Eastern Compost LLC

Type IV Solid Waste Composting Facility

Submitted to

NC Division of Waste Management

RECEIVED
JAN 21 2010
SOLID WASTE SECTION

APPROVED
MES 3/4/10

NORTH CAROLINA
PROFESSIONAL
SEAL
032075
ENGINEER
KATHRYN S. BENSON

Prepared by

CH2MHILL

License #: F-0699

January 2010

Comment No.	Comment	Section	Response to Comment
1	The front page or cover and drawing sheets should be signed, dated and sealed by a licensed engineer.	General	Complete.
2	Page 2, § 1 and Drawing Sheet 2: Confirm that Eastern Compost facility meets all the design requirements in accordance with 15A NCAC 13B .1404(c.)	Application Narrative	Confirmed.
3	Page 2, § 1 and Drawing Sheet 2: Include the letter of Mr. Adam Cook of the City of Rocky Mount, as an appendix, in accordance with land use zoning requirements 15A NCAC 13B .1405(b)(C.)	Application Narrative	Included in Appendix to Application Narrative
4	Page 3, § 2.2: Explain why the screening process is designed prior to curing? Compost has less volume and a lower moisture content after it has been cured making screening more energy efficient.	Design Report	This has been revised.
5	Page 4, § 2.3: Provide a copy of the analytical result of the composition of the ferric sulfate sludge received from the City of Raleigh's drinking water treatment plant.	Design Report	Included in Appendix A.
6	Page 4, § 2.3: Provide a typical composting recipe, by weight or volume, of ferric sulfate, biosolids, and bulking agents used at the facility	Design Report	Included in the compost Mix Calculations
7	Page 4, § 2.3: Explain the discrepancy in the annual incoming ferric sulfate tonnage between 9,894.17 tons in this section and 12, 480 tons in the previous section (Page 2, Application Narrative § 1, where 240 tons/week x 52 weeks/year = 12,480 tons).	Design Report	Discrepancy has been corrected
8	Page 4, § 2.3: : Provide a copy of the typical analytical composition of the biosolids sludge received from the City of Wilson's Water Reclamation Facility.	Design Report	Included in Appendix.
9	Page 4, § 2.3: Explain the discrepancy in the annual biosolids tonnage between 5,048.48 tons in this section and 7,540 tons in the previous section (Page 2, Application Narrative § 1, where 145 tons/week x 52 weeks/year = 7,540 tons).	Design Report	Discrepancy has been corrected.
10	Page 5, § 2.3: Include all the analytical results of the primary wastes in the body of the final report	Design Report	Included in Appendix.
11	Page 5, § 2.3: Clarify if the facility is accepting, or is going to accept, the listed "Potential Waste Stream", including engineered wood. If so, provide the related testing results, such as the formaldehyde resin test.	Design Report	Included in Appendix.
12	Page 7, § 2.6: Include the key technical specifications of the Frontier Windrow Turner, as an appendix.	Design Report	Included in Appendix.
13	Page 7, § 2.7: Provide a detailed discussion in this section to address how offensive odor is minimized at the property boundary and what kinds of corrective actions would be taken if an offensive odor crosses the property boundary.	Design Report	Included in Design Report.
14	Page 7, § 2.8: Please be advised that the facility's stormwater handling capacity must be designed to handle a 25 year, 24 hour storm, instead of a 10 year, 24 hour event. In Section III.6 of the DWQ Storm Water permit (WQ0033492), a 25 year, 24 hour storm event is also specified.	Design Report	Is currently desinged to the 25-year capcity.
15	Page 8, § 2.9, Table 5 "Daily Materials Balance": Where does the Ferric Sulfate sludge go on this table?	Design Report	Table 9.1
16	Page 8, § 2.9, Table 5 "Daily Materials Balance": Clarify if any of the potential waste stream (Page 5 §§ 2.3:	Design Report	Table 9.1
17	§ 2 Appendix A: Provide a clean copy of the preliminary engineering calculations.	Design Report	PER Calcualtion shown in the body of the report.
18	§ 2 Appendix A: Provide a calculation for a scenario that the screening is done after the curing process is over.	Design Report	Done
19	§ 2 Appendix A, and Drawing Sheet 3: Clarify how the eleven windrows of the same length are built at one time despite the fact that the grassed swale is present in the currently active composting area.	Design Report	Illustrated on drawings.
20	§ 2 Appendix A: Confirm that a 28-day curing duration is sufficient to produce commercial-grade compost that can achieve a balanced pH and adequate maturity.	Design Report	Compost testing results over the last 2-year indciated 28-days is suffcient.
21	(Page 4) § 2 Appendix A: Provide the C:N ratio and moisture content for the 7-bucket recipe that is adapted at the facility.	Design Report	Included in the revised Daily Materials Balance
22	Comparing with the earlier composting permit application submittals, the new application has eliminated the entire component of "future expansions". Clarify is there is a time line pursuing such "future expansions".	Design Report	Future expansion timeline will vary based on need. In order to antcipate growth a DWQ permti was obtained for future expansions.
23	Page 10, §§3.5.1 & §§3.5.2: Provide a typical recipe for handling ferric sulfate and biosolids. Include the calculation of the C:N ratio and moisture content.	Operations Plan (§§1) & Operations Manual (§§2)	Included in the revised Daily Materials Balance
24	Page 17, §§4.2, and Drawing Sheet 3 of 3: Because the grassed swale takes over a large portion of active composting area in the northeaster quadrant of the existing active composting areas (see previous permit application submittals), provide a diagram to show the actual layout of the windrows in the active composting areas.	Operations Plan (§§1) & Operations Manual (§§2)	Included in Plans.
25	Page 22, §§6.2: In composting, the maturation of a compost is the degree of level of completeness of composting, which is generally defined by an array of physical, chemical and biological criteria, such as C:N ratio, CO2 respiration, O2 demand, Dewar Self heating test, CH4:N ratio, NH3 concentration, volatile organic acid concentration, soluble salts, moisture content, and plant germination tests. The US Composting Council, for example, promotes its Seal of Testing Assurance (STA) program in testing the maturity of a compost. Confirm if Eastern Compost is involve with "Maturity" tests for its composting products.	Operations Plan (§§1) & Operations Manual (§§2)	Composting Testing laboratory using based in California provides for "maturity" testing.
26	Page 25-29, §§7.5-7.7: When a compost test fails to meet Federal pathogen and vector requirements (40 CFR), which imposes a potential threat to the public health and the environment, the facility shall report the failed testing result to the division within 72 hours after receiving the testing result(s). Distribution of the compost products must stop until a further test confirms that the batch of re-composted products have met the federal safety standard.	Operations Plan (§§1) & Operations Manual (§§2)	Statement revised in O&M Plan
27	Provide a copy of the final design and final drawing(s) of the wastewater recycle system, including the information such as the freeboard, emergency spillway, and construction timeline, among others.	Stormwater Plan (§§§)	Included in DWQ appilcation appendix.
28	The attached drawing at the end of this section (§§§) is different from Drawing Sheet 3 of 3. Clarify when the proposed "future asphalt PAD" will be built, where the receiving, mixing, active composting, curing and storing areas are located, and how the eleven composting windrows are laid out in the combined active composting area.	Stormwater Plan (§§§)	Future expansion timeline will vary based on need. In order to antcipate growth a DWQ permti was obtained for future expansions.

Facility Application for Type 4 Solid Waste Composting Permit, Battleboro, North Carolina

PREPARED FOR: Michael Scott/DWM

PREPARED BY: CH2M HILL

DATE: January 2010

Eastern Compost, LLC would like to obtain a permit for a Type 4 Facility in Edgecombe County, North Carolina. If you have any questions regarding this application, please contact Kathryn Benson at 919) 875-4311 ext. 51750.

The following information is required for an application for a permit to construct a proposed Large Type 4 solid waste compost facility:

1. **An aerial photograph or scaled drawing, where one inch is less than or equal to 400 feet, accurately showing the area within one-fourth of the mile of the proposed site's boundaries with the following specifically identified:**

   a. Entire property owned or leased by the person proposing the site;

   b. Location of all homes, wells, industrial buildings, public or private utilities and roads, watercourses, dry runs, and other applicable information regarding the general topography within one-fourth mile; and

   c. Land use and zoning of the proposed site.

   All requirements shown on Figure 1 attached to this narrative.

2. **A letter from the unit of government having zoning jurisdiction over the site which states that the proposed use is allowed within the existing zoning, if any, and that any necessary zoning approval or permit has been obtained.**

   Letter from Mr. Adam Cook, Senior Planner of City of Rocky Mount is contained within Appendix A of Application Narrative. The site is zoned A-1 (Agricultural District) and a composting facility is an appropriate use within this zoning classification.

3. **An explanation of how the site complies with siting and design standards in Rule .1404 of this Section.**

   All requirements of 15A NCAC 13B Section .1404 have been met. A visual representation of these requirements are included on Sheet 2 and Sheet 3 of the drawing package.

   - The site is not located within the 100-year floodplain. The distance from the floodplain is 367 feet.

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–	Consolidated Diesel – weekly	75 tons pallets
–	Parson's Pallets – weekly	75 tons sawdust
–	Yard Debris – weekly	75 tons wood

Potential Waste Stream:	
–	Tobacco dust
–	Fly ash
–	Wood ash
–	Wood fiber sludge
–	Animal bedding
–	Municipal wastewater & water residuals (Biosolids, alum, ferric)
–	Ground Water Well Residuals
–	Engineered wood
–	Paper waste
–	Sheetrock/gypsum board
–	Agri-business waste
–	Food-by-products
–	Amino Acids

5. Site plans at a scale where one inch is less than or equal to 100 feet to the inch that delineates the following:

a. Existing and proposed contours, at intervals appropriate to the topography;

b. Location and elevations of dikes, trenches, and other water control devices and structures for the diversion and controlled removal of surface water;

c. Designated setbacks, buffer zones and property lines;

d. Proposed utilities and structures;

e. Access roads, details on traffic patterns;

f. Areas for unloading, processing, active composting, curing, and storage of material;

g. Areas for unloading, processing, and storing recyclables, household hazardous waste, and other materials, where applicable;

Emmett Wadford – Sales Representative
Responsible for marketing and sales of finished products

All personnel are required to attend the Eastern Compost, LLC annual in house training program. The program covers the importance of maintenance; how to carry out a walk around inspection; how to perform maintenance checks and inspections to identify potential problems and safety procedures. To ensure the safety of the public when on site, quarterly traffic flow meetings are also required.

All personnel are required to complete 6 hours of continuing education through a certified compost program.

d. A schedule for operation, including days and hours that the facility will be open, preparations before opening, and procedures to be followed after closing for the day;

The normal hours are:

Monday through Friday	8:00 A.M. until 5:00 P.M.
Saturday	8:00 A.M. until Noon, Saturday
Sunday	Closed

Preparations before opening will include visually inspect facility and daily preventative maintenance of all equipment prior to use. Closing procedures will include making sure all windrow data has been properly recorded and any unblended or raw material is properly covered/stored to prevent any adverse environmental effects.

e. For mixed waste processing facilities, a plan for removing and disposal of household hazardous waste from the waste stream;

All household hazardous waste will be identified, stockpiled and disposed of properly.

f. Special precautions or procedures for operating during wind, heavy rain, snow, freezing or other adverse conditions;

When wind becomes greater than 25 miles an hour the facility will be closed to dumping to all dry material that may create problem dust. During periods of heavy rain windrows will not be turned to allow the external formed shell to shed water. Unblended or raw materials will be bermed to help prevent excessive runoff during periods of heavy rain. During snow events snow will be plowed outside of the leachate control area. Snow on the windrows will be incorporated with the windrow turner.

Odor and vectors at the site are monitored daily and controlled by proper site sanitation and following established composting procedures. Background information on all raw feedstocks will be assessed prior to shipment to the Eastern

b. A process flow diagram of the entire facility, including the type, size, and location of all major equipment, and feed stock flow streams. The flow streams shall indicate the quantity of material on a wet weight and volumetric basis;

c. A description and sizing of the storage facilities for amendment, bulking agent, solid waste, recyclables, household hazardous waste and finished compost;

d. The means for measuring, shredding, mixing, and proportioning input materials;

e. Anticipated process duration, including receiving, preparation, composting, curing, and distribution;

f. The separation, processing, storage, and ultimate disposal of non-compostable materials, if applicable;

g. A description of the location of all temperature, air and any other type of monitoring points, and the frequency of monitoring;

h. A description of how the temperature control and monitoring equipment will demonstrate that the facility meets the requirements in Rule .1406 Items (10), (11), or (12) of this Section, as appropriate for the feedstock;

i. The method of aeration, including turning frequency or mechanical aeration equipment and aeration capacity;

j. A description of the air emission and control technologies;

k. A description of the method to control surface water run-off; and the method to control, collect, treat, and dispose of leachate generated; and

l. A description of any recycling or other material handling processes used at the facility.

All items are addressed in the Design Report and Operations Manual.

8. A description of the label or other information source that meets the requirements of Rule .1407(k) of this Section.

An information sheet accompanies the product that contains the classification grade, recommended uses, application rates, restrictions on usage and Total N.

9. Engineering plans and specifications for the facility, including manufacturer's performance data for all equipment selected.

Information contained within the design drawing package and operations manual.

B. The following information is required for reviewing an application for a permit to operate a Type 4 or Large Type 2 or 3 solid waste composting facility:

3. **A quality assurance plan for the process and final product which lists the procedures used in inspecting incoming materials; monitoring, sampling and analyzing the compost process and final product, testing schedule, and record keeping requirements;**

   Details provided in chapter seven of the operation manual.

4. **A fact sheet and process flow diagram that summarizes actual equipment sizing, aeration capacity, detention times, storage capacity, and flow rates (wet weight and volumetric) for the system and equipment chosen;**

   Details provided in the design manual.

5. **As-built drawings;**

   Provided in the drawings package.

6. **A copy of all applicable local, state, and federal permits and approvals necessary for the proper operation of the facility; and**

   Contained within Appendix A of the application narrative.

7. **Product marketing and distribution plan.**

   Marketing top quality finished compost to landscapers, nurseries, garden stores, golf courses, homeowners and farmers will rely heavily on our ability to meet the needs of each end user. Specific needs of the end users will be determined and met. Multiple initial blends, screening, and compost age allows for a diversified marketing approach. Frequent testing and support data available to every end use will help them with their decisions and add substance to Eastern Compost's top quality product.

   Because of Eastern Compost, LLC's strong agricultural background, emphasis on land application and marketing our product to farmers will be a priority. Product promotion through demonstration plots, agricultural extension services, and testimonials will be utilized in the Eastern Compost, LLC marketing program.

   All compost produced at the Eastern Compost, LLC facility is marketed and distributed as bulk product only. Pricing will de determined based on volume production cost, transportation cost, and overall market trends.

   Distribution in a pre-determined target area will be handled with in-house trucking. Contract hauling will be used if needed to ensure prompt service. Product pick-up by end user is allowed.

GENERAL

Prior to distribution of the compost product, several key regulatory and quality control parameters must be met during the composting process. Records containing the information required to show these parameters have been met must be

The nutrient content of compost is also a quality component. The major plant nutrients supplied by compost are nitrogen, phosphorus, and potassium (N-P-K). Most minor plant nutrients are also contained in compost, and these also contribute to its quality and value. The level of nutrients in compost is controlled by the chemical composition of the input biosolids, the bulking agent used, and the extent to which the bulking agent is contained in the final screened product. Thus, the way in which operators can influence this quality parameter is to assure efficient screening and minimum carryover of the bulking agent into the compost product. The content of these nutrients should be known to allow end users to make correct decisions regarding the addition of supplemental nutrition.

Particle Size

This quality parameter is primarily a function of the screen size used. Different end-users of compost will have different requirements as far as particle size distribution of the compost. The most demanding user in this regard will be horticulturists who will use the material in potting mixtures, or landscapers who will use it in turf topdressing. Those who will incorporate the compost into the soils, e.g. landscapers, field crop growers, will have less stringent requirements. End users can identify the requirements for particle size. A 3/8-inch screen size is the most common size in biosolids composting facilities and has shown to provide a good quality, versatile compost suitable for several users. If a potentially large user in the area requires a different screen size, the screens can be interchanged.

Stability

The term stability, as used here, is defined as a product that will not undergo rapid decomposition or produce nuisance odors when applied by users. Unstable compost consumes nitrogen and oxygen in significant quantities to support biological activity, which generates significant heat, carbon dioxide, and water vapor. Stable compost consumes almost no nitrogen and oxygen and generates almost no carbon dioxide or heat. Unstable compost demands nitrogen and can cause nitrogen deficiency in soils and be detrimental to plant growth. If the compost has undergone the prescribed composting and curing, there should be no problem in achieving a stable product. Critical to achieving stability is assuring that a minimum of 30 days curing is provided.

Concentration of Trace Elements and Heavy Metals

The content of undesirable elements in compost, such as heavy metals and certain organic substances will be a direct result of the levels of these elements in the input biosolids and, to a lesser extent, the bulking agents. Many of the contaminants, referred to as heavy metals, are actually needed by plants for normal growth. Therefore, measuring the concentration of these elements will provide valuable management data relevant to the fertilizer requirements of plants, and subsequent fertilizer application rates. Also, certain heavy metals can be phytotoxic to plants in

Bulk Density

Bulk density is used to convert compost application rates from tonnage to cubic yards. Bulk density is also used to determine the volume of compost that may be transported at a given time, taking into consideration that most vehicles have a specified maximum gross weight limit. It may also affect other handling issues such as front-end loader size and bucket capacity. Bulk density is greatly influenced by the moisture content of the compost.

Organic Matter Content

Organic matter content is the measure of carbon-based materials in compost. Being aware of a product's organic matter content is necessary for determining compost application rates for specific situations such as soil incorporation and topsoil production, and it is used as a means to measure the value of some products. State Departments of Transportation (DOT) include organic matter content in their specifications.

Product Consistency over Time

This quality parameter is one of the most important to end-users. In order to incorporate compost into their operating practices, users must be certain that, within narrow limits, each batch of material has the same properties. Without product consistency, end users cannot be assured of consistent field results. The operators must work toward the production of a consistent product, which is vital to the long-term success of the distribution program.

Appendix A

CITY OF ROCKY MOUNT NORTH CAROLINA

DEPARTMENT OF
PLANNING AND DEVELOPMENT

April 5, 2007

Jason Smith
Eastern Compost, LLC
8487 Battleboro-Leggett Road
PO Box 460
Battleboro NC 27809

Re: 8487 Battleboro-Leggett Road

To Whom It May Concern:

The above mentioned property with parcel number 387335621500 is zoned A-1 (Agricultural District). The A-1 district is intended to provide for land situated on the fringe of the urban area that is agricultural in nature and is customarily situated in the city's extraterritorial jurisdiction. A compost facility is a permitted use in the A-1 district. If you have any questions my number is (252) 972-1106.

Sincerely,

Adam Cook
Senior Planner
City of Rocky Mount

Eastern Compost, LLC

Design Report

SECTION 1

Design Capacity

The Eastern Compost, LLC facility Battleboro, North Carolina is designed to process 40,560 tons/year of new feedstock or 54,600 tons/year of total feedstock for composting to produce up to 27,300 tons/year of finished product. Analytical Results regarding the feedstocks can be found in Appendix A. These calculations can be found in Appendix B. If feedstock materials are changed, the production numbers would change based on the bulk density of the feedstock materials.

The equipment maintained on site includes:

Quantity	Equipment
1	Frontier Windrow Turner F-18 (Technical Specification found in Appendix C) 6' x 18' self propelled windrow turner. Capacity is approximately 4700 cubic yard per hour
1	McCloskey Trommel Screen 516RE 127 hp Cat powered screen
1	Beast Bandit Horizontal Grinder 3680 565 hp Cat powered grinder. Hourly throughout approximately 300 cubic yards
1	Haybuster Tubgrinder 1500 Hourly throughout approximately 150 cubic yards
1	Case 521 Wheel Loader 3.5 cubic yard bucket
1	Cat 930G Wheel Loader 3.5 cubic yard bucket
1	John Deere 544 Wheel Loader 3.5 cubic yard bucket
2	Volvo Dump Trucks – 17 cubic yard bed
1	Mack Dump Truck – 17 cubic yard bed

SECTION 2

Process Flow Diagram

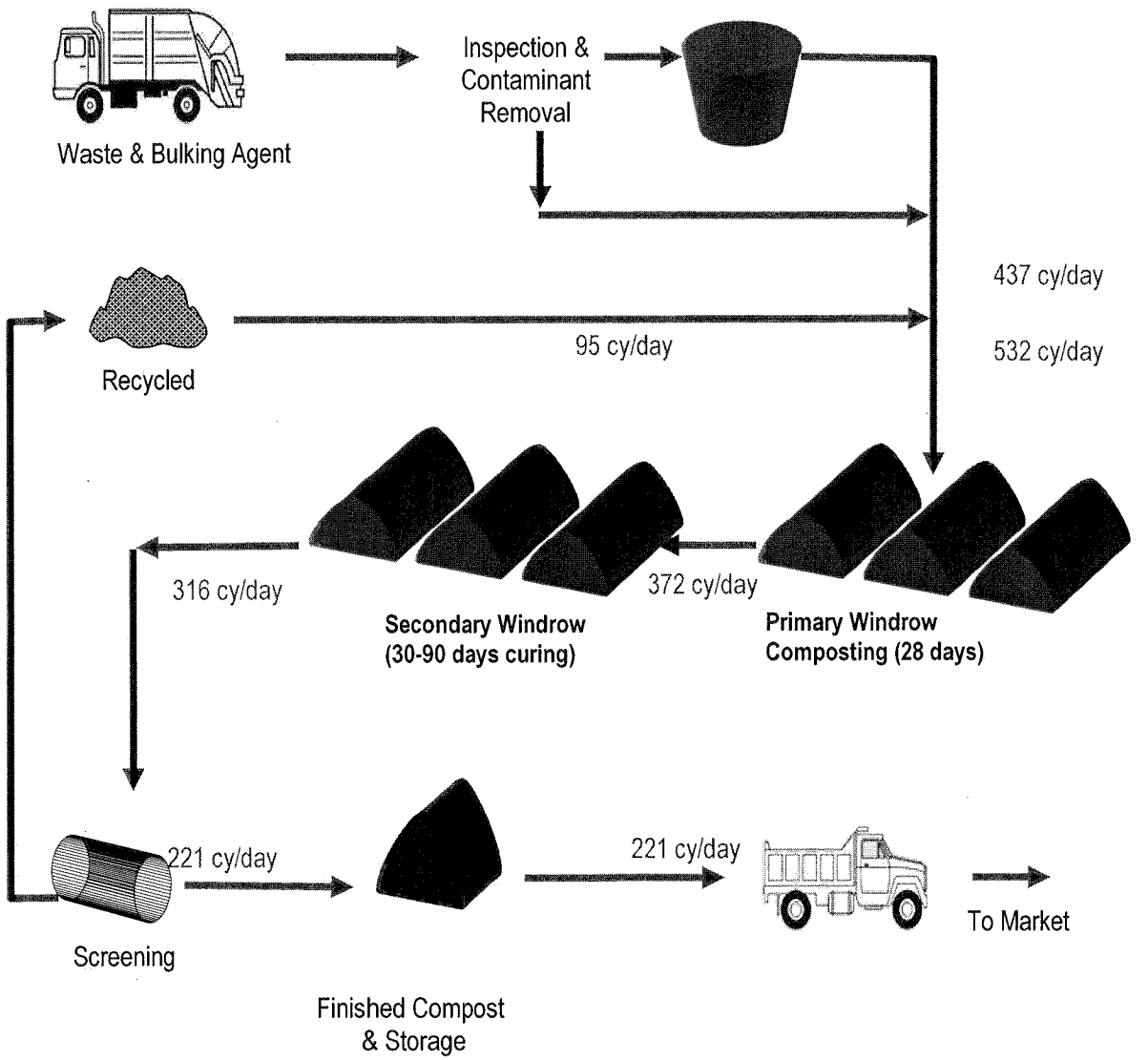

FIGURE 2-1
Process Flow Diagram
(Based on 5 Days per Week Daily Design Volumes)

SECTION 3

Shredding, Mixing, and Proportioning of Input Materials

A graded compacted soil area located to the northeast side of the Eastern Compost site provides storage for pallets, cotton gin waste, and similar bulking agents received. These materials are ground using a Beast Bandit 3680 horizontal grinder (Haybuster Tubgrinder 1500 for back-up purposes). Material is typically double ground using a 2" diamond screen. This storage area is approximately 5 acres and provides up to 340 days storage of bulking material. Appendix C contains the analytical results for various feedstocks and finished products.

3.1 Ferric Sulfate

The City of Raleigh uses Ferric Sulfate as a coagulant in their drinking water treatment process. The sludge is dewatered and trucked to the Eastern Compost site. The ferric sulfate design criteria are summarized as follows in 3-1.

TABLE 3-1
Ferric Sulfate Design Criteria Summary

Item	Quantity
Annual Tonnage of Ferric Sulfate Sludge	12,480
Daily Tonnage, TPD, 5-Day-per-Week Basis	48
Annual Tonnage, Dry-Tons per-Year	2246
Daily Tonnage, DTPD, 5-Day-per-Week Basis	8.64
Solids Content, Percent Total Solids	18
Bulk Density, pounds per cubic feet	1350

3.2 Biosolids

Dewatered, stabilized biosolids from the City of Wilson's Water Reclamation Facility are transported to the Eastern Compost site. The biosolids design criteria are summarized as follows in Table 3-2.

Current Primary Waste Stream:	
– City of Wilson – weekly	145 tons biosolids
– City of Raleigh – weekly	240 tons ferric
– Boseman Farms – December thru March	700 tons poultry litter
– Bruce Foods – July thru December	135 tons waste potato
– Cheesecake Factory – monthly	2 tons food-by-product
– Enfield & Whitakers Cotton Gin – weekly	150 tons gin trash
– Murphy Brown Farms – May thru October	200 tons waste hay
– Consolidated Diesel – weekly	75 tons pallets
– Parson's Pallets – weekly	75 tons sawdust
– Yard Debris – weekly	75 tons wood

Potential Waste Stream:
– Tobacco dust
– Fly ash
– Wood ash
– Wood fiber sludge
– Animal bedding
– Municipal wastewater & water residuals (Biosolids, alum, ferric)
– Ground Water Well Residuals
– Engineered wood
– Paper waste
– Sheetrock/gypsum board
– Agri-business waste
– Food-by-products
– Amino Acids

3.4 Recycle

The finished compost is screened through ¾, ½, 3/8 or ¼ inch screens depending upon the intended usage. Material retained by the screen (overs) is recycled back into the compost mix.

SECTION 4

Process Duration

Biosolids and Ferric Sulfate received is processed as soon as possible after receiving. It is anticipated that active composting will occur for 28 days. The maturation and storage duration will be between 30 and 90 days depending upon demands.

SECTION 5

Monitoring

Temperatures in the piles are monitored during daily operation. Temperatures are monitored using portable thermometers (i.e. no in-line or continuous monitoring). Daily operating parameters are recorded in the log books.

The log books will record the day the windrow was built, daily temperatures, and turning events. The log books will be used to show that the windrows maintained temperatures of 131°F or greater for at least 15 days during which the windrows were turned at least 5 times.

SECTION 6

Aeration Method

The composting process used at the Eastern Compost, LLC is windrow composting. Aeration is achieved through using the proper proportion of bulking agent to compost materials and through windrow turning. Windrows are turned at least 5 times during the active composting phase using a Frontier Windrow Tuner.

SECTION 7

Air Emissions and Control Technologies

When wind becomes greater than 25 miles an hour the facility will be closed to dumping to all dry material that may create problem dust. During periods of heavy rain windrows will not be turned to allow the external formed shell to shed water. Unblended or raw materials will be bermed to help prevent excessive runoff during periods of heavy rain. During snow events snow will be plowed outside of the leachate control area. Snow on the windrows will be incorporated with the windrow turner.

Odor and vectors at the site are monitored daily and controlled by proper site sanitation and following established composting procedures. Background information on all raw feedstocks will be assessed prior to shipment to the Eastern Compost, LLC facility in order to help minimize vectors and odors. Feedstock materials with excessive dryness will be mixed with excess leachate water to help control airborne particulates. Leachate will only be applied prior to the beginning of PFRP requirements. Water will be applied to help control airborne particulates in active windrows. The location of our composting pad is situated in a natural pine tree buffer. This buffer will help facilitate the reduction in noise, airborne particulates, and odors from leaving the core area.

SECTION 8

Surface Water Control

Operating under the new memorandum of agreement for permitting of composting and mulching facilities, a non-discharge design has been prepared. The Division of Water Quality has granted a permit for this proposed facility. The permit and materials submitted for the permit application are attached as Appendix D. This design allows for onsite storage of runoff from all active parts of the composting process, including: un-loading and processing areas of biosolids and active compost areas. Curing and storage areas do not contain stormwater ponds. Collected stormwater and leachate is recycled in the composting process prior to the beginning of PFRP requirements, land applied, or pumped and treated to maintain a minimum of 2 feet of freeboard at all times, and ensure enough volume is available in the basin to capture runoff from the 25 year, 24 hour storm.

One drystorage basin was designed to capture any runoff from the active composting area. The total volume of storage provided, including the 1 ft of freeboard is 1.35 million gallons. The volume required for treatment is 1.03 Million Gallons for the 24-hour, 25-year storm. The basin is designed for a maximum depth of 5 ft: 4 feet for runoff storage, and 1 feet of freeboard.

SECTION 9

General Design Criteria

The materials balance is necessary to define the equipment size, space requirements, materials handling and manpower needs for the composting facility. Table 9-1 presents typical daily mix quantities. There is variability according to the feedstock materials available.

9.1 General Design Criteria

Table 9-2 indicates the sizing and storage capacity at the Eastern Compost, LLC Facility. Table 9-3 presents the capacity of the facility. Detailed calculations can be found in Appendix B. Solids and density information for the ferric sulfate biosolids, bulking agents, initial mix and finished compost are based on the results from samples taken by Eastern Compost, LLC. Operating days are assumed to be 5 days per-week in the design criteria and the materials balance.

TABLE 9-2
General Design Information

Process	Area (yd^2)	Pile height (ft)
Unloading and Processing	66.000	8
Biosolids/Ferric Storage	2,700	5
Active Composting	9,780	8
Maturation and Storage	35,000	12

TABLE 9-3
Facility Capacity

Process	Volume (CY/day)	Bulk Density (lb/CY)	Tons/yr
Active Composting	532	790	54,600
Screening	316	800	32,800
Recycle	95	800	9,880
Maturation and Storage	372	950	45,900
Finished Compost	221	950	27.300

Appendix A
Analytical Results

Samples | Page #

- City of Wilson Class B (Municipal Biosolid Cake) ..... 1 – 13
- City of Wilson Class A (Municipal Biosolids Cake)..... 14 – 21
- City of Wilson Ferric Sulfate (Water Residual Liquid)..... 15 – 31
- Wood Chips..... 32
- Cotton Trash..... 33
- Compost..... 34
- City of Raleigh Ferric Sulfate (Water Residual Cake)..... 35 – 42
- City of Raleigh Alum (Water Residual Cake)..... 43 – 44
- Sawdust.....45
- Fly Ash.....46
- Compost.....47 – 77
- Ground Water Well Residuals (Wayne County).....78 – 87
- Cell Cream (Industrial By-Product).....88 – 91
- Industrial Class A Biosolid Cake.....92 – 97
- Industrial Carbon Source.....98 – 99
- Amino Acids.....100 – 101

Report Number:
R09037-8008
Account Number:
45969

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: CITY OF WILSON WMF
POB 10
WILSON, NC 27893

FOR: 200702.A10-CLASS B BIO=
SOLIDS HOMINY CREEK
WQ0001896
NC CERT #257

COPY: SCOTT CARPENTER

ATTN: DEBRA COLLINS

LAB NUMBER: 40811
SAMPLE ID: WI-020509

REPORT OF ANALYSIS

DATE SAMPLED: 2/5/2009 1230
DATE RECEIVED: 2/6/2009 1000
DATE REPORTED: 2/11/2009 **PAGE:** 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	18.11	181100	100	JM	02/06/09	16:00	SM 2540G
Nitrogen, Total Kjeldahl	6.87	68700	10	JM	02/09/09	16:00	SM 4500 (NorgB+NH3C)
Phosphorus	2.17	21700	100	KM	02/10/09	16:00	SW 846-3051/6010B
Potassium	0.15	1500	100	KM	02/10/09	16:00	SW 846-3051/6010B
Sulfur	1.58	15800	100	KM	02/10/09	16:00	SW 846-3051/6010B
Calcium	1.54	15400	100	KM	02/10/09	16:00	SW 846-3051/6010B
Magnesium	0.50	5000	100	KM	02/10/09	16:00	SW 846-3051/6010B
Sodium	0.07	700	100	KM	02/10/09	16:00	SW 846-3051/6010B
Iron		36100	1	KM	02/10/09	16:00	SW 846-3051/6010B
Aluminum		16800	10	KM	02/10/09	16:00	SW 846-3051/6010B
Manganese		452	1	KM	02/10/09	16:00	SW 846-3051/6010B
Copper		324	1	KM	02/10/09	15:00	SW 846-3051/6010B
Zinc		897	1	KM	02/10/09	16:00	SW 846-3051/6010B
Nitrogen, Ammonia (as N)	1.59	15900	10	JM	02/09/09	14:00	SM 4500(NH3B+NH3C)
Nitrogen, Organic (N)	5.28	52800	100	DCH			CALCULATION
Nitrogen, NO3+NO2		< 1	1	KS	02/09/09	15:00	SM 4500-NO3F
Cadmium		2.5	1	KM	02/10/09	16:00	SW 846-3051/6010B
Chromium		27	5	KM	02/10/09	16:00	SW 846-3051/6010B

Silver, Cyanide, TCLP, and ICR results to follow.

All values are on a dry weight basis except as noted. Detection Limit on all N series is on a wet basis. BDL* - Below Detection Limit

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PAUL C. H. CHU

Report Number:
R09037-8008
Account Number:
45969

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: CITY OF WILSON WMF
POB 10
WILSON, NC 27893

FOR: 200702.A10-CLASS B BIO=
SOLIDS HOMINY CREEK
WQ0001896
NC CERT #257

COPY: SCOTT CARPENTER

ATTN: DEBRA COLLINS

LAB NUMBER: 40811
SAMPLE ID: WI-020509

REPORT OF ANALYSIS

DATE SAMPLED: 2/5/2009 1230
DATE RECEIVED: 2/6/2009 1000
DATE REPORTED: 2/11/2009 PAGE: 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Nickel		26	5	KM	02/10/09	16:00	SW 846-3051/6010B
Lead		21	5	KM	02/10/09	16:00	SW 846-3051/6010B
Arsenic		6.0	1.0	KM	02/10/09	15:00	SW 846-6010B
Mercury		0.6	0.4	KM	02/10/09	15:00	SW 846-7471A
Selenium		3.2	1.0	KM	02/10/09	15:00	SW 846-6010B
pH (Std. Unit, As is)	7.68		0.01	JM	02/09/09	12:30	SW 846-9045D
Molybdenum		10	5	KM	02/10/09	16:00	SW 846-3051/6010B
Chloride		1470	10	JM	02/11/09	15:50	SM 4500CL-D

Silver, Cyanide, TCLP, and ICR results to follow.

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Paul Chu
PAUL C. H. CHU

Report Number:
R09100-8006
Account Number:
45969

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: CITY OF WILSON WMF
POB 10
WILSON, NC 27893

FOR: 200702.A10-CITY OF WILSON
"CLASS B" BIO-SOLIDS
HOMINY CREEK WQ0001896
NC CERT #257

COPY: SCOTT CARPENTER

ATTN: DEBRA COLLINS

LAB NUMBER: 42245
SAMPLE ID: WI-040909

REPORT OF ANALYSIS

DATE SAMPLED: 4/9/2009 1130
DATE RECEIVED: 4/10/2009 1000
DATE REPORTED: 4/15/2009 **PAGE:** 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	17.78	177800	100	JM	04/10/09	16:00	SM 2540G
Nitrogen, Total Kjeldahl	7.63	76300	10	MW	04/13/09	16:00	SM 4500 (NorgB+NH3C)
Phosphorus	2.58	25800	100	KM	04/13/09	16:00	SW 846-3051/6010B
Potassium	0.18	1800	100	KM	04/13/09	16:00	SW 846-3051/6010B
Sulfur	1.71	17100	100	KM	04/13/09	16:00	SW 846-3051/6010B
Calcium	1.57	15700	100	KM	04/13/09	16:00	SW 846-3051/6010B
Magnesium	0.54	5400	100	KM	04/13/09	16:00	SW 846-3051/6010B
Sodium	0.07	700	100	KM	04/13/09	16:00	SW 846-3051/6010B
Iron		43610	1	KM	04/13/09	16:00	SW 846-3051/6010B
Aluminum		14500	10	KM	04/13/09	16:00	SW 846-3051/6010B
Manganese		427	1	KM	04/13/09	16:00	SW 846-3051/6010B
Copper		328	1	KM	04/13/09	15:00	SW 846-3051/6010B
Zinc		912	1	KM	04/13/09	16:00	SW 846-3051/6010B
Nitrogen, Ammonia (as N)	1.67	16700	10	MW	04/13/09	14:00	SM 4500(NH3B+NH3C)
Nitrogen, Organic (N)	5.96	59600	100	DCH			CALCULATION
Nitrogen, NO3+NO2		< 1	1	KS	04/15/09	15:00	SM 4500-NO3F
Cadmium		2.8	1	KM	04/13/09	16:00	SW 846-3051/6010B
Chromium		27	5	KM	04/13/09	16:00	SW 846-3051/6010B

TKN CHECK IS OUT OF LIMITS. ALL OTHER QC DATA IS ACCEPTABLE.
SILVER RESULTS TO FOLLOW!!!
CN RESULTS TO FOLLOW!!!!

All values are on a dry weight basis except as noted. Detection Limit on all N series is on a wet basis. BDL* - Below Detection Limit

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Paul ok

Report Number:
R09100-8006
Account Number:
45969

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: CITY OF WILSON WMF
POB 10
WILSON, NC 27893

FOR: 200702.A10-CITY OF WILSON
"CLASS B" BIO-SOLIDS
HOMINY CREEK WQ0001896
NC CERT #257

COPY: SCOTT CARPENTER

ATTN: DEBRA COLLINS

LAB NUMBER: 42245
SAMPLE ID: WI-040909

REPORT OF ANALYSIS

DATE SAMPLED: 4/9/2009 1130
DATE RECEIVED: 4/10/2009 1000
DATE REPORTED: 4/15/2009 PAGE: 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Nickel		29	5	KM	04/13/09	16:00	SW 846-3051/6010B
Lead		28	5	KM	04/13/09	16:00	SW 846-3051/6010B
Arsenic		8.0	1.0	KM	04/13/09	15:00	SW 846-6010B
Mercury		0.7	0.4	KM	04/14/09	15:00	SW 846-7471A
Selenium		2.9	1.0	KM	04/13/09	15:00	SW 846-6010B
pH (Std. Unit, As is)	8.48		0.01	MW	04/13/09	12:30	SW 846-9045D
Molybdenum		11	5	KM	04/13/09	16:00	SW 846-3051/6010B
Chloride		938	10	MW	04/13/09	15:50	SM 4500CL-D

TKN CHECK IS OUT OF LIMITS. ALL OTHER QC DATA IS ACCEPTABLE.
SILVER RESULTS TO FOLLOW!!!
CN RESULTS TO FOLLOW!!!!

All values are on a dry weight basis except as noted. Detection Limit on all N series is on a wet basis. BDL* - Below Detection Limit

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Report Number:
R09162-8005
Account Number:
45969

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: CITY OF WILSON WMF
POB 10
WILSON, NC 27893

FOR: 200702.A10 HOMINY CREEK
WWTP "CLASS B"

NC CERT #257

COPY: SCOTT CARPENTER

ATTN: DEBRA COLLINS

LAB NUMBER: 43462
SAMPLE ID: WI 061009 (B)

REPORT OF ANALYSIS

DATE SAMPLED: 6/10/2009 0900
DATE RECEIVED: 6/11/2009 0930
DATE REPORTED: 6/17/2009 **PAGE:** 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	19.69	196900	100	RD	06/11/09	16:00	SM 2540G
Nitrogen, Total Kjeldahl	6.48	64800	10	JM	06/12/09	16:00	SM 4500 (NorgB+NH3C)
Phosphorus	2.63	26300	100	KM	06/15/09	16:00	SW 846-3051/6010C
Potassium	0.14	1400	100	KM	06/15/09	16:00	SW 846-3051/6010C
Sulfur	2.16	21600	100	KM	06/15/09	16:00	SW 846-3051/6010C
Calcium	1.56	15600	100	KM	06/15/09	16:00	SW 846-3051/6010C
Magnesium	0.69	6900	100	KM	06/15/09	16:00	SW 846-3051/6010C
Sodium	0.10	1000	100	KM	06/15/09	16:00	SW 846-3051/6010C
Iron		51200	1	KM	06/15/09	16:00	SW 846-3051/6010C
Aluminum		17000	10	KM	06/15/09	16:00	SW 846-3051/6010C
Manganese		526	1	KM	06/15/09	16:00	SW 846-3051/6010C
Copper		367	1	KM	06/15/09	15:00	SW 846-3051/6010C
Zinc		1030	1	KM	06/15/09	16:00	SW 846-3051/6010C
Nitrogen, Ammonia (as N)	1.71	17100	10	JM	06/12/09	14:00	SM 4500(NH3B+NH3C)
Nitrogen, Organic (N)	4.77	47700	100	DCH			CALCULATION
Nitrogen, NO3+NO2		< 1	1	KS	06/15/09	15:00	SM 4500-NO3F
Cadmium		1.8	1	KM	06/15/09	16:00	SW 846-3051/6010C
Chromium		36	5	KM	06/15/09	16:00	SW 846-3051/6010C

SILVER RESULTS TO FOLLOW!!!
CN RESULTS TO FOLLOW!!!!

All values are on a dry weight basis except as noted. Detection Limit on all N series is on a wet basis. BDL* - Below Detection Limit

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Paul Ch[illegible]
PAUL C. [illegible]U

Report N er:
R09162-8005
Account Number:
45969

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: CITY OF WILSON WMF
POB 10
WILSON, NC 27893

FOR: 200702.A10 HOMINY CREEK
WWTP "CLASS B"

NC CERT #257

COPY: SCOTT CARPENTER

ATTN: DEBRA COLLINS

LAB NUMBER: 43462
SAMPLE ID: WI 061009 (B)

REPORT OF ANALYSIS

DATE SAMPLED: 6/10/2009 0900
DATE RECEIVED: 6/11/2009 0930
DATE REPORTED: 6/17/2009 **PAGE:** 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Nickel		30	5	KM	06/15/09	16:00	SW 846-3051/6010C
Lead		35	5	KM	06/15/09	16:00	SW 846-3051/6010C
Arsenic		5.9	1.0	KM	06/12/09	15:00	SW 846-3051/6010C
Mercury		0.7	0.4	KM	06/12/09	15:00	SW 846-7471A
Selenium		2.0	1.0	KM	06/12/09	15:00	SW 846-6010C
pH (Std. Unit, As is)	8.14		0.01	RD	06/12/09	12:30	SW 846-9045D
Molybdenum		11	5	KM	06/15/09	16:00	SW 846-3051/6010C
Chloride		769	10	RD	06/15/09	15:50	SM 4500CL-D

SILVER RESULTS TO FOLLOW!!!
CN RESULTS TO FOLLOW!!!!

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PAUL C. H. CHU

Report Number:
R09219-8007
Account Number:
45969

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: CITY OF WILSON WMF
POB 10
WILSON, NC 27893

FOR: 200702.A10 CITY OF WILSON
CLASS B BIO-SOLIDS
HOMINY CREEK WQ0001896
NC CERT #257

COPY: DEBRA COLLINS

ATTN: DEBRA COLLINS

LAB NUMBER: 44452
SAMPLE ID: WI-080409

REPORT OF ANALYSIS

DATE SAMPLED: 8/6/2009 1600
DATE RECEIVED: 8/7/2009 1030
DATE REPORTED: 8/12/2009 **PAGE:** 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	18.25	182500	100	JM	08/07/09	16:00	SM 2540G
Nitrogen, Total Kjeldahl	6.64	66400	10	MW	08/10/09	16:00	SM 4500 (NorgB+NH3C)
Phosphorus	2.58	25800	100	KM	08/10/09	16:00	SW 846-3051/6010C
Potassium	0.15	1500	100	KM	08/10/09	16:00	SW 846-3051/6010C
Sulfur	1.96	19600	100	KM	08/10/09	16:00	SW 846-3051/6010C
Calcium	1.65	16500	100	KM	08/10/09	16:00	SW 846-3051/6010C
Magnesium	0.50	5000	100	KM	08/10/09	16:00	SW 846-3051/6010C
Sodium	0.12	1200	100	KM	08/10/09	16:00	SW 846-3051/6010C
Iron		49200	1	KM	08/10/09	16:00	SW 846-3051/6010C
Aluminum		18700	10	KM	08/10/09	16:00	SW 846-3051/6010C
Manganese		646	1	KM	08/10/09	16:00	SW 846-3051/6010C
Copper		341	1	KM	08/10/09	15:00	SW 846-3051/6010C
Zinc		958	1	KM	08/10/09	16:00	SW 846-3051/6010C
Nitrogen, Ammonia (as N)	1.81	18100	10	MW	08/10/09	14:00	SM 4500(NH3B+NH3C)
Nitrogen, Organic (N)	4.83	48300	100	DCH			CALCULATION
Nitrogen, NO3+NO2		13	1	KS	08/11/09	15:00	SM 4500-NO3F
Cadmium		2.1	1	KM	08/10/09	16:00	SW 846-3051/6010C
Chromium		33	5	KM	08/10/09	16:00	SW 846-3051/6010C

All values are on a dry weight basis except as noted. Detection Limit on all N series is on a wet basis. BDL* - Below Detection Limit

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Paul Chu
PAUL C. H. CHU

Report N er:
R09219-8007
Account Number:
45969

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: CITY OF WILSON WMF
POB 10
WILSON, NC 27893

FOR: 200702.A10 CITY OF WILSON
CLASS B BIO-SOLIDS
HOMINY CREEK WQ0001896
NC CERT #257

COPY: DEBRA COLLINS

ATTN: DEBRA COLLINS

LAB NUMBER: 44452
SAMPLE ID: WI-080409

REPORT OF ANALYSIS

DATE SAMPLED: 8/6/2009 1600
DATE RECEIVED: 8/7/2009 1030
DATE REPORTED: 8/12/2009 **PAGE:** 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Nickel		28	5	KM	08/10/09	16:00	SW 846-3051/6010C
Lead		29	5	KM	08/10/09	16:00	SW 846-3051/6010C
Arsenic		5.9	1.0	KM	08/10/09	15:00	SW 846-3051/6010C
Mercury		0.5	0.4	KM	08/10/09	15:00	SW 846-7471A
Selenium		5.6	1.0	KM	08/10/09	15:00	SW 846-6010C
pH (Std. Unit, As is)	8.72		0.01	RD	08/10/09	12:30	SW 846-9045D
Molybdenum		11	5	KM	08/10/09	16:00	SW 846-3051/6010C
Chloride		1046	10	RD	08/11/09	15:50	SM 4500CL-D

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PAUL C. H. CHU

Report Number: 09-282-0200
Account Number: 45969
Submitted By: DEBRA COLLINS

http://www.allabs.com

A&L Eastern Laboratories, Inc.
7621 Whitepine Road Richmond, Virginia 23237 (804) 743-9401 Fax (804) 271-6446
The One Source.

Send To: CITY OF WILSON WMF
DEBRA COLLINS
POB 10
WILSON , NC 27893

Project : 200702.A10 CITY OF WILSON CLASS B
BIOSOLIDS HOMINY CREEK WQ0001896
NC CERT. # 257

REPORT OF ANALYSIS

Lab Number : 73058
Sample Id : WI-100809

Date Sampled: 10/08/2009 17:00
Date Received: 10/09/2009 00:00
Date Reported: 10/14/2009

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE/TIME	METHOD
Total Solids *	19.49	194900	100.0	JM	10/09/2009 16:30	SM-2540G
Moisture *	80.51	805100	100.0	JM	10/09/2009 16:30	SM-2540G
Total Kjeldahl Nitrogen	5.39	53900	100	JM	10/12/2009 10:00	SM-4500-NH3C-TKN
Total Phosphorus	3.18	31800	100	KM	10/12/2009 08:30	SW-6010B
Total Potassium	0.17	1700	100	KM	10/12/2009 08:30	SW-6010B
Total Sulfur	2.25	22500	100	KM	10/12/2009 08:30	SW-6010B
Total Calcium	2.05	20500	100	KM	10/12/2009 08:30	SW-6010B
Total Magnesium	0.56	5600	100	KM	10/12/2009 08:30	SW-6010B
Total Sodium	0.12	1190	100	KM	10/12/2009 08:30	SW-6010B
Total Iron	5.93	59300	1	KM	10/12/2009 08:30	SW-6010B
Total Aluminum	1.94	19400	10	KM	10/12/2009 08:30	SW-6010B
Total Manganese	0.11	1090	1	KM	10/12/2009 08:30	SW-6010B
Total Copper	0.04	350	1	KM	10/12/2009 08:30	SW-6010B
Total Zinc	0.11	1120	1	KM	10/12/2009 08:30	SW-6010B
Ammonia Nitrogen	1.28	12800	100	JM	10/12/2009 08:30	SM-4500-NH3C
Organic N	4.10	41000	100	JM	10/14/2009 18:07	CALCULATION
Nitrate+Nitrite-N		10	1	JM	10/12/2009 08:30	SM-4500-NO3E
Total Cadmium		3.2	1.0	KM	10/12/2009 08:30	SW-6010B

All values are on a dry weight basis except as noted by asterisk. Detection limit on all N series is on a wet basis.

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Oscar Ruiz

Report Number: 09-282-0200
Account Number: 45969
Submitted By: DEBRA COLLINS

http://www.allabs.com

A&L Eastern Laboratories, Inc.
7621 Whitepine Road Richmond, Virginia 23237 (804) 743-9401 Fax (804) 271-6446

The One Source.

Send To: CITY OF WILSON WMF
DEBRA COLLINS
POB 10
WILSON , NC 27893

Project : 200702.A10 CITY OF WILSON CLASS B
BIOSOLIDS HOMINY CREEK WQ0001896
NC CERT. # 257

REPORT OF ANALYSIS

Lab Number : 73058
Sample Id : WI-100809

Date Sampled: 10/08/2009 17:00
Date Received: 10/09/2009 00:00
Date Reported: 10/14/2009

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE/TIME	METHOD
Total Chromium		38	5	KM	10/12/2009 08:30	SW-6010B
Total Nickel		32	5	KM	10/12/2009 08:30	SW-6010B
Total Lead		36	5	KM	10/12/2009 08:30	SW-6010B
Total Arsenic		8.3	1.0	KM	10/12/2009 08:30	SW-6010B
Total Mercury		0.6	0.4	KM	10/12/2009 13:55	SW-7471A
Total Selenium		3.3	1.0	KM	10/12/2009 08:30	SW-6010B
pH (as received) *	7.66		1.00	JM	10/12/2009 08:30	SW-9045D
Total Molybdenum		14	5	KM	10/12/2009 08:30	SW-6010B
Chloride		1140	1.00	JM	10/12/2009 09:00	SM-4500Cl-D

All values are on a dry weight basis except as noted by asterisk. Detection limit on all N series is on a wet basis.

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Oscar Ruiz

Primary Laboratories, Inc.

7423 Lee Davis Road, Mechanicsville, VA 23111 . Telephone (804) 559-9004 . Fax (804) 559-9306

ANALYTICAL LABORATORY REPORT

16-Feb-09 **R09037-8008**

A & L Eastern Laboratories, Inc.
Attn: Kathy Scott
7621 Whitepine Road
Richmond, Virginia 23237

CITY OF WILSON WMF **45969**
POB 10
WILSON NC 27893

Date Received: 10-Feb-09
Date Sampled: 5-Feb-09
Work Order No: 0902072-01
Units of Measure: mg/L
Client ID: **A&L#: 40811** **200702.A10 CLASS B BIOSOLIDS HOMINY CREEK**

Test Description	Final Result	Reporting Limit	Regulatory Level	Method Numbers*	Date Analyzed	Tech. Initials
TCLP Metals						
Arsenic	<0.050	0.050	5.0	SW-846 1311/6010B	12-Feb-09	HV
Barium	<0.020	0.020	100.0	SW-846 1311/6010B	12-Feb-09	HV
Cadmium	<0.010	0.010	1.0	SW-846 1311/6010B	12-Feb-09	HV
Chromium	<0.020	0.020	5.0	SW-846 1311/6010B	12-Feb-09	HV
Lead	<0.050	0.050	5.0	SW-846 1311/6010B	12-Feb-09	HV
Mercury	<0.002	0.002	0.2	SW-846 1311/7471	10-Feb-09	HV
Selenium	<0.050	0.050	1.0	SW-846 1311/6010B	12-Feb-09	HV
Silver	<0.020	0.020	5.0	SW-846 1311/6010B	12-Feb-09	HV
TCLP Chlorinated Pesticides						
Methoxychlor	<0.0001	0.0001	10.0	SW-846 1311/8082A	16-Feb-09	HV
Lindane	<0.0001	0.0001	0.4	SW-846 1311/8082A	16-Feb-09	HV
Heptachlor	<0.0001	0.0001	0.008	SW-846 1311/8082A	16-Feb-09	HV
Heptachlor epoxide	<0.0001	0.0001	0.008	SW-846 1311/8082A	16-Feb-09	HV
Endrin	<0.0001	0.0001	0.02	SW-846 1311/8082A	16-Feb-09	HV
Chlordane	<0.0005	0.0005	0.03	SW-846 1311/8082A	16-Feb-09	HV
Toxaphene	<0.002	0.002	0.5	SW-846 1311/8082A	16-Feb-09	HV

Primary Laboratories, Inc.
Results

16-Feb-09

Date Sampled: 5-Feb-09
Work Order No: 0902072-01
Units of Measure: mg/L
Client ID: **A&L#: 40811**

Test Description	Final Result	Reporting Limit	Regulatory Level	Method Numbers*	Date Analyzed	Tech. Initials
TCLP Herbicides						
2,4-D	<0.01	0.01	10.0	SW-846 1311/8151A	16-Feb-09	HV
2,4,5-TP (Silvex)	<0.002	0.002	1.0	SW-846 1311/8151A	16-Feb-09	HV
TCLP Volatiles						
Benzene	<0.005	0.005	0.5	SW-846 1311/8260B	12-Feb-09	PB
2-Butanone (MEK)	<0.100	0.100	200.0	SW-846 1311/8260B	12-Feb-09	PB
Carbon tetrachloride	<0.005	0.005	0.5	SW-846 1311/8260B	12-Feb-09	PB
Chlorobenzene	<0.005	0.005	100.0	SW-846 1311/8260B	12-Feb-09	PB
Chloroform	<0.005	0.005	6	SW-846 1311/8260B	12-Feb-09	PB
1,2-Dichloroethane	<0.005	0.005	0.5	SW-846 1311/8260B	12-Feb-09	PB
1,1-Dichloroethene	<0.005	0.005	0.7	SW-846 1311/8260B	12-Feb-09	PB
Tetrachloroethene	<0.005	0.005	0.7	SW-846 1311/8260B	12-Feb-09	PB
Trichloroethene	<0.005	0.005	0.5	SW-846 1311/8260B	12-Feb-09	PB
Vinyl Chloride	<0.010	0.010	0.2	SW-846 1311/8260B	12-Feb-09	PB
TCLP Semivolatiles						
o-Cresol	<0.010	0.010	200.0	SW-846 1311/8270C	16-Feb-09	HV
m-Cresol	<0.010	0.010	200.0	SW-846 1311/8270C	16-Feb-09	HV
p-Cresol	<0.010	0.010	200.0	SW-846 1311/8270C	16-Feb-09	HV
Cresol (Total)	<0.030	0.030	200.0	SW-846 1311/8270C	16-Feb-09	HV
1,4-Dichlorobenzene	<0.010	0.010	7.5	SW-846 1311/8270C	16-Feb-09	HV
2,4-Dinitrotoluene	<0.050	0.050	0.1	SW-846 1311/8270C	16-Feb-09	HV
Hexachlorobenzene	<0.010	0.010	0.13	SW-846 1311/8270C	16-Feb-09	HV
Hexachlorobutadiene	<0.010	0.010	0.5	SW-846 1311/8270C	16-Feb-09	HV
Hexachloroethane	<0.010	0.010	3.0	SW-846 1311/8270C	16-Feb-09	HV
Nitrobenzene	<0.010	0.010	2.0	SW-846 1311/8270C	16-Feb-09	HV
Pentachlorophenol	<0.050	0.050	100.0	SW-846 1311/8270C	16-Feb-09	HV
Pyridine	<0.020	0.020	5.0	SW-846 1311/8270C	16-Feb-09	HV
2,4,5-Trichlorophenol	<0.010	0.010	400.0	SW-846 1311/8270C	16-Feb-09	HV
2,4,6-Trichlorophenol	<0.010	0.010	2.0	SW-846 1311/8270C	16-Feb-09	HV

Primary Laboratories, Inc.
Results

16-Feb-09

Date Sampled: 5-Feb-09
Work Order No: 0902072-01
Client ID: **A&L#: 40811**

Test Description	Final Result	Reporting Limit	Units of Measure	Method Numbers*	Date Analyzed	Tech. Initials
Silver	<2.0	2.0	mg/Kg	SW-846 3050/6010B	12-Feb-09	HV
Cyanide	<0.010	0.010	mg/Kg	4500CN E	13-Feb-09	AS
Reactivity						
Cyanide	<1	1	mg/Kg	SW 846	16-Feb-09	AS
Sufide	<0.05	0.05	mg/Kg	Chap. 7.3	16-Feb-09	NA
Corrosivity	Non-corrosive	-	-	SW 846 Chap. 7.2	16-Feb-09	AS
Flash Point	>140	140	Degree F	1010	16-Feb-09	AS

* All methods are Standard Methods 18th Edition unless otherwise noted.

Signature: David B. Stoneman for
Parry L. Bragg
Laboratory Manager

Date: 2-16-09

These analytical results are based upon materials provided by the client and are intended for the exclusive use of the client. These analytical results represent the best judgement of Primary Laboratories, Inc. Primary Laboratories, Inc. assumes no responsibility, express or implied, as to the interpretation of the analytical results contained in this report. This report is not to be reproduced except with the written approval of Primary Laboratories, Inc.

Report Number:
R09016-8004
Account Number:
45969

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

REPORT PRINTED 2/4/2009

TO: CITY OF WILSON WMF
POB 10
WILSON, NC 27893

FOR: WQ0023177 CLASS A BIOSOLIDS

NC CERT #257

COPY: SCOTT CARPENTER

ATTN: DEBRA COLLINS

LAB NUMBER: 40363
SAMPLE ID: WI011509

REPORT OF ANALYSIS

DATE SAMPLED: 1/15/2009 1030
DATE RECEIVED: 1/16/2009 1200
DATE REPORTED: 1/21/2009 PAGE: 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	35.03	350300	100	JM	01/16/09	16:00	SM 2540G
Nitrogen, Total Kjeldahl	2.77	27700	10	JM	01/19/09	16:00	SM 4500 (NorgB+NH3C)
Phosphorus	1.41	14100	100	KM	01/19/09	16:00	SW 846-3051/6010B
Potassium	0.07	700	100	KM	01/19/09	16:00	SW 846-3051/6010B
Sulfur	2.05	20500	100	KM	01/19/09	16:00	SW 846-3051/6010B
Calcium	15.60	156000	100	KM	01/19/09	16:00	SW 846-3051/6010B
Magnesium	0.40	4000	100	KM	01/19/09	16:00	SW 846-3051/6010B
Sodium	0.05	500	100	KM	01/19/09	16:00	SW 846-3051/6010B
Iron		63000	1	KM	01/19/09	16:00	SW 846-3051/6010B
Aluminum		8620	10	KM	01/19/09	16:00	SW 846-3051/6010B
Manganese		449	1	KM	01/19/09	16:00	SW 846-3051/6010B
Copper		241	1	KM	01/19/09	15:00	SW 846-3051/6010B
Zinc		713	1	KM	01/19/09	16:00	SW 846-3051/6010B
Nitrogen, Ammonia (as N)	0.07	700	10	JM	01/19/09	14:00	SM 4500(NH3B+NH3C)
Nitrogen, Organic (N)	2.70	27000	100	DCH			CALCULATION
Nitrogen, NO3+NO2		15	1	KS	01/19/09	15:00	SM 4500-NO3F
Cadmium		BDL*	1	KM	01/19/09	16:00	SW 846-3051/6010B
Chromium		16	5	KM	01/19/09	16:00	SW 846-3051/6010B

WQ0023177 CLASS A BIOSOLIDS
TOTAL TCLP, SILVER, AND CYANIDE RESULTS TO FOLLOW.

All values are on a dry weight basis except as noted. Detection Limit on all N series is on a wet basis. BDL* - Below Detection Limit

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Paul Chu
PAUL C. H. CHU

Report Number:
R09016-8004
Account Number:
45969

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

REPORT PRINTED 2/4/2009

TO: CITY OF WILSON WMF
POB 10
WILSON, NC 27893

FOR: WQ0023177 CLASS A
BIOSOLIDS

NC CERT #257

COPY: SCOTT CARPENTER

ATTN: DEBRA COLLINS

LAB NUMBER: 40363
SAMPLE ID: WI011509

REPORT OF ANALYSIS

DATE SAMPLED: 1/15/2009 1030
DATE RECEIVED: 1/16/2009 1200
DATE REPORTED: 1/21/2009 **PAGE:** 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Nickel		18	5	KM	01/19/09	16:00	SW 846-3051/6010B
Lead		16	5	KM	01/19/09	16:00	SW 846-3051/6010B
Arsenic		7.0	1.0	KM	01/19/06	15:00	SW 846-6010B
Mercury		0.4	0.4	KM	01/19/09	15:00	SW 846-7471A
Selenium		1.8	1.0	KM	01/19/06	15:00	SW 846-6010B
Molybdenum		7	5	KM	01/19/09	16:00	SW 846-3051/6010B
Chloride		2040	10	MW	02/03/09	15:50	SM 4500CL-D

WQ0023177 CLASS A BIOSOLIDS
TOTAL TCLP, SILVER, AND CYANIDE RESULTS TO FOLLOW.

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PAUL C. CHU

Report Number:
R09043-8006
Account Number:
45969

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: CITY OF WILSON WMF
POB 10
WILSON, NC 27893

FOR: 200702.A13-CITY OF WILSON
CLASS A BIO-SOLIDS
TOISNOT WTP WQ0032748
NC CERT #257

COPY: SCOTT CARPENTER

ATTN: DEBRA COLLINS

LAB NUMBER: 40925
SAMPLE ID: T020509

REPORT OF ANALYSIS

DATE SAMPLED: 2/11/2009 1530
DATE RECEIVED: 2/12/2009 0930
DATE REPORTED: 2/17/2009 PAGE: 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	3.15	31500	100	JM	02/12/09	16:00	SM 2540G
Nitrogen, Total Kjeldahl	0.83	8300	10	JM	02/13/09	16:00	SM 4500 (NorgB+NH3C)
Phosphorus	0.12	1200	100	KM	02/16/09	16:00	SW 846-3051/6010B
Potassium	0.03	300	100	KM	02/16/09	16:00	SW 846-3051/6010B
Sulfur	2.14	21400	100	KM	02/16/09	16:00	SW 846-3051/6010B
Calcium	0.22	2200	100	KM	02/16/09	16:00	SW 846-3051/6010B
Magnesium	0.05	500	100	KM	02/16/09	16:00	SW 846-3051/6010B
Sodium	0.11	1100	100	KM	02/16/09	16:00	SW 846-3051/6010B
Iron		409000	1	KM	02/16/09	16:00	SW 846-3051/6010B
Aluminum		6070	10	KM	02/16/09	16:00	SW 846-3051/6010B
Manganese		309	1	KM	02/16/09	16:00	SW 846-3051/6010B
Copper		41	1	KM	02/16/09	15:00	SW 846-3051/6010B
Zinc		62	1	KM	02/16/09	16:00	SW 846-3051/6010B
Nitrogen, Ammonia (as N)	0.22	2200	10	JM	02/13/09	14:00	SM 4500(NH3B+NH3C)
Nitrogen, Organic (N)	0.61	6100	100	DCH			CALCULATION
Nitrogen, NO3+NO2		< 1	1	KS	02/13/09	15:00	SM 4500-NO3F
Cadmium		5.3	1	KM	02/16/09	16:00	SW 846-3051/6010B
Chromium		25	5	KM	02/16/09	16:00	SW 846-3051/6010B

Ag, CN, TCLP, AND ICR RESULTS TO FOLLOW!

All values are on a dry weight basis except as noted. Detection Limit on all N series is on a wet basis. BDL* - Below Detection Limit

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PAUL C. H. CHU

Report Number:
R09043-8006
Account Number:
45969

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: CITY OF WILSON WMF
POB 10
WILSON, NC 27893

FOR: 200702.A13-CITY OF WILSON
CLASS A BIO-SOLIDS
TOISNOT WTP WQ0032748
NC CERT #257

COPY: SCOTT CARPENTER

ATTN: DEBRA COLLINS

LAB NUMBER: 40925
SAMPLE ID: T020509

REPORT OF ANALYSIS

DATE SAMPLED: 2/11/2009 1530
DATE RECEIVED: 2/12/2009 0930
DATE REPORTED: 2/17/2009 **PAGE:** 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Nickel		15	5	KM	02/16/09	16:00	SW 846-3051/6010B
Lead		26	5	KM	02/16/09	16:00	SW 846-3051/6010B
Arsenic		6.3	1.0	KM	02/13/09	15:00	SW 846-6010B
Mercury		1.6	0.4	KM	02/16/09	15:00	SW 846-7471A
Selenium		< 1.0	1.0	KM	02/13/09	15:00	SW 846-6010B
pH (Std. Unit, As is)	3.81		0.01	RD	02/13/09	12:30	SW 846-9045D
Molybdenum		BDL*	5	KM	02/16/09	16:00	SW 846-3051/6010B
Chloride		708	10	JM	02/16/09	15:50	SM 4500CL-D

Ag, CN, TCLP, AND ICR RESULTS TO FOLLOW!

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PAUL C. H. CHU

Report N er:
R09016-7002
Account Number:
45969

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: CITY OF WILSON WMF
POB 10
WILSON, NC 27893

FOR: WQ0023177 CLASS A
BIOSOLIDS

COPY: SCOTT CARPENTER

ATTN: DEBRA COLLINS

LAB NUMBER: 40393
SAMPLE ID: WI 011509

FERTILIZER ANALYSIS REPORT

DATE RECEIVED: 1/16/2009 1200
DATE REPORTED: 1/21/2009 PAGE: 1

PARAMETER	RESULT	UNIT	DETECTION LIMIT	METHOD
Moisture (105 deg. C)	64.97	%	0.01	AOAC 950.01
pH	12.3		0.1	A&L SOP 7.01
Calcium Carbonate Equiv. (CCE)	30.80	%	0.01	AOAC 955.01
Passing #20 Sieve	99.42	%	0.01	AOAC 924.02
Passing #60 Sieve	94.20	%	0.01	AOAC 924.02
Passing #100 Sieve	90.19	%	0.01	AOAC 924.02
Effective Neutralizing Value	29	%		CALCULATION

Note: WQ0023177 Class A Biosolids

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Paul Chu
PAUL C. H. CHU

Primary Laboratories, Inc.

7423 Lee Davis Road, Mechanicsville, VA 23111 . Telephone (804) 559-9004 . Fax (804) 559-9306

ANALYTICAL LABORATORY REPORT

23-Jan-09 **R09016-8004**

A & L Eastern Laboratories, Inc.
Attn: Kathy Scott
7621 Whitepine Road
Richmond, Virginia 23237

CITY OF WILSON WMF
POB 10
WILSON NC 27893 **45969**

Date Received: 19-Jan-09
Date Sampled: 15-Jan-09
Work Order No: 0901135-01
Units of Measure: mg/L
Client ID: **A&L#: 40363** **WQ0023177 CLASS A BIOSOLIDS**

Test Description	Final Result	Reporting Limit	Regulatory Level	Method Numbers*	Date Analyzed	Tech. Initials
TCLP Metals						
Arsenic	<0.050	0.050	5.0	SW-846 1311/6010B	22-Jan-09	HV
Barium	0.318	0.020	100.0	SW-846 1311/6010B	22-Jan-09	HV
Cadmium	<0.010	0.010	1.0	SW-846 1311/6010B	22-Jan-09	HV
Chromium	<0.020	0.020	5.0	SW-846 1311/6010B	22-Jan-09	HV
Lead	<0.050	0.050	5.0	SW-846 1311/6010B	22-Jan-09	HV
Mercury	<0.002	0.002	0.2	SW-846 1311/7471	22-Jan-09	HV
Selenium	<0.050	0.050	1.0	SW-846 1311/6010B	22-Jan-09	HV
Silver	<0.020	0.020	5.0	SW-846 1311/6010B	22-Jan-09	HV
TCLP Chlorinated Pesticides						
Methoxychlor	<0.0001	0.0001	10.0	SW-846 1311/8082A	22-Jan-09	HV
Lindane	<0.0001	0.0001	0.4	SW-846 1311/8082A	22-Jan-09	HV
Heptachlor	<0.0001	0.0001	0.008	SW-846 1311/8082A	22-Jan-09	HV
Heptachlor epoxide	<0.0001	0.0001	0.008	SW-846 1311/8082A	22-Jan-09	HV
Endrin	<0.0001	0.0001	0.02	SW-846 1311/8082A	22-Jan-09	HV
Chlordane	<0.0005	0.0005	0.03	SW-846 1311/8082A	22-Jan-09	HV
Toxaphene	<0.002	0.002	0.5	SW-846 1311/8082A	22-Jan-09	HV

Primary Laboratories, Inc.
Results

23-Jan-09

Date Sampled: 15-Jan-09
Work Order No: 0901135-01
Units of Measure: mg/L
Client ID: **A&L#: 40363**

Test Description	Final Result	Reporting Limit	Regulatory Level	Method Numbers*	Date Analyzed	Tech. Initials
TCLP Herbicides						
2,4-D	<0.01	0.01	10.0	SW-846 1311/8151A	23-Jan-09	HV
2,4,5-TP (Silvex)	<0.002	0.002	1.0	SW-846 1311/8151A	23-Jan-09	HV
TCLP Volatiles						
Benzene	<0.005	0.005	0.5	SW-846 1311/8260B	22-Jan-09	PB
2-Butanone (MEK)	<0.100	0.100	200.0	SW-846 1311/8260B	22-Jan-09	PB
Carbon tetrachloride	<0.005	0.005	0.5	SW-846 1311/8260B	22-Jan-09	PB
Chlorobenzene	<0.005	0.005	100.0	SW-846 1311/8260B	22-Jan-09	PB
Chloroform	<0.005	0.005	6	SW-846 1311/8260B	22-Jan-09	PB
1,2-Dichloroethane	<0.005	0.005	0.5	SW-846 1311/8260B	22-Jan-09	PB
1,1-Dichloroethene	<0.005	0.005	0.7	SW-846 1311/8260B	22-Jan-09	PB
Tetrachloroethene	<0.005	0.005	0.7	SW-846 1311/8260B	22-Jan-09	PB
Trichloroethene	<0.005	0.005	0.5	SW-846 1311/8260B	22-Jan-09	PB
Vinyl Chloride	<0.010	0.010	0.2	SW-846 1311/8260B	22-Jan-09	PB
TCLP Semivolatiles						
o-Cresol	<0.010	0.010	200.0	SW-846 1311/8270C	22-Jan-09	HV
m-Cresol	<0.010	0.010	200.0	SW-846 1311/8270C	22-Jan-09	HV
p-Cresol	<0.010	0.010	200.0	SW-846 1311/8270C	22-Jan-09	HV
Cresol (Total)	<0.030	0.030	200.0	SW-846 1311/8270C	22-Jan-09	HV
1,4-Dichlorobenzene	<0.010	0.010	7.5	SW-846 1311/8270C	22-Jan-09	HV
2,4-Dinitrotoluene	<0.050	0.050	0.1	SW-846 1311/8270C	22-Jan-09	HV
Hexachlorobenzene	<0.010	0.010	0.13	SW-846 1311/8270C	22-Jan-09	HV
Hexachlorobutadiene	<0.010	0.010	0.5	SW-846 1311/8270C	22-Jan-09	HV
Hexachloroethane	<0.010	0.010	3.0	SW-846 1311/8270C	22-Jan-09	HV
Nitrobenzene	<0.010	0.010	2.0	SW-846 1311/8270C	22-Jan-09	HV
Pentachlorophenol	<0.050	0.050	100.0	SW-846 1311/8270C	22-Jan-09	HV
Pyridine	<0.020	0.020	5.0	SW-846 1311/8270C	22-Jan-09	HV
2,4,5-Trichlorophenol	<0.010	0.010	400.0	SW-846 1311/8270C	22-Jan-09	HV
2,4,6-Trichlorophenol	<0.010	0.010	2.0	SW-846 1311/8270C	22-Jan-09	HV

Primary Laboratories, Inc.
Results

23-Jan-09

Date Sampled: 15-Jan-09
Work Order No: 0901135-01
Client ID: **A&L#: 40363**

Test Description	Final Result	Reporting Limit	Units of Measure	Method Numbers*	Date Analyzed	Tech. Initials
Reactivity						
Cyanide	<1	1	mg/Kg	SW 846	22-Jan-09	AS
Sufide	<0.05	0.05	mg/Kg	Chap. 7.3	22-Jan-09	NA
Corrosivity	Corrosive	-	-	SW 846 Chap. 7.2	23-Jan-09	AS
Flash Point	>140	140	Degree F	1010	23-Jan-09	AS

* All methods are Standard Methods 18th Edition unless otherwise noted.

Signature: David B. Stoneman / for
Parry L. Bragg
Laboratory Manager

Date: 1-23-09

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Primary Laboratories, Inc.

7423 Lee Davis Road, Mechanicsville, VA 23111 . Telephone (804) 559-9004 . Fax (804) 559-9306

ANALYTICAL LABORATORY REPORT

18-Jun-09 **R09162-8015**

A&L Eastern Laboratories, Inc.
Attn: Kathy Scott
7621 Whitepine Road
Richmond, VA 23237

CITY OF WILSON **45969**
DEBRA COLLINS
POB 10
WILSON NC 27893

Date Received: 12-Jun-09
Date Sampled: 10-Jun-09 **WI 061009(A)**
Work Order No: 0906145-01
Client ID: **A&L#: 43480** **200702.A13 HOMINY CREEK WWTP "CLASS A"**

Test Description	Final Result	Reporting Limit	Units of Measure	Method Numbers*	Date Analyzed	Tech. Initials
pH	9.50	-	pH Units	4500H$^+$B	18-Jun-09	HV
Corrosivity	Non-corrosive	-	-	SW 846 Chap. 7.2	18-Jun-09	HV

* All methods are Standard Methods 18th Edition unless otherwise noted.

Signature: David B. Stoneman / for
Parry L. Bragg
Laboratory Manager

Date: 6-18-09

These analytical results are based upon materials provided by the client and are intended for the exclusive use of the client. These analytical results represent the best judgement of Primary Laboratories, Inc. Primary Laboratories, Inc. assumes no responsibility, express or implied, as to the interpretation of the analytical results contained in this report. This report is not to be reproduced except with the written approval of Primary Laboratories, Inc.

Report Number:
R09037-8009
Account Number:
45969

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

REPORT PRINTED 2/23/2009

TO: CITY OF WILSON WMF
POB 10
WILSON, NC 27893

FOR: 200702.A13-CLASS A BIO-SO
LDIS WIGGINS MILL WTP
WQ0032748
NC CERT #257

COPY: SCOTT CARPENTER

ATTN: DEBRA COLLINS

LAB NUMBER: 40812
SAMPLE ID: WM 020509

REPORT OF ANALYSIS

DATE SAMPLED: 2/5/2009 1500
DATE RECEIVED: 2/6/2009 1000
DATE REPORTED: 2/11/2009 **PAGE:** 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	1.04	10400	100	JM	02/06/09	16:00	SM 2540G
Nitrogen, Total Kjeldahl	1.54	15400	10	JM	02/09/09	16:00	SM 4500 (NorgB+NH3C)
Phosphorus	0.10	1000	100	KM	02/10/09	16:00	SW 846-3051/6010B
Potassium	0.06	600	100	KM	02/10/09	16:00	SW 846-3051/6010B
Sulfur	2.26	22600	100	KM	02/10/09	16:00	SW 846-3051/6010B
Calcium	0.23	2300	100	KM	02/10/09	16:00	SW 846-3051/6010B
Magnesium	0.06	600	100	KM	02/10/09	16:00	SW 846-3051/6010B
Sodium	0.12	1200	100	KM	02/10/09	16:00	SW 846-3051/6010B
Iron		392000	1	KM	02/10/09	16:00	SW 846-3051/6010B
Aluminum		9630	10	KM	02/10/09	16:00	SW 846-3051/6010B
Manganese		219	1	KM	02/10/09	16:00	SW 846-3051/6010B
Copper		44	1	KM	02/10/09	15:00	SW 846-3051/6010B
Zinc		65	1	KM	02/10/09	16:00	SW 846-3051/6010B
Nitrogen, Ammonia (as N)	0.48	4800	10	JM	02/09/09	14:00	SM 4500(NH3B+NH3C)
Nitrogen, Organic (N)	1.06	10600	100	DCH			CALCULATION
Nitrogen, NO3+NO2		< 1	1	KS	02/09/09	15:00	SM 4500-NO3F
Cadmium		3.7	1	KM	02/10/09	16:00	SW 846-3051/6010B
Chromium		29	5	KM	02/10/09	16:00	SW 846-3051/6010B

Silver, Cyanide, TCLP, and ICR results to follow.

All values are on a dry weight basis except as noted. Detection Limit on all N series is on a wet basis. BDL* - Below Detection Limit

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PAUL C. H. CHU

Report N er:
R09037-8009
Account Number:
45969

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

REPORT PRINTED 2/23/2009

TO: CITY OF WILSON WMF
POB 10
WILSON, NC 27893

FOR: 200702.A13-CLASS A BIO-SO
LDIS WIGGINS MILL WTP
WQ0032748
NC CERT #257

COPY: SCOTT CARPENTER

ATTN: DEBRA COLLINS

LAB NUMBER: 40812
SAMPLE ID: WM 020509

REPORT OF ANALYSIS

DATE SAMPLED: 2/5/2009 1500
DATE RECEIVED: 2/6/2009 1000
DATE REPORTED: 2/11/2009 PAGE: 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Nickel		9	5	KM	02/10/09	16:00	SW 846-3051/6010B
Lead		BDL*	5	KM	02/10/09	16:00	SW 846-3051/6010B
Arsenic		4.3	1.0	KM	02/10/09	15:00	SW 846-6010B
Mercury		< 0.4	0.4	KM	02/10/09	15:00	SW 846-7471A
Selenium		< 1.0	1.0	KM	02/10/09	15:00	SW 846-6010B
pH (Std. Unit, As is)	4.05		0.01	JM	02/09/09	12:30	SW 846-9045D
Molybdenum		BDL*	5	KM	02/10/09	16:00	SW 846-3051/6010B
Chloride		388	10	JM	02/11/09	15:50	SM 4500CL-D

Silver, Cyanide, TCLP, and ICR results to follow.

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Paul Chu
PAUL C. H. CHU

Report Number:
R09128-8003
Account Number:
45969

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: CITY OF WILSON WMF
POB 10
WILSON, NC 27893

FOR: CITY OF WILSON WMF
NC CERT #257

COPY: SCOTT CARPENTER

ATTN: DEBRA COLLINS

LAB NUMBER: 42819
SAMPLE ID: WM050709

REPORT OF ANALYSIS

DATE SAMPLED: 5/7/2009 1400
DATE RECEIVED: 5/8/2009 1000
DATE REPORTED: 5/14/2009 **PAGE:** 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	0.80	8000	100	JM	05/08/09	16:00	SM 2540G
Nitrogen, Total Kjeldahl	1.25	12500	10	JM	05/11/09	16:00	SM 4500 (NorgB+NH3C)
Phosphorus	0.06	600	100	KM	05/11/09	16:00	SW 846-3051/6010B
Potassium	0.13	1300	100	KM	05/11/09	16:00	SW 846-3051/6010B
Sulfur	3.76	37600	100	KM	05/11/09	16:00	SW 846-3051/6010B
Calcium	0.76	7600	100	KM	05/11/09	16:00	SW 846-3051/6010B
Magnesium	0.13	1300	100	KM	05/11/09	16:00	SW 846-3051/6010B
Sodium	0.84	8400	100	KM	05/11/09	16:00	SW 846-3051/6010B
Iron		319000	1	KM	05/11/09	16:00	SW 846-3051/6010B
Aluminum		3350	10	KM	05/11/09	16:00	SW 846-3051/6010B
Manganese		1590	1	KM	05/11/09	16:00	SW 846-3051/6010B
Copper		84	1	KM	05/11/09	15:00	SW 846-3051/6010B
Zinc		48	1	KM	05/11/09	16:00	SW 846-3051/6010B
Nitrogen, Ammonia (as N)	0.88	8800	10	JM	05/11/09	14:00	SM 4500(NH3B+NH3C)
Nitrogen, Organic (N)	0.37	3700	100	DCH			CALCULATION
Nitrogen, NO3+NO2		< 1	1	KS	05/12/09	15:00	SM 4500-NO3F
Cadmium		5.4	1	KM	05/11/09	16:00	SW 846-3051/6010B
Chromium		13	5	KM	05/11/09	16:00	SW 846-3051/6010B

SILVER RESULTS TO FOLLOW!!!
THE MATRIX SPIKE RECOVERY FOR "Al" IS OUT OF LIMITS. ALL OTHER QC DATA IS ACCEPTABLE.

All values are on a dry weight basis except as noted. Detection Limit on all N series is on a wet basis. BDL* - Below Detection Limit

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PAUL C. [illegible]IU

Report N er:
R09128-8003
Account Number:
45969

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: CITY OF WILSON WMF
POB 10
WILSON, NC 27893

FOR: CITY OF WILSON WMF
NC CERT #257

COPY: SCOTT CARPENTER

ATTN: DEBRA COLLINS

REPORT OF ANALYSIS

LAB NUMBER: 42819
SAMPLE ID: WM050709

DATE SAMPLED: 5/7/2009 1400
DATE RECEIVED: 5/8/2009 1000
DATE REPORTED: 5/14/2009 PAGE: 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Nickel		10	5	KM	05/11/09	16:00	SW 846-3051/6010B
Lead		26	5	KM	05/11/09	16:00	SW 846-3051/6010B
Arsenic		6.3	1.0	KM	05/11/09	15:00	SW 846-6010B
Mercury		< 0.4	0.4	KM	05/13/09	15:00	SW 846-7471A
Selenium		< 1.0	1.0	KM	05/11/09	15:00	SW 846-6010B
pH (Std. Unit, As is)	5.51		0.01	RD	05/11/09	12:30	SW 846-9045D
Molybdenum		BDL*	5	KM	05/11/09	16:00	SW 846-3051/6010B
Chloride		936000	10	JM	05/11/09	15:50	SM 4500CL-D

SILVER RESULTS TO FOLLOW!!!
THE MATRIX SPIKE RECOVERY FOR "Al" IS OUT OF LIMITS. ALL OTHER QC DATA IS ACCEPTABLE.

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Paul Chu
PAUL C. H. CHU

Report Number:
R09219-8006
Account Number:
45969

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: CITY OF WILSON WMF
POB 10
WILSON, NC 27893

FOR: 200702.A13 CITY OF WILSON
CLASS A BIO-SOLIDS
WIGGINS MILLS WTP
WQ0032748 NC CERT #257

COPY: SCOTT CARPENTER

ATTN: DEBRA COLLINS

LAB NUMBER: 44451
SAMPLE ID: WM080609

REPORT OF ANALYSIS

DATE SAMPLED: 8/6/2009 1100
DATE RECEIVED: 8/7/2009 1030
DATE REPORTED: 8/12/2009 **PAGE:** 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	0.79	7900	100	JM	08/07/09	16:00	SM 2540G
Nitrogen, Total Kjeldahl	1.52	15200	10	MW	08/10/09	16:00	SM 4500 (NorgB+NH3C)
Phosphorus	0.08	800	100	KM	08/10/09	16:00	SW 846-3051/6010C
Potassium	0.04	400	100	KM	08/10/09	16:00	SW 846-3051/6010C
Sulfur	1.68	16800	100	KM	08/10/09	16:00	SW 846-3051/6010C
Calcium	0.18	1800	100	KM	08/10/09	16:00	SW 846-3051/6010C
Magnesium	0.05	500	100	KM	08/10/09	16:00	SW 846-3051/6010C
Sodium	0.24	2400	100	KM	08/10/09	16:00	SW 846-3051/6010C
Iron		458000	1	KM	08/10/09	16:00	SW 846-3051/6010C
Aluminum		3480	10	KM	08/10/09	16:00	SW 846-3051/6010C
Manganese		1570	1	KM	08/10/09	16:00	SW 846-3051/6010C
Copper		36	1	KM	08/10/09	15:00	SW 846-3051/6010C
Zinc		57	1	KM	08/10/09	16:00	SW 846-3051/6010C
Nitrogen, Ammonia (as N)	0.38	3800	10	MW	08/10/09	14:00	SM 4500(NH3B+NH3C)
Nitrogen, Organic (N)	1.14	11400	100	DCH			CALCULATION
Nitrogen, NO3+NO2		165	1	KS	08/11/09	15:00	SM 4500-NO3F
Cadmium		BDL*	1	KM	08/10/09	16:00	SW 846-3051/6010C
Chromium		23	5	KM	08/10/09	16:00	SW 846-3051/6010C

All values are on a dry weight basis except as noted. Detection Limit on all N series is on a wet basis. BDL* - Below Detection Limit

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PAUL C. H. CHU

Report N er:
R09219-8006
Account Number:
45969

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: CITY OF WILSON WMF
POB 10
WILSON, NC 27893

FOR: 200702.A13 CITY OF WILSON
CLASS A BIO-SOLIDS
WIGGINS MILLS WTP
WQ0032748 NC CERT #257

COPY: SCOTT CARPENTER

ATTN: DEBRA COLLINS

LAB NUMBER: 44451
SAMPLE ID: WM080609

REPORT OF ANALYSIS

DATE SAMPLED: 8/6/2009 1100
DATE RECEIVED: 8/7/2009 1030
DATE REPORTED: 8/12/2009 PAGE: 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Nickel		15	5	KM	08/10/09	16:00	SW 846-3051/6010C
Lead		BDL*	5	KM	08/10/09	16:00	SW 846-3051/6010C
Arsenic		7.9	1.0	KM	08/10/09	15:00	SW 846-3051/6010C
Mercury		< 0.4	0.4	KM	08/10/09	15:00	SW 846-7471A
Selenium		16.0	1.0	KM	08/10/09	15:00	SW 846-6010C
pH (Std. Unit, As is)	3.50		0.01	RD	08/10/09	12:30	SW 846-9045D
Molybdenum		5	5	KM	08/10/09	16:00	SW 846-3051/6010C
Chloride		676	10	RD	08/11/09	15:50	SM 4500CL-D

All values are on a dry weight basis except as noted. Detection Limit on all N series is on a wet basis. BDL* - Below Detection Limit

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Paul Chu
PAUL C. H. CHU

Primary Laboratories, Inc.

7423 Lee Davis Road, Mechanicsville, VA 23111 . Telephone (804) 559-9004 . Fax (804) 559-9306

ANALYTICAL LABORATORY REPORT

16-Feb-09 **R09037-8009**

A & L Eastern Laboratories, Inc.
Attn: Kathy Scott
7621 Whitepine Road
Richmond, Virginia 23237

CITY OF WILSON WMF **45969**
POB 10
WILSON NC 27893

Date Received: 10-Feb-09
Date Sampled: 6-Feb-09
Work Order No: 0902073-01
Units of Measure: mg/L
Client ID: **A&L#: 40812** **200702.A13-CLASS A BIOSOLIDS WIGGINS MILL**

Test Description	Final Result	Reporting Limit	Regulatory Level	Method Numbers*	Date Analyzed	Tech. Initials
TCLP Metals						
Arsenic	<0.050	0.050	5.0	SW-846 1311/6010B	12-Feb-09	HV
Barium	<0.020	0.020	100.0	SW-846 1311/6010B	12-Feb-09	HV
Cadmium	<0.010	0.010	1.0	SW-846 1311/6010B	12-Feb-09	HV
Chromium	<0.020	0.020	5.0	SW-846 1311/6010B	12-Feb-09	HV
Lead	<0.050	0.050	5.0	SW-846 1311/6010B	12-Feb-09	HV
Mercury	<0.002	0.002	0.2	SW-846 1311/7471	10-Feb-09	HV
Selenium	<0.050	0.050	1.0	SW-846 1311/6010B	12-Feb-09	HV
Silver	<0.020	0.020	5.0	SW-846 1311/6010B	12-Feb-09	HV
TCLP Chlorinated Pesticides						
Methoxychlor	<0.0001	0.0001	10.0	SW-846 1311/8082A	16-Feb-09	HV
Lindane	<0.0001	0.0001	0.4	SW-846 1311/8082A	16-Feb-09	HV
Heptachlor	<0.0001	0.0001	0.008	SW-846 1311/8082A	16-Feb-09	HV
Heptachlor epoxide	<0.0001	0.0001	0.008	SW-846 1311/8082A	16-Feb-09	HV
Endrin	<0.0001	0.0001	0.02	SW-846 1311/8082A	16-Feb-09	HV
Chlordane	<0.0005	0.0005	0.03	SW-846 1311/8082A	16-Feb-09	HV
Toxaphene	<0.002	0.002	0.5	SW-846 1311/8082A	16-Feb-09	HV

Primary Laboratories, Inc.
Results

16-Feb-09

Date Sampled: 6-Feb-09
Work Order No: 0902073-01
Units of Measure: mg/L
Client ID: **A&L#: 40812**

Test Description	Final Result	Reporting Limit	Regulatory Level	Method Numbers*	Date Analyzed	Tech. Initials
TCLP Herbicides						
2,4-D	<0.01	0.01	10.0	SW-846 1311/8151A	16-Feb-09	HV
2,4,5-TP (Silvex)	<0.002	0.002	1.0	SW-846 1311/8151A	16-Feb-09	HV
TCLP Volatiles						
Benzene	<0.005	0.005	0.5	SW-846 1311/8260B	12-Feb-09	PB
2-Butanone (MEK)	<0.100	0.100	200.0	SW-846 1311/8260B	12-Feb-09	PB
Carbon tetrachloride	<0.005	0.005	0.5	SW-846 1311/8260B	12-Feb-09	PB
Chlorobenzene	<0.005	0.005	100.0	SW-846 1311/8260B	12-Feb-09	PB
Chloroform	<0.005	0.005	6	SW-846 1311/8260B	12-Feb-09	PB
1,2-Dichloroethane	<0.005	0.005	0.5	SW-846 1311/8260B	12-Feb-09	PB
1,1-Dichloroethene	<0.005	0.005	0.7	SW-846 1311/8260B	12-Feb-09	PB
Tetrachloroethene	<0.005	0.005	0.7	SW-846 1311/8260B	12-Feb-09	PB
Trichloroethene	<0.005	0.005	0.5	SW-846 1311/8260B	12-Feb-09	PB
Vinyl Chloride	<0.010	0.010	0.2	SW-846 1311/8260B	12-Feb-09	PB
TCLP Semivolatiles						
o-Cresol	<0.010	0.010	200.0	SW-846 1311/8270C	16-Feb-09	HV
m-Cresol	<0.010	0.010	200.0	SW-846 1311/8270C	16-Feb-09	HV
p-Cresol	<0.010	0.010	200.0	SW-846 1311/8270C	16-Feb-09	HV
Cresol (Total)	<0.030	0.030	200.0	SW-846 1311/8270C	16-Feb-09	HV
1,4-Dichlorobenzene	<0.010	0.010	7.5	SW-846 1311/8270C	16-Feb-09	HV
2,4-Dinitrotoluene	<0.050	0.050	0.1	SW-846 1311/8270C	16-Feb-09	HV
Hexachlorobenzene	<0.010	0.010	0.13	SW-846 1311/8270C	16-Feb-09	HV
Hexachlorobutadiene	<0.010	0.010	0.5	SW-846 1311/8270C	16-Feb-09	HV
Hexachloroethane	<0.010	0.010	3.0	SW-846 1311/8270C	16-Feb-09	HV
Nitrobenzene	<0.010	0.010	2.0	SW-846 1311/8270C	16-Feb-09	HV
Pentachlorophenol	<0.050	0.050	100.0	SW-846 1311/8270C	16-Feb-09	HV
Pyridine	<0.020	0.020	5.0	SW-846 1311/8270C	16-Feb-09	HV
2,4,5-Trichlorophenol	<0.010	0.010	400.0	SW-846 1311/8270C	16-Feb-09	HV
2,4,6-Trichlorophenol	<0.010	0.010	2.0	SW-846 1311/8270C	16-Feb-09	HV

Primary Laboratories, Inc.
Results

16-Feb-09

Date Sampled: 6-Feb-09
Work Order No: 0902073-01
Client ID: **A&L#: 40812**

Test Description	Final Result	Reporting Limit	Units of Measure	Method Numbers*	Date Analyzed	Tech. Initials
Silver	<2.0	2.0	mg/Kg	SW-846 3050/6010B	12-Feb-09	HV
Cyanide	<0.010	0.010	mg/Kg	4500CN E	13-Feb-09	AS
Reactivity						
Cyanide	<1	1	mg/Kg	SW 846	16-Feb-09	AS
Sufide	<0.05	0.05	mg/Kg	Chap. 7.3	16-Feb-09	NA
Corrosivity	Non-corrosive	-	-	SW 846 Chap. 7.2	16-Feb-09	AS
Flash Point	>140	140	Degree F	1010	16-Feb-09	AS

* All methods are Standard Methods 18th Edition unless otherwise noted.

Signature: David B. Stoneman / for
Parry L. Bragg
Laboratory Manager

Date: 2-16-09

These analytical results are based upon materials provided by the client and are intended for the exclusive use of the client. These analytical results represent the best judgement of Primary Laboratories, Inc. Primary Laboratories, Inc. assumes no responsibility, express or implied, as to the interpretation of the analytical results contained in this report. This report is not to be reproduced except with the written approval of Primary Laboratories, Inc.

Report N er:
R07045-8007
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EASTERN COMPOST
NC CERT #257

COPY: SCOTT CARPENTER

LAB NUMBER: 40933
SAMPLE ID: WOOD CHIPS

REPORT OF ANALYSIS

DATE SAMPLED: 2/9/2007 1130
DATE RECEIVED: 2/14/2007 1200
DATE REPORTED: 2/16/2007 PAGE: 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	84.32	843200	100	JM	02/14/07	16:00	SM 2540G
Moisture, Total	15.68	156800	100	DH	02/16/07	9:00	EPA-160.3
Nitrogen, Total Kjeldahl	0.38	3800	100	MW	02/15/07	16:00	EPA 351.3
Solids, Volatile(Organic Matter)	80.77	807700	100	JM	02/15/07	16:00	SM 2540G
C:N Ratio	122		1	DH	02/16/07	9:00	Calculation
Total Organic Carbon (Calc)	47	470000	100	DH	02/16/07	16:00	CALCULATION

All values are on a dry weight basis except as noted. *Detection Limit on all N series is on a wet basis.

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Paul Chu
PAUL C. H. CHU

Report Number:
R07045-8007
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EASTERN COMPOST
NC CERT #257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 40934
SAMPLE ID: COTTON TRASH

DATE SAMPLED: 2/9/2007 1130
DATE RECEIVED: 2/14/2007 1200
DATE REPORTED: 2/16/2007 PAGE: 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	85.65	856500	100	JM	02/14/07	16:00	SM 2540G
Moisture, Total	14.35	143500	100	DH	02/16/07	9:00	EPA-160.3
Nitrogen, Total Kjeldahl	1.53	15300	100	MW	02/15/07	16:00	EPA 351.3
Solids, Volatile(Organic Matter)	94.07	940700	100	JM	02/15/07	16:00	SM 2540G
C:N Ratio	36		1	DH	02/16/07	9:00	Calculation
Total Organic Carbon (Calc)	55	550000	100	DH	02/16/07	16:00	CALCULATION

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Paul Chu
PAUL C. H. CHU

Report N er:
R07045-8007
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EASTERN COMPOST
NC CERT #257

COPY: SCOTT CARPENTER

LAB NUMBER: 40935
SAMPLE ID: COMPOST

REPORT OF ANALYSIS

DATE SAMPLED: 2/9/2007 1130
DATE RECEIVED: 2/14/2007 1200
DATE REPORTED: 2/16/2007 PAGE: 3

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	38.74	387400	100	JM	02/14/07	16:00	SM 2540G
Moisture, Total	61.26	612600	100	DH	02/16/07	9:00	EPA-160.3
Nitrogen, Total Kjeldahl	1.10	11000	100	MW	02/15/07	16:00	EPA 351.3
Solids, Volatile(Organic Matter)	38.47	384700	100	JM	02/15/07	16:00	SM 2540G
C:N Ratio	20		1	DH	02/16/07	9:00	Calculation
Total Organic Carbon (Calc)	22	220000	100	DH	02/16/07	16:00	CALCULATION

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Paul Chu
PAUL C. H. CHU

Report Number:
R07045-8007
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EASTERN COMPOST
NC CERT #257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 40936
SAMPLE ID: FERRIC

DATE SAMPLED: 2/9/2007 1130
DATE RECEIVED: 2/14/2007 1200
DATE REPORTED: 2/16/2007 PAGE: 4

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	18.54	185400	100	JM	02/14/07	16:00	SM 2540G
Moisture, Total	81.46	814600	100	DH	02/16/07	9:00	EPA-160.3
Nitrogen, Total Kjeldahl	0.80	8000	100	MW	02/15/07	16:00	EPA 351.3
Solids, Volatile(Organic Matter)	27.88	278800	100	JM	02/15/07	16:00	SM 2540G
C:N Ratio	20		1	DH	02/16/07	9:00	Calculation
Total Organic Carbon (Calc)	16	160000	100	DH	02/16/07	16:00	CALCULATION

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Paul Chu
PAUL C. H. CHU

Report N er:
R07094-8013
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: 200708.A10 RALEIGH WTP
NC CERT #257

COPY: SCOTT CARPENTER

LAB NUMBER: 41890
SAMPLE ID: RWTP

Water Residuals Cake

REPORT OF ANALYSIS

DATE SAMPLED: 4/12/2007 1330
DATE RECEIVED: 4/4/2007 1400
DATE REPORTED: 4/9/2007 PAGE: 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	23.91	239100	100	DH	04/04/07	16:00	SM 2540G
Nitrogen, Total Kjeldahl	0.87	8700	100	MW	04/05/07	16:00	EPA 351.3
Phosphorus	0.18	1800	100	JM	04/05/07	16:00	SW 846-6010B
Potassium	< 0.01	0	100	JM	04/05/07	16:00	SW 846-6010B
Sulfur	0.70	7000	100	JM	04/05/07	16:00	SW 846-6010B
Calcium	0.07	700	100	JM	04/05/07	16:00	SW 846-6010B
Magnesium	0.03	300	100	JM	04/05/07	16:00	SW 846-6010B
Sodium	< 0.01	0	100	JM	04/05/07	16:00	SW 846-6010B
Iron		345000	1	JM	04/06/07	16:00	SW 846-6010B
Aluminum		9320	10	JM	04/05/07	16:00	SW 846-6010B
Manganese		21700	1	JM	04/05/07	16:00	SW 846-6010B
Copper		36	1	JM	04/05/07	15:00	SW 846-6010B
Zinc		65	1	JM	04/05/07	16:00	SW846-6010B
Nitrogen, Ammonia (as N)	0.02	200	10	MW	04/05/07	14:00	EPA 350.2
Nitrogen, Organic (N)	0.85	8500	100	DCH			CALCULATION
Nitrogen, NO3+NO2		< 1	1	DH	04/05/07	15:00	SM 4500-NO3F
pH (Std. Unit, As is)	5.7		0.01	RD	04/05/07	12:30	SW 846-9045C

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Paul Chu
PAUL C. H. CHU

Report Number:
R07204-8001
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: E M JOHNSON WTP

NC CERT #257

COPY: JASON SMITH

LAB NUMBER: 43715 water res cake
SAMPLE ID: CRM071807

REPORT OF ANALYSIS

DATE SAMPLED: Not Provided
DATE RECEIVED: 7/23/2007 1030
DATE REPORTED: 7/27/2007 **PAGE:** 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	19.83	198300	100	JM	07/23/07	16:00	SM 2540G
Nitrogen, Total Kjeldahl	0.96	9600	100	JM	07/24/07	16:00	EPA 351.3
Phosphorus	0.08	800	100	JM	07/25/07	16:00	SW 846-3051/6010B
Potassium	< 0.01	0	100	JM	07/25/07	16:00	SW 846-3051/6010B
Sulfur	0.64	6400	100	JM	07/25/07	16:00	SW 846-3051/6010B
Calcium	0.08	800	100	JM	07/25/07	16:00	SW 846-3051/6010B
Magnesium	0.02	200	100	JM	07/25/07	16:00	SW 846-3051/6010B
Sodium	< 0.01	0	100	JM	07/25/07	16:00	SW 846-3051/6010B
Iron		378000	1	JM	07/25/07	16:00	SW 846-3051/6010B
Aluminum		4270	10	JM	07/25/07	16:00	SW 846-3051/6010B
Manganese		32300	1	JM	07/25/07	16:00	SW 846-3051/6010B
Copper		38	1	JM	07/25/07	15:00	SW 846-3051/6010B
Zinc		165	1	JM	07/25/07	16:00	SW 846-3051/6010B
Cadmium		9.0	1	JM	07/25/07	16:00	SW 846-3051/6010B
Chromium		14	5	JM	07/25/07	16:00	SW 846-3051/6010B
Nickel		343	5	JM	07/25/07	16:00	SW 846-3051/6010B
Lead		6	5	JM	07/25/07	16:00	SW 846-3051/6010B
Arsenic		4.5	1.0	PC	07/24/07	15:00	SW 846-6010B

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Paul Chu
PAUL C. H. CHU

Report N er:
R07204-8001
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: E M JOHNSON WTP

NC CERT #257

COPY: JASON SMITH

LAB NUMBER: 43715
SAMPLE ID: CRM071807

Water Res. Cake

REPORT OF ANALYSIS

DATE SAMPLED: Not Provided
DATE RECEIVED: 7/23/2007 1030
DATE REPORTED: 7/27/2007 PAGE: 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Mercury		< 0.4	0.4	JM	07/25/07	15:00	SW 846-7471A
Selenium		5.5	1.0	PC	07/24/07	15:00	SW 846-6010B
Molybdenum		27	5	JM	07/25/07	16:00	SW 846-3051/6010B

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Paul Chu
PAUL C. H. CHU

City of Raleigh Neuse River WW Lab

WW Certification # 51/ EPA Lab Code NC01029

Laboratory Report of Analysis

Sample Origination: **EMJ Class A**

Date	TS %	pH SU	VS %	TP mg/L	TKN mg/L	NH3 mg/L	NO3-2 mg/L	PAN mg/L	As mg/kg	Cd mg/kg	Cu mg/kg	Fe mg/kg	Mn mg/kg
06/01/09													
06/02/09													
06/03/09	19.76		30.70	105.50	685.70	455.50	1.92	298.73	7.085	1.012	48.583	352,463.563	31,423.077
06/04/09													
06/05/09													
06/06/09													
06/07/09													
06/08/09													
06/09/09													
06/10/09	18.49		31.69	113.75	834.40	92.45	7.87	276.68	8.112	1.082	65.441	364,425.635	34,401.839
06/11/09													
06/12/09													
06/13/09													
06/14/09													
06/15/09													
06/16/09													
06/17/09	20.06		32.40	125.00	794.70	83.30	0.76	255.83	7.976	1.994	47.856	332,338.983	26,611.665
06/18/09													
06/19/09													
06/20/09													
06/21/09													
06/22/09													
06/23/09													
06/24/09	20.04		31.34	139.00	829.60	5.84	19.17	269.22	7.984	1.996	49.401	353,872.754	34,403.194
06/25/09													
06/26/09													
06/27/09													
06/28/09													
06/29/09													
06/30/09													
Minimum	18.49		30.70	105.50	685.70	5.84	0.76	255.83	7.085	1.012	47.856	332,338.983	26,611.665
Maximum	20.06		32.40	139.00	834.40	455.50	19.17	298.73	8.112	1.996	65.441	364,425.635	34,403.194
Average	19.59		31.53	120.81	786.10	159.27	7.43	275.11	7.789	1.521	52.820	350,775.234	31,709.944

Darrell Crews Date

Laboratory Supervisor

ty of Raleigh Neuse River WW Lab

WW Certification # 51/ EPA Lab Code NC01029

Laboratory Report of Analysis

Sample Origination: **EMJ Class A**

Mo mg/kg	Ni mg/kg	Pb mg/kg	Se mg/kg	Zn mg/kg	Ca mg/kg	K mg/kg	Mg mg/kg	Na mg/kg	Hg mg/kg
8.097	37.449	58.704	15.182	52.126	<506.073	<506.073	<506.073	<506.073	0.003
8.112	42.726	63.277	16.225	60.573	<540.833	<540.833	<540.833	<540.833	0.002
7.478	35.394	57.827	12.961	43.370	2,265.204	<498.504	<498.504	<498.504	0.003
9.481	39.421	57.884	14.970	37.924	<499.002	<499.002	<499.002	<499.002	0.003
7.478	35.394	57.827	12.961	37.924	<499.002	<498.504	<498.504	<498.504	0.002
9.481	42.726	63.277	16.225	60.573	2,265.204	<540.833	<540.833	<540.833	0.003
8.292	38.748	59.423	14.835	48.498	<952.778	<511.103	<511.103	<511.103	0.003

Darrell Crews Date

Laboratory Supervisor

40

UNITEST

6701 Conference Drive
Raleigh, NC 27607

Telephone: (919) 834-4984
Fax: (919) 834-6497

NC/WW Cert. #: 067
NC/DW Cert. #: 37731

Laboratory Report

--- Prepared for ---
Larry McMillan
Raleigh/Northside, City of
P.O. BOX 590
E.M. JOHNSON WATER PLANT
Raleigh, NC 27602

Report Date: 4/20/2007
Date Received: 3/7/2007

Work Order #: 0703-00243

Project No.: 01
Project ID: FULL TCLP ANALYSIS

Cust. Code: RA2870
Cust. P.O.#: **CHECK BOOK**

No.	Sample ID	Date Sampled	Time Sampled	Matrix	Sample Type	Condition
001	SLUDGE (RAW)	3/7/2007	10:45	WW	Grab	4 +/- 2 deg C

Test Performed	Method	Results	Analyzed Date	Analyzed Time	Qualifier
Metals TCLP Package	EPA 1311		3/21/07	9:16	
TCLP Arsenic	EPA 200.8	<0.050 mg/L	3/21/07	9:16	
TCLP Barium	EPA 200.8	<1.0 mg/L	3/21/07	9:16	
TCLP Cadmium	EPA 200.8	<0.010 mg/L	3/21/07	9:16	
TCLP Chromium	EPA 200.8	<0.050 mg/L	3/21/07	9:16	
TCLP Lead	EPA 200.8	<0.050 mg/L	3/21/07	9:16	
TCLP Selenium	EPA 200.8	<0.050 mg/L	3/21/07	9:16	
TCLP Silver	EPA 200.8	<0.010 mg/L	3/21/07	9:16	
TCLP Mercury Analysis	EPA 245.1	<0.050 mg/L	3/19/07	9:25	
Metals/SVOA TCLP Extraction	EPA 1311	<0.2 ug/L	3/14/07	0:00	
Metals Digest. of TCLP Ext.	EPA 200.8	DONE	3/14/07	0:00	
TCLP Pesticides; Liquids	EPA 8081A	DONE	3/14/07	0:00	
gamma-BHC (Lindane)	EPA 8081A		3/14/07	9:00	
Chlordane	EPA 8081A	<0.050# ug/L	3/14/07	0:00	
Endrin	EPA 8081A	<0.050# ug/L	3/14/07	0:00	
Heptachlor	EPA 8081A	<0.005# ug/L	3/14/07	0:00	
Heptachlor Epoxide	EPA 8081A	<0.005# ug/L	3/14/07	0:00	
Methoxychlor	EPA 8081A	<0.8 ug/L	3/19/07	9:00	
Toxaphene	EPA 8081A	<0.050# ug/L	3/14/07	0:00	
TCLP Volatiles by 8260B	EPA 8260B	<0.050# ug/L	3/14/07	0:00	
Benzene	EPA 8260B		3/15/07	3:14	
Carbon tetrachloride	EPA 8260B	<5 ug/L	3/15/07	3:14	
Chlorobenzene	EPA 8260B	<5 ug/L	3/15/07	3:14	
Chloroform	EPA 8260B	<5 ug/L	3/15/07	3:14	
1,2-Dichloroethane	EPA 8260B	21.2 ug/L	3/15/07	0:00	
1,1-Dichloroethene	EPA 8260B	<5 ug/L	3/15/07	3:14	
Methyl ethyl ketone (MEK)	EPA 8260B	<5 ug/L	3/15/07	3:14	
Tetrachloroethene	EPA 8260B	<50 ug/L	3/15/07	3:14	
Trichloroethene	EPA 8260B	<5 ug/L	3/15/07	3:14	
Vinyl chloride	EPA 8260B	<5 ug/L	3/15/07	3:14	
TCLP 8270	EPA 8270C	<10 ug/L	3/15/07	3:14	
1,4-Dichlorobenzene	EPA 8270C		4/2/07	9:00	
2,4-Dinitrotoluene	EPA 8270C	<0.050 mg/L	4/2/07	9:00	
Hexachlorobenzene	EPA 8270C	<0.050 mg/L	4/2/07	9:00	
Hexachlorobutadiene	EPA 8270C	<0.050 mg/L	4/2/07	9:00	

6701 Conference Drive
Raleigh, NC 27607

Telephone: (919) 834-4984
Fax: (919) 834-6497

NC/WW Cert. #: 067
NC/DW Cert. #: 37731

Laboratory Report

Work Order #: 0703-00243

No.	Sample ID	Date Sampled	Time Sampled	Matrix	Sample Type	Condition
001	SLUDGE (RAW)	3/7/2007	10:45	WW	Grab	4 +/- 2 deg C

Test Performed	Method	Results	Analyzed Date	Analyzed Time	Qualifier
Hexachloroethane	EPA 8270C	<0.050 mg/L	4/2/07	9:00	
2-Methylphenol	EPA 8270C	<0.050 mg/L	4/2/07	9:00	
3- & 4-Methylphenol	EPA 8270C	<0.100 mg/L	4/2/07	9:00	
Nitrobenzene	EPA 8270C	<0.050 mg/L	4/2/07	9:00	
Pentachlorophenol	EPA 8270C	<0.250 mg/L	4/2/07	9:00	
Pyridine	EPA 8270C	<0.050 mg/L	4/2/07	9:00	
2,4,5-Trichlorophenol	EPA 8270C	<0.050 mg/L	4/2/07	9:00	
2,4,6-Trichlorophenol	EPA 8270C	<0.050 mg/L	4/2/07	9:00	
TCLP Herbicides by 8151	EPA 8151		3/14/07	0:00	
2,4-D	EPA 8150	<0.050# ug/L	3/14/07	0:00	
2,4,5-TP (Silvex)	EPA 8150	<0.050# ug/L	3/14/07	0:00	
Flashpoint (Setaflash)	EPA 1020	>230# deg-F	3/14/07	0:00	
Reactive Cyanide	EPA 4500C&E	<0.01# mg/kg	3/14/07	0:00	
ctive Sulfide	SW846-9030A	<1.0# mg/kg	3/14/07	0:00	
rrosivity to Steel	SW846-1110	6.34# mm/yr	3/14/07	0:00	
Extraction, 8080, TCLP	EPA 3510	DONE	3/14/07	0:00	
Extr., ZHE, TCLP Volatiles	EPA 1311	DONE	3/14/07	0:00	
Extraction, 8270 TCLP	EPA 3510	DONE	4/2/07	9:00	
Extr., Herbicides, TCLP	EPA 8150	DONE	3/14/07	0:00	
Initial TCLP Prep (non-vol)	SW846 1311	DONE	3/14/07	0:00	

Reviewed by:

for Tritest, Inc.

Report Number
09-310-0207 **Page:** 3 of 4

Account Number
45691

Send To: GRANVILLE FARMS INC
POB 1396
OXFORD , NC 27565

A&L Eastern Laboratories, Inc.

7621 Whitepine Road Richmond, Virginia 23237 (804) 743-9401 Fax (804) 271-6446

www.al-labs-eastern.com

Submitted By: SCOTT CARPENTER
Purchase Order :
Report Date : 11/13/2009
Date Received : 11/06/2009

Project : 110309
NC CERT #257

REPORT OF ANALYSIS

Date Sampled :

Lab Number: 73479
Sample Id : EMJL 110309

Analysis	Result	Quantitation Limit	Method	Date and Time Test Started	Analyst
Total Solids , %	17.13	0.01	SM-2540G	11/06/2009 16:39	KM
Moisture , %	82.87	0.01	SM-2540G	11/06/2009 16:39	KM
Total Calcium , %	0.16	0.01	AG TOTAL METALS	11/09/2009 15:00	KM
Total Magnesium , %	0.05	0.01	AG TOTAL METALS	11/09/2009 15:00	KM
Total Sodium , %	0.01	0.01	AG TOTAL METALS	11/09/2009 15:00	KM
Total Aluminum , %	1.63	0.01	SW-6010B	11/09/2009 15:00	KM
Total Manganese , %	0.41	0.01	SW-6010B	11/09/2009 15:00	KM
pH (as received) , s.u.	6.01	1.00	SW-9045D	11/09/2009 07:45	JM
Available Phosphorus as P2O5 , %	0.01	0.01	AOAC 993.31	11/10/2009 07:59	KM
Available Potassium (as K2O) , %	0.010	0.010	AOAC 983.02	11/10/2009 07:59	KM
Specific Gravity , g/mL	1.13	0.001	ASTM D-1298-85	11/09/2009 16:59	KM
Total Nitrogen , %	0.25	0.01	AOAC 2.4.02	11/10/2009 10:59	BB
Phosphorus (as P2O5) , %	0.06	0.01	AOAC 2.3.02	11/09/2009 09:30	KM
Ammoniacal Nitrogen , %	0.01	0.01	AOAC 2.4.07	11/10/2009 07:45	JM

Oscar Ruiz

Sample results are reported 'as received' and are not moisture corrected unless noted.

Report Number
09-310-0207 **Page:** 4 of 4

Account Number
45691

Send To: GRANVILLE FARMS INC
POB 1396
OXFORD , NC 27565

A&L Eastern Laboratories, Inc.

7621 Whitepine Road Richmond, Virginia 23237 (804) 743-9401 Fax (804) 271-6446

www.al-labs-eastern.com

Submitted By: SCOTT CARPENTER
Purchase Order :
Report Date : 11/13/2009
Date Received : 11/06/2009

Project : 110309
NC CERT #257

REPORT OF ANALYSIS

Date Sampled :

Lab Number: 73479
Sample Id : EMJL 110309

Analysis	Result	Quantitation Limit	Method	Date and Time Test Started	Analyst
Nitrate Nitrogen , %	<0.010	0.010	AOAC 2.4.12	11/09/2009 08:44	KM
Sulfate Sulfur (SO4-S)	0.54	0.01	AOAC 2.6.28B	11/09/2009 15:00	KM
Total Sulfur , %	2.12	0.010	AOAC 2.6.28A	11/09/2009 09:29	KM
Urea Nitrogen , %	0.140	0.010	AOAC 2.4.20	11/09/2009 13:05	JM

Method Reference:
American Society for Testing and Materials, Annual Book of ASTM Standards
Official Methods of Analysis of AOAC International, 17th Edition, 1998
Standard Methods for the Analysis of Water and Wastewater, 20th Ed. 1998
USEPA, SW-846, Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, 3rd Ed. Current Revision

Comments:
Due to the pH of the sample, acidity is not applicable.

Sample results are reported 'as received' and are not moisture corrected unless noted.

Oscar Ruiz

44

Report Number:
R07045-8007
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

4T

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EASTERN COMPOST
NC CERT #257

COPY: SCOTT CARPENTER

LAB NUMBER: 40937
SAMPLE ID: SAWDUST

REPORT OF ANALYSIS

DATE SAMPLED: 2/9/2007 1130
DATE RECEIVED: 2/14/2007 1200
DATE REPORTED: 2/16/2007 **PAGE:** 5

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	70.80	708000	100	JM	02/14/07	16:00	SM 2540G
Moisture, Total	29.20	292000	100	DH	02/16/07	9:00	EPA-160.3
Nitrogen, Total Kjeldahl	0.10	1000	100	MW	02/15/07	16:00	EPA 351.3
Solids, Volatile(Organic Matter)	99.05	990500	100	JM	02/15/07	16:00	SM 2540G
C:N Ratio	582		1	DH	02/16/07	9:00	Calculation
Total Organic Carbon (Calc)	58	580000	100	DH	02/16/07	16:00	CALCULATION

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Paul Chu
PAUL C. H. CHU

Report N er:
R07045-8007
Account Number:
45691

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TO: GRANVILLE FARMS INC
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OXFORD, NC 27565

FOR: EASTERN COMPOST
NC CERT #257

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LAB NUMBER: 40938
SAMPLE ID: FLY ASH

REPORT OF ANALYSIS

DATE SAMPLED: 2/9/2007 1130
DATE RECEIVED: 2/14/2007 1200
DATE REPORTED: 2/16/2007 PAGE: 6

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	99.94	999400	100	JM	02/14/07	16:00	SM 2540G
Moisture, Total	0.06	600	100	DH	02/16/07	9:00	EPA-160.3
Nitrogen, Total Kjeldahl	0.04	400	100	MW	02/15/07	16:00	EPA 351.3
Solids, Volatile(Organic Matter)	1.58	15800	100	JM	02/15/07	16:00	SM 2540G
C:N Ratio	22		1	DH	02/16/07	9:00	Calculation
Total Organic Carbon (Calc)	1	10000	100	DH	02/16/07	16:00	CALCULATION

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Paul Chu
PAUL C. H. CHU

Report Number:
R07040-8003
Account Number:
45691

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(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EASTERN COMPOST #3
NC CERT #257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 40860
SAMPLE ID: EASTERN COMPOST #3

DATE SAMPLED: Not Provided
DATE RECEIVED: 2/9/2007 1000
DATE REPORTED: 2/14/2007 PAGE: 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	33.25	332500	100	JM	02/09/07	16:00	SM 2540G
Moisture, Total	66.75	667500	100	JM	02/12/07	9:00	EPA-160.3
Nitrogen, Total Kjeldahl	1.77	17700	100	MW	02/12/07	16:00	EPA 351.3
Phosphorus	0.72	7200	100	JM	02/12/07	16:00	SW 846-6010B
Potassium	0.29	2900	100	JM	02/12/07	16:00	SW 846-6010B
Sulfur	0.61	6100	100	JM	02/12/07	16:00	SW 846-6010B
Calcium	0.64	6400	100	JM	02/12/07	16:00	SW 846-6010B
Magnesium	0.10	1000	100	JM	02/12/07	16:00	SW 846-6010B
Sodium	0.03	300	100	JM	02/12/07	16:00	SW 846-6010B
Iron		122055	1	JM	02/12/07	16:00	SW 846-6010B
Aluminum		5250	10	JM	02/12/07	16:00	SW 846-6010B
Manganese		4180	1	JM	02/12/07	16:00	SW 846-6010B
Copper		85	1	JM	02/12/07	15:00	SW 846-6010B
Zinc		187	1	JM	02/12/07	16:00	SW846-6010B
Nitrogen, Ammonia (as N)	0.27	2700	10	MW	02/12/07	14:00	EPA 350.2
Nitrogen, Organic (N)	1.50	15000	100	DCH			CALCULATION
Nitrogen, NO3+NO2		4	1	DH	02/12/07	15:00	SM 4500-NO3F
pH (Std. Unit, As is)	6.5		0.01	RD	02/12/07	12:30	SW 846-9045C

All values are on a dry weight basis except as noted. *Detection Limit on all N series is on a wet basis.

