY, FINE/COARSE SAND
	14	70.0 70.1	50=1 1/4"			70		NO RECOVERY BORING TERMINATED @ 70.0'
						75		
						80		

BORING TERMINATED 70.0
BORING REFUSAL N/A
WATER TOB DEPTH 59.5
WATER 24 HR: DEPTH 55.0
WATER LOSSES N/A
CASING SIZE N/A LENGTH N/A

METHOD OF ADVANCING BORING	DEPTH
POWER AUGER	0 TO 70.0
HAND CHOP: W/MUD: W/WATER	TO
ROTARY DRILL: W/MUD: W/WATER	TO
DIAMOND CORE	TO

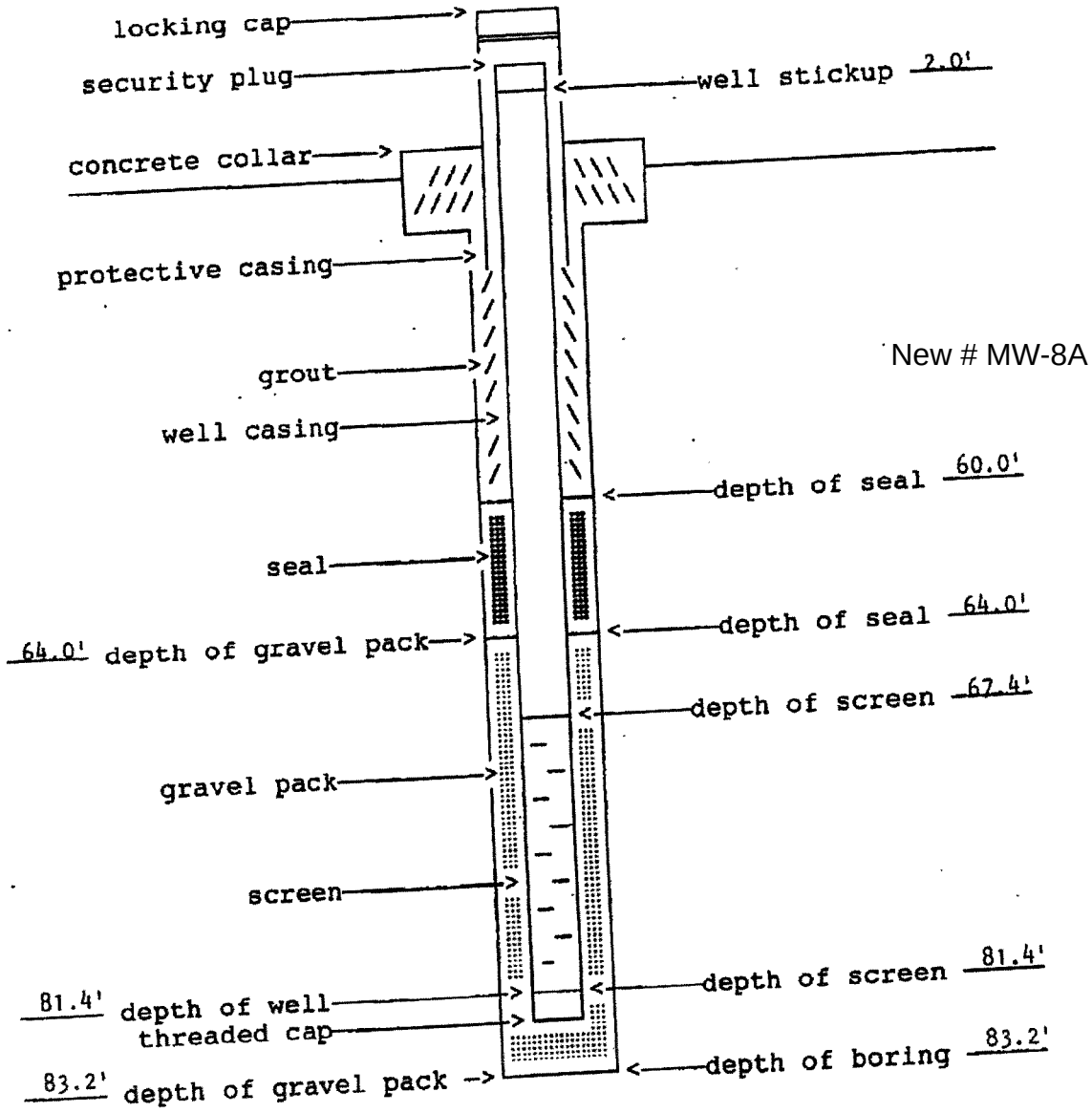
+ STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES

New # MW-8A

MW-8A
(former MW-4A)

MONITORING WELL INSTALLATION RECORD

JOB NAME: MNS LANDFILL



DATE INSTALLED: 2-11-92 INSPECTOR: J Meaders	DUKE POWER COMPANY GEOTECHNICAL CENTER	MONITORING WELL NUMBER: MW-8A

MW-8A
(former MW-4A)

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 DUKE POWER COMPANY
DRILLER REGISTRATION NUMBER 921

STATE WELL CONSTRUCTION PERMIT NUMBER: 59-1105-wm-0785 New # MW-8A

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: CORNELIUS N.C.
(Road, Community, or Subdivision and Lot No.)
County: MECKLENBURG

2. OWNER DUKE POWER COMPANY
ADDRESS P.O. BOX 1006 (Street or Route No.)
CHARLOTTE (City or Town) N.C. (State) 28201 (Zip Code)

3. DATE DRILLED 1-28-92 USE OF WELL MONITORING
4. TOTAL DEPTH 83.2' CUTTINGS COLLECTED ☐ Yes ☒ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: 57.2 FT. ☐ above ☒ below TOP OF CASING.
TOP OF CASING IS 2.0 FT. ABOVE LAND SURFACE.
7. YIELD (gpm): N/A METHOD OF TEST N/A
8. WATER ZONES (depth): N/A

9. CHLORINATION: Type N/A Amount N/A

10. CASING:

	Depth From	Depth To	Diameter	Wall Thickness or Weight/Ft.	Material
	+2.0	67.4	2"	SCH. 40	PVC

11. GROUT:

	Depth From	Depth To	Material	Method
	0.0	60.0	CEMENT W/BENTONITE	PUMP

12. SCREEN:

	Depth From	Depth To	Diameter	Slot Size	Material
	67.4	81.4	2"	.010	PVC

13. GRAVEL PACK:

	Depth From	Depth To	Size	Material
	64.0	83.2	ES = .014 UC = 3.5	SAND

14. REMARKS: BENTONITE SEAL 60.0'-64.0'

DRILLING LOG

Depth From	Depth To	Formation Description
		SEE ATTACHED SOIL TEST BORING FIELD REPORT, ALSO WELL INSTALLATION RECORD.
		MW-8A

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)

MW-8A

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 2-11-92

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

W-1 Revised 11/84

MW-8A
(former MW-4A)

Form 25630 (R3-87)

FORM M-26C	REVISION 2
	PAGE 1 OF 2

DUKE POWER COMPANY
CONSTRUCTION DEPARTMENT
PROJECT McGUIRE

SOIL TEST BORING FIELD REPORT

STARTING TIME N/A
GROUND SURFACE ELEV. 757.61
HRS. DRILLING N/A HRS. MOVING N/A
JOB NO. N/A
JOB NAME McGUIRE LAND FILL
DATE 1-28-92 WEATHER P.C. MILD INSPECTOR J.W. Masters BORING NO. MW-8A
New # MW-8A

