Duke Power
A Duke Energy Company

Duke Power
Group Environment, Health & Safety
13339 Hagers Ferry Road
Huntersville, NC 28078-7929

September 23, 1999

North Carolina Department of
Environment and Natural Resources
Division of Waste Management
Solid Waste Section
1646 Mail Service Center
Raleigh, NC 27699-1646

Attention: Mr. James C. Coffey
Environmental Engineering Supervisor, Permitting Branch

Re: Industrial Landfill Closure Plan
Marshall Steam Station
Permit Number 18-04, Catawba County

Record: 004991-DP
Certified: Z 194 383 762

Dear Mr. Coffey:

Please reference the attached closure plan for the Marshall Steam Station Industrial Landfill (Permit Number 18-04) as required by 15A NCAC 13B.0505. This plan contains a post closure care plan and a post closure groundwater monitoring sampling and analysis plan for the ash portion of the landfill (Phase II). This revised groundwater monitoring sampling and analysis plan addresses questions about the suitability of the pre-existing monitoring wells expressed in an August 17, 1999 letter from Ellen Lorscheider. Plans are being made to install the additional monitoring well (MW-5) as stipulated in the August 17th letter. Monitoring well (MW-1) will continue to be monitored per the Post Closure Groundwater Monitoring Program Sampling and Analysis Plan.

Note that the asbestos and construction & demolition portions of this landfill are to remain operational. A report detailing the projected 5 year expansion of the asbestos portion of the landfill will be submitted to your office in the near future.

The last placement of ash into the landfill is estimated to be 12/31/99. When the ash portion of the landfill has been closed in accordance with 15A NCAC 13B.0505, Duke Power will notify your office in writing so that a site inspection may be performed by your staff.

If there are additional concerns, questions or comments, please contact me at (704) 875-4655. A timely response to this closure plan would be deeply appreciated. Thank you for your time and effort on our behalf.

Sincerely,

Allen Stowe

Allen Stowe, Scientist
Environmental Protection

jas/mssclosure

Attachment

cc: Ellen Lorscheider – NC DENR, Solid Waste Section

bc: Donna Burrell w/attachments
Sonny Cook w/o attachments
Buddy Davis w/o attachments
Mark Hollis w/o attachments
Steve Immel w/attachments
Bill Miller w/o attachments
Mike Ruhe w/o attachments
Ron Santini w/o attachments

Marshall Steam Station Industrial Landfill
Phase II
Catawba County
Permit 18-04
Post Closure Conditions

1. **MANAGEMENT OF LANDFILL GAS: The owner and/or operator shall take the measures necessary to ensure that the closed site shall continue to meet the design standards for landfill gas found in Rule .0503(2)(a).**

   The permitted area for the Marshall Steam Station Industrial Landfill consists of three areas. One area is a coal ash monofill (Phase II) that receives coal flyash (58 acres) from the combustion of coal at Marshall Steam Station, a second area that receives asbestos (38.1 acres) from Marshall and other Duke facilities, and a third area that receives demolition and construction debris from Marshall Steam Station (2.9 acres).

   The portion of the landfill to be closed is the fly ash monofill (Phase II), containing fly ash from combustion of coal at Marshall Steam Station.

   No other wastes are permitted to be disposed of in this landfill, nor have any other types of wastes been placed in this landfill. Rule .0503(2)(a) requires that the concentration of explosive gases be monitored at site structures and at the property boundary.

   Only the portion of the landfill receiving coal flyash will be closed (Phase II). Fly ash for combustion of coal does not generate or emit explosive gases; therefore no monitoring is required.

2. **MANAGEMENT OF SURFACE WATER: The owner and/or operator shall take the measures necessary to ensure that the closed site shall meet the requirements of Rule .0503(2)(c). In addition, the landfill shall be maintained such that surface water runoff occurs in a controlled manner, and that surface water shall not be impounded over waste.**

   Rule .0503(2)(c) requires:
   (c) A site shall meet the following surface water requirements:
   (i) A site shall not cause a discharge of pollutants into waters of the state that is in violation of the requirements of the National Pollutant Discharge Elimination System (NPDES), under Section 402 of the Clean Water Act, as amended, or that is in violation of standards promulgated under G.S. 143-214.1 and G.S. 143-215;
   (ii) A site shall not cause a discharge of dredged material or fill material into waters of the state that is in violation of the requirements under Section 404 of the Clean Water Act, as amended, or that is in violation of any state requirements regulating the discharge of dredged or fill material into waters of the state, including wetlands; and
   (iii) A site shall not cause non-point source pollution of waters of the state that violates assigned water quality standards.

   Drawing M-10A, Revision 3, shows a plan view of the landfill and the surface water drainage feature for the landfill (Phase II). As shown on this drawing, runoff from precipitation falling

onto the surface of the landfill is controlled by the use of vegetated slopes, ditches, culverts, and other engineered features. These features control the surface water on the landfill by routing water off of the landfill surface and minimize erosion of the soil cover. The design of the surface water control features was previously submitted to the Section as Attachment A of MSS-0215.00-00-0001 Specification on Clearing, Constructing, Operating, and Closing Dry Ash Landfill.

Drawing M-10B shows a section view of the ash landfill (Phase II), with the final earth cover thickness and surface slope grading requirements. The surface slope grading requirements for the uppermost elevation (top) of the landfill are one-half percent (½%) minimum and three percent (3%) maximum slope.

Surface water runoff from the landfill drains to the Marshall Steam Station Ash Basin, an NPDES Permitted (Permit #NC0004987) treatment system. The permitted discharge from this treatment system is monitored and the results are reported to the Water Quality Section.

The inspection and maintenance of the surface water drainage features for Phase II is addressed in the Marshall Steam Station Industrial Landfill (Phase II) Post Closure Care Plan, Section 3.0. Regular inspections and performing maintenance, as required, will ensure compliance with Rule .0503(2)(c).

3. **AIR QUALITY: The owner/operator shall ensure that landfill units do not violate any applicable requirements developed under a State Implementation Plan approved or promulgated by the U.S. EPA Administrator pursuant to Section 110 of the Clean Air Act.**

Duke Power's Phase II landfill unit at Marshall Steam Station does not violate any applicable requirements under the State Implementation Plan. The following rules are addressed:

Air quality regulations in 15A NCAC 2D.1700 apply to municipal solid waste (MSW) landfills as defined in 40 CFR 60.751. Since this landfill unit does not accept household waste, the landfill is not considered a MSW landfill and is therefore not subject to the requirements in Rule 2D.1700. In addition, because the landfill is used to store only fly-ash, the landfill is not expected to be a source of methane gas. Therefore, Duke Power is not in violation of any applicable requirements in the rule.

Air quality regulations in 15A NCAC 2D.0540 apply to "Particulates from Fugitive Non-process Dust Emission Sources". The air permit for Marshall Steam Station does not have any requirements associated with fugitive emissions from the landfill. In addition, Duke has not received "substantive complaints" as defined in the regulation that required action by the Division of Air Quality or preparation of control plans by Duke Power. Therefore, Duke Power is not in violation of any applicable requirements in the rule.

4. **FINAL COVER SYSTEM: The integrity and effectiveness of the final cover system and any permanent erosion control devices must be maintained. This could include making repairs to the cover as necessary to correct the effects of settlement, subsidence, erosion, or other events.**

   The integrity of the final soil cover, the effectiveness of the permanent erosion control devices, and the effectiveness of the surface water control devices for Phase II is discussed in the Marshall Steam Station Industrial Landfill (Phase II) Post Closure Care Plan, Section 3.0. This section also discusses the post closure inspection plan for the landfill.