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Paul Chu
PAUL C. H. CHU

Report N er:
R07040-8003
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EASTERN COMPOST #3
NC CERT #257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 40860
SAMPLE ID: EASTERN COMPOST #3

DATE SAMPLED: Not Provided
DATE RECEIVED: 2/9/2007 1000
DATE REPORTED: 2/14/2007 PAGE: 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Volatile(Organic Matter)	58.39	583900	100	JM	02/12/07	16:00	SM 2540G
C:N Ratio	19		1	JM	02/12/07	9:00	Calculation
Total Organic Carbon (Calc)	34	340000	100	JM	02/12/07	16:00	CALCULATION

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PAUL C. H. CHU

Report Number:
R07040-8002
Account Number:
45691

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TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EASTERN COMPOST #2
NC CERT #257

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REPORT OF ANALYSIS

LAB NUMBER: 40859
SAMPLE ID: EASTERN COMPOST #2

DATE SAMPLED: Not Provided
DATE RECEIVED: 2/9/2007 1000
DATE REPORTED: 2/14/2007 PAGE: 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	58.00	580000	100	JM	02/09/07	16:00	SM 2540G
Moisture, Total	42.00	420000	100	JM	02/12/07	9:00	EPA-160.3
Nitrogen, Total Kjeldahl	0.75	7500	100	MW	02/12/07	16:00	EPA 351.3
Phosphorus	0.22	2200	100	JM	02/12/07	16:00	SW 846-6010B
Potassium	0.39	3900	100	JM	02/12/07	16:00	SW 846-6010B
Sulfur	1.42	14200	100	JM	02/12/07	16:00	SW 846-6010B
Calcium	5.30	53000	100	JM	02/12/07	16:00	SW 846-6010B
Magnesium	0.32	3200	100	JM	02/12/07	16:00	SW 846-6010B
Sodium	0.05	500	100	JM	02/12/07	16:00	SW 846-6010B
Iron		82200	1	JM	02/12/07	16:00	SW 846-6010B
Aluminum		11800	10	JM	02/12/07	16:00	SW 846-6010B
Manganese		3610	1	JM	02/12/07	16:00	SW 846-6010B
Copper		62	1	JM	02/12/07	15:00	SW 846-6010B
Zinc		84	1	JM	02/12/07	16:00	SW846-6010B
Nitrogen, Ammonia (as N)	0.03	300	10	MW	02/12/07	14:00	EPA 350.2
Nitrogen, Organic (N)	0.72	7200	100	DCH			CALCULATION
Nitrogen, NO3+NO2		3	1	DH	02/12/07	15:00	SM 4500-NO3F
Cadmium		2.0	1	JM	02/12/07	16:00	SW 846-6010B

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Paul Chu
PAUL C. H. CHU

Report N er:
R07040-8002
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EASTERN COMPOST #2
NC CERT #257

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REPORT OF ANALYSIS

LAB NUMBER: 40859
SAMPLE ID: EASTERN COMPOST #2

DATE SAMPLED: Not Provided
DATE RECEIVED: 2/9/2007 1000
DATE REPORTED: 2/14/2007 PAGE: 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Chromium		27	5	JM	02/12/07	16:00	SW 846-6010B
Nickel		42	5	JM	02/12/07	16:00	SW 846-6010B
Lead		< 5	5	JM	02/12/07	16:00	SW 846-6010B
Arsenic		16.6	0.2	KM	02/12/07	15:00	SW 846-7061A
Mercury		< 0.4	0.4	KM	02/13/07	15:00	SW 846-7471A
Selenium		6.4	0.2	KM	02/12/07	15:00	SW 846-7741A
pH (Std. Unit, As is)	7.7		0.01	RD	02/12/07	12:30	SW 846-9045C
Solids, Volatile(Organic Matter)	41.67	416700	100	JM	02/12/07	16:00	SM 2540G
Molybdenum		5	5	JM	02/12/07	16:00	SW 846-6010B
C:N Ratio	32		1	JM	02/12/07	9:00	Calculation
Total Organic Carbon (Calc)	24	240000	100	JM	02/12/07	16:00	CALCULATION

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PAUL C. H. CHU

Report Number:
R07040-8001
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

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(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EASTERN COMPOST #1
NC CERT #257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 40858
SAMPLE ID: EASTERN COMPOST #1

DATE SAMPLED: Not Provided
DATE RECEIVED: 2/9/2007 1000
DATE REPORTED: 2/14/2007 PAGE: 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	42.77	427700	100	JM	02/09/07	16:00	SM 2540G
Moisture, Total	57.23	572300	100	JM	02/12/07	9:00	EPA-160.3
Nitrogen, Total Kjeldahl	0.78	7800	100	MW	02/12/07	16:00	EPA 351.3
Phosphorus	0.29	2900	100	JM	02/12/07	16:00	SW 846-6010B
Potassium	0.46	4600	100	JM	02/12/07	16:00	SW 846-6010B
Sulfur	1.94	19400	100	JM	02/12/07	16:00	SW 846-6010B
Calcium	6.61	66100	100	JM	02/12/07	16:00	SW 846-6010B
Magnesium	0.39	3900	100	JM	02/12/07	16:00	SW 846-6010B
Sodium	0.05	500	100	JM	02/12/07	16:00	SW 846-6010B
Iron		83200	1	JM	02/12/07	16:00	SW 846-6010B
Aluminum		16200	10	JM	02/12/07	16:00	SW 846-6010B
Manganese		3400	1	JM	02/12/07	16:00	SW 846-6010B
Copper		60	1	JM	02/12/07	15:00	SW 846-6010B
Zinc		96	1	JM	02/12/07	16:00	SW846-6010B
Nitrogen, Ammonia (as N)	0.08	800	10	MW	02/12/07	14:00	EPA 350.2
Nitrogen, Organic (N)	0.70	7000	100	DCH			CALCULATION
Nitrogen, NO3+NO2		4	1	DH	02/12/07	15:00	SM 4500-NO3F
Cadmium		3.0	1	JM	02/12/07	16:00	SW 846-6010B

All values are on a dry weight basis except as noted. *Detection Limit on all N series is on a wet basis.

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PAUL C. H. CHU

Report N[illegible]er:
R07040-8001
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EASTERN COMPOST #1
NC CERT #257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 40858
SAMPLE ID: EASTERN COMPOST #1

DATE SAMPLED: Not Provided
DATE RECEIVED: 2/9/2007 1000
DATE REPORTED: 2/14/2007 **PAGE:** 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Chromium		47	5	JM	02/12/07	16:00	SW 846-6010B
Nickel		50	5	JM	02/12/07	16:00	SW 846-6010B
Lead		< 5	5	JM	02/12/07	16:00	SW 846-6010B
Arsenic		27.4	0.2	KM	02/12/07	15:00	SW 846-7061A
Mercury		< 0.4	0.4	KM	02/13/07	15:00	SW 846-7471A
Selenium		4.5	0.2	KM	02/12/07	15:00	SW 846-7741A
pH (Std. Unit, As is)	8.5		0.01	RD	02/12/07	12:30	SW 846-9045C
Solids, Volatile(Organic Matter)	36.78	367800	100	JM	02/12/07	16:00	SM 2540G
Molybdenum		6	5	JM	02/12/07	16:00	SW 846-6010B
C:N Ratio	27		1	JM	02/12/07	9:00	Calculation
Total Organic Carbon (Calc)	21	210000	100	JM	02/12/07	16:00	CALCULATION

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Paul Chu
PAUL C. H. CHU

Report Number:
R07204-8002
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EASTERN COMPOST

NC CERT #257

COPY: JASON SMITH

REPORT OF ANALYSIS

LAB NUMBER: 43716
SAMPLE ID: EC071807

DATE SAMPLED: 7/18/2007
DATE RECEIVED: 7/23/2007 100
DATE REPORTED: 7/26/2007 **PAGE:** 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	58.29	582900	100	JM	07/23/07	16:00	SM 2540G
Nitrogen, Total Kjeldahl	2.21	22100	100	JM	07/24/07	16:00	EPA 351.3
Phosphorus	1.09	10900	100	JM	07/24/07	16:00	SW 846-3051/6010B
Potassium	0.43	4300	100	JM	07/24/07	16:00	SW 846-3051/6010B
Sulfur	0.71	7100	100	JM	07/24/07	16:00	SW 846-3051/6010B
Calcium	0.89	8900	100	JM	07/24/07	16:00	SW 846-3051/6010B
Magnesium	0.17	1700	100	JM	07/24/07	16:00	SW 846-3051/6010B
Sodium	0.01	100	100	JM	07/24/07	16:00	SW 846-3051/6010B
Iron		104752	1	JM	07/24/07	16:00	SW 846-3051/6010B
Aluminum		7760	10	JM	07/24/07	16:00	SW 846-3051/6010B
Manganese		4880	1	JM	07/24/07	16:00	SW 846-3051/6010B
Copper		107	1	JM	07/24/07	15:00	SW 846-3051/6010B
Zinc		261	1	JM	07/24/07	16:00	SW 846-3051/6010B
Nitrogen, Ammonia (as N)	0.58	5800	10	JM	07/24/07	14:00	EPA 350.2
Nitrogen, Organic (N)	1.63	16300	100	DCH			CALCULATION
Nitrogen, NO3+NO2		187	1	KS	07/25/07	15:00	SM 4500-NO3F
pH (Std. Unit, As is)	7.26		0.01	RD	07/24/07	12:30	SW 846-9045C
Solids, Volatile(Organic Matter)	40.41	404100	100	KS	07/24/07	16:00	SM 2540G

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Paul Chu
PAUL C. H. CHU

Report N er:
R07204-8002
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EASTERN COMPOST

NC CERT #257

COPY: JASON SMITH

REPORT OF ANALYSIS

LAB NUMBER: 43716
SAMPLE ID: EC071807

DATE SAMPLED: 7/18/2007
DATE RECEIVED: 7/23/2007 100
DATE REPORTED: 7/26/2007 PAGE: 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
C:N Ratio	11		1	JM	07/24/07	9:00	Calculation
Total Organic Carbon (Calc)	23	230000	100	JM	07/24/07	16:00	CALCULATION

All values are on a dry weight basis except as noted. *Detection Limit on all N series is on a wet basis.

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Paul Chu
PAUL C. H. CHU

Report Number:
R08015-8006
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EASTERN COMPOST
NC CERT #257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 40293
SAMPLE ID: EC1011407

DATE SAMPLED: 1/14/2007 0805
DATE RECEIVED: 1/15/2008 1200
DATE REPORTED: 1/18/2008 **PAGE:** 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	47.36	473600	100	JM	01/15/08	16:00	SM 2540G
Nitrogen, Total Kjeldahl	1.48	14800	10	JM	01/16/08	16:00	EPA 351.3
Phosphorus	1.13	11300	100	DH	01/16/08	16:00	SW 846-3051/6010B
Potassium	0.19	1900	100	DH	01/16/08	16:00	SW 846-3051/6010B
Sulfur	1.16	11600	100	DH	01/16/08	16:00	SW 846-3051/6010B
Calcium	1.95	19500	100	DH	01/16/08	16:00	SW 846-3051/6010B
Magnesium	0.14	1400	100	DH	01/16/08	16:00	SW 846-3051/6010B
Sodium	0.05	500	100	DH	01/16/08	16:00	SW 846-3051/6010B
Iron		109000	1	DH	01/16/08	16:00	SW 846-3051/6010B
Aluminum		8310	10	DH	01/16/08	16:00	SW 846-3051/6010B
Manganese		4500	1	DH	01/16/08	16:00	SW 846-3051/6010B
Copper		171	1	DH	01/16/08	15:00	SW 846-3051/6010B
Zinc		509	1	DH	01/16/08	16:00	SW 846-3051/6010B
Nitrogen, Ammonia (as N)	0.10	1000	10	JM	01/16/08	14:00	EPA 350.2
Nitrogen, Organic (N)	1.38	13800	100	DCH			CALCULATION
Nitrogen, NO3+NO2		1465	1	KS	01/17/08	15:00	SM 4500-NO3F
pH (Std. Unit, As is)	5.99		0.01	RD	01/16/08	12:30	SW 846-9045C
Solids, Volatile(Organic Matter)	43.94	439400	100	JM	01/16/08	16:00	SM 2540G

All values are on a dry weight basis except as noted. *Detection Limit on all N series is on a wet basis.

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Paul Chu
PAUL C. H. CHU

Report N er:
R08015-8006
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EASTERN COMPOST
NC CERT #257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 40293
SAMPLE ID: EC1011407

DATE SAMPLED: 1/14/2007 0805
DATE RECEIVED: 1/15/2008 1200
DATE REPORTED: 1/18/2008 PAGE: 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
C:N Ratio	2		1	DH	01/16/08	9:00	Calculation
Total Organic Carbon (Calc)	26	260000	100	DH	01/16/08	16:00	CALCULATION

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Paul Chu
PAUL C. H. CHU

Report Number:
R08142-8010
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: COW PASTURE PILE
NC CERT #257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 42903
SAMPLE ID: COW PASTURE PILE

DATE SAMPLED: 5/20/2008 0830
DATE RECEIVED: 5/21/2008 1000
DATE REPORTED: 5/23/2008 PAGE: 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	41.83	418300	100	JM	05/21/08	16:00	SM 2540G
Nitrogen, Total Kjeldahl	1.64	16400	10	JM	05/22/08	16:00	EPA 351.3
Phosphorus	1.26	12600	100	KM	05/22/08	16:00	SW 846-3051/6010B
Potassium	0.19	1900	100	KM	05/22/08	16:00	SW 846-3051/6010B
Sulfur	1.24	12400	100	KM	05/22/08	16:00	SW 846-3051/6010B
Calcium	2.53	25300	100	KM	05/22/08	16:00	SW 846-3051/6010B
Magnesium	0.15	1500	100	KM	05/22/08	16:00	SW 846-3051/6010B
Sodium	0.05	500	100	KM	05/22/08	16:00	SW 846-3051/6010B
Iron		113000	1	KM	05/22/08	16:00	SW 846-3051/6010B
Aluminum		7730	10	KM	05/22/08	16:00	SW 846-3051/6010B
Manganese		4410	1	KM	05/22/08	16:00	SW 846-3051/6010B
Copper		165	1	KM	05/22/08	15:00	SW 846-3051/6010B
Zinc		494	1	KM	05/22/08	16:00	SW 846-3051/6010B
Nitrogen, Ammonia (as N)	0.00	0	10	JM	05/22/08	14:00	EPA 350.2
Nitrogen, Organic (N)	1.64	16400	100	DCH			CALCULATION
Nitrogen, NO3+NO2		3133	1	KS	05/23/08	15:00	SM 4500-NO3F
Cadmium		2.7	1	KM	05/22/08	16:00	SW 846-3051/6010B
Chromium		74	5	KM	05/22/08	16:00	SW 846-3051/6010B

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Paul Chu
PAUL C. H. CHU

Report N er:
R08142-8010
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: COW PASTURE PILE
NC CERT #257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 42903
SAMPLE ID: COW PASTURE PILE

DATE SAMPLED: 5/20/2008 0830
DATE RECEIVED: 5/21/2008 1000
DATE REPORTED: 5/23/2008 PAGE: 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Nickel		38	5	KM	05/22/08	16:00	SW 846-3051/6010B
Lead		22	5	KM	05/22/08	16:00	SW 846-3051/6010B
Arsenic		5.1	1.0	KM	05/22/08	15:00	SW 846-6010B
Mercury		0.8	0.4	KM	05/22/08	15:00	SW 846-7471A
Selenium		2.6	1.0	KM	05/22/08	15:00	SW 846-6010B
pH (Std. Unit, As is)	5.33		0.01	RD	05/22/08	12:30	SW 846-9045C
Solids, Volatile(Organic Matter)	43.23	432300	100	DH	05/22/08	16:00	SM 2540G
Molybdenum		10	5	KM	05/22/08	16:00	SW 846-3051/6010B
C:N Ratio	15		1	KM	05/22/08	9:00	Calculation
Total Organic Carbon (Calc)	25	250000	100	KM	05/22/08	16:00	CALCULATION

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PAUL C. H. CHU

Report Number:
R08326-8004
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: 200706.A10-FERRIC COMPOST
NC CERT #257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 46627
SAMPLE ID: EC112008

DATE SAMPLED: 11/20/2008 1325
DATE RECEIVED: 11/21/2008 1000
DATE REPORTED: 11/26/2008 **PAGE:** 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	37.19	371900	100	JM	11/21/08	16:00	SM 2540G
Nitrogen, Total Kjeldahl	0.71	7100	10	JM	11/24/08	16:00	SM 4500 (NorgB+NH3C)
Phosphorus	0.06	600	100	KM	11/24/08	16:00	SW 846-3051/6010B
Potassium	0.04	400	100	KM	11/24/08	16:00	SW 846-3051/6010B
Sulfur	0.28	2800	100	KM	11/24/08	16:00	SW 846-3051/6010B
Calcium	0.23	2300	100	KM	11/24/08	16:00	SW 846-3051/6010B
Magnesium	0.04	400	100	KM	11/24/08	16:00	SW 846-3051/6010B
Sodium	0.02	200	100	KM	11/24/08	16:00	SW 846-3051/6010B
Iron		126000	1	KM	11/24/08	16:00	SW 846-3051/6010B
Aluminum		3720	10	KM	11/24/08	16:00	SW 846-3051/6010B
Manganese		3820	1	KM	11/24/08	16:00	SW 846-3051/6010B
Copper		19	1	KM	11/24/08	15:00	SW 846-3051/6010B
Zinc		34	1	KM	11/24/08	16:00	SW 846-3051/6010B
Nitrogen, Ammonia (as N)	0.06	600	10	JM	11/24/08	14:00	SM 4500(NH3B+NH3C)
Nitrogen, Organic (N)	0.65	6500	100	DCH			CALCULATION
Nitrogen, NO3+NO2		79	1	KS	11/24/08	15:00	SM 4500-NO3F
pH (Std. Unit, As is)	4.92		0.01	RD	11/24/08	12:30	SW 846-9045C

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Paul Chu
PAUL C. H. CHU

Report N er:
R08291-8006
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: 200706 A10 EASTERN COMPOST

NC CERT #257

COPY: SCOTT CARPENTER

LAB NUMBER: 45630
SAMPLE ID: EC 101608 COMPOST

REPORT OF ANALYSIS

DATE SAMPLED: 10/16/2008 0950
DATE RECEIVED: 10/17/2008 1200
DATE REPORTED: 10/22/2008 PAGE: 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	45.71	457100	100	JM	10/17/08	16:00	SM 2540G
Nitrogen, Total Kjeldahl	2.06	20600	10	JM	10/20/08	16:00	SM 4500 (NorgB+NH3C)
Phosphorus	0.94	9400	100	JM	10/20/08	16:00	SW 846-3051/6010B
Potassium	0.34	3400	100	JM	10/20/08	16:00	SW 846-3051/6010B
Sulfur	0.80	8000	100	JM	10/20/08	16:00	SW 846-3051/6010B
Calcium	0.93	9300	100	JM	10/20/08	16:00	SW 846-3051/6010B
Magnesium	0.21	2100	100	JM	10/20/08	16:00	SW 846-3051/6010B
Sodium	0.07	700	100	JM	10/20/08	16:00	SW 846-3051/6010B
Iron		95500	1	JM	10/20/08	16:00	SW 846-3051/6010B
Aluminum		8720	10	JM	10/20/08	16:00	SW 846-3051/6010B
Manganese		1210	1	JM	10/20/08	16:00	SW 846-3051/6010B
Copper		125	1	JM	10/20/08	15:00	SW 846-3051/6010B
Zinc		320	1	JM	10/20/08	16:00	SW 846-3051/6010B
Nitrogen, Ammonia (as N)	0.77	7700	10	JM	10/20/08	14:00	SM 4500(NH3B+NH3C)
Nitrogen, Organic (N)	1.29	12900	100	DCH			CALCULATION
Nitrogen, NO3+NO2		228	1	KS	10/21/08	15:00	SM 4500-NO3F
Cadmium		BDL*	1	JM	10/20/08	16:00	SW 846-3051/6010B
Chromium		92	5	JM	10/20/08	16:00	SW 846-3051/6010B

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Paul Chu
PAUL C. H. CHU

Report Number:
R08291-8006
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: 200706 A10 EASTERN
COMPOST

NC CERT #257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 45630
SAMPLE ID: EC 101608 COMPOST

DATE SAMPLED: 10/16/2008 0950
DATE RECEIVED: 10/17/2008 1200
DATE REPORTED: 10/22/2008 PAGE: 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Nickel		42	5	JM	10/20/08	16:00	SW 846-3051/6010B
Lead		8	5	JM	10/20/08	16:00	SW 846-3051/6010B
Arsenic		3.9	1.0	KM	10/20/08	15:00	SW 846-6010B
Mercury		0.7	0.4	KM	10/20/08	15:00	SW 846-7471A
Selenium		2.9	1.0	KM	10/20/08	15:00	SW 846-6010B
pH (Std. Unit, As is)	7.43		0.01	CB	10/20/08	12:30	SW 846-9045C
Solids, Volatile(Organic Matter)	47.59	475900	100	JM	10/20/08	16:00	SM 2540G
Molybdenum		5	5	JM	10/20/08	16:00	SW 846-3051/6010B
C:N Ratio	13		1	DH	10/20/08	9:00	Calculation
Total Organic Carbon (Calc)	28	280000	100	DH	10/20/08	16:00	CALCULATION

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Paul Chu
PAUL C. H. CHU

Report N er:
R08142-8009
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EQUIPMENT PILE
NC CERT #257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 42902
SAMPLE ID: EQUIPMENT PILE

DATE SAMPLED: 5/20/2008 0830
DATE RECEIVED: 5/21/2008 1000
DATE REPORTED: 5/23/2008 PAGE: 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	32.35	323500	100	JM	05/21/08	16:00	SM 2540G
Nitrogen, Total Kjeldahl	0.80	8000	10	JM	05/22/08	16:00	EPA 351.3
Phosphorus	0.06	600	100	KM	05/22/08	16:00	SW 846-3051/6010B
Potassium	0.04	400	100	KM	05/22/08	16:00	SW 846-3051/6010B
Sulfur	0.41	4100	100	KM	05/22/08	16:00	SW 846-3051/6010B
Calcium	0.22	2200	100	KM	05/22/08	16:00	SW 846-3051/6010B
Magnesium	0.04	400	100	KM	05/22/08	16:00	SW 846-3051/6010B
Sodium	0.03	300	100	KM	05/22/08	16:00	SW 846-3051/6010B
Iron		104000	1	KM	05/22/08	16:00	SW 846-3051/6010B
Aluminum		4900	10	KM	05/22/08	16:00	SW 846-3051/6010B
Manganese		7920	1	KM	05/22/08	16:00	SW 846-3051/6010B
Copper		17	1	KM	05/22/08	15:00	SW 846-3051/6010B
Zinc		28	1	KM	05/22/08	16:00	SW 846-3051/6010B
Nitrogen, Ammonia (as N)	0.01	100	10	JM	05/22/08	14:00	EPA 350.2
Nitrogen, Organic (N)	0.79	7900	100	DCH			CALCULATION
Nitrogen, NO3+NO2		143	1	KS	05/23/08	15:00	SM 4500-NO3F
Cadmium		1.7	1	KM	05/22/08	16:00	SW 846-3051/6010B
Chromium		31	5	KM	05/22/08	16:00	SW 846-3051/6010B

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Paul Chu
PAUL C. H. CHU

Report Number:
R08142-8009
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EQUIPMENT PILE
NC CERT #257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 42902
SAMPLE ID: EQUIPMENT PILE

DATE SAMPLED: 5/20/2008 0830
DATE RECEIVED: 5/21/2008 1000
DATE REPORTED: 5/23/2008 PAGE: 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Nickel		18	5	KM	05/22/08	16:00	SW 846-3051/6010B
Lead		8	5	KM	05/22/08	16:00	SW 846-3051/6010B
Arsenic		2.1	1.0	KM	05/22/08	15:00	SW 846-6010B
Mercury		0.5	0.4	KM	05/22/08	15:00	SW 846-7471A
Selenium		1.8	1.0	KM	05/22/08	15:00	SW 846-6010B
pH (Std. Unit, As is)	5.24		0.01	RD	05/22/08	12:30	SW 846-9045C
Solids, Volatile(Organic Matter)	65.86	658600	100	DH	05/22/08	16:00	SM 2540G
Molybdenum		< 5	5	KM	05/22/08	16:00	SW 846-3051/6010B
C:N Ratio	48		1	KM	05/22/08	9:00	Calculation
Total Organic Carbon (Calc)	38	380000	100	KM	05/22/08	16:00	CALCULATION

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Paul Chu
PAUL C. H. CHU

Report N er:
R09050-8006
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: 200706.A10 EASTERN COM-
POST BIOSOLID COMPOST

NC CERT #257

COPY: SCOTT CARPENTER

LAB NUMBER: 41082
SAMPLE ID: EC021809

REPORT OF ANALYSIS

DATE SAMPLED: 2/18/2009 1030
DATE RECEIVED: 2/19/2009 1030
DATE REPORTED: 2/24/2009 PAGE: 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	46.77	467700	100	JM	02/19/09	16:00	SM 2540G
Nitrogen, Total Kjeldahl	2.10	21000	10	JM	02/20/09	16:00	SM 4500 (NorgB+NH3C)
Phosphorus	0.63	6300	100	KM	02/20/09	16:00	SW 846-3051/6010B
Potassium	0.36	3600	100	KM	02/20/09	16:00	SW 846-3051/6010B
Sulfur	0.65	6500	100	KM	02/20/09	16:00	SW 846-3051/6010B
Calcium	0.95	9500	100	KM	02/20/09	16:00	SW 846-3051/6010B
Magnesium	0.18	1800	100	KM	02/20/09	16:00	SW 846-3051/6010B
Sodium	0.03	300	100	KM	02/20/09	16:00	SW 846-3051/6010B
Iron		64410	1	KM	02/20/09	16:00	SW 846-3051/6010B
Aluminum		6560	10	KM	02/20/09	16:00	SW 846-3051/6010B
Manganese		629	1	KM	02/20/09	16:00	SW 846-3051/6010B
Copper		85	1	KM	02/20/09	15:00	SW 846-3051/6010B
Zinc		402	1	KM	02/20/09	16:00	SW 846-3051/6010B
Nitrogen, Ammonia (as N)	0.43	4300	10	JM	02/20/09	14:00	SM 4500(NH3B+NH3C)
Nitrogen, Organic (N)	1.67	16700	100	DCH			CALCULATION
Nitrogen, NO3+NO2		239	1	KS	02/20/09	15:00	SM 4500-NO3F
Cadmium		1.4	1	KM	02/20/09	16:00	SW 846-3051/6010B
Chromium		177	5	KM	02/20/09	16:00	SW 846-3051/6010B

All values are on a dry weight basis except as noted. Detection Limit on all N series is on a wet basis. BDL* - Below Detection Limit

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Paul Chu
PAUL C. H. CHU

Report Number:
R09050-8006
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: 200706.A10 EASTERN COM-
POST BIOSOLID COMPOST

NC CERT #257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 41082
SAMPLE ID: EC021809

DATE SAMPLED: 2/18/2009 1030
DATE RECEIVED: 2/19/2009 1030
DATE REPORTED: 2/24/2009 PAGE: 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Nickel		65	5	KM	02/20/09	16:00	SW 846-3051/6010B
Lead		13	5	KM	02/20/09	16:00	SW 846-3051/6010B
Arsenic		1.1	1.0	KM	02/20/09	15:00	SW 846-6010B
Mercury		< 0.4	0.4	KM	02/23/09	15:00	SW 846-7471A
Selenium		< 1.0	1.0	KM	02/20/09	15:00	SW 846-6010B
pH (Std. Unit, As is)	6.90		0.01	RD	02/20/09	12:30	SW 846-9045D
Solids, Volatile(Organic Matter)	56.89	568900	100	JM	02/23/09	16:00	SM 2540G
Molybdenum		BDL*	5	KM	02/20/09	16:00	SW 846-3051/6010B
C:N Ratio	16		1	DH	02/24/09	9:00	Calculation
Total Organic Carbon (Calc)	33	330000	100	DH	02/24/09	16:00	CALCULATION

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Paul Chu
PAUL C. H. CHU

Report N er:
R09050-8007
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: 200706.A10 EASTERN COM-
POST FERRIC COMPOST

NC CERT#257

COPY: SCOTT CARPENTER

LAB NUMBER: 41083
SAMPLE ID: EC021809A

REPORT OF ANALYSIS

DATE SAMPLED: 2/18/2009 1030
DATE RECEIVED: 2/19/2009 1030
DATE REPORTED: 2/24/2009 PAGE: 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	29.92	299200	100	JM	02/19/09	16:00	SM 2540G
Nitrogen, Total Kjeldahl	0.82	8200	10	JM	02/20/09	16:00	SM 4500 (NorgB+NH3C)
Phosphorus	0.08	800	100	KM	02/20/09	16:00	SW 846-3051/6010B
Potassium	0.09	900	100	KM	02/20/09	16:00	SW 846-3051/6010B
Sulfur	0.67	6700	100	KM	02/20/09	16:00	SW 846-3051/6010B
Calcium	0.34	3400	100	KM	02/20/09	16:00	SW 846-3051/6010B
Magnesium	0.06	600	100	KM	02/20/09	16:00	SW 846-3051/6010B
Sodium	0.03	300	100	KM	02/20/09	16:00	SW 846-3051/6010B
Iron		241000	1	KM	02/20/09	16:00	SW 846-3051/6010B
Aluminum		6950	10	KM	02/20/09	16:00	SW 846-3051/6010B
Manganese		10400	1	KM	02/20/09	16:00	SW 846-3051/6010B
Copper		29	1	KM	02/20/09	15:00	SW 846-3051/6010B
Zinc		56	1	KM	02/20/09	16:00	SW 846-3051/6010B
Nitrogen, Ammonia (as N)	0.07	700	10	JM	02/20/09	14:00	SM 4500(NH3B+NH3C)
Nitrogen, Organic (N)	0.75	7500	100	DCH			CALCULATION
Nitrogen, NO3+NO2		18	1	KS	02/20/09	15:00	SM 4500-NO3F
Cadmium		3.2	1	KM	02/20/09	16:00	SW 846-3051/6010B
Chromium		92	5	KM	02/20/09	16:00	SW 846-3051/6010B

All values are on a dry weight basis except as noted. Detection Limit on all N series is on a wet basis. BDL* - Below Detection Limit

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Paul Chu
PAUL C. H. CHU

Report Number:
R09050-8007
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: 200706.A10 EASTERN COM-POST FERRIC COMPOST

NC CERT#257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 41083
SAMPLE ID: EC021809A

DATE SAMPLED: 2/18/2009 1030
DATE RECEIVED: 2/19/2009 1030
DATE REPORTED: 2/24/2009 PAGE: 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Nickel		36	5	KM	02/20/09	16:00	SW 846-3051/6010B
Lead		19	5	KM	02/20/09	16:00	SW 846-3051/6010B
Arsenic		10.7	1.0	KM	02/20/09	15:00	SW 846-6010B
Mercury		< 0.4	0.4	KM	02/23/09	15:00	SW 846-7471A
Selenium		< 1.0	1.0	KM	02/20/09	15:00	SW 846-6010B
pH (Std. Unit, As is)	5.47		0.01	RD	02/20/09	12:30	SW 846-9045D
Solids, Volatile(Organic Matter)	42.40	424000	100	JM	02/23/09	16:00	SM 2540G
Molybdenum		5	5	KM	02/20/09	16:00	SW 846-3051/6010B
C:N Ratio	30		1	DH	02/24/09	9:00	Calculation
Total Organic Carbon (Calc)	25	250000	100	DH	02/24/09	16:00	CALCULATION

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PAUL C. H. CHU

Report N er:
R09100-8007
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EASTERN COMPOST
200706.A10 BIOSOLID
COMPOST
NC CERT #257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 42246
SAMPLE ID: ECO040909

DATE SAMPLED: 4/9/2009 1030
DATE RECEIVED: 4/10/2009 1000
DATE REPORTED: 4/16/2009 PAGE: 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	49.29	492900	100	JM	04/10/09	16:00	SM 2540G
Nitrogen, Total Kjeldahl	1.75	17500	10	MW	04/13/09	16:00	SM 4500 (NorgB+NH3C)
Phosphorus	0.88	8800	100	KM	04/13/09	16:00	SW 846-3051/6010B
Potassium	0.36	3600	100	KM	04/13/09	16:00	SW 846-3051/6010B
Sulfur	0.82	8200	100	KM	04/13/09	16:00	SW 846-3051/6010B
Calcium	1.04	10400	100	KM	04/13/09	16:00	SW 846-3051/6010B
Magnesium	0.19	1900	100	KM	04/13/09	16:00	SW 846-3051/6010B
Sodium	0.05	500	100	KM	04/13/09	16:00	SW 846-3051/6010B
Iron		92600	1	KM	04/13/09	16:00	SW 846-3051/6010B
Aluminum		6290	10	KM	04/13/09	16:00	SW 846-3051/6010B
Manganese		1410	1	KM	04/13/09	16:00	SW 846-3051/6010B
Copper		118	1	KM	04/13/09	15:00	SW 846-3051/6010B
Zinc		295	1	KM	04/13/09	16:00	SW 846-3051/6010B
Nitrogen, Ammonia (as N)	0.59	5900	10	MW	04/13/09	14:00	SM 4500(NH3B+NH3C)
Nitrogen, Organic (N)	1.16	11600	100	DCH			CALCULATION
Nitrogen, NO3+NO2		672	1	KS	04/15/09	15:00	SM 4500-NO3F
pH (Std. Unit, As is)	6.14		0.01	MW	04/13/09	12:30	SW 846-9045D
Solids, Volatile(Organic Matter)	47.19	471900	100	MW	04/13/09	16:00	SM 2540G

TKN CHECK IS OUT OF LIMITS. ALL OTHER QC DATA IS ACCEPTABLE.

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Paul Chu
PAUL C. H. CHU

Report Number:
R09100-8007
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EASTERN COMPOST
200706.A10 BIOSOLID
COMPOST
NC CERT #257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 42246
SAMPLE ID: ECO040909

DATE SAMPLED: 4/9/2009 1030
DATE RECEIVED: 4/10/2009 1000
DATE REPORTED: 4/16/2009 PAGE: 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
C:N Ratio	16		1	KM	04/13/09	9:00	Calculation
Total Organic Carbon (Calc)	27	270000	100	KM	04/13/09	16:00	CALCULATION

TKN CHECK IS OUT OF LIMITS. ALL OTHER QC DATA IS ACCEPTABLE.

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Paul Chu
PAUL C. H. CHU

Report N er:
R09050-8007
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: 200706.A10 EASTERN COM-
POST FERRIC COMPOST

NC CERT#257

COPY: SCOTT CARPENTER

LAB NUMBER: 41083
SAMPLE ID: EC021809A

REPORT OF ANALYSIS

DATE SAMPLED: 2/18/2009 1030
DATE RECEIVED: 2/19/2009 1030
DATE REPORTED: 2/24/2009 PAGE: 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	29.92	299200	100	JM	02/19/09	16:00	SM 2540G
Nitrogen, Total Kjeldahl	0.82	8200	10	JM	02/20/09	16:00	SM 4500 (NorgB+NH3C)
Phosphorus	0.08	800	100	KM	02/20/09	16:00	SW 846-3051/6010B
Potassium	0.09	900	100	KM	02/20/09	16:00	SW 846-3051/6010B
Sulfur	0.67	6700	100	KM	02/20/09	16:00	SW 846-3051/6010B
Calcium	0.34	3400	100	KM	02/20/09	16:00	SW 846-3051/6010B
Magnesium	0.06	600	100	KM	02/20/09	16:00	SW 846-3051/6010B
Sodium	0.03	300	100	KM	02/20/09	16:00	SW 846-3051/6010B
Iron		241000	1	KM	02/20/09	16:00	SW 846-3051/6010B
Aluminum		6950	10	KM	02/20/09	16:00	SW 846-3051/6010B
Manganese		10400	1	KM	02/20/09	16:00	SW 846-3051/6010B
Copper		29	1	KM	02/20/09	15:00	SW 846-3051/6010B
Zinc		56	1	KM	02/20/09	16:00	SW 846-3051/6010B
Nitrogen, Ammonia (as N)	0.07	700	10	JM	02/20/09	14:00	SM 4500(NH3B+NH3C)
Nitrogen, Organic (N)	0.75	7500	100	DCH			CALCULATION
Nitrogen, NO3+NO2		18	1	KS	02/20/09	15:00	SM 4500-NO3F
Cadmium		3.2	1	KM	02/20/09	16:00	SW 846-3051/6010B
Chromium		92	5	KM	02/20/09	16:00	SW 846-3051/6010B

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Paul Chu
PAUL C. H. CHU

Report Number:
R09050-8007
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: 200706.A10 EASTERN COM-
POST FERRIC COMPOST

NC CERT#257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 41083
SAMPLE ID: EC021809A

DATE SAMPLED: 2/18/2009 1030
DATE RECEIVED: 2/19/2009 1030
DATE REPORTED: 2/24/2009 PAGE: 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Nickel		36	5	KM	02/20/09	16:00	SW 846-3051/6010B
Lead		19	5	KM	02/20/09	16:00	SW 846-3051/6010B
Arsenic		10.7	1.0	KM	02/20/09	15:00	SW 846-6010B
Mercury		< 0.4	0.4	KM	02/23/09	15:00	SW 846-7471A
Selenium		< 1.0	1.0	KM	02/20/09	15:00	SW 846-6010B
pH (Std. Unit, As is)	5.47		0.01	RD	02/20/09	12:30	SW 846-9045D
Solids, Volatile(Organic Matter)	42.40	424000	100	JM	02/23/09	16:00	SM 2540G
Molybdenum		5	5	KM	02/20/09	16:00	SW 846-3051/6010B
C:N Ratio	30		1	DH	02/24/09	9:00	Calculation
Total Organic Carbon (Calc)	25	250000	100	DH	02/24/09	16:00	CALCULATION

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PAUL C. H. CHU

Report N er:
R09100-8008
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EASTERN COMPOST
200706.A10 FERRIC COMPOST

NC CERT#257

COPY: SCOTT CARPENTER

LAB NUMBER: 42247
SAMPLE ID: EC040909A

REPORT OF ANALYSIS

DATE SAMPLED: 4/9/2009 1030
DATE RECEIVED: 4/10/2009 1000
DATE REPORTED: 4/15/2009 PAGE: 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	34.33	343300	100	JM	04/10/09	16:00	SM 2540G
Nitrogen, Total Kjeldahl	0.69	6900	10	MW	04/13/09	16:00	SM 4500 (NorgB+NH3C)
Phosphorus	0.06	600	100	KM	04/13/09	16:00	SW 846-3051/6010B
Potassium	0.03	300	100	KM	04/13/09	16:00	SW 846-3051/6010B
Sulfur	0.70	7000	100	KM	04/13/09	16:00	SW 846-3051/6010B
Calcium	0.15	1500	100	KM	04/13/09	16:00	SW 846-3051/6010B
Magnesium	0.03	300	100	KM	04/13/09	16:00	SW 846-3051/6010B
Sodium	0.01	100	100	KM	04/13/09	16:00	SW 846-3051/6010B
Iron		372000	1	KM	04/13/09	16:00	SW 846-3051/6010B
Aluminum		5220	10	KM	04/13/09	16:00	SW 846-3051/6010B
Manganese		25300	1	KM	04/13/09	16:00	SW 846-3051/6010B
Copper		33	1	KM	04/13/09	15:00	SW 846-3051/6010B
Zinc		54	1	KM	04/13/09	16:00	SW 846-3051/6010B
Nitrogen, Ammonia (as N)	0.07	700	10	MW	04/13/09	14:00	SM 4500(NH3B+NH3C)
Nitrogen, Organic (N)	0.62	6200	100	DCH			CALCULATION
Nitrogen, NO3+NO2		72	1	KS	04/15/09	15:00	SM 4500-NO3F
pH (Std. Unit, As is)	4.45		0.01	MW	04/13/09	12:30	SW 846-9045D
Solids, Volatile(Organic Matter)	31.90	319000	100	MW	04/13/09	16:00	SM 2540G

TKN CHECK IS OUT OF LIMITS. ALL OTHER QC DATA IS ACCEPTABLE.

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Paul Chu
PAUL C. H. CHU

Report Number:
R09100-8008
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EASTERN COMPOST
200706.A10 FERRIC COMPOST

NC CERT#257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 42247
SAMPLE ID: EC040909A

DATE SAMPLED: 4/9/2009 1030
DATE RECEIVED: 4/10/2009 1000
DATE REPORTED: 4/15/2009 **PAGE:** 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
C:N Ratio	27		1	KM	04/13/09	9:00	Calculation
Total Organic Carbon (Calc)	19	190000	100	KM	04/13/09	16:00	CALCULATION

TKN CHECK IS OUT OF LIMITS. ALL OTHER QC DATA IS ACCEPTABLE.

All values are on a dry weight basis except as noted. Detection Limit on all N series is on a wet basis. BDL* - Below Detection Limit

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Paul Chu
PAUL C. H. CHU

Report N er:
R09162-8006
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EC061009(B)
NC CERT #257

COPY: SCOTT CARPENTER

LAB NUMBER: 43463
SAMPLE ID: EC061009 (B)

REPORT OF ANALYSIS

DATE SAMPLED: 6/10/2009 1500
DATE RECEIVED: 6/11/2009 0930
DATE REPORTED: 6/17/2009 PAGE: 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	57.29	572900	100	RD	06/11/09	16:00	SM 2540G
Nitrogen, Total Kjeldahl	1.76	17600	10	JM	06/12/09	16:00	SM 4500 (NorgB+NH3C)
Phosphorus	0.96	9600	100	KM	06/12/09	16:00	SW 846-3051/6010C
Potassium	0.26	2600	100	KM	06/12/09	16:00	SW 846-3051/6010C
Sulfur	0.55	5500	100	KM	06/12/09	16:00	SW 846-3051/6010C
Calcium	0.82	8200	100	KM	06/12/09	16:00	SW 846-3051/6010C
Magnesium	0.29	2900	100	KM	06/12/09	16:00	SW 846-3051/6010C
Sodium	0.05	500	100	KM	06/12/09	16:00	SW 846-3051/6010C
Iron		67400	1	KM	06/12/09	16:00	SW 846-3051/6010C
Aluminum		10000	10	KM	06/12/09	16:00	SW 846-3051/6010C
Manganese		1270	1	KM	06/12/09	16:00	SW 846-3051/6010C
Copper		113	1	KM	06/12/09	15:00	SW 846-3051/6010C
Zinc		297	1	KM	06/12/09	16:00	SW 846-3051/6010C
Nitrogen, Ammonia (as N)	0.37	3700	10	JM	06/12/09	14:00	SM 4500(NH3B+NH3C)
Nitrogen, Organic (N)	1.39	13900	100	DCH			CALCULATION
Nitrogen, NO3+NO2		136	1	KS	06/15/09	15:00	SM 4500-NO3F
pH (Std. Unit, As is)	6.57		0.01	RD	06/12/09	12:30	SW 846-9045D
Solids, Volatile(Organic Matter)	53.33	533300	100	JM	06/12/09	16:00	SM 2540G

All values are on a dry weight basis except as noted. Detection Limit on all N series is on a wet basis. BDL* - Below Detection Limit

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Paul Chu
PAUL C. H. CHU

Report Number:
R09162-8006
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EC061009(B)
NC CERT #257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 43463
SAMPLE ID: EC061009 (B)

DATE SAMPLED: 6/10/2009 1500
DATE RECEIVED: 6/11/2009 0930
DATE REPORTED: 6/17/2009 **PAGE:** 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
C:N Ratio	18		1	KM	06/12/09	9:00	Calculation
Total Organic Carbon (Calc)	31	310000	100	KM	06/12/09	16:00	CALCULATION

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PAUL C. H. CHU

Report N er:
R09162-8007
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EC061009(F)
NC CERT #257

COPY: SCOTT CARPENTER

LAB NUMBER: 43464
SAMPLE ID: EC061009 (F)

REPORT OF ANALYSIS

DATE SAMPLED: 6/10/2009 1530
DATE RECEIVED: 6/11/2009 0930
DATE REPORTED: 6/17/2009 PAGE: 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	31.38	313800	100	RD	06/11/09	16:00	SM 2540G
Nitrogen, Total Kjeldahl	0.68	6800	10	JM	06/12/09	16:00	SM 4500 (NorgB+NH3C)
Phosphorus	0.12	1200	100	KM	06/12/09	16:00	SW 846-3051/6010C
Potassium	0.06	600	100	KM	06/12/09	16:00	SW 846-3051/6010C
Sulfur	0.65	6500	100	KM	06/12/09	16:00	SW 846-3051/6010C
Calcium	0.26	2600	100	KM	06/12/09	16:00	SW 846-3051/6010C
Magnesium	0.05	500	100	KM	06/12/09	16:00	SW 846-3051/6010C
Sodium	0.05	500	100	KM	06/12/09	16:00	SW 846-3051/6010C
Iron		291000	1	KM	06/12/09	16:00	SW 846-3051/6010C
Aluminum		6360	10	KM	06/12/09	16:00	SW 846-3051/6010C
Manganese		9040	1	KM	06/12/09	16:00	SW 846-3051/6010C
Copper		36	1	KM	06/12/09	15:00	SW 846-3051/6010C
Zinc		64	1	KM	06/12/09	16:00	SW 846-3051/6010C
Nitrogen, Ammonia (as N)	0.07	700	10	JM	06/12/09	14:00	SM 4500(NH3B+NH3C)
Nitrogen, Organic (N)	0.61	6100	100	DCH			CALCULATION
Nitrogen, NO3+NO2		115	1	KS	06/15/09	15:00	SM 4500-NO3F
pH (Std. Unit, As is)	4.45		0.01	RD	06/12/09	12:30	SW 846-9045D
Solids, Volatile(Organic Matter)	40.06	400600	100	JM	06/12/09	16:00	SM 2540G

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Paul Chu
PAUL C. H. CHU

Report Number:
R09162-8007
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: EC061009(F)
NC CERT #257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 43464
SAMPLE ID: EC061009 (F)

DATE SAMPLED: 6/10/2009 1530
DATE RECEIVED: 6/11/2009 0930
DATE REPORTED: 6/17/2009 **PAGE:** 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
C:N Ratio	34		1	KM	06/12/09	9:00	Calculation
Total Organic Carbon (Calc)	23	230000	100	KM	06/12/09	16:00	CALCULATION

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Paul Chu
PAUL C. H. CHU

Report N er:
R08086-8004
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: 200805.A10 WAYNE COUNTY
WATER DISTRICT

NC CERT #257

COPY: SCOTT CARPENTER

LAB NUMBER: 41638
SAMPLE ID: SEW-032508

REPORT OF ANALYSIS

DATE SAMPLED: 3/25/2008 1400
DATE RECEIVED: 3/26/2008 0900
DATE REPORTED: 3/31/2008 PAGE: 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	3.13	31300	100	JM	03/26/08	16:00	SM 2540G
Nitrogen, Total Kjeldahl	0.19	1900	10	JM	03/27/08	16:00	EPA 351.3
Phosphorus	1.81	18100	100	KM	03/27/08	16:00	SW 846-3051/6010B
Potassium	0.04	400	100	KM	03/27/08	16:00	SW 846-3051/6010B
Sulfur	0.05	500	100	KM	03/27/08	16:00	SW 846-3051/6010B
Calcium	0.27	2700	100	KM	03/27/08	16:00	SW 846-3051/6010B
Magnesium	0.04	400	100	KM	03/27/08	16:00	SW 846-3051/6010B
Sodium	0.04	400	100	KM	03/27/08	16:00	SW 846-3051/6010B
Iron		254000	1	KM	03/27/08	16:00	SW 846-3051/6010B
Aluminum		21400	10	KM	03/27/08	16:00	SW 846-3051/6010B
Manganese		25700	1	KM	03/27/08	16:00	SW 846-3051/6010B
Copper		86	1	KM	03/27/08	15:00	SW 846-3051/6010B
Zinc		180	1	KM	03/27/08	16:00	SW 846-3051/6010B
Nitrogen, Ammonia (as N)	0.03	300	10	JM	03/27/08	14:00	EPA 350.2
Nitrogen, Organic (N)	0.16	1600	100	DCH			CALCULATION
Nitrogen, NO3+NO2		45	1	KS	03/31/08	15:00	SM 4500-NO3F
Cadmium		4.8	1	KM	03/27/08	16:00	SW 846-3051/6010B
Chromium		8	5	KM	03/27/08	16:00	SW 846-3051/6010B

TCLP RESULTS TO FOLLOW!!!

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Paul Chu
PAUL C. H. CHU

Report Number:
R08086-8004
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: 200805.A10 WAYNE COUNTY
WATER DISTRICT

NC CERT #257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 41638
SAMPLE ID: SEW-032508

DATE SAMPLED: 3/25/2008 1400
DATE RECEIVED: 3/26/2008 0900
DATE REPORTED: 3/31/2008 **PAGE:** 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Nickel		6	5	KM	03/27/08	16:00	SW 846-3051/6010B
Lead		13	5	KM	03/27/08	16:00	SW 846-3051/6010B
Arsenic		44.3	1.0	KM	03/27/08	15:00	SW 846-6010B
Mercury		< 0.4	0.4	KM	03/28/08	15:00	SW 846-7471A
Selenium		1.5	1.0	KM	03/27/08	15:00	SW 846-6010B
pH (Std. Unit, As is)	6.58		0.01	RD	03/27/08	12:30	SW 846-9045C
Molybdenum		< 5	5	KM	03/27/08	16:00	SW 846-3051/6010B

TCLP RESULTS TO FOLLOW!!!

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PAUL C. H. CHU

Report N er:
R08086-8003
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: 200805.A10 WAYNE COUNTY
WATER DISTRICT

NC CERT #257

COPY: SCOTT CARPENTER

LAB NUMBER: 41637
SAMPLE ID: NWW-032508

REPORT OF ANALYSIS

DATE SAMPLED: 3/25/2008 1230
DATE RECEIVED: 3/26/2008 0900
DATE REPORTED: 3/31/2008 PAGE: 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	2.88	28800	100	JM	03/26/08	16:00	SM 2540G
Nitrogen, Total Kjeldahl	0.14	1400	10	JM	03/27/08	16:00	EPA 351.3
Phosphorus	1.65	16500	100	KM	03/27/08	16:00	SW 846-3051/6010B
Potassium	0.06	600	100	KM	03/27/08	16:00	SW 846-3051/6010B
Sulfur	0.07	700	100	KM	03/27/08	16:00	SW 846-3051/6010B
Calcium	2.47	24700	100	KM	03/27/08	16:00	SW 846-3051/6010B
Magnesium	0.15	1500	100	KM	03/27/08	16:00	SW 846-3051/6010B
Sodium	0.12	1200	100	KM	03/27/08	16:00	SW 846-3051/6010B
Iron		332000	1	KM	03/27/08	16:00	SW 846-3051/6010B
Aluminum		251	10	KM	03/27/08	16:00	SW 846-3051/6010B
Manganese		107000	1	KM	03/27/08	16:00	SW 846-3051/6010B
Copper		26	1	KM	03/27/08	15:00	SW 846-3051/6010B
Zinc		1850	1	KM	03/27/08	16:00	SW 846-3051/6010B
Nitrogen, Ammonia (as N)	< 0.001	0	10	JM	03/27/08	14:00	EPA 350.2
Nitrogen, Organic (N)	0.14	1400	100	DCH			CALCULATION
Nitrogen, NO3+NO2		222	1	KS	03/31/08	15:00	SM 4500-NO3F
Cadmium		8.8	1	KM	03/27/08	16:00	SW 846-3051/6010B
Chromium		12	5	KM	03/27/08	16:00	SW 846-3051/6010B

TCLP RESULTS TO FOLLOW!!!

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Paul Chu
PAUL C. H. CHU

Report Number:
R08086-8003
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: 200805.A10 WAYNE COUNTY
WATER DISTRICT

NC CERT #257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 41637
SAMPLE ID: NWW-032508

DATE SAMPLED: 3/25/2008 1230
DATE RECEIVED: 3/26/2008 0900
DATE REPORTED: 3/31/2008 PAGE: 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Nickel		58	5	KM	03/27/08	16:00	SW 846-3051/6010B
Lead		25	5	KM	03/27/08	16:00	SW 846-3051/6010B
Arsenic		37.4	1.0	KM	03/27/08	15:00	SW 846-6010B
Mercury		< 0.4	0.4	KM	03/28/08	15:00	SW 846-7471A
Selenium		27.0	1.0	KM	03/27/08	15:00	SW 846-6010B
pH (Std. Unit, As is)	7.23		0.01	RD	03/27/08	12:30	SW 846-9045C
Molybdenum		< 5	5	KM	03/27/08	16:00	SW 846-3051/6010B

TCLP RESULTS TO FOLLOW!!!

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Paul Chu
PAUL C. H. CHU

Report N er:
R08086-8001
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: 200805.A10 WAYNE COUNTY
WATER DISTRICT

NC CERT #257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 41635
SAMPLE ID: EW3-032508

DATE SAMPLED: 3/25/2008 1030
DATE RECEIVED: 3/26/2008 0900
DATE REPORTED: 3/31/2008 PAGE: 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	2.48	24800	100	JM	03/26/08	16:00	SM 2540G
Nitrogen, Total Kjeldahl	0.56	5600	10	JM	03/27/08	16:00	EPA 351.3
Phosphorus	1.01	10100	100	KM	03/27/08	16:00	SW 846-3051/6010B
Potassium	0.12	1200	100	KM	03/27/08	16:00	SW 846-3051/6010B
Sulfur	0.04	400	100	KM	03/27/08	16:00	SW 846-3051/6010B
Calcium	1.37	13700	100	KM	03/27/08	16:00	SW 846-3051/6010B
Magnesium	0.15	1500	100	KM	03/27/08	16:00	SW 846-3051/6010B
Sodium	0.15	1500	100	KM	03/27/08	16:00	SW 846-3051/6010B
Iron		189000	1	KM	03/27/08	16:00	SW 846-3051/6010B
Aluminum		3330	10	KM	03/27/08	16:00	SW 846-3051/6010B
Manganese		71500	1	KM	03/27/08	16:00	SW 846-3051/6010B
Copper		76	1	KM	03/27/08	15:00	SW 846-3051/6010B
Zinc		839	1	KM	03/27/08	16:00	SW 846-3051/6010B
Nitrogen, Ammonia (as N)	0.12	1200	10	JM	03/27/08	14:00	EPA 350.2
Nitrogen, Organic (N)	0.44	4400	100	DCH			CALCULATION
Nitrogen, NO3+NO2		93	1	KS	03/31/08	15:00	SM 4500-NO3F
Cadmium		3.3	1	KM	03/27/08	16:00	SW 846-3051/6010B
Chromium		17	5	KM	03/27/08	16:00	SW 846-3051/6010B

TCLP RESULTS TO FOLLOW!!!

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Paul Chu
PAUL C. H. CHU

Report Number:
R08086-8001
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: 200805.A10 WAYNE COUNTY
WATER DISTRICT

NC CERT #257

COPY: SCOTT CARPENTER

REPORT OF ANALYSIS

LAB NUMBER: 41635
SAMPLE ID: EW3-032508

DATE SAMPLED: 3/25/2008 1030
DATE RECEIVED: 3/26/2008 0900
DATE REPORTED: 3/31/2008 **PAGE:** 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Nickel		< 5	5	KM	03/27/08	16:00	SW 846-3051/6010B
Lead		17	5	KM	03/27/08	16:00	SW 846-3051/6010B
Arsenic		1.4	1.0	KM	03/27/08	15:00	SW 846-6010B
Mercury		< 0.4	0.4	KM	03/28/08	15:00	SW 846-7471A
Selenium		16.7	1.0	KM	03/27/08	15:00	SW 846-6010B
pH (Std. Unit, As is)	6.77		0.01	RD	03/27/08	12:30	SW 846-9045C
Molybdenum		< 5	5	KM	03/27/08	16:00	SW 846-3051/6010B

TCLP RESULTS TO FOLLOW!!!

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Paul Chu
PAUL C. H. CHU

Primary Laboratories, Inc.

7423 Lee Davis Road, Mechanicsville, VA 23111 . Telephone (804) 559-9004 . Fax (804) 559-9306

ANALYTICAL LABORATORY REPORT

2-Apr-08 **R08086-8004**

A & L Eastern Laboratories, Inc.
Attn: Kathy Scott
7621 Whitepine Road
Richmond, Virginia 23237

GRANVILLE FARMS INC
POB 1396
OXFORD NC 27565

45691

Date Received: 27-Mar-08
Date Sampled: 25-Mar-08
Work Order No: 0803196-01
Client ID: **A&L#: 41638** **200805.A10 WAYNE CO WATER DIST**

Test Description	Final Result	Reporting Limit	Regulatory Level	Units of Measure	Standard Methods (18)	Date Analyzed	Tech. Initials
TCLP Metals							
Arsenic	<0.050	0.050	5.0	mg/L	1311/6010B	1-Apr-08	HV
Barium	0.565	0.020	100.0	mg/L	1311/6010B	1-Apr-08	HV
Cadmium	<0.010	0.010	1.0	mg/L	1311/6010B	1-Apr-08	HV
Chromium	<0.020	0.020	5.0	mg/L	1311/6010B	1-Apr-08	HV
Lead	<0.050	0.050	5.0	mg/L	1311/6010B	1-Apr-08	HV
Mercury	<0.002	0.002	0.2	mg/L	7471	1-Apr-08	HV
Selenium	<0.050	0.050	1.0	mg/L	1311/6010B	1-Apr-08	HV
Silver	<0.020	0.020	5.0	mg/L	1311/6010B	1-Apr-08	HV
TCLP Chlorinated Pesticides							
Methoxychlor	<0.0001	0.0001	10.0	mg/L	1311/8082	31-Mar-08	HV
Lindane	<0.0001	0.0001	0.4	mg/L	1311/8082	31-Mar-08	HV
Heptachlor	<0.0001	0.0001	0.008	mg/L	1311/8082	31-Mar-08	HV
Heptachlor epoxide	<0.0001	0.0001	0.008	mg/L	1311/8082	31-Mar-08	HV
Endrin	<0.0001	0.0001	0.02	mg/L	1311/8082	31-Mar-08	HV
Chlordane	<0.0005	0.0005	0.03	mg/L	1311/8082	31-Mar-08	HV
Toxaphene	<0.002	0.002	0.5	mg/L	1311/8082	31-Mar-08	HV

Primary Laboratories, Inc.
Results

2-Apr-08

Date Sampled: 25-Mar-08
Work Order No: 0803196-01
Client ID: **A&L#: 41638**

Test Description	Final Result	Reporting Limit	Regulatory Level	Units of Measure	Standard Methods (18)	Date Analyzed	Tech. Initials
TCLP Herbicides							
2,4-D	<0.01	0.01	10.0	mg/L	1311/8151A	31-Mar-08	HV
2,4,5-TP (Silvex	<0.002	0.002	1.0	mg/L	1311/8151A	31-Mar-08	HV
TCLP Volatiles							
Benzene	<0.005	0.005	0.5	mg/L	1311/8260	31-Mar-08	PB
2-Butanone (MEK)	<0.100	0.100	200.0	mg/L	1311/8260	31-Mar-08	PB
Carbon tetrachloride	<0.005	0.005	0.5	mg/L	1311/8260	31-Mar-08	PB
Chlorobenzene	<0.005	0.005	100.0	mg/L	1311/8260	31-Mar-08	PB
Chloroform	<0.005	0.005	6	mg/L	1311/8260	31-Mar-08	PB
1,2-Dichloroethane	<0.005	0.005	0.5	mg/L	1311/8260	31-Mar-08	PB
1,1-Dichloroethene	<0.005	0.005	0.7	mg/L	1311/8260	31-Mar-08	PB
Tetrachloroethene	<0.005	0.005	0.7	mg/L	1311/8260	31-Mar-08	PB
Trichloroethene	<0.005	0.005	0.5	mg/L	1311/8260	31-Mar-08	PB
Vinyl Chloride	<0.010	0.010	0.2	mg/L	1311/8260	31-Mar-08	PB
TCLP Semivolatiles							
o-Cresol	<0.010	0.010	200.0	mg/L	1311/8270C	31-Mar-08	HV
m-Cresol	<0.010	0.010	200.0	mg/L	1311/8270C	31-Mar-08	HV
p-Cresol	<0.010	0.010	200.0	mg/L	1311/8270C	31-Mar-08	HV
Cresol (Total)	<0.030	0.030	200.0	mg/L	1311/8270C	31-Mar-08	HV
1,4-Dichlorobenzene	<0.010	0.010	7.5	mg/L	1311/8270C	31-Mar-08	HV
2,4-Dinitrotoluene	<0.050	0.050	0.1	mg/L	1311/8270C	31-Mar-08	HV
Hexachlorobenzene	<0.010	0.010	0.13	mg/L	1311/8270C	31-Mar-08	HV
Hexachlorobutadiene	<0.010	0.010	0.5	mg/L	1311/8270C	31-Mar-08	HV
Hexachloroethane	<0.010	0.010	3.0	mg/L	1311/8270C	31-Mar-08	HV
Nitrobenzene	<0.010	0.010	2.0	mg/L	1311/8270C	31-Mar-08	HV
Pentachlorophenol	<0.050	0.050	100.0	mg/L	1311/8270C	31-Mar-08	HV
Pyridine	<0.020	0.020	5.0	mg/L	1311/8270C	31-Mar-08	HV
2,4,5-Trichlorophenol	<0.010	0.010	400.0	mg/L	1311/8270C	31-Mar-08	HV
2,4,6-Trichlorophenol	<0.010	0.010	2.0	mg/L	1311/8270C	31-Mar-08	HV

Primary Laboratories, Inc.
Results

2-Apr-08

Date Sampled: 25-Mar-08
Work Order No: 0803196-01
Client ID: **A&L#: 41638**

Test Description	Final Result	Reporting Limit	Units of Measure	Standard Methods	Date Analyzed	Tech. Initials
Reactivity						
Cyanide	<1	1	mg/Kg	SW 846	1-Apr-08	AS
Sufide	<0.05	0.05	mg/Kg	Chap. 7.3	1-Apr-08	NA
Corrosivity	Non-corrosive	-	-	SW 846 Chap. 7.2	28-Mar-08	AS
Flash Point	>140	140	Degree F	1010	28-Mar-08	AS

Note: Samples received in laboratory on ice.

Signature: David B. Stoneman / for
Parry L. Bragg
Laboratory Manager

Date: 4/2/08

These analytical results are based upon materials provided by the client and are intended for the exclusive use of the client. These analytical results represent the best judgement of Primary Laboratories, Inc. Primary Laboratories, Inc. assumes no responsibility, express or implied, as to the interpretation of the analytical results contained in this report. This report is not to be reproduced except with the written approval of Primary Laboratories, Inc.

Report Number:
R09162-8008
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

Cell Cream

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: AJ 061009
NC CERT #257

COPY: SCOTT CARPENTER

LAB NUMBER: 43465
SAMPLE ID: AJ061009

REPORT OF ANALYSIS

DATE SAMPLED: 6/10/2009 0800
DATE RECEIVED: 6/11/2009 0800
DATE REPORTED: 6/17/2009 PAGE: 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	16.34	163400	100	RD	06/11/09	16:00	SM 2540G
Nitrogen, Total Kjeldahl	12.88	128800	10	JM	06/12/09	16:00	SM 4500 (NorgB+NH3C)
Phosphorus	0.73	7300	100	KM	06/12/09	16:00	SW 846-3051/6010C
Potassium	0.21	2100	100	KM	06/12/09	16:00	SW 846-3051/6010C
Sulfur	1.28	12800	100	KM	06/12/09	16:00	SW 846-3051/6010C
Calcium	0.08	800	100	KM	06/12/09	16:00	SW 846-3051/6010C
Magnesium	0.02	200	100	KM	06/12/09	16:00	SW 846-3051/6010C
Sodium	0.07	700	100	KM	06/12/09	16:00	SW 846-3051/6010C
Iron		498	1	KM	06/12/09	16:00	SW 846-3051/6010C
Aluminum		53	10	KM	06/12/09	16:00	SW 846-3051/6010C
Manganese		17	1	KM	06/12/09	16:00	SW 846-3051/6010C
Copper		5	1	KM	06/12/09	15:00	SW 846-3051/6010C
Zinc		BDL*	1	KM	06/12/09	16:00	SW 846-3051/6010C
Nitrogen, Ammonia (as N)	0.50	5000	10	JM	06/12/09	14:00	SM 4500(NH3B+NH3C)
Nitrogen, Organic (N)	12.38	123800	100	DCH			CALCULATION
Nitrogen, NO3+NO2		10	1	KS	06/15/09	15:00	SM 4500-NO3F
Cadmium		BDL*	1	KM	06/12/09	16:00	SW 846-3051/6010C
Chromium		5	5	KM	06/12/09	16:00	SW 846-3051/6010C

All values are on a dry weight basis except as noted. Detection Limit on all N series is on a wet basis. BDL* - Below Detection Limit

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Paul Chu
PAUL C. H. CHU

Report N er:
R09162-8008
Account Number:
45691

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: GRANVILLE FARMS INC
POB 1396
OXFORD, NC 27565

FOR: AJ 061009
NC CERT #257

COPY: SCOTT CARPENTER

LAB NUMBER: 43465
SAMPLE ID: AJ061009

REPORT OF ANALYSIS

DATE SAMPLED: 6/10/2009 0800
DATE RECEIVED: 6/11/2009 0800
DATE REPORTED: 6/17/2009 PAGE: 2

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Nickel		BDL*	5	KM	06/12/09	16:00	SW 846-3051/6010C
Lead		BDL*	5	KM	06/12/09	16:00	SW 846-3051/6010C
Arsenic		< 1.0	1.0	KM	06/12/09	15:00	SW 846-3051/6010C
Mercury		< 0.4	0.4	KM	06/12/09	15:00	SW 846-7471A
Selenium		< 1.0	1.0	KM	06/12/09	15:00	SW 846-6010C
pH (Std. Unit, As is)	3.03		0.01	RD	06/12/09	12:30	SW 846-9045D
Molybdenum		BDL*	5	KM	06/12/09	16:00	SW 846-3051/6010C

All values are on a dry weight basis except as noted. Detection Limit on all N series is on a wet basis. BDL* - Below Detection Limit

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Paul Chu
PAUL C. H. CHU

CORNERSTONE LABORATORIES, LLC

AJINOMOTO **October 2, 2009**

ACCOUNT #: 09-0301 **REPORT NUMBER: 266-09-007**

TCLP Metals

Laboratory Number: 65431

Sample ID: Cell Cream
Tumbled: September 24, 2009

Analysis	Result	Regulatory Limit	Method	Date/Time Analyzed	Analyst
Arsenic	<0.050 mg/L	5.0 mg/L	6010B	09/25/09 13:09	M. Blum
Barium	0.596 mg/L	100.0 mg/L	6010B	09/25/09 13:09	M. Blum
Cadmium	<0.050 mg/L	1.0 mg/L	6010B	09/25/09 13:09	M. Blum
Chromium	0.071 mg/L	5.0 mg/L	6010B	09/25/09 13:09	M. Blum
Lead	<0.050 mg/L	5.0 mg/L	6010B	09/25/09 13:09	M. Blum
Mercury	<0.009 mg/L	0.2 mg/L	7040	09/28/09 09:00	T. Tran
Selenium	0.449 mg/L	1.0 mg/L	6010B	09/25/09 13:09	M. Blum
Silver	<0.010 mg/L	5.0 mg/L	6010B	09/25/09 13:09	M. Blum

TCLP Volatiles

Laboratory Number: 65431

Sample ID: Cell Cream
Tumbled: September 24, 2009

Analysis	Result	Regulatory Limit	Method	Date/Time Analyzed	Analyst
Benzene	<0.100 mg/L	0.5 mg/L	8260B	09/28/09 16:23	K. Shinn
Carbon Tetrachloride	<0.100 mg/L	0.5 mg/L	8260B	09/28/09 16:23	K. Shinn
Chlorobenzene	<0.100 mg/L	100.0 mg/L	8260B	09/28/09 16:23	K. Shinn
Chloroform	<0.100 mg/L	6.0 mg/L	8260B	09/28/09 16:23	K. Shinn
1,4-Dichlorobenzene	<0.100 mg/L	7.5 mg/L	8260B	09/28/09 16:23	K. Shinn
1,2-Dichloroethane	<0.100 mg/L	0.5 mg/L	8260B	09/28/09 16:23	K. Shinn
1,1-Dichloroethylene	<0.100 mg/L	0.7 mg/L	8260B	09/28/09 16:23	K. Shinn
Methyl Ethyl Ketone	<0.100 mg/L	200.0 mg/L	8260B	09/28/09 16:23	K. Shinn
Tetrachloroethylene	<0.100 mg/L	0.7 mg/L	8260B	09/28/09 16:23	K. Shinn
Trichloroethylene	<0.100 mg/L	0.5 mg/L	8260B	09/28/09 16:23	K. Shinn
Vinyl Chloride	<0.100 mg/L	0.2 mg/L	8260B	09/28/09 16:23	K. Shinn

CORNERSTONE LABORATORIES, LLC

AJINOMOTO **October 2, 2009**

ACCOUNT #: 09-0301 **REPORT NUMBER: 266-09-007**

TCLP Extractables

Laboratory Number: 65431

Sample ID: Cell Cream
Tumbled: September 24, 2009

Analysis	Result	Regulatory Limit	Method	Date/Time Analyzed	Analyst
Cresol (Total)	<1.200 mg/L	200.0 mg/L	8270C	09/29/09 11:10	K. Shinn
2,4-Dinitrotoluene	<0.040 mg/L	0.13 mg/L	8270C	09/29/09 11:10	K. Shinn
Hexachlorobenzene	<0.040 mg/L	0.13 mg/L	8270C	09/29/09 11:10	K. Shinn
Hexachloro-1,3-butadiene	<0.040 mg/L	0.5 mg/L	8270C	09/29/09 11:10	K. Shinn
Hexachloroethane	<0.040 mg/L	3.0 mg/L	8270C	09/29/09 11:10	K. Shinn
Nitrobenzene	<0.040 mg/L	2.0 mg/L	8270C	09/29/09 11:10	K. Shinn
Pentachlorophenol	<0.040 mg/L	100.0 mg/L	8270C	09/29/09 11:10	K. Shinn
Pyridine	<0.200 mg/L	5.0 mg/L	8270C	09/29/09 11:10	K. Shinn
2,4,5-Trichlorophenol	<0.040 mg/L	400.0 mg/L	8270C	09/29/09 11:10	K. Shinn
2,4,6-Trichlorophenol	<0.040 mg/L	2.0 mg/L	8270C	09/29/09 11:10	K. Shinn

TCLP Pesticides

Laboratory Number: 65431

Sample ID: Cell Cream
Tumbled: September 24, 2009

Analysis	Result	Regulatory Limit	Method	Date/Time Analyzed	Analyst
Chlordane	<0.0005 mg/L	0.0300 mg/L	8081B	09/30/09 11:29	S. LaBonia
Endrin	<0.0005 mg/L	0.0200 mg/L	8081B	09/30/09 11:29	S. LaBonia
Heptachlor	<0.0005 mg/L	0.0080 mg/L	8081B	09/30/09 11:29	S. LaBonia
Heptachlor Epoxide	<0.0005 mg/L	0.0080 mg/L	8081B	09/30/09 11:29	S. LaBonia
Lindane	<0.0005 mg/L	0.4000 mg/L	8081B	09/30/09 11:29	S. LaBonia
Methoxychlor	<0.0005 mg/L	10.0000 mg/L	8081B	09/30/09 11:29	S. LaBonia
Toxaphene	<0.0050 mg/L	0.5000 mg/L	8081B	09/30/09 11:29	S. LaBonia

TCLP Herbicides

Laboratory Number: 65431

Sample ID: Cell Cream
Tumbled: September 24, 2009

Analysis	Result	Regulatory Limit	Method	Date/Time Analyzed	Analyst
2,4-D	<0.02 mg/L	10.00 mg/L	8151A	10/01/09 10:19	S. LaBonia
Silvex	<0.02 mg/L	1.00 mg/L	8151A	10/01/09 10:19	S. LaBonia

CORNERSTONE LABORATORIES, LLC

AJINOMOTO **October 2, 2009**

ACCOUNT #: 09-0301 **REPORT NUMBER: 266-09-007**

Residual Soil Testing Results

Laboratory Number: 65429 **Sample ID: Bio Solids**

Analysis	Result	Detection Limit	Method	Date/Time Analyzed	Analyst
Aluminum	46.1 mg/Kg	0.1 mg/Kg	6010B	09/25/09 10:56	M. Blum
Arsenic	<0.1 mg/Kg	0.1 mg/Kg	6010B	09/25/09 10:56	M. Blum
Cadmium	<0.1 mg/Kg	0.1 mg/Kg	6010B	09/25/09 10:56	M. Blum
Calcium	224.3 mg/Kg	0.1 mg/Kg	6010B	09/25/09 10:56	M. Blum
Copper	3.9 mg/Kg	0.1 mg/Kg	6010B	09/25/09 10:56	M. Blum
Lead	0.8 mg/Kg	0.1 mg/Kg	6010B	09/25/09 10:56	M. Blum
Magnesium	779.3 mg/Kg	0.1 mg/Kg	6010B	09/25/09 10:56	M. Blum
Mercury	<0.009 mg/Kg	0.009 mg/Kg	7040A	09/28/09 11:00	T. Tran
Molybdenum	<0.1 mg/Kg	0.1 mg/Kg	6010B	09/25/09 10:56	M. Blum
Nickel	1.5 mg/Kg	0.1 mg/Kg	6010B	09/25/09 10:56	M. Blum
Phosphorous	24 mg/Kg	10 mg/Kg	6010B	09/25/09 10:56	M. Blum
Potassium	1,195 mg/Kg	10 mg/Kg	6010B	09/25/09 10:56	M. Blum
Selenium	0.6 mg/Kg	0.1 mg/Kg	6010B	09/25/09 10:56	M. Blum
Sodium	1,548 mg/Kg	10 mg/Kg	6010B	09/25/09 10:56	M. Blum
Zinc	34.7 mg/Kg	0.1 mg/Kg	6010B	09/25/09 10:56	M. Blum
Ammonia-Nitrogen	1,563 mg/Kg	100 mg/Kg	AOAC	10/01/09 09:00	M. Blum
Nitrate-Nitrite Nitrogen	3,210 mg/Kg	100 mg/Kg	AOAC	10/01/09 14:00	M. Blum
TKN	4,890 mg/Kg	100 mg/Kg	AOAC	10/01/09 08:15	M. Blum
Total Solids	17.6 %	0.1 %	AOAC	10/01/09 15:00	M. Blum
pH	8.17 s.u.	1-14 s.u.	AOAC	10/01/09 08:00	M. Blum
SAR	15.2	N/A	Calculation	10/02/09 11:00	S. LaBonia

CORNERSTONE LABORATORIES, LLC

AJINOMOTO **October 2, 2009**

ACCOUNT #: 09-0301 **REPORT NUMBER: 266-09-007**

TCLP Metals

Laboratory Number: 65429

Sample ID: Bio Solids
Tumbled: September 24, 2009

ANALYSIS	RESULT	Regulatory Limit	METHOD	DATE/TIME ANALYZED	ANALYST
Arsenic	<0.050 mg/L	5.0 mg/L	6010B	09/25/09 13:12	M. Blum
Barium	0.543 mg/L	100.0 mg/L	6010B	09/25/09 13:12	M. Blum
Cadmium	<0.050 mg/L	1.0 mg/L	6010B	09/25/09 13:12	M. Blum
Chromium	0.212 mg/L	5.0 mg/L	6010B	09/25/09 13:12	M. Blum
Lead	<0.050 mg/L	5.0 mg/L	6010B	09/25/09 13:12	M. Blum
Mercury	<0.009 mg/L	0.2 mg/L	7040	09/28/09 09:00	T. Tran
Selenium	<0.050 mg/L	1.0 mg/L	6010B	09/25/09 13:12	M. Blum
Silver	<0.010 mg/L	5.0 mg/L	6010B	09/25/09 13:12	M. Blum

TCLP Volatiles

Laboratory Number: 65429

Sample ID: Bio Solids
Tumbled: September 24, 2009

ANALYSIS	RESULT	Regulatory Limit	METHOD	DATE/TIME ANALYZED	ANALYST
Benzene	<0.100 mg/L	0.5 mg/L	8260B	09/28/09 17:01	K. Shinn
Carbon Tetrachloride	<0.100 mg/L	0.5 mg/L	8260B	09/28/09 17:01	K. Shinn
Chlorobenzene	<0.100 mg/L	100.0 mg/L	8260B	09/28/09 17:01	K. Shinn
Chloroform	<0.100 mg/L	6.0 mg/L	8260B	09/28/09 17:01	K. Shinn
1,4-Dichlorobenzene	<0.100 mg/L	7.5 mg/L	8260B	09/28/09 17:01	K. Shinn
1,2-Dichloroethane	<0.100 mg/L	0.5 mg/L	8260B	09/28/09 17:01	K. Shinn
1,1-Dichloroethylene	<0.100 mg/L	0.7 mg/L	8260B	09/28/09 17:01	K. Shinn
Methyl Ethyl Ketone	<0.100 mg/L	200.0 mg/L	8260B	09/28/09 17:01	K. Shinn
Tetrachloroethylene	<0.100 mg/L	0.7 mg/L	8260B	09/28/09 17:01	K. Shinn
Trichloroethylene	<0.100 mg/L	0.5 mg/L	8260B	09/28/09 17:01	K. Shinn
Vinyl Chloride	<0.100 mg/L	0.2 mg/L	8260B	09/28/09 17:01	K. Shinn

CORNERSTONE LABORATORIES, LLC

AJINOMOTO **October 2, 2009**

ACCOUNT #: 09-0301 **REPORT NUMBER: 266-09-007**

TCLP Extractables

Laboratory Number: 65429

Sample ID: Bio Solids
Tumbled: September 24, 2009

ANALYSIS	RESULT	Regulatory Limit	METHOD	DATE/TIME ANALYZED	ANALYST
Cresol (Total)	<1.200 mg/L	200.0 mg/L	8270C	09/29/09 11:54	K. Shinn
2,4-Dinitrotoluene	<0.040 mg/L	0.13 mg/L	8270C	09/29/09 11:54	K. Shinn
Hexachlorobenzene	<0.040 mg/L	0.13 mg/L	8270C	09/29/09 11:54	K. Shinn
Hexachloro-1,3-butadiene	<0.040 mg/L	0.5 mg/L	8270C	09/29/09 11:54	K. Shinn
Hexachloroethane	<0.040 mg/L	3.0 mg/L	8270C	09/29/09 11:54	K. Shinn
Nitrobenzene	<0.040 mg/L	2.0 mg/L	8270C	09/29/09 11:54	K. Shinn
Pentachlorophenol	<0.040 mg/L	100.0 mg/L	8270C	09/29/09 11:54	K. Shinn
Pyridine	<0.200 mg/L	5.0 mg/L	8270C	09/29/09 11:54	K. Shinn
2,4,5-Trichlorophenol	<0.040 mg/L	400.0 mg/L	8270C	09/29/09 11:54	K. Shinn
2,4,6-Trichlorophenol	<0.040 mg/L	2.0 mg/L	8270C	09/29/09 11:54	K. Shinn

TCLP Pesticides

Laboratory Number: 65429

Sample ID: Bio Solids
Tumbled: September 24, 2009

ANALYSIS	RESULT	Regulatory Limit	METHOD	DATE/TIME ANALYZED	ANALYST
Chlordane	<0.0005 mg/L	0.0300 mg/L	8081B	09/30/09 12:05	S. LaBonia
Endrin	<0.0005 mg/L	0.0200 mg/L	8081B	09/30/09 12:05	S. LaBonia
Heptachlor	<0.0005 mg/L	0.0080 mg/L	8081B	09/30/09 12:05	S. LaBonia
Heptachlor Epoxide	<0.0005 mg/L	0.0080 mg/L	8081B	09/30/09 12:05	S. LaBonia
Lindane	<0.0005 mg/L	0.4000 mg/L	8081B	09/30/09 12:05	S. LaBonia
Methoxychlor	<0.0005 mg/L	10.0000 mg/L	8081B	09/30/09 12:05	S. LaBonia
Toxaphene	<0.0050 mg/L	0.5000 mg/L	8081B	09/30/09 12:05	S. LaBonia

TCLP Herbicides

Laboratory Number: 65429

Sample ID: Bio Solids
Tumbled: September 24, 2009

ANALYSIS	RESULT	Regulatory Limit	METHOD	DATE/TIME ANALYZED	ANALYST
2,4-D	<0.02 mg/L	10.00 mg/L	8151A	10/01/09 09:21	S. LaBonia
Silvex	<0.02 mg/L	1.00 mg/L	8151A	10/01/09 09:21	S. LaBonia

Report N[illegible]er:
R09160-8004
Account Number:
46974

A&L EASTERN LABORATORIES, INC.

7621 Whitepine Road • Richmond, Virginia 23237
(804) 743-9401 • Fax No. (804) 271-6446

TO: AJINOMOTO
4020 AJNOMOTO DR
RALEIGH, NC 27610

FOR: PO#07200 SLUDGE CAKE
NC CERT #257

COPY: KEVIN ADAMS

LAB NUMBER: 43411
SAMPLE ID: SLUDGE CAKE

REPORT OF ANALYSIS

DATE SAMPLED: 6/8/2009
DATE RECEIVED: 6/9/2009 1000
DATE REPORTED: 6/12/2009 PAGE: 1

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE	ANALYSIS TIME	METHOD
Solids, Total (As is)	16.88	168800	100	JM	06/09/09	16:00	SM 2540G
Nitrogen, Total Kjeldahl	8.68	86800	10	JM	06/10/09	16:00	SM 4500 (NorgB+NH3C)
Nitrogen, Ammonia (as N)	0.30	3000	10	JM	06/10/09	14:00	SM 4500(NH3B+NH3C)
Nitrogen, Organic (N)	8.38	83800	100	DCH			CALCULATION
Nitrogen, NO3+NO2		14	1	KS	06/10/09	15:00	SM 4500-NO3F

All values are on a dry weight basis except as noted. Detection Limit on all N series is on a wet basis. BDL* - Below Detection Limit

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Paul Chu
PAUL C. H. CHU

NCDA&CS Agronomic Division Phone: (919)733-2655 Web site: www.ncagr.gov/agronomi/ **Report: W08689**

Waste Analysis Report

06/08/2009

Grower: **Ajinomoto**
4020 Ajinomoto Dr*
Raleigh, NC 27610

Farm: Attn: William Gibson

Wake County

Copies to: Faw, Gary

Sample Information | **Laboratory Results (parts per million unless otherwise noted)**

Sample ID: BS0603

Waste Code: IOE

Description: Indust.-Other (Aer)

N	*P*	*K*	*Ca*	*Mg*	*S*	*Fe*	*Mn*	*Zn*	*Cu*	*B*	*Mo*	*Cl*	*C*
Total 78574	7240	6819	2154	1473	6992	595	36.6	42.4	17.7	26.2			
IN-N 412													
-NH4 407													
-NO3 4.76	*Na*	*Ni*	*Cd*	*Pb*	*Al*	*Se*	*Li*	*pH*	*SS*	*C:N*	*DM%*	*CCE%*	ALE(tons)
OR-N	12309										17.14		
Urea 34.7													

Recommendations:

Application Method	*N*	*P2O5*	*K2O*	*Ca*	*Mg*	*S*	*Fe*	*Mn*	*Zn*	*Cu*	*B*	*Mo*	*Cl*
	Nutrients Available for First Crop										***lbs/ton (wet basis)***		
Broadcast	10.8	3.4	2.2	0.44	0.30	1.4	0.12	0.01	0.01	T	0.01		
Soil Incorp	13.5	4.3	2.5	0.55	0.38	1.8	0.15	0.01	0.01	T	0.01		

Other Elements	*Na*	*Ni*	*Cd*	*Pb*	*Al*	*Se*	*Li*
	lbs/ton (wet basis)						
Broadcast	4.2						
Soil Incorp	4.2						

Completed: 6/8/2009

North Carolina
Tobacco Trust Fund Commission

Reprogramming of the laboratory-information-management system that makes this report possible is being funded through a grant from the North Carolina Tobacco Trust Fund Commission.

Thank you for using agronomic services to manage nutrients and safeguard environmental quality.
- Steve Troxler, Commissioner of Agriculture

Report Number: 09-310-0203
Account Number: 45691
Submitted By: SCOTT CARPENTER

A&L Eastern Laboratories, Inc.
7621 Whitepine Road Richmond, Virginia 23237 (804) 743-9401 Fax (804) 271-6446
www.al-labs-eastern.com

Send To: GRANVILLE FARMS INC
POB 1396
OXFORD , NC 27565

Project : AJ 110309
NC CERT #257

REPORT OF ANALYSIS

Lab Number : 73471
Sample Id : AJ 110309

Date Sampled: 11/03/2009 10:30
Date Received: 11/06/2009 00:00
Date Reported: 11/10/2009

PARAMETER	RESULT (%)	RESULT (mg/kg)	DETECTION LIMIT (mg/kg*)	ANALYST	ANALYSIS DATE/TIME	METHOD
Total Solids *	16.11	161100	100.0	JM	11/06/2009 15:29	SM-2540G
Moisture *	83.89		100.0	JM	11/06/2009 15:29	SM-2540G
Total Calcium	0.31	3100	100	KM	11/09/2009 08:20	SW-6010B
Total Magnesium	0.34	3400	100	KM	11/09/2009 08:20	SW-6010B
Total Sodium	0.97	9670	100	KM	11/09/2009 08:20	SW-6010B

All values are on a dry weight basis except as noted by asterisk. Detection limit on all N series is on a wet basis.

Our reports and letters are for the exclusive and confidential use of our clients, and may not be reproduced in whole or part, nor may any reference be made to the work, the results, or the company in any advertising, news release, or other public announcements without obtaining our prior written authorization.

Oscar Ruiz

CORNERSTONE LABORATORIES, LLC

AJINOMOTO **October 2, 2009**

ACCOUNT #: 09-0301 **REPORT NUMBER: 266-09-007**

TCLP Metals

Laboratory Number: 65430

Sample ID: Carbon
Tumbled: September 24, 2009

Analysis	Result	Regulatory Limit	Method	Date/Time Analyzed	Analyst
Arsenic	<0.050 mg/L	5.0 mg/L	6010B	09/25/09 13:06	M. Blum
Barium	0.867 mg/L	100.0 mg/L	6010B	09/25/09 13:06	M. Blum
Cadmium	<0.050 mg/L	1.0 mg/L	6010B	09/25/09 13:06	M. Blum
Chromium	0.076 mg/L	5.0 mg/L	6010B	09/25/09 13:06	M. Blum
Lead	<0.050 mg/L	5.0 mg/L	6010B	09/25/09 13:06	M. Blum
Mercury	<0.009 mg/L	0.2 mg/L	7040	09/28/09 09:00	T. Tran
Selenium	<0.050 mg/L	1.0 mg/L	6010B	09/25/09 13:06	M. Blum
Silver	<0.010 mg/L	5.0 mg/L	6010B	09/25/09 13:06	M. Blum

TCLP Volatiles

Laboratory Number: 65430

Sample ID: Carbon
Tumbled: September 24, 2009

Analysis	Result	Regulatory Limit	Method	Date/Time Analyzed	Analyst
Benzene	<0.100 mg/L	0.5 mg/L	8260B	09/28/09 15:44	K. Shinn
Carbon Tetrachloride	<0.100 mg/L	0.5 mg/L	8260B	09/28/09 15:44	K. Shinn
Chlorobenzene	<0.100 mg/L	100.0 mg/L	8260B	09/28/09 15:44	K. Shinn
Chloroform	<0.100 mg/L	6.0 mg/L	8260B	09/28/09 15:44	K. Shinn
1,4-Dichlorobenzene	<0.100 mg/L	7.5 mg/L	8260B	09/28/09 15:44	K. Shinn
1,2-Dichloroethane	<0.100 mg/L	0.5 mg/L	8260B	09/28/09 15:44	K. Shinn
1,1-Dichloroethylene	<0.100 mg/L	0.7 mg/L	8260B	09/28/09 15:44	K. Shinn
Methyl Ethyl Ketone	<0.100 mg/L	200.0 mg/L	8260B	09/28/09 15:44	K. Shinn
Tetrachloroethylene	<0.100 mg/L	0.7 mg/L	8260B	09/28/09 15:44	K. Shinn
Trichloroethylene	<0.100 mg/L	0.5 mg/L	8260B	09/28/09 15:44	K. Shinn
Vinyl Chloride	<0.100 mg/L	0.2 mg/L	8260B	09/28/09 15:44	K. Shinn

CORNERSTONE LABORATORIES, LLC

AJINOMOTO **October 2, 2009**

ACCOUNT #: 09-0301 **REPORT NUMBER: 266-09-007**

TCLP Extractables

Laboratory Number: 65430

Sample ID: Carbon
Tumbled: September 24, 2009

Analysis	Result	Regulatory Limit	Method	Date/Time Analyzed	Analyst
Cresol (Total)	<1.200 mg/L	200.0 mg/L	8270C	09/29/09 10:26	K. Shinn
2,4-Dinitrotoluene	<0.040 mg/L	0.13 mg/L	8270C	09/29/09 10:26	K. Shinn
Hexachlorobenzene	<0.040 mg/L	0.13 mg/L	8270C	09/29/09 10:26	K. Shinn
Hexachloro-1,3-butadiene	<0.040 mg/L	0.5 mg/L	8270C	09/29/09 10:26	K. Shinn
Hexachloroethane	<0.040 mg/L	3.0 mg/L	8270C	09/29/09 10:26	K. Shinn
Nitrobenzene	<0.040 mg/L	2.0 mg/L	8270C	09/29/09 10:26	K. Shinn
Pentachlorophenol	<0.040 mg/L	100.0 mg/L	8270C	09/29/09 10:26	K. Shinn
Pyridine	<0.200 mg/L	5.0 mg/L	8270C	09/29/09 10:26	K. Shinn
2,4,5-Trichlorophenol	<0.040 mg/L	400.0 mg/L	8270C	09/29/09 10:26	K. Shinn
2,4,6-Trichlorophenol	<0.040 mg/L	2.0 mg/L	8270C	09/29/09 10:26	K. Shinn

TCLP Pesticides

Laboratory Number: 65430

Sample ID: Carbon
Tumbled: September 24, 2009

Analysis	Result	Regulatory Limit	Method	Date/Time Analyzed	Analyst
Chlordane	<0.0005 mg/L	0.0300 mg/L	8081B	09/30/09 10:53	S. LaBonia
Endrin	<0.0005 mg/L	0.0200 mg/L	8081B	09/30/09 10:53	S. LaBonia
Heptachlor	<0.0005 mg/L	0.0080 mg/L	8081B	09/30/09 10:53	S. LaBonia
Heptachlor Epoxide	<0.0005 mg/L	0.0080 mg/L	8081B	09/30/09 10:53	S. LaBonia
Lindane	<0.0005 mg/L	0.4000 mg/L	8081B	09/30/09 10:53	S. LaBonia
Methoxychlor	<0.0005 mg/L	10.0000 mg/L	8081B	09/30/09 10:53	S. LaBonia
Toxaphene	<0.0050 mg/L	0.5000 mg/L	8081B	09/30/09 10:53	S. LaBonia

TCLP Herbicides

Laboratory Number: 65430

Sample ID: Carbon
Tumbled: September 24, 2009

Analysis	Result	Regulatory Limit	Method	Date/Time Analyzed	Analyst
2,4-D	<0.02 mg/L	10.00 mg/L	8151A	10/01/09 09:50	S. LaBonia
Silvex	<0.02 mg/L	1.00 mg/L	8151A	10/01/09 09:50	S. LaBonia

Report Number
09-300-0214 **Page:** 1 of 2

Account Number
46974

Send To: AJINOMOTO
4020 AJNOMOTO DR
RALEIGH , NC 27610

A&L Eastern Laboratories, Inc.

7621 Whitepine Road Richmond, Virginia 23237 (804) 743-9401 Fax (804) 271-6446

www.al-labs-eastern.com

Submitted By: GARY FAW
Purchase Order : 09446
Report Date : 10/30/2009
Date Received : 10/27/2009

Project : AMINO ACID MIXTURE

REPORT OF ANALYSIS

Date Sampled :

Lab Number: 73307
Sample Id : AAMIX

Analysis	Result	Quantitation Limit	Method	Date and Time Test Started	Analyst
pH (as received) , s.u.	8.25		SW-9045D	10/28/2009 09:00	JM
Available Phosphorus as P2O5 , %	0.06	0.01	AOAC 993.31	10/28/2009 10:20	KM
Available Potassium (as K2O) , %	0.050	0.010	AOAC 983.02	10/28/2009 10:20	KM
Specific Gravity , g/mL	0.639	0.001	ASTM D-1298-85	10/28/2009 14:00	JM
Total Nitrogen , %	18.3	0.01	AOAC 2.4.02	10/28/2009 10:30	BB
Phosphorus (as P2O5) , %	0.14	0.01	AOAC 2.3.02	10/28/2009 10:05	KM
Ammoniacal Nitrogen , %	0.16	0.01	AOAC 2.4.07	10/29/2009 08:30	JM
Moisture (Oven 105C) , %	1.25	0.01	AOAC 2.2.01	10/28/2009 10:00	KM
Nitrate Nitrogen , %	<0.010	0.010	AOAC 2.4.12	10/28/2009 11:50	KM
Total Sulfur , %	1.06	0.01	AOAC 2.6.28B	10/28/2009 11:50	KM
Urea Nitrogen , %	0.740	0.010	AOAC 2.4.20	10/29/2009 08:30	JM

Sample results are reported 'as received' and are not moisture corrected unless noted.

Oscar Ruiz

Report Number
09-300-0214 **Page:** 2 of 2

Account Number
46974

Send To: AJINOMOTO
4020 AJNOMOTO DR
RALEIGH , NC 27610

www.al-labs-eastern.com

A&L Eastern Laboratories, Inc.
7621 Whitepine Road Richmond, Virginia 23237 (804) 743-9401 Fax (804) 271-6446

Submitted By: GARY FAW
Purchase Order : 09446
Report Date : 10/30/2009
Date Received : 10/27/2009

Project : AMINO ACID MIXTURE

REPORT OF ANALYSIS

Date Sampled :

Lab Number: 73307
Sample Id : AAMIX

Analysis	Result	Quantitation Limit	Method	Date and Time Test Started	Analyst

Method Reference:
American Society for Testing and Materials, Annual Book of ASTM Standards
Official Methods of Analysis of AOAC International, 17th Edition, 1998
USEPA, SW-846, Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, 3rd Ed. Current Revision
Comments:

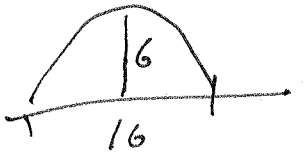
Sample results are reported 'as received' and are not moisture corrected unless noted.

Oscar Ruiz

Appendix B
Calculations

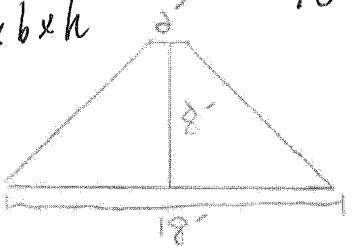
Windrow volume

Assume trapezoid



$A_{6\times16} = \frac{2}{3} \times 6 \times 16 = 64\,ft^2$

$A = \frac{2}{3} \times b \times h$



X $h \leq 6'$

∴ turner max = 6' x 18'

$A = \frac{(a+b)h}{2}$

$A = \frac{(18+2)(8)}{2} = 80\,ft^2$

See O&M chp. 4 P.4-1

600' x 8' x 15-1

Windrow is 300' long

$V = 80\,ft^2 \cdot 300\,ft = 24{,}000\,ft^3 = 889\,yd^3$ / per Row

Assume 21 days active composting - volume reduced by 30%

$V_{to\ screening} = (889\,yd^3)(0.7) = 622.3\,yd^3$

Assume screening recovers 50% of amendment & produces 40% (by volume) of product

$V_{to\ maturation} = (622.3\,yd^3)(0.4) = 249\,yd^3$

$V_{to\ recycle} = (622.3 - 249)(0.5) = 186.7\,yd^3$

Assume volume shrinks 10% during maturation & storage

$V_{finished} = (249\,yd^3)(0.9) = 224\,yd^3$

Per windrow

Active compost - $889\,yd^3\,(940\,lbs/yd^3) \times \frac{1\,ton}{2000\,lbs} = 418$ tons

After screening - $249\,yd^3\,(950\,lbs/yd^3) \cdot 1\,ton/2000\,lbs = 118$ tons

Recycle - $186.7\,yd^3\,(918\,lbs/yd^3) \times 1\,ton/2000\,lbs = 85.7$ tons

Finished product - $224\,yd^3\,(950\,lbs/yd^3) \times 1\,ton/2000\,lbs = 106$ tons

CH2MHILL

SUBJECT: EASTERN COMPOST, LLC
VOLUME & THROUGHPUT CALCS

BY: MK
SHEET NO. 2 of 3
DATE: 4/19/07
PROJECT NO.

ASSUME CURING TIME IS 28 DAYS

$\frac{365 \text{ days}}{\text{yr}} \cdot \frac{1 \text{ WINDROW}}{28 \text{ days}} = 13$ WINDROWS/YR

1-day x 5p = 260 days

11 WINDROWS CAN BE BUILT AT ONE TIME

SO, 13 x 11 = 143 WINDROWS/YR TOTAL

IN ONE YEAR

ACTIVE COMPOST (118 TONS/WINDROW)(143 WINDROWS/YR)
59,750 TONS/YR

TO MATURATION (118)(143)
16,900 TONS/YR

RECYCLE (85.7)(143)
12,275 TONS/YR

FINISHED PRODUCT (106)(143)
15,215 TONS/YR

ACTIVE COMPOSTING CAPACITY

11 WINDROWS CAN BE BUILT AT ONE TIME

SO, MAX $V_{WINDROWS} = (889 yd^3)(11) = 9779 yd^3$

ASSUME 8' SPACE IN BETWEEN WINDROWS

ACTIVE COMPOSTING AREA

$11(18 \times 300) + 10(8 \times 300) = 83,400 ft^2$

PAD SIZE = $98,000 ft^2$

SO, AREA AVAILABLE FOR BIOSOLIDS/FERRIC STORAGE IS:

$98,000 ft^2 - 83,400 ft^2 = 14,600 ft^2$

ASSUME PILES ARE 5' HIGH

$V_{FS\ STORAGE} = (14,600 ft^2)(5 ft)$

$= 73,000 ft^3$

$= 2,700\ yd^3$

MATURATION & STORAGE CAPACITY

AREA OF PAD = $158,200 ft^2$

ASSUME 15' high RECTANGULAR PILE

$V = (158,200 ft^2)(\frac{15 ft}{2})$

$= 949,200 ft^3$

$= 35,000\ yd^3$

BULKING AGENT STORAGE CAPACITY

PAD AREA = $222,700 ft^2$

ASSUME 8' HIGH PILE

$V = (222,700 ft^2)(8 ft)$

$= 1,781,600 ft^3$

$= 66,000\ yd^3$

CH2MHILL

SUBJECT: EXAMPLE MIXING CALCULATIONS, EASTERN CONTRACT, LLC

BY: MLA

SHEET NO. ___ of ___ DATE ___

PROJECT NO. ___

	A	B	C	D	E	F	G
	MATERIAL	# BUCKETS	VOLUME/BUCKET (CY)	BULK DENSITY (lb/CY)	WEIGHT (lbs)	% SOLIDS	DRY WEIGHT (lbs)
1	BIOSOLIDS	1	3.5	1,465	5127.5	17.0%	871.7
2	FERRIC SULFATE	1	3.5	1,350	4725	18.5%	874.1
3	GROUND PALLETS	3	3.5	351	3685.5	84.3%	3107.6
4	OVERS	2	3.5	918	6426	55.0%	3534.3
5	TOTAL	7			19964		8387.7
6	% SOLIDS					42.0%	

$$\text{TOTAL \% SOLIDS} = \left(\frac{\sum_{N=1}^{4} (BN \cdot CN \cdot DN \cdot FN)}{\sum_{N=1}^{4} (BN \cdot CN \cdot DN)} \right) \times 100$$

Appendix C

Frontier Windrow Turner F-18 Technical Specifications

FRONTIER F-18

SPECIFICATIONS:

Machine Shipping Dimensions:

Length: 27' (45' with trailer package installed)
Depth: 8' 6"
Height: 12' 7" (with trailer pkg. installed: 13'6")
Weight: 34,000 lbs (trailer pkg. adds 7,000 lbs)

Machine Working Mode Dimensions:

Width 26'
Depth 13' 9" (includes cab and tail extended)
Height 12' 7" (lowered) 14' 3" (raised)

Tunnel Dimensions:

Width: 18 feet. **FRONT AND REAR**
Depth: 12' (includes Tail Section fully extended)
Height: 6' 3" (lowered) to 8' (raised)
Lining: 1/4" Steel Safety Plate
Lining (optional) 1/4" Stainless Steel Plate

Engine: Cummins QSM 400 HP, Tier 3

Engine, Optional: Caterpillar C-13 Acert 415 HP, Tier 3 (Hydraulic reversing cooling fan only)

Engine Cooling: Hydraulic Reversing radiator cooling fan actuates via electric switch inside cab. Radiator faces forward on machine to minimize incoming debris. Self cleaning /removable intake screen assures maximum filtration of incoming air

Engine Cooling Option (Cummins only): Air actuated, microprocessor temperature controlled, direct drive, reversing pitch fan (requires "smart clutch" option)

Cab: Slides 15 inches forward of the frame to give extra visibility and reduce noise and heat from engine. Pressurized, air-conditioned, heater, defroster, charcoal filter for light ammonia, windshield wiper/washer, tinted safety glass, extra sound suppressed, fully adjustable swivel seat , lockable door, and folding arm-rests with controls.

Instrumentation: Electronic Engine Monitor package (all functions) both with audio/visual warnings, engine defaults with de-rate and shut-down protection. Hydraulic oil temperature gauge, reversing fan switch (auto reverse optional) with warning lights, In-cab Clutch micro processor (on-off) control "smart clutch".

Drum: Length: 17' 8"
Diameter: 20"dia. drum with 1/2" wall. 34"dia. w/ paddles installed. Replaceable 4 7/16" 4140 Drive Shafts (shafts not welded to drum)

Paddles: 26 left, 26 right, 26 center paddles. Complete mixing and aeration, **US Patent # 5,586,731**. Mixing: right and left to center, center to right and left (top to bottom, inside out and outside in). Material is thoroughly entrained in air. Drum does <u>not</u> "tunnel" under material. Patented paddles scoop and blow air: (18,000 cfm) Tunnel, tail section and protective belting are designed accommodate mixing

and allow oxygen rich air to enter front and CO2 air to exit rear. Material contacts paddle tips only and does not wear drum brackets and drum surface. Hard surfacing is not necessary on drum or paddle brackets.

Drum Drive: Drum disengagement shall be accomplished via close coupled, friction disc clutch with electric over hydraulic controlled engagement / disengagement.

Speed reduction from engine RPM to final drum RPM shall be accomplished by a double reduction, gearbox- belt system (gearbox primary and V-Belt secondary speed reduction).

Tensioning (secondary reduction) will be accomplished by separating the drive and driven pulley. (No Idler Pulleys).

Secondary v-belt tension will be maintained by an automatic, self-adjusting, hydraulic tensioning system. Frontier exclusive, Patent Pending

Bottom Pulley Guard will be capable of sustaining the entire weight of the machine to protect the drive belts from damaging rocks etc.

Clutch: Close coupled Clutch, double friction disc 14", electric over hydraulic actuation, 100% power transfer efficiency

Clutch (Optional) (Cummins only): Close coupled "Smart Clutch" (Self protecting), micro-processor controlled, self adjusting, wet disc 14" clutch. This "smart" clutch shall be "self-protecting" against all operating conditions and operator abuse. It will actuate via on-off switch in operators cab and function with 99% power transfer efficiency.

Wheel Drive: Independent hydraulically powered drive with inline brake (Two wheel drive-Front only) and planetary drive. Automatically adjusts to drum speed for high production - electronically controlled. Propel pumps are pressurized at the suction port to prevent cold oil cavitation.

Four Wheel Drive (optional): provides features above with lock-up and power to all four wheels simultaneously, regardless of ground conditions.

Tires: Drive: 42 x 25.00 – 20 12 ply (Two and Four wheel drive)
Castors: 16.5L - 16.1 14 Ply (Two wheel drive only)

Tanks: Fuel: 240 gallons
Hydraulic Oil: 50 gallons.

Safety: Outside lights (front, rear, and top deck), back-up alarms, parking brakes, hand rails.

Self Trailering Package (optional): US Patent # 5,586,731
Hydraulically detachable Kingpin hitch and dolly. Quick disconnect airbrakes and running lights. Hydraulically rotateable drive wheel assemblies, rear tail section and retractable cab for legal highway width and height. Road ready in 20 minutes with one man and no special tools.

Warranty:

Engine: Two years/2000 hours from Cummins factory.
Engine Optional: Five years/6000 hours/ parts and labor/ $200 deductable
Machine: One year parts and labor coverage against mechanical and structural failure

Appendix D
DWQ Permit

Michael F. Easley, Governor

William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources

Coleen H. Sullins, Director
Division of Water Quality

December 24, 2008

Jason Smith, Partner
Eastern Compost, LLC
Post Office Box 460
Battleboro, North Carolina 27809

Subject: Permit No. WQ0033492
Eastern Compost, LLC
Closed-Loop Recycle System
Edgecombe County

Dear Mr. Smith:

In accordance with your permit request received September 25, 2008, we are forwarding herewith Permit No. WQ0033492, dated December 24, 2008, to Eastern Compost, LLC for the construction of the subject closed-loop wastewater recycle facilities.

This permit shall be effective from the date of issuance until November 30, 2013 shall void Permit No. WQ0033492 issued December 24, 2008 and shall be subject to the conditions and limitations as specified therein. Please pay particular attention to the monitoring requirements in this permit. Failure to establish an adequate system for collecting and maintaining the required operational information will result in future compliance problems.

If any parts, requirements, or limitations contained in this permit are unacceptable, you have the right to request an adjudicatory hearing upon written request within thirty (30) days following receipt of this permit. This request must be in the form of a written petition, conforming to Chapter 150B of the North Carolina General Statutes, and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, NC 27699-6714. Unless such demands are made this permit shall be final and binding.

One set of approved plans and specifications is being forwarded to you. If you need additional information concerning this matter, please contact Alice M. Wessner at (919) 715-5208 or alice.wessner@ncmail.net.

Sincerely,

for Coleen H. Sullins

cc: Edgecombe County Health Department
Raleigh Regional Office, Aquifer Protection Section
Kathryn Benson, CH2M Hill, 3201 Beechleaf Court Suite 300, Raleigh, NC 27604
Technical Assistance and Certification Unit
APS Central Files

NORTH CAROLINA

ENVIRONMENTAL MANAGEMENT COMMISSION

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

RALEIGH

CLOSED-LOOP RECYCLE SYSTEM PERMIT

In accordance with the provisions of Article 21 of Chapter 143, General Statutes of North Carolina as amended, and other applicable Laws, Rules, and Regulations

PERMISSION IS HEREBY GRANTED TO

Eastern Compost, LLC

Edgecombe County

FOR THE

construction of a 28,975 gallon per day (GPD) wastewater recycle system consisting of approximately nine acres of drainage area including approximately 5 acres of impervious surface which drains to a 1.35 million gallon clay lined lagoon to serve Eastern Compost, LLC, with no discharge of wastes to the surface waters, pursuant to the application received September 25, 2008 received by the Division of Water Quality (Division), and in conformity with the project plan, specifications, and other supporting data subsequently filed and approved by the Department of Environment and Natural Resources and considered a part of this permit.

This permit shall be effective from the date of issuance until November 30, 2013, shall void Permit No. WQ0033492 issued December 24, 2008, and shall be subject to the following specified conditions and limitations:

I. **SCHEDULES** [please review the entire permit for reporting, monitoring, and other on-going activities]

1. Upon completion of construction and prior to operation of this permitted facility, a certification (see attached form) must be received from a professional engineer certifying that the permitted facility has been installed in accordance with this permit, the approved plans and specifications, and other supporting materials including the location of all monitoring wells as applicable. If this project is to be completed in phases and partially certified, you shall retain the responsibility to track further construction approved under the same permit, and shall provide a final certificate of completion once the entire project has been completed. Mail the Certification to the Aquifer Protection Section, Division of Water Quality, 1636 Mail Service Center, Raleigh, NC 27699-1636.

2. The Raleigh Regional Office, telephone number (919) 791-4200, shall be notified at least forty-eight (48) hours in advance (excluding weekends and holidays) of operation of the installed facilities so that an in-place inspection can be made. Such notification to the regional supervisor shall be made during the normal office hours from 8:00 a.m. until 5:00 p.m. on Monday through Friday, excluding State Holidays.

3. Prior to construction of the subject closed loop recycle system, the Permittee shall submit a complete Operation and Maintenance Plan as well as a Residual Management Plan in accordance with 15A NCAC 02T .1007 and .1008 respectively.

4. If not already installed, a waste-level gauge, to monitor waste levels in the lagoon, shall be installed within 60 days of issuance of this permit / prior to operation. Caution shall be taken not to damage the integrity of the liner (if provided) when installing the gauge

5. No later than six months prior to the expiration of this permit, the Permittee shall request renewal of this permit on official Division forms. Upon receipt of the request, the Division will review the adequacy of the facilities described therein, and if warranted, will renew the permit for such period of time and under such conditions and limitations as it may deem appropriate. Please note that Rule 15A NCAC 02T .0105(d) requires an updated site map to be submitted with the permit renewal application.

6. Prior to installation of wastewater return pump from the lagoon to the windrows, plans and specifications shall be approved by the Division of Water Quality.

II. PERFORMANCE STANDARDS

1. The closed-loop recycle system shall be effectively maintained and operated at all times so that there is no discharge to the surface waters, nor any contravention of groundwater or surface water standards. In the event that the facilities fail to perform satisfactorily, including the creation of nuisance conditions due to improper operation and maintenance, the Permittee shall take immediate corrective actions including those actions that may be required by the Division, such as the construction of additional or replacement wastewater treatment, recycle, or disposal facilities.

2. The issuance of this permit shall not relieve the Permittee of the responsibility for damages to ground or surface waters resulting from the operation of this facility.

3. The facilities permitted herein must be constructed according to the following setbacks:

   a. The setbacks for treatment and/or storage units shall be as follows (all distances in feet):

i.	Any habitable residence or place of public assembly under separate ownership or not to be maintained as part of the project site:	100
ii.	Any private or public water supply source:	100
iii.	Surface waters:	50
iv.	Any well with the exception of a Division approved groundwater monitoring well:	100
v.	Any property line:	50

III. OPERATION AND MAINTENANCE REQUIREMENTS

1. The facilities shall be properly maintained and operated at all times. The facilities shall be effectively maintained and operated as a non-discharge system to prevent the discharge of any wastewater resulting from the operation of this facility. The Permittee shall maintain an Operation and Maintenance Plan pursuant to 15A NCAC 02T .1007 including operational functions, maintenance schedules, safety measures, and a spill response plan.

2. Upon classification of the wastewater treatment and closed-loop recycle facilities by the Water Pollution Control System Operators Certification Commission (WPCSOCC), the Permittee shall designate and employ a certified operator to be in responsible charge (ORC) and one or more certified operator(s) to be back-up ORC(s) of the facilities in accordance with 15A NCAC 08G .0200. The ORC shall visit the facilities in accordance with 15A NCAC 08G .0200 or as specified in this permit and shall comply with all other conditions specified in these rules.

3. Public access to the wastewater treatment equipment, wastewater storage structure(s), and closed-loop recycle system shall be controlled.

4. The residuals generated from these treatment facilities must be disposed / utilized in accordance with 15A NCAC 02T .1100. The Permittee shall maintain a residual management plan pursuant to 15A NCAC 02T .1008.

5. Diversion or bypassing of untreated wastewater from the treatment facilities is prohibited.

6. The storage lagoon shall be constructed and maintained to contain the accumulation of water from a 25-year, 24-hour storm event.

7. Freeboard in the lagoon shall not be less than one foot at any time.

8. A waste-level gauge, to monitor waste levels in the lagoon shall be provided. This gauge shall have readily visible permanent markings indicating the maximum liquid level at the top of the temporary liquid storage volume, minimum liquid level at the bottom of the temporary liquid storage volume, and the lowest point on top of the dam elevations.

9. A protective vegetative cover shall be established and maintained on all earthen basin embankments (outside toe of embankment to maximum allowable temporary storage elevation on the inside of the embankment), berms, pipe runs, erosion control areas, and surface water diversions. Trees, shrubs, and other woody vegetation shall not be allowed to grow on the earthen basin dikes or embankments. Earthen basin embankment areas shall be kept mowed or otherwise controlled and accessible.

IV. MONITORING AND REPORTING REQUIREMENTS

1. Any monitoring (including groundwater, surface water, soil or plant tissue analyses) deemed necessary by the Division to ensure surface and ground water protection will be established and an acceptable sampling reporting schedule shall be followed.

2. All laboratory analyses for effluent, ground waters, or surface waters shall be made by a laboratory certified by the Division for the required parameter(s) under 15A NCAC 02H .0800.

3. Freeboard (waste level to the lowest elevation on the top of the embankment) in the lagoon shall be recorded weekly. Freeboard recording results shall be maintained at the facility for a period of no less than five years, and shall be made available to the Division upon request.
4. A record shall be maintained of all residuals removed from this facility. This record shall include the name of the hauler, permit authorizing the disposal or a letter from a municipality agreeing to accept the residuals, date the residuals were hauled, and volume of residuals removed.

5. **Noncompliance Notification:**

   The Permittee shall report by telephone to the Raleigh Regional Office, telephone number (919)791-4200, as soon as possible, but in no case more than 24 hours or on the next working day following the occurrence or first knowledge of the occurrence of any of the following:

   a. Any occurrence at the wastewater treatment facility which results in the treatment of significant amounts of wastes which are abnormal in quantity or characteristic, such as the dumping of the contents of a basin or tank; the known passage of a slug of hazardous substance through the facility; or any other unusual circumstances.

   b. Any process unit failure, due to known or unknown reasons, that render the facility incapable of adequate wastewater treatment such as mechanical or electrical failures of pumps, aerators, compressors, etc.

c. Any failure of a pumping station, sewer line, or treatment facility resulting in a by-pass directly to receiving waters.

d. Any time that self-monitoring information indicates that the facility has gone out of compliance with its permit requirements.

For any emergency that requires immediate reporting (e.g., discharges to surface waters, imminent failure of a storage structure, etc.) outside normal business hours must be reported to the Division's Emergency Response personnel at telephone number (800) 662-7956, (800) 858-0368, or (919) 733-3300. Persons reporting such occurrences by telephone shall also file a written report in letter form within five (5) days following first knowledge of the occurrence. This report must outline the actions taken or proposed to be taken to ensure that the problem does not recur.

V. INSPECTIONS

1. Adequate inspection and maintenance shall be provided by the Permittee to ensure proper operation of the subject facilities.

2. The Permittee or his designee shall inspect the wastewater treatment and disposal facilities to prevent malfunctions and deterioration, operator errors and discharges which may cause or lead to the release of wastes to the environment, a threat to human health, or a nuisance. The Permittee shall keep an inspection log or summary including at least the date and time of inspection, observations made, and any maintenance, repairs, or corrective actions taken by the Permittee. This log of inspections shall be maintained by the Permittee for a period of five years from the date of the inspection and shall be made available upon request to the Division or other permitting authority.

3. Any duly authorized officer, employee, or representative of the Division may, upon presentation of credentials, enter and inspect any property, premises or place on or related to the disposal site or facility at any reasonable time for the purpose of determining compliance with this permit; may inspect or copy any records that must be maintained under the terms and conditions of this permit, and may obtain samples of groundwater, surface water, or leachate.

VI. GENERAL CONDITIONS

1. Failure to abide by the conditions and limitations contained in this permit may subject the Permittee to an enforcement action by the Division in accordance with North Carolina General Statute 143-215.6A to 143-215.6C.

2. This permit shall become voidable unless the facilities are constructed in accordance with the conditions of this permit, the approved plans and specifications, and other supporting data.

3. This permit is effective only with respect to the nature and volume of wastes described in the application and other supporting data. No variances to applicable rules governing the construction and / or operation of the permitted facilities are granted unless specifically requested and granted in this permit.

4. The issuance of this permit does not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances, which may be imposed by other government agencies (local, state, and federal) that have jurisdiction. Of particular concern to the Division are applicable river buffer rules in 15A NCAC 02B .0200, erosion and sedimentation control requirements in 15A NCAC Chapter 4 and under the Division's General Permit NCG010000, and any requirements pertaining to wetlands under 15A NCAC 02B .0200 and 02H .0500.

5. In the event there is a desire for the facilities to change ownership, or there is a name change of the Permittee, a formal permit request must be submitted to the Division on official Division form(s), documentation from the parties involved, and other supporting materials as may be appropriate. The approval of this request will be considered on its merits and may or may not be approved. The Permittee of record shall remain fully responsible for compliance until a permit is issued to the new owner.

6. The Permittee shall retain a set of approved plans and specifications for the life of the facilities permitted herein.

7. The Permittee shall maintain this permit until all permitted facilities herein are properly closed or permitted under another permit issued by the appropriate permitting authority.

8. The Permittee must pay the annual fee within thirty (30) days after being billed by the Division. Failure to pay the fee accordingly may cause the Division to initiate action to revoke this permit pursuant to 15A NCAC 02T .0105(e).

Permit issued this the 24th of December 2008

NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

for Coleen H. Sullins. Director
Division of Water Quality
By Authority of the Environmental Management Commission

Permit Number WQ0033492

ENGINEER'S CERTIFICATION

_____ Partial _____ Final

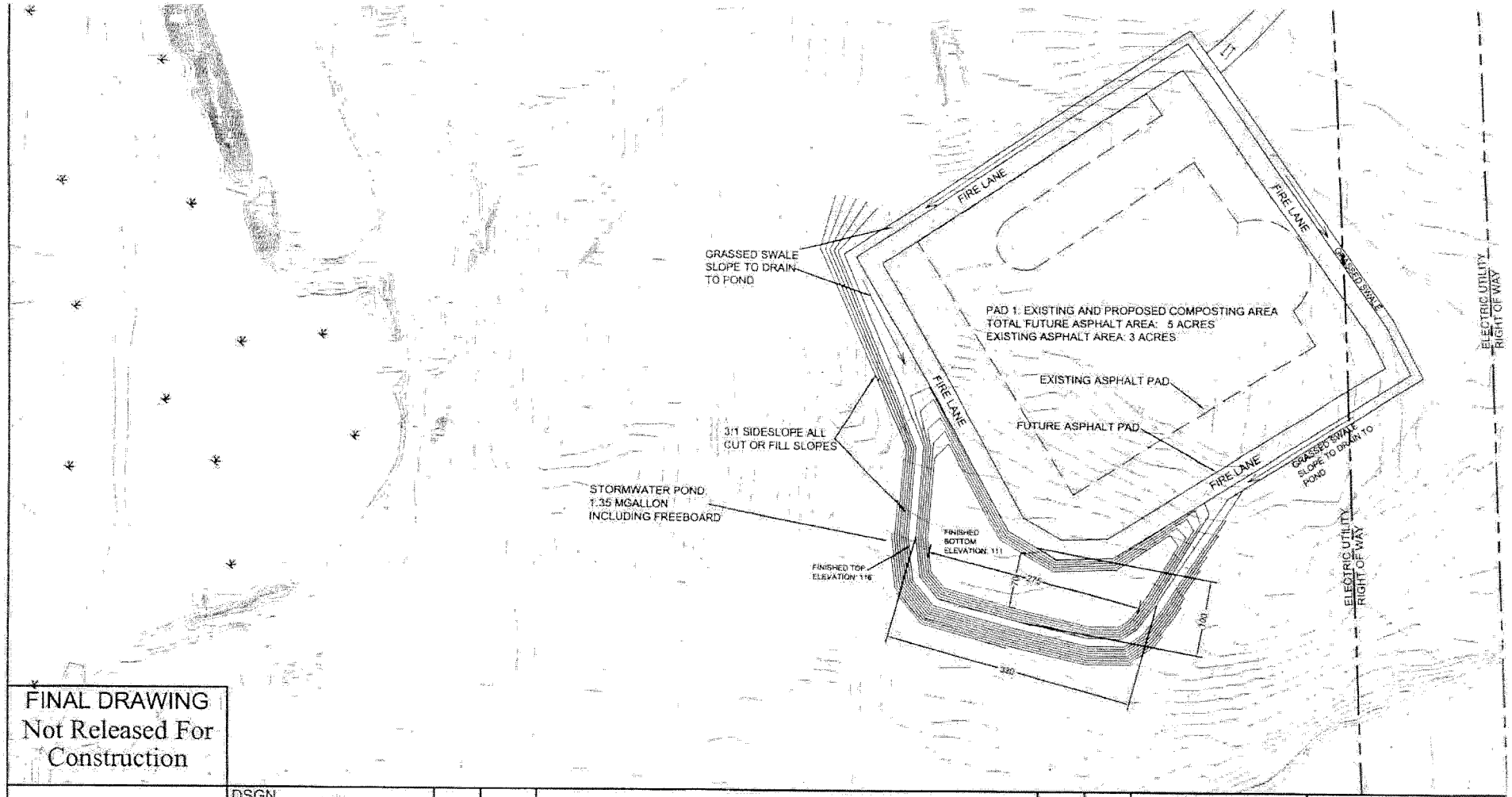
I, _____, as a duly registered Professional Engineer in the State of North Carolina, having been authorized to observe (periodically, weekly, full time) the construction of the project,

_____, _____
Project Name *Location and County*

for the Permittee hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of this permit, the approved plans and specifications, and other supporting materials.

Signature _____ Registration No. _____

Date _____



FINAL DRAWING
Not Released For
Construction

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DR	LJS						BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.
CHK	KSB						
APVD		NO.	DATE	REVISION	BY	APVD	

NORTH CAROLINA PROFESSIONAL SEAL 032075 ENGINEER KATHRYN S. BENSON

Operation Plan

The normal hours of operation are 8:00 AM to 5:00 PM, Monday through Friday and 8:00 AM to 12:00 AM Saturday. Company employees will have unlimited access to the facility when scheduled activities dictate. The facility will be locked at all other times.

Pre Open

Preparations before opening will include visually inspect facility and daily preventative maintenance of all equipment prior to use. Any issues found that might create poor compost, fugitive dust, offensive odors, runoff or any non compliance issues will be addressed immediately. Minor equipment problems will be fixed on site as soon as possible. Major problems will be scheduled for outside repair as soon as possible. Equipment with problems deemed unsafe to operate will be shut down until repairs are made. Facility safety is paramount. If the facility conditions are deemed unsafe by staff, the site will be closed to all activities.

Equipment and Training

All preventative maintenance, minor repair, and replacement of ware parts will be done on site by Eastern Compost, LLC personnel or at Boseman Farms Shop.

All major repairs will be done by a certified service technician from Greg Poole Equipment Company or by Richard Ferguson of Fergie's Truck Repair in Spring Hope, North Carolina.

All equipment will have an inspection record and a maintenance record to ensure all required periodic inspections and preventive maintenance services are completed. These records will be reviewed on a monthly basis.

All personnel are required to attend the annual in house training program. The Eastern Compost, LLC program covers the importance of maintenance; how to carry out a walk around inspection; how to perform maintenance checks and inspections to identify potential problems and safety procedures. To ensure the safety of the public when on site, quarterly traffic flow meetings are also required.

All personnel are required to complete 6 hours of continuing education through a certified compost program.

Leachate Pond Operation and Maintenance

A leachate collection pond is located to the south of the composting pad. When rain falls, runoff water is conveyed to the pond by the swales surrounding the asphalt pad. Water flows through the swales to the pond evaporates, or is re-used in the composting process. No water is to bypass the pond nor will any water leave the pond once it has entered unless pumped for use in the composting process or pumped and disposed of properly through waste management.

Maintenance of this system will include inspection of the swales, pond, and integrity of the pond liner after every rainfall event of 1 inch or greater. At no time will the water depth be allowed to reach to within one foot of the berm top (freeboard) unless during unusual rainfall event. During or before an expected extreme rainfall event (or Hurricane) the pond

will be completely emptied of water to allow for maximum storage capacity. The Rocky Mount waste water plant has agreed to accept water from this facility when heavy rainfall is expected. Water will be pumped and hauled to Rocky Mount in these instances. On a monthly basis and throughout each turning and composting process, water will be used to the maximum extent to maintain the correct moisture level within the compost windrows.

Maintenance of the pond and swale will include but not limited to:

- Swales are to remain cleared of debris to allow free flow of water to the pond, sediment buildup will be removed on a quarterly basis and re-used within the composting process.
- Fix all damages to integrity of the swales and pond liner upon first notice
- Remove sediment buildup within the pond once more than 25% of the designed pond volume has been filled with sediment. Sediment and buildup will be re-used within the composting process.

Material Handling

Incoming materials are deposited at designated areas and stockpiled within the compost yard until rows are built. Bulky materials such as yard debris, pallets, hay, and other feedstock's needing size reduction will be ground using a Beast Bandit 3680 horizontal grinder (Haybuster Tubgrinder 1500 for back-up purposes). Material is double ground using a 2" diamond screen.

Step-by-Step procedures for manual mixing with the FEL and Windrow Turner:

1. Determine the volume of biosolids to be mixed. This is estimated from the volume of the FEL bucket and the number of buckets to be mixed at one time, typically one (1) to two (2).
2. Check and log solids content for the biosolids. This information should be provided by the staff of the dewatering operations at the WWTP.
3. Determine the volumetric mix ratio of each constituent using the mix solids calculation sheet in Appendix A in the Design Report and the bulk density of the constituents as estimated in the materials balance or measured in the field.
4. Using the FEL place a bed of one (1) of the bulking agents one (1) to two (2) feet high and approximately one (1) FEL bucket width wide.
5. Place biosolids on top of the bulking agent bed with the FEL.
6. Place the remainder of the needed bulking agent over the top of the biosolids.
7. Pick up and drop the constituents several times with the FEL bucket.
8. Continue mixing with the FEL and the Frontier Windrow Turner until a thorough blend is achieved. The row should be turned from 3 to 5 times with the Frontier Windrow Turner to help thoroughly blend the different feedstocks.
9. Visually inspect the mix for thorough blending. A good mix will be uniform in color, have all the bulking agent coated with biosolids and should have no balls or clumps larger than 4" in diameter.
10. Place the mixture into the compost pile and repeat the process.

A front end loader is used to build approximately two rows each week depending on the volume of incoming material. The row is turned 3 to 5 times with the Frontier Windrow Turner to help thoroughly blend the different feedstocks and initiate the compost process.

Windrow temperatures, moisture levels and weather conditions are monitored and recorded daily. These criteria help establish when subsequent turnings will occur. These records will ensure that compliance with PFRP, which is a minimum temperature of 131F for 15 days, turned 5 times, is completed. After these requirements are met, windrows are turned periodically to help maintain temperatures.

When a compost test fails to meet Federal pathogen and vector requirements (40 CFR), which imposes a potential threat to the public health and the environment, the facility shall report the failed testing result to the division within 72 hours after receiving the testing result(s). Distribution of the compost products must stop until a further test confirms that the batch of re-composted products have met the federal safety standard.

As space is needed or when the active composting is finished, rows are moved from the asphalt pads to the clay pad for further curing. Finished compost will be screened to ¾" minus or less by a McCloskey Trommel. Screened compost volumes will be determined by the end use demand. Agricultural land application will sometimes be done immediately after composting is completed without screening.

When wind becomes greater than 25 miles an hour the facility will be closed to dumping to all dry material that may create problem dust. During periods of heavy rain windrows will not be turned to allow the external formed shell to shed water. Unblended or raw materials will be bermed to help prevent excessive runoff during periods of heavy rain. During snow events snow will be plowed outside of the leachate control area. Snow on the windrows will be incorporated with the windrow turner.

Odor and vectors at the site are monitored daily and controlled by proper site sanitation and following established composting procedures. Background information on all raw feedstocks will be assessed prior to shipment to the Eastern Compost, LLC facility in order to help minimize vectors and odors. Feedstocks with excessive dryness will be mixed with excess leachate water to help control airborne particulates. Leachate will only be applied prior to the beginning of PFRP requirements. Water will be applied to help control airborne particulates in active windrows. The location of our composting pad is situated in a natural pine tree buffer. This buffer will help facilitate the reduction in noise, airborne particulates, and odors from leaving the core area.

Feedstocks

Incoming feedstock's are recorded by volume (cubic yard) and by weight (tons). Food-by-products, industrial waste, agribusiness' waste, municipals waste water treatment plant and water treatment plant residuals, gin trash, pallets, and chicken litter will all be recorded in tons. Carbon material used for bulking agents will be recorded as cubic yards. Wastewater treatment plant (biosolids) and water treatment plant (ferric) are the main feedstocks. Other feedstocks are added based on availability and ratios to ensure proper composting within each windrow. Feedstocks are delivered and stored in the raw product storage area of the pad.

Active Composting - Windrows

Windrows are constructed from the SW to SE side of the asphalt pad. Temperatures are taken daily at 4 places along the windrow with a Res-temp thermometer. Moisture will be

checked as needed by the squeegee test. Each row position is numbered one thru eleven. Subsequent rows built in a position will receive a letter footnote (1, 1A, 1B, etc.) This identification will help with sampling and testing results.

Maturation and Storage- Finished Product

Screening may occur prior to placement in finished product storage area. Curing will occur for an additional 30 to 90 days.

Delivery and Distribution

All incoming waste materials will be delivered by Eastern Compost personnel. Any deliveries made other than Eastern Compost employees will be scheduled through the Controller. Likewise all distribution actives are monitored compost personnel. Finished compost will be transported in clean trucks and loaded with a dedicated wheel loader to help prevent cross contamination. Some compost destined for land application will be hauled off site in spreaders. There will be no unauthorized dumping of any material at any time.

Testing

Compost samples of finished compost products are periodically tested for nutrients availability. Based on the permit requirements a complete compost analysis is done by Soil Control Labs at the required frequency.

Safety

All safety procedures outlined in the operations manual must be followed. The following personal hygiene recommendations are stressed as common practices to all compost facility employees.

- Wash hands before eating, drinking, or smoking.
- Food should not be eaten or stored near biosolids. Do not drink from plant hoses.
- If heavily contacted with biosolids, immediately take a hot shower and put on clean clothing. The supervisor should be notified.
- It is recommended that showers be taken each day and hair be washed prior to leaving the plant site.
- All employees working at the compost facility must wear protective clothing, i.e. uniforms and/or coveralls, and safety shoes.
- Change from protective clothing to street clothing at the end of each day. Soiled, protective clothing should not leave the premises.
- Goggles, dust masks, and hard hats must be available and should be worn by employees working in the mixing and screening areas.
- Wash, disinfect, and bandage ANY cut, no matter how small. Any break in the skin can become a source of infection. Change bandages frequently and wear protective clothing over the wound.
- Keep fingernails closely trimmed and clean (dirty nails can harbor pathogens).

Corrective Action

PROBLEM	***CORRECTIVE ACTION***
Compost pile temperatures too high (>70°C)	1. Mix more frequently. 2. Poor air flow through pile. Poor mixing would most likely cause this. Check moisture content and teardown pile and remix, if needed.
Compost pile temperatures too low	1. Insufficient amount of new bulking agent; remove pile, re-mix and replace.
Blinding/clogging of screen	1. Solids content too low; pile material in drying space and aerate until solids content is >55 percent.
Odors coming from paved area	1. Possible ponding of leachate around debris; clean paved surface. 2. Possible collection of debris in catch basins; remove and clean catch basin debris.
Rain run-off ponding around catch basins	1. Possible ponding may occur during periods of short-duration, heavy rain; however, if this remains, check catch basins for clogging debris.
Blowing dust	1. Clean area around screen. 2. If coming from finished compost stockpiles, wet piles.
Equipment Breakdown	1. All preventative maintenance, minor repair, and replacement of ware parts will be done on site by our personnel or at Boseman Farms Shop. 2. Rental equipment will be obtained if necessary. 3. All major repairs will be done by a certified service technician from Greg Poole Equipment Company or by Richard Ferguson of Fergie's Truck Repair in Spring Hope, North Carolina.
Fire	1. Use fire extinguisher on-site. 2. Contact local fire department.
Unusual traffic conditions	1. Modify schedule of operation to avoid.

Eastern Compost, LLC
Operations & Maintenance Report

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SECTION 1

Introduction

Eastern Compost, LLC has developed a windrow composting facility at their site in Battleboro, North Carolina. This O&M manual provides information regarding the proper operation of the composting facility, record keeping and product testing/utilization recommendations.

The personnel on-site is the following:

Personnel	Title	Duties
Jason Smith	Facility Manager	Manage all aspects of the compost facility operations
Sammy Hedgepath	Controller	Complies and records all data associated with the facility
John Fisher	Compost Facility Coordinator	Responsible for all daily on-site operations
David Hinton & J.T. Bryant	Loader Operators	Blends incoming material, builds windrow, screens finished product and grinding wood products
Hilliard Webb, Jackie Smith, & David Randolph	Truck Drivers	Deliver feedstocks to the compost facility and transport finished material offsite
Emmett Wadford	Sales Representative	Responsible for marketing and sales of finished products

All personnel are required to attend the eastern Compost, LLC annual in house training program. The program covers the importance of maintenance; how to carry out a walk around inspection; how to perform maintenance checks and inspections to identify potential problems and safety procedures. To ensure the safety of the public when on site, quarterly traffic flow meetings are also required.

All personnel are required to complete 6 hours of continuing education through a certified compost program.

The equipment maintained on site includes:

Quantity	Equipment
1	Frontier Windrow Turner F-18 6' x 18' self propelled windrow turner. Capacity is approximately 4700 cubic yard per hour
1	McCloskey Trommel Screen 516RE 127 hp Cat powered screen
1	Beast Bandit Horizontal Grinder 3680 565 hp Cat powered grinder. Hourly throughout approximately 300 cubic yards
1	Haybuster Tubgrinder 1500 Hourly throughout approximately 150 cubic yards
1	Case 521 Wheel Loader 3.5 cubic yard bucket
1	Cat 930G Wheel Loader 3.5 cubic yard bucket
1	John Deere 544 Wheel Loader 3.5 cubic yard bucket
2	Volvo Dump Trucks – 17 cubic yard bed
1	Mack Dump Truck – 17 cubic yard bed

All preventative maintenance, minor repair, and replacement of ware parts will be done on site by our personnel or at Boseman Farms Shop.

All major repairs will be done by a certified service technician from Greg Poole Equipment Company or by Richard Ferguson of Fergie's Truck Repair in Spring Hope, North Carolina.

All equipment will have an inspection record and a maintenance record to ensure all required periodic inspections and preventive maintenance services are completed. These records will be reviewed on a monthly basis.

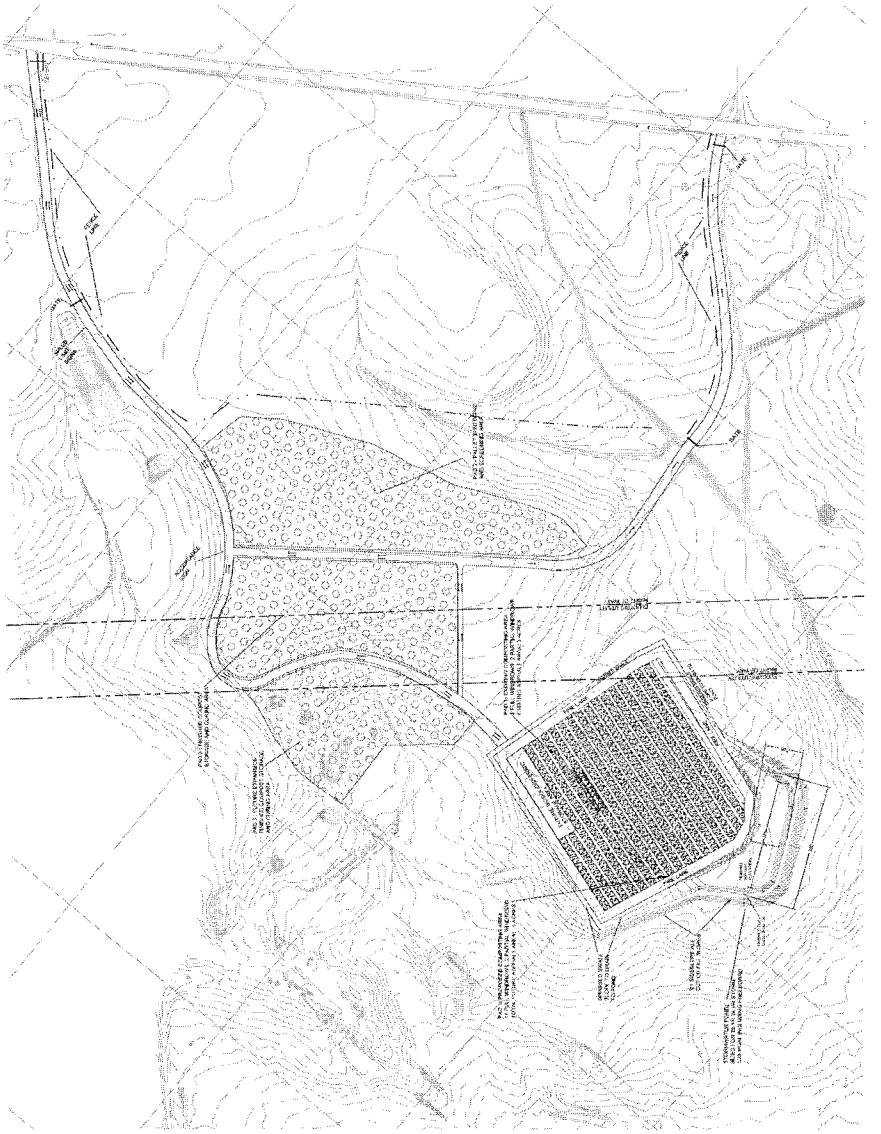
The normal facility staffed operating hours are:

Monday through Friday	8:00 A.M to 5:00 P.M
Saturday	8:00 AM to Noon
Sunday	Closed

Preparations before opening include visually inspect facility and daily preventative maintenance of all equipment prior to use. Closing procedures will include making sure all windrow data has been properly recorded and any unblended or raw material is properly covered/stored to prevent any adverse environmental effects.

Figure 1-1 below shows a partial view of the site plan and the location of the composting facility at the site.

FIGURE 1-1
Partial Site Plan



SECTION 2

Composting Process

2.1 Introduction

The windrow composting process was selected for the Eastern Compost, LLC Facility. The reasons for selecting this process are:

- It is one of the lowest cost systems for biosolids composting;
- It is flexible and can use a wide variety of bulking agents;
- The process complies with the US Environmental Protection Agency (USEPA) and State of North Carolina regulations;
- The product produced can, and has been, successfully marketed.

The facility capacity, materials handling and economics of the process are sensitive to the percent solids produced of the ferric sulfate residuals and biosolids received. The higher the solids content, the less amendment is needed which results in less material handling and lower operational costs. The higher solids content and lower amount of amendment that is needed results in a lesser overall volume of materials to be composted.

Since a major aspect of composting is to ensure aerobic conditions within the composting mass, adequate porosity must be provided in the piles to allow for air movement. In order to achieve proper pore space, an amendment is blended with biosolids or other materials requiring stabilization. The amendment not only provides for pore space, but also adjusts the moisture content of the biosolids/amendment mixture so that water does not block the pores and there is sufficient free pore space for oxygen transfer. In addition, the amendment adjusts the carbon/nitrogen ratio for more favorable decomposition and reduction in nitrogen (ammonia) losses.

The following composting process parameters are discussed at length in the sections below:

- Materials Balance
- Solids Content
- Process Flow
- Temperature
- Oxygen Content
- Aeration Rates
- Carbon to Nitrogen Ratio

2.2 Material Balance

The materials balance is necessary to define the equipment, space requirements, materials handling and manpower needs of the facility. The average mix calculations and the mass and volume balance is shown below in Tables 2-1 & 2-2. This materials balance is based on data showing that the facility could be expected to receive approximately 780 wet tons per week or 156 wet tons per operating day based on five operating days per week. The primary materials to be composted received regularly each week include biosolids cake (18 percent solids), ferric sulfate cake (18 percent solids), cotton gin trash (86 percent solids) and woody materials such as pallets, ground brush and sawdust ranging from 60 to 84 percent solids. Secondary materials generated seasonally include poultry litter, food wastes and waste hay at much smaller amounts.

From the mass balance, it can be seen that the facility is expected to produce 221 cubic yards or 110 tons of compost per day.

TABLE 2-1
Compost Mix Calculations
Eastern Compost – Based on 5-Day-per-Week Average

Ingredient	Moisture Content (%)	Bulk Density (lb/cy)	Organic Carbon (% dw)	Nitrogen (% dw)	C:N Ratio	Mass (tons)	% of Mixture Weight	Approx. volume (CY)	% of Mixture Volume
Biosolids	82	1465	40	7.6	5.3	29.0	14%	39.6	6%
Ferric Sulfate solids	82	1350	16.0	0.8	20.0	48.0	23%	71.1	11%
Gin Trash	14	300	55.0	1.5	36.7	30.0	14%	200.0	30%
Pallets	16	350	47.0	0.4	123.7	15.0	7%	85.7	13%
Ground Brush	40	500	44.0	0.8	55.0	15.0	7%	60.0	9%
Sawdust	30	400	58.0	0.1	580.0	15.0	7%	75.0	11%
Water	100	1685	0.0	0.0	0.0	15.0	7%	17.8	3%
Poultry Litter	50.0	450	40.0	6.0	6.7	2.7	1%	12.0	2%
Food Wastes	80.0	1400	50.0	3.2	15.6	0.5	0%	0.7	0%
Overs	45.0	800	25.0	1.0	25.0	38.0	18%	95.0	14%
Waste Hay	12.0	225	40.0	0.3	133.3	0.8	0%	7.1	1%
Urea Fertilizer	0.05	745	N/A	46.0	N/A	0.000	N/A	N/A	N/A

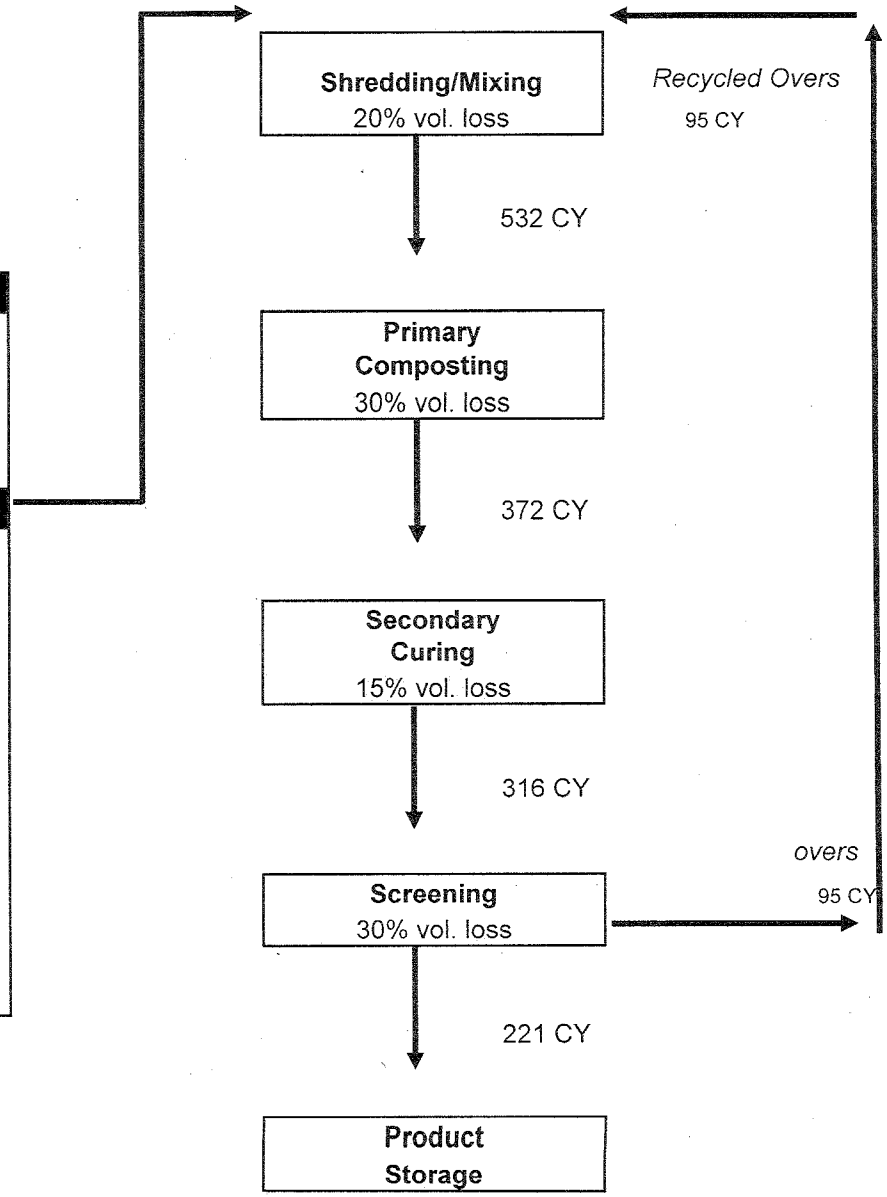
			Target
Calculated Moisture Content of Mix			55 to 65
Calculated C/N ratio of Mix	**31.1**		25 to 30
Calculated Bulk Density of Mix	**629.5**	**lb/CY**	600 to 800

Weight of materials	**209.0**	**tons**	
Pre-mix volume of materials	**664.0**	**CY**	
Volume reduction during mixing	**20%**		
Post-mixing volume of materials	**531.2**	**CY**	
Post-mixing bulk density		**lb/CY**	800 to 1000

TABLE 2-2
Mass & Volume Balance
Eastern Compost – Based on 5 Day per Week Average

Mix Characteristics	
Calculated Moisture Content of Mix	**0.55 %**
Calculated C/N ratio of Mix	**31.1**
Calculated Bulk Density of Mix	**629 lb/CY**
Post-mixing bulk density	**787 lb/CY**

Ingredients	Mass (tons)	Volume (CY)
Biosolids	29	40
Ferric Sulfate solids	48	71
Gin Trash	30	200
Pallets	15	86
Ground Brush	15	60
Sawdust	15	75
Water	15	18
Secondary Materials	42	115
Urea Fertilizer	1	1
Totals	210	665



See Appendix B calculations

The materials balance is based on an average of the materials anticipated. Two (2) important issues should be remembered:

- If the biosolids or ferric sulfate solids appear to be wetter than usual, the amount of wood chips or other bulking agents in the mix will need to be increased.
- The supervisor will determine the need for adding additional bulking agent to achieve a satisfactory mix (40-50 percent total solids), using the materials balance as a guideline.

This material balance represents the daily average blend for the annual average blend. Eastern Compost, LLC adjusts based on feedstock availability. Regardless of the feedstocks input:

- The pile temperature must be maintained at a minimum of 55°C (131oF) for 15 days to kill pathogenic organisms and qualify as a process to further reduce pathogens (PFRP). During the high temperature period the windrow shall be turned at least five times.
- The pile temperature must average of 45°C (113°F) or above, with no readings below 40°C (104oF), for 14 days to reduce vector attraction.

Refer to Section 3.5 for mixing procedures.

2.3 Solids Content

The biosolids/bulking agent mixture must contain sufficient voids or air space to allow for air to flow through the entire mass of composting materials. The voids in the mixture will be filled with water or air. When voids are filled with water, airflow is restricted and anaerobic zones develop in the mixture. It has been established through operational experience at other biosolids composting facilities that the solids content of the mix should be in the range of 40% to 45% to assure sufficient airflow. At solids content below 40%, aeration will be slowed and this can lead to the development of odor problems (malodors). In addition, low temperatures could develop in the compost pile as a result of inadequate aeration. Solids contents above 65% will inhibit microbial action due to lack of moisture. The quantity of bulking agent required to achieve a solids content in the mixture above 45% is excessive considering that little gain in process performance occurs.

Bulking agents or amendments are added to the biosolids and other wet wastes prior to composting for four (4) main reasons:

1. To increase the solids content of the biosolids;
2. To increase the porosity of the biosolids;
3. To add structural stability for stacking the biosolids; and
4. To increase the Carbon to Nitrogen (C:N) ratio.

Typically, dewatered biosolids and ferric sludges are a sticky, pasty, jello-like material with relatively little pore space. In order to prepare them for aerobic composting, a bulking agent of some type is added to create a mixture that will compost effectively. Many different materials such as wood chips, pine bark, leaves, shredded paper, and shredded rubber tires

can be used as bulking agents. However, the effects of different bulking agents on the four (4) items listed above, on product quality, and on their relative costs must be taken into account when selecting a bulking agent.

Ground pallets from a grinding operation at the Eastern Compost site are used as the primary bulking agent. Cotton gin waste, waste hay, yard waste, or similar can also be used as a supplemental bulking agent in the process.

2.4 Process Flow Diagram

Figure 2-2 shows the process flow diagram of the composting facility. This figure should be referenced as the process flow is described. The basic steps in the composting process are as follows:

1. Dewatered biosolids cake is generated at the City's WWTP and hauled to the Compost Facility in trailer trucks three (3) days per week. Normal operation is to mix biosolids as it arrives at the compost facility. However, this asphalt active composting pad can be used to store at least one (1) days production of dewatered biosolids cake.

2. An operator using a front-end loader (FEL) will load the correct amount of amendment (determined by the solids content of the biosolids and amendments). The FEL is used to build approximately two rows each week depending on the volume of incoming material. The row should be turned 3 to 5 times with the Frontier Windrow Turner to help thoroughly blend the different feedstocks and initiate the compost process.

3. Windrow temperatures, moisture levels and weather conditions are monitored and recorded daily. These criteria help establish when subsequent turnings will occur. Detailed descriptions of procedures and recordkeeping can be found in Chapter 7.

4. After PFRP requirements as stated in 15 A North Carolina Administrative Code 13B Section .1408 are met (minimum temperature of 131°F for 15 days, turned 5 times), windrows are turned periodically to help maintain temperatures. As space is needed rows are moved by FEL from the asphalt pad within the active composting area to the finished compost/maturation area for further curing.

5. Finished compost will be screened to ¾" minus or less by a McCloskey Trommel. Screened compost volumes will be determined by the end use demand. Agricultural land application will sometimes be done immediately after composting is completed without total screening. The screened overs material is recycled and placed in the recycle storage area and used for re-use in mixing. The compost is transferred by a FEL to the finished product storage and maturation area.

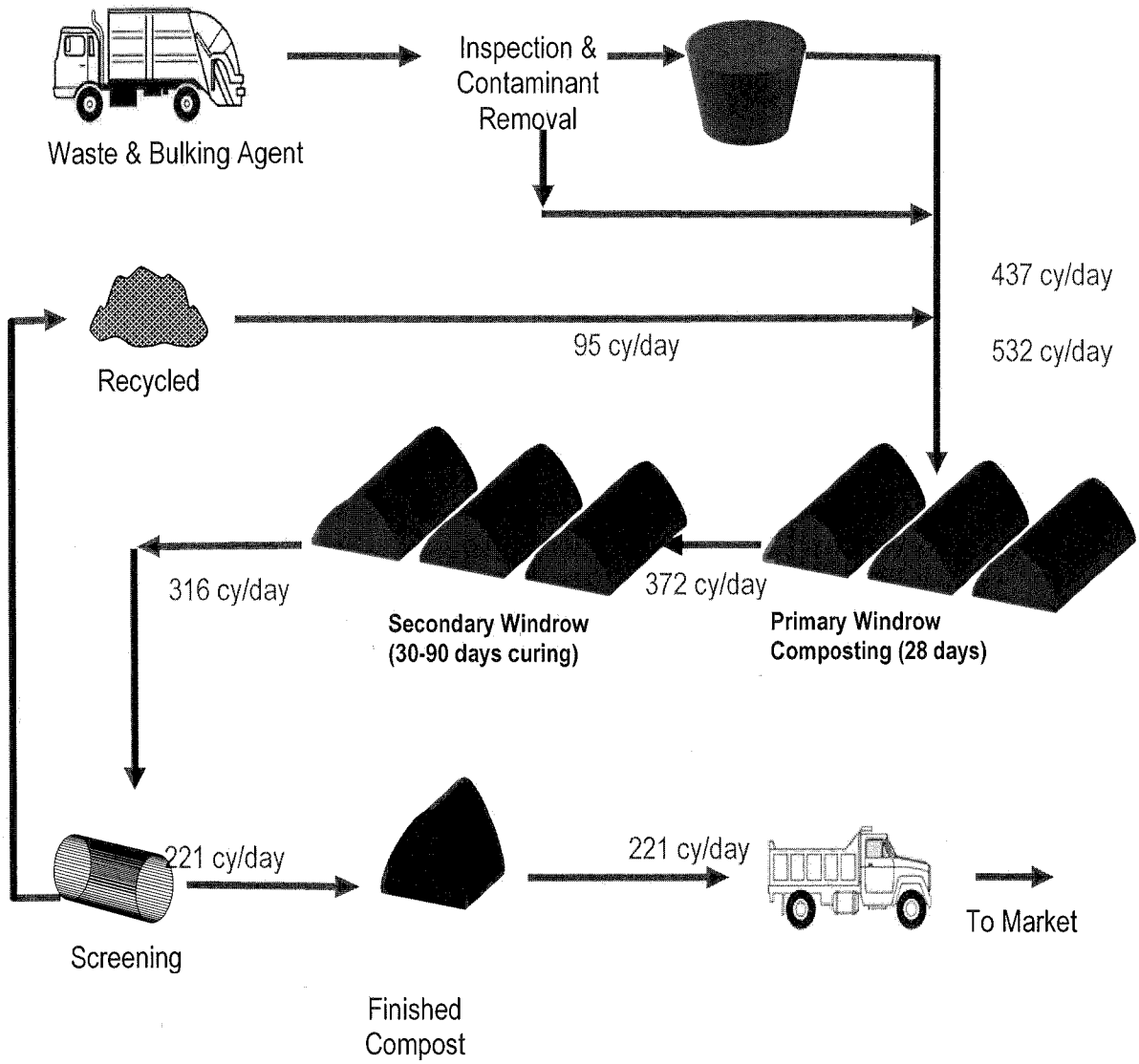


FIGURE 2-2
Process Flow Diagram
(Based on 5 Days per Week Daily Design Volumes)

2.5 Temperature

The high temperatures generated during composting are the result of aerobic biological activity. As the microorganisms break down the organic matter in the compost pile, energy in the form of heat is released. This heat plays an important part in the composting process. The temperature of the composting mass is a very important parameter and it affects the following aspects of the operation:

- Temperature is important in killing disease causing organisms (pathogens);
- Temperature affects the rate of decomposition of the feed materials;
- Temperature affects odor production;
- Temperature promotes evaporation of water, and
- Temperature is important in killing weed seeds.

Biosolids and some food wastes can contain human pathogens such as bacteria, parasites, worms, and viruses. These pathogens, however, are killed when exposed to high temperatures over a given period of time. Studies have shown that if the temperature in the composting pile reaches 55°C (131°F) for a period of three (3) consecutive days or more, pathogens are destroyed. This temperature target is easily achievable during the composting process. The following USEPA and requirements as stated in 15 A North Carolina Administrative Code 13B Section .1408 are met for the composting process and must be documented at the facility:

- The pile temperature must be maintained at a minimum of 55°C (131oF) for 15 days to kill pathogenic organisms and qualify as a process to further reduce pathogens (PFRP). During the high temperature period the windrow shall be turned at least five times.
- The pile temperature must average of 45°C (113°F) or above, with no readings below 40°C (104°F), for 14 days to reduce vector attraction.

Biosolids and ferric sulfate sludge also contain organic materials. These materials are broken down and stabilized by various microorganisms. Temperature plays an important part in the rate at which the organic matter is broken down or stabilized. Stabilization is important since unstabilized biosolids can produce malodors. The ideal temperature range for growth of these organisms is between 45°C (113°F) and 60°C (140°F). Temperatures higher than 65°C (150°F) can slow the composting process.

The decomposition of organic material in the biosolids and other solids will produce odors, especially if the oxygen concentration drops below a critical level. Composting is aimed at destroying putrescent (odor causing) compounds. The rate of breakdown, therefore, is important and this rate is controlled by temperatures. Furthermore, at high temperatures, new compounds, which produce odors, are generated. It has been shown that in some cases high temperatures (above 65°C) have been a cause of odor problems. The operator, therefore, should attempt to maintain pile temperatures as near to 55°C (131°F) as possible by turning each pile throughout the composting process.

2.6 Oxygen Content

There are two (2) important terms in composting with regards to oxygen content: aerobic (presence of oxygen) and anaerobic (absence of oxygen). Composting of sludges or biosolids will be done under aerobic conditions. This is extremely important since aerobic conditions will make the rate of stabilization of organic matter in composting more rapid; thus, resulting in less odors. The amount of oxygen provided to the mix controls the amount of oxygen available to the microbes; and thus, their activity. An insufficient supply of oxygen will result in reduced microbial activity, which in turn will result in a reduction in temperature of the mass. The windrow system used at this facility should be operated to provide oxygen in the range of 5% to 20%. If the oxygen level drops below 5%, anaerobic conditions (lack of oxygen) in the compost pile can be expected. This condition will slow the composting process, lower pile temperatures, and could also produce malodors if it is maintained for any length of time. Monitoring of oxygen content of the composting pile is not a routine need, but may be undertaken in the event of problems with temperatures and odors.

2.7 Carbon to Nitrogen Ratio (C:N)

In practice, the carbon-to-nitrogen (C:N) ratio is not measured because effective and timely composting can occur over a wide range of C:N ratios. Also, the bulking agent (wood chip/recycled chips) biosolids mix will generally result in a satisfactory C:N ratio when mixed with biosolids to meet the moisture content required for the process.

A C:N ratio in the range of 26:1 to 31:1 is optimal for rapid microbial activity. Higher C:N ratios tend to result in slower microbial activity and can cause lower temperatures in the compost pile. Lower C:N ratios can result in the accumulation of free nitrogenous compounds (ammonia) that may volatilize and be lost from the compost, thereby reducing the nitrogen content of the compost. While this is not detrimental to the process, the fertilizer value of the compost is reduced by loss of nitrogen. In addition, ammonia odors may develop during the composting process if the C:N ratio is too low.

If bulking agents other than wood chips are used, the effect on the C:N ratio must be considered and accounted for. This may require an adjustment in the mix ratio of bulking agent to biosolids. At the Eastern Compost, LLC Facility, the amount of wood chips and recycle chips added to the mixture should be ample enough to provide enough available carbon to adjust the C:N ratio to within the desirable range. The C:N ratio for the various feedstock materials and an average mix has been developed in Table 1 based on laboratory measurements of these materials or estimates based on data found in the literature. A calculated C/N ratio for the average quantities of materials to be composted at Eastern Compost is approximately 31 to 1 which is in the optimal range.

SECTION 3

Materials Handling and Mixing Procedures

3.1 Introduction

Proper handling and blending of materials at the start of composting is vital to ensuring the success of the process.

- Inattention to proper receiving and storage of raw materials can lead to odor and product contamination issues
- Incorrect proportioning may cause process problems and render the product unsuitable for use.
- Poor blending will reduce product quality and can increase odor production.

As in any industrial process, it is vital to control the types, proportioning and blending of the raw materials to ensure a safe and high quality end product.

3.2 Ferric Sulfate Sludge Receiving

Dewatered ferric sulfate sludge cake is generated at the City of Raleigh's EM Johnson Water Treatment Plant and hauled to the Compost Facility in trailer trucks, three to five days per week. The facility nominally receives one or two truckloads per operating day. The facility receives approximately 240 tons per week. Dewatered cake is dumped on the asphalt pad within the active composting area at the Northeast Corner. There is a combined 3667 cubic yards of storage capacity for both ferric sulfate sludge and biosolids.

3.3 Biosolids Receiving

Dewatered biosolids cake is generated at the City of Wilson WWTP and hauled to the Compost Facility in trailer trucks three to four days a week. The facility nominally receives one or two truckloads per operating day. The facility receives approximately 145 tons per week. There is a combined 3667 cubic yards of storage capacity for both ferric sulfate sludge and biosolids.

3.4 Bulking Agent Storage

A graded compacted soil area located to the northeast side of the Eastern Compost site provides storage for pallets, cotton gin waste, and similar bulking agents received. These materials are ground using a Beast Bandit 3680 horizontal grinder (Haybuster Tubgrinder 1500 for back-up purposes). Material is double ground using a 2" diamond screen. This storage area is approximately 5 acres and provides up to 340 days of storage capacity for bulking material.

The following are the materials anticipated to be used as bulking agents:

- Wood pallets (ground);
- Cotton gin trash;
- Agribusiness waste
- Screened recycled bulking agent

3.5 Mixing

Proper mixing is essential to the functioning of the composting process. The operator has control over the mixing process and attention to detail is worth the effort. The function of mixing is to intimately combine the biosolids, ferric sulfate sludge, food wastes and bulking agents to create a compostable mass. The ratio, as well as the method of combining the biosolids and bulking agent, will affect the physical properties of the mixture. The goal of mixing is to control the solids content of the mix and to create a mass that is sufficiently porous to allow air to flow through it. The mix must possess structural integrity sufficient to maintain porosity when built into the compost pile. In addition, mixing provides for the dispersal of the biosolids throughout the mass to expose maximum biosolids surface area to the decomposing organisms.

3.5.1 Mix Solids Content

The composting mass is a mixture of biosolids and ferric sulfate coated wood chips (ground pallets), mulch, cotton gin trash, and recycled bulking agent. Interspersed within the mixture are pores of varying sizes, shapes, and continuity. Depending upon the solids content of the mix, the pores will be filled with water and air in various relative amounts. The lower the solids content, the greater the percentage of pores filled with water.

Lower solids contents will tend to result in restricted air movement compared to higher solids contents. To ensure aerobic conditions (the presence of adequate oxygen) and sufficient potential for airflow to aid in drying of the mass, mixing operations must be controlled to provide a mix solids content of between 40% Total Solids (TS) and 50% TS. Both the biosolids and bulking agent solids contents affect the solids content of the mix. A change in solids content of the biosolids will require a change in the amount of bulking agents to be used. Mix solids contents below 40% will restrict airflow and oxygen transport and increase the occurrence of anaerobic zones in the mass. This should be avoided.

3.5.2 Mixing Process Description

Before mixing, it is essential to estimate the amount of biosolids, sludge, food wastes and bulking agents to be used in the batch of mix to be produced. In all of the mixing methods to be discussed below, all or a portion of the bulking agent must be prepared first before adding the biosolids, sludge or food wastes. The reasons for this vary with the mixing method employed. This is discussed in greater detail below. As bulking agents used or the biosolids increase in moisture content, the ratio of bulking agent to solids will increase. Conversely, as moisture contents decrease, the Bulking agent to solids ratio will decrease.

Variations in the solids content for any of the constituents of the mix will cause the above proportions to change. The mix ratio is determined by performing periodic solids analyses on each batch of compost to ensure the initial mix is within the 40% to 50% TS range. A calculation should be used to determine the mix solids content when solids contents for the constituent parts of the mix vary from those shown in the materials balance provided in Chapter 2.

3.5.3 Mixing Methods- Manual Mixing With Front End Loader and Windrow Turner

The general process is to place down layers of constituent materials according to the step-by-step procedures below, for construction of the pile, and once on the ground to turn over the materials several times with the FEL until a blend is created.

Step-by-Step procedures for manual mixing with the FEL:

1. Determine the volume of biosolids, ferric sulfate sludge and food wastes to be mixed. This is estimated from the volume of the FEL bucket and the number of buckets to be mixed at one time, typically one (1) to two (2).
2. Check and log solids content for the biosolids. This information should be provided by the staff of the dewatering operations at the WWTP.
3. Determine the volumetric mix ratio of each constituent using the solids contents and the bulk density of the constituents as estimated in the materials balance or measured in the field.
4. Using the FEL place a bed of one (1) of the bulking agents one (1) to two (2) feet high and approximately one (1) FEL bucket width wide.
5. Place biosolids, ferric sulfate sludge and food wastes on top of the bulking agent bed with the FEL
6. Place the remainder of the needed bulking agent over the top of these wet materials.
7. Pick up and drop the constituents several times with the FEL bucket.
8. Continue mixing with the FEL and the Frontier Windrow Turner until a thorough blend is achieved. The row should be turned from 3 to 5 times with the Frontier Windrow Turner to help thoroughly blend the different feedstock materials.
9. Visually inspect the mix for thorough blending. A good mix will be uniform in color, have all the bulking agent coated with biosolids and should have no balls or clumps larger than 4″ in diameter.
10. Place the mixture into the compost pile as outlined in Chapter 4 and repeat the process.

SECTION 4

Composting

windrow
600 x 8' x 15'

In Appdx B calculate
300' x 8' x 18'

4.1 Introduction

The biosolids/ferric sulfate composting unit process is the heart of the composting facility. Windrows are built on a 3-acre asphalt pad. Windrows are 600 feet long with a height of eight feet and a 15 foot base. Total volume per windrow is 1780 cubic yards. The mixture is composted for approximately 28 days during which time pathogen kill and vector attraction reduction temperature requirements are met. The biosolids and ferric sulfate sludge are also stabilized and dried out during the process.

4.2 Compost Pile Building

$\frac{2}{3} \times 6 \times 16 = 64$ cy

Incoming materials are deposited at designated areas and stockpiled within the compost yard until rows are built. Bulky materials such as yard debris, pallets, hay, and other feedstock's needing size reduction will be ground using a 3680 horizontal grinder. (Haybuster Tubgrinder 1500 for back-up purposes). Material is typically double ground using a 2" diamond screen.

Windrows are constructed from the SW to SE side of the asphalt pad. A front end loader is used to build approximately two rows each week depending on the volume of incoming material. The row is turned 3 to 5 times with the Frontier Windrow Turner to help thoroughly blend the different feedstocks in the row, and initiate the compost process.

4.3 Turning

Composting is a controlled aerobic process that results in the partial decomposition and stabilization of organic materials by the action of microbes. For composting to occur properly, the mass must be effectively aerated. In the windrow composting method, effective aeration is accomplished both by the addition of bulking material and by turning of the windrow. In order for the composting process to qualify as a PFRP, a temperature of 131°F or greater shall be maintained in the windrow for at least 15 days, during which time the pile is turned at least five times. After these requirements are met, windrows are turned periodically to help maintain temperatures.

4.4 Pile Monitoring & Data Recording

Windrow temperatures, moisture levels and weather conditions are monitored and recorded daily. These process parameters help establish when subsequent turnings will occur. These records will ensure PFRP or a minimum temperature of 131°F for at least 15 days, and turned 5 times is completed. As space is needed or when the active composting is finished, rows are moved from the asphalt pads to the clay pad for further curing. When a compost test fails to meet Federal pathogen and vector requirements (40 CFR), which

imposes a potential threat to the public health and the environment, the facility shall report the failed testing result to the division within 72 hours after receiving the testing result(s). Distribution of the compost products must stop until a further test confirms that the batch of re-composted products have met the federal safety standard.

In addition to the regulatory requirements, monitoring the compost pile temperature provides a means for checking on how the process is working.

Temperatures are taken daily at 4 places along the windrow with a long stem thermometer. Moisture will be checked as needed by the squeegee test. Each row position is numbered one thru eleven. Subsequent rows built in a position will receive a letter footnote (1, 1A, 1B, etc.) This identification will help with sampling and testing results.

4.5 Maturation and Storage

Typically, windrow curing will continue for another 30 to 90 days after primary composting. Curing can be done before or after screening, although curing before screening will allow further breakdown of the materials into compost.

During pile teardown, compost can be contaminated with pathogens from the front-end loader bucket. In the event the same front-end loader is used to handle the initial mix, the bucket should be cleaned of any visible biosolids before it is used to tear piles down or move compost to screening, curing, storage, or distribution. Repeatedly picking up and dumping fresh bulking agent will scour out most of the residual biosolids. Shovels may also be used to remove visible traces of biosolids, leaving the bucket clean enough to handle compost.

SECTION 5

Screening Procedures

5.1 Introduction

Compost is screened for two (2) reasons. These are to:

1. Enhance the commercial value of the product; and
2. Capture oversized material to be returned to the process as bulking agent.

Compost is marketed as a soil amendment product, and as such must have characteristics similar to soil. From the screening point of view, this means that the largest particle size should be ½". Most compost is screened to 3/8" to ½" with some specialty products screened to ¼" size. The smaller particle size material is generally considered a higher value product. However, the value given to particle size is dependent on local market demands. The oversized material recovered from screening is recycled back to the beginning of the process as bulking agent.

Screening can be performed either before or after the curing process. At the Eastern Compost, LLC Facility screening is designed to be performed after curing. This has several advantages:

- The compost tends to be dryer after curing
- More of the bulking agent will be broken down and pass through screening into the compost
- Less odors will be present after curing.

Compost screening operations are sensitive to moisture content of the material being screened.

5.2 Screening

After approximately 28 days of composting, the compost pile materials should be combined into new windrows for curing an additional 30 days. After curing, the compost pile material is removed and transported to the screening area using the front-end loader (FEL). Once the material arrives at the screening area, it is loaded directly into the hopper of the McCloskey Trommel Screen. The screen has a nominal 3/8" opening to produce 3/8" minus compost product.

The sizing of the compost product will depend on the moisture content of the compost, and feed conveyor speed setting. Refer to the O&M Manual for the McCloskey Trommel Screen for proper operation and maintenance procedures and for further details.

As in the beginning of the composting process, the solids content of the material loaded to the screen is critical. The optimal solids content for compost screening is 60-65% TS. A minimum solids content of 55 %TS is suggested to screen the material effectively. If the

solids content is less than 55 %TS, the compost will stick to the oversized bulking material and the screen reducing the effectiveness of the screen. If the compost material is too wet for screening, the material should continue to be composted to dry the material out for screening. When compost is removed from the active compost pile, the pore space is filled with hot, saturated vapor that is quickly released. This fluffing and re-stacking operation enhances the drying of the material.

Additionally, if the solids content for compost screening is too dry (greater than 65 percent) dust can be expected in the area immediately surrounding the screen. Other measures that should be taken to prevent dust are to avoid overloading of the screen and to perform regular housekeeping around and on the screen. The O&M Manual for the McCloskey Trommel screener should be consulted to learn of any dust effects to the machine. [

During screening operations, the output piles from the screen should be observed frequently to verify that compost is not sticking to the oversized bulking material coming out of the screen. If there is little or no material coming through the trommel screen, the screen is blinding. In this case, the material should be returned to the composting pad for drying until it will pass through the screen. If the oversized bulking material comes out of the screen caked with compost, much of the compost end product will wind up being recirculated back into the composting process. In such a case, the oversized bulking material will be recycled back into the composting process with compost adhering to it. This compost will reduce the porosity of the incoming mixture and subsequently reducing the effectiveness of aeration. The results could be increased odor and slower stabilization of the compost. Just as when the screen is blinding, the material should be placed back in the composting process and aerated until it is dry enough to screen effectively.

5.3 Screening Process Description

The following are step-by-step screening procedures to be used at the facility:

1. Check the solids content of the compost material prior to screening.
2. If the solids content is 55 to 65 percent, remove the compost material from the composting/curing area with a FEL and load into the screen feed hopper. If the solids content is below 55 percent, continue to aerate the material until the solids content reaches a minimum of 55 percent.
3. Operate screen machinery in accordance with screen equipment O&M Manual.
4. Make frequent observations of the oversized material and compost pile. If the discharged oversized material is caked with compost, the material is too wet for screening and should be transported back to the composting bay for further drying.
5. In general, if the compost is too wet to screen after 28 days of composting and 30 days of curing, increase composting time or turning frequency.
6. After material is screened, transport compost to the finished product storage and final curing area and return oversized material to the recycled material storage/mixing area.

SECTION 6

Maturation and Storage

6.1 Introduction

The maturation process is an extension of the composting process. The purpose of maturation is to provide additional decomposition to achieve a mature and stable end product. During maturation, decomposition occurs at a slower rate than composting at mesophilic temperatures. The maturation and storage area is located in the northeastern corner of the site on a natural pad with an area of 3.63 acres. This pad provides approximately 36,000 cubic yards of working capacity for maturation and finished storage.

6.2 Maturation and Storage Pile Building

After screening, front end loaders are used to move the compost to the maturation and storage area. The buckets on the front end loaders are cleaned between handling of feedstocks and immature compost. Maturation will take place for an additional period of between 30 and 90 days.

SECTION 7

Sampling, Testing and Record Keeping for Quality Assurance

7.1 General

Sampling and testing at the composting facility is necessary to:

- Monitor the process efficiency;
- Provide data for regulatory agencies; and
- Provide data for troubleshooting when problems develop.

It is extremely important that all sampling and testing be done at representative points in the process in a consistent manner. The data that results from any sampling and testing program is only as good as the collected sample. Sampling should be done in a consistent manner, on a regular basis, and using specific techniques. This section outlines the sampling schedule to be used and the sampling and testing procedures required for a successful sampling and testing program. The operator should make every effort to perform sampling in a consistent routine, according to these guidelines. Deviation from these guidelines should only be made under unusual circumstances after obtaining the approval of the Facility Manager and in accordance with 15 A North Carolina Administrative Code 13B Section .1408.

When a compost test fails to meet Federal pathogen and vector requirements (40 CFR), which imposes a potential threat to the public health and the environment, the facility shall report the failed testing result to the division within 72 hours after receiving the testing result(s). Distribution of the compost products must stop until a further test confirms that the batch of re-composted products have met the federal safety standard.

7.2 Sampling and Testing Schedule

- The sampling and testing performed at the Eastern Compost, LLC facility is in accordance with 15 A North Carolina Administrative Code 13B Section .1408.
- A composite sample of the compost produced at each compost facility shall be analyzed at intervals of every 20,000 tons of compost produced or every six months, whichever comes first, for test parameters required. The parameters include foreign matter, arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc, pathogens and Total nitrogen (Total N required for products containing sludge subject to 40 CFR 503).
- Sample collection, preservation, and analysis shall assure valid and representative results pursuant to a Division-approved quality assurance plan. At least three individual samples (of equal volume) shall be taken from each batch produced in separate areas

along the side of the batch. Each sampling point shall be at a depth of two to six feet into the pile from the outside surface of the pile. Samples that have been analyzed for metals shall be composited and accumulated over a six month period or at intervals of every 20,000 tons of product produced, whichever comes first. Any sample collected for testing for pathogens and nutrients shall be a representative composite sample of the compost and shall be processed within a period of time required by the testing procedure.

- Compost containing sewage sludge shall be tested in accordance with 40 CFR 503, Subpart B.
- Foreign matter content shall be determined by passing a dried, weighed sample of the compost product through a one-quarter inch screen. EPA Method 160.3 shall be used to dry the sample. The material remaining on the screen shall be visually inspected, and the foreign matter that can be clearly identified shall be separated and weighed. The weight of the separated foreign matter divided by the weight of the total sample shall be determined and multiplied by 100. This shall be the percent dry weight of the foreign matter content.

7.3 Grab Sampling

7.3.1 Grab Sample Definition

Grab samples are samples that are collected at one (1) particular time, in one (1) particular location of a certain process. Analysis from this type of sample will provide results from a random portion of the process stream (i.e. biosolids, mix, etc.) being sampled. In order to achieve a more representative analysis of a given process stream, many grab samples can be collected at various times and analyzed individually or these grab samples can be combined into one (1) large sample for an analysis known as a composite sample.

7.3.2 Grab Sampling Procedure

Grab samples should be collected using a clean, dry sampling jar (one (1) pint glass or plastic) or sterile zip lock baggies. The sample should be collected at a point in the material to be sampled that is homogeneous (completely mixed) and representative of the batch of material that is being sampled. Each grab sample collected should be approximately the same volume as previous grab samples.

7.4 Composite Sampling

7.4.1 Composite Sample Definition

Composite samples are a mixture of grab samples that are collected individually at various times at the same location in a certain process or a mixture of samples that are collected individually at various locations in a certain process. Grab samples should be immediately transferred to a composite sample container for storage. These types of samples generally provide a more representative sample for analysis than does a grab type sample because it will reflect variations in the process.

7.4.2 Composite Sampling Procedure

Composite samples should be stored in a clean, dry sampling jar (one (1) gallon or larger) with an air-tight, screw-on lid. The sampling container should be appropriately marked and stored in a cool, dry place, out of direct sunlight, preferably a refrigerator. At the end of the day, after the last grab sample is added to the composite jar, the composite sample should be well mixed and a representative portion placed in a smaller sampling jar (one (1) pint) or zip lock baggie for analysis. The sampling jar should be covered with an air-tight lid and stored in a refrigerator until it is delivered to the laboratory for analysis. Analysis should be performed as quickly as possible, preferably within 24 hours after collection. The sample jar should be adequately labeled with sample name, date of collection, and the operator's name.

7.5 Sample Testing Procedures

7.5.1 Transfer of Samples

After all compost samples have been collected as outlined in Sections 7.1 through 7.3, the sealed sample containers should be taken to the laboratory for analysis as quickly as possible. There, qualified, experienced technicians should perform the required analyses as outlined in Section 7.1. Soil Control Labs is the current laboratory used by Eastern Compost, LLC.

7.5.2 Total Solids Content

Samples that must be analyzed for solids content (percent total solids) should be analyzed as follows:

Measure tare weight of empty sample drying dish.

Insure sample container contents are homogeneous by mixing with a rod or paddle.

Place approximately 20 grams or more of the sample in the sample-drying dish. When measuring initial mixes, unscreened compost or bulking agents, a larger sample of approximately 100 grams will be required for better accuracy.

Record weight of sample drying dish with sample.

Place sample dish in a controlled drying oven at 221°F (105°C).

Remove sample container after 24 hours and place in an enclosed dessicator to cool.

Reweigh sample after it has cooled to room temperature.

Determine percent total solids of material using the following formula:

$$\%TS = 1 - \frac{(WB-WA)}{WB} \times 100\%$$

Where:

%TS = percent total solids

WB = weight of sample before drying (minus tare weight)

WA = weight of sample after drying (minus tare weight)

7.5.3 Volatile Solids Content

The volatile solids content (percent volatile) of the biosolids or other materials can be determined using the following procedure:

1. After obtaining a weight of the dried material in 7.5.2, place material in a controlled muffler furnace at 1022°F (550°C).

Note: Caution should be used if analyzing bulking agents for volatile solids content as the materials may ignite.

2. Remove sample container after 24 hours and place in an enclosed desiccator to cool.
3. Reweigh sample after it has cooled to room temperature.
4. Determine percent volatile content of material using the following formula:

$$\% \text{ Volatile} = \frac{(WB-WA)}{WB} \times 100\%.$$

Where:

% Volatile = percent volatile solids

WB = weight of sample before burning (minus tare weight)

WA = weight of sample after burning (minus tare weight)

7.5.4 Coliform, Salmonella, and Metals

All samples to be analyzed for coliforms, and metals should be analyzed according to the US Composting Council's Test Methods for the Examination of Composting and Compost (TMECC) procedures.

7.6 Operational Record Keeping Procedures

Keeping accurate records is an important part of the operation of any composting facility. Proper records are necessary for the Facility Manager to monitor the performance of the facility and to make operational decisions. Of great importance is the establishment of a reliable continuing record for proof of performance, thus justifying operational decisions, expenditures, and recommendations. Daily operational records also provide information useful in process adjustments required due to climatic or seasonal changes or other recurring problems of a specific nature. This information is useful to employees of the facility, as well as to operators of other facilities who may have related problems. Records and reports also provide valuable information for release in public relations efforts, as well as legal reference should a law suit or other action be threatened. Accurate records also provide the basis for planning future plant expansion, planning future modifications, establishing and adjusting operating budgets, and providing evidence of performance in compliance with regulatory agencies.

State and Federal regulatory agencies require record keeping on a continuing basis, which allows them to determine the facility efficiency and the effectiveness of the treatment in achieving the desired standards. Personnel from North Carolina Division of Waste Management make periodic visits to treatment facilities and during these inspections a

review of operational and other records may be requested. Records must be kept on hand for five years.

Therefore, an accurate set of records is necessary and useful to the Facility Manager, operators, and others who are interested in the performance and operation of the composting facility.

When a compost test fails to meet Federal pathogen and vector requirements (40 CFR), which imposes a potential threat to the public health and the environment, the facility shall report the failed testing result to the division within 72 hours after receiving the testing result(s). Distribution of the compost products must stop until a further test confirms that the batch of re-composted products have met the federal safety standard.

7.6.1 Types of Records

Records can generally be divided into three (3) categories:

- Administrative and physical plant records;
- Maintenance records; and
- Operational records.

Administrative and physical records include information such as cost and budget information, manpower and personnel records, safety records, as-built drawings, and specifications. Maintenance records include manufacturer's information and equipment maintenance records, maintenance costs, and parts inventories. Operational records include daily and monthly operating reports as well as analytical results.

While the administrative and maintenance records are important and necessary, this section of the O&M Manual will only address the operational records used at the Eastern Compost, LLC facility. The minimum record requirements in accordance with 15 A NCAC 13B Section .1408 (b) are as follows:

1. Daily operational records must be maintained, which include, at a minimum, temperature data (length of the composting period) and quantity of material processed;
2. Analytical results on compost testing;
3. The quantity, type and source of waste received;
4. The quantity and type of waste processed into compost;
5. The quantity and type of compost produced by product classification; and
6. The quantity and type of compost removed for use or disposal, by product classification, and the market or permitted disposal facility.

7.7 Annual Reporting Record Keeping Procedures

An annual report for the period July 1 to June 30 shall be submitted by all facility owners or operators to the Division of Waste Management by August 1st and shall contain:

1. The facility name, address, and permit number;

2. The total quantity in tons, with sludge values expressed in wet and dry weight, and type of waste received at the facility during the year covered by the report, including tons of waste received from local governments of origin;
3. The total quantity in tons, with sludge values expressed in dry weight, and type of waste processed into compost during the year covered by the report;
4. The total quantity in tons and type of compost produced at the facility, by product classification, during the year covered by the report;
5. The total quantity in tons and type of compost removed for use or disposal from the facility, by product classification, along with a general description of the market if for use during the year covered by the report;
6. Monthly temperature monitoring to support Rule .1406
7. Results of tests required in by Rule .1408.

Yearly totals of solid waste received and composted shall be reported back to the local government of origin for annual recycling reporting.

SECTION 8

Troubleshooting Procedures

8.1 General

Table 8-1 below describes some common problems at composting facilities and corrective actions for these problems.

TABLE 8-1
Common Problems and Corrective Actions

PROBLEM	CORRECTIVE ACTION
Compost pile temperatures too high (>70°C)	1. Mix more frequently. 2. Poor air flow through pile. Poor mixing would most likely cause this. Check moisture content and add more bulking agent and remix, if needed.
Compost pile temperatures too low	1. Insufficient amount of new bulking agent; add more bulking agent to the windrow andre-mix.
Blinding/clogging of screen	1. Solids content too low; pile material in drying space and turn with windrow turner until solids content is >55 percent.
Odors coming from paved area	1. Possible ponding of leachate around debris; clean paved surface. 2. Possible collection of debris in catch basins; remove and clean catch basin debris baskets.
Rain run-off ponding around catch basins	1. Possible ponding may occur during periods of short-duration, heavy rain; however, if this remains, check catch basins for clogging debris.
Blowing dust	1. Clean area around screen. 2. If coming from finished compost stockpiles, wet piles.
Equipment Breakdown	1. All preventative maintenance, minor repair, and replacement of ware parts will be done on site by our personnel or at Boseman Farms Shop. 2. Rental equipment will be obtained if necessary. 3. All major repairs will be done by a certified service technician from Greg Poole Equipment Company or by Richard Ferguson of Fergie's Truck Repair in Spring Hope, North Carolina.
Fire	1. Use fire extinguisher on-site. 2. Contact local fire department.
Unusual traffic conditions	1. Modify schedule of operation to avoid.

SECTION 9

Health and Safety

9.1 General

Municipal wastewater biosolids contain pathogens. Composting, if carried out properly, will destroy pathogens. The following are some general recommendations for the health and safety of workers at the Eastern Compost, LLC facility.

9.2 Personal Hygiene

The following personal hygiene recommendations should be stressed as common practices to all compost facility employees.

- Wash hands before eating, drinking, or smoking.
- Food should not be eaten or stored near biosolids. Do not drink from plant hoses.
- If heavily contacted with biosolids, immediately take a hot shower and put on clean clothing. The supervisor should be notified.
- It is recommended that showers be taken each day and hair be washed prior to leaving the plant site.
- All employees working at the compost facility must wear protective clothing, i.e. uniforms and/or coveralls, and safety shoes.
- Change from protective clothing to street clothing at the end of each day. Soiled, protective clothing should not leave the premises.
- Goggles, dust masks, and hard hats must be available and should be worn by employees working in the mixing and screening areas.
- Wash, disinfect, and bandage ANY cut, no matter how small. Any break in the skin can become a source of infection. Change bandages frequently and wear protective clothing over the wound.
- Keep fingernails closely trimmed and clean (dirty nails can harbor pathogens).

It is also recommended that tetanus, diphtheria, hepatitis, polio, and typhoid inoculations be given. Records of inoculations should be kept on file for each employee. Individuals who are highly debilitated or have severe allergies or asthma should not be employed to work around compost facilities.

9.3 Personal Protective Equipment

Personal Protective Equipment (PPE) must be evaluated as to the level of protection necessary for particular operating conditions and then made available to facility employees.

The list below includes the PPE typically used and/or required in a compost facility workplace:

- Uniforms and/or coveralls
- Safety shoes with steel toes and non-slip shoe soles
- Eye protective goggles and dust masks should be worn, particularly in the screening areas
- Hard hats
- Noise reduction protection should be used in areas where extended exposure to continuous high decibel levels are expected
- Disposable rubber latex or chemical resistant gloves for handling and/or sampling of biosolids.
- Dust filter masks

Following use, PPE's should be disposed of, or adequately cleaned, dried, and readied for reuse.

9.4 Electrical and Mechanical Equipment Hazard Prevention

The materials handling equipment in the screening and mixing areas should be operated with care and caution. Only qualified electricians or instrumentation specialists should be allowed to service or troubleshoot these devices to prevent accidental injury by electrical shock.

9.5 Employee Health and Safety Training

Eastern Compost, LLC personnel must recognize and understand the potential health and safety risks associated with routine job activities in the various process stages of composting. Facility personnel must be kept updated and aware of operational procedures through the use of periodic training sessions to remind them of the safety requirements specific to their job profiles in accordance with the facility-specific health and safety plan. Some general safety rules are:

- Make sure that you understand the job that has to be done. Review the facility equipment O&M Manual prior to attempting repairs/changes.
- Use common sense when attempting a job. Use the safest way to get the work done, including using the proper equipment and tools.
- Use the buddy system in case of repair of electrical or mechanical equipment (have a co-worker stand guard, and remember to properly lock and tag equipment at the main control panel to inform people that you are working on equipment remotely).
- Keep the right attitude towards safety. Lack of awareness or a careless attitude can lead to accidents.

- Make sure you know where the first aid kit and fire extinguishers are located. Understand how to use the first aid kit.

9.5.1 First Aid

In addition to general health and safety protocol, it is recommended that all facility employees receive both first-aid and cardiopulmonary resuscitation (CPR) training. American Red Cross can provide this training in group settings or a representative can be appointed to receive teaching certification and offer the courses to the compost facility personnel. Standard fist aid is required to be updated every three (3) years, whereas CPR refresher training is conducted on an annual basis.

At the composting facility, portable first aid kits and stations should be strategically located and accessible around the facility and all personnel should know immediately where the nearest station is located.

9.5.2 Fire Extinguisher

Potential fire hazards at a compost facility are created from the build-up of fine dry dust particles on and around operational motors and control panels. The presence of these build-ups can cause overheating and potential fire if continuous site cleaning and maintenance are not practiced. Portable fire extinguishers should be maintained in a state of readiness at several locations throughout the compost area, particularly near the screening and mixing equipment.

The annual inspection of facility fire extinguishers provides a good opportunity for fire extinguisher training and refresher practices.

9.5.3 Physical Exposure

Facility personnel who may come in contact with physical exposures on the job should be kept aware of the health aspects associated with the fluids, solids, and airborne constituents found at composting facilities. Training concerning safe work practices around these potential exposures should include recommended protective equipment and proper disposal procedures.

9.5.3.1 Biosolids

Training in the handling, sampling, and processing of biosolids should be made available upon the initial assignment to an area where the potential exposure exists. Pathogens exist in wastewater treatment plant operations and composting, when performed correctly, is one (1) method used to destroy this potential exposure. Pathogens from biosolids are likely to enter the body through the nose, eyes, or mouth. For this reason, personal hygiene, PPE, first aid, and eyewashes are the most effective safety aspects necessary to reduce the potential exposure to pathogens through contact with biosolids.

9.5.3.2 Bioaerosols

Like the procedures to be followed under contact with biosolids, bioaerosols are airborne microorganisms that can enter the body in the same locations. Bioaerosols can become airborne during mixing, aeration, and screening of composted materials. Once airborne,

bioaerosols may be inhaled or contact the eyes. Dirty hands also may result in inadvertent transmission to the mouth or eyes.

Facility employees should refer to Sections 9.2 Personal Hygiene; 9.3 Personal Protective Equipment; and 9.5.1 First Aid for reminder information on Health and Safety.

9.5.3.3 Dust

Excessive dust can be a health hazard as a result of its irritating effect on eyes and mucous membranes if proper PPE, such as eye protective goggles and dust filter masks, are not worn by all personnel in the affected areas. During periods of extremely dry weather, excessive dust can be controlled by sprinkling screening areas, conveyors, and facility traffic areas. Goggles and dust masks should be worn in "dusty" conditions.

William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources

Coleen H. Sullins, Director
Division of Water Quality

December 24, 2008

Jason Smith, Partner
Eastern Compost, LLC
Post Office Box 460
Battleboro, North Carolina 27809

Subject: Permit No. WQ0033492
Eastern Compost, LLC
Closed-Loop Recycle System
Edgecombe County

Dear Mr. Smith:

In accordance with your permit request received September 25, 2008, we are forwarding herewith Permit No. WQ0033492, dated December 24, 2008, to Eastern Compost, LLC for the construction of the subject closed-loop wastewater recycle facilities.

This permit shall be effective from the date of issuance until November 30, 2013 shall void Permit No. WQ0033492 issued December 24, 2008 and shall be subject to the conditions and limitations as specified therein. Please pay particular attention to the monitoring requirements in this permit. Failure to establish an adequate system for collecting and maintaining the required operational information will result in future compliance problems.

If any parts, requirements, or limitations contained in this permit are unacceptable, you have the right to request an adjudicatory hearing upon written request within thirty (30) days following receipt of this permit. This request must be in the form of a written petition, conforming to Chapter 150B of the North Carolina General Statutes, and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, NC 27699-6714. Unless such demands are made this permit shall be final and binding.

One set of approved plans and specifications is being forwarded to you. If you need additional information concerning this matter, please contact Alice M. Wessner at (919) 715-5208 or alice.wessner@ncmail.net.

Sincerely,

for Coleen H. Sullins

cc: Edgecombe County Health Department
Raleigh Regional Office, Aquifer Protection Section
Kathryn Benson, CH2M Hill, 3201 Beechleaf Court Suite 300, Raleigh, NC 27604
Technical Assistance and Certification Unit
APS Central Files

NORTH CAROLINA

ENVIRONMENTAL MANAGEMENT COMMISSION

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

RALEIGH

CLOSED-LOOP RECYCLE SYSTEM PERMIT

In accordance with the provisions of Article 21 of Chapter 143, General Statutes of North Carolina as amended, and other applicable Laws, Rules, and Regulations

PERMISSION IS HEREBY GRANTED TO

Eastern Compost, LLC

Edgecombe County

FOR THE

construction of a 28,975 gallon per day (GPD) wastewater recycle system consisting of approximately nine acres of drainage area including approximately 5 acres of impervious surface which drains to a 1.35 million gallon clay lined lagoon to serve Eastern Compost, LLC, with no discharge of wastes to the surface waters, pursuant to the application received September 25, 2008 received by the Division of Water Quality (Division), and in conformity with the project plan, specifications, and other supporting data subsequently filed and approved by the Department of Environment and Natural Resources and considered a part of this permit.

This permit shall be effective from the date of issuance until November 30, 2013, shall void Permit No. WQ0033492 issued December 24, 2008, and shall be subject to the following specified conditions and limitations:

I. **SCHEDULES** [please review the entire permit for reporting, monitoring, and other on-going activities]

1. Upon completion of construction and prior to operation of this permitted facility, a certification (see attached form) must be received from a professional engineer certifying that the permitted facility has been installed in accordance with this permit, the approved plans and specifications, and other supporting materials including the location of all monitoring wells as applicable. If this project is to be completed in phases and partially certified, you shall retain the responsibility to track further construction approved under the same permit, and shall provide a final certificate of completion once the entire project has been completed. Mail the Certification to the Aquifer Protection Section, Division of Water Quality, 1636 Mail Service Center, Raleigh, NC 27699-1636.

2. The Raleigh Regional Office, telephone number (919) 791-4200, shall be notified at least forty-eight (48) hours in advance (excluding weekends and holidays) of operation of the installed facilities so that an in-place inspection can be made. Such notification to the regional supervisor shall be made during the normal office hours from 8:00 a.m. until 5:00 p.m. on Monday through Friday, excluding State Holidays.

3. Prior to construction of the subject closed loop recycle system, the Permittee shall submit a complete Operation and Maintenance Plan as well as a Residual Management Plan in accordance with 15A NCAC 02T .1007 and .1008 respectively.

4. If not already installed, a waste-level gauge, to monitor waste levels in the lagoon, shall be installed within 60 days of issuance of this permit / prior to operation. Caution shall be taken not to damage the integrity of the liner (if provided) when installing the gauge

5. No later than six months prior to the expiration of this permit, the Permittee shall request renewal of this permit on official Division forms. Upon receipt of the request, the Division will review the adequacy of the facilities described therein, and if warranted, will renew the permit for such period of time and under such conditions and limitations as it may deem appropriate. Please note that Rule 15A NCAC 02T .0105(d) requires an updated site map to be submitted with the permit renewal application.

6. Prior to installation of wastewater return pump from the lagoon to the windrows, plans and specifications shall be approved by the Division of Water Quality.

II. PERFORMANCE STANDARDS

1. The closed-loop recycle system shall be effectively maintained and operated at all times so that there is no discharge to the surface waters, nor any contravention of groundwater or surface water standards. In the event that the facilities fail to perform satisfactorily, including the creation of nuisance conditions due to improper operation and maintenance, the Permittee shall take immediate corrective actions including those actions that may be required by the Division, such as the construction of additional or replacement wastewater treatment, recycle, or disposal facilities.

2. The issuance of this permit shall not relieve the Permittee of the responsibility for damages to ground or surface waters resulting from the operation of this facility.

3. The facilities permitted herein must be constructed according to the following setbacks:

   a. The setbacks for treatment and/or storage units shall be as follows (all distances in feet):

i. Any habitable residence or place of public assembly under separate ownership or not to be maintained as part of the project site:	100
ii. Any private or public water supply source:	100
iii. Surface waters:	50
iv. Any well with the exception of a Division approved groundwater monitoring well:	100
v. Any property line:	50

III. OPERATION AND MAINTENANCE REQUIREMENTS

1. The facilities shall be properly maintained and operated at all times. The facilities shall be effectively maintained and operated as a non-discharge system to prevent the discharge of any wastewater resulting from the operation of this facility. The Permittee shall maintain an Operation and Maintenance Plan pursuant to 15A NCAC 02T .1007 including operational functions, maintenance schedules, safety measures, and a spill response plan.

2. Upon classification of the wastewater treatment and closed-loop recycle facilities by the Water Pollution Control System Operators Certification Commission (WPCSOCC), the Permittee shall designate and employ a certified operator to be in responsible charge (ORC) and one or more certified operator(s) to be back-up ORC(s) of the facilities in accordance with 15A NCAC 08G .0200. The ORC shall visit the facilities in accordance with 15A NCAC 08G .0200 or as specified in this permit and shall comply with all other conditions specified in these rules.

3. Public access to the wastewater treatment equipment, wastewater storage structure(s), and closed-loop recycle system shall be controlled.

4. The residuals generated from these treatment facilities must be disposed / utilized in accordance with 15A NCAC 02T .1100. The Permittee shall maintain a residual management plan pursuant to 15A NCAC 02T .1008.

5. Diversion or bypassing of untreated wastewater from the treatment facilities is prohibited.

6. The storage lagoon shall be constructed and maintained to contain the accumulation of water from a 25-year, 24-hour storm event.

7. Freeboard in the lagoon shall not be less than one foot at any time.

8. A waste-level gauge, to monitor waste levels in the lagoon shall be provided. This gauge shall have readily visible permanent markings indicating the maximum liquid level at the top of the temporary liquid storage volume, minimum liquid level at the bottom of the temporary liquid storage volume, and the lowest point on top of the dam elevations.

9. A protective vegetative cover shall be established and maintained on all earthen basin embankments (outside toe of embankment to maximum allowable temporary storage elevation on the inside of the embankment), berms, pipe runs, erosion control areas, and surface water diversions. Trees, shrubs, and other woody vegetation shall not be allowed to grow on the earthen basin dikes or embankments. Earthen basin embankment areas shall be kept mowed or otherwise controlled and accessible.

IV. MONITORING AND REPORTING REQUIREMENTS

1. Any monitoring (including groundwater, surface water, soil or plant tissue analyses) deemed necessary by the Division to ensure surface and ground water protection will be established and an acceptable sampling reporting schedule shall be followed.

2. All laboratory analyses for effluent, ground waters, or surface waters shall be made by a laboratory certified by the Division for the required parameter(s) under 15A NCAC 02H .0800.

3. Freeboard (waste level to the lowest elevation on the top of the embankment) in the lagoon shall be recorded weekly. Freeboard recording results shall be maintained at the facility for a period of no less than five years, and shall be made available to the Division upon request.
4. A record shall be maintained of all residuals removed from this facility. This record shall include the name of the hauler, permit authorizing the disposal or a letter from a municipality agreeing to accept the residuals, date the residuals were hauled, and volume of residuals removed.

5. **Noncompliance Notification:**

   The Permittee shall report by telephone to the Raleigh Regional Office, telephone number (919)791-4200, as soon as possible, but in no case more than 24 hours or on the next working day following the occurrence or first knowledge of the occurrence of any of the following:

   a. Any occurrence at the wastewater treatment facility which results in the treatment of significant amounts of wastes which are abnormal in quantity or characteristic, such as the dumping of the contents of a basin or tank; the known passage of a slug of hazardous substance through the facility; or any other unusual circumstances.

   b. Any process unit failure, due to known or unknown reasons, that render the facility incapable of adequate wastewater treatment such as mechanical or electrical failures of pumps, aerators, compressors, etc.

c. Any failure of a pumping station, sewer line, or treatment facility resulting in a by-pass directly to receiving waters.

d. Any time that self-monitoring information indicates that the facility has gone out of compliance with its permit requirements.

For any emergency that requires immediate reporting (e.g., discharges to surface waters, imminent failure of a storage structure, etc.) outside normal business hours must be reported to the Division's Emergency Response personnel at telephone number (800) 662-7956, (800) 858-0368, or (919) 733-3300. Persons reporting such occurrences by telephone shall also file a written report in letter form within five (5) days following first knowledge of the occurrence. This report must outline the actions taken or proposed to be taken to ensure that the problem does not recur.

V. INSPECTIONS

1. Adequate inspection and maintenance shall be provided by the Permittee to ensure proper operation of the subject facilities.

2. The Permittee or his designee shall inspect the wastewater treatment and disposal facilities to prevent malfunctions and deterioration, operator errors and discharges which may cause or lead to the release of wastes to the environment, a threat to human health, or a nuisance. The Permittee shall keep an inspection log or summary including at least the date and time of inspection, observations made, and any maintenance, repairs, or corrective actions taken by the Permittee. This log of inspections shall be maintained by the Permittee for a period of five years from the date of the inspection and shall be made available upon request to the Division or other permitting authority.

3. Any duly authorized officer, employee, or representative of the Division may, upon presentation of credentials, enter and inspect any property, premises or place on or related to the disposal site or facility at any reasonable time for the purpose of determining compliance with this permit; may inspect or copy any records that must be maintained under the terms and conditions of this permit, and may obtain samples of groundwater, surface water, or leachate.

VI. GENERAL CONDITIONS

1. Failure to abide by the conditions and limitations contained in this permit may subject the Permittee to an enforcement action by the Division in accordance with North Carolina General Statute 143-215.6A to 143-215.6C.

2. This permit shall become voidable unless the facilities are constructed in accordance with the conditions of this permit, the approved plans and specifications, and other supporting data.

3. This permit is effective only with respect to the nature and volume of wastes described in the application and other supporting data. No variances to applicable rules governing the construction and / or operation of the permitted facilities are granted unless specifically requested and granted in this permit.

4. The issuance of this permit does not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances, which may be imposed by other government agencies (local, state, and federal) that have jurisdiction. Of particular concern to the Division are applicable river buffer rules in 15A NCAC 02B .0200, erosion and sedimentation control requirements in 15A NCAC Chapter 4 and under the Division's General Permit NCG010000, and any requirements pertaining to wetlands under 15A NCAC 02B .0200 and 02H .0500.

5. In the event there is a desire for the facilities to change ownership, or there is a name change of the Permittee, a formal permit request must be submitted to the Division on official Division form(s), documentation from the parties involved, and other supporting materials as may be appropriate. The approval of this request will be considered on its merits and may or may not be approved. The Permittee of record shall remain fully responsible for compliance until a permit is issued to the new owner.

6. The Permittee shall retain a set of approved plans and specifications for the life of the facilities permitted herein.

7. The Permittee shall maintain this permit until all permitted facilities herein are properly closed or permitted under another permit issued by the appropriate permitting authority.

8. The Permittee must pay the annual fee within thirty (30) days after being billed by the Division. Failure to pay the fee accordingly may cause the Division to initiate action to revoke this permit pursuant to 15A NCAC 02T .0105(e).

Permit issued this the 24th of December 2008

NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

for Coleen H. Sullins. Director
Division of Water Quality
By Authority of the Environmental Management Commission

Permit Number WQ0033492

ENGINEER'S CERTIFICATION

_____ Partial _____ Final

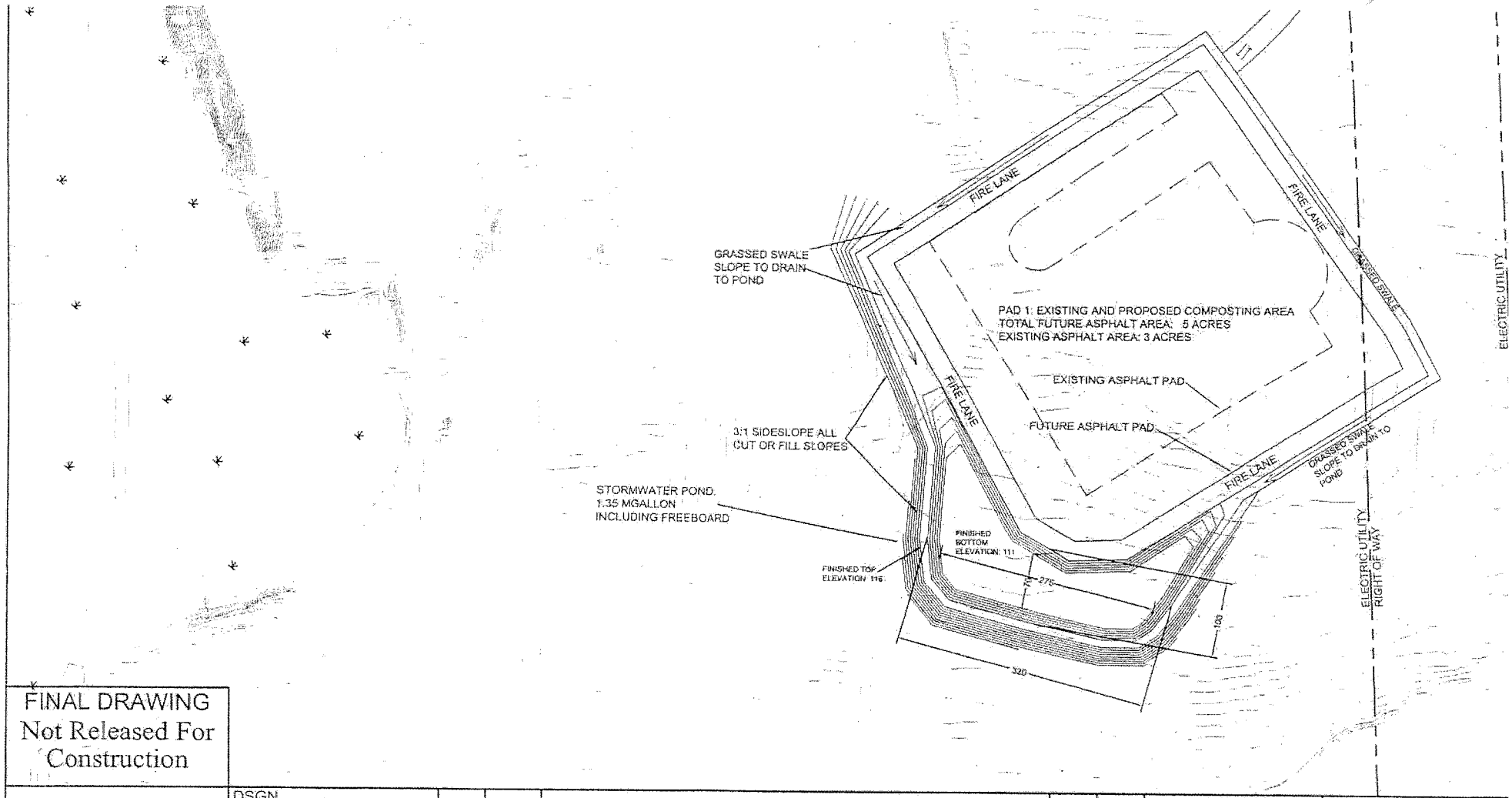
I, _____, as a duly registered Professional Engineer in the State of North Carolina, having been authorized to observe (periodically, weekly, full time) the construction of the project,

_____, _____
Project Name *Location and County*

for the Permittee hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of this permit, the approved plans and specifications, and other supporting materials.

Signature _____ Registration No. _____

Date _____.



FINAL DRAWING
Not Released For
Construction

DSGN	LJS			250 0 125 250 1 inch = 250 ft. 1 inch = 250 ft. 22" x 34" sheet			VERIFY SCALE
DR	LJS						BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.
CHK	KSB						
APVD		NO.	DATE	REVISION	BY	APVD	

NORTH CAROLINA PROFESSIONAL SEAL 032075 ENGINEER KATHRYN S. BENSON