SAMPLING 1ST 6"	2ND 6"	3RD 6"	SCALE	UD	SOIL CLASSIFICATION AND REMARKS
			40		NO SOIL SAMPLING REQUIRED
			45		
			50		AUGER REFUSAL @ 52.0
RUN = 2.2					SLIGHT / FRESH WEATHERING
REC = 2.2 = 100%					HARD / VERY HARD, MOD. CLOSE JOINTS
RQD = 2.2 = 100%					END RUN 54.2
			55		SLIGHT / FRESH WEATHERING
RUN = 5.0					HARD / VERY HARD.
REC = 4.0 = 80%					MOD. CLOSE JOINTS
RQD = 4.0 = 80%					END RUN @ 59.2
			60		
RUN = 5.0					NO RECOVERY
REC = 0 = 0%					END RUN @ 64.2
RQD = 0 = 0%					
			65		
RUN = 5.0					NO RECOVERY
REC = 0 = 0%					END RUN @ 69.2
RQD = 0 = 0%					
			70		
RUN = 5.0					NO RECOVERY
REC = 0%					END RUN @ 74.2
RQD = 0%					
			75		VERY SLIGHT / COMPLETE WEATHERING
RUN = 5.0					HARD / VERY SOFT
REC = 4.3					VERY CLOSE / CLOSE JOINTS
RQD = 1.5					END RUN @ 79.2
			80		

BORING TERMINATED 83.2
BORING REFUSAL 52.0
WATER TOB DEPTH DRY @ 52.0'
WATER 24 HR: DEPTH 55.2
WATER LOSSES NONE
CASING SIZE N/A LENGTH N/A

METHOD OF ADVANCING BORING	DEPTH
POWER AUGER	0 TO 52.0
HAND CHOP: W/MUD: W/WATER	TO
ROTARY DRILL: W/MUD: W/WATER	TO
DIAMOND CORE	52 TO 83.2

+ STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES

MW-8A
(former MW-4A

Form 25630 (R3-87)

FORM M-26C	REVISION 2
	PAGE 2 OF 2

DUKE POWER COMPANY
CONSTRUCTION DEPARTMENT
PROJECT McGUIRE

SOIL TEST BORING FIELD REPORT

STARTING TIME N/A
GROUND SURFACE ELEV.
HRS. DRILLING N/A HRS. MOVING N/A
JOB NO. N/A
JOB NAME McGUIRE LANDFILL
DATE 2-3-92 WEATHER P.C. MILD INSPECTOR J.W. Meadows BORING NO. MW-8A

SAMPLING	1ST 6"	2ND 6"	3RD 6"	SCALE	UD	SOIL CLASSIFICATION AND REMARKS
Run = 40				80		VERY SEVERE / SLIGHT WEATHERING
REC = 25 = 60%						SOFT / HARD
RQD = 1.3 = 32.5%						VERY CLOSE/CLOSE JOINTS
						END RUN @ 83.2'
				85		BORING TERMINATED @ 83.2'
				90		
				95		
				100		
				105		
				110		
				115		
				120		

BORING TERMINATED 83.2
BORING REFUSAL 52.0
WATER TOB DEPTH DRY @ 52.0'
WATER 24 HR: DEPTH 55.2
WATER LOSSES NONE
CASING SIZE N/A LENGTH N/A

METHOD OF ADVANCING BORING	DEPTH
POWER AUGER	0 TO 52.0
HAND CHOP: W/MUD: W/WATER	TO
ROTARY DRILL: W/MUD: W/WATER	TO
DIAMOND CORE	52 TO 83.2