5. **PROPOSED USES: The owner/operator shall submit a proposal for the Section's review and approval addressing post closure uses of the facility. Proposed post closure uses shall not violate any post closure conditions found in this letter. In particular, plans for post closure uses shall avoid possibilities for the entrapment of methane gas. Routine landfill gas monitoring within structures and at the facility may not be sufficient to detect potentially dangerous situations.**

   There are no proposed post closure uses for the Phase II portion of the landfill.

6. **ONGOING SOLID WASTE MANAGEMENT ACTIVITIES: Continuing solid waste management activities, if any, shall not violate any post closure conditions found in this letter, and must meet any other applicable requirements.**

   After closure of Phase II of this landfill, no additional wastes will be placed in the fly ash portion of landfill (Phase II). The portion of the landfill receiving asbestos and the portion of the landfill receiving demolition and construction debris will continue to receive these permitted wastes.

7. **RECORDATION: The owner/operator shall ensure that the recordation requirements for land disposal sites found in Rule .0204 are met.**

   In accordance with Rule .0204, a certified copy of the permit for the landfill was filed with the registrar of deeds for Catawba County. A copy of the recorded permit is attached.

8. **WATER QUALITY MONITORING AND REPORTING REQUIREMENTS**

   The groundwater monitoring and analysis for the post closure care period is found in the Marshall Steam Station Industrial Landfill (Phase II) Post Closure Care Plan Ground Water Monitoring Program Sampling and Analysis Plan, Attachment 2.

Copy of
Certified Landfill Permit
Recorded with
Catawba County
Registrar of Deeds

Ronald H. Levine, M.D., M.P.H.
STATE HEALTH DIRECTOR

DIVISION OF HEALTH SERVICES
P.O. Box 2091
Raleigh, N.C. 27602-2091

BOOK 1344 PAGE 583

6656

CERTIFIED COPY OF SOLID WASTE PERMIT

I do hereby certify that the attached PERMIT is an exact and true copy of Permit No. 18-04.

FILED
JAN 17 AM 9 03

O. W. Strickland, Head
Solid & Hazardous Waste Management Branch
Environmental Health Section

North Carolina
Catawba County

I, Nell T. Sellers, a Notary Public for said County and State, do hereby certify that O. W. Strickland personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and official seal, this the 30th day of December, 1983.

(official seal)

Nell T. Sellers
Notary Public

My commission expires July 24, 1987.

NORTH CAROLINA, COUNTY OF CATAWBA

The foregoing certificate of Nell T. Sellers, N. P. of Wake Co., NC, is certified to be correct. This instrument was filed for registration on the 17th day of January, 1984 at 9:03 AM and recorded in Book 1344 at Page 583.

This the 17th day of January, 1984.

Ruth Mackie
REGISTER OF DEEDS

PERMIT NO. 18-04

DATE ISSUED 12-30-83

STATE OF NORTH CAROLINA
DEPARTMENT OF HUMAN RESOURCES
Division of Health Services
P.O. Box 2091 Raleigh 27602

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SOLID WASTE PERMIT

Duke Power Company is hereby issued a permit to operate a Sanitary Landfill for disposal of flyash located at Marshall Steam Station on N.C. 150, Catawba County, in accordance with Article 13B of the General Statutes of North Carolina and all rules promulgated thereunder and subject to the conditions set forth in this permit. The facility is located on the below described property.

Disposal site is located on the northeast side of the waste treatment pond.

O. W. Strickland

O. W. Strickland, Head
Solid & Hazardous Waste Management
Branch
Environmental Health Section

DHS Form 2871 (Rev. 1/82)
Solid & Hazardous Waste Management Branch

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PERMIT NO. 18-04

DATE ISSUED 12/30/83

SOLID WASTE PERMIT

Conditions of Permit:

1. This permit may be subject to review at an administrative hearing upon petition of anyone whose legal rights, privileges and duties may have been affected by the issuance thereof.

2. This permit shall not be effective unless the certified copy is filed in the register of deeds' office, in the grantor index under the name of the owner of the land in the county or counties in which the land is located. After recordation, the certified copy shall be returned to the Solid & Hazardous Waste Management Branch and shall have indicated on it the page and book number, date of recordation and registrar's seal.

3. The following requirements shall be met prior to receiving solid waste at the site:

   a. Site preparation shall be in accordance with construction plan.

   b. Site inspection shall be made by a representative of the Division of Health Services.

4. This solid waste disposal facility is permitted to receive flyash from Marshall Steam Station only.

5. This permit is for construction according to plans prepared by Monier Resources, Inc., dated 3/16/83. Any modification or deviation from the approved plans shall be approved by the N.C. Solid and Hazardous Waste Management Branch.

6. Operational requirements may be amended by the Division of Health Services as needed, based on performance of the operation.

7. Slopes on fill areas shall not exceed 3:1, surface water shall be handled so as not to erode slopes, and bench terraces shall be used according to Soil Conservation Service specifications.

8. A detailed erosion control/final stabilization plan shall be developed during construction and implementation of this plan.

DUKE POWER COMPANY

MARSHALL STEAM STATION INDUSTRIAL LANDFILL (PHASE II)

POST CLOSURE CARE PLAN

1.0 Chronology

Final cover will be established on all areas of the fly ash portion of the landfill (Phase II) within one hundred eighty (180) days from last receipt of wastes. Within one hundred twenty (120) days of completion of the final cover, the area will be stabilized with native grasses and vegetation.

Duke Power will conduct post-closure inspections on the fly ash portion of the landfill (Phase II) for a minimum period of five (5) years following closure as outlined in Section 3.1. At that time the post closure inspection requirements will be reviewed with the NCDENR.

2.0 Final Cover Requirements and Erosion Control

2.1 Final Cover

Final cover for the landfill (Phase II) finished surfaces will be applied in accordance with the design shown on drawings M-10A, Revision 3 and M-10B, Revision 1. Copies of these drawings are included as Attachment 1. The final cover requirements are also described in MSS-0215.00-00-0001 Specification on Clearing, Constructing, Operating, and Closing Dry Ash Landfill.

2.2 Erosion Control

Within one hundred twenty (120) days of completion of the final cover, the area will be stabilized with native grasses and vegetation as required by Appendix A – Erosion Control and Sedimentation Plan of MSS-0215.00-00-0001 Specification on Clearing, Constructing, Operating, and Closing Dry Ash Landfill. Until the vegetation is well established, the area will be inspected on an as needed basis to ensure that the erosion control measures are functioning properly, and the integrity of the final cover is maintained.

3.0 Post Closure Care Plan

Upon completion of closure, a post-closure monitoring and inspection plan will be implemented to ensure continuing compliance. This plan outlines the inspection activities that will be carried out for a period of five years (5) unless a variance is obtained. The Marshall Environmental Coordinator is the individual responsible for the implementation and documentation of the following monitoring and inspection plan for Phase II.

3.1 Inspection

For the first two years after completion of closure, a quarterly inspection for Phase II will include the following:

1. Inspection of the final cover layer for integrity and settlement
2. Erosion control measures including drainage ditches, vegetative cover.
3. Accessibility to monitoring wells.
4. Sedimentation control features.

The above items will be inspected semi-annually after the first two (2) years in June and December. A report will be prepared to document the inspection.

Any deficiencies discovered will be corrected within thirty (30) days of discovery. The Marshall Environmental Coordinator will be responsible for ensuring any required repairs are completed.

Duke Power will conduct post-closure inspections on Phase II for a minimum period of five (5) years following closure. At that time the post closure inspection requirements will be reviewed with the NCDENR.

3.2 Explosive Gas Monitoring

Due to the nature of the wastes disposed of in the Marshall Steam Station Industrial Landfill Phase II, explosive gas monitoring will not be conducted.

3.3 Security

The road access to landfill is controlled by a gate. Access is limited to Duke personnel or site contractors.

3.4 Documentation

A copy of all monitoring and maintenance inspection reports shall be maintained by the Marshall Environmental Coordinator.

3.5 Review and Revision Processes

Any deviations from the Post Closure Care Plan will be approved by NC Department of Environment and Natural Resources prior to implementation. Should revisions to the Post Closure Care Plan be necessary, the revisions shall be reviewed and approved by NCDENR prior to implementation

4.0 Ground Water Quality Monitoring Sampling and Analysis Plan

The groundwater quality monitoring and sampling and analysis plan is included as Attachment 2.

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Attachment 1

Drawings

M-10A Revision 3

M-10B Revision 1

Attachment 2

Marshall Steam Station
Industrial Landfill
(Phase II)
Post Closure Care
Ground Water Monitoring Program
Sampling and Analysis Plan

MARSHALL STEAM STATION
INDUSTRIAL LANDFILL - PHASE II
PERMIT # 18-04
POST-CLOSURE
GROUND-WATER MONITORING PROGRAM
SAMPLING AND ANALYSIS PLAN

Prepared By:
Duke Power Company
September 20, 1999

Ronald A. Santini 9.20.99

Ronald A. Santini, PH-GW(American Institute of Hydrology)

1.0 PROGRAM DESCRIPTION

1.1 SCOPE OF WORK

This Post-Closure Ground-Water Monitoring Program is designed to address post-closure ground-water monitoring around the Dry Ash Landfill at Marshall Steam Station. This plan 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 in "Interim Guidelines and Specifications for Preparing Quality Assurance Plans" (QAMS-500/80), and documents the methodologies of field sampling, record-keeping protocols, data quality objectives, and data validation procedures that will be used in this program.

1.2 WELL LOCATION AND INSTALLATION

Four wells are used to monitor groundwater quality in the vicinity of the landfill (Phase II). The locations of these wells are shown on Figure 1. The monitoring well survey coordinates and elevations are shown on Table 1.

The landfill is located within the drainage basin for the Marshall Steam Station Ash Basin. The landfill was constructed on top of and along the eastern side of a low ridge. The crest of this ridge decreases in elevation, dropping to the south-southeast, and on top of a former portion of the ash basin.

Due to the location of the landfill and the adjacent topography, there are no locations where a monitoring well could be installed directly upgradient of the landfill. Well MW-4 was installed in an area that is generally upgradient of the landfill and is used to monitor the groundwater that is representative of the upgradient groundwater quality. MW-4 is located approximately 500 feet north northwest of the landfill footprint.

Well MW-2 is located approximately 300 feet south of the landfill footprint. Although this well is location downgradient of the landfill, the screen elevation (771.0' to 761.9') is below the elevation of the ash basin pond (790'). The well is located approximately 300 feet from the ash basin.

Well MW-3 is located approximately to the northeast of the landfill, approximately 80 feet inside the property line. Investigation of groundwater flow in this area with temporary wells show that groundwater flow is towards the landfill at this well. However the well is useful in determining compliance with ground water standards at the compliance boundary and therefore is included in the post closure care monitoring plan.

Well MW-5 will be installed approximately 150 feet east of the landfill footprint.

Each of the wells is screened near the water table. These wells are constructed of two-inch diameter PVC well screen and casing. Each well intercepts the aquifer with a ten foot section of PVC well screen with a slot size of 0.010 inch. These wells were installed by a North Carolina registered driller in accordance with applicable NCDENR regulations.

Figure 2 shows a typical construction diagram for the wells. The wells are equipped with dedicated bladder pump systems (Figure 3).

1.3 PARAMETERS AND FREQUENCY

Sampling parameters, units of measure, methods, and detection limits are presented in Table 2. The parameters represent pertinent groundwater quality standards. The wells will be sampled semi-annually in February and August. Sampling results will be submitted to the State within 90 days of sampling.

1.4 DATA QUALITY OBJECTIVES

The overall quality assurance (QA) objective is to ensure that data of known and acceptable quality are provided. All measurements will be made so as to yield results that are representative of the groundwater. All data will be calculated and reported in units consistent with those of other agencies and organizations to allow comparability of databases.

The 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 Power Company Laboratory Services Procedures Manual, and are available upon request.

Detection limits for the water analyses presented in Table 2 are generally specified by the analytical methods. As stated above, appropriate methods have been selected to meet applicable standards for groundwater quality or the requirements of applicable permits. 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 information with each data package to allow reviewers of the data to be aware of encountered sample problems.

2.0 SAMPLING PROCEDURES

2.1 SAMPLING EQUIPMENT

Development, purging and sampling equipment are chosen to ensure the materials making up the equipment are compatible with the sample parameters and also comply with state and federal regulatory requirements for sampling. Positive-gas-displacement fluorocarbon resin bladder pumps are installed in each monitoring well as a dedicated purging and sampling system.

2.1.1 Equipment Cleaning Procedures

All equipment used to monitor groundwater elevations and quality at the landfill use dedicated equipment. However, in the event non-dedicated equipment is used, reusable water level meters, development pumps, purging, and sampling equipment are cleaned between wells in accordance with standard EPA approved cleaning procedures for field equipment described in "Standard Operating Procedures and Quality Assurance Manual", Engineering Support Branch, EPA Region IV, May, 1996.

2.2 GROUND-WATER SAMPLING

2.2.1 Developing the Well

After installation of new wells, and prior to initial sampling, the monitoring wells are developed. 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 sandpack surrounding the screen, to minimize future clogging of the well and increase well efficiency. Development involves removing

an estimated ten or more well volumes from the well using a positive-gas-displacement fluorocarbon resin bladder pump with an up-and-down agitation to loosen particles from the well screen. After development of a well, a true well depth is recorded.

2.2.2 Ground-Water Level and Total Depth Measurements

Water-level measurements are required to confirm the ground-water 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 top of each well casing. All depth and water-level measurements are referenced to the top of the well casing and recorded to the nearest one-hundredth of a foot.

Water levels are measured with a tape graduated in tenths of a foot. The tape consists of a conductivity meter integrated into the tape. When the tape encounters the water surface an electrical current is generated activating a audible alarm. The water level is measured on the tape at the time of the alarm. Three readings are taken prior to recording the actual water level. The total depth, water-level measurements, and calculated well volume are recorded on the Ground-Water Monitoring Data Sheet (Figure 4).

2.2.3 Low Flow Purging the Well

Prior to each sampling event, the well is purged to remove any standing water which may not be representative of formation water. Purging is accomplished by pumping. Dedicated bladder pump intakes are set at least one foot above the bottom of the well.

