REVISED OPERATIONS PLAN
LINCOLN COUNTY LANDFILL – PHASE III

Permit No.	Date	Document ID No.
55-03	**December 10, 2008**	**6238**

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December 4, 2008
Solid Waste Section
Asheville Regional Office

Prepared For:

Lincoln County
5291 Crouse Road
Crouse, North Carolina 28033

Prepared By:

S&ME
9751 Southern Pine Blvd.
Charlotte, North Carolina 28273

S&ME Project No. 1356-08-125

LETTER OF TRANSMITTAL

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9751 Southern Pine Blvd.
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S&ME

DATE 12/1/08	JOB NO. 1356-08-125
ATTENTION Larry Frost	
RE: Lincoln County Landfill	
Revised Operations Plan	
Phone:	
Fax:	

North Carolina Department of Environment and Natural Resources
Asheville Regional Office
2090 US HWY 70
Swannanoa, North Carolina 28778

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Letter ☒ Report ☐ Calculation ☐ CD

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ASHEVILLE REGIONAL OFFICE

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SIGNED Julie R. Petersen
Julie R. Petersen, P.G.

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REVISED OPERATIONS PLAN
LINCOLN COUNTY LANDFILL – PHASE III
CROUSE, NORTH CAROLINA

S&ME PROJECT NO. 1356-08-125

Prepared for:

Lincoln County Landfill
5291 Crouse Road
Crouse, North Carolina, 28033

Prepared by:

S&ME, Inc.
9751 Southern Pine Boulevard
Charlotte, North Carolina 28273
(704) 523-4726

November 25, 2008

S&ME

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1973 • 2008

November 25, 2008

Lincoln County
5291 Crouse Road
Crouse, North Carolina 28033

Attention: Mrs. Nancy Rickard, Solid Waste Manager

Reference: Lincoln County Landfill – Phase III
Revised Operations Plan
Lincoln County, North Carolina
S&ME Project No. 1356-08-125

Dear Mrs. Rickard:

S&ME, Inc. (S&ME) is pleased to submit this Revised Operations Plan for the Lincoln County Landfill – Phase III. This work was completed in general accordance with S&ME Proposal No. 1356-20729-08. This Revised Operations Plan has been modified to include the newly operational Type I composting facility on-site as per the .1400 rules of the 15A NCAC 13B standards.

S&ME appreciates the continued opportunity to support Lincoln County with this Revised Operations Plan. We trust this information is responsive to your needs at this time. If you have questions regarding this document or desire our further assistance, please do not hesitate to contact us.

Respectfully submitted,

S&ME, Inc.

Julie R. Petersen, P.G.
Project Manager

Ken Daly, P.E.
Senior Project Engineer

Senior Reviewed by: Jason S. Reeves, P.E., Senior Engineer

c: NCDENR – Division of Waste Management – Solid Waste Section (1 copy)
Larry Frost – NCDENR – Asheville Regional Office (1 copy)

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I Phasing Diagrams

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1. MSW LANDFILL OPERATIONS AND MAINTENANCE

The Lincoln County MSW Landfill is owned and operated by Lincoln County. Operation of the landfill is the responsibility of the Solid Waste Manager of Lincoln County Landfill. The Operations Manager is responsible for the maintenance of the site.

1.1 Landfilling Sequence

The development of the Lincoln County MSW Landfill has been sequenced in phases. Landfilling operations generally precede from the up-gradient end of Phases I and II towards the down-gradient end by the use of cells. To continue the existing sequencing, Phase IIII is "piggybacked" onto Phase II, and will be raised to an elevation of 932 feet. Each cell within Phase III will be filled to approximately 10 to 12 feet on the initial solid waste lift and the entire cell will be covered prior to beginning the initial solid waste lift of the next cell. Once the initial lift has been placed in Cells 1 through 3, the second and subsequent lifts of solid waste will be placed. This method is intended to reduce leachate generation by diverting stormwater with the daily cover.

1.2 Stormwater Collection and Removal System

Outside the landfill limits, the perimeter berms with adjacent permanent drainage ditches will divert surface water run-on from entering the landfill limits. A temporary divider berm and pipes are provided within each cell to allow removal of surface water that has not contacted waste. These temporary pipes, located at the low point of each cell, pass through the divider berm and the Phase III interim berm to allow open channel flow drainage to the down gradient surface water collection and removal system, where surface water is discharged into a channel leading to a sediment basin.

Prior to landfilling a cell, the surface water drainage pipe within the cell shall be removed and replaced with backfill. The Operations Manager shall observe and document the removal of the pipe to verify that the underlying liner system is not damaged. Following the pipe removal, surface water that accumulates within the active cell will either infiltrate into the operational cover or flow into the leachate header pipe located at the low point of the cell. This surface water, which has contacted waste, will then flow into the leachate collection and removal system and will be treated as leachate. In addition, the up-gradient temporary divider berm shall be removed and used as daily cover. Care shall be taken during removal of the divider berm so that at least 24 inches of operational cover remains above the liner system.

Since landfilling will progress from up-gradient to down-gradient, surface water will drain down-gradient of the active face and flow into the leachate collection system. Landfilled areas up-gradient of the active face will be graded so that surface water drains around the active face. Prior to development of the last cell within the phase, the divider berm shall be removed and used as daily cover. In addition, the HDPE stormwater removal pipe shall be grouted along the entire length of pipe and capped. It is recommended that this task be observed by the design engineer to verify that the liner penetration has been completely sealed.

1.3 Leachate Collection and Removal System

The leachate collection and removal system consists of a geonet composite with a series of collection pipe laterals. The lateral pipes are connected to an HDPE header pipe that provides gravity drainage of the leachate to sump locations within the phase. Leachate is discharged by pumping to the leachate conveyance and storage system.

The general operation required to activate a cell for waste placement will include the activation of the leachate collection and removal system within the active cell. This task is accomplished by opening the leachate header pipe located along the toe of the perimeter berm just up-gradient from the previously removed surface water drainage pipe. Opening of the leachate header pipe will involve removal of the temporary armored channel and cover geotextile over the header pipe drainage material. The opened header pipe feeds directly into the leachate collection and removal system such that rain water entering the cell will now enter the leachate collection and removal system and not pond within the cell. The temporary geotextile placed over the header pipe drainage material shall be cut along its centerline and pulled back just prior to placing waste over the header pipe. The Operations Manager shall document the activation of the leachate collection system within each cell and file the documentation in the facility operation records. The ENGINEER will be on-site to monitor and document the removal of the stormwater system and the activation of the leachate collection and removal system in the sump area.

Clean-out pipes have been provided at the ends of the leachate header pipes in the event that the leachate collection and removal pipes become clogged. If a clogging problem exists within a pipe, the pipe can be cleaned out by the use of a clean-out snake or high pressure water flushing.

1.4 Placement of Waste and Cover Material

Prior to waste placement, stakes indicating the limits of waste placement, as shown on the Engineering Plan Drawings, shall be located. The solid waste shall be compacted as densely as practical using landfill compactors and dozers. Waste placement will be in lifts not less than 10 feet in vertical thickness for the initial fill placement adjacent to the lined side slopes. A minimum of five feet of waste must be placed on the cell floor before truck access or compaction with a landfill compactor is allowed. A minimum of four passes by the compactor will be required prior to placement of the next lift of waste. Based on the type of waste, additional passes may be required to achieve higher compaction rates.

Initially the waste shall be placed from up-gradient to down-gradient, but 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. A minimum five percent slope shall be graded on the landfill surface to promote surface water runoff. Solid waste shall not be disposed of in water, and surface water shall not be impounded over or in the solid waste. In addition, the landfill active face should be as small as possible to reduce the amount of daily cover. Phasing Diagrams for the proposed landfilling sequence are presented in **Appendix I**.

As waste is being placed directly onto the operational cover, care shall be taken so that sharp objects are not placed directly on the operational cover to minimize the potential of damaging the leachate collection and liner systems. All cover material will be obtained from on-site stockpiles or

borrow areas. Solid waste will be covered with a layer of compacted soil at least 6 inches thick or a geotextile fabric. A demonstration and permit modification request will be submitted to the Division of Waste Management should it become desired to utilize alternative daily covers.

An intermediate cover shall be placed on areas where waste placements will be inactive for 12 months or more. The intermediate cover will be placed at frequencies suitable for specific waste management operations. Areas receiving intermediate soil cover shall be grassed in accordance with the Rules. The final cover system shall be placed in accordance with the Closure/Post-Closure Program.

1.5 Waste Acceptance, Disposal and Screening Requirements

The procedural requirements for waste acceptance at the Lincoln County Landfill will generally be the same as those currently in use. The landfill will accept industrial, commercial, and municipal solid wastes, and may accept special wastes upon proper approval for disposal. Special waste shall be handled in accordance with local, state and federal guidelines. The landfill shall only accept those solid wastes which it is permitted to receive.

The landfill owner or operator shall notify the Division of Waste Management within 24 hours of attempted disposal of any waste the landfill is not permitted to receive, including waste from outside the area the landfill is permitted to serve. No hazardous, liquid, or infectious waste shall be accepted or disposed of in the landfill. Wastes prohibited for disposal include those hazardous wastes defined in 15A NCAC 13A (including hazardous waste from conditionally exempt small quantity generators), polychlorinated biphenyls as defined in 40 Code of Federal Regulations (CFR) 761, septic waste, waste oil or any waste that is determined to contain "free liquids" as defined by EPA Method 9095 (Paint Filter Liquids Test), S.W. 846.

Management of asbestos shall be in accordance with 40 CFR 61. Asbestos shall be disposed of at the landfill on the bottom of the active landfill face apart from other wastes and immediately covered with soil.

Bulk or non-containerized liquid waste may not be disposed in the landfill unless the waste is a household waste other than septic waste or waste oil or the waste is leachate or gas condensate from the landfill. Containers holding liquid waste may not be disposed in the landfill unless the container is a small container similar in size to that normally found in household waste, the container is designed to hold liquids for use other than storage, or the waste is a household waste. Management of asbestos shall be in accordance with 40 CFR 61.

Non-regulated medical waste may be disposed with general solid waste. All sharps that are broken or unbroken shall be placed in a sealed, puncture-proof container prior to disposal. Spoiled foods, animal carcasses, abattoir waste, hatchery waste, and other animal waste delivered to the disposal site should be immediately covered with soil.

The sludge from a wastewater treatment plant may be disposed with general solid waste in accordance with passing the Paint Filter Liquids Test (EPA Method 9095) and tested with a Toxicity Characteristic Leaching Procedure (TCLP). Barrels and drums shall not be disposed of

unless they are empty and perforated sufficiently to ensure that they do not contain liquid (except for household wastes in small containers of original packaging) or hazardous waste. Additional materials banned from the Subtitle D landfill include hazardous waste, aluminum cans, lead batteries, white goods, whole tires, and yard waste and land clearing debris.

The County shall conduct a screening program at the facility for detecting and preventing disposal of hazardous and liquid waste. The program shall consist of random inspections of incoming loads. One inspection should be performed on a minimum weekly basis for commercial and industrial waste. The selection of the vehicle that will have its load inspected shall be the responsibility of the Operations Manager. The selection will be made at the scales or landfill workface. The hauler shall be required to sign the Pre-Acceptance Agreement (after being completed by the Screening Inspector). The Operations Manager shall notify the landfill facility's "Screening Inspector" (chosen by the Operations Manager and adequately trained) to meet the designated hauler at an area specifically set aside for conducting screening inspections (preferably on a level solid ground, pavement or concrete pad) away from the working face and any on-going landfill operations. The hauler shall dump the load of waste on the pad then the Screening Inspector shall "sort" through the waste using a loader or other similar equipment for handling bulky materials and by hand with a rake or shovel. Once the waste is spread thin enough to observe the entire load, the inspector will record the information required on the Detailed Screening Report and Waste Screening Checklist. If liquid or hazardous wastes are not found in the inspected load, then the waste will be disposed of on the working face in the cell immediately after completion of the inspection.

If hazardous or liquid wastes are identified in the load, the screening inspector shall immediately notify the Operations Manager. If hazardous waste is identified, the hazardous materials emergency response team for Lincoln County shall also be notified. If liquid waste is discovered, it shall be contained on the pad (either with curb for asphalt or concrete pad, with a soil berm or with other suitable measures) temporarily until an absorbent can be placed with the liquid or until proper containers are available for filling. The saturated absorbent or containers will then be disposed of at an appropriate facility. If hazardous waste is discovered, it shall be maintained in the same manner as the liquid waste and will be disposed of at a suitable facility for hazardous waste as determined by the emergency response team or a qualified environmental/hazardous waste consultant.

Records of any inspections shall be maintained in a "Screening Inspection" file or notebook as a permanent record at the facility office. Sample forms for the waste acceptance and screening inspections are provided in **Appendix II**. These forms include a Waste Screening Checklist, a Pre-Acceptance Agreement, and a Detailed Screening Report. Facility personnel involved with the screening inspections should be trained for identification of hazardous and liquid wastes through programs offered by the State or by the Solid Waste Association of North America (SWANA). The "Screening Inspector" should also have the Occupational Safety and Health Administration (OSHA) 40-hour hazardous waste and safety training.

1.6 Training of Facility Personnel

Due to the diversity of job tasks required at Subtitle D type landfills and the critical nature of the landfill components, personnel should be adequately trained to handle the operation and maintenance of the facility. Some of the critical tasks include:

- Operation and maintenance of leachate storage tanks and associated piping
- Maintaining leachate flow volumes and records
- Accurate records of waste loading (quantitative and qualitative)
- Identification of hazardous and liquid wastes
- Control of accidental fires

The Operations Manager should have a general understanding of all the tasks required for site operations. He should have individuals performing the various tasks that have had training for the specific tasks they are assigned through programs offered by the State or by organizations like SWANA.

1.7 Operations Record Keeping

Lincoln County maintains an on-site operating record in accordance with the North Carolina Solid Waste Management Rules, Section .1626 (10). The operating record includes the following:

- Waste screening program
- Waste screening inspections
- Waste screening training program
- Waste determination records
- Waste amounts received (and source)
- Methane gas monitoring plan, gas monitoring results, and any remediation plans
- Groundwater monitoring information
    - Documentation of approval from the Division
    - Approved groundwater monitoring plan
    - Groundwater monitoring results
    - Notice of statistically significant changes in constituents (if any)
    - Report of explanation of significant changes if not caused by the MSWLF unit
    - Notice of Appendix II constituents detected (if any)
    - Report of each sampling event
    - Permit modification to document selection of corrective action (if any)
    - Report justifying alternative corrective measures (if any)
    - Report documenting completion of corrective action (if any)
- Closure and post-closure monitoring plan and results
- Closure cost estimate and financial assurance documentation
- Records required by 40 CFR 61 (asbestos rules)
- Operations plan
- Leachate management plan

The above records will be kept in the operating record for the active life of the landfill and the post-closure care period. All 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 by Lincoln County include:

- Facility Permits
  - Solid waste facility permits
  - EPA generator I.D./permit
  - National Pollutant Discharge Elimination System (NPDES) stormwater discharge permit
  - Non-domestic wastewater discharge permit
  - Erosion and sediment control plan permit
- Regulatory agency inspection reports
- Employee training program and records
- Internal Vehicle maintenance records
- Site drawings and specifications
- Spill Prevention, Control and Countermeasure (SPCC) plan
- Special waste acceptance records
- NCDENR Acknowledgement Letter to Operate a Small Type I Composting Unit

2. C&D LANDFILL OPERATIONS AND MAINTENANCE

The C&D Landfill is owned and operated by Lincoln County. It is located on the mid-eastern portion of the Lincoln County Landfill site. The Operations Manager is responsible for the operations and maintenance of the site.

Lincoln County anticipates that the waste stream for the C&D Landfill will be generated from residential, agricultural facilities, commercial businesses, and industrial facilities within the State of North Carolina. The waste stream will typically be waste resulting from the construction, remodeling, repair or demolition operations on pavement, buildings, or other structures. No household solid waste, commercial solid waste, industrial solid waste, hazardous waste, PCB waste, liquid waste or other banned wastes that may pose a threat to the environment and public health will be disposed at this facility.

Fill materials required for construction of perimeter berms, subgrade, and cover will be obtained from excavation of the landfill.

2.1 Landfill Capacity

The C&D Landfill consists of Phases I and II. The Phase II landfill is an expansion of the C&D Phase I landfill. The development of the C&D Landfill - Phase II will be in two (2) sub-phases as a "piggy back" system up the existing Phase I slope. Phase IIA will provide the foundation base for Phase IIB. Phase IIB will "piggyback" Phase IIA and Phase I. Sub-phasing will be designated as an elevation up the slope based on tonnage rates. The sub-phasing is divided out based on two elevations that approximately represents five years of landfill capacity. The capacity is based on a yearly disposal rate of 20,000 tons/year at 5 percent increase per year at a unit weight of 1,200 lbs/cy (0.6 tons/cy).

2.2 Landfill Phasing

Waste will be initially placed in Phase II from the upgradient (west) to the downgradient (east) end of the phase. An initial approximate 10-foot lift of waste will be placed across the phase floor working from upgradient to downgradient areas. After the initial solid waste lift has been placed, the subsequent solid waste lifts will also proceed from the upgradient end toward the downgradient end. Once the lifts of waste are high enough, the waste shall be "piggy-backed" onto the existing adjacent C&D Landfill - Phase I. This procedure will continue until proposed final contours for Phase II are reached. Additional phased filling will proceed after Phase II is completed, contingent on future permitting by the State of North Carolina.

The C&D Landfill – Phase II will be operated with equipment owned by Lincoln County Landfill. Primarily, one waste compactor, one dozer, one excavator, one pan, one grader, and a water truck will be used for site operations and maintenance. Additional equipment will be available as necessary during operation of the C&D landfill.

2.3 Stormwater Collection and Removal

Stormwater runoff from the proposed C&D Landfill – Phase II will be directed to existing sediment basins through a system of diversion benches, downchute piping, direct runoff, and temporary channels, as needed. The sediment basins, channels, and benches will be observed on a regular basis and any necessary repairs will be made as early as practical.

2.4 Waste Placement

Waste placement will be in lifts of approximately 10-foot vertical thickness. As mentioned earlier, each lift will begin at the upgradient (west) end of the phase and progress towards the downgradient (east) end and once the lifts of waste are high enough, the waste shall be "piggy-backed" onto the existing adjacent C&D Landfill - Phase I.

As higher elevations are reached, the waste may be placed from downgradient to upgradient on the active face slope as long as landfill surfaces are graded to allow proper drainage. Soil berms will be constructed as necessary to divert run-on from entering the working face or allowing run off to escape active areas.

2.5 Waste Acceptance and Disposal Requirements

The C&D landfill is expected to receive a waste stream of the following waste types:

- Land-clearing debris as defined in G.S. 130A-290, specifically, solid waste that is generated solely from land-clearing activities, such as stumps, trees, etc.;
- Inert Debris defined as waste that consists solely of material that is virtually inert, such as brick, concrete, rock, cut tires and clean soil;
- Asphalt in accordance with G.S. 130-294(m); and
- Construction and demolition debris defined as solid waste resulting solely from construction, remodeling, repair of demolition operations on pavement, buildings, or other structures.

The landfill operator shall notify the Division within 24 hours of attempt to dispose of any other waste products. No hazardous, liquid, or infectious waste shall be accepted or disposed of in the C&D Landfill.

3. YARD WASTE AND MULCHING OPERATIONS

The Small Type I Composting Unit is owned and operated by Lincoln County. The Composting Unit "Yard Waste Area" is located between the existing C&D Landfill and the existing Area "E" Closed Landfill, just north of the existing Area "D" Phase I Landfill. The Operations Manager is responsible for the operations and maintenance of the site.

3.1 Yard Waste Generation and Acceptance

The waste stream for the Yard Waste Area is generated from residential yard maintenance and land clearing activities within Lincoln County. No items except for tree limbs, brush, grass clippings, leaves and similar vegetative material will be accepted to the Yard Waste Area.

3.2 Yard Waste Composting

Raw yard waste materials are processed in a tub grinder via a front-end loader and ground up into mulch. The mulch is then formed into parabolic windrows and aerated monthly by front-end loaders until the internal compost temperature is elevated to at least 55 degrees Celsius (°C) and maintained for 3 days. Once internal temperatures are raised to 55°C and maintained for 3 days, the mulch will be stockpiled and used for the facility's roads during wet weather work. Mulch is also delivered to schools located within Lincoln County for playground use upon request. Any excess mulch is given away to the general public by the landfill.

3.3 Stormwater Collection and Removal

Stormwater runoff from the Yard Waste Area is directed to existing Sediment Basins SB-E and SB-B through a system of channels and culverts. The sediment basins, channels, and culverts will be observed on a regular basis, and any necessary repairs will be made as early as practical.

4. SITE OPERATIONS AND MAINTENANCE

The site operations and maintenance plan is for the entire Lincoln County Landfill. It incorporates items that are needed for the MSW and C&D landfills, and Yard Waste Area. The items covered in the site operations cover topics from erosion control to methane control. Contingency items will be discussed along with controlling odor and vectors.

4.1 Erosion/Sedimentation Control Maintenance and Water Protection

Erosion/sedimentation control structures include sediment basins, sediment traps, and channels. Sediment basins shall be checked after periods of significant runoff. Sediment shall be removed from the basin to its original dimensions when sediment accumulates to one half of the design depth. The sediment basins, embankments, spillways and outlets shall also be observed for erosion damage. Necessary repairs shall be made as soon as practicable. Trash or debris within the sediment basin riser shall be removed.

Channels shall be observed for damage after each runoff event. Riprap-lined channels and outlet protection aprons used to prevent damage to channel vegetation shall be observed for washouts. Riprap shall be added to these areas as needed to maintain the integrity of the structure.

Embankment slopes shall be periodically observed for erosion. The embankment slopes shall be mowed at least once a year. The embankment slopes shall be refertilized in the second year unless vegetation growth is fully adequate. The damaged areas shall be reseeded, fertilized and mulched immediately. Seeding, fertilizing and mulching shall be in accordance with the North Carolina Erosion and Sedimentation Control Guidelines.

Provisions for a vegetative ground cover sufficient to restrain erosion must be accomplished within 30 working days or 120 calendar days upon completion of any phase of landfill development.

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. 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.

4.2 Access and Security Requirements

The site is enclosed by a fence with access controlled by means of gates. A security check station and weigh scales are located at the landfill entrance to evaluate the incoming waste for proper disposal. An attendant is on duty at the site at all times while the landfill is open for public use to insure compliance with operational requirements. Facilities currently in place will remain operational. Access roads to the site shall be of all weather construction and maintained in good condition.

The removal of solid waste from the landfill is prohibited unless the owner or operator approves and the removal is not performed on the working force. Barrels and drums shall not be disposed of unless they are empty and perforated sufficiently to ensure that no liquid or hazardous waste is contained therein, except fiber drums containing asbestos.

4.3 Dust, Litter, Odors, and Vectors

Dust generated due to landfill activities will be controlled through the application of water by truck or other approved dust control products, if necessary. Removal of mud and dirt from the roads will also be a part of the dust control measures and will be accomplished with a motor grader. Additionally, final cover will be vegetated as soon as practical in order to minimize the blowing of dust on-site.

The potential problem of blowing litter will be minimized by limiting the active working face and using daily cover over the active fill area. Other methods, such as the utilization of pickers and portable fencing will be employed to contain loose paper and other wind blown refuse during the landfill operations. The landfill area will be policed as required to collect airborne materials.

Odors generated due to landfill activity will be controlled through the application of daily cover. If odors continue to be a problem, masking agents and/or neutralizers will be used to alleviate this problem. If odors persist, passive and/or active venting will be used. Control of vectors, such as rodents and flies, is accomplished by denying them a food source by applying daily cover. Placement of soil cover may be necessary at more intervals that are frequent in order to control vectors, fires, blowing litter and scavenging.

4.4 Landfill Signs

Signs providing information on disposal procedures, the hours that the site is open for public use, and the permit number; also, signage stating that no hazardous or un-permitted waste can be received without written permission from the State Division of Waste Management, and other pertinent information will be posted at the site entrance. Traffic signs and markers are provided as necessary to promote an orderly traffic pattern to and from the discharge area and maintain efficient operating conditions.

4.5 Fire Control

No open burning of solid waste will be permitted at the Lincoln County Landfill. 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.

If a fire occurs at the landfill, the local fire department shall be notified. Hot loads that are brought in are to be immediately dumped away from the landfill and the fire department is to be called. The hot load is to be sprayed down with water until the fire or combustion is extinguished. The load is then to be reloaded for disposal in the landfill.

4.6 Methane Gas Monitoring Program

A methane gas-monitoring program has been implemented to detect possible migration of methane gas off-site from the existing landfill and future landfill development. The methane gas monitoring program is in accordance to the requirements of the North Carolina Solid Waste Management Rules, Section .1626(4)(b).

4.6.1 MSW Methane Gas Monitoring Program

Included in this program is the permanent methane monitoring system, monitoring well locations and construction, methane monitoring procedures, sampling frequency and reporting requirements. Proposed gas monitoring well locations are shown on the Gas Management System Plan contained in the Engineering Plan. Details of the gas management system are also provided in the Engineering Plan Drawings.

4.6.2 Permanent Methane Monitoring Well System

The proposed permanent gas monitoring wells are positioned to detect methane gas that may migrate into the structures located at the landfill (landfill office and maintenance building) or beyond the landfill property boundary. The wells are located between the waste boundary and the property boundary and between the waste boundary and facility structures that are occupied or used regularly by landfill personnel. The landfill perimeter gas monitoring wells are spaced from 100 to 200 feet outside the waste boundary and at intervals of no more than 500 feet apart.

The proposed methane gas monitoring well locations are shown in the Engineering Plan. Actual locations of the methane monitoring wells may change slightly depending on soil, hydrogeologic, and hydraulic conditions encountered during site investigations or development.

4.6.3 Methane Monitoring Well Construction

Methane monitoring wells shall be constructed around the perimeter of the landfill by advancing an auger to the depth of groundwater or elevation equal to the lowest elevation at bottom of the landfill, whichever is greater. A one-inch diameter schedule 40 polyvinyl chloride (PVC) perforated pipe will be inserted into each boring hole and the annular space backfilled with pea gravel. The top of the boreholes shall be sealed with a concrete bentonite mixture and the wells protected with steel lockable covers. The PVC pipe will be installed with a non-venting PVC pipe cap at each location. The well construction records for each of the methane monitoring wells and their actual locations shall be placed in the operating record and submitted to the State.

4.6.4 Methane Monitoring Procedures and Frequency

The methane monitoring will be performed by the Lincoln County Landfill personnel trained to use an explosimeter. Methane monitoring will be conducted in each of the methane monitoring wells and within the facility structures occupied by the landfill personnel using a gas meter.

Testing procedures for the wells are to be as follows:

1. Calibrate the explosimeter (if required) in accordance with the manufacturer's recommendations for methane calibration using 1.5% methane test gas in an area free from potential methane contamination.
2. Aspirate to purge the explosimeter 4 to 5 times prior to each reading in an area free from potential methane contamination.
3. Open the cover of the methane monitoring well.
4. Insert the explosimeter tube into the well at a depth of 1-2 feet from the top of casing.
5. Aspirate 5 to 7 times immediately before gas is evacuated.
6. Read the percent methane and percent LEL (lower explosive limit).
7. Record reading on a form to be included in the operating record.

Testing procedures for the facility structures are as follows:

1. Calibrate the explosimeter (if required) in accordance with the manufacturer's recommendations.
2. Aspirate to purge the explosimeter (4 to 5 times) prior to each reading in an area free from potential methane contamination.
3. For Structures with concrete slab-on-grade: Place explosimeter tube beside any penetrations through walls or floors (i.e., floor drains, electrical outlets and switches, wall mounted lights, cracks in slab, etc.) or around floorboard if plumbing and electrical fixtures are not present. Aspirate 5 to 7 times at each location. Purge explosimeter (as above) prior to moving to the next location.
4. For Structures with a crawl space: Conduct testing as described above. In addition, perform testing at the opening for the entrance to the crawl space and any vents or openings for the crawl space. Insert explosimeter 2 to 3 feet into the opening to the crawl space and aspirate 5 to 7 times. Purge explosimeter prior to moving to the next location.
5. Read and record percent methane and percent LEL on a form to be included in the operating record.

As required by the Solid Waste Management Rules, the methane monitoring will be conducted on a minimum quarterly basis.

4.6.5 Reporting Requirements and Response Plan

The results of the measurements of the methane gas monitoring wells will be recorded for each monitoring well and within each facility structure for each sampling event and placed in the operating record. The State regulations require that explosive gases be controlled such that concentrations of gases will be less than 25 percent of the LEL (lower explosive limit) for methane in site structures and less than the LEL for methane in the subgrade at the facility property boundaries.

If methane gas levels exceeding the maximum LEL (25% LEL in site structures and LEL at facility property boundary) are detected, the Lincoln County Landfill personnel shall immediately take all necessary steps to protect human health and notify the Division of Solid Waste Management. The steps that should be taken include but are not limited to:

- Evacuate and restrict access to facility structures or exterior areas with high methane levels
- Prohibit use of equipment and materials that may cause sparks or an open flame
- Report methane levels to the Landfill Manager
- Turn off electrical main switch outside of the structure where high methane levels are present
- Landfill Manager should direct qualified and properly equipped response teams/contractors to locate the source of methane and cap or isolate it

Within seven days of detecting levels exceeding the maximum LEL, the methane gas levels shall be placed in the operating record with a description of the steps taken to protect human health. Within 60 days of detecting gas levels exceeding the maximum LEL, a remediation plan for the methane gas releases shall be implemented. The plan shall be placed in the operating record, and the Division shall be notified that the plan has been implemented. An extension to the schedules noted above may be granted by the Division if a need for an extension is demonstrated by Lincoln County.

4.6.6 C&D Methane Gas Monitoring Program

Gas monitoring will be performed annually in the groundwater monitoring wells and within on-site manned structures. If methane gas is encountered, surface probing will be performed to determine the extent of gas migration for use in design and installation of a permanent gas monitoring system for on-site facility structures and property boundaries. If the permanent gas monitoring system detects methane above acceptable limits, a remediation plan will be prepared and implemented.

Explosive gases will be controlled such that concentrations of gases will be less than 25 percent of the lower explosive limit (LEL) in site structures and below the LEL of gases in the subgrade at the property boundary.

4.7 Leachate Management System for MSW Landfill

The maintenance of the leachate management system's physical facilities (consisting of HDPE piping and manholes and lift station and tanks) and records is performed by the on-site landfill operations manager for Lincoln County. Leachate will be sampled semi-annually, concurrent with the groundwater sampling events. Leachate should be sampled for constituents listed in Section .1634 Detection Monitoring Program of the Solid Waste Management Rules which include pH, BOD, COD, TDS, phosphate, nitrate, and sulfate. If the County contracts landfill operations to a private company, the contracted operator will be responsible for maintenance of the leachate management system.

4.7.1 Maintenance, Record Keeping and Sampling

Periodic maintenance checks and cleaning shall be performed on the leachate storage tanks and equipment as recommended by the manufacturer. The maintenance checks will consist of checking equipment for corrosion, leakage, wear, scale build-up, improper functioning, and any other improper operations. Appropriate measures shall be taken when maintenance checks reveal any equipment is operating in a way other than what is specified by the manufacturer.
The County shall maintain records of the amounts of leachate generated and disposed of at the wastewater treatment facility. The County shall conduct leachate quality sampling for the parameters and frequencies as required by the existing leachate discharge permit. Additional semi-annual leachate quality sampling shall include the same parameters as performed for the groundwater monitoring. This sampling event shall be performed concurrently with the semi-annual groundwater sampling events. The leachate shall be sampled for constituents listed in Section .1634 Detection Monitoring Program of Solid Waste Management.

4.7.2 System Design

Leachate by regulatory definition is water that drains through solid waste. A more general definition includes water that contacts or has the potential for contacting solid waste such as precipitation that falls on an open landfill cell. Free liquids originating in a landfill cell are collected in the cell under drain system and conveyed by gravity flow through a pipeline to allow for discharge to the leachate storage tanks. The leachate is hauled to a local wastewater treatment plant (WWTP) for treatment. If leachate strengths increase, a future aeration system or mixing system will be added as needed.

The leachate storage tanks have a capacity of 500,000 gallons. Based on the HELP model estimated daily average and peak leachate generation volumes, the leachate storage tanks can accommodate adequate holding time or storm surges.

4.7.3 Contingency Plan

Under normal operation, leachate will be pumped at least twice a week. The volume of leachate stored would not be allowed to exceed 250,000 gallons without beginning removal operations. A factor of safety is available in the leachate storage capacity in the event of storm surges. In emergencies, the valve provided at the first manhole exiting the landfill cell can be closed to back up leachate in the landfill. When this occurs, Lincoln County shall notify the State within 24 hours and submit a written report to the State within three days that provides the reason for the occurrence.

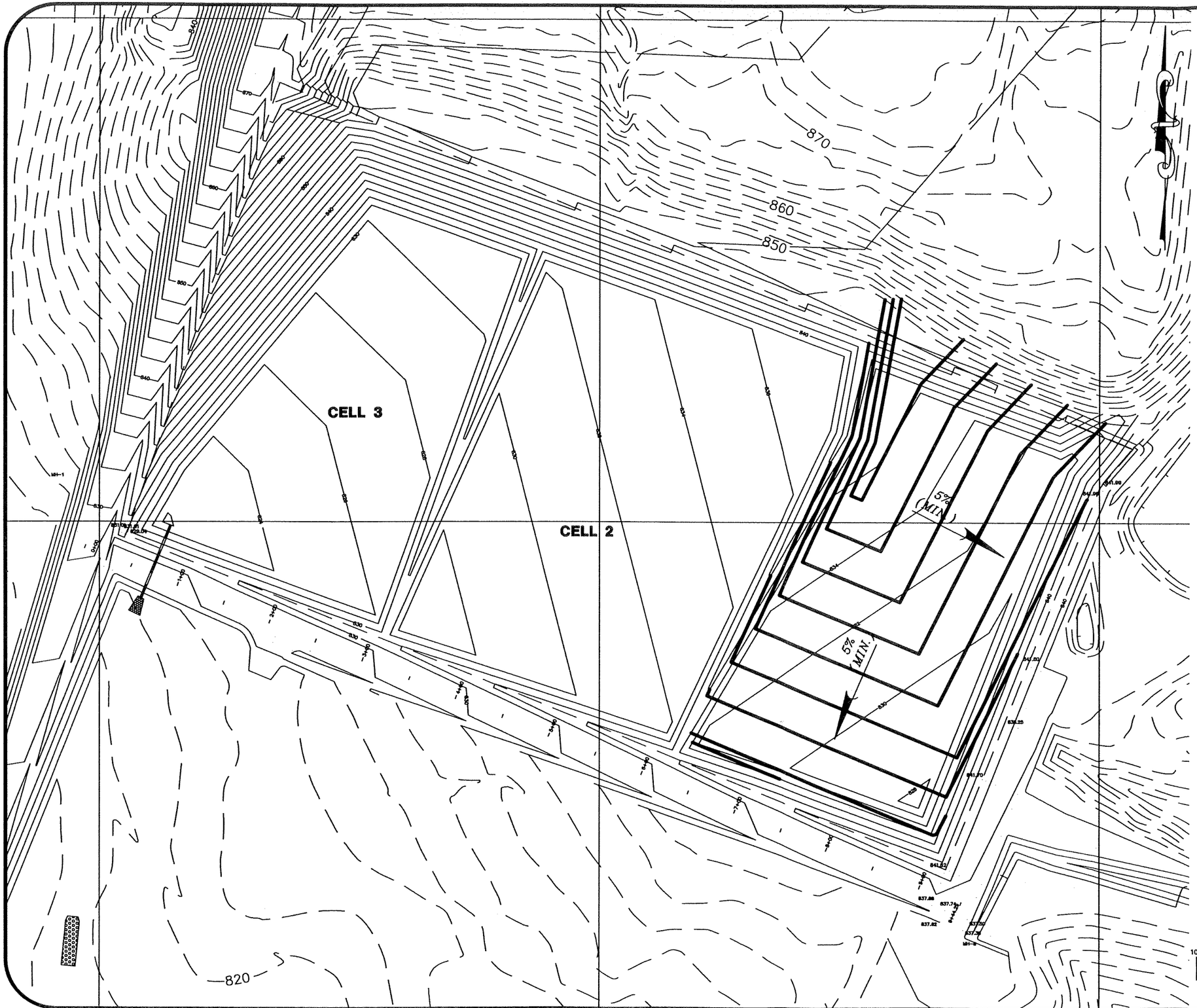
In the event of extreme operational conditions requiring the temporary shutdown of the leachate storage basin, a contingency plan shall be used. The plan shall be implemented in the case of repairs or maintenance required for the tanks and the leachate pipeline between the landfill cell and leachate storage tanks. The leachate shall be truck hauled to the local WWTP. The valve provided at the first manhole exiting the landfill cell shall be closed to back up the leachate in the landfill. If the pipeline between the cell and storage basin requires repairs, the leachate can be pumped and hauled from one of the header cleanouts along the basin berm.

5. REFERENCES

S&ME Inc., September 3, 2004. Application for Permit to Construct, Lincoln County Landfill – Phase III, Volumes I and II.

APPENDIX I

PHASING DIAGRAMS



LEGEND

EXISTING GRADE CONTOUR

PROPOSED GRADE CONTOUR

PROPOSED PHASE III OPERATIONS GRADE CONTOUR

REFERENCE:
BASE TOPOGRAPHICAL AND PLANIMETRIC MAP FROM AERIAL PHOTOGRAPH SURVEY PERFORMED APRIL 1, 2003; PROVIDED BY SUTTLES SURVEYING, P.A.

GRAPHIC SCALE

100 0 50 100 200

(IN FEET)

DATE: 11-14-08
DRAWN BY: JRP
CHECKED BY:
SCALE: AS SHOWN
PROJECT NO. 1356-08-125

S&ME
WWW.SMEINC.COM

CELL 1 PHASING DIAGRAM
PHASE III OPERATIONS PLAN
LINCOLN COUNTY LANDFILL – PHASE III
CROUSE, NORTH CAROLINA

FIGURE NO.
OP-1

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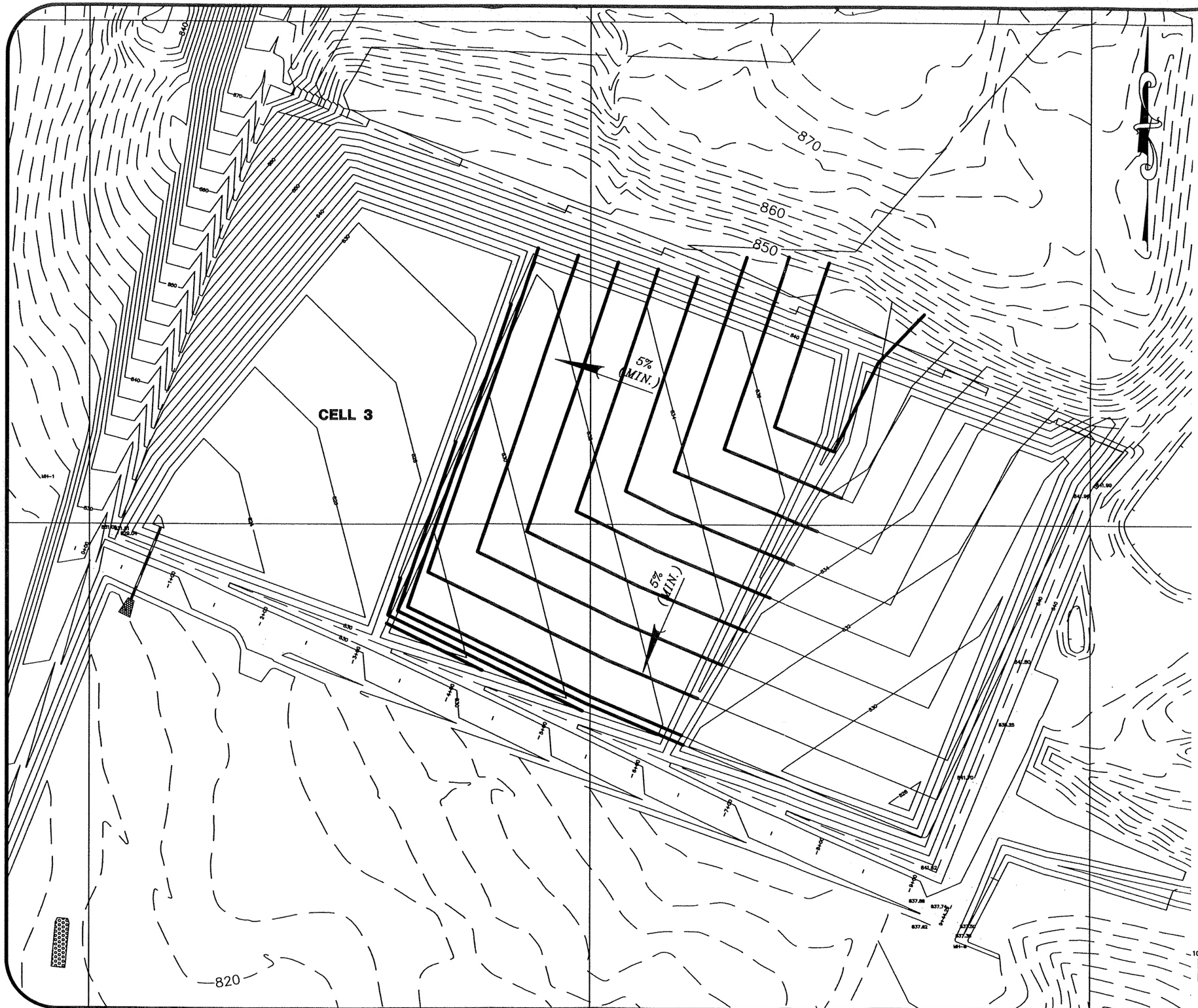

LEGEND

EXISTING GRADE CONTOUR

PROPOSED GRADE CONTOUR

PROPOSED PHASE III OPERATIONS GRADE CONTOUR

REFERENCE:
BASE TOPOGRAPHICAL AND PLANIMETRIC MAP FROM AERIAL PHOTOGRAPH SURVEY PERFORMED APRIL 1, 2003; PROVIDED BY SUTTLES SURVEYING, P.A.

GRAPHIC SCALE

100 0 50 100 200

(IN FEET)

DATE:	11-14-08
DRAWN BY:	JRP
CHECKED BY:	
SCALE:	AS SHOWN
PROJECT NO.	1356-08-125

S&ME
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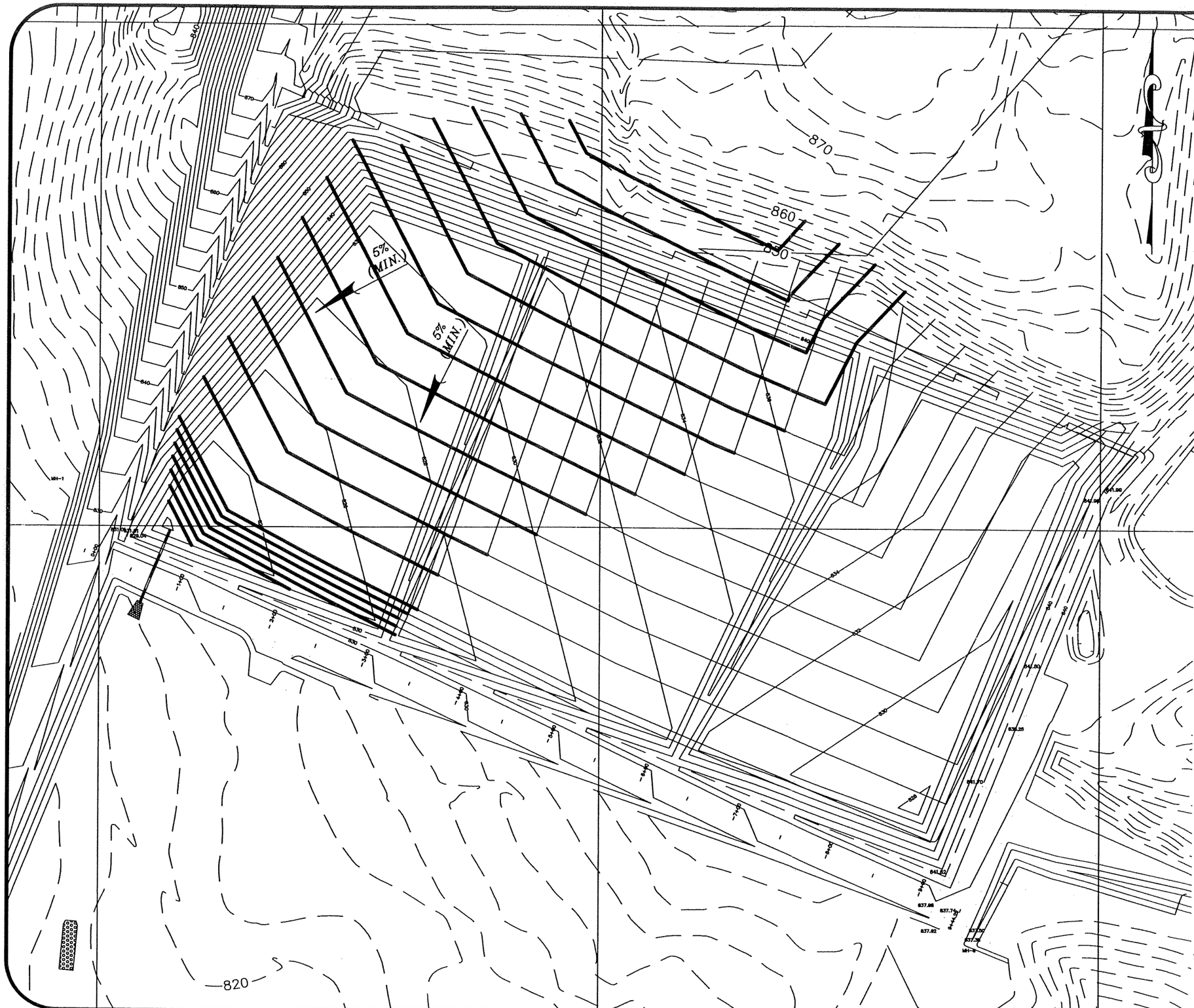
CELL 2 PHASING DIAGRAM
PHASE III OPERATIONS PLAN

LINCOLN COUNTY LANDFILL – PHASE III
CROUSE, NORTH CAROLINA

FIGURE NO.

OP-2

S:\1356\PROJECTS\2008\1356-08-125 LCLF Revised Ops Plan\Drawings\Phasing Diagrams.dwg



LEGEND

EXISTING GRADE CONTOUR

PROPOSED GRADE CONTOUR

PROPOSED PHASE III OPERATIONS GRADE CONTOUR

REFERENCE:
BASE TOPOGRAPHICAL AND PLANIMETRIC MAP FROM AERIAL PHOTOGRAPH SURVEY PERFORMED APRIL 1, 2003; PROVIDED BY SUTTLES SURVEYING, P.A.

GRAPHIC SCALE

100 0 50 100 200

(IN FEET)

DATE:	11-14-08
DRAWN BY:	JRP
CHECKED BY:	
SCALE:	AS SHOWN
PROJECT NO.	1356-08-125

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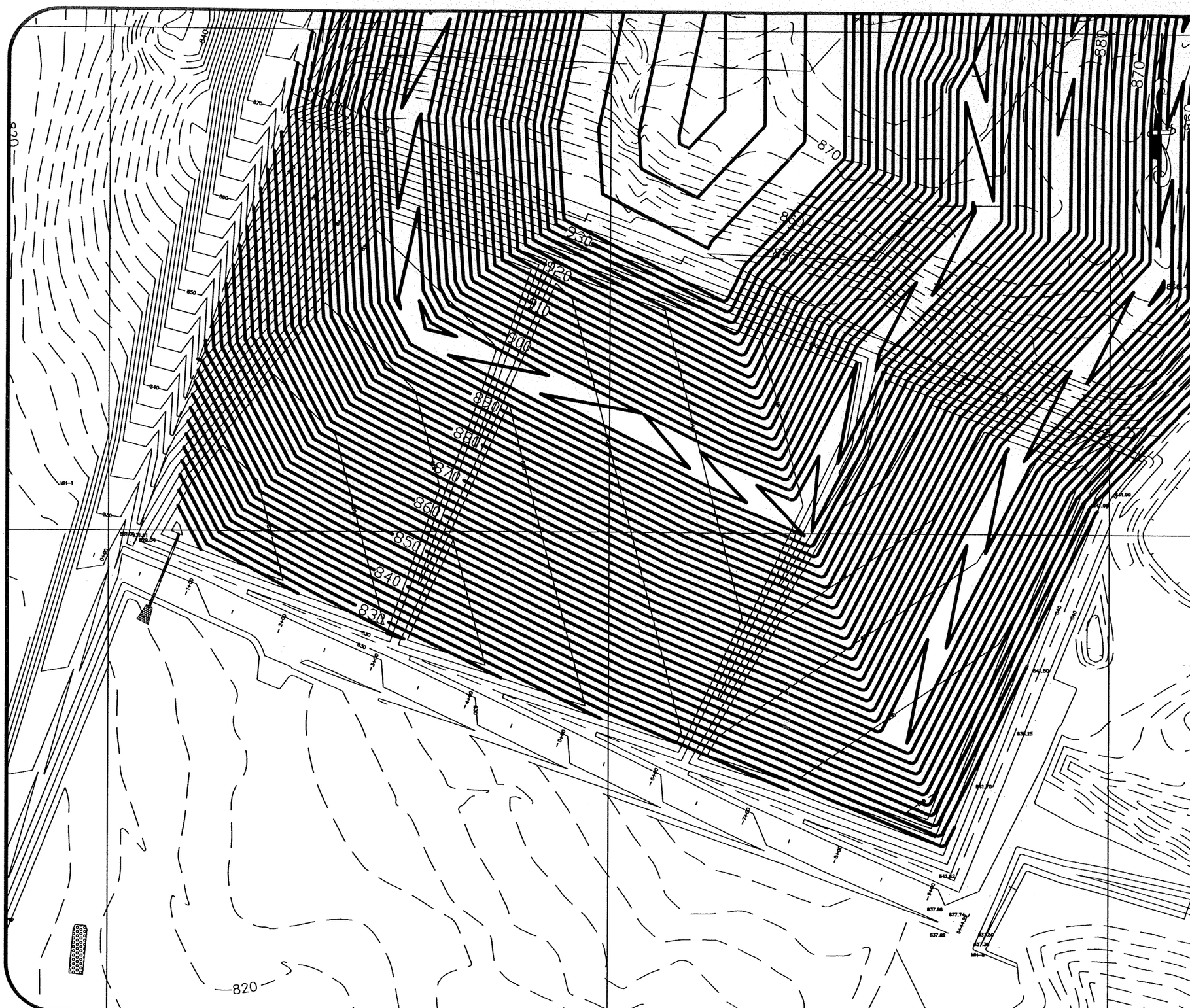
CELL 3 PHASING DIAGRAM
PHASE III OPERATIONS PLAN

LINCOLN COUNTY LANDFILL – PHASE III
CROUSE, NORTH CAROLINA

FIGURE NO.

OP-3

S:\1356\PROJECTS\2008\1356-08-125 LCLF Revised Ops Plan\Drawings\Phasing Diagrams.dwg



LEGEND

EXISTING GRADE CONTOUR

PROPOSED GRADE CONTOUR

PROPOSED PHASE III OPERATIONS GRADE CONTOUR

REFERENCE:
BASE TOPOGRAPHICAL AND PLANIMETRIC MAP FROM AERIAL PHOTOGRAPH SURVEY PERFORMED APRIL 1, 2003; PROVIDED BY SUTTLES SURVEYING, P.A.

GRAPHIC SCALE

100 0 50 100 200

(IN FEET)

DATE: 11-14-08
DRAWN BY: JRP
CHECKED BY:

SCALE: AS SHOWN
PROJECT NO. 1356-08-125

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PHASING DIAGRAM AT CLOSURE
PHASE III OPERATIONS PLAN

LINCOLN COUNTY LANDFILL - PHASE III
CROUSE, NORTH CAROLINA

FIGURE NO.
OP-4

S:\1356\PROJECTS\2008\1356-08-125 LCLF Revised Ops Plan\Drawings\Phasing Diagrams.dwg

APPENDIX II

WASTE ACCEPTANCE AND SCREENING FORMS

LINCOLN COUNTY LANDFILL LINCOLN COUNTY, NORTH CAROLINA WASTE SCREENING CHECK LIST	YES	NO
CONTAINERS		
FULL.....	_____	_____
PARTIALLY FULL.....	_____	_____
EMPTY.....	_____	_____
CRUSHED.....	_____	_____
PUNCTURED.....	_____	_____
POWDERS/DUST		
IDENTIFIED.....	_____	_____
UNKNOWN.....	_____	_____
MATERIAL SATURATED.....	_____	_____
LABEL FOR HAZARDOUS MATERIAL.....	_____	_____
ODOR/FUMES		
STRONG.....	_____	_____
FAINT.....	_____	_____
SUBSTANTIAL HEAT COMING FROM ANY MATERIAL.....	_____	_____
ITEMS FOUND		
BATTERIES.....	_____	_____
OIL.....	_____	_____
BIOMEDICAL.....	_____	_____
RADIOACTIVE.....	_____	_____
ASHES/RESIDUE.....	_____	_____
SOD/SOIL.....	_____	_____
OTHER.....	_____	_____
(CHECK ALL THAT APPLY)		

SOURCE: SWANA

LINCOLN COUNTY LANDFILL
LINCOLN COUNTY, NORTH CAROLINA

PRE-ACCEPTANCE AGREEMENT

DATE _____ TIME _____ WEIGH BILL _____

CLERK OR RECEIVING AGENT _____

CUSTOMER NAME/NUMBER OR IDENTIFICATION _____

VEHICLE LICENSE _____ STATE _____

WASTE DESCRIPTION (check ALL that apply)

RESIDENTIAL _____ COMMERCIAL _____ INDUSTRIAL _____

INSTITUTIONAL _____ YARD TRIMMINGS _____ SPECIAL _____

SPECIAL DESCRIPTION _____

TOTAL WEIGHT _____

WEIGHT OF VEHICLE (TARE WEIGHT) _____

WEIGHT OF WASTE DELIVERED _____

HAULER AGREES AND WARRANTS THAT HE/SHE IS DELIVERING SOLID WASTE ONLY FOR THIS LOAD AND ANY SUBSEQUENT LOADS TO THIS FACILITY. HAULER DOES HEREBY INDEMNIFY THE FACILITY OPERATOR FOR DAMAGES CAUSED BY THE DELIVERY OF ANY HAZARDOUS/TOXIC OR OTHERWISE UNACCEPTABLE MATERIAL.

_____

DRIVER'S SIGNATURE

SOURCE: SWANA

LINCOLN COUNTY LANDFILL
LINCOLN COUNTY, NORTH CAROLINA

DETAILED SCREENING REPORT

WASTE SOURCE _____
ADDRESS _____
_____
_____
_____

PROBABLE [ ] SUSPECTED [ ] CONFIRMED [ ]

WASTE HAULER _____
ADDRESS _____
_____
_____
_____

DRIVER'S NAME _____
DETAIL _____
_____
_____

NOTIFIED:

WASTE SOURCE [ ] HAULING MANAGEMENT [ ] SITE MANAGEMENT [ ]

STATE [ ] FEDERAL [ ]

NAME _____

WITNESS (IF ANY) _____

DATE _____ TIME _____ AM PM

ACTION REQUIRED:

SOURCE: SWANA