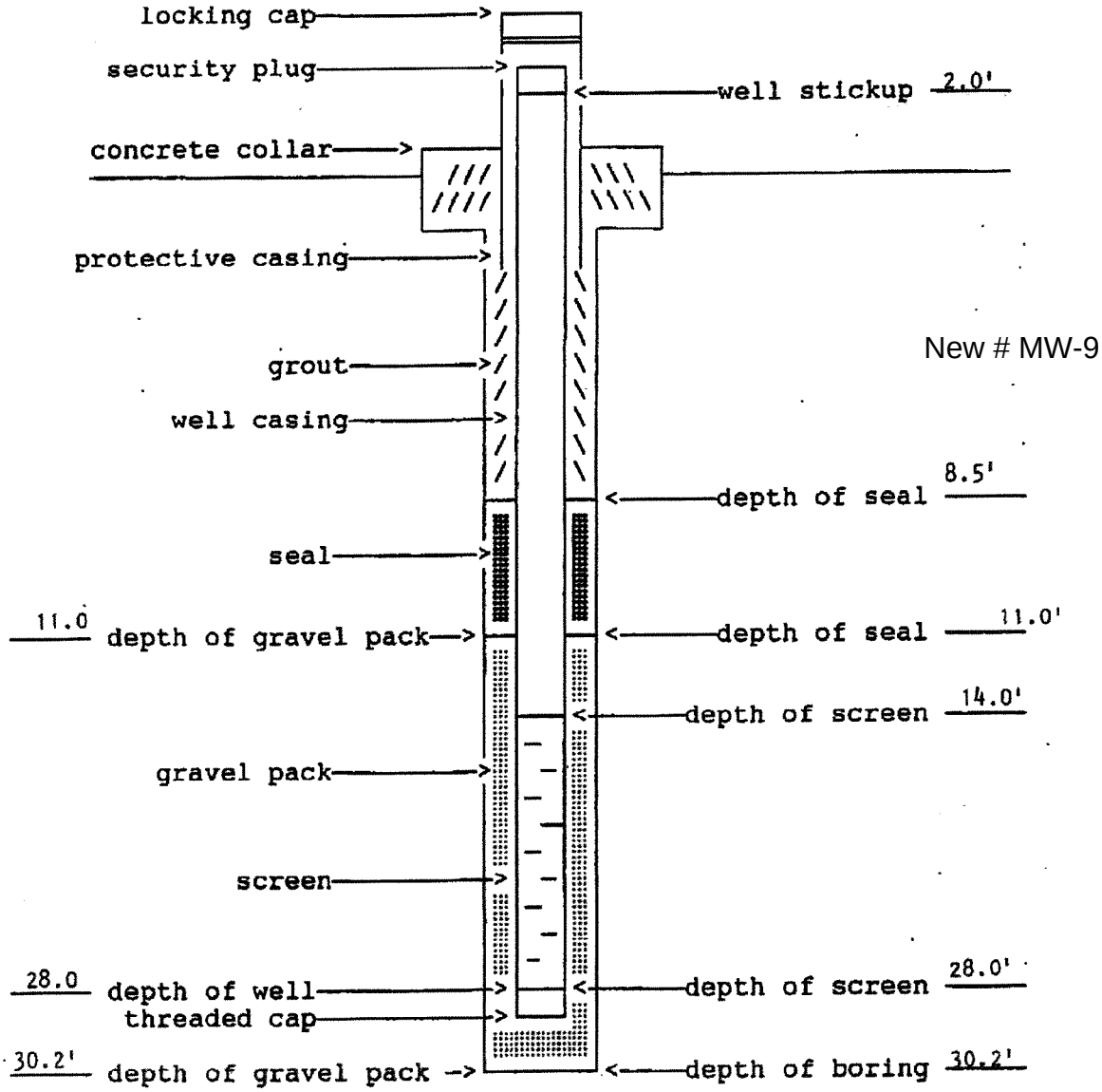
+ STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES

New # MW-9

MW-9
(former MW-5)

MONITORING WELL INSTALLATION RECORD

JOB NAME: MNS LANDFILL



DATE INSTALLED: 2-19-92 INSPECTOR: J Meaders	DUKE POWER COMPANY GEOTECHNICAL CENTER	MONITORING WELL NUMBER: MW-9

MW-9
(Former MW-5)

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 DUKE POWER COMPANY
DRILLER REGISTRATION NUMBER 921

STATE WELL CONSTRUCTION PERMIT NUMBER: 59-1105-[illegible] New # MW-9 -

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: CORNELIUS N.C. County: MECKLENBURG
(Road, Community, or Subdivision and Lot No.)
2. OWNER DUKE POWER COMPANY
ADDRESS P.O. BOX 1006 (Street or Route No.)
CHARLOTTE (City or Town) N.C. (State) 28201 (Zip Code)
3. DATE DRILLED 2-19-92 USE OF WELL MONITORING
4. TOTAL DEPTH 30.2' CUTTINGS COLLECTED ☐ Yes ☒ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: 19.4 FT. ☐ above ☒ below TOP OF CASING,
TOP OF CASING IS 2.0 FT. ABOVE LAND SURFACE.
7. YIELD (gpm): N/A METHOD OF TEST N/A
8. WATER ZONES (depth): N/A
9. CONTAMINATION: Type N/A Amount N/A
10. CASING:

	Depth From	To	Diameter	Wall Thickness or Weight/Ft.	Material
	+2.0'	14.0	2"	SCH. 40	PVC

11. GROUT:

	Depth From	To	Material	Method
	0.0	8.5	CEMENT/w/BENTONITE	PUMP

12. SCREEN:

	Depth From	To	Diameter	Slot Size	Material
	14.0	28.0	2 in.	.010 in.	PVC
			in.	in.	
			in.	in.	