Low flow purging is accomplished by reducing the pump discharge rate to less than 500 ml/minute. The water removed is measured in a graduated container to insure proper flow rate. If the flow rate is greater than 500 ml/minute, the flow rate is slowed to achieve a low-flow condition (less than 500 ml/min). Under normal rates of recovery, monitoring wells should be sampled within 24 hours of purging in accordance with EPA guidelines. In situations were low-flow sampling evacuates a monitoring well, samples are collected as soon as the well recovers sufficiently. Samples are then collected in the order of the parameters' volatilization sensitivity (Section 2.2.5).

2.2.4 Field Measurements

During low-flow purging of the well, samples are collected at timed intervals to obtain measurements of pH, specific conductivity, dissolved oxygen, oxidation-reduction potential (ORP), turbidity and temperature. Stable readings during a low-flow purging event in a well are considered those which are within 10% of each other for all parameters listed above. Once purging has indicated stable conditions, the well can be sampled.

The field instrumentation is calibrated with reference standards prior to and after each sampling day as described in the Environmental Chemistry Procedure 3210 or manufacturers specifications (available upon request). The pH meter is calibrated with two different pH standards which usually bracket the expected ground-water pH (pH standards 7.0 and 4.0). The conductivity meter is calibrated with a standard nearest the expected ground-water conductivity. Dissolved oxygen is calibrated using air calibration or Winkler calibration. ORP is calibrated with hydroquinone solution having a known mV reading. Turbidity is calibrated using standards that cover the range of turbidity expected. The results are recorded on the Field Sampling Calibration Form (Figure 5). The sample readings are recorded on the Ground-Water Monitoring Data Sheet (Figure 4).

2.2.5 Low Flow Sample Collection

After sufficient purging and stable field measurements, pumping rates are reduced to near-zero energy by reducing the pump discharge rate below that of the purge rate. This near-zero sampling rate further minimizes the potential of re-suspension of colloids. Wells are sampled for the parameters of interest. If non-dedicated or non-disposable equipment is used (i.e. cleaned in the field between wells), background wells are sampled before downgradient wells. Sampling personnel wear clean, disposable, non-powdered latex gloves at each well. Samples are collected in the order of the volatilization sensitivity of the parameters:

- Total metals
- Sulfate and chloride
- TDS

If ground-water samples, for which metals analysis will be conducted, have a turbidity of higher than 50 NTU, an additional sample for metals analysis will be collected by filtering through an 0.45um filter, unpreserved and stored on ice. The unpreserved sample is stored at 4°C until delivered to the laboratory. The laboratory will digest the sample within 72 hours of sample collection as outlined in Standard Methods 3030C. This sample is used to explain the interaction of preservatives and particulates on analytical results.

2.2.6 Sample Containers, Volume, Preservative, and Holding Time

All sample containers supplied for the collection of ground-water samples by the laboratory are new, precleaned and/or prebaked as approved by EPA procedures appropriate for the parameters of interest. Table 3 summarizes the sample containers, sample volume, preservation procedures and holding times required for each type of sample and parameter. Sample containers are kept closed until used. All sample containers are provided by DPC or vendor laboratories.

3.0 SAMPLE TRACKING

The chain of custody program allows for the tracing of possession and handling of individual samples from the time of field collection through laboratory analysis and report preparation.

3.1 SAMPLE LABELING

Sample containers are labeled at the time of sampling with the following information: sampling date and time, sample identification number, and initials of sample collector.

3.2 FIELD DOCUMENTATION

This information is contained on the Groundwater Monitoring Data Sheets, the Field Sampling Calibration Form, or the Chain-of-Custody Record and Analysis Request Form (See Section 3.3) which are filled out for each sampling event. These loose-leaf sheets are arranged in sequential order and filed by project and date. All recorded entries are made in indelible ink. Errors are corrected by drawing a line through the error, initialing and dating the correction, and starting a new entry on the next line (if necessary). Information recorded on these documents include:

- 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 on sampling event
- Name of collector(s)
- Climatic conditions including estimate of air temperature

3.3 CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST FORM (CCRARF)

The CCRARF (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 parameter. 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 used
- Signature of persons involved in the chain of possession
- Inclusive dates of possession

3.4 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 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 are 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, chain-of-custody entries are completed on the CCRARF for all samples. Upon transfer of custody, the chain-of-custody form is signed by a sampling crew member, including the date and time. Samples are delivered to outside laboratories by DPC personnel or courier.

All chain-of-custody forms received by the laboratory(s) are signed and dated by the respective Supervising Scientist(s) or their designee (at the DPC 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 DPC laboratory personnel are described in detail in the DPC Laboratory Services Procedures Manual.

4.0 ANALYTICAL PROCEDURES

The main analytical laboratory used in this program is the DPC 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 Laboratory Services Procedures Manual are available for review upon request to:

Laboratory Manager
Laboratory Services Section
Duke Power Company, Group Environment, Health & Safety
Environmental Center
13339 Hagers Ferry Road
Huntersville, North Carolina 28078
704-875-5304

Vendor laboratories that meet EPA and North Carolina certification requirements may be used for analyses which cannot be performed in-house.

The analytical procedures used for this Groundwater Monitoring Program are briefly described in Table 2. Conductivity, pH, and/or turbidity are measured in the field according to DPC Laboratory Services Procedures Manual or instrument manufacturers' instructions.

5.0 INTERNAL QUALITY CONTROL CHECKS

Internal laboratory control checks used by the laboratories are described in their generic QAP and procedures manual. 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 above field QC blanks and replicates included as internal QC checks are described as follows:

- **Field Blanks**: A field blank consists of sample containers 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.

- **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. It is returned to the laboratory with the field samples, and analyzed along with the field samples for parameters of interest.

6.0 VALIDATION OF FIELD DATA PACKAGE

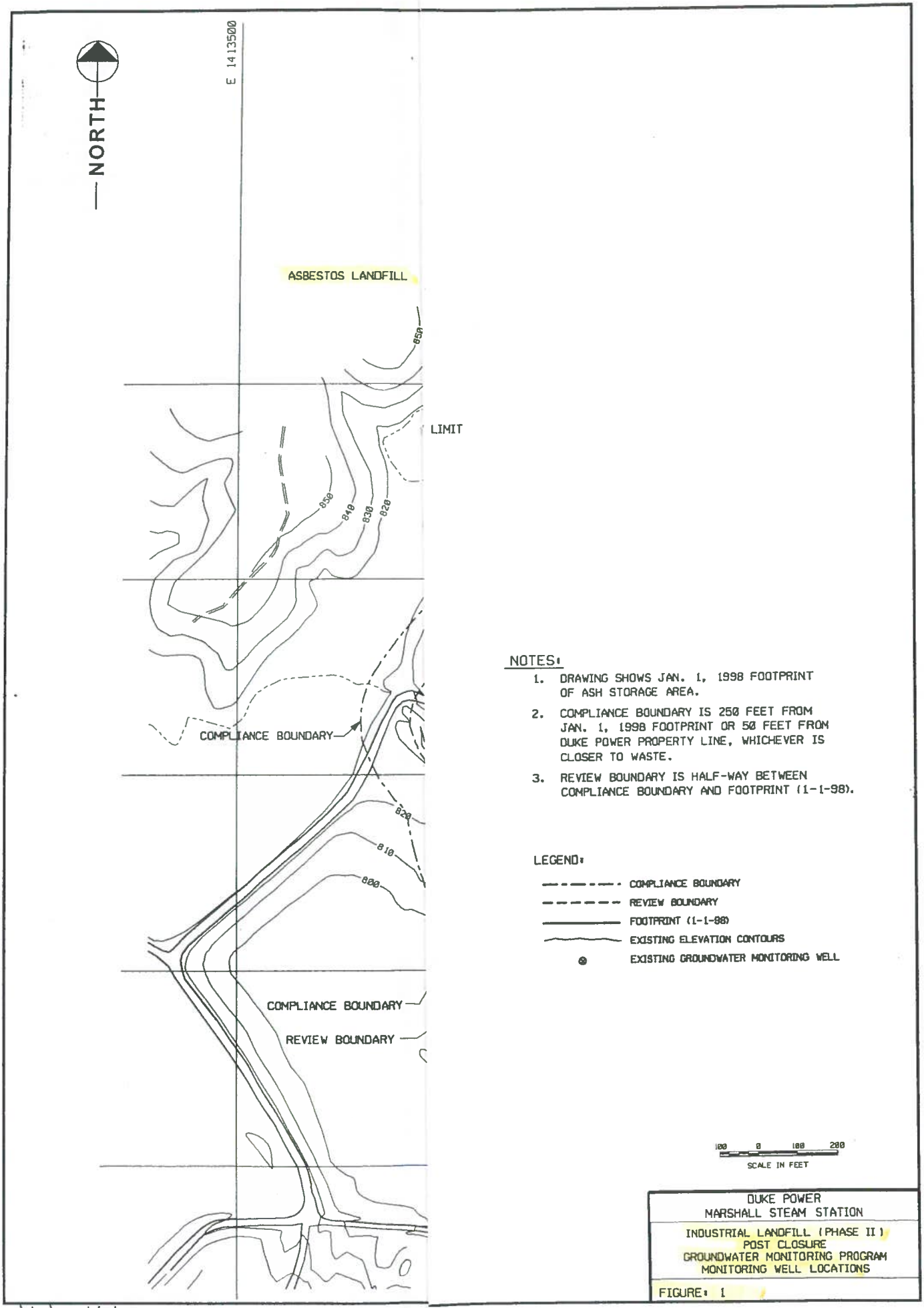
The field data package will be reviewed by the Project Scientist for completeness and accuracy. The field data package includes all of the field records and measurements developed by the sampling team personnel. The field data package validation procedure consist of:

- A review of field data contained on the Groundwater Monitoring Data Sheets for completeness.
- A 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 condition.
- A review of the Chain-Of-Custody Record and Analysis Request Form for proper completion, signatures of field personnel and the laboratory sample custodian, and dates, and for verification that the correct analyses were specified.

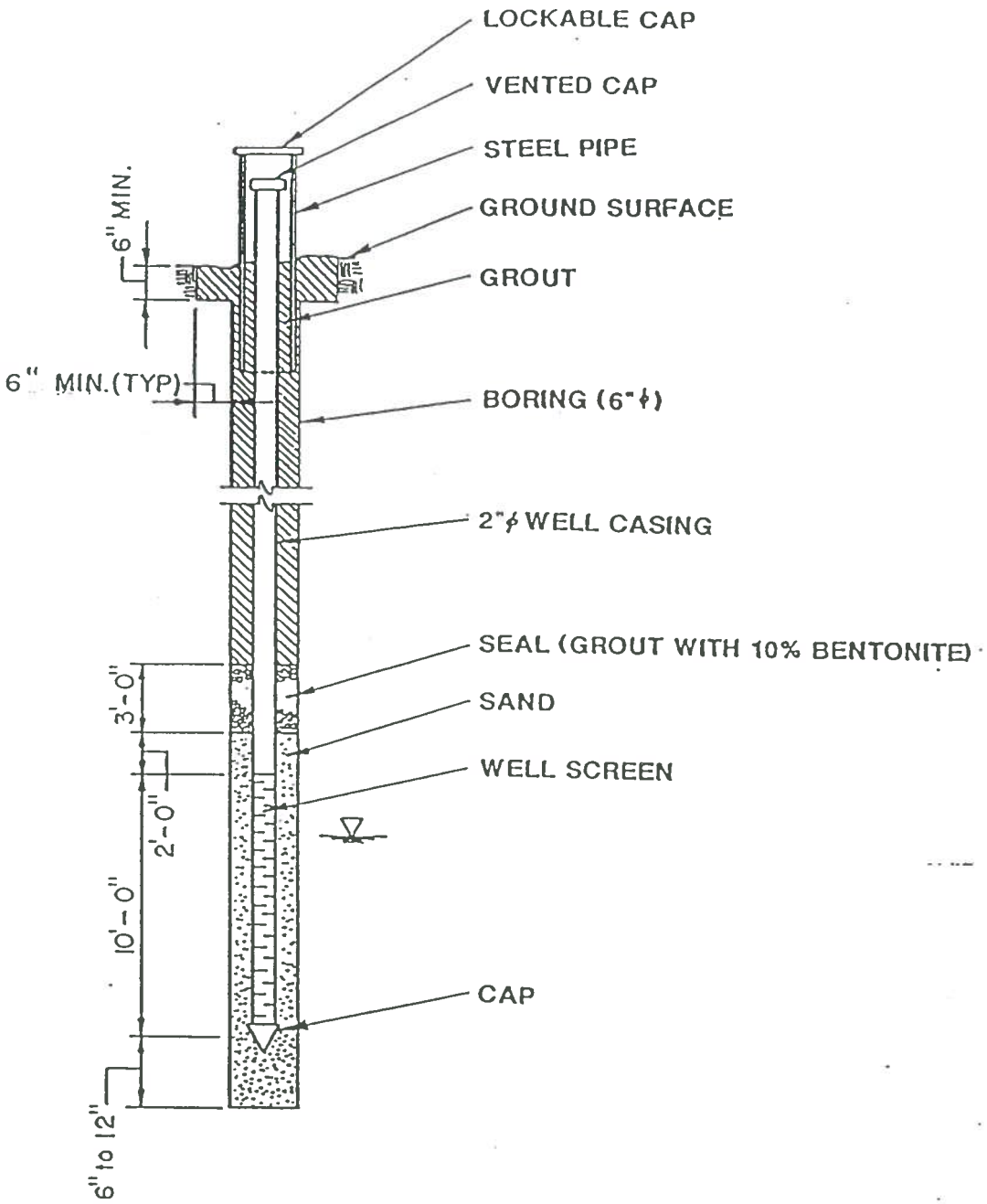
7.0 REPORT SUBMITTAL

A report summarizing field and laboratory data, groundwater contours, groundwater direction and hydraulic gradient, and a cover letter describing trends will be submitted to the North Carolina Department of Environment and Natural Resources within 90 days of sampling. The State will be notified in the event that vendor lab analyses have not been completed within this time frame. All Ground-Water Monitoring Data Sheets, Field Calibration Forms, Chain-of-Custody Record and Analysis Request Forms, Laboratory(s) QA data, and Data Validation Checklists are kept in fire-proof file cabinets or microfiched, and are available upon request.

FIGURES



c:\dgn\marsh1.dgn



OTES: 1.ALL DIMENSIONS ARE APPROXIMATE.
2.ALL CASING MATERIAL SHALL BE Sch 40 PVC.
3.WELL SCREEN MATERIAL SHALL BE Sch 40 PVC.

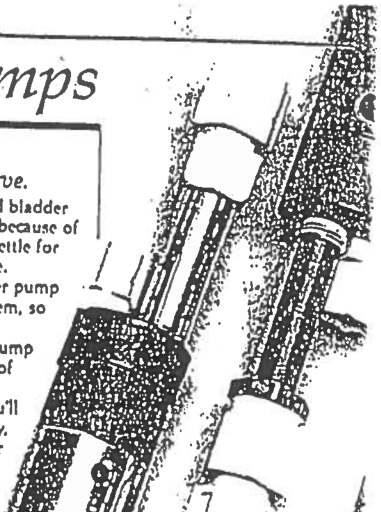
DUKE POWER CO.

GROUNDWATER MONITORING WELL DETAIL

FIGURE 2

WELL WIZARD®

Sampling Pumps



Choose the system that gives you the superior performance you deserve.

The whole reason you're selecting a dedicated bladder pump system for groundwater monitoring is because of its accuracy and long-term reliability. Don't settle for second best—get the high quality you deserve.

QED built the business of dedicated bladder pump systems. Our pumps are the heart of the system, so we spare no effort to make them the best.

Many of the details that make a superior pump are subtle modifications resulting from years of experience. They may not be obvious at first glance, but check the specs of our pumps. You'll find flow rates, pumping lifts, material quality, durability, and selection that clearly show our commitment to supplying you with the best pumps possible.

SPECIFICATIONS

MODEL NO.	BODY MATERIAL	BLADDER MATERIAL	TUBE FITTINGS	MAXIMUM LIFT (ft.)	A	B	C	D	PUMP WEIGHT (lbs.)
					(Dimensions in inches)				
P1100	PVC	PVC	Polypropylene	300	40.85	4.65	3.70	1.66	3
T1100	Teflon	Teflon	Teflon	250	40.33	4.13	2.96	1.66	4
P1101	PVC	Teflon	Polypropylene	300	40.85	4.65	3.70	1.66	3
P1101H	PVC	Teflon	316 S.S.	600	40.75	4.50	3.70	1.66	3
ST1101P	316 S.S.	Teflon	316 S.S.	1000	40.50	4.12	3.12	1.66	10
T1200	Teflon 316 S.S.	Teflon	316 S.S.	300	41.14	3.93	3.06	1.50	3
P1201	PVC 316 S.S.	Teflon	Polypropylene	300	41.23	4.02	3.06	1.50	4
P1201H	PVC 316 S.S.	Teflon	316 S.S.	600	41.37	4.16	3.20	1.50	4
T1400	Teflon 316 S.S.	Teflon	316 S.S.	200	15.87	3.87	2.87	1.00	3

All Air Supply Tube Fittings 0.25" O.D. [illegible]

[illegible]

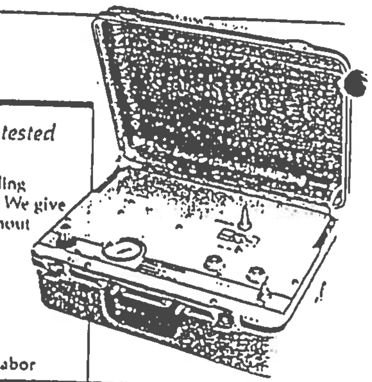
Field Replaceable Bladders

For Pumps	W/ Hand Tool	W/O Hand Tool
T1100	14055	14065
P1101	14057	14067
T1200	35315	35320
P1201	35315	35320

Note: [illegible]

WELL WIZARD®

Controllers



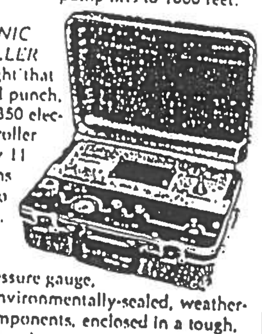
State-of-the-art, 100% performance-tested units cycle pumps automatically.

QED has more experience designing and building pneumatic controller devices than anyone else. We give you a better choice of controllers, with or without drivers—all field-proven performers. Versatile QED controllers are fully adjustable, can operate high-rate purge pumps and still be throttled down to 0 psi for TEGD-recommended low flow rates for sample vial filling. One-person portability, fast set-up, and unattended cycling greatly reduce labor requirements.

STANDARD & HIGH-PRESSURE CONTROLLER

All 3013 series models are compatible with a wide range of external gas sources and use sophisticated pneumatic design that requires no batteries or electrical supply. Optional Pump Manifold (Model 3000) lets one controller operate three sampling pumps within a 20-foot radius simultaneously. High pressure models allow pump lifts to 1000 feet.

ELECTRONIC CONTROLLER



A lightweight that packs a real punch, the Model 350 electronic controller weighs only 11 pounds, runs pumps up to 250 ft. deep. Complete with flow throttle, pressure gauge, and other environmentally-sealed, weather-resistant components, enclosed in a tough, protective carrying case.

SPECIFICATIONS

Model No.	Logic	Maximum Supply Pressure	Maximum Pump Depth	Wt.
3013	Pneumatic	[illegible]	[illegible]	[illegible]
[illegible]	Pneumatic	[illegible]	[illegible]	[illegible]
[illegible]	Pneumatic	[illegible]	[illegible]	[illegible]
350	Electronic	[illegible]	[illegible]	[illegible]

[illegible]

Extra performance built right in

Pneumatic power

3013 series controllers have all-pneumatic design for maximum reliability. No battery to drain, no long waits for recharging or replacement batteries—if you've got pressure, you've got power. Third-generation pneumatic logic controls provide inherent shock and moisture resistance for real field ruggedness.

Electronic efficiency

Model 350 has uniquely efficient circuits that work for 100 hours on one set of cheap, readily available AA batteries. Warning light shows a full day's power left, so you won't get left out in the field.

Stay in the driver's seat

Field-proven compressor carts roll easily on high-flotation pneumatic tires, for true one-person portability even in heavy mud or snow. Constructed to take long hours, rough terrain—and the payloads are QED's reliable, high-power engine/compressor combinations that can operate pumps to 300 feet.

No hidden charges

QED systems come complete—no extra costs for hoses, batteries, chargers or other necessary equipment. For example, all units have two 25 foot, heavy-duty industrial air supply hoses with quick-connect fittings—standard, not additional.

FIGURE 3

DUKE POWER COMPANY
GROUNDWATER MONITORING DATA SHEET

LOCATION:			
PROJECT TITLE:			
SAMPLING DATE:		FIELD CREW	

MONITORING WELL NUMBER: ____

WATER LEVEL METER #: ____

TIME SAMPLE COLLECTED: ____

WELL VOLUME CALCULATION

WELL DIAMETER (INCHES)	WELL DEPTH (FEET)		WATER LEVEL (FEET)		WATER COLUMN (FEET)		3.14 x r^2		VOLUME (FT^3)
2"		-		=		X	0.0218	=	
4"		-		=		X	0.0873	=	

LITERS PER WELL VOLUME REMOVED:

WELL VOLUME	LITERS TO REMOVE: (FT^3 x 28.32 l/FT^3)	
	2" WELL	4" WELL
1		
5		
10		
20		

OBSERVATIONS:

ODORS DETECTED:		FREE PRODUCT MEASUREMENT:	
TYPE:		METHOD:	
STRONG:		THICKNESS:	
MINOR:		OTHER:	
NONE:			

WATER LEVEL (FEET)	METHOD (P=PUMP) (B=BAIL)	VOLUME (LITERS)	EVACUATED VOLUME (LITERS)		pH (SU)	TEMP (deg C)	SPECIFIC CONDUCT. (umho/cm)		COMPLETE EVACUATION (Y/N)
N/A									

COMMENTS: WATER LEVEL AND WELL DEPTH REFERENCED TO TOP OF PVC WELL CASING.

Fig. A

Form 18570 (R7-87)

FIELD SAMPLING CALIBRATION FORM

Study: _____

: _____ Water Collector: _____

Crew: _____ Surface Unit Reader: _____

Weather & Lake Conditions: _____

Equipment: Sonde#: _____ Other Instruments: _____

Cable#: _____ _____

Battery#: _____ _____

Surface Unit#: _____ _____

Procedure Number: PESCS/ 3210 Water Quality Analyzer: [redacted] DS 3

Calibration Time		Time:		Time:		Time:	
Variable	Calib. Std.	Initial (Hydrolab) →	Adj. To (Std.)	Initial (Hydrolab) →	Adj. To (Std.)	Initial (Hydrolab) →	Adj. To (Std.)
Temp. °C							
Therm.#: _____		. -/->	.	. -/->	.	. -/->	.
Therm.#: _____		. -/->	.	. -/->	.	. -/->	.
DO mg/l	W		.		.		.
	W		.		.		.
	W		.		.		.
	AW	. →	.	. →	.	. →	.
pH	B	. →	7.00	. →	7.00	. →	7.00
	B	. →	4.01	. →	4.01	. →	4.01
	B	. →	9.18	. →	9.18	. →	9.18
SP COND mho/cm	SS	. →	.	. →	.	. →	.
	SS	. →	.	. →	.	. →	.
	SS	. →	.	. →	.	. →	.

': B – Buffer
W – Winkler
AW – Average Winkler
SS – Standard Solution

NA – Not Applicable
IM – Instrument Malfunction
→ – Adjusted to
-/-> – Not Adjusted to

Fig. 5

DUKE POWER COMPANY
Laboratory Services
MNS Bldg. # 7405 (MG03A1)
13339 Hagers Ferry Road
Huntersville, NC 28078

CHAIN OF CUST[illegible]DY RECORD AND ANALYSIS REQUEST FORM *

Form 8[illegible] (R10-93)

LS CLIENT CONTACT/PHONE[1]: _____
CLIENT[2]: _____
Project Name[3]: _____
Results to/Phone[4]: _____
Address and/or PROFS[5]: _____
Matrix (type of samples)/QC Level[6]: _____
SAM No.[7]: _____

FRAC [8]	CHEMPLOT Number [9]	Sample Description or ID[10]	Collected using sampling instructions[11] Date	Time	Name	ANALYSES REQUESTED by bottle type—MUST NOTE PRESERVATIVE[12] (may note special DL or Method)[13]

Sample Preserved ☐ Yes ☐ No [14]
Name:

Total # of samples[15]:

Delivered by[16]:	Delivered by:	Delivered by:
Date/Time:	Date/Time:	Date/Time:
Received by:	Received by:	Received by:

Turnaround Requested[19]:
☐ Routine (3 weeks)
☐ Rush (2 weeks)
☐ Emergency Rush
☐ Date Results Requested _____

Comments[17]: _____

* See instructions on back of form.

[illegible] LS Files Pink Client Copy

TABLES

Table 1. Monitoring Well Information

WELL ID	UNITS	MW2	MW3	MW4	MW5
NORTH	Feet	683,834.2	685,990.7	686,658.4	TO BE
EAST	Feet	1,415,046.3	1,415,309.4	1,414,395.4	INSTALLED
TYPE		PVC	PVC	PVC	DATA NOT
DIAMETER	Inches	2"	2"	2"	AVAILABLE
TOP OF CASING	Feet (amsl)	797.21	813.07	867.15	
TOTAL DEPTH	Feet	35.31	27.97	50.05	
DEPTH TO WATER	Feet	7.83	7.48	32.30	
SCREEN LENGTH	Feet	10	10	10	
TOP OF SCREEN	Feet (amsl)	771.9	795.1	827.1	
BOTTOM OF SCREEN	Feet (amsl)	761.9	785.1	817.1	
PUMP TYPE		BLADDER	BLADDER	BLADDER	
PUMP INLET ELEVATION	Feet (amsl)	762.9	786.1	818.1	

Table 2. Sample Parameters, Analytical Methods and Detection Limits

PARAMETER	UNITS	ANALYTICAL METHOD	DETECTION LIMITS
Insitu Parameters			
Field pH	pH Units	Hydrolab	NA
Specific Conductance	umhos/cm	Hydrolab	NA
Dissolved Oxygen	mg/L	Hydrolab	NA
Temperature	°C	Hydrolab	NA
Turbidity	NTU	Hydrolab	NA
Oxidation-Reduction Potential	mV	Hydrolab	NA
Water Levels	ft	Water Level Meter	0.010 ft
Laboratory Analyses			
Chloride	mg/l	EPA 325.2	1.0
Arsenic	mg/l	SM3030C/EPA 206.2	0.0010
Barium	mg/l	SM3030C/EPA 200.7	0.0050
Cadmium	mg/l	SM3030C/EPA 213.2	0.00010
Chromium	mg/l	SM3030C/EPA 218.2	0.0010
Copper	mg/l	SM3030C/EPA 220.2	0.0050
Iron	mg/l	SM3030C/EPA 200.7	0.010
Lead	mg/l	SM3030C/EPA 239.2	0.0020
Manganese	mg/l	SM3030C/EPA 200.7	0.0050
Mercury	mg/l	SM3030C/EPA 245.1	0.00010
Selenium	mg/l	SM3030C/EPA 270.2	0.0010
Silver	mg/l	SM3030C/EPA 272.2	0.00020
Zinc	mg/l	SM3030C/EPA 200.7	0.0050
Sulfate	mg/l	EPA 375.4	1.0
Fluoride	mg/l	EPA 340.2	0.10
TDS	mg/l	EPA 160.1	1.0

Table 3. Sample Containers, Volumes, Preservatives and Holding Times.

PARAMETER	CONTAINERS	PRESERVATIVES	HOLDING TIMES
Insitu Parameters			
Field pH	Insitu	None	Analyze Immediately
Specific Conductance	Insitu	None	Analyze Immediately
Dissolved Oxygen	Insitu	None	Analyze Immediately
Oxidation Reduction Potential	Insitu	None	Analyze Immediately
Turbidity	Insitu	None	Analyze Immediately
Temperature	Insitu	None	Analyze Immediately
Laboratory Analyses			
Chloride	500 ml HDPE	None Required	28 days
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
Copper	500 ml HDPE	pH<2 HNO_3	6 months
Iron	500 ml HDPE	pH<2 HNO_3	6 months
Lead	500 ml HDPE	pH<2 HNO_3	6 months
Manganese	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
Zinc	500 ml HDPE	pH<2 HNO_3	6 months
Sulfate	500 ml HDPE	Cool 4°C	28 days
Fluoride	500 ml HDPE	pH<2 HNO_3	6 months
TDS	500 ml HDPE	Cool 4°C	7 days

DWG. NO. M-10A REV. 3

NOTES

1. All work shall be performed in accordance with Duke Power Company Specification MSS-0215.00-00-0001 entitled Marshall Steam Station, Units 1-4, Specification on Clearing, Constructing, Operating, and Closing Dry Flyash Landfill. Included in Specification MSS-0215.00-00-0001 as Appendix A is the Erosion and Sedimentation Control Plan.
2. Drawings M-10A, M-10B,M-10C, and M-10D supercede Part 2 of Dry Flyash Landfill as shown on M-EX-1 and M-EX-2.
3. All stormwater runoff from areas where work is performed shall be routed to drain to the Ash Basin.
4. Soil cover shall be placed completely over the landfill as follows: 1 foot minimum depth on gentle slopes (flatter than 5%) and 2 feet minimum depth on slopes steeper than 5%.
5. Borrow material for soil cover and earth rims shall be obtained from within the permitted boundary in such a manner as to increase the ash storage capacity or facilitate drainage control.
6. Drainage ditches shall be constructed at all berms in order to drain runoff from the upland slopes as shown. Unless noted otherwise, all berm ditches shall be Type 1 as shown on drawing M-10-C. HP designates high point.
7. All corrugated metal pipes (CMP's) shall be installed to the specified lines and grades shown on a smooth uniform bedding with 2 feet (minimum) of soil cover. Open trenches shall be backfilled and compacted to the density of the surrounding material. CMP's shall be plain galvanized steel, 18 gauge (minimum) with 2 inches by ½ inch corrugations, and in accordance with ASTM A-444.
8. For deed description of the Asbestos and Demolition Landfill, refer to Real Estate Department Mountain Island File No. 1462-A dated 4/20/89.
9. For deed description of the Ash Landfill areas, refer to Exhibit I, Plant Marshall Ash Basin, Disposal Site for Monex Resources, Real Estate Department File No. 407-55B dated 6/12/89.
10. For deed descriptions of Duke Power property limits shown on this drawing, refer to the following Real Estate Department Mountain Island File No's: 1462-A dated 4/20/90, 882-A dated 12/13/61, 947 dated 7/17/62, 924E dated 7/20/93, and 1178-B dated 3/24/83.
11. With the exception of the Ash Landfill-Phase II, the active area of the Asbestos Landfill, and the Demolition Landfill, this drawing was prepared by photogrammetric methods using aerial photography dated February 23,1992. The portions of this drawing showing the Ash Landfill-Phase II, the active area of the Asbestos Landfill, and the Demolition Landfill were developed based on a field survey performed February 2,1994.
12. In order to maximize the storage capacity of the Ash Landfill and simplify its construction, ash was dredged into coves of the Ash Basin along the western edge of the Ash Landfill. Ash was subsequently landfilled over the dreged ash.
13. Any removal of ash from the Ash Landfill shall be performed in accordance with North Carolina solid waste management rules- 15A NCAC 13B, section .1700 entitled Requirements for Beneficial Use of Coal Combustion By-Products. In addition, ash should not be removed from the landfill without prior notification to the state of North Carolina- Dept of Environment, Health, and Natural Resources- Div. of Land Resources- Land Quality Section- Mooresville Regional Office.

LEGEND

- Permitted Landfill Boundary Limit
- Duke Power Company Property Limit
- Existing Elevation Contour At Final Grade
- Existing Elevation Contour (To Be Graded)
- Direction of Stormwater Runoff Drainage
- Existing Groundwater Monitoring Well

REFERENCE DRAWINGS

M-1.01 Site Plan
M-10 Landfills and Ash Basin - Plan
M-10B Ash Landfill - Sections
M-10C Ash Landfill - Sections and Details
M-10D Ash Landfill - Erosion and Sediment Control Plan
M-25D Ash Storage Basin - Plan, Sections, and Details

NO.	REVISIONS	DRN	DATE	CHKD	DATE	APPR	DATE	CIVIL	ELEC.	MECH.
								INSPECTED		
3	REVISED TO SHOW NEW PROPERTY LINES.	CWC	9-15-99	GDB	9-16-99	GDB	9-16-99	—	—	—
2	REVISED ELEVATION OF RIDGE IN ASH LANDFILL IN PHASE II	CWC	8-3-99	GDB	8-3-99	GDB	8-3-99	—	—	—
1	ADDED NOTES 12 & 13,LIMIT OF DISTURBED AREA AND (5) TYPE OUTLET STABILIZATION APRONS.RELEASED FOR CONSTRUCTION.	CLR	10/29/96	MPM	10/31/96	GDB	10/31/96			
ORIG.	RELEASED FOR INFORMATION.	WDW	5-27-96	MPM	4-1-96	GDB	4-1-96			

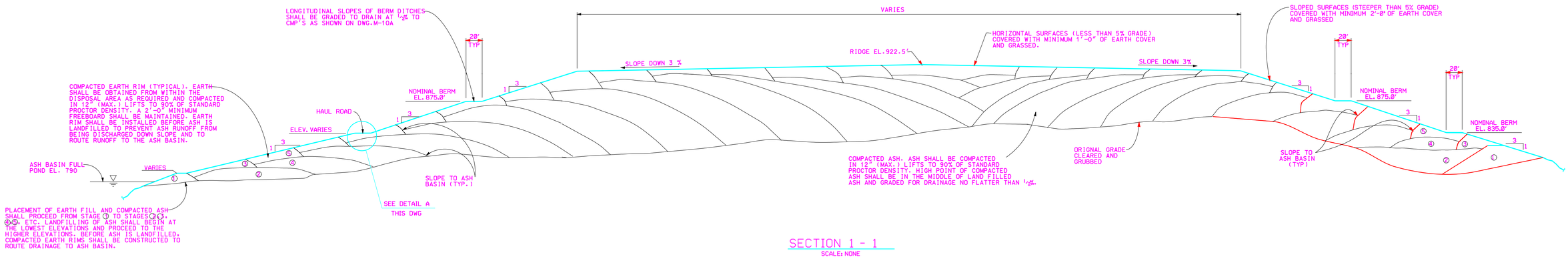
DUKE POWER COMPANY
MARSHALL STEAM STATION

ASH LANDFILL
PLAN

DESIGNER M.P.MARTIN DATE 10/24/95 INSP. DATE
DRAWN W.D.WHISENANT DATE 10/24/95 INSP. DATE
CHECKED MIKE MARTIN DATE 4-1-96 APPR. G.D. BLEVINS DATE 4-1-96
SCALE DWG. NO. M-10A REV 3

ERN:MR0011EK

DWG. NO. M-10B REV. 1



SECTION 1 - 1
SCALE: NONE

DETAIL A
SCALE: NONE

SECTION 2 - 2
SCALE: NONE

FOR NOTES AND REFERENCE DRAWINGS SEE DWG. M-10A

NO.	REVISIONS	DRN	DATE	CHKD	DATE	APPR	DATE
1	REVISED SLOPE DOWN TO 3% AND RIDGE ELEV. TO 922.5' IN SECTION 1-1.	CWC	8-3-99	GDB	8-3-99	GDB	8-3-99
0	RELEASED FOR CONSTRUCTION	CLR	10/29/96	MPM	10/31/96	GDB	10/31/96
ORIG.	RELEASED FOR INFORMATION.	WDW	3/27/96	MPM	4/1/96	GDB	4/1/96

ELEC. — MECH. —
INSPECTED WAIVED

DUKE POWER COMPANY
MARSHALL STEAM STATION

ASH LANDFILL
SECTIONS & DETAILS

DESIGNER MP MARTIN DATE 4/18/95 INSP. WAIVED DATE
DRAWN WD WHISENANT DATE 4/18/95 INSP. WAIVED DATE
CHECKED MIKE MARTIN DATE 4-1-96 APPR. G.D. BLEVINS DATE 4-1-96

SCALE NOTED
DWG. NO. M-10B REV 1

ERN: MR0011EL