OPERATIONS PLAN
RETIRED ASH BASIN (RAB) - ASH LANDFILL
ALLEN STEAM STATION
BELMONT, NORTH CAROLINA

S&ME Project No. 1356-06-825

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1. GENERAL FACILITY OPERATIONS

1.1 Overview

This Operations Plan is part of the Permit to Construct Application for the Retired Ash Basin (RAB) ash landfill at Duke Energy's Plant Allen Steam Station and presents the landfill's operational requirements for: (1) general facility operation; (2) waste handling and landfill sequencing; and (3) leachate and storm water management. This Operations Plan was prepared consistent with requirements of Rules .0505 of 15A NCAC 13B of the North Carolina Solid Waste Management Rules.

The proposed RAB ash landfill is owned by Duke Energy. The operations of the facility will either be overseen by a Duke Energy Operations Manager or subcontracted to an outside company.

1.2 Contact Information

Correspondence and questions concerning the operation of the RAB ash landfill should be directed to the appropriate entity as follows:

- ***OWNER***
  Duke Energy – Allen Steam Station
  253 Plant Allen Road, Belmont, NC 28012
  (704) 829-2423
  Facility Contact: Don Scruggs

- ***STATE REGULATORY AGENCY***
  North Carolina Department of Environment and Natural Resources
  Division of Waste Management, Solid Waste Section
  Asheville Regional Office
  2090 US Highway 70, Swannanoa, NC 28778
  (828) 296-4500
  Regional Engineer: Larry Frost

- ***ENGINEER***
  S&ME, Inc.
  9751 Southern Pine Blvd., Charlotte, NC 28273
  (704) 523-4726
  Project Engineer: Ken Daly, P.E.

1.3 Safety

Landfill operations at the RAB ash landfill were developed considering the health and safety of the facility's operating staff. Duke Energy will provide each of the operating staff with site specific safety training prior to landfill operations and designate safety protocol on-site in accordance to Duke Energy's Safe Work Practices. An Emergency Action Plan (EAP) is included in Appendix I to provide guidance in the event of a slope

failure.

1.4 Access and Security Requirements

Access roads to the landfill will be of all weather construction and maintained in good condition. To prevent unauthorized entry, access to the Duke Energy property is controlled by means of perimeter fencing and controlled access entrances.

1.5 Signs

Signs providing the permit number, stating that no hazardous or un-permitted waste can be received without written permission from the State Division of Waste Management, Solid Waste Section (Division) and other pertinent information will be posted at the site entrance. Traffic signs and markers will be provided as necessary to promote an orderly traffic pattern to and from the active disposal area and maintain efficient operating conditions. The entrance sign will state:

"Industrial Solid Waste Landfill Facility
Permit No. 36-12
No Hazardous or Un-Permitted Waste Allowed
Contact Plant Environmental Health and Safety"

1.6 Dust Control

Dust generated on haul roads will be controlled through the application of water, road maintenance, and a tire rinse. Mud and dirt from the haul and access roads will be removed by washing or with heavy construction equipment. Dust and windblown ash will be controlled through the use of cover soils and interim spray applied coverings such as cement-based coverings (i.e. posi-shell) and hydroseed mulch. Additionally, interim and final covers will be vegetated as soon as practical in order to minimize the blowing of dust on-site.

1.7 Fire Control

No open burning shall be permitted at the RAB ash landfill. Ash is a non combustible material and the threat of fire is minimal. However, if a fire occurs at the landfill the local fire department shall be notified and equipment and stockpiled soil shall be provided to control accidental fires. Any fire that occurs at the landfill shall be reported to the Division within 24 hours and a written notification will be submitted within 15 days by the Operations Manager.

1.8 Training

Due to the diversity and nature of job tasks required at the landfill, personnel should be adequately trained to handle facility operations and maintenance. The Operations Manager should have a general understanding of all the tasks required for site operations. Individuals performing the various tasks should have adequate training for the specific tasks they are assigned. Noteworthy operations and maintenance tasks to be addressed in training include:

- maintaining accurate records of waste loading (quantitative and qualitative);
- operating requirements for storm water segregation from exposed waste areas; and
- operating and maintaining leachate collection system and leak detection system.

The facility operator will complete approved operator training courses in accordance with permit requirements.

1.9 Record Keeping

An operating record will be maintained on-site and will include the following:

- Leak Detection System (LDS) monitoring information;
  - documentation of an approved response action plan from the Division;
  - records of the amount of liquids removed at each sump;
  - notice of exceedence of action leakage rate for sumps (if any);
  - preliminary assessment report for exceedence of action leakage rate (if any);
  - reports documenting remedial actions (if any);
- closure and post-closure LDS monitoring plan and results;
- closure cost estimate and financial assurance documentation; and
- Operations Plan.

The above records will be kept in the operating record for the active life of the landfill and the post-closure care period. Information contained in the operating record must be furnished upon request to the Division or made available for inspection by the Division. Additional records kept on-site will include:

- Facility Permits;
  - solid waste facility permits;
  - National Pollutant Discharge Elimination System (NPDES) storm water discharge permit;
  - Erosion and Sediment Control Plan;
- regulatory agency inspection reports;
- Site Suitability Study;
- employee training program and records;
- internal vehicle maintenance records; and
- site drawings and specifications.

1.10 Erosion and Sedimentation Control

1.10.1 Erosion Control Device Monitoring

Erosion and sedimentation control features include temporary and permanent sediment basins, rain gutters, road ditches, outlet protection aprons, downchute piping, and direct runoff to perimeter ditches. Prior to landfill closure, sediment basins shall be checked weekly. During post closure, sediment basins shall be checked quarterly and within 24-hours of a 1-inch rainfall event. Sediment shall be removed from each structure to its original dimensions when sediment accumulates to one half of the design depth. The sediment basins, embankments, spillways and outlets shall also be checked for erosion damage. Necessary repairs shall be made as soon as practical. Any trash or debris within the riser structures or outfalls shall be removed.

Prior to closure, channels shall be monitored after each runoff event. Post closure, channels shall be checked after each 1-inch rainfall event. Riprap-lined channel sections and outlet protection aprons shall be checked for washouts. Riprap shall be added to these areas as needed to maintain the integrity of the structure.

1.10.2 Surface Erosion Monitoring

Vegetative ground cover sufficient to control erosion must be established within 15 working days or 90 calendar days upon completion of any phase of landfill development as per the North Carolina Erosion and Sedimentation Control Guidelines. Seedbed preparation, seeding, soil amendments, and mulching for the establishment of vegetative ground cover shall be applied in accordance with Figure 6: Seeding Specification.

Slopes shall be periodically checked for erosion and vegetative quality, and fertilized and mowed at least once a year. A slope or portion thereof shall be identified as needing maintenance and if it meets any one of the following conditions:

- Exposed waste on exterior slopes;
- Bare spots larger than 25 square feet;
- Bare spots make up more than 2% of total seeded area;
- Rills exceeding 4 inches in depth;
- Areas of cracking, sliding, or sloughing; or
- Areas of seepage

Slopes identified as needing maintenance shall be repaired immediately as appropriate to correct deficiencies. Repair activities may include re-dressing the slope, filling in low areas, and/or seeding in accordance with Figure 6: Seeding Specification. In the event that cracking, sliding, sloughing, or seepage is identified on slopes, a slope failure identification criteria is met , and the Notification Sequence provided in the Emergency Action Plan (EAP) included in Appendix I should be followed accordingly.

1.10.3 Stormwater Discharge

The landfill operation shall not cause a discharge of pollutants into waters of the United States, including wetlands, that violates any requirement of the Clean Water Act, including, but not limited to, NPDES requirements, pursuant to Section 402. In addition, under the requirements of Section 404 of the Clean Water Act, the discharge of dredged or fill material into waters of the state that would be in violation of the requirements shall not be allowed by landfill operations.

Operations at the landfill shall not cause the discharge of a non-point source of pollution to waters of the United States, including wetlands, that violates any requirement of an area-wide or statewide water quality management plan that has been approved under Section 208 or 319 of the Clean Water Act, as amended.

2. WASTE HANDLING AND LANDFILL SEQUENCING

2.1 Landfill Capacity

The RAB ash landfill is comprised of two Phases (Phase 1 and Phase 2). The landfill phases are divided into cells and the cells are further divided into subcells. Landfill sequencing is further described in Section 2.4 of this Operations Plan. The landfill is estimated to have a storage life of approximately 12 years, based on a projected 500,000 tons per year disposal rate. The disposal rate assumes no beneficial ash reuse.

The landfill capacity was estimated using the proposed grading and closure plans in conjunction with the anticipated annual disposal rates. The gross volume of the landfill, which consists of the airspace between the protective cover soil and the proposed final cover surface, was estimated to be on the order of 2,082,500 cubic yards for Phase 1 and 3,958,200 cubic yards for Phase 2 for a total volume of 6,040,700 cubic yards. The approximate final cover soil volume considering a 3-foot thick cover (2-ft final cover and 1-ft interim cover) over an approximate 50-acre footprint is approximately 242,200 cubic yards. Deducting the approximate final cover soil volume, the airspace available for waste placement (including operational soils) is 5,789,500 cubic yards. Using an assumed in-place waste density of 75 lb/ft^3 (1.01 $tons/yd^3$), the available dry tonnage of waste to be placed in the landfill was estimated to be on the order of 5,856,500 tons.