13. GRAVEL PACK:

	Depth From	To	Size	Material
	11.0	30.2	ES = .014 UC = 3.5	SAND

14. REMARKS: BENTONITE SEAL 8.5' - 11.0'

Depth From	To	DRILLING LOG Formation Description
		SEE ATTACHED SOIL TEST
		BORING FIELD REPORT, ALSO
		WELL INSTALLATION RECORD
		MW-9

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)

MW-9

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 2-19-92

GW-1 Revised 11/84

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

MW-9
(Former MW-5)

Form 25630 (R3-87)

FORM M-26C	REVISION 2
	PAGE 1 OF 1

DUKE POWER COMPANY
CONSTRUCTION DEPARTMENT
PROJECT MCGUIRE

SOIL TEST BORING FIELD REPORT

STARTING TIME N/A
GROUND SURFACE ELEV. 710.27
HRS. DRILLING N/A HRS. MOVI... N/A
JOB NO. N/A
JOB NAME MCGUIRE LANDFILL
DATE 2-19-92 WEATHER CLD. RAIN INSPECTOR J.W. Meuders BORING NO. MW-9

	SAMPLING	1ST 6"	2ND 6"	3RD 6"	SCALE	UD	SOIL CLASSIFICATION AND REMARKS
					0	*	NOTE: NO S.P.T. TAKEN UNTIL 30.2' JAR SAMPLES TAKEN AS SHOWN BELOW.
*	1 5.0	N/A	N/A	N/A	5		RED, MICA, SILTY, FINE/MEDIUM SAND.
*	2 10.0	N/A	N/A	N/A	10		RED/REDDISH BROWN, MICA, SILTY, FINE/MED. SAND.
*	3 15.0	N/A	N/A	N/A	15		REDDISH BROWN, MICA, SILTY, FINE/MED SAND
*	4 20.0	N/A	N/A	N/A	20		YELLOWISH BROWN, MICA, SILTY, FINE/MEDIUM SAND
*	5 25.0	N/A	N/A	N/A	25		STRONG BROWN/YELLOWISH BROWN, MICA, SILTY, FINE/MED. SAND.
*	6 30.2 31.7	9	12	18	30		OLIVE BROWN, MICA, SILTY, FINE/MEDIUM SAND
							BORING TERMINATED @ 30.2
					35		
					40		

+ STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES

BORING TERMINATED 30.2
BORING REFUSAL N/A
WATER TOB DEPTH 19.3
WATER 24 HR: DEPTH 17.4
WATER LOSSES N/A
CASING SIZE N/A LENGTH N/A

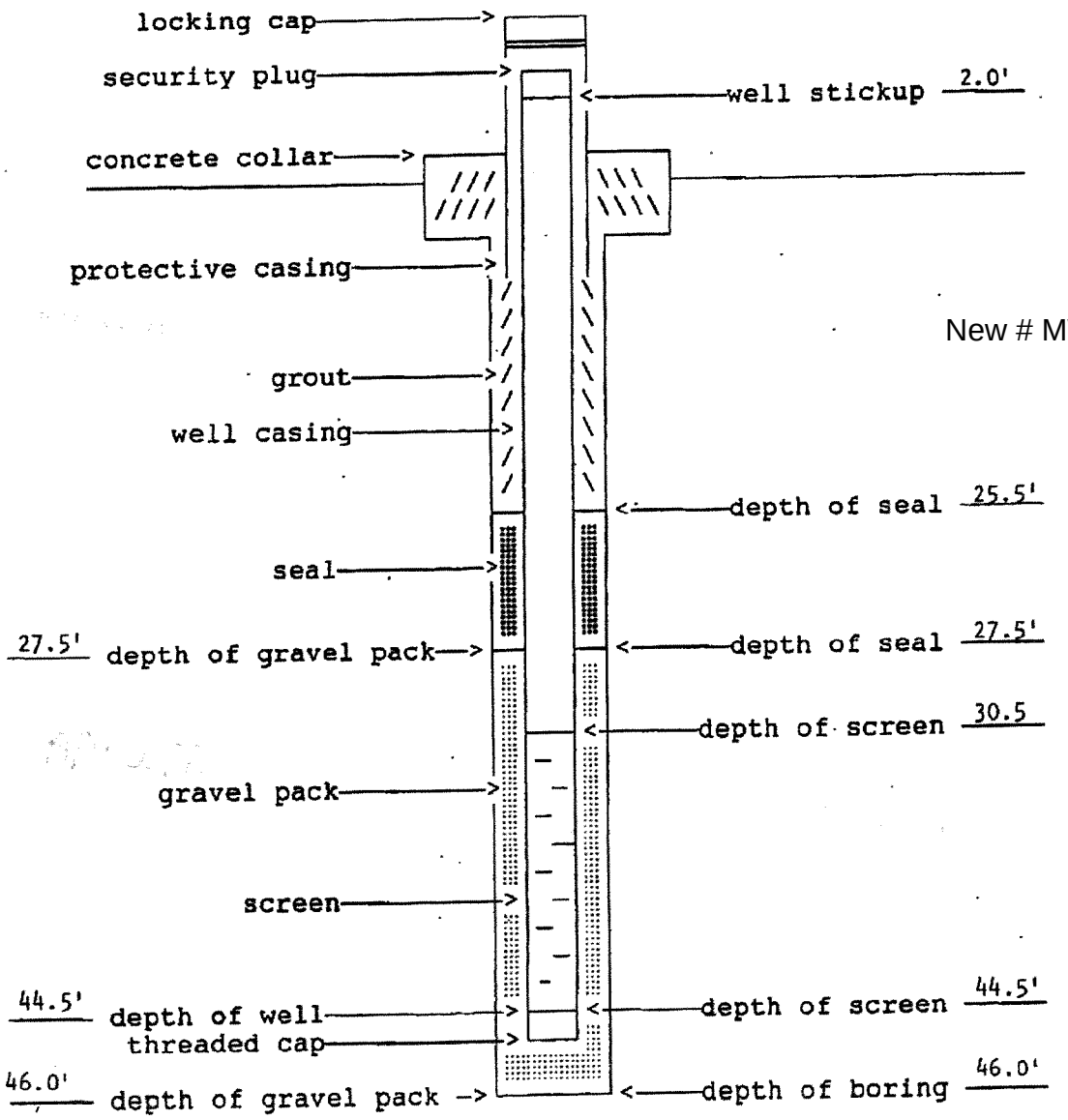
METHOD OF ADVANCING BORING	DEPTH
POWER AUGER	0 TO 30.2
HAND CHOP: W/MUD: W/WATER	TO
ROTARY DRILL: W/MUD: W/WATER	TO
DIAMOND CORE	TO

New # MW-9A

MW-9A
(Former MW-5A)

MONITORING WELL INSTALLATION RECORD

JOB NAME: MNS LANDFILL



DATE INSTALLED: 2-18-92 INSPECTOR: J Meaders	DUKE POWER COMPANY GEOTECHNICAL CENTER	MONITORING WELL NUMBER: MW-9A

MW-9A.
(former MW-5A)

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 DUKE POWER COMPANY
DRILLER REGISTRATION NUMBER 921

STATE WELL CONSTRUCTION PERMIT NUMBER: 59-1105-wm-0785
New # MW-9A

1. WELL LOCATION: (Show sketch of the location below)
Nearest Town: CORNELIUS N.C.
(Road, Community, or Subdivision and Lot No.)