2.2 Waste Acceptance, Disposal and Screening Requirements

The landfill will only accept combustion products residuals including fly ash, bottom ash, boiler slag, mill rejects, and flue gas desulfurization (FGD) residue generated at the Allen Steam Station. The landfill owner or operator shall notify the Division within 24 hours of attempted disposal of any wastes the landfill is not permitted to receive. Hazardous, liquid, or infectious wastes shall not be disposed of in the landfill.

The proposed landfill will be receiving a relatively consistent and homogeneous waste stream of combustion products residuals generated solely from the Allen Steam Station. Waste will be hauled and disposed of by dedicated and consistent operators from the waste source to the landfill. As hauling and disposal operations are wholly contained within the site, random inspections are not proposed. Rather loads will be monitored continuously through operations. Based on the consistent and homogeneous waste stream it is anticipated that municipal solid waste, hazardous, liquid, or non-permitted wastes will be readily distinguished from the ordinary waste stream.

2.3 Operating Concepts

The primary objective of the RAB ash landfill is to operate safely and efficiently while minimizing leachate generation and controlling storm water. The landfill development will be sequenced in Phases as indicated on Figure 1. The Facility's final closure grading plan is presented on Figure 2. Landfilling operations will generally proceed from the west towards the east by the use of cells. Each cell is divided into smaller subcells. In general, waste placement will be performed in 10-foot lifts with operations usually being focused within a

particular cell area. Subsequent landfilling operations in the cell will generally be limited to an exposed surface area of approximately 2 acres, at the operator's discretion, with waste in other areas covered with daily, intermediate, or final cover as appropriate. Soil diversion berms will be used to collect and divert the non-contact storm water runoff to areas where the runoff will be directed to a sediment basin. When the desired waste elevations are obtained within the cell, waste placement will move to the next cell where the process will be repeated.

2.4 Landfill Sequencing

The general steps for the operation of the landfill are summarized below and are shown on the operations diagrams provided as Figures 1 through 5.

Waste placement shall begin in Cell 1, Subcell 1A as illustrated in Figure 3 and shall progress sequentially, as illustrated in the cross section provided in Figure 4. The first 10-foot lift shall be placed in Subcell 1A; after the first lift is placed in Subcell 1A, the raincover shall be removed from Subcell 1B and the first 10-foot lift shall be placed in Subcell 1B. After the first 10-foot lift of waste is placed across Cell 1, waste placement shall then continue across Cell 1 in 10-foot lifts until the Cell 1 final grades are achieved, as shown on Figure 3.

Once final grades are achieved in Cell 1, waste placement shall begin in Cell 2 following the same general format as Cell 1, where a 10-foot lift is placed in Subcell 2A, then the rain cover is removed from Subcell 2B; then a 10-foot lift is placed into Subcell 2B. Waste placement in Cell 2 shall continue in 10-foot lifts until Phase 1 final grades are achieved. Final grades for Cell 2 shall piggyback onto Cell 1, as shown on Figure 5, for the completion of Phase 1.

In the event that the projected 500,000 tons per year disposal rate is exceeded such that it may influence the loading rate from waste placement during operations, the landfill owner or operator shall notify the Division and evaluate the influence on landfill stability. In the event that these steps for landfill operations are changed such that it may affect the expected loading rate from waste placement during operations, the landfill owner or operator shall notify the Division and evaluate the influence on landfill stability.

2.5 Waste and Cover Material Placement

Waste and cover material shall be placed to the lines and grades shown on the grading plans with slopes no steeper than 3 (horizontal) to 1 (vertical). The Cell 1 grading plan is provided in Figure 3. The Phase 1 grading plan is provided in Figure 5. Prior to waste placement, stakes indicating the limits of waste placement, as shown on the Engineering Plan Drawings, shall be located. The waste shall be compacted as densely as practical using compactors and dozers in approximate 1-foot lifts to achieve a vertical operational lift thickness of 10 feet. Quality assurance monitoring and testing for waste placement is included in the Operations Quality Assurance Plan in Appendix II.

Initially, the waste shall be placed from up-gradient to down-gradient. As higher waste elevations are achieved, the waste may be placed from down-gradient to up-gradient on the

active face slope, as long as landfill surfaces are graded to allow proper drainage and segregation. A minimum five percent slope shall be graded on the landfill surface to promote surface water runoff. Waste shall not be disposed of in water, and surface water shall not be impounded over or within the waste.

Flue gas desulfurization (FGD) residue will be spread in 6-inch lifts in the center of the operational area. No FGD residue shall be placed within 25 feet of the exterior slopes. Prior to placement of the next fill lift, material should be adequately blended with the other waste. The waste stream was assumed for design to be comprised predominantly of ash. Should the waste stream change at some time during operations, the design slope stability analyses must be reviewed for the changed conditions.

Should the quantity of combustion products residuals other than fly ash (listed in Section 2.2) exceed 25,000 tons per year and is placed in an area larger than one-acre and is placed in a thickness exceeding 12-inches, the waste fill compaction shall be monitored and tested according to the requirements above.

The landfill active face should, at the operator's discretion, generally be approximately a 2-acre area to reduce the amount of exposed waste. Operational soil cover should be applied at least once a week or when the active area reaches approximately a 2-acre area. Operational soil cover shall be a 6-inch thick layer constructed of on-site soil or an approved alternative, such as tarps, spray applied cement based applications (i.e. posi-shell), or spray applied hydroseed mulch. A 12-inch thick interim cover layer shall be placed on areas where final grades have been reached or where waste placement will be inactive for 12 months or more.

2.6 Final Cover

The final cover system for a completed phase will be finished within 180 days following the beginning of closure activities unless otherwise approved by the Division.

The proposed final cover will consist of a compacted interim soil cover, 40-mil LLDPE geomembrane liner, geocomposite drainage layer, an 18-inch thick earthen barrier layer, and a 6-inch earthen vegetative layer. A proposed alternative is to use a 50-mil structured geomembrane with an integral drainage layer overlain with a geotextile. The geomembrane will provide a barrier layer to reduce leachate generation. The vegetative layer will consist of on-site soil suitable for maintaining a grass cover and controlling erosion. Surface water that percolates through the vegetative layer and 18-inch thick earthen barrier layer will drain through the geocomposite drainage layer. The geocomposite will day-light periodically across the cover system and at the toe of the landfill final cover slope to provide drainage.

3. ENVIRONMENTAL MANAGEMENT

3.1 Storm Water Collection and Conveyance

Storm water runoff from the landfill will be directed via a system of rain gutters, road ditches, downchute piping, and direct runoff to perimeter ditches surrounding the landfill limits. The perimeter ditches and southern downchute pipes discharge directly to a sediment basin on the south side of the landfill. Final and interim erosion and sediment control plans are contained within the Permit to Construct Application.

During initial operations of each cell within the non-active subcell, a geomembrane raincover will be used to reduce leachate generation. The collected water can then be pumped into the sediment basin.

The storm water collection and conveyance system shall be checked regularly and maintained such that necessary repairs will be made as early as practical.

3.2 Leachate Collection System (LCS)

The leachate collection system (LCS) consists of a geocomposite drainage layer with a series of lateral collection pipes. The lateral pipes are connected to a header pipe that provides gravity drainage of the leachate to sumps. From the sumps, the leachate is pumped to the active ash basin by forcemain then discharged under the plant's existing NPDES permit.

The general operation required to begin waste placement includes the activation of the LCS. This task is accomplished by removing the sacrificial geomembrane cover to expose the LCS corridor. The opened LCS corridor flows directly into the sumps such that rain water entering the cell will now enter the LCS. The Operations Manager shall document LCS activation within each cell and file the documentation in the facility operation records. The design engineer will be on-site to monitor and document the removal of the sacrificial geomembrane cover and the activation of the LCS in the sump area.

Clean-out pipes have been provided at the ends of the LCS leachate lateral and header pipes. If clogging is suspected, the LCS pipes can be cleaned out by the use of a clean-out snake or high pressure water flushing or monitored with camera equipment.

3.2.1 Maintenance, Record Keeping and Sampling

The maintenance of the leachate management system's physical facilities (consisting of HDPE piping, sumps, and pumps) and records will be performed by or under the direct supervision of Duke Energy.

Leachate will be pumped to the active ash basin on-site then discharged under the plant's existing NPDES permit. Water leaving the active ash basin will be sampled in accordance with the requirements of the plant's NPDES discharge permit.
Periodic equipment maintenance shall be performed as recommended by the equipment manufacturer. Equipment maintenance will consist of checking equipment for corrosion,

leakage, wear, scale build-up, improper functioning, and other improper operations. Appropriate corrective measures shall be taken when equipment is not operating properly.

The LCS sump shall be equipped with a dedicated pump system. The LCS pump system contains one low-flow pump (25 gallons per minute) and one high-flow pump (230 gallons per minute). The pump system shall operate automatically based on level switches with a low level cutoff and high level run-start activations. Additionally, a visual high level alarm shall be in place which will also have a high level activation. See the table below for LCS specific sump operations levels. The LCS system control panels will be equipped with visual alarms programmed to identify sump liquid levels. LCS visual alarms will be checked and tested for proper function weekly.

Pump	**Low level cutoff**	**High level run-start**	**High level alarm activation**
Low-flow (25 gpm)	0.5 feet (6 inches)	1.5 feet (18 inches)	2.5 feet (30 inches)
High-flow (230 gpm)		2.0 feet (24 inches)	

Records shall be maintained documenting the amounts of leachate generated and disposed of at the active ash basin.

Leachate from the LCS system shall be sampled in accordance with the approved monitoring plan. Leachate will be sampled semiannually from dedicated sample ports located on the LCS system. Leachate quality will be analyzed and reported consistent with the requirements of the approved monitoring plan. The following constituents will be analyzed for semi-annually:

Temperature	Arsenic	Barium
Boron	Cadmium	Chloride
Chromium	Copper	Fluoride
Iron	Lead	Manganese
Mercury	Nickel	Nitrate
pH	Selenium	Silver
Sulfate	Zinc	Total Dissolved Solids

3.2.2 Contingency Plan

In the unlikely event that leachate can not be pumped to the active ash basin (i.e. a power outage), leachate flow will be temporarily stored within the landfill until such time that pumping operations to the active ash basin can be restored. Please note that the design provides for redundant electrical supply from the power plant, such that the system will switch to the backup power supply line in the event that primary power is lost. In such an event, the Division shall be notified in writing, within 30 days, about the events and corrective actions taken.

3.3 Leak Detection System (LDS)

A leak detection system (LDS) has been incorporated into the design of the RAB ash landfill. The LDS consists of a secondary 60 mil HDPE liner system overlain by a secondary geocomposite drainage layer connected to LDS sumps. To aid in determining the location of a possible leak source and to reduce the likelihood of premature closure of an entire landfill cell as a consequence of excessive leakage, the LDS of each landfill cell is subdivided into two subcells, each with a dedicated LDS sump. Flow collected in the sumps will be transferred to the active ash basin via the leachate force main.

Each LDS sump shall be equipped with a dedicated pump system. Each LDS pump system contains one low-flow pump (25 gallons per minute). The LDS pump system shall operate automatically based on level switches with a low level cutoff and a high level run-start activation. Additionally, a visual high level alarm shall be in place which will also have a high level activation. See the table below for LDS specific sump operations levels. The LDS system control panels will be equipped with visual alarms programmed to identify sump liquid levels. LDS visual alarms will be checked and tested for proper function weekly.

Pump	**Low level cutoff**	**High level run-start**	**High level alarm activation**
Low-flow (25 gpm)	0.5 feet (6 inches)	1.5 feet (18 inches)	2.0 feet (24 inches)

The LDS has been designed with an Initial Response Leakage Rate (IRLR) of 300 gallons per acre per day and an action leakage rate (ALR) of 500 gallons per acre per day. Should fluid collected in the LDS exceed the IRLR or ALR based on routine flow meter readings, the owner or operator shall take steps as indicated in the facility's Response Action Plan presented in Section 3.3.3.

The management of the leak detection system's physical facilities (consisting of piping and flow meters) and records of monitoring will be performed by or under the direct supervision of Duke Energy.

3.3.1 LDS Maintenance

Periodic equipment maintenance shall be performed as recommended by the manufacturer. Equipment maintenance will consist of checking equipment for corrosion, wear, scale build-up, improper functioning, and other improper operations. Appropriate corrective measures shall be taken when equipment is not operating properly. The LDS system control panels will be equipped with visual alarms programmed to identify sump liquid levels. LDS sump controls will be checked and tested for proper function weekly.

3.3.2 Record Keeping and Monitoring

Flow will be measured at the discharge of each LDS sump by a totalizing flow meter. The facility shall maintain records of monthly flow rate data from each LDS sump from the activation of the cell drainage system and until the waste height reaches approximately 40 feet. From that point, flow rate data shall be collected on a quarterly basis until landfill closure.

During the post-closure care period, semi-annual monitoring is required. If the liquid levels in the sumps stay below the pump high level run-start (no pump flow) for more than 1 year, then flow rates can be recorded annually. However, if at any time during post-closure care the pump high level run-start level is exceeded on the semi-annual or annual schedules, the facility must return to monthly monitoring, until such time as the liquid level remains below the pump high-level run start activation level for two consecutive months.

The purpose of LDS monitoring is to monitor if the leakage rates have been exceeded. Specific leakage rates are identified in Section 3.3. To determine if exceedances of the leakage rates have occurred, the facility must convert monitored data to an average daily flow rate for each sump (in gallons per acre per day, gpad). For example, the average daily flow rate in gpad is equal to the total monthly flow rate divided by the number of days in the month, divided by the area of the cell in acres. For calculation purposes, subcell areas are summarized for Cells 1 and 2 in the table below.

Subcell	Areas
Cell 1A	4.9 acres
Cell 1B	5.9 acres
Cell 2A	7.6 acres
Cell 2B	6.2 acres

If a leakage rate is exceeded, then the Division must be notified as set forth in the Response Action Plan presented in Section 3.3.3.

3.3.3 Response Action Plan

The purpose of the response action plan is to describe the necessary course of action in the event the Initial Response Leakage Rate (IRLR) and/or the Action Leakage Rate (ALR) are exceeded. If the IRLR is exceeded, steps 1 through 4 will be followed. Should the ALR also be exceeded steps 1 through 6 will be followed. The IRLR and ALR are referenced collectively as “leakage rates” in the following response action plan steps.

The IRLR is 300 gallons per acre per day.

The ALR is 500 gallons per acre per day.

The response action steps include:

Step 1 (IRLR and ALR):
Review physical equipment (pump and flow meter) function and data to confirm flow readings. Review operations to evaluate where operating equipment may have contacted the landfill liner or how landfill operations may have influenced the exceedance.

If the exceedance is confirmed, the cell LDS flow shall be recorded daily. Should the daily monitored LDS flow exceed the IRLR or ALR after the initial exceedance, operational responses may include: the reduction of active face area; grading to provide improved drainage; and/or, the addition of interim soil cover.

Step 2 (IRLR and ALR):
Within 14 days of identifying that a leakage rate has been exceeded, the facility shall contact the Division in writing. Daily LDS flow recording shall continue. Should none of the daily measured LDS flow rates exceed the leakage rate within 14 days of initial identification of the exceedance, monthly LDS flow averaging shall resume.

Step 3 (IRLR and ALR):
Within 30 days of identifying that a leakage rate has been exceeded, the facility shall submit to the Division a written preliminary assessment which shall include at a minimum:

- the amount of the liquid exceedance including initial measurement and daily measurements, if necessary, to date;
- likely sources of the liquids;
- the possible leak location;
- the possible leak size;
- the probable cause of the leak; and
- an outline of the short-term actions being taken and planned.

Step 4 (IRLR and ALR):
To the extent practicable, evaluate the location, size and cause of the leak; and assess the potential for leakage escaping into the environment and its mobility. Leachate quality shall be sampled, including a chemical analysis of LDS fluids, to evaluate potential hazards (pH and RCRA metals).

Step 5 (ALR Only):
When the ALR is exceeded, establish whether or not the unit should be closed or receipt of waste should be curtailed; and conclude whether waste should be removed from the unit for inspection, engineered controls, or repair of the subcell liner and drainage system. Evaluate and prepare to implement what other short-term or long-term measures shall be taken to mitigate or stop any leaks according to the stage (early operations, middle operations, or closed) of landfill development, as detailed in Section 3.3.2, the discussion on LDS flow measurement.

Step 6 (ALR Only):
Within 60 days of identifying that the ALR has been exceeded, submit to the Division the results of the evaluation performed in Step 4, any actions taken according to Step 5, and any further measures planned. For as long as there is an exceedance of the action leakage rate, the owner or operator shall submit monthly reports to the Division summarizing the results of the remedial actions taken and

further actions planned.

3.4 Landfill Gas Management

Waste will consist of combustion products residuals including fly ash, bottom ash, boiler slag, mill rejects, and flue gas desulfurization (FGD) residue generated at the Allen Steam Station. The majority of the waste stream (approximately 95% or more) will consist of fly ash. A small portion of the remaining waste stream will consist of FGD residue. Based on the nature of the waste it is not anticipated that methane or hydrogen sulfide gas will be generated or that odor will be an issue. However, Duke Energy proposes to monitor for the presence of these gases throughout active landfill operations as summarized in the following sections.

3.4.1 Monitoring Program

Duke Energy will monitor for the presence of methane and hydrogen sulfide gas on an annual basis during landfill operations. Monitoring will be conducted by sampling/measuring within 12 to 24 inches of the landfill surface with a handheld gas meter. Monitoring shall be conducted continuously while traversing the landfill cell and active face on an approximate 100-foot wide grid pattern.

3.4.2 Record Keeping

Results of the gas monitoring program will be maintained in the operating record.

3.4.3 Contingency Plan

In the event that methane or hydrogen sulfide gases are detected, appropriate actions will be taken. In the event that gases are regularly detected during active landfill operations, the final closure and post-closure plan will be developed to address gas. It is anticipated that a minimum response will be to provide a passive gas venting system with the final closure. In the event that odor becomes a concern during operations, landfill operating procedures will be evaluated. Corrective measures may include reducing the active face area and placing additional or more frequent operational soil cover.

FIGURES

1 Facility Subgrade Grading Plan
2 Facility Final Closure Grading Plan
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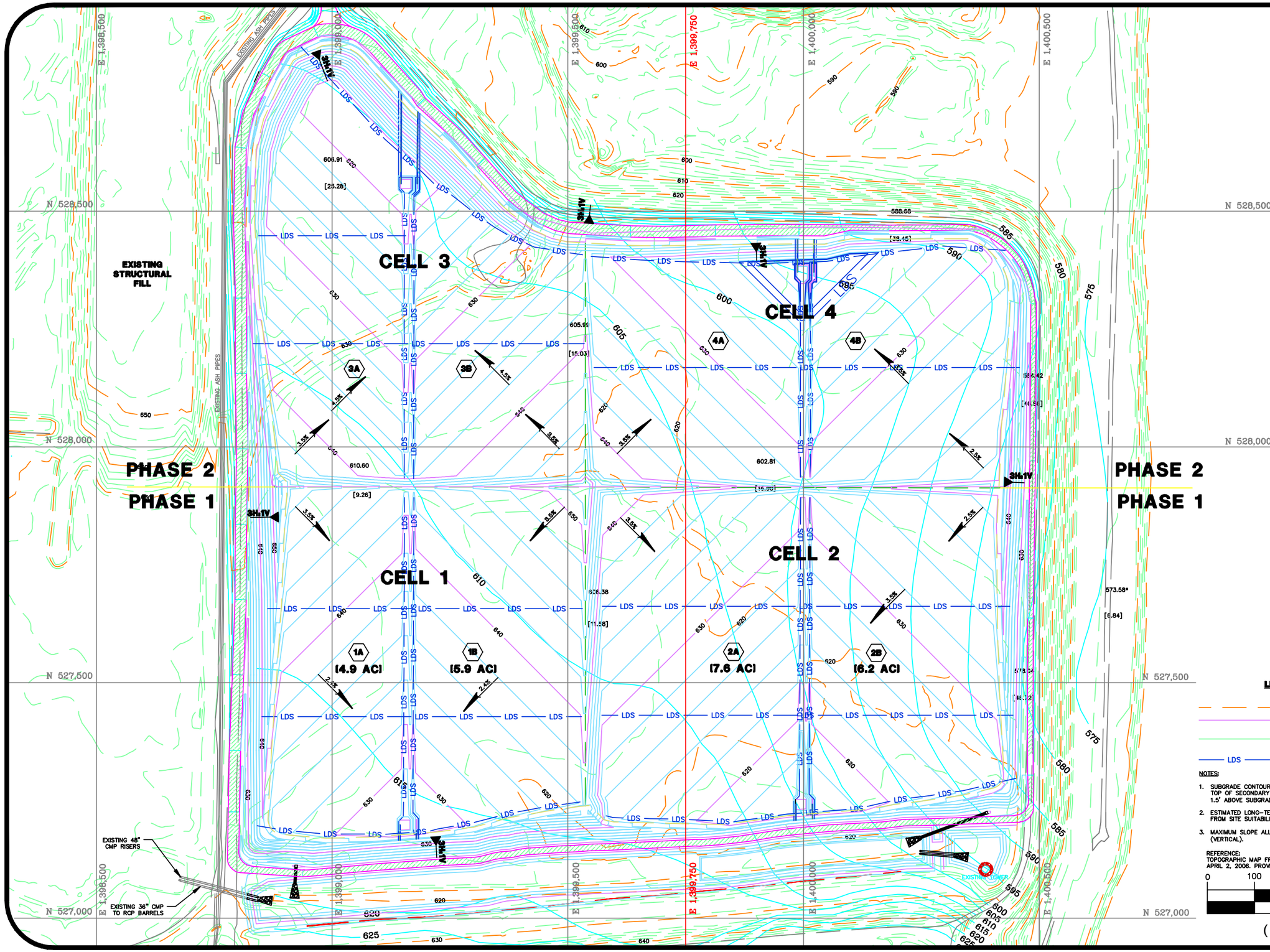
4 Phase 1 Cross Section
5 Phase 1 Final Grading Plan
6 Seeding Specification



LEGEND

- EXISTING GRADE CONTOUR
- PROPOSED GRADE CONTOUR (NOTE 1)
- PERIMETER BERM CONTOURS (SEE DETAIL CASE 2)
- LDS — LDS PIPES

NOTES:

1. SUBGRADE CONTOURS REPRESENT BOTTOM OF 18" SOIL LINER. TOP OF SECONDARY LINER SYSTEM GRADES ARE UNIFORMLY 1.5' ABOVE SUBGRADE.
2. ESTIMATED LONG-TERM SEASONAL HIGH GROUNDWATER TABLE FROM SITE SUITABILITY STUDY DATED AUGUST 31, 2007.
3. MAXIMUM SLOPE ALLOWABLE IS 3 (HORIZONTAL) TO 1 (VERTICAL).

REFERENCE:
TOPOGRAPHIC MAP FROM AERIAL PHOTOGRAPHY PERFORMED ON APRIL 2, 2006. PROVIDED BY NOVA SURVEYING AND MAPPING, INC..

0 100 200 400

(IN FEET)

SCALE: 1" = 200'
DATE: 3-12-08
PROJECT NO. 1356-06-825
DRAWN BY: ELH
CHECKED BY:

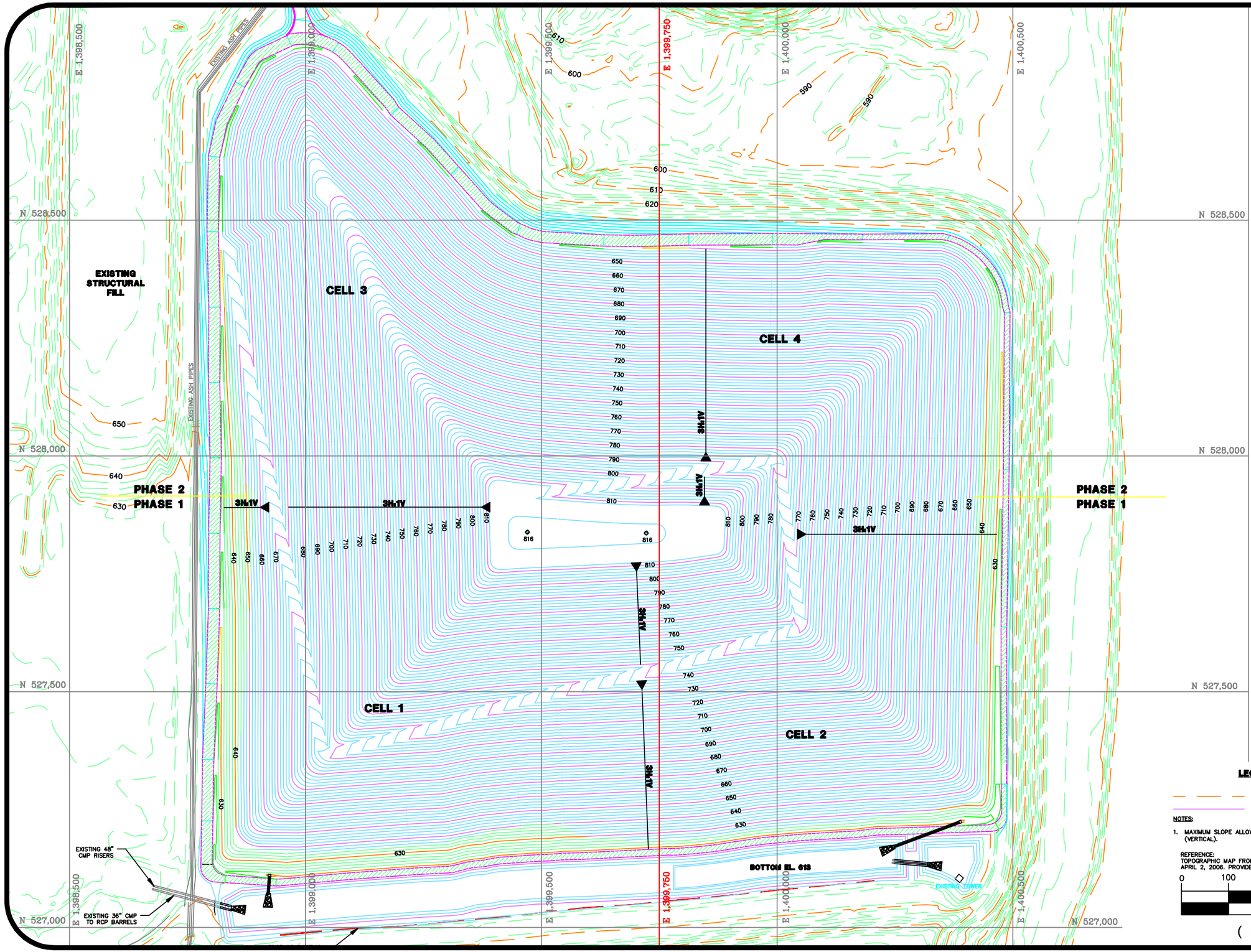
S&ME
WWW.SMEINC.COM

FACILITY SUBGRADE GRADING PLAN
RAB ASH LANDFILL

ALLEN STEAM STATION
BELMONT, NORTH CAROLINA

FIGURE NO.
1

S:\1356\PROJECTS\2006\1356-06-825 DUKE POWER - ALLEN STEAM STATION ASH LANDFILL\PERMIT (TO CONSTRUCT) APPLICATION\REPORTS\OPERATIONS PLAN\RTC 9.17.09\CAD\FIG 1



LEGEND

EXISTING GRADE CONTOUR

PROPOSED GRADE CONTOUR

NOTES:

1. MAXIMUM SLOPE ALLOWABLE IS 3 (HORIZONTAL) TO 1 (VERTICAL).

REFERENCE:
TOPOGRAPHIC MAP FROM AERIAL PHOTOGRAPHY PERFORMED ON APRIL 2, 2006. PROVIDED BY NOVA SURVEYING AND MAPPING, INC..

0 100 200 400

(IN FEET)

SCALE: 1" = 200'

DATE: 3-12-08

PROJECT NO. 1356-06-825

DRAWN BY: CLD

CHECKED BY:

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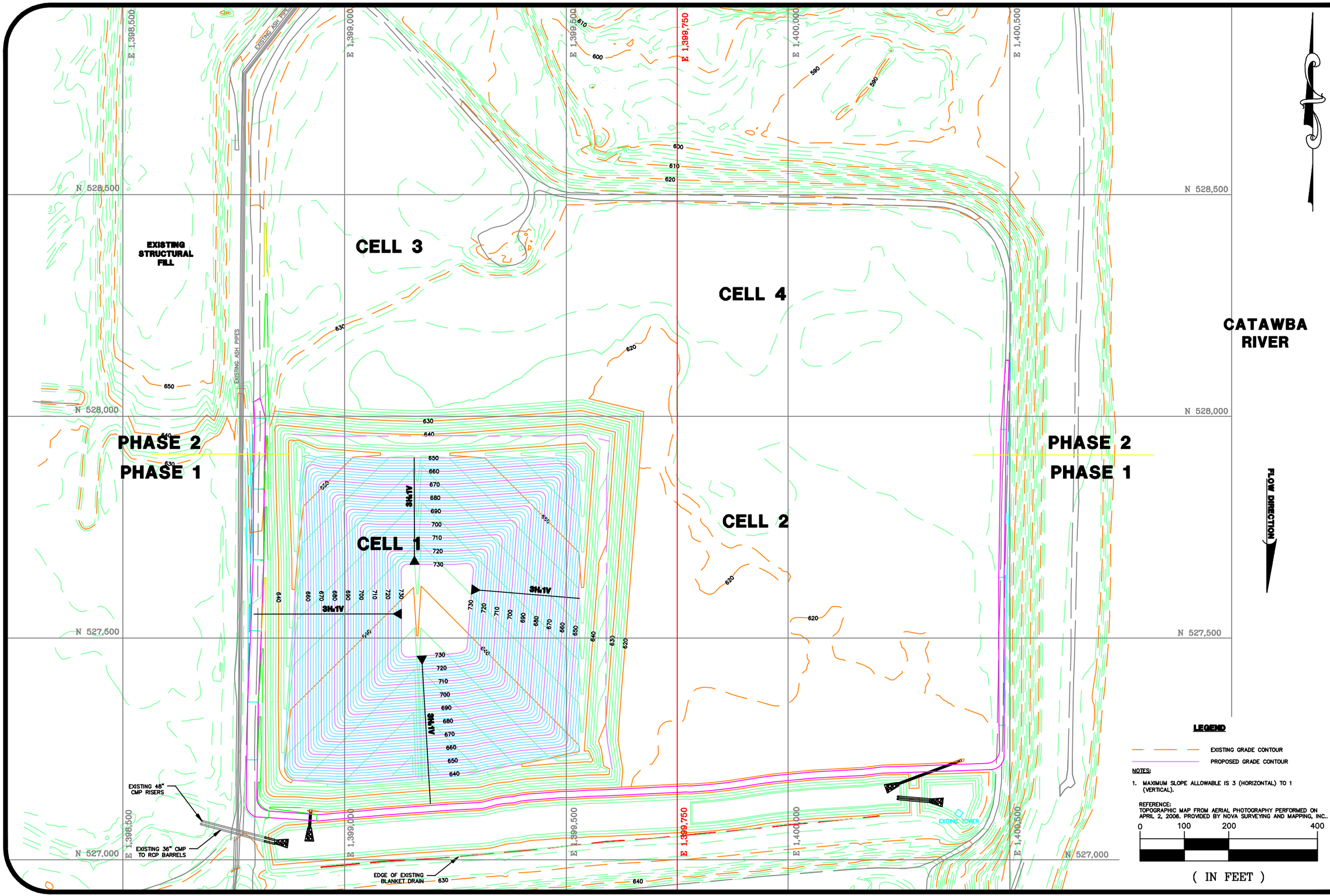
FACILITY CLOSURE GRADING PLAN
RAB ASH LANDFILL

PLANT ALLEN STEAM STATION
BELMONT, NORTH CAROLINA

FIGURE NO.

2

S:\1356\PROJECTS\2006\1356-06-825 DUKE POWER - ALLEN STEAM STATION ASH LANDFILL\PERMIT (TO CONSTRUCT) APPLICATION\REPORTS\OPERATIONS PLAN\RTC 9.17.09\FIG 2



SCALE: 1" = 200'
PROJECT NO. 1356-06-825
DATE: 3-12-08
DRAWN BY: CHR
CHECKED BY:

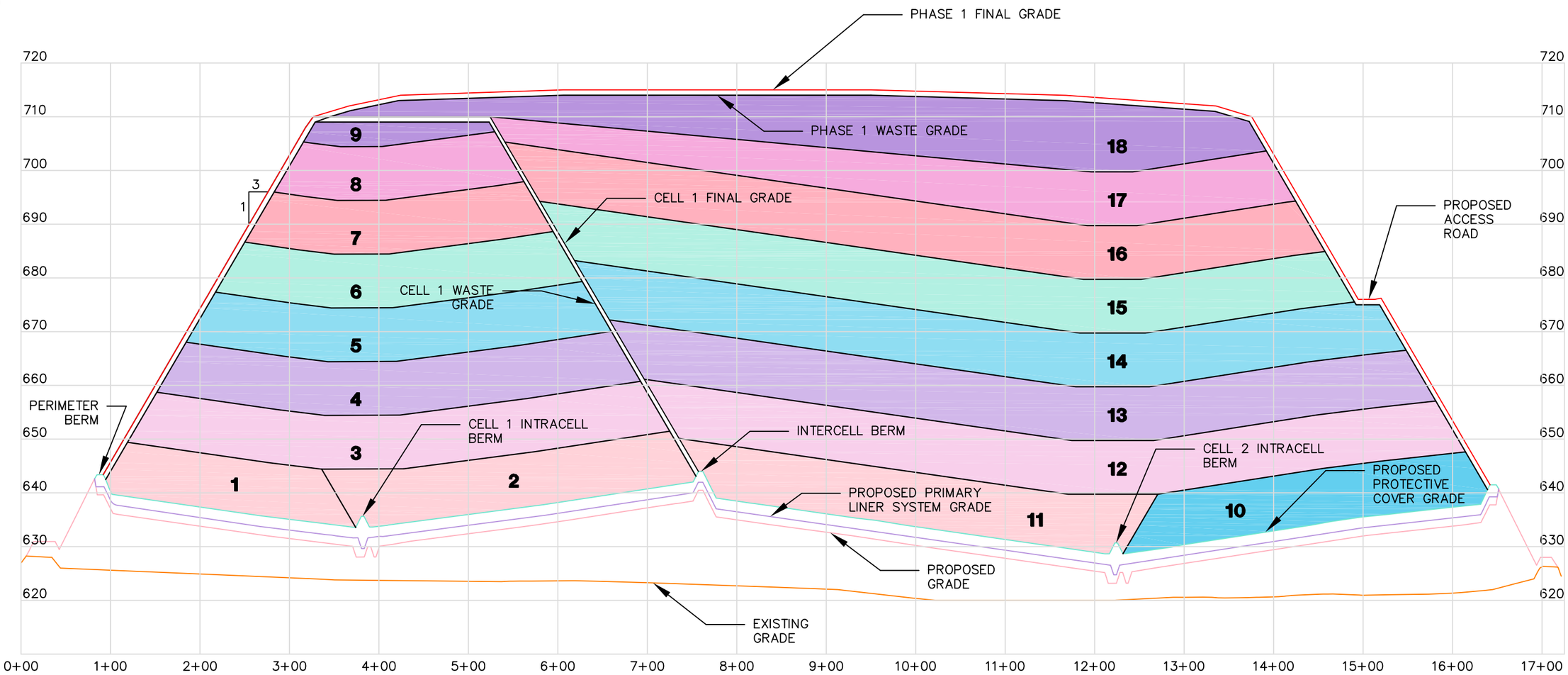
S&ME
WWW.SMEINC.COM

CELL 1 FINAL GRADING PLAN
RAB ASH LANDFILL

ALLEN STEAM STATION
BELMONT, NORTH CAROLINA

FIGURE NO.
3

S:\1356\PRJ\EPTS\2008\1356_06_825 DUKE POWER - ALLEN STEAM STATION ASH LANDFILL\PERMIT APPLICATION\REPORTS\OPERATIONS PLAN\PTS 3 CELL



CROSS-SECTION AA'

LEGEND

EXISTING GROUND SURFACE

PROPOSED 10' LIFT

VERTICAL GRAPHIC SCALE

20 0 10 20 40

(IN FEET)

HORIZONTAL GRAPHIC SCALE

120 0 60 120 240

(IN FEET)

DATE: 1/25/08

DRAWN BY: CFS

CHECKED BY:

SCALE: AS SHOWN

PROJECT NO. 1356-06-825

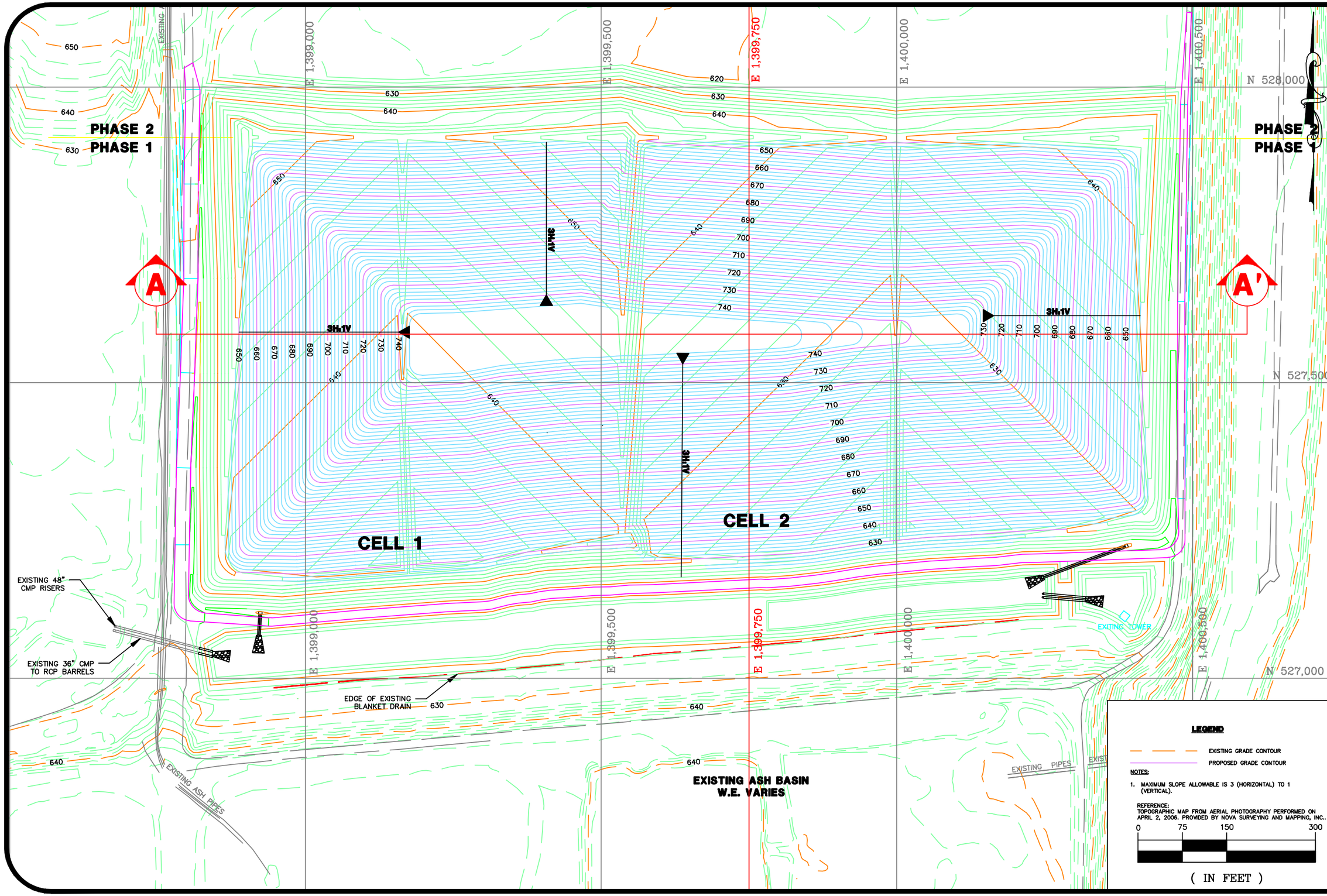
S&ME WWW.SMEINC.COM

PHASE I CROSS SECTION
RETIRED ASH BASIN - ASH LANDFILL

DUKE ENERGY – ALLEN STEAM STATION
BELMONT, NORTH CAROLINA

FIGURE NO.

4



SCALE: 1" = 150'
PROJECT NO. 1356-06-825
DATE: 3-12-08
DRAWN BY: ELH
CHECKED BY:

S&ME
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PHASE I FINAL GRADING PLAN
RAB ASH LANDFILL

ALLEN STEAM STATION
BELMONT, NORTH CAROLINA

FIGURE NO.
5

S:\1356\PROJECTS\2006\1356-06-825 DUKE POWER - ALLEN STEAM STATION ASH LANDFILL\PERMIT (TO CONSTRUCT) APPLICATION\REPORTS\OPERATIONS PLAN\RTC 9.17.09\FIG 5

DEFINITION
Controlling runoff and erosion on disturbed areas by establishing perennial vegetative cover with seed.

PURPOSE
To reduce erosion and decrease sediment yield from disturbed areas, and to permanently stabilize such areas in a manner that is economical, adapts to site conditions, and allows selection of the most appropriate plant materials.

SPECIFICATIONS

SEEDBED REQUIREMENTS
Establishment of vegetation should not be attempted on sites that are unsuitable due to inappropriate soil texture, poor drainage, concentrated overland flow, or steepness of slope until measures have been taken to correct these problems.

To maintain a good stand of vegetation, the soil must meet certain minimum requirements as a growth medium. The existing soil should have these criteria:

- Enough fine–grained (silt and clay) material to maintain adequate moisture and nutrient supply (available water capacity of at least .05 inches water to 1 inch of soil).
- Sufficient pore space to permit root penetration.
- Sufficient depth of soil to provide an adequate root zone. The depth to rock or impermeable layers such as hardpans should be 12 inches or more, except on slopes steeper than 2:1 where the addition of soil is not feasible.
- A favorable pH range for plant growth, usually 6.0 – 6.5.
- Free from large roots, branches, stones, large clods of earth, or trash of any kind. Clods and stones may be left on slopes steeper than 3:1 if they are to be hydro seeded.

If any of the above criteria are not met – i.e., if existing soil is too coarse, dense, shallow or acidic to foster vegetation – special amendments are required. The soil conditioners described below may be beneficial or, preferably, topsoil may be applied.

SEEDBED PREPARATION
Install necessary mechanical erosion and sedimentation control practices before seeding, and complete grading according to the approved plan.

Lime and fertilizer needs should be determined by soil tests. Directions, sample cartons, and information sheets are available through county Agricultural Extension offices. Testing is also done by commercial laboratories.

When soil tests results are not available, follow rates suggested in the seeding specifications shown at right. Application rates usually fall into the following ranges:

- Ground agricultural limestone:
  Light–textured, sandy soils: 1 to 1–1/2 tons/acre
  Heavy–textured, clayey soils: 2–3 tons/acre
- Fertilizer:
  Grasses: 800–1200 lb/acre of 10–10–10 (or the equivalent)
  Grass–legume mixtures: 800–1200 lb/acre of 5–10–10 (or the equivalent)

Apply lime and fertilizer evenly and incorporate into the top 4–6 inches of soil by disking or other suitable means. Operate machinery on the contour. When using a hydro seeder, apply lime and fertilizer to a rough, loose surface.

Roughen surfaces prior to seeding.

Complete seedbed preparation by breaking up large clods and raking into a smooth, uniform surface (slopes less than 3:1). Fill in or level depressions that can collect water. Broadcast seed into a freshly loosened seedbed that has not been sealed by rainfall.

SEEDING
Seeding dates given in the seeding mixture specifications are designated as "best" or "possible". Seedings properly carried out within the "best" dates have a high probability of success. It is also possible to have satisfactory establishment when seeding outside these dates. However, as you deviate from them, the probability of failure increases rapidly. Seeding on the last date shown under "possible" may reduce changes of success by 30–50%. Always take this into account in scheduling land–disturbing activities.

Use certified seed for permanent seeding whenever possible.

Labeling of non–certified seed is also required by law. Labels contain important information on seed purity, germination, and presence of wood seeds. Seeds must meet State standards for content of noxious weeds. Do no accept seed containing "prohibited" noxious weed seed.

Inoculate legume seed with the Rhizobium bacteria appropriate to the species of legume.
Apply seed uniformly with a cyclone seeder, drop–type spreader, drill, cultipacker seeder, or hydro seeder on a firm, friable seedbed.

When using a drill or cultipacker seeder, plant small grains no more than 1 inch deep, grasses and legumes no more than 1/2 inch. Equipment should be calibrated in the field for the desired seeding rate.

When using broadcast–seeding methods, subdivide the area into workable sections and determine the amount of seed needed for each section. Apply one–half the seed while moving back and forth across the area, making a uniform pattern: then apply the second half in the same way, but moving at right angles to the first pass.

Mulch all plantings immediately after seeding.

HYDRO SEEDING
Surface roughening is particularly important when hydro seeding, as a roughened slope will provide some natural coverage for lime, fertilizer, and seed. The surface should not be compacted or smooth. Fine seedbed preparation is not necessary for hydro seeding operations: large clods, stones, and irregularities provide cavities in which seeds can lodge.

Rate of wood fiber (cellulose) application should be at least 2,000 lb/acre.

Apply legume inoculants at four times the recommended rate when adding inoculant to a hydro seeder slurry.

If a machinery breakdown of 1/2 to 2 hours occurs, add 50% more seed to the tank, based on the proportion of the slurry remaining. This should compensate for damage to seed. Beyond 2 hours, a full rate of new seed may be necessary.

Lime is not normally applied with a hydraulic seeder because it is abrasive. It can be blown onto steep slopes in dry form.

MAINTENANCE
Generally, a stand of vegetation cannot be determined to be fully established until soil cover has been maintained for one full year from planting. Inspect seeded areas for failure and make necessary repairs and reseedings within the same season, if possible.

Reseeding––If a stand has inadequate cover, re–evaluate choice of plant materials and quantities of lime and fertilizer. Re–establish the stand after seedbed preparation or over– seed the stand. Consider seeding temporary, annual species if the time of year is not appropriate for permanent seeding.

If vegetation fails to grow, soil must be tested to determine if acidity or nutrient imbalance is responsible.

Fertilization––On the typical disturbed site, full establishment usually requires re–fertilization in the second growing season. Fine turf requires annual maintenance fertilization. Use soil tests if possible or follow the guidelines given for the specific seeding mixture.

TEMPORARY SEEDING SPECIFICATIONS

Seeding mixture (fall)

Species*	Rate (lb/acre)
Rye (grain)	120

Seeding Mixture (late winter early spring)

Species*	Rate (lb/acre)
Rye (grain)	120
Annual Lespedeza	50

Omit Annual Lespedeza when duration of temporary cover is not to extend beyond July.

Seeding mixture (summer)

Species*	Rate (lb/acre)
German Millet	40

Seeding dates (Piedmont)

Fall:	Aug. 15 – Dec. 30
Late winter (early spring):	Jan. 1 – May 1 Late
Summer:	May 1 – Aug. 15

Soil amendments
Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10–10–10 fertilizer.

Mulch
Apply 4,000 lb/acre straw. Anchor mulch by tacking with asphalt, roving or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring. tool.

Maintenance
Re–fertilize if growth is not fully adequate. Reseed, re–fertilize and mulch immediately following erosion or other damage.

Pursuant to G.S. 113A–57(2), the angle for graded slopes and fills shall be no greater than the angle that can be retained by vegetative cover or other adequate erosion–control devices or structures. In any event, slopes left exposed will, within 21 calendar days of completion of any phase of grading, be planted or otherwise provided with temporary or permanent ground cover, devices, or structures sufficient to restrain erosion.

Pursuant to G.S. 113A–57(3), provisions for permanent groundcover sufficient to restrain erosion must be accomplished for all disturbed areas within 15 working days or 90 calendar days (whichever is shorter) following completion of construction or development.

*REF: 6.10 A,B and C, NC Erosion and Sediment Control Planning and Design Manual, 2006

PERMANENT SEEDING SPECIFICATIONS

Seeding mixture

Species	Rate (lb/acre)
Annual ryegrass	40
Foxtail millet	30
Tall fescue	31
Red top	21
Durana clover	8

Nurse plants
Between May 1 and Aug. 15, add 10 lb/acre German millet or 15 lb/acre Sudan grass. Prior to May 1 or after Aug. 15, add 40 lb/acre rye (grain).

Seeding dates

	Best	Possible
Fall:	Aug. 25 – Sept. 15	Aug. 20 – Oct. 25
Late winter:	Feb. 15 – Mar. 21	Feb. 1 –Apr. 15

Fall is best for tall fescue and late winter for lespedezas. Over seeding of Kobe lespedeza over fall–seeded tall fescue is very effective.

Soil amendments
Apply lime and fertilizer according to soil tests, or apply 4,000 lb/acre ground agricultural limestone and 1,000 lb/acre 10–10–10 fertilizer.

Mulch
Apply 4,000–5,000 lb/acre grain straw or equivalent cover of another suitable mulching material. Anchor mulch by tacking with asphalt, roving, or netting. Netting is the preferred anchoring method on steep slopes.

Maintenance
Re–fertilize in the second year unless growth is fully adequate. May be mowed once or twice a year, but mowing is not necessary. Reseed, fertilize, and mulch damaged areas immediately.

Pursuant to G.S. 113A–57(3), provisions for permanent groundcover sufficient to restrain erosion must be accomplished for all disturbed areas within 15 working days or 90 calendar days (whichever is shorter) following completion of construction or development.

GENERAL SEEDING SPECIFICATIONS

DATE: 9–17–09
DRAWN BY: CHR
CHECKED BY:
SCALE: N.T.S.
PROJECT NO. 1356–06–825
ENGINEERING LICENSE NO: F–0176

S&ME
9751 SOUTHERN PINE BLVD.
CHARLOTTE, N.C. 28273
(704)523–4726
WWW.SMEINC.COM

SEEDING SPECIFICATION
RAB ASH LANDFILL
ALLEN STEAM STATION
BELMONT, NORTH CAROLINA

FIGURE NO.
6

S:\1356\PROJECTS\2006\1356-06-825 DUKE POWER - ALLEN STEAM STATION ASH LANDFILL\PERMIT (TO CONSTRUCT) APPLICATION\REPORTS\OPERATIONS PLAN\RTC 9.17.09\FIG 6 SEEDING.DWG

APPENDIX I

Emergency Action Plan (EAP)

EMERGENCY ACTION PLAN (EAP)
RETIRED ASH BASIN (RAB) - ASH LANDFILL
ALLEN STEAM STATION
BELMONT, NORTH CAROLINA

S&ME Project No. 1356-06-825

Prepared for:
526 South Church Street
Charlotte, North Carolina 28202

Prepared by:
S&ME, Inc.
9751 Southern Pine Boulevard
Charlotte, North Carolina 28273

November 20, 2009

Emergency Action Plan (EAP)
Notification Sequence

Sequence 1: If one of the **Alert Conditions** listed in Section 3 of this plan has been observed, but slope failure does not appear imminent then the following notification sequence is followed by the **Owner**:

Owner

Solid Waste Section Staff
Mooresville Regional Office
Telephone #: 704-663-1699

OR

Raleigh Central Office
Telephone #: 919-508-8495

AND

Owner's Engineer

AND

Proceed to Sequence 2 if conditions warrant

Sequence 2: If one of the **Emergency Conditions** is occurring or slope failure appears to be otherwise imminent, the following notification sequence is followed by the Owner:

Owner

Duke Energy Environment, Health & Safety Contact
Telephone #: 704-829-2423

Plant Control Room
Telephone #: 704-829-2360
(Available 24 hours)

AND

Gaston County Emergency Management
Telephone #: 704-866-3350 (M-F; 8AM-5PM)
704-866-3300 (after hours)

Emergency Communications Center
Telephone #: 704-866-3004

AND

State Emergency Operations Center
Telephone #: 1-800-858-0368
(Available 24 hours)

In the event of an **Emergency Condition**, if directed by the station, assemble at the designated Assembly Area.

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2 PROJECT DESCRIPTION.....1

3 SLOPE FAILURE INDENTIFICATION CRITERIA.....1

4 NOTIFICATION SEQUENCE.....3

1. STATEMENT OF PURPOSE

The purpose of this Emergency Action Plan (EAP) is to safeguard the lives and reduce damage to Duke Energy's Allen Steam Station property or surrounding properties, in the event of slope failure of the retired ash basin (RAB) ash landfill.

This EAP establishes slope instability identification criteria, identifies emergency response entities, identifies impacted areas, establishes procedures for notification and provides contact information for emergency notifications. This EAP provides a framework for consistent and appropriate response to slope failure events, should they occur. Implementation and familiarity with the elements of the EAP will reduce the risk associated with landfill operations and help to mitigate impacts resulting from slope failure events.

2. PROJECT DESCRIPTION & IMPACTS

The ash landfill is located on the eastern portion of the Duke Energy – Allen Steam Station property approximately 0.25 miles south of the Allen Steam Station in the footprint of a retired ash basin (RAB). Ash waste fill heights are expected to be on the order of 200 feet with slopes constructed at 3 (horizontal) to 1 (vertical) slopes.

The RAB is bound to the north, east, south, and west by earthen dikes. Adjacent to the RAB to the north is the Station's coal pile and the Catawba River is located to the east. Adjacent to the RAB to the south is an existing active ash basin, and to the west is a structural fill area. Impacted areas are located on Duke Energy's Allen Steam Station property. The critical slope, in regards to the health and safety of the general public, is the eastern slope of the landfill, which is upstream of the Catawba River.

3. SLOPE FAILURE IDENTIFICATION CRITERIA

3.1 Alert Status

The following conditions indicate a potential emergency situation. If one or more of these conditions are observed, the owner should initiate Notification Sequence 1 immediately:

i. cracking on landfill slope faces;

ii. bulging on landfill slope faces;

iii. wet spots, seepage, or flow emerging from or near the landfill slope faces; and

iv. shallow sloughing up to about three feet deep.

While under Alert Status, the owner shall continuously monitor slope conditions of the landfill. The owner shall communicate regularly with North Carolina Department of Environment and Natural Resources (NCDENR) personnel and the Engineer. The owner

shall determine if conditions warrant a transition to Emergency Status, and notify the emergency management authorities.

3.2 Emergency Status

The following conditions indicate slope failure is possible. If one or more of these conditions is observed, the owner should initiate Notification Sequence 2 immediately:

i. slope faces in the process of cracking, sliding, or sloughing.

ii. turbid seepage (that is, muddy seepage) and or boils emerging from the landfill slope faces.

4. NOTIFICATION SEQUENCE

Sequence 1: If one of the Alert Conditions listed in Section 3 of this plan has been observed, but slope failure does not appear imminent then the following notification sequence is followed by the Owner:

Owner

→ Land Quality Section Staff
Mooresville Regional Office
Telephone #: 704-663-1699

OR

Raleigh Central Office
Telephone #: 919-508-8495

AND

→ Owner's Engineer

AND

→ **Proceed to Sequence 2 if conditions warrant**

Sequence 2: If one of the **Emergency Conditions** is occurring or slope failure appears to be otherwise imminent, the following notification sequence is followed by the Owner:

Owner

→ Duke Energy Environment, Health & Safety Contact
Telephone #: 704-829-2423

Plant Control Room
Telephone #: 704-829-2360
(Available 24 hours)

AND

→ Gaston County Emergency Management
Telephone #: 704-866-3350 (M-F; 8AM-5PM)
704-866-3300 (after hours)

Emergency Communications Center
Telephone #: 704-866-3004

AND

→ State Emergency Operations Center
Telephone #: 1-800-858-0368
(Available 24 hours)

In the event of an **Emergency Condition**, if directed by the station, assemble at the designated Assembly Area.

APPENDIX II

Operations Quality Assurance Plan
(Revised November 11, 2010)

OPERATIONS QUALITY ASSURANCE PLAN
RETIRED ASH BASIN (RAB) - ASH LANDFILL
ALLEN STEAM STATION
BELMONT, NORTH CAROLINA

S&ME Project No. 1356-06-825

Prepared for:
526 South Church Street
Charlotte, North Carolina 28202

Prepared by:
S&ME, Inc.
9751 Southern Pine Boulevard
Charlotte, North Carolina 28273

November 11, 2010

TABLE OF CONTENTS

Section **Page**

1 PROJECT DESCRIPTION.....1

2 QA MONITORING AND TESTING.....1

1. PROJECT DESCRIPTION

Quality assurance (QA) monitoring and testing of waste placement during operations of the RAB Ash Landfill shall be performed as presented herein. QA monitoring and testing will be provided by an engineering and testing firm independent of the operator specializing in the observation and testing of soils.

2. QA MONITORING AND TESTING

2.1 Waste Placement

Waste shall be placed and compacted in loose lifts to achieve a 12-inch compacted lift thickness. These incremental lifts shall be placed to achieve a vertical operational lift thickness of 10 feet. The waste filling sequence shall be consistent with the Operations Plan. In general the waste filling sequence shall progress in 10-ft thick operational lifts, with each lift completed across a whole cell before beginning the next lift.

2.2 QA Field Monitoring

QA field monitoring shall be performed to verify that operations are being performed in accordance with the general steps outlined in Section 2 of the Operations Plan. The engineering technician responsible for field monitoring shall document the waste type, location of waste placement, and general placement and compaction methods during waste placement. Documentation shall include information, such as the operator's equipment types and number of passes to achieve the minimum compaction requirements. Waste placement monitoring documentation shall be maintained with the on-site operation records.

2.3 QA Field Testing

QA field testing shall be performed to monitor the compaction and moisture conditioning during waste placement. Waste shall be compacted to a minimum 95 percent of its Standard Proctor (ASTM D 698) maximum dry density. Compacted moisture content shall be within 5 percent of optimum moisture content.

In-place density and moisture content testing shall be performed at the following frequencies:

Cells 1 and 3: One test per 8,000 cubic yards (or one test per 216,000 square feet per 12-inch thick lift).

Cells 2 and 4: One test per 2,000 cubic yards (or one test per 54,000 square feet per 12-inch thick lift).

In-place density testing shall be performed using the Sand-Cone Method (ASTM D 1556), Nuclear Methods (ASTM D 6938), or the Drive-Cylinder Method (ASTM D 2937). Moisture content testing shall be performed using the Direct Heating Method (ASTM D 4959) or Nuclear Methods (ASTM D 6938). Density testing shall generally be performed and test locations documented on a one-acre grid, and including areas within 25 feet of

exterior slopes. Waste placement testing records shall be maintained with the on-site operations records.

In the event that an in-place density and moisture content test fails, the area of waste placement shall be reworked, reconditioned, and retested until the minimum compaction requirement is met.

2.4 Laboratory Testing

Laboratory testing shall be performed at the following frequencies:

Cells 1 and 3: One Standard Proctor moisture-density relationship (ASTM D 698) developed per 50,000 cubic yards of material placed.

Cells 2 and 4: One Standard Proctor moisture-density relationship (ASTM D 698) developed per 20,000 cubic yards of material placed.

Laboratory testing records shall be maintained with the on-site operations records.

S&ME

December 3, 2010

North Carolina Department of Environment and Natural Resources
Solid Waste Section, Division of Waste Management
Asheville Regional Office
2090 US Highway 70
Swannanoa, NC 28778

Attention: Mr. Larry Frost, P.E.
larry.frost@ncdenr.gov

Reference: Permit to Operate – Additional Information
Retired Ash Basin (RAB) – Ash Landfill (Permit No. 36-12)
Duke Energy - Allen Steam Station, Belmont, NC
S&ME Project No. 1356-06-825 Ph. 09
North Carolina P.E. Firm License No. F-0176

Dear Mr. Frost:

As you requested during a December 2, 2010 telephone conversation with Mr. Kenneth Daly of S&ME, Inc., we are submitting this letter and the attached Operations Plan for Phase 1 (Cells 1 and 2) of the RAB Ash Landfill at Duke Energy's Allen Steam Station. The attached Operations Plan is the most up-to-date plan. The latest revision includes modifications to the "Operations Quality Assurance Plan" in Appendix II. These modifications reflect the requested field and laboratory testing frequencies in Dam Safety Section's "Certificate of Approval" letter dated November 30, 2010. An electronic copy of the Operations Plan is also included in the attached CD.

The attached CD also includes S&ME's "Permit to Operate – Modifications Request – Response to NCDENR Comments" dated November 11, 2010. This document was prepared in response to Dam Safety Section's "Revision Request Letter" dated October 27, 2010.

Please contact us as your convenience if you have questions or need additional information.

Sincerely,
S&ME, Inc.

Kyle Baucom

Kyle Baucom, E.I.
Staff Professional

Kenneth R. Daly JSR for

Kenneth R. Daly, P.E.
Senior Project Engineer

Attachments: Operations Plan, Revised November 11, 2010
Additional Information CD including electronic copies of:
Operations Plan, Revised November 11, 2010
Permit to Operate – Modifications Request – Response to NCDENR Comments