County: MECKLENBURG

2. OWNER DUKE POWER COMPANY
ADDRESS P.O. BOX 1006 (Street or Route No.)
CHARLOTTE (City or Town) N.C. (State) 28201 (Zip Code)

3. DATE DRILLED 2-18-92 USE OF WELL MONITORING
4. TOTAL DEPTH 46.0' CUTTINGS COLLECTED ☐ Yes ☒ No
5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No
6. STATIC WATER LEVEL: 19.5' FT. ☐ above ☒ below TOP OF CASING.
TOP OF CASING IS 2.0 FT. ABOVE LAND SURFACE.
7. YIELD (gpm): N/A METHOD OF TEST N/A
8. WATER ZONES (depth): N/A

9. DESTINATION: Type N/A Amount N/A

10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From +2.0'	To 25.5	Ft.	2"	SCH. 40	PVC
From	To	Ft.			
From	To	Ft.			

11. GROUT:

	Depth		Material	Method
From 0.0	To 25.5	Ft.	CEMENT/BENTONITE	PUMP
From	To	Ft.		

12. SCREEN:

	Depth		Diameter	Slot Size	Material
From 30.5	To 44.5	Ft.	2 in.	.010 in.	PVC
From	To	Ft.	in.	in.	
From	To	Ft.	in.	in.	

13. GRAVEL PACK:

	Depth		Size	Material
From 27.5	To 46.0	Ft.	ES = .014 UC = 3.5	SAND
From	To	Ft.		

14. REMARKS: BENTONITE SEAL 25.5'–27.5

Depth From	To	Formation Description
		SEE ATTACHED SOIL TEST BORING FIELD REPORT, ALS WELL INSTALLATION RECOR
		MW-9A

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)

MW-9A

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 2-18-92

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

GW-1 Revised 11/84

MW-9A
(Former MW-5A)

Form 25630 (R3-87)

FORM M-26C	REVISION 2
	PAGE 1 OF 2

DUKE POWER COMPANY
CONSTRUCTION DEPARTMENT
PROJECT McGUIRE

SOIL TEST BORING FIELD REPORT

STARTING TIME N/A
GROUND SURFACE ELEV. 710.30
HRS. DRILLING N/A HRS. MOVING N/A
JOB NO. N/A
JOB NAME McGUIRE LANDFILL
DATE 2-18-92 WEATHER CLD, RAIN INSPECTOR J.W. Meadows BORING NO. MW 12 New # MW-9A

	SAMPLING		1ST 6"	2ND 6"	3RD 6"	SCALE	UD	SOIL CLASSIFICATION AND REMARKS
						0	*	NOTE: NO SP.T. TAKEN UNTIL 35.0, JAR SAMPLES TAKEN AS SHOWN BELOW.
*	1	5.0	N/A	N/A	N/A	5		REDDISH BROWN/RED, MICA, FINE, SANDY SILT
*	2	10.0	N/A	N/A	N/A	10		REDDISH BROWN, MICA, SILTY, FINE/MEDIUM SAND
*	3	15.0	N/A	N/A	N/A	15		REDDISH BRN, MICA, SILTY, FINE/MED. SAND.
*	4	20.0	N/A	N/A	N/A	20		REDDISH BRN./REDDISH YEL., MICA, SILTY, FINE/MED SAND
*	5	25.0	N/A	N/A	N/A	25		REDDISH BRN/REDDISH YEL, MICA, SILTY, FINE/MED. SAND
*	6	30.0	N/A	N/A	N/A	30		REDDISH BRN, MICA, SILTY, FINE/MED. SAND
	7	35.0 36.5	21	21	29	35		OLIVE BRN, MICA, SILTY, FINE/MEDIUM SAND.
	8	40.0 41.5	21	23	30	40		OLIVE GRAY, MICA, SILTY, FINE/MEDIUM SAND

BORING TERMINATED 46.0
BORING REFUSAL 46.0
WATER TOB DEPTH 22.7
WATER 24 HR: DEPTH 17.5
WATER LOSSES N/A
CASING SIZE N/A LENGTH N/A

METHOD OF ADVANCING BORING	DEPTH
POWER AUGER	0 TO 46.0
HAND CHOP: W/MUD: W/WATER	TO
ROTARY DRILL: W/MUD: W/WATER	TO
DIAMOND CORE	TO

+ STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES