CRAVEN AG SERVICE COMPOST SITE APPLICATION FOR LARGE TYPE III FACILITY

APPROVED DOCUMENT
Division of Waste Management
Solid Waste Section
Approved June 17, 2014
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Revised November 2012

PREPARED FOR:

CRAVEN AG SERVICES, Inc.
RIVER ROAD
NEW BERN, NC

DEVELOPED BY:

GARY MACCONNELL, P.E,
President, MacConnell and Associates

ZACH FULLER, P.E.
Project Manager, MacConnell and Associates

ROBERT RUBIN
President, A. R. Rubin and Associates

J.W. DUNHAM
President Craven Ag Service

Revised through
June 2014

Craven
AG SERVICES, INC.
2115 Hwy 55 West New Bern, NC 28562

Billy Dunham, President
Office – 252-633-5334
Cell- 252-670-8530

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To Whom It May Concern:
Composting and Land Application Branch
NC Division of Waste Management
1646 Mail Service Center
Raleigh NC 27699-1646

To Whom It May Concern:

The Craven AG Service compost facility located at 5391 River Road is owned by John W Dunham and Jene H Dunham. We are also the owners of Craven Ag Service and do here by give permission to Craven Ag Service to permit and operate a permanent composting facility on this property.

Billy Dunham John W. (Billy) Dunham

Jene Dunham Jene Dunham

Witness Frances Mills

I, Helen Mills Davis, a Notary Public of the County Of CRAVEN

State of North Carolina, hereby certify that John W. Dunham, Jene Dunham

Appeared personally before me this day and being duly sworn acknowledged that the above form was executed by him.

Witness my hand and notarial seal, this 23 day of September 2011

SEAL

Helen Mills Davis
Notary

My Commission Expires 3-9-2015

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Background and Introduction: Materials Contained herein are derived from North Carolina Administrative Code (NCAC) and the compost requirements contained in 15 A NCAC 13B 1400 et seq. and are intended to support the application to permit and operate a Compost Production facility in Craven County, NC.

The operation proposed involves expanding the approved 3.005 acre demonstration site to include a 4.7 acre and 1.8 acre site for a total of 9.505 acres. The expansion will create a new mix/blend area and windrow area, expand the finish product and blending area, and develop a more permanent and sustainable compost operation utilizing the entire area specified as the CAS compost operation. Site 1 is the 1.8 acre site to the south containing Area 1, Site 2 is the large 4.7 acre site to the southwest containing Area 2, and Site 3 is the existing 3.005 acre demonstration site containing Area 3 as shown on plan Sheet C-102. The operation will take place on the three portions of the site listed in the permit application. Areas with jurisdictional wetland and areas in flood prone portions of the large acreage tract are not intended for coverage under this permit.

The effort is intended to allow Craven Ag Service (CAS) to remain in operation while the activities necessary for expansion onto the larger proposed site occur. The operations on the existing site have demonstrated to CAS and NCDWM the viability of a compost operation. The existing demonstration site has capacity to function satisfactorily for approximately 18 additional months while the expansion areas are developed. The intent is to permit the entire facility as a permanent compost operation.

This application is intended to support requirements in the .1400 rule to permit a septage/FOG/MSW compost facility.

A. Site Location (.1405 (b)(1))

The Craven Ag Service, Inc. Compost Facility is currently operating through a demonstration permit. The site is located on River Road in Craven County, NC. The site is located between River Road and the Neuse River. The property contains 89.34 acres, but only those portions of the large acreage tract located on the higher elevations will be utilized in the compost operation. The specific location of the compost facility is shown on a site map and aerial photographic maps included in Attachment 1. The Craven Ag Service, Inc. Compost Site is located so as to meet or exceed all the applicable buffers for a Large Type 3 composting facility posed in NC Rule. The buffer distances between existing residences and active compost production is over 500 feet. No product will be stored within 500 feet of existing off-site residences, however finished product storage, haul roads, ingress and egress to storage is within the 500 foot buffer. The 500 foot buffer to Area 3 (Curing) and composting area boundaries will be field delineated with markers. These markers will show the location of the 100 year flood plain. The applicable buffers are shown on the site map provided in Attachment 1.

The proposed compost site is currently permitted as a septage receiver site. Land application of septage will be halted in areas permitted for composting activities. The entire area was investigated previously by Mr. Fred Smith. His site and soils report were submitted as a portion of the permitting package submitted to obtain the septage land application permit and are included as an attachment to this report. This previously submitted report contains the relevant site and soil information required to obtain a land application permit and similar information is required for the compost operation. This site and soil report is in the record for the CAS site and is considered as representative of the current underlying soil features.

The application for the compost site permit does include feedstocks from the ongoing CAS septage and grease trap dewatering operation currently permitted at the Highway 55 facility. In addition to these regulated wastes, bulking materials and feedstocks will be as listed in Section D, Part 1 of this document.

B. Letter from Craven County Planning (1405(a)(2))

The Craven County Zoning letter, 12 May, 2011 is attached as appendix A.

C. Compliance: (.1405(b)(3) and .1404 (a)

(1) The Craven Ag site is located on a terrace landscape position adjacent to the Neuse River in Craven County, NC. Portions of the property are in designated 100 year flood elevation areas and designated as AE in the FEMA flood maps (FIRM Map, Map Number 37205544001, 2 July, 2004). The areas designated as Zone AE or the AE floodway are not intended to host compost operations.
(2) The site map attached identifies property boundaries and demonstrates compliance with mandated buffer requirements (NO active compost operations will take place within 500 feet of off-site residences).
(3) The site map attached indicates adequate buffer between site operations and adjacent residences or dwellings.
(4) The site map attached indicates adequate buffer between site operations and wells.
(5) The site map attached indicates adequate buffer between compost operations and waterways.
(6) There is no direct discharge of pollutants from the site. An assessment by Ken Pickle, NCDENR - DWQ indicates no direct runoff. Water quality standards apply to discharge systems; non-point sources of discharge have been addressed through the operations plan.
(7) No portion of the operation is located over a closed solid waste operation.
(8) No portion of the operation is located within 25 feet of a berm or swale.
(9) No discharge of pollutants will impact section 404 waters or areas or violate water quality standards.
(10) Site assessments confirm no groundwater within 24 inches of soil surface.

Compliance: 1404(b)

1. Not applicable

Compliance: .1404(c)

1. Access to the site is controlled at locked gate along River Road
2. Effective sediment control practices are in place and practiced
3. Air emissions are controlled by turning appropriately and maintaining required buffers
4. Odor emissions are controlled by managing compost turning operations and feedstock management

D. Operational Details:

1. Waste types: See Table 3-1 (Section G, Part 3 - Raw Materials, Proposed Feedstock Volumes and Protocol For Compost).

2. Site assessment: There are three discrete areas which comprise the CAS Compost production facility. The soil evaluations indicate seasonal groundwater elevations at a depth of well over 24 inches in each of these areas. The three areas are: initial receiving area (area 1), compost windrow area (area 2) and the compost windrow, storage and curing, and marketing area (area 3). Soil evaluation indicated the predominant soil texture in the initial receiving (area 1) and compost windrow areas (area 2) along the western portion of the site as loamy sand. The soil materials in these areas will be modified by addition and subsequent incorporation of coal dust/ash/compost fines to introduce fine particles and modify soil texture in the control zone as described. This will be accomplished with a disk or roto-tiller set to incorporate to a depth of 6 inches and with several lift/disk events the material will be incorporated to a depth of 12 inches. The current demonstration area (area 3) has been modified over the last few years through continued use as a compost production facility and the natural and planned addition of compost fines and coal combustion dust to the site. The soil texture in the existing compost manufacturing area (area 3) currently serving as the demonstration site is fine sandy loam as determined by hand-texture method and to be confirmed by laboratory analysis. This meets requirements contained in DWM Rule NCAC.1404 10 b, nonetheless additional fines will be added to assure soil texture meets regulatory requirements where necessary. The soil texture on this demonstration site has been modified over the original texture by the years of operation during which fine textured soil particles were deposited on the site. These materials consist of: fine textured ash, organic materials such as fine organics and fine soil particles from yard and leaf waste, and compost produced on the site. This is listed as area 3 on the plans. Prior to moving a significant volume of additional fines into area 3, a comprehensive assessment of the soil texture will be accomplished throughout area 3. This will be done through assessment of soil texture by the hand texture method (information attached) at 25 foot intervals

through the area. The assessment will be accomplished to a depth of 12 inches by a CPSS. Areas identified as containing soil resources characterized as finer than loamy sand will not be amended. Areas characterized as loamy sand will be amended as described for areas 1 and 2 using the successive lift/disk/till method. The soil texture will be confirmed at each area by laboratory analysis of the soil material extracted from each site to a depth of 12 inches.

Areas 1, 2 and 3 will be modified through addition of fine materials to render the texture finer than loamy sand as necessary. This is described in the paragraph below. This will be confirmed by hand texturing at 20 sites per acre and through laboratory analysis for discrete soil materials collected from each of the areas. These area samples will be evaluated for area 1, 2, and 3 as a discrete sample from each of the three areas assessed by laboratory analysis and the hand texturing from the 20 samples per acre for each areas.

A typical lift will consist of 1 to 2 inches of compost fines or ash, this material will be disked and tilled to a depth of approximately 6 inches. This will result in a new horizon approximately 8 inches in depth. Following this, a second lift will be placed atop the modified soil and the procedure followed again. If the initial lift was developed with compost fines, the second lift will be accomplished with fine ash. This will create a top most layer of soil extending to a depth of 10 inches. The soil material developed will be assessed to a depth of 12 inches; this will include a 2 inch layer of the original soil, the original 6 inch layer and the additional lifts of 1 to 2 inches each required to add the 4 inch lift specified. This constitutes addition of 33% soil fines in the uppermost layer of soil.

The site had been investigated previously to obtain the permit to operate a septage land application site. This report was submitted by Mr. Fred Smith, CPSS. Mr. Smith indicated that the report was on file at DWM and if additional site/soil work were required, he would be willing to accommodate DWM needs, but that the initial investigation did provide information relevant to the subsurface soil conditions along the western side of the site.

The area proposed as the mix/blend area will contain a concrete pad and push wall to serve as a mixing and blending. Site 1 (1.8 acre site) will contain a concrete pad to serve as a receiving area for all putrescible material (see plan Sheet C-102). Site will also be the area (Area 1) used to store bulking material for the composting operation. When the putrescible material arrives on the concrete pad, a Kuhn/Knight Mixer will be used to mix and blend this material with the bulking material. Once the mixing is done it will be hauled in the mixer to the composting site and windrowed (Site 2/Area 2).

The area proposed as an active compost windrow area will be developed for active compost production operations using a compacted ash base with incorporation of the coal ash using a disk (TCLP Attached) to provide a working surface, to reduced soil permeability and to provide an area compliant with the texture requirement in rule. The ash material contains a mix of particle sizes and when compacted, the variation in particle size results in reduced permeability. The permeability will be confirmed by the project team (Mr. MacConnell and Mr. Rubin and Mr. Scott Frederick, CPSS or Mr. Tom Hinson, CPSS will confirm soil texture) and reported to DWM.

Groundwater monitoring wells are proposed as indicated in the attached report by Cpec Environmental, Inc. A single up-gradient well is proposed to establish and benchmark background levels of groundwater quality. Two down gradient wells are proposed. The approximate well locations are provided on site plans

E. Site Plan: Site plan is attached, see attachment 1

The site plan indicates that NO potable water-supply wells are located on the site and no surface water storage facilities are on the site nor will they be proposed. Drinking water for operators is provided as bottled water and supplements process water required for compost operations is provided by the wet waste accepted at the facility.

The plan indicates that no residences are located within 500 feet of the active compost production sites or storage areas, however haul roads are located within 500 feet of existing off-site residences. Markers will be maintained marking the 500 foot setback along the northern edge of Area 3 (Curing).

Portions of the large acreage site do contain areas that are clearly wetlands, BUT NO area proposed for the compost production or storage are located in jurisdictional wetland areas. Markers will be installed and maintained delineating composting areas. Portions of the tract located between the Neuse River and the western portion of the site are wetlands; these areas are unsuited for any of the operations proposed, they are untrafficable and are NOT proposed as a part of the compost operation. The site had been investigated previously by Fred Smith and those areas designated as suited for land application are NOT wetlands. The flood hazard map attached demonstrates flood plain issues do not influence the site selected to host the compost operations. Portions of the site had been previously permitted as septage receivers, portions of the permitted septage receiver areas are proposed to host the compost production and storage. Those areas currently permitted as septage receivers will be excluded from land application as the compost operation expands.

F. Compost Facility Permittee and general operation guide

1. Mr. J. W. (Billy) Dunham is the Permittee for this facility. The Craven Ag operation is a family business. Personnel involved in the compost operation are:

    a. J. W. (Billy) Dunham, Operator in responsible charge
    b. Mack Dunham, Assistant Facility Operator
    c. John Dunham, Assistant Facility Operator
    d. Maintenance crew
    e. Equipment crew
    f. Transportation crew (over-the-road crew)

2. Operations Schedule: The Craven Ag compost operation may be open between 7:00 A.M. through 7:00 P.M. Monday through Saturday depending on the need to process and move compost. These operating hours will accommodate inflow, outflow of finish product and required compost production operations. Hours of operation may be less than reported here. Upon completion of a typical work day, the compost windrows will be checked to assure proper cover is in-place and the gate will be closed and locked as staff exit the site.

3. HHW - Household Hazardous Wastes are not composted at the site. If these materials are ever received on the site, they will be removed and handled through approved HHW operations.

4. Special precautions: During inclement weather (excessive rain, severe winds, snow, ice, or weather warning associated with tornado or hurricane), the facility will not actively mix or blend incoming feedstock materials. Compost windrow turning may proceed if site and soil conditions permit access to the site and the operation can be conducted safely without generating runoff or endangering staff.

5. Vector and nuisance conditions will be addressed by maintaining proper cover over windrows to prevent vector attraction. Noise associated with equipment operations will be controlled by operating only during posted hours of operation, no Sunday morning operation, and by controlling vehicle speed along River Road. Dust control if needed will be achieved by wetting roadways and other surfaces generating dust.

6. Finished compost will be utilized as a component of bioretention mix in stormwater systems, as a medium for plant growth, as a landscape material and for agricultural, horticultural, and silvicultural operations and as substrate for plant growth. All compost materials will be certified as PFRP and representative samples of the material will be tested as accomplished by NCDA for organic matter, nutrient, regulated metals, and salt levels as required in rule.

7. An operations and maintenance manual is provided. The Operations manual lists activities of individuals involved, operational requirements during normal operations and adverse weather, turning frequencies, temperature monitoring requirements, product quality testing and disposition for the compost, groundwater monitoring, safety, and other operational issues.

G. Compost Facility Design

1. The current Craven Ag, Inc. Compost Facility consists of a series of compacted marl gravel, compost and compacted soil/ash pads each of varying size. The compost site proposed contains several distinct areas to be developed using the coal ash as a soil amendment to develop suitable soil texture in the compost operations or a concrete pad in the mix/blend area. These are identified on the site map attached:

   Area 1 – Receiving Area - material receiving and mix pit
   Area 2 – Active Composting Area - material composting/processing area to assure PFRP and VAR compliance.
   Area 3 – Storage/Curing Area/Finished product storage Area - screening and material curing, as well as areas suited for storing finished compost or dry feedstock materials and for short term storage while materials are held waiting distribution and marketing.

   In addition to these defined areas, the site may also contain temporary tank trucks for storage and treatment of the raw materials to be processed and composted. These consist of above ground portable tanks ranging from 1,500 to 6,500 gallons capacity. The proposed area involves development of a concrete mixing/blending pad (Area 1).

   The design team will certify to DWM that Sites 1, 2, and 3 are developed as permitted with the ash materials to reduce permeability and prepare a stable working surface. Ash and compost fines will be applied over the site as described in the plans with a loader, spread evenly, and disked into all three sites. This will provide a 9 to 12 inch thick slowly permeable pad suitable for this type facility. Groundwater wells are proposed as indicated in the attached report by Cpec Environmental. The Groundwater monitoring plan is included in the O and M manual.

   The compost is to be manufactured from ingredients listed in Table 3-1 (Section G, Part 3 - Raw Materials, Proposed Feedstock Volumes and Protocol For Compost) of this document. New feedstock sources will be tested to determine levels of nutrients, regulated metals, organic carbon and salt prior to receipt and these new feedstocks will be submitted to DWM as needed for approval. No new feedstock will be allowed if regulated metal levels exceed the Table 1 values listed in 40 CFR Part 503 or if excluded by TCLP or as a toxic or hazardous waste.

All of the putrescible material is mixed and blended with a suitable substrate on the concrete pad on the day of arrival to prevent nuisance problems. On day of arrival, the non-putrescible materials are stored in the raw material storage areas for subsequent use as needed for staging purposes. A mixer with a feed auger is used to combine the blended raw materials, which are then placed into the windrow compost production area. The windrow compost process continues in these open windrows for approximately 60 days from placement to product. At the end of the composting process, the PFRP/VAR compliant compost is moved by loader onto the compacted finished compost storage pad for curing. The finished compost is to be stored for a period of not less than 120 days and not to exceed 270 days for curing. A maturity test will be used to assess the stage of maturity of the compost. The finished compost may be sold in bulk as a soil amendment, blended with topsoil or sand marketed as finish compost, topsoil or bio-retention blend.

The facility is intended to accommodate up to 50,000 tons per year of compostable materials. These materials will be received on a varying schedule and daily receipts may exceed 100 tons, while annual processing will not exceed 50,000 tons. This schedule supports 300 days of active operation per year. Compost mixes or blends will be developed each day based on incoming feedstocks and ultimate market opportunity. Coarse materials will be used to produce silvicultural product while the finer textured materials will be mixed and blended for the horticulture and bioretention blend markets.

2. Compost Recipes

The exact blends and mixtures are developed based on proprietary mixes and blends developed by Craven Ag Service, Inc., for specific end uses or general compost production. The characteristics of a portion of the raw materials used for compost mixture calculations are described in the Operations and Maintenance Manual.

The composting operation serves primarily to receive feedstocks and bulking materials listed in Table 3-1 (Section G, Part 3 - Raw Materials, Proposed Feedstock Volumes and Protocol For Compost) of this document. Composting septage and dewatered grease trap wastes will allow an increase in the hydraulic loads onto the land treatment operation permitted for Craven Ag Service and to provide an outlet for solids produced in dewatering operations operated by CAS. The mixtures of substrate and waste should result in an initial C:N ratio of ~30:1 and a moisture content of ~75%.

3. Raw Materials, Proposed Feedstock Volumes and Protocol For Compost

The maximum waste production and processing assumptions for the compost operation are:

a. 50,000 gallons grease trap waste processed 5 days per week (10 to 20 dry tons/day after dewatering)
b. 50,000 gallons of septage processed 5 days per week (10 to 20 dry tons per day after dewatering)
c. 5,000 gallons of portable toilet waste processed 5 days/week (0.5 DT/D)
d. 20,000 pounds (10 tons) of vegetative waste per day received
e. 100,000 pounds (50 tons) per day feedstock from municipal, commercial, agricultural/agribusiness, and industrial sources.

These volumes will vary seasonally, but total production from all sources will not exceed 50,000 dry tons annually.

The solids portion of the processed liquid waste is to be composted. The liquid will be accommodated through land application, transported to a separate and properly permitted land treatment facility or to a permitted POTW (such as Kinston POTW). In addition to the nitrogen sources available from the septage and dewatered grease trap waste, several sources of carbonaceous bulking materials are readily available for utilization in the composting process. These materials are listed below and the estimated quantity received per week is estimated in Table 3-1 Please note that quantities received vary depending on market conditions and are subject to change:

Table 3-1

Compost Feedstocks

Feedstock	Estimated Quantity (Tons)
hardwood and softwood sawdust from local manufacturing plants	15
wood shavings	15
mixed wood chips and sawdust from ground pallets (nail free)	15
animal litter or transport bedding materials from livestock operations	15
DAF skimmings (from Maola)	6
scraped animal manure	3
straw bedding material from the on-site free-stall dairy, horse, or cattle barns	12
poultry litter from local poultry growers	15
untreated wallboard from home/mobile home construction/manufacture	6
pre and post consumer food waste	12
hay/straw harvested from the land	15

application fields	
ground corn cobs	3
ground and un-ground yard waste	15
dewatered septage	30-60
dewatered grease trap wastes	30-60
field crop residue	6
construction debris (clean wood scrap from construction operations)	6
vegetative agricultural/agribusiness wastes (wet indigestible hay or forage, corn stover, cotton gin trash, peanut hulls, tobacco scraps/spoilage, tobacco dust)	12
land clearing debris material	6
seafood processing wastes (crab scrap, fish processing wastes)	3

Items Incorporated with Finished Product

Feedstock	Estimated Quantity (Tons)
lime mud from water treatment operations	3
non-toxic/non-hazardous combustion dust and ash	6

Prohibited Materials

Municipal sludge
Hazardous waste
Infectious waste

Entrance signage and property boundary marking will be accomplished listing the type of facility, the permit number, and appropriate contact information.

4. Flow Diagram

The composting process at the Craven Ag Service Compost Facility is depicted on the site plan showing the processing area, mixing pad, the compost production windrows, the curing area and the screening/mixing area and may described as follows: dry raw materials are received and stored prior to use in the "dry material" storage areas. These materials are combined with a daily delivery of wet raw materials and the dewatered materials generated off-site at the Craven Ag dewatering facility. The dry materials are placed directly onto the pad and the dewatered or processed septage/grease trap materials are placed over the top of the material, these materials are mixed and blended using a

loader in an approximate 50/50 ratio. These raw feedstock materials are loaded via loader into the bulk mixer (Knight Mixer - RC 200 Series, see Attachment 5). The proper ratio of material introduced onto the mixing pad is determined by the number of "buckets" of material placed by the loader. The bulk mixing operation thoroughly combines the raw material and "mixed" raw materials are transferred to the compost production area. Windrows are turned with a windrow turner as required to achieve the 5 turnings in 15 days for PFRP compliance and VAR compliance. After initial treatment in the compost windrows for PFRP and VAR compliance, the compost is removed to the initial storage or curing area, where it is allowed to complete the compost curing process. A **Solvita** test will be used to assess the maturity of the compost.

A process flow diagram, showing the equipment and flow of materials through the composting system is included in Attachment 2. The critical flow duration in the active windrow is 15 days at required temperature with 5 consecutive turnings as required in rule. Typical time in an active windrow will be 4 to 6 weeks to allow for temperature rise from ambient to thermophilic and required mixing. Mixing and blending will be accomplished in a single day. Composting will require an estimated 21 days. Curing may require between 2 and 3 months depending on end use and Solvita test results. Storage can be accomplished following a Solvita test indication that the material is stable. Storage will be dependent on end use and may require op to 9 months depending on users.

5. Leachate Collection and Recycle System

The concrete mixing pad will collect leachate for transport to the compost for use in the process or to a permitted wastewater receiver site. Leachate is removed as needed or as required and incorporated back into compost batch as a liquid and nitrogen source or allowed to evaporate. Any addition of leachate back to the windrow is carried out in the primary loading of the windrow and results in an additional full processing and heat cycle which results in the Process to Further Reduce Pathogens (PFRP) to be repeated. In very wet conditions or in an emergency, such as a sustained power outage or equipment breakdown, the collected leachate will be transferred to the nearby permitted wastewater treatment facility in Kinston, NC.

6. Preliminary Compost Analysis/Quality

Detailed compost characterizations have been performed previously by NCDA on several samples of the finished compost. All units in the analysis are measured on a dry weight basis (mg/kg). Attachment 3 shows a summary of the results from NCDA sampling. The finished compost does not exhibit high concentration of regulated or heavy metals. The raw material sources are primarily agricultural in nature and do not have significant heavy metal concentrations.

7. Pathogen Reduction Verification

Pathogens are to be reduced as required in the NC Solid Waste Compost Rules, Section .1406. The CAS Facility shall maintain the compost process at a temperature above 55 degrees C (131 degrees F) for 15 days with the required 5 turning events and the material may be retained longer on the active compost portion of the site following the PFRP compliance. This satisfies both the VAR and PFRP requirement.

The completed compost from the CAS Compost Facility will have a fecal coliform density of less than 1,000 colonies Most Probable Number (MPN) per gram of dry solids. The materials will demonstrate pathogen reduction requirements by process monitoring (time and temperature).

8. Protocol For Compost Which does not Meet Pathogen Reduction Level

All finished compost which does not meet the time temperature requirements listed in rule (131 degrees F for 15 days) or tested fecal coliform level of 1,000 colonies per gram of dry material are to be returned to the windrow and subjected to an additional, high heat cycle (131 degrees Fahrenheit for 15 or more days with required turnings). Product may be re-sampled if readings are believed to be a "false positive." Temperature probes will be calibrated annually to assure reliable measures. In the event that this process does not reduce the fecal coliform count or the manager/operator decides that the additional composting is of no value, then the material will be land applied to an appropriate, permitted off-site disposal area (permitted for class B material through NCDWQ or NCDWM) or transported to a permitted landfill.

9. Contingency Plans for the Operation

An operating manual detailing the composting facility operations and procedures, including recipes, equipment, monitoring, maintenance, and record keeping is included as Attachment 4.

Contingency plans for operation in the event of equipment breakdown or temporary power failure or inclement weather essential operations will be accomplished with alternative equipment; for example, if turning is required and the turner is inoperable, turning will be accomplished with front end loader.

Problems with operation of the composting facility during extreme weather conditions such as heavy rain or high winds will be minimized because of limited ingress to the site. Essential operations will be accomplished as required with equipment available.

In freezing conditions, it may be necessary to modify the compost cycle to assure temperatures are maintained adequately. This may require turning during late morning and early afternoon hours to take advantage of warmer day-time temperatures. This practice should allow the temperature to reach and maintain the desired level in excess of 131 degrees Fahrenheit for at least 15 days with the required turnings to meet the PFRP requirements. Special caution will need to be taken with the operation of skid loader equipment in any areas where the small amount of leachate could freeze and present a slippage hazard. Operators will be trained in proper operation of all equipment to assure a safe and sound operation.

10. Compost Equipment: The equipment proposed for the compost operation is described in the Operations and Maintenance Manual, attached. The equipment is identical to that currently utilized in the ongoing compost demonstration.

11. Vector Reduction

On day of arrival, putrescible materials will be mixed, blended and prepared for composting, then placed into the compost windrow on that same day to reduce nuisance vectors. These materials will be covered with 3 to 6 inches of finished compost, 3 to 6 inches of a carbon rich material such as sawdust or a layer of plastic as described in the operation and maintenance manual to prevent escape of odor. Other dry stock component materials may be stored for longer periods. The VAR requirements established in rule shall be met through the windrow composting method (minimum temperatures of 131 degrees with 5 turnings) for PFRP compliance.

12. Traffic Flow

Based on the maximum throughput production of the compost operation a maximum of two tractor trailer loads of compost per day would leave the facility on average. The over the road tractor trailers are anticipated to move on the gravel access road leading from the facility to River Road, thence to NC Highways and roads for ultimate distribution in the area. Given the existing truck traffic from the facility, the additional effect on local traffic of a maximum of two trucks of finish compost per day, 4 to 5 loads of dry feedstock materials, and 2 to 3 loads of dewatered material on average will be negligible.

H. Marketing Plan and Materials

A portion of the finished compost has normally been sold by bulk to local buyers. At present, CAS Compost Facility has established a strong working relationship and goodwill with growers and producers in the area to continue with expansion of markets for soil amendment, compost and bioretention area soil mixes. A comprehensive set of

information sheets will be provided to end users depending on the use. Information sheets will be provided for horticultural, agricultural and silvicultural uses. Samples are contained in the O and M Manual.

Copies of the previous communication from the NC Division of Solid Waste regarding the Compost Facility are included as Attachment 9.

I. SUBMITTAL

Gary MacConnell and Zach Fuller with MacConnell and Associates and I appreciate the opportunity to compile this permit application for the CAS Compost Facility. Initial development and final review of these materials was provided by Billy Dunham, Gary MacConnell, Zach Fuller and A. R. Rubin. If either you or the NC DENR DWM representatives/reviewers have any questions regarding this report, please contact us directly.

Sincerely,

Gary MacConnell, P.E.

A. R. Rubin

attachments

Attachment 1. Site and Topographic Maps of the Compost Facility

Map Legend

- PARCEL HOOKS
- Recorded Survey Lot#s
- Parcels
- city_limits_outline
- City_Name_Labels
- Main Highways
- Railroad
- USGS Blueline Streams
- Building Sketches
- Flood Insurance Rate Maps
- SUBGROUPS

Craven County does NOT warrant the information shown on this map and should be used ONLY for tax assessment purposes.

1 inch equals 250 feet

N

Attachment 2. Design Schematics

Please see drawings titled "Craven Ag Services, Inc. – Compost Facility" dated December 3, 2012.

Attachment 3. Compost Analysis Report

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Waste Management
Dexter R. Matthews
Director

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

February 3, 2010

Mr. Billy Dunham
Craven Ag Services, Inc.
2115 Hwy 55 West
New Bern, North Carolina 28562

Re: SWCD-25-01

Dear Mr. Dunham:

The Division of Waste Management, Solid Waste Section, has reviewed the results of the tests conducted on the compost produced at your compost demonstration project in Craven County. The test results meet the minimum requirements for pathogens, regulated metals and man made inerts in the Solid Waste Compost Rules. The compost is therefore approved for distribution.

This approval is ongoing as long as the required tests are conducted every 6 months or 20,000 tons, the results are acceptable and are submitted to the Division in a timely manner. In addition, operational records must be maintained and be available to Division staff during inspections.

If you have any questions please feel free to contact me at 919-508-8508.

Sincerely,

Michael E. Scott, Environmental Supervisor
Composting & Land Application Branch

cc: Ray Williams, Environmental Senior Specialist
Central File

h:cla/compost/Distribu/ 25-craven/Dunham-distrappr0210.doc

1646 Mail Service Center, Raleigh, North Carolina 27699-1646
Phone: 919-508-8400 \ FAX: 919-733-4810 \ Internet: www.wastenotnc.org

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One NorthCarolina Naturally

Craven
AG SERVICES, INC.
2115 Hwy 55 West New Bern, NC 28562

BILLY DUNHAM, PRESIDENT
(252) 633-5334
(252) 670-8530

RECEIVED JAN 28 2010 SOLID WASTE SECTION

Mike Scott
Composti8ng and Land Application Branch
N.C. Division of Waste Management
1646 Mail Service Center
Raleigh, N. C. 27699-1646

Dear Mr. Scott:

I have completed testing requirements set fourth in section .1408 pages 13 of the N. C. Solid Waste Compost Rules. Sampling was done according to rules set fourth in this sections 1 through 5 a and b. I am sending you the following information:

1. Foreign Matter Content: 24 oz were taken from the sample collected (sample collection was taken according to Item 2 of section .1408) and dried in the oven at 300 degrees F. After drying the compost was allowed to cool to room temperature. Then we screened it with ¼ inch wire mesh over a pan. No foreign matter was found. Therefore, I am saying that we have less than 1 % foreign matter.

2. Waste Analysis Report. Two samples were analyzed. Sample number 1L1C is a 50 % lime and 50 % compost sample. Sample number ClS in 100 % compost. (See enclosed report)

3. Pathogen Analysis was done by Microbac Laboratories in Fayetteville, N.C. The samples were taken at 6:00 AM and hand delivered to the lab by 10:30 AM of the same day. (See enclosed report)

4. The temperature of the sampled batch was 105 degrees F. These piles were done in July and August of 2009.

What other information is needed before I can start moving this product as a class A Compost?

Billy Dunham

Billy Dunham

Craven Ag Service, Inc.

NCDA&CS Agronomic Division Phone: (919)733-2655 Web site: www.ncagr.gov/agronomi/ Report: W04858

Waste Analysis Report

Grower: Dunham, Billy/John/Mac
C/O Craven Ag Service
2115 Hwy 55 W
New Bern, NC 28562

Copies to:

Farm:

Received: 01/11/2010 Completed: 01/14/2010 Links to Helpful Information

Craven County

Sample Information	Laboratory Results (parts per million unless otherwise noted)														
Sample ID:	N		P	K	Ca	Mg	S	Fe	Mn	Zn	Cu	B	Mo	Cl	C
1L1C	Total	7767	1907	2213	94319	2616	763	856	120	57.1	21.1	9.37			167085
	IN-N														
Waste Code:	-NH4														
FCW	-NO3		Na	Ni	Cd	Pb	Al	Se	Li	pH	SS	C:N	DM%	CCE%	ALE (tons)
Description:	OR-N		1798	13.5	0.24	2.86				9.19	88	21.51	63.13		
Composted Waste - Other	Urea														

Recommendations:	Nutrients Available for First Crop													Other Elements						
											lbs/ton (wet basis)						lbs/ton (wet basis)			
Application Method	N	P2O5	K2O	Ca	Mg	S	Fe	Mn	Zn	Cu	B	Mo	Cl	Na	Ni	Cd	Pb	Al	Se	Li
Broadcast	3.9	3.3	2.7	71.5	2.0	0.58	0.65	0.09	0.04	0.02	0.01			2.3	0.02	T	T			
Soil Incorp	4.9	4.1	3.0	89.3	2.5	0.72	0.81	0.11	0.05	0.02	0.01			2.3	0.02	T	T			

Completed: January 14, 2010

Sample Information	Laboratory Results (parts per million unless otherwise noted)														
Sample ID:	N		P	K	Ca	Mg	S	Fe	Mn	Zn	Cu	B	Mo	Cl	C
C1S	Total	9608	1166	1635	18792	832	775	933	94.1	84.9	25.2	9.54			191805
	IN-N														
Waste Code:	-NH4														
FCW	-NO3		Na	Ni	Cd	Pb	Al	Se	Li	pH	SS	C:N	DM%	CCE%	ALE (tons)
Description:	OR-N		344	2.23	0.32	5.20				7.97	33	19.96	52.47		
Composted Waste - Other	Urea														

Recommendations:	Nutrients Available for First Crop													Other Elements						
											lbs/ton (wet basis)						lbs/ton (wet basis)			
Application Method	N	P2O5	K2O	Ca	Mg	S	Fe	Mn	Zn	Cu	B	Mo	Cl	Na	Ni	Cd	Pb	Al	Se	Li
Broadcast	4.0	1.7	1.7	11.8	0.52	0.49	0.59	0.06	0.05	0.02	0.01			0.36	T	T	0.01			
Soil Incorp	5.0	2.1	1.9	14.8	0.65	0.61	0.73	0.07	0.07	0.02	0.01			0.36	T	T	0.01			

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

® Microbac Laboratories, Inc.
FAYETTEVILLE DIVISION
2592 HOPE MILLS ROAD
FAYETTEVILLE, NC 28306
(910) 864-1920 FAX (910) 864-8774
R. W. SANDERS, VICE PRESIDENT

http://www.microbac.com E-Mail: rsanders@microbac.com

STATE CERT ID.
NC #11
NC #37714
USDA #3787

CHEMISTRY · MICROBIOLOGY · FOOD SAFETY · CONSUMER PRODUCTS
WATER · AIR · WASTES · FOOD · PHARMACEUTICALS · NUTRACEUTICALS

CERTIFICATE OF ANALYSIS

Craven AG Service
Mr. Billy Dunham
2115 Hwy 5 SW
New Bern, NC 28562

Permit No.
Sampler: Dunham

Date Reported:	01/11/2010
Date Received:	01/06/2010
Order Number:	1001-00888
Invoice No.:	70585
Customer #:	B900
Sample Date:	01/06/2010
Sample Time:	6:00

Subject: Compost, Class A

SMP	Test	Method	Result	Date	Time	Tech
001	Compost, Grab					
	SOLIDS, % TOTAL	SM 2540 G	64.1 %	01/06/2010	11:00	PGR
	COLIFORM, FECAL	SM18 9221E	<2.0 MPN/gram	01/06/2010	10:50	PGR

RESPECTFULLY SUBMITTED: R. W. Sanders
MICROBAC LABORATORIES, INC.

Thank you for your business. We invite your feedback on our level of service to you. Please contact the Laboratory Director, Ron Sanders at 910-864-1920, Robert Morgan, COO, at rmorgan@microbac.com or Trevor Boyce, CEO, at tboyce@microbac.com with any comments or suggestions.

LAB CODES: N/D = None Detected N/F = None Found < = Less than > = Greater than Est. = Estimated

The data and other information contained on this, and other accompanying documents, represent only the sample(s) analyzed and is rendered upon the condition that it is not to be reproduced wholly or in part for advertising or other purposes without written approval from the laboratory.
USDA-EPA-NIOSH Testing Food Sanitation Consulting Chemical and Microbiological Analyses and Research

MEMBER ACIL

NCDA&CS Agronomic Division **Phone: (919)733-2655** **Web site: www.ncagr.gov/agronomi/** **Report: W05353**

Waste Analysis Report

Grower: **Dunham, Billy/John/Mac**
C/O Craven Ag Service
2115 Hwy 55 W
New Bern, NC 28562

Copies to:

Farm:

Craven County

Received: 02/21/2012 **Completed:** 02/27/2012 Links to Helpful Information

Sample Information	Laboratory Results (parts per million unless otherwise noted)														
Sample ID:		*N*	*P*	*K*	*Ca*	*Mg*	*S*	*Fe*	*Mn*	*Zn*	*Cu*	*B*	*Mo*	*Cl*	*C*
TD2	*Total*	27499	2896	30627	27383	5648	4983	3733	377	74.6	22.2	52.9			
	IN-N														
Waste Code:	*-NH4*														
100	*-NO3*		*Na*	*Ni*	*Cd*	*Pb*	*Al*	*Se*	*Li*	*pH*	*SS*	*C:N*	*DM%*	*CCE%*	ALE(tons)
Description:	*OR-N*		208										64.92		
Indust.-Other	*Urea*														

Recommendations:	Nutrients Available for First Crop										*lbs/ton (wet basis)*			Other Elements				*lbs/ton (wet basis)*		
Application Method	*N*	*P2O5*	*K2O*	*Ca*	*Mg*	*S*	*Fe*	*Mn*	*Zn*	*Cu*	*B*	*Mo*	*Cl*	*Na*	*Ni*	*Cd*	*Pb*	*Al*	*Se*	*Li*
Broadcast	10.7	5.2	38.2	21.3	4.4	3.9	2.9	0.29	0.06	0.02	0.04			0.27						
Soil Incorp	14.3	6.5	43.0	26.7	5.5	4.9	3.6	0.37	0.07	0.02	0.05			0.27						

Completed: 2/24/2012

Sample Information	Laboratory Results (parts per million unless otherwise noted)														
Sample ID:		*N*	*P*	*K*	*Ca*	*Mg*	*S*	*Fe*	*Mn*	*Zn*	*Cu*	*B*	*Mo*	*Cl*	*C*
CP1	*Total*	16823	1817	1780	32321	920	4576	1783	83.3	129	62.0	21.8			249872
	IN-N														
Waste Code:	*-NH4*														
FCW	*-NO3*		*Na*	*Ni*	*Cd*	*Pb*	*Al*	*Se*	*Li*	*pH*	*SS*	*C:N*	*DM%*	*CCE%*	ALE(tons)
Description:	*OR-N*		1056							7.31	81	14.85	62.64		
Composted Waste - Other	*Urea*														

Recommendations:	Nutrients Available for First Crop										*lbs/ton (wet basis)*			Other Elements				*lbs/ton (wet basis)*		
Application Method	*N*	*P2O5*	*K2O*	*Ca*	*Mg*	*S*	*Fe*	*Mn*	*Zn*	*Cu*	*B*	*Mo*	*Cl*	*Na*	*Ni*	*Cd*	*Pb*	*Al*	*Se*	*Li*
Broadcast	8.4	3.1	2.1	24.3	0.69	3.4	1.3	0.06	0.10	0.05	0.02			1.3						
Soil Incorp	10.5	3.9	2.4	30.4	0.86	4.3	1.7	0.08	0.12	0.06	0.02			1.3						

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

Attachment 4. Composting Operations Manual

Craven Ag Service, Inc. Compost Facility Operations Guide For Large Type III Facility

November 2013

Prepared for: **Craven Ag Service, Inc.**
Compost Site Located at
5391 River Road
Vanceboro, NC

Developed by: **J. W. (Billy) Dunham, Craven Ag Service**
Dr. A. R. Rubin,
Gary MacConnell, P.E., and
Zach Fuller, P.E.

NORTH CAROLINA PROFESSIONAL SEAL 17069 ENGINEER GARY S. MACCONNELL 11/21/13

Craven Ag Service, Inc.; Large Type III Compost Facility Information

Owner: J. W. (Billy) Dunham

Location: Site Location: 5391 River Road
Vanceboro, NC

Office Location:
2115 W. Highway 55
New Bern NC

Permit: Pending

Primary Contact: J. W. (Billy) Dunham

Office: 252 663 5334 (CAS Office, Highway 55 – NO office is located on the site, but a shed will be provided for equipment, supplies and shelter)
Cell: 252 670 8530

Regulatory Agency Emergency Contact:

NCDWM, Eastern Region: Ray Williams (2529483955)

Hours of Operation:

Monday to Friday: 7:00 AM – 7:00 PM
Saturday: 7:00 am – 3:00PM
Sunday: Closed

Prohibited Feedstocks:

Hazardous waste
Infectious waste

Craven Ag Service Compost Facility - Operations Guide

1.0 Introduction

The Craven Ag Service Compost Facility is located in the northern part of Craven County, North Carolina, near the intersection of River Road and Highway 4, approximately 5 miles southwest of Vanceboro, NC. This facility currently operates in accordance with a demonstration permit, and will be permitted by NCDENR-DWM as a Large Type 3 composting operation. The purpose of this operations guide is to comply with Section 1406 of the DWM regulations. Key personnel involved in the production of compost at this facility will acknowledge reading of this manual (below) to assure a basic understanding of the policies and procedures contained herein.

NAME:	DATE:
NAME:	DATE
NAME:	DATE:

Site management personnel will receive training as provided by the U.S. Compost Council, NC DWM, NCSU and the training activities shall be documented. The site owner is certified through DWQ as a residuals Land Applicator and through DWM a Septage Land Applier.

The raw feedstock materials for the composting operation will come from permitted sources. Please see Table 3-1 (Section G, Part 3 - Raw Materials, Proposed Feedstock Volumes and Protocol For Compost) in the Application.

Materials composted must be permitted in the DWM permit. New feedstocks will be tested (typically by NCDA) and approved by consultants to Craven Ag Service or DWM prior to receipt.

The composting operation will be conducted in open windrows specifically designed for compost production. Feedstock storage and final composting/curing will occur on compacted soil based pads. The windrows are fed from a concrete mixing pad and fresh compost is discharged following the PFRP and VAR compliance stage of the windrow process to a second portion of the compacted soil pad. The Concrete mix/blend pad will be developed as soon as permitted. The pad consists of a mix/blend area located in Area 1. The concrete pad consists of a reinforced concrete pad as designed. The pad contains a sloping bottom mix/blend area and a flat storage/receiving area as specified on the attached drawing. The mixed/blended materials will be transported to the active compost production pads located as shown on the site plan for composting. These areas will be slowly permeable pads.

Construction assurance for the concrete area will be documented by the design team and certified by the project team to DWM. Should documentation be required for the current compacted soil pads that will be provided by the team to DWM. The compacted pads help prevent introduction of undesirable material such as stones into the compost. Liquid or leachate generated during the compost feedstock mixing will be collected in a tanker, reused as a moisture source in compost, or transported off site to an approved wastewater facility.

1.1 Composting Requirements and General Operations

Compost is defined by the U.S. Composting Council as "the product resulting from the controlled biological decomposition of organic matter that has been sanitized through the generation of heat and stabilized to the point that it is beneficial to plant growth." Composting is accomplished by mixing an energy source (carbonaceous material) with a nutrient source (nitrogen and phosphorus containing materials) in a prescribed manner to meet microbial requirements necessary to support metabolic processes. Moisture levels, solids levels, and nutrient levels in the compost feedstocks are controlled to assure the process reaches the required temperatures for the time prescribed by rule (15 days above 131 degrees F with 5 turnings in that 15 day time). The process is carried out under specific moisture and temperature conditions for a specified period of time. Critical steps and procedures are necessary to ensure that the composting process proceeds properly with a minimum of odors, adverse environmental impacts, and other process related problems. This O and M Manual is intended to enumerate many of these steps and procedures.

The facility will be divided into four (4) distinct areas. A process flow diagram is provided in the attachment to this report. These processes are accomplished in the areas as listed herein: receiving area, active composting area, curing area, and storage area.

Receiving area (mix pad): Here raw materials are received, this does include the concrete mix pad at the entrance to the process; here incoming materials are mixed and blended in preparation for subsequent placement in the windrows and these materials are inspected visually to assure only permitted products are present (unpermitted materials will be removed placed in a small 8 to 10 cubic yard dumpster and transported to a MSW landfill). Mixing, blending and measures will be accomplished on a "by volume" basis. Weight measures may be accomplished at the various sources, but compost operations will be based on volumetric assessments. Wood waste, wood chip, and yard waste will be chipped prior to use as feedstock.

Active Composting (Windrow) area: here the mixed/blended materials from the mix pad are placed into the long windrows for compost operations and where PFRP and VAR compliance will take place;

Curing area: here composted materials stored or cured, screened and prepared for distribution; and

Storage and final processing area: here finished, screened materials are stored prior to distribution and marketing or transport off site. This is a compacted, exterior storage area where finish compost is field stored and awaiting transport to various markets.

Materials permitted for receipt at the facility will be received in the receiving area. Solid and Semi Dry materials from off-site sources (litter, shavings, etc) will be stored for short times to prevent addition of moisture on the compacted pad or the concrete pad waiting blending with the dewatered septage and FOG. If necessary, dry materials will be covered with a tarp to prevent moisture accumulation. Dewatered Grease Trap and Septic Waste which has been processed through the Dewatering box at the Craven Ag Dewatering facility off Highway 55 will be placed

onto the concrete mixing pad for proper mixing with the dry bulking materials using the loader bucket and the lift and drop mix method. The dewatered materials will be stored at the CAS Dewatering site and will be transported to the compost area only for processing into compost; NO FOG/septage will be stored on the compost site. The dewatered material from the dewatering site will be transported to the compost site in 20 cubic yard leak proof boxes as currently accomplished for immediate mixing and blending – NO dewatered material storage is proposed. All putrescible materials will be mixed and blended during a workday. Prior to daily closing, mixed/blended material will be placed into a windrow. NO putrescible will be stored overnight without blending as a compost feedstock.

A volume of wood shavings or litter equal to the volume of dewatered material will be placed on the pad. The material volumes are determined by loader scoop volume (typically 2 cubic yards per loader). The dewatered material and the dry bulking material will be mixed together for approximately 10 to 20 minutes to assure complete mixing. This process is not intended to generate excess liquid. Should liquid be generated during this initial mixing, it will be collected by gravity flow to the base of the pad and discharged to the dry bulking materials for subsequent use or be collected in a tanker for subsequent use as liquid; any excess moisture can be transported to Kinston for processing, but that is not anticipated. Materials will not be accepted at the site during inclement weather since ingress and egress is difficult.

Prior to blending or transport into the compost windrows area, all materials will be examined to assure proper moisture level (upon firm squeezing, material will release a thin film of water to hand or a few drops of water). If material is too wet, additional bulking material will be added to dry the mixture; if too dry, liquid from the tanker described above will be added to the mixture to provide moisture. Dry materials will be mixed or blended at the proprietary mix or blend ratios developed at Craven Ag Service for various compost end uses and markets.

Materials will be formed into the windrows using the loader-mixer buckets or by dump truck. Feedstock materials will be transported to the windrows and placed carefully in windrows by lifting and dropping materials to provide final mixing and blending, preliminary aeration, and minimal compaction prior to windrow activities. Windrow dimensions shall be as shown in the chart below. Material placed in this manner should heat adequately to assure PFRP compliance. Temperatures will be monitored and recorded daily to demonstrate compliance with PFRP and VAR requirements. Windrow areas are designated on the facility permit and all windrows will be marked with date of formation and dates of turning.

Windrow/Pile Type	Maximum Height	Maximum Width	Average Windrow Spacing
Active	6 feet	15 feet	8 feet
Curing	20 feet	25 feet	4 feet
Finished Product	30 feet	50 feet	4 feet
Dry Feedstocks	30 feet	50 feet	N/A

The windrow compost process achieves the VAR and PFRP compliance. Demonstrated compliance with VAR requires temperatures exceeding 104 degrees F for 14 days or longer, and averaging 114 degrees F or higher for the 14 day period. This is the minimum temperature

required and this is intended as PFRP, not PSRP consequently the higher temperature/longer time is required.

Compliance with PFRP requires maintaining temperatures above 131 degrees F for 15 days with at least 5 turnings of the windrows. The intent of this activity is to expose all particles in the windrow to the high PFRP temperatures. These PFRP temperatures have consistently been exceeded in the VAR area of windrow operations and a PFRP windrow is a "de facto" VAR. Material will be moved through the active compost production area (area 2) using a front-end-loader bucket to lift and drop or windrow turner (as available) until material has achieved required VAR and PFRP compliance and has been rotated in the windrow for a minimum of 60 days to cure unless a row crop operation has a need for the PFRP compliant product.

Temperatures will be monitored during active composting at specified locations located every 25 feet along each windrow and at depths of 24" and 36" into the windrow at each of these locations. Temperature monitoring will be accomplished Monday through Saturday. Once compliance with all PFRP and VAR requirements has been established through the time/temperature monitoring, the compost shall be moved to area 3 for curing and screening. Materials not meeting the required time/temperature standard will be transported to a permitted MSW facility, applied to a permitted septage site, or returned to the head of a windrow for reprocessing.

The curing/screening area is intended as the portion of the site where the compost matures and is prepared for distribution. Compost in the curing area will be turned approximately once per week. This process is important in developing stable compost suitable for a wide variety of end-use applications. The stability and maturity of the compost will be assessed through the Solvita test. Once a material has met standards for the Solvita test, curing is complete and the material is mature compost suitable for any use. Compost material can be used any time following compliance with the 15 day, 5 turning, temperature over 131 degrees F if a suitable receiver crop is available. Typically this fresh compost is best suited to row crop applications.

Once ready for distribution, the compost will be transported by loader to a screening operation collocated with storage in the storage area. The screen separates fine material from coarse material. The fines are placed into the final stage of the operation while the larger materials are recycled back through the compost operation by transport back to the initial mix pad area in dump-truck or loader to feedstock storage/mix/blend area. Here these coarse materials are mixed and blended with incoming material and returned to compost windrows as "seed". Undesirable materials removed during screening will be collected on site in a small dumpster and transported to a MSW landfill for disposal as required. These undesirable materials will be stored in a small dumpster located near the screen until sufficient volume is available for MSW disposal.

A quality assurance/quality control program will be instituted at Craven Ag Service. This process will help to assure:

A. Compliance with appropriate rules and regulations
B. Product quality consistent with specified or designated end use
C. Trained personnel remain available to manufacture quality compost

The QA/QC effort will involve the compliance testing and monitoring including: routine temperature monitoring and recording, nutrient and regulated metals testing, foreign material content and bacteriologic sampling. Nutrient sampling will be conducted by NCDA. The compliance testing for regulated metals and bacteria will be conducted by a private certified laboratory. Sampling will be conducted initially for every 10,000 tons of material produced or four times (3 month intervals) per year to assure compliance with rule and adequate QA/QC is in place. This is more rigid than current rule and is deemed necessary to demonstrate compliance. Annual calibration will be required on temperature probes. An annual report submitted to DWM is required as a part of the QA/QC program.

In the event that an additional raw material stream becomes available to be added to the composting operation, the material will be submitted for review and approval by the DWM-Solid Waste Section or to this consultant prior to use as a feedstock. The following procedure will be utilized to submit raw materials for approval to the Solid Waste Section:

1. A sample of the raw material will be taken according to the protocol detailed in Section 5.2 of this manual.
2. The sample will be analyzed for the parameters listed in Table 2, Section 5.3 of this manual.
3. A report of the analysis results and a written request for inclusion of the raw material, including proposed handling instructions for the raw material, will be submitted to the Solid Waste Section. The request will include: source, volume, and assurance that the volume proposed will not facilitate permit violation.
4. Upon notification of approval of the raw material by the Solid Waste Section, the raw material may be incorporated into the process used for compost production.

Incoming or raw material will be inspected visually prior to and during the initial mix/blend operation by the facility operator to assure unwanted trash is not present, that no material received is prohibited by permit, and that the material received is authorized under the permit. This will occur as material is placed on the mix pad and as material is placed in the mixer. As stated, undesirable materials will be transported to a MSW landfill or returned to the generator where possible.

During periods of excessive rainfall, runoff will result. The vegetated buffers down gradient of the site are intended to treat this runoff and allow infiltration. Vegetative buffers will be covered in one inch of compost, lightly disked, and planted with fescue. A soil test will determine the optimum nutrient requirements. The soil material present above the water-table is well suited to runoff during the infiltration process. Groundwater monitoring wells will be installed as recommended by Cpec Environmental, Inc.

1.2 Moisture

Appropriate moisture is necessary to compliment the biological processes of the microorganisms responsible for the degradation of organic matter and stabilization of compost. Composting is a naturally occurring aerobic process. Consequently, the moisture content is influenced by the necessity of supplying oxygen and venting off-gasses. As moisture increases, the particles in the compost become denser and air spaces shrink, limiting the supply of oxygen and the ability to off-gas. If oxygen supply drops to below 8%, the process becomes anaerobic and slows dramatically. The results are foul odors, and the need to restore the aerobic conditions, which will delay the processing time and reduce production rates.

Experience has shown that oxygen consumption in compost operations increase at moisture levels above 40% and reaches a maximum at 60%. Based on the proposed ratio of materials, the initial moisture content will be reduced from approximately 70% to the optimum initial moisture level of 60 % by mixing the wetter feedstocks with dry materials. The initial moisture levels encountered of near 70% will possibly slow the degradation process of the compost materials until moisture reduces to approximately 60%. As a consequence, the wetter feedstocks will be mixed with dry materials on a 50/50 volume ratio to increase solids levels and reduce moisture levels to a more optimum level prior to feeding the materials onto the compost mix pad. The optimum moisture content for compost materials transported to the windrow is 60% to 65%. This is the target for this operation and it will be met by the 50/50 mix (by loader bucket volume) using the front-end-loader to lift and drop, mix and blend feedstocks. All blending of feedstocks will occur on the concrete pad located at the end of the initial receiving area and in the mix pit collocated with the pad.

The composting process may also be inhibited when moisture levels fall below 40%. Moisture levels will be maintained such that compost materials are thoroughly wetted without being waterlogged or dripping excess water. As a rule of thumb, the compost materials are too wet if water can be squeezed out of a handful and too dry if the handful does not feel moist to the touch or if firm squeezing does not result in a film of water on the hand or gloved hand. A moisture meter, similar to that described in the Equipment Specifications (Appendix 2), would provide a more accurate determination of the initial moisture content of the compost material, but is not considered necessary for operation of the facility.

No additional moisture is needed for the compost process, should excessively hot and dry weather prevail and supplemental moisture is required, it will be supplied from a potable system and the time temperature requirements will restart. The basic compost materials, with the exception of the sawdust, litter, cotton wastes or gin trash and corncobs, are wet and therefore it is unlikely that very much additional moisture will be needed. In all likelihood, the material will normally compost "as-is" as achieved through blending with semi-solid and dry feedstock materials.

Given that multiple windows are presently used, excess moisture can be managed by simply allowing the initial heating cycle to rise, or by turning the windrows frequently to drive water vapor off by venting excess moisture to the atmosphere. The higher the heat generated in the process will also have the additional beneficial effect of killing off potentially pathogenic

organisms such as coliform or salmonella, helminthes eggs or cysts, or inactivating viruses and other organisms regulated in waste treatment processes.

Particle size and structure are also important when determining the optimum moisture content. Generally, the smaller the particles the more available the surface area for microorganism habitat and the greater the microbial activity. This is only the case if sufficient oxygen is available. Insufficient oxygen presents the same problem described earlier with too much moisture. A combination of excessive moisture and small particles is doubly detrimental. A typical target for particles 15 mm (1/2 inch) in diameter or larger is to keep the compost mixture content at 55-65% moisture. If the particles are 5-15 mm (less than ½ inch), a 45-55% moisture content is recommended. If particles are too small and/or wet, bulking materials such as sawdust, ground corn stover or ground wall-board can be added. This is also subject to variation depending on the specific materials available for the compost

1.3 Temperature

Temperature should be monitored closely every 25 feet along the windrow length in all active windrows and recorded daily. Metabolic or biological activity increases with increasing temperature. The optimum temperature range for composting and pathogen reduction is between 131° F (54.4° C) and 160° F (71.1° C) once the process has begun. As stated in the North Carolina Solid Waste Compost Rules section .1406, the facility shall maintain the compost process at a temperature above 131° F (55° C) for 15 consecutive days or longer, with 5 turnings to ensure the highest level of pathogen reduction. If pile temperature falls significantly during the composting period, odors may develop. If the pile material does not reach operating temperature, investigate piles for moisture content, porosity, and thoroughness of mixing. Compost managed at the required temperatures will favor destruction of pathogens.

Monitor temperature of the compost windrows **daily – except Sunday.** Appendix 1 provides a Temperature Record form. The system operator should monitor temperatures at specified monitoring locations along the windrow. Temperature monitoring locations are every 25 feet along active windrows. The temperature monitoring probes consist of 36 inch to 48 inch long dial stem thermometers. Temperature monitoring shall be accomplished at the 24 to 30 inch depth at each monitoring location. The temperature probes must be calibrated annually to assure they are reading temperatures accurately.

1.4 Mixing and Process Time

Mixing the compost with the loader bucket turner method is necessary to ensure that all particles are exposed to the high temperatures required to inactivate potentially pathogenic microorganisms. The mixing redistributes air pockets to insure proper oxygen levels for the composting process. The mixing is accomplished by the rotation of the composting mass. Mixing in the windrow with the lift and drop loader bucket turning method assures that all particles in the compost mass are exposed to the required temperatures for the required time. Pathogen reduction (PFRP) is achieved in the active compost windrow. Should any batch of material fail the PFRP requirement it will be reprocessed to achieve the 131 degree for 15 day with 5 turning requirement, transported to an approved MSW facility or applied to a permitted

land receive site in accordance with septage/FOG land treatment rules. The operator recognizes this will reduce the volume of septage and FOG which can be applied and the nutrient management plan will be adjusted accordingly. Records indicate NO "off spec" material has been produced during the CAS demonstration and the "recipe" for success is well established.

Mixing of raw materials with the loader is done to evenly distribute additives and bulk materials throughout the composting material. Feedstock mixing and blending shall be done on the concrete pad proposed; the pad is shown on the drawing attached. Feedstock mixing and blending prior to composting shall be done by mixing approximately 50% by volume active materials such as the dewatered septage and grease trap wastes with approximately 50% by volume wood chip/sawdust, 50% yard and leaf waste, etc. The pre-compost mixing shall be accomplished by successive scooping, lifting and dropping of materials with a 5 to 8 cubic yard front-end-loader bucket. At least three scoop/lift/fall cycles will be required to mix materials adequately. Liquids will be placed in the mass of material by creating a "v" shaped trough in the dry materials prior to adding the liquid materials.

The PFRP compliance temperature is achieved in the compost windrow area, and the curing stage follows the active compost phase. The curing phase will require between 60 days and 270 days of storage in the windrow. Curing time depends on end use; agricultural use is typically a 60 day cure time while horticultural uses may require up to 270 days of curing. Materials processed in the curing area will be tested using a Solvita test to assure adequate curing. Materials may be bagged or moved to bulk outside storage at off-site locations following finishing in the storage area. Disposition of compost following compliance depends on market outlets. The finished product is normally dark brown to black in color with a 60%-65% solids composition based on analysis. The odor is slightly earthy or musty and texture is loose. The volume is roughly half of the original volume.

Composting time required is primarily a function of the amount of air supplied. The efficiency can be increased and composting time decreased with added aeration by forced air or increasing turning cycles. This also produces a cooling effect which must be monitored. Once the most active of the composting processes is complete (as measured by PFRP Compliance), the compost can be stockpiled without further temperature monitoring until used.

1.5 Carbon:Nitrogen Ratio (C:N)

The carbon to nitrogen ratio is the most important chemical consideration in compost. The C:N ration desired is between 25:1 and 40:1. Other nutrients are generally contained in sufficient ratios for composting in most organic wastes. Carbon and nitrogen are consumed in the decomposition process at a rate which is proportional to one another.

The main goal is to produce compost which will not deprive soil of its natural nitrogen due to a nitrogen deficiency in the compost. A low carbon to nitrogen ratio during decomposition will result in ammonia volatilization. A high carbon to nitrogen ratio reduces the efficiency of the process, because more microbial activity is required to reduce the C:N ratio. The optimum C:N ratio for finished compost is between 25:1 and 40:1 (carbon to nitrogen). The NCDA tests (waste

analysis) will be used to assess C:N ratios. To assure levels are appropriate, C:N ratios will be assessed through routine sampling and when new feedstocks are added to the system.

1.6 Compost Recipes

Ongoing analysis has produced several compost recipes with potential for use at the composting facility. These recipes assume a "Plug Flow" batch of compost. The process time for the compost batch is normally 30 days in a windrow to comply with VAR and PFRP requirements and another 60 to 270 days in the Curing Pile prior to being screened and ready for market. Once cured and compliant with a Solvita test, the process can be considered a finish product and is suitable for distribution and beneficial use. The finish product may be moved off site and stocked for ultimate use. Typical chemical and moisture characteristics of common raw materials used in composting operations are shown in the following table.

Table 1. Raw Material Characteristics

Raw Material[1]	% N	C:N Ratio	% Moisture Content
Vegetable Waste	4.2	10:1	82
Dewatered Septage	3	25:1	70
Dewatered FOG	1.5	50-60:1	70
DAF Skimmings (est)	0.75 to 1.0	100 to 150:1	90
Hardwood Sawdust	0.09	560:1	25
Sawdust Bedding	0.24	442:1	40
Ground Corn Cobs	.6	98:1	15
Ash	<0.5	400:1	5
Gin trash/cotton waste	.5	120:1	10
Tobacco Dust	0.75 to 1.5	40:1	15
Ground Yard Waste	.9	80:1	40
Land Clearing Debris	.09	560:1	--

[1]Nitrogen and Carbon Information based on data from "On-Farm Composting Handbook" or testing on-site materials

2.0 Operations

The Craven Ag Service Compost Facility will be operated daily, from 7:00 am until 7:00 pm Monday through Friday and 7:00 am through 3:00 PM on Saturday. Additional hours of operation may occur during periods of high demand for the finished compost material; however, no Sunday operations are planned and these will be accomplished on a strict as needed basis.

Operations will proceed according to the requirements and procedures detailed in this operations manual.

2.1 Personnel Duties and Requirements

1. Compost Facility Operator - This individual is responsible for overall operation of the Compost facility. He is responsible for loading the proper amount of the selected raw material into the mixer to insure a good quality finished compost. In addition, the facility operator is responsible for maintaining all the temperature monitoring logs and collecting samples of the finished compost for analysis.

2. Assistant Facility Operator(s) - This individual will assist the facility operator, as necessary, and additionally will be responsible for upkeep and clean up around the compost facility. This individual will perform routine preventative maintenance on the composting equipment. This position will be filled as required, and may require more than one person.

3. Maintenance crew - These personnel will be provided from the on-site Craven Ag Service staff available to Craven Ag Environmental or from other operations as maintenance staff required to perform major maintenance or repairs on the equipment required for the composting activities.

4. Equipment crew - These personnel will be responsible for screening and custom blending the finished compost material, and for loading trucks for delivery.

5. Transport - These personnel will operate over-the-road transfer trucks. The compost will either be trucked to the final destination by over-the-road trucks, or may be removed by vendor trucks as well, depending on size of the order. It is anticipated that direct sale of bulk material to local contractors would be accommodated by direct loading of the buyer vehicles (private trucks or trailers).

2.2 Compost Testing Needs

In addition to the routine testing of the compost material every 10,000 tons or every 3 months for the parameters specified in Section 5 of this manual, and the 6 day/wk monitoring of the composting process for temperature, it may be advantageous to test compost material for carbon, nitrogen, moisture, and pH should compost fail to reach desired temperature or if odor problems develop. The finished compost material will be monitored every 3 months or 10,000 tons of compost processed (the smaller of the two) for nutrients and regulated metals tested by the North Carolina Department of Agriculture. More frequent testing will be accomplished as additional feedstock is added or as process optimization begins, to ensure that the composting process has been successful and that the NC Solid Waste Section annual reporting requirements have been met. Testing may be accomplished on a more frequent basis than required by rule as varying feedstocks are added to the compost and as end users require test product quality information. New feedstocks will be tested by NCDA Waste Analysis prior to incorporation.

2.3 Storage

Storage of finished compost should be limited to 4 to 6 months after completion of the process depending on market needs. Compost should be utilized within this time period if at all possible. Storage will be provided in either open areas of the on-site storage area in the area designated, immediately south of the processing area, on land out of the flood-plain or at off site locations awaiting disposition and use.

2.4 Maintenance Practices and Cleanliness

In order to optimize the composting process, proper maintenance of the facility and equipment is recommended. Listed below are some maintenance practices that can be implemented to ensure the productivity of the facility.

1. Do not allow any equipment that exceeds design load limits on or within twenty feet of the concrete pad.

2. Maintain all electrical and mechanical equipment in good operating condition by following electrical codes and manufacturers' recommendations. Inspect and repair grounding rods, switches, wiring, and all vehicles and equipment involved in the process.

3. Fences, railing, roofing, and/or warning signs must be maintained to provide warning and prevent unauthorized entry.

4. Repair any vehicular, vandalism or animal damage. Inspect and maintain runoff control structures.

5. Keep the area around the composting facility mowed and free of tall weeds and brush.

6. Clean, shovel, or dry sweep compost production and bagging areas as required to maintain pleasant work environment. Clean and dry any oil spills, wet material spills immediately to sustain reasonably safe work environment.

7. The stormwater section from DWQ has determined no runoff is generated in design rain events which may exit the site to surface water. In an emergency, liquid collected from the site will be transferred to the City of Kinston, NC WWTP. Any liquid addition to compost occurring following storm events will restart the PFRP Process at the time liquid is added to windrows.

The following is a list of practices that will reduce the potential of odors being emitted from the Compost Site. Where practical, some or all of these practices may be utilized. The odor management practices include:

1. Avoid overly wet feedstocks and compost. The use of relatively coarse co-composting materials that allow oxygen diffusion into the pile can help avoid odor problems.

2. Activities such as mixing and movement of odorous raw materials shall be scheduled to minimize the impact of odors. Accomplish these activities only early in the work day to take advantage of rising air currents. Avoid doing these activities on hot, still days or holidays and weekends. Windy conditions or early morning hours are better times to conduct such activities. Monitor the wind direction and postpone activities that may release significant odors when the wind is blowing toward the most sensitive neighbors.

3. Prevent puddles and standing water on the compost pad.

4. Minimize dust, which can transport odor by spraying a fine mist over roads and other surfaces.

5. Ensure that proper aeration, pH, and temperature control is maintained during the composting process.

6. Covering the upper third of the windrow with either 3 to 6 inches of finished compost, 3 to 6 inches of a stable, carbon rich material such as wood chip, or covering the area with a heavy (20 ml) plastic sheet or tarp.

2.5 Seasonal and Weather Management

Composting can continue year round, even during cold weather. Seasonal and weather variations may require operational adjustments that compensate for the change in weather conditions. The insulation layer covering the windrows should sufficiently buffer the mass of materials in the windrow against temperature variation, and changes in the operation should not be required.

Cold weather can slow the composting process by increasing the heat transfer rate from the composting operation into the atmosphere, but the insulation layer should mitigate this transfer. The lower air temperatures reduce the microbial activity, especially near the surface. This, in turn, decreases the amount of heat generated.

Warm weather enhances water loss due to evaporation from the windrows. Water or recovered leachate should be added if materials become too dry (moisture content drops below 40%). Again, the loss should not be excessive from the windrow, and controls can be implemented by scheduling turning operations or adding moisture as required.

In event excess liquid accumulates on the site because of wet weather or other adverse conditions, that excess liquid (runoff) will be treated by the vegetated buffers located along site boundaries.

2.6 Contingency Plans

1. Equipment Breakdown

In the event of a breakdown of the compost equipment (mixer, loader, screens, etc.), delivery of raw materials from the Craven Ag Service septage/FOG dewatering facility will be suspended until the equipment is repaired or replaced and material passes all VAR and PFRP requirements.

2. Fire

In the case of a fire, immediately notify the local fire department. If employee safety is not compromised, the company pump truck may be utilized to extinguish the fire.

3. Freezing Conditions

Operation in freezing conditions requires inspection of system components to assure cold weather will not produce safety hazards. Additional caution in operation of the loader is necessary during conditions where ice may have formed on the site. Frozen raw materials should not be added to the bulk mixer (Knight) due to the possibility of damaging the mixer blades and auger.

4. Extended Power Failure

Operations during an extended power failure may be accomplished by the use of a portable generator for any system components requiring electricity. No critical process equipment requires electricity and a power loss will not impact operation of the equipment either on the site or proposed. Temperature monitoring of the composting windrows during a power failure must be continued, and any compost which does not meet the temperature criteria must be re-processed. Again, no critical equipment requires electricity.

5. Windy Conditions

Windy conditions should have little effect on the composting operation since windrows are located in open areas surrounded by trees. However, during excessively windy conditions (over 25 MPH) special attention must be given while turning the windrows and during the loading of raw materials (especially light materials such as sawdust) which could tend to "blow off" the composting area. It is anticipated that the local vegetation (tree line) will tend to block a great deal of the wind from the facility. However, if windy conditions are demonstrated to have a detrimental effect on the continued processing of the compost, consideration will be given to planting additional windbreaks.

6. Disposal or Re-Processing of Poor Quality Products

The design team anticipates that the compost produced at this facility will easily meet the standards for Class A compost. In the event that a batch of compost does not meet the requirements for Class A compost, several options exist. An initial option would be to re-process the batch in an attempt to meet the Class A compost requirements. This option would be selected if the controlling factor indicating poor quality was pathogen reduction.

Compost materials which do not meet Class A compost requirements but meet the Class B or PSRP compost may be land applied under specific circumstances in accordance with a separate permit. Specifically, these materials could be applied to agricultural land, provided the land is used for silvicultural or non-food chain related production, or the material could be used for land reclamation projects. Compost which does not meet either Class A or Class B criteria, and is deemed undesirable for any attempt at re-processing, will be disposed of in an appropriate approved, sub-part D landfill site such as CRSWMA.

3.0 Equipment Specifications

The equipment required to operate the Craven Ag Service Composting Site can be characterized as either processing or monitoring equipment.

3.1 Processing Equipment

The primary processing equipment currently utilized at the site for composting is a Loader to serve as a Compost Windrow Turner, a mixer to assure feedstocks are properly mixed prior to placement in the windrow and a screen to assure high quality end product is generated. The windrow turning is achieved by lifting and cascading compost to allow reaeration. Equipment may change with time, but basic functions associated with each will remain as critical to the process. Equipment may be replaced with like equipment and new equipment will be reported to NCDWM as it is obtained.

A rubber tired Loader and a dump truck will be used to transport the raw compost mix to the windrows. Finished compost shall be transported by loader or dump truck to the curing area and ultimately to the finish product storage area (Area 4) and segregated into batches in the storage area. Final screening will be accomplished in a rotating screen as material is transported off site or as finished/cured material is placed into storage. Large screened particles (over 1.5 inch diameter) will be reused in the compost operation as bulking material. This coarse material will be moved to the initial mix/blend area and reused to inoculate incoming material and facilitate aeration in the process.

3.2 Monitoring Equipment

A probe-type dial stem thermometer (as manufactured by REOTEMP) with a 36" stainless steel stem is currently used to measure the temperature of the compost in the windrows or compost piles in the active compost production area (area 2). The thermometer has a temperature range of 0-200 degrees Fahrenheit. CAS has several thermometers available on site. These will be calibrated annually and replacement thermometers will be purchased as needed. Calibration of all thermometers shall be accomplished annually.

An additional, optional device that can prove very useful in the production of compost is a moisture meter. This device is more accurate than the "hand squeeze" method of moisture determination. REOTEMP Instrument Corporation has developed a moisture meter which determines moisture levels via a sensor that measures electrical conductivity of the raw materials. The device is available in lengths of 36", 48", and 60". CAS has purchased this process monitoring device and has been using it throughout the demonstration process.

Equipment specifications for the equipment discussed above can be found in Appendix 2.

4.0 Nutrient Management Plan

The majority of the compost produced by the Composting Facility will ideally be sold as a soil amendment. Additional or excess compost will be sold in bulk to local greenhouses and landscape contractors for use as a soil amendment or to the NCDOT for use in highway landscape projects.

In the event of a long term market decline, it may be desirable to land apply some compost off-site. In this case, the material must be a Class A product, or an approval from the NCDWM must be obtained. Land application to agricultural cropland may be used as long as appropriate records are maintained. Compost application rates will vary depending on the agronomic needs of the crop and whether the compost is being used as a primary nutrient source. If the finished compost is used as a primary nutrient source, it should be spread following agronomic practices used for spreading manure. However, compost is generally spread onto land at a thickness of 0.5 to 1 inch. If it is applied at a rate greater than this, it becomes too difficult to incorporate into the soil. Conventional manure spreaders are ideal for handling and spreading compost. The distribution and marketing guide described as CAS Compost Quality and Use should be followed by end users.

5.0 Compost Record Keeping, Analysis and Reporting Requirements

The compost produced at the Craven Ag Service Compost Facility will be routinely analyzed to insure quality control is maintained. Analysis shall be conducted by the North Carolina Department of Agriculture (NCDA), Soil Test Laboratory on Blue Ridge Road in Raleigh, or by a certified analytical laboratory (A and L, Prism Laboratories, Southern Testing, etc.). The compost will be monitored for temperature daily to insure vector and pathogen reduction compliance (see record keeping forms in Appendix 1). An annual report will be submitted to the

NC Solid Waste Section by August 1st of each year, in compliance with NCAC 13B Section .1408 (c). All records will be kept on site.

5.1 Daily Record Keeping

The compost facility will maintain daily (except Sunday) temperature, compost processing length and daily volume of compost processed records for the composting operation. In addition, the volumes of the various feedstocks will be recorded to ascertain the optimum mix and blend ratios for the continued operation at this facility. Each day's production will be flagged as it is transported from the mix/blend area to the windrow. Each section of windrow will be identified with the day of mixing and placement and these areas will be tracked through the entire process. Each area within the windrows will be monitored for temperature and turn date to assure the 15 day/131 degree/5 turning requirements are met. In addition, once a windrow is completed, similar records will be developed until the time requirement is met for the entire windrow. The existing recordkeeping program has indicated the PFRP compliance is addressed by the ongoing program.

5.2 Routine Compost Sampling Procedure

The compost must be sampled at intervals of once per every 20,000 tons of compost produced or every six (6) months, whichever comes first; for purposes of this project more frequent testing shall be accomplished (every 10,000 T) and every quarter. Composite samples are to be collected through the sample period and composited for final testing. A minimum of three 100 Ml composites will be through the period, refrigerated and composited for nutrient and metal analysis. Bacteria samples will be collected in accord with test laboratory procedures. The sample tested is to be a representative sample of the compost produced during the compost cycle.

The samples will be obtained in a sterile manner according to the following procedure. The sample will be obtained from the batch of finished compost from piles, immediately prior to the screening and bagging equipment. The sample will consist of a multiple position composite grab sample. A minimum of 5 discrete locations within the finished compost pile in Area 3, immediately prior to the screening /bagging and bulk loading processing of the pile, will be sampled as a composite sample.

These sample locations will be taken from within the finished pile, and will represent a "cross section" of the pile, not just the "surface". The sampling will be conducted wearing latex or nitrile gloves, and the composite samples will be well mixed to insure a representative sample is tested. Samples will be refrigerated immediately or placed in sealed containers in a cooler for transport to the laboratory. Collected composite samples will be placed in sterile bags provided by the laboratory when pathogen samples are to be run on the material. Samples shall be delivered to the laboratory within 24 hours if pathogen testing is to be performed. It is essential to coordinate with the laboratory ahead of sampling to insure that the proper "hold times" for the various parameters to be tested are not exceeded. It may be desirable to run intermediate nutrient and heavy metal content samples at a more frequent interval than the once every 20,000 tons as specified by regulation and CAS has agreed to accomplish testing at a more frequent basis.

5.3 Routine Compost Analysis

The analysis must include the parameters listed in Table 2. Metal testing must comply with measurements less than the regulatory limits in 40 CFR part 503, Table 3 based on dry weight (mg/kg). Testing shall be conducted by private certified laboratories for regulated metals and bacteria. NCDA testing is adequate for nutrients, metals as process (non-compliance) values and foreign matter can be tested by trained personnel.

Foreign matter testing will be determined as follows. The compost material will be dried (EPA Method 160.3), weighed and passed through a one quarter inch (1/4") screen. All materials remaining on the screen will be visually inspected and all foreign material (glass, plastic, metal, etc.) will be removed and weighed. The weight of the removed foreign material, divided by the weight of the total dried sample, multiplied by 100% will be recorded and reported as the percentage foreign material observed in the sample.

Table 2. Routine Compost Analysis Requirements

Parameter	Reporting Unit	Test Method
Foreign Matter	%	As described in Subparagraph (5) of 13B Section .1408
Cadmium	mg/kg dry weight basis	EPA Standard Methods 3050/3051
Copper	mg/kg dry weight basis	"
Lead	mg/kg dry weight basis	"
Nickel	mg/kg dry weight basis	"
Zinc	mg/kg dry weight basis	"
Pathogens (Fecal Coliform)	MPN/1000 grams of Sample	Standard Methods for the Examination of Water and Wastewater, Part 9221 E or Part 9222 D
Total Kjeldahl Nitrogen*	%	NCDA
Phosphorus*	%	NCDA
Potassium*	%	NCDA
Salts*		NCDA Standard Analysis

* Not required by statute, but these analyses provide useful information on product quality

5.4 Annual Report

Craven Ag Service will submit an annual report to the NC Solid Waste Section by August 1st of each year, in compliance with NCAC 13B Section .1408 (c). The annual report will contain the facility name, address, permit number, a summary of the total quantities of raw material received at the facility, the total quantity of compost produced by the facility, and the total quantity of compost removed from the facility (marketed or disposed of off-site). The annual report will also include temperature monitoring records and the results of the required analysis for metals, pathogen reduction analysis (fecal coliform), and for the percentage of foreign matter in the finished compost.

6.0 Safety & Health

Proper attention to health and safety at composting facilities can prevent most occupational risks. The safety concerns in composting relate primarily to the use of equipment. If front-end loaders or other standard farm equipment is used, eye and ear protection should be used. Normal safety precautions, such as those provided with the equipment, should be followed. The Farm Safety Association has developed a fact sheet (No. F-017 - Agricultural Machinery Hazards - See Appendix 3) which should be reviewed by all personnel operating or working near machinery.

Fires are rarely a problem in outdoor composting, as properly moist composting material does not readily burn. However, if material does dry out and if storage piles are too large, spontaneous combustion becomes a possibility. This phenomenon occurs at moisture contents approximately between 25% and 45%. In piles over 12 feet high, it is possible for the internal heat of the compost to initiate chemical reactions, which then lead to spontaneous combustion. Proper attention to moisture, temperature, and pile size is the best protection against this problem. An accessible water supply is a valuable safety precaution.

Human health concerns relating to compost depend both on the individual and on the material being composted. While few pathogenic organisms found in farm animal manures or vegetative wastes affect humans, normal sanitary measures are important (such as washing hands before touching food, eyes, etc.). Some individuals may be hyper-sensitive to some of the organisms in compost. The high population of many of the species of mold and fungi in an active compost process can cause allergic reactions in sensitive individuals. Simple precautions, such as wearing dust masks or even half-mask respirators with disposable cartridges, can help limit human exposure to organisms that may cause allergic reactions. Conditions which may predispose individuals to an infection or allergic response include allergies, asthma, such medication conditions such as antibiotics, punctured eardrum, weakened immune system, adrenal cortical hormones, etc. Workers with any of these conditions should not be assigned to a composting operation. If a worker does develop an allergic reaction to compost, it is important to recognize the problem promptly so that it does not develop into a chronic condition. To prevent health concerns during particularly dry and dusty conditions, a dust mask or half mask respirators should be worn.

Blood borne pathogen testing should be accomplished on employees of the compost operation as a part of the annual physical.

With proper knowledge, equipment, caution, and precautions, these sources of harm can be removed or limited, and injuries, illnesses, and deaths can be prevented.

List of Appendices

Appendix 1. Record Keeping Forms

Appendix 2. Equipment Specifications

Appendix 3. Safety Information

Appendix 1. Record Keeping Forms

OFF-SITE COMPOST REMOVAL RECORD

Recipient's Name & Address	Date	Quantity Received	Signature

Craven Ag Service - Composting Site

Composting Activity Record

Batch Number	Date	Temperature Recorded (Yes/No)	Samples Taken and Submitted?	Moisture Added (gal)	Mixture Used - Volume of Feedstock, Sawdust, Manure and Bulking Material Used

Craven Ag Service - Composting Facility
Temperature Monitoring Record

Batch Identification Number: _____

Date Batch Started: _____

Data Collected By: _____

Sample Location Windrow	Month/Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Sample Location (Drum or Windrow)	Month/Year	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

Appendix 2. Equipment Specifications

TROMMEL SCREEN

N 40 Inc
P.O. Box 1330
Rockwell, NC 28138
Phone: (336) 499-5881
Fax: (336) 499-5882
Web: www.n40compost.com

TERRA SELECT
T 7

Specifications:

- **Machine Length:** 44.6'
- **Machine Height:** 13'
- **Machine Width:** 8.3'

- **Hopper Capacity:** 8 Yds^3

- **Screening Drum:**
  - **Length:** 25'
  - **Diameter:** 7.2'
  - **Drum Speed:** 0-23 rpm. Infinitely Adjustable

- **Discharge Belts:**
  - **Fines**
    - **Belt Length:** 16'
    - **Belt Width:** 39"
  - **Overs:**
    - **Belt Length:** 16'
    - **Belt width:** 39"
  - **Cross Belt Width:** 39"

- **Engine:**
  - **Type:** Turbo Diesel
  - **Manufacturer:** Perkins
  - **Horsepower:** 121

- **Fuel Tank:** 79 Gallons

- **Supports:** (2) Hydraulic Actuated at Front
  (1) Hydraulic Actuated at Rear

- **Machine Weight:** 50,705 lbs.

- **Central Lubrication Points**

Warranty:

Warranty covers proven defects in workmanship and material for a period of Twelve (12) months or 1000 hours from date of delivery to the customer's site.
The warranty includes Parts, Labor, Travel, and Shipping.
The warranty does not cover Rubber Parts, Wear and Spare Parts and Glass

Delivery:

Machine will be delivered to your site
Total price includes all Shipping, Trucking, Freight, Set-up charges, etc.

Optional Equipment:

- Wind Sifter
- Additional Screening Drum
- Automatic Central Lubrication unit
- Radio Control 8 channel
- Remote Control Tipping Grizzly
- Additional hydraulic connection
- Additional hydraulic rear support
- Hydraulic Drive
- Terra Select – **E**nergy – **C**ontrol – **S**ystem

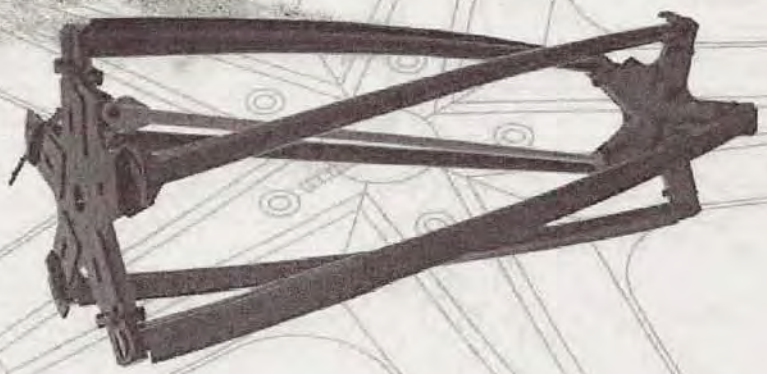
This exclusive control monitors the level of the hopper by means of a sensor. When the hopper is empty, the control automatically stops the screening machine and the engines speed is reduced to idling speed of approximately 700 rpm. When the hopper is filled again, the screen is automatically restarted and the engine is accelerated to nominal speed. This leads to a considerable saving, when for example the wheel loader has to load a truck during the screening process

RC 200 SERIES

Reel Commercial

TMR Mixers - with Optional Helix Reel

500 – 950 Cubic Feet

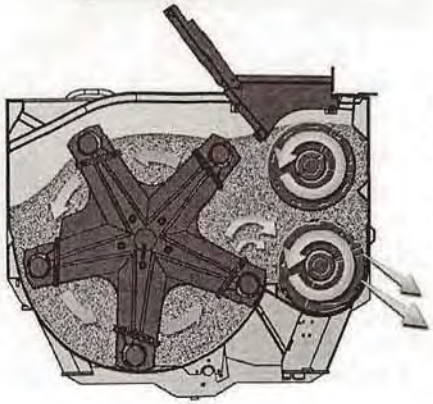


REVOLUTIONARY HELIX REEL

WORLD-WIDE LEADER IN TMR MIXERS

RC 200 SERIES

Fully-redesigned RC 200 Series Commercial Reel mixers provide superior durability and performance, with new advanced options that separate them from the competition. The all-new, open-concept Helix reel option offers faster, more consistent mixing and improved load leveling with any ration. The Helix Reel design optimizes the mixing of wet by-product rations, but through extensive testing has proven to provide quality performance in all rations. The Heavy-Duty Drive option offers extended life, in even the most extreme use cycles, and provides the ability to mix the heaviest feedstuffs. These enhancements, combined with the versatility and low horsepower requirement that are the hallmark of the reel and auger design, put these new RC models at the head of their class! With truck, trailer and stationary models there's a machine to fit every feeding situation.



Low Fuel Consumption!

The gentle tumbling action of the reel works with the two side blending augers for fast, thorough end-to-end and side-to-side mixing. The design minimizes force and pressure, resulting in low horsepower requirements and, correspondingly, less fuel consumption for economical operation.

Rugged and Durable

An optional heavy-duty drive provides heavier chains throughout and a larger diameter countershaft and bearings for added strength and extended life in the toughest mixing conditions and heaviest use cycles.

Flexible for Roughage and Grains

The grain-auger option provides gentle handling of more delicate feeds like flaked corn to maintain ration quality. The roughage-auger option features notched, sectional flighting with welded-in, self-sharpening, hardened knives for better hay-handling capability.

Improved Discharge

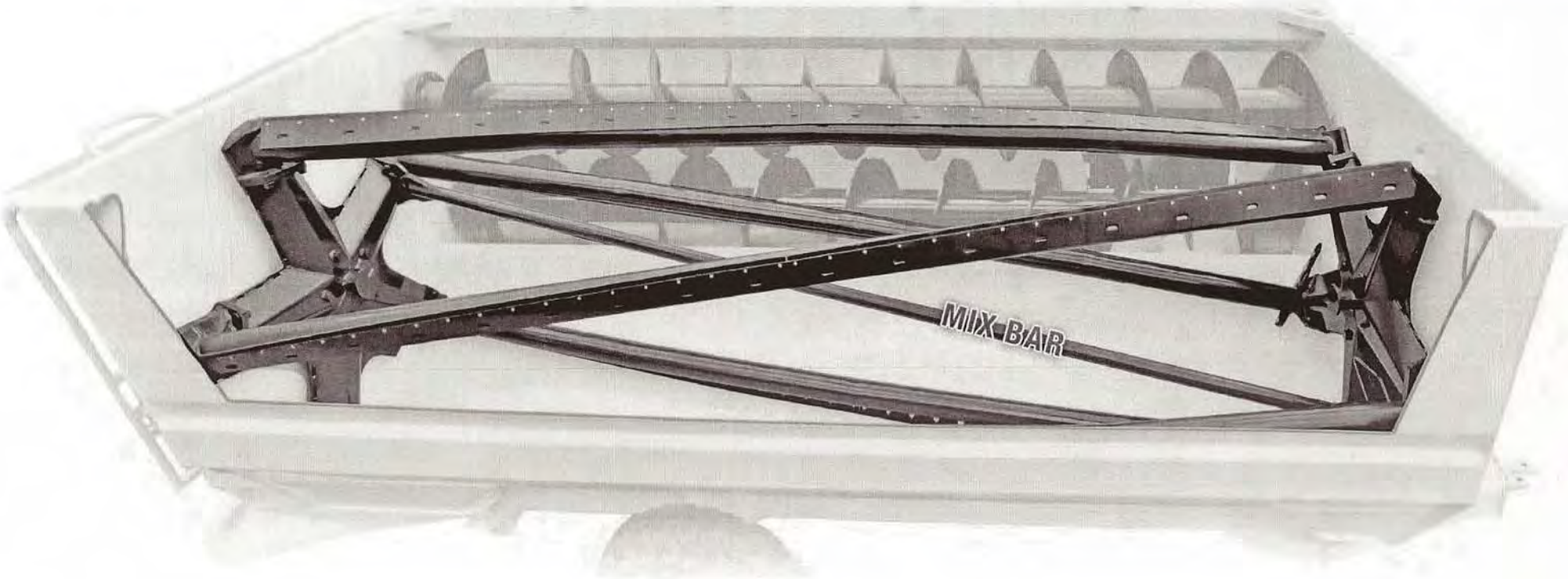
The discharge door and linkage have been reinforced to provide reliable service and long life. The slide tray linkage has also been improved, with increased adjustability to adapt to different feeding situations.

Secure, but Accessible

The improved, single handled latch provides easy access to the oil bath and secure closure to protect the drive system. An improved lip seal keeps oil in and dirt and debris out to help minimize wear on drive components.

RC 200 SERIES

Helix Reel Technology



The Helix Design

The optional Helix Reel has a robust build and has been thoroughly tested to withstand the most challenging conditions. The helical design of the reel crossbars evens the pressure across the length of the reel for smoother, more consistent operation. It also engages with the feed more smoothly.

Open Center Reel

The all-new, open-center design eliminates obstructions in the reel and provides superior feed movement and unparalleled mixing action. The benefits are unmistakable, with faster, more consistent mixing, improved load leveling, optimized mixer space utilization and fewer dead spots for the ultimate in ration quality.

Superior Mixing of Wet By-Product Rations

A mix bar runs diagonally across the center of the reel to help ensure consistent feed movement throughout the entire mixing chamber. The reel crossbars keep feed moving efficiently around the outside of the chamber. The secondary mechanical mixing action from the mix bar provides a fast and thorough mix even in wet, heavy rations with large amounts of distillers grains.

Improved Load Leveling

With all potential obstacles removed from the center of the reel, feed is free to flow unobstructed from one end of the mixing chamber to the other. This greatly improves the end-to-end mixing action and helps eliminate uneven filling for optimum load leveling in any ration. Even leveling allows consistent use of the full capacity of the machine for maximum efficiency.

Faster, More Even Unloading and Cleanout

Cleanout speed is a key factor that can limit feeding efficiency, extending feeding cycles and ultimately costing valuable time and money. The new open-center Helix design provides fast, consistent unloading, with quicker, more complete cleanout than competitive models. The result is optimum performance, allowing the operator to move on to the next batch faster.

Enhanced Performance for Grain and Roughage Rations

The cutting-edge design has been extensively tested with the toughest beef and dairy rations. The results are clear, from dry, dusty materials, to wet, heavy rations, the new RC 200 series mixers with Helix Reel technology set a new standard for quality performance and superior mixing to meet the needs of even the most demanding producers.

EFFECTIVE HAY HANDLING!

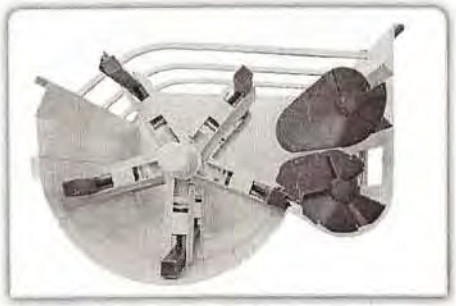
Roughage Maxx

With the Roughage Maxx System, scalloped knives are added to the lower auger to maximize hay processing. The knives provide a more consistent particle length and more even blending of the ration. The result is a more uniform and palatable ration with reduced sorting for overall better feed efficiency.

Hay Maxx

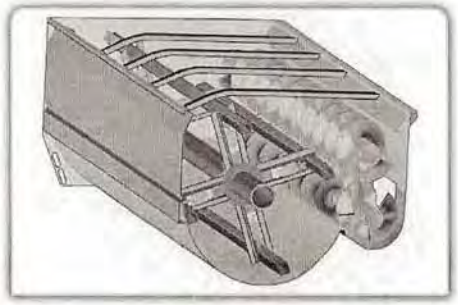
The Hay Maxx System provides enhanced processing of a wide variety of materials. Hay and other bulky materials can be placed on the pan, allowing them to be preprocessed by the upper auger before entering the mixing chamber.

STANDARD REEL OPTION



Large-Diameter Reel

The large-diameter reel gently lifts material up into the side blending augers. The large reel provides ample room for feed movement and quality mixing action. It ensures fast mixing and unloading, which saves time and helps ensure ration quality.



Four- or Five-Arm Reel

The four-arm reel minimizes the pressure placed on higher-roughage feed and the extra space within the reel enhances hay processing and reduces mixing time. The five-arm reel ensures faster mixing and unloading in heavier grain rations and provides more even load distribution on the reel arms.

CUSTOMIZED OPTIONS

Standard or Lowered Right Side

The option of a standard or lowered right side allows customers the flexibility to choose the setup that best matches the needs of their operation.

Rugged Undercarriage Options

Straight-single and walking-tandem bogie axle options are available for trailer models, providing flexibility for varied terrain. Both feature heavy-duty spindles and hubs for maximum durability and long life.

Truck Tire Option

The truck tire option includes wheels and tires or wheels only. These tires provide outstanding reliability and performance at an economical price. (Aircraft tires no longer available.)

Discharge Options

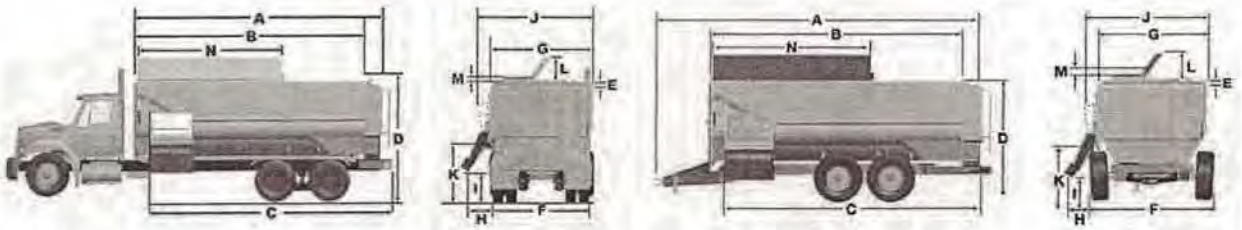
Truck models come with a standard slide tray for fast, consistent discharge. Trailer models offer the slide tray plus a 4-auger discharge option with adjustable height for feeding into higher bunks.

Improved Slide Tray Linkage

The cylinder and linkage for the slide tray option have been relocated and improved. This change provides increased adjustability and eliminates the possibility of the tray extending over center when opened.

MODEL SPECIFICATIONS

Visit your dealer or our website at www.KuhnNorthAmerica.com for information on all Kuhn Knight products.



TRAILER-TR TRUCK-TK

MODEL	RC 250		RC 260		RC 270		RC 295	
DIMENSIONS (INCHES)	**TR**	**TK**	**TR**	**TK**	**TR**	**TK**	**TR**	**TK**
A - Overall Length	242	189	272	219	302	249	294	247
B - Mixing Chamber Length	168	168	198	198	228	228	216	216
C - Front Discharge to Bumper	182	180	212	210	242	240	231	232
D - Overall Height [1,2]	107	120	107	120	107	120	126	135
E - Lowered Right Side Reduction	12	12	12	12	12	12	NA	NA
F - Tread Width [2]	101	96	101	96	101	96	110	96
G - Overall Width (mixer only)	102	102	102	102	102	102	120	120
H - Slide Tray - max. reach	22	22	22	22	22	22	30	30
- 4-Auger Discharge - max. reach 2' / 3'	32/42	NA	32/42	NA	32/42	NA	NA	NA
I - Slide Tray - max. height	35	48	35	48	35	48	50	59
- 4-Auger Discharge - max. height 2' / 3'	50/56	NA	50/56	NA	50/56	NA	NA	NA
J - Slide Tray - transport width	114	114	114	114	114	114	128	128
- 4-Auger Discharge - transport width - 2' / 3'	126/130	NA	126/130	NA	126/130	NA	NA	NA
K - Hinge Height for Discharge	47	56	47	56	47	56	56	65
L - Height - haypan up	22	22	22	22	22	22	22	22
M - Height - haypan down	8	8	8	8	8	8	8	8
N - Length - haypan	120	120	144	144	144	144	144	144

SPECIFICATIONS				
Unit Weight [3] - Helix Reel (TR/TK) pounds	16,000/14,950	17,200/16,090	21,000/18,820	25,300/20,250
Unit Weight [3] - Std. Reel (TR/TK) pounds	14,800/13,750	16,000/14,830	19,800/17,620	24,450/19,400
Maximum Net Load - pounds	15,000	18,000	21,000	28,500
Mixing Capacity - cubic foot	500	600	700	950
Reel				
- Diameter	70"			84"
- Drive Shaft Diameter	5"			8" Tube
- Arms	Standard Reel - Roughage:4, Grain:5 / Helix Reel:5			5 (all)
- Hopper Thickness	3/8"			3/8"
- Speed RPM	5.6 - 6.8			4.6 - 5.2
Lower Auger				
- Flighting Diameter	24"			28"
- Flighting Thickness[4] - sectional	5/8"			5/8"
- Drive Shaft Diameter	3 1/2"			5"
- Tube - outside diameter	6 5/8"		8 5/8"	8 5/8"
Upper Auger				
- Flighting Diameter	22"		24"	28"
- Tube - outside diameter	6 5/8"		8 5/8"	8 5/8"
- Flighting Thickness - sectional	1/2"			1/2"
- Drive Shaft Diameter	3 1/2"			4"
Auger Hopper Thickness	3/8"			3/8"
Side Sheets Thickness	1/4"			1/4"
End Sheets Thickness	1/4"			1/4"
Standard or Lowered Right Side	Either Option Available			Standard Only
Door Opening Size	42" x 22"			48" x 26"
Roller Chain Drive				
- Standard	80-100-120-140			100-140-160-200
- Optional Heavy-Duty	100-120-140-140			HD Standard
Spindle Diameter - single axle / tandem axle	4 1/2" / NA	4 1/2" / 3 3/8"		NA / 4 1/2"
Hub	HD 10-bolt			HD 10-bolt
Tongue Weight - % gross weight	9%	11%	10%	11.5%
Tractor Requirement - PTO HP [5]	100	110	120	170

[1] Truck dimensions based on 41" truck frame height.
[2] Heights and widths will vary depending on tire size.
[3] Unit is equipped with most common options.
[4] 3/4" flighting at convergence is standard.
[5] Horsepower requirement may vary with different materials. Consult operator's manual for proper tractor sizing.

We reserve the right to change any equipment specifications, design, or materials without notice. These mixers are designed for agricultural use only with materials estimated up to 30 lbs. per cubic foot. Contact factory for non-agricultural use or heavier materials. Equipment shown in this literature may be protected by at least one patent and/or trademark.

SAFETY FIRST

Always read and understand the Operator's Manual and all Safety Decals before using the equipment.

YOUR KUHN KNIGHT DEALER

Kuhn North America, Inc.
Corporate Headquarters – 1501 West Seventh Avenue
Brodhead, WI 53520 – Phone: (608) 897-2131 – Fax: (608) 897-2561
www.KuhnNorthAmerica.com

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The Aeromaster PT-Series

Pull-Type Compost Turners

Advanced Drum Design

- Variable drum speed
- Maximum aeration, CO2 release
- Peaks windrow naturally
- Superior blending

Unique Watering/ Inoculant System

- Moisten and inoculate as you turn
- Even and thorough application
- Prevents water runoff and pooling

Hydraulically Retractable Drum

- Lifts completely out of the row in seconds
- Locks in place for safe transport
- Allows windrow inspection
- Easy exit from windrow

Exceptional Reliability, Low Maintenance

- Simple design requires little daily maintenance
- Heavy-duty tubular steel construction
- Expert craftsmanship

Models include: PT-120 (10-foot), PT-130 (11-foot) and PT-170 (14-foot)

Designed to Produce High Quality Compost

Midwest Bio-Systems • 28933–35 E St. • Tampico, IL 61283
(815) 438-7200 • www.midwestbiosystems.com

Aeromaster PT Series Pull Type Compost Turners

The Competitive Edge...

The **advanced drum design** turns materials outside in and inside out to provide superior blending, aeration and CO_2 release. The variable 150-270 RPM drum speed ensures flexibility in blending new rows and building crumb structure. With an open hood the drum design naturally forms a peaked windrow.

The unique water and inoculation system assures even moisture to every particle as the turner moves through the windrow.

Windrow size varies with turner model. Aeromaster models process from 1,000 to 2,300 cubic yards per hour. The hydraulically adjustable rear axle adjusts on-the-go 6" up or down for optimum drum height when moving through the windrow. Contact Midwest Bio-Systems or your authorized dealer for assistance in choosing the model that is the best fit your operation.

Other Features:

- Heavy-duty construction — Tubular steel frame means low maintenance coupled with exceptional reliability.
- Driveline safety — Automatic clutch PTO driveline protection.
- One-man operation — Aerate, blend, water and inoculate all in one pass.

The **mechanical watering and inoculation system** with water manifold and spray nozzles assures even moisture to every particle as the turner moves through the row. Turner water system with cam-lock hose fitting is ready for quick attachment to the Aeromaster Water Tank and Trailer unit of your choice. The convenience of adding water as the row is turned assures sufficient moisture for maximum biological activity and material breakdown.

This process also reduces water waste, minimizing runoff and pooling. The system includes four sets of nozzle inserts for maximum control over the quantity of water applied.

The ***retractable drum assembly*** hydraulically lifts out of the windrow in seconds at any time. This unique feature allows the operator to view the windrow stratification and inspect the profile of windrow. Should windrow conditions or other priorities require an early exit from the windrow, the vertical lift feature makes it quick and easy. The hydraulic ram safety valve provides protection from hood movement and safety latches lock the hood in vertical position for transport.

The operator can ***adjust the drum height***, with the hydraulically controlled trailer axle and the outrigger jack to minimize the anaerobic layer at the bottom of the windrow.

Tractor Requirements

- 80 - 120 horsepower
- 540 power takeoff (PTO)
- Creeper gear or hydrostatic drive (to allow for 0.2 mph or 20 feet per minute of travel at rated PTO speed)
- Two sets of remote hydraulic outlets
- A third set of hydraulic outlets with free return required for optional hydraulic water pump

Also from Midwest Bio-Systems...

Advanced Composting Products and Services

- ACS Compost Workshops
- Compost Microbial Inoculants
- Compost Quality & Feedstock Laboratory Analysis
- Test Instruments
- Fabric Covers

Aeromaster Compost Production Equipment

- Self-Propelled
- Tractor Pulled

Sustainable Balanced Soil Fertility System

- Chemical and microbiological laboratory analysis
- Interpretation of lab analysis
- Fertility programming
- Liquid microbial inoculants, food sources, and nutrients
- Tea Power Products — For the production of high quality agriculturally effective compost tea

The drum assembly can be lifted completely out of the windrow.

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Appendix 3. Safety Information

FARM SAFETY ASSOCIATION
Growing Safety

AGRICULTURAL MACHINERY HAZARDS

FACTSHEET

The very fact that agricultural machinery uses tremendous power to do work makes its operation a potential hazard for both the operator and bystanders. Even though manufacturers try to ensure that their machinery is as safe as possible, the nature of some work creates inherent hazards, which cannot be removed. Most accidents with agricultural machinery can be attributed to human error.

In many cases the operator forgot something, took a shortcut or a risk, ignored a warning, wasn't paying close attention or failed to follow safety rules. Accidents with farm machinery can be crippling or even fatal. It is important to recognize and be alert to possible hazards and to take precautions to avoid injury.

There are many different kinds of agricultural machinery--mowers, tractors, shredders, harvesters, grinders, blowers, augers, balers, etc.--but they all have similar characteristics and similar hazards. You can be cut, crushed, pulled in or struck by an object thrown by these machines.

They can have cutting edges, gears, and chains, revolving shafts, rotating blades, levers and similar hazards. You can also be injured if you fall while working on or near any of these machines.

Some machine parts cannot be completely shielded in order to do their job. For instance, a cutting blade cannot be totally enclosed, or it could not cut. Operators remove guards for maintenance and often they don't get replaced. This creates a potentially dangerous situation.

Most agricultural machines have similar or common components to do their work. A basic understanding of these and the hazards they pose will heighten your safety awareness and prevent injury.

SHEAR POINTS

Shear points are created when the edges of two objects are moved closely enough together to cut a soft material, as in the case of a pair of shears or an auger.

Cutting points are created when a single object moves forcefully or rapidly enough to cut, as in the case of a sickle blade.

Both shear and cutting points are created on machinery designed to cut, as in harvesters, and on those that are not designed to cut, as in an auger. They are hazards because of their cutting force, and because they often move so rapidly that they may not be visible. It can be easy to forget that they are operating.

Because some cutting and shearing points cannot be guarded, it is important to be aware of the hazard and to be especially alert when they are operating. It is also important to warn others and to look out for their safety, because of the danger of thrown objects while using cutting-type equipment.

PINCH POINTS

Pinch points are formed when two rotating objects move together and at least one of them moves in a circle. For example, the point at which a belt runs onto a pulley is a pinch point.

Belt drives, chain drives and gear drives are other sources of pinch points in power transmission devices. Feed rolls, gathering chains and similar equipment to draw crops into the machine also create pinch points.

Fingers, hands and feet can be caught directly in pinch points, or they may be drawn into the pinch points by loose clothing that becomes entangled. Contact may be made by just brushing against unshielded parts or by falling against them.

You can become entangled in pinch points if you take chances and reach over or work near rotating parts. Machines move too fast to get out of a pinch point once you become caught in it.

To avoid injury from pinch points, be aware of the areas where pinch points occur and avoid them. Wear clothing that fits well and is not loose or floppy. Never reach over or work near rotating parts. Turn off machinery to work on it. Always replace shields if you must remove them for maintenance.

WRAP POINTS

Rotating shafts are the most common source of wrap point accidents, although any exposed machine part that rotates can be a wrap point. A cuff, sleeve, pant leg or just a thread can catch on a rotating part and result in serious injury. Entanglement with a wrap point can pull you into the machine, or clothing may become so tightly wrapped that you are crushed or suffocated. In other cases, you could be thrown off balance and fall into other machine parts.

Even a perfectly round shaft can be a hazard if there is enough pressure to hold clothing against the shaft. Shafts that are not round increase the hazard significantly. Clothing is more likely to catch if there is a little mud or dried manure, or a nick on the shaft. Ends of shafts that protrude beyond bearings are also dangerous. Universal joints, keys and fastening devices can also snag clothing.

Check all equipment for potential wrap points, and shield those that can be shielded. Place warnings on those that cannot be covered, or paint them a bright color, perhaps with wide stripes. Be aware of wrap points and be alert to their danger.

CRUSH POINTS

Crush points are created when two objects move toward each other or one object moves toward a stationary one. For example, hitching tractors to implements may create a potential crush point.

Failure to block up equipment safely can result in a fatal crushing injury. A jack may slip, a hose or overhead support may break, or the equipment may roll. Be sure to take extra precautions when working with machinery that is raised for any reason.

Crushing injuries most commonly occur to fingers that are crushed at the hitching point. Wait until the tractor has stopped before stepping into the hitching position.

If possible arrange the hitch point so that the tractor can be backed into position without anyone between. Always know what the other person is doing.

The head or chest of an operator may be crushed between the equipment and a low beam or other part of a building. Usually, these accidents occur when operating the machine in reverse Tree limbs are also potential hazards when working with tractors and other machinery.

To prevent being crushed or pinned, first, recognize the potentially dangerous situations, then, avoid them whenever possible.

Block all machinery securely if you must work under it. If an implement can roll freely, block its wheels so it cannot roll.

FREE-WHEELING PARTS

Many machine parts continue to spin after the power is shut off. Examples of this are cutter heads of forage harvesters, hammer mills of feed grinders, rotary mower blades, fans, flywheels, etc.

Never touch these parts until they have stopped moving completely. This may take as long as several minutes.

SPRINGS

Springs are commonly used to help lift equipment such as shock absorbers, and to keep belts tight and may harbour potentially dangerous stored energy. Springs under compression will expand with great force when released, and springs that are stretched will contract rapidly when released.

Know what direction a spring will move and how it might affect other machine parts when released, and stay out of its path.

HYDRAULIC SYSTEMS

Hydraulic systems store considerable energy. They lift implements, such as plows, change the position of implement components, such as a combine header or bulldozer blade, operate hydraulic motors and assist in steering and braking.

Careless servicing, adjustment or replacement of parts can result in serious injury. High-pressure blasts of hydraulic oil can injure eyes or other body parts by burning or penetrating the tissue due to the liquid being hot. Leaks are a serious hazard.

Never inspect hydraulic hoses with your hands because a fine jet of hydraulic fluid can pierce the skin. Jet streams from even pinhole leaks can penetrate flesh. Get medical attention quickly, or you could lose that part of the body that was injected.

Use a piece of cardboard to test the hose for leaks. Before attempting any service on hydraulic systems, shut off the engine, which powers the hydraulic pump.

Lower the implement to the ground and relieve the pressure. Follow the instructions in your operator's manual, because the specific procedures for servicing the systems are very important to your safety.

PULL-IN POINTS

Pull-in points usually occur when someone tries to remove plant material or other obstacles that have become stuck in feed rolls or other machinery parts. Always shut off the power before attempting to clear plugged equipment.

The information and recommendations contained in this publication are believed to be reliable and representative of contemporary expert opinion on the subject material. The Farm Safety Association Inc. does not guarantee absolute accuracy or sufficiency of subject material, nor can it accept responsibility for health and safety recommendations that may have been omitted due to particular and exceptional conditions and circumstances.

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(519) 823-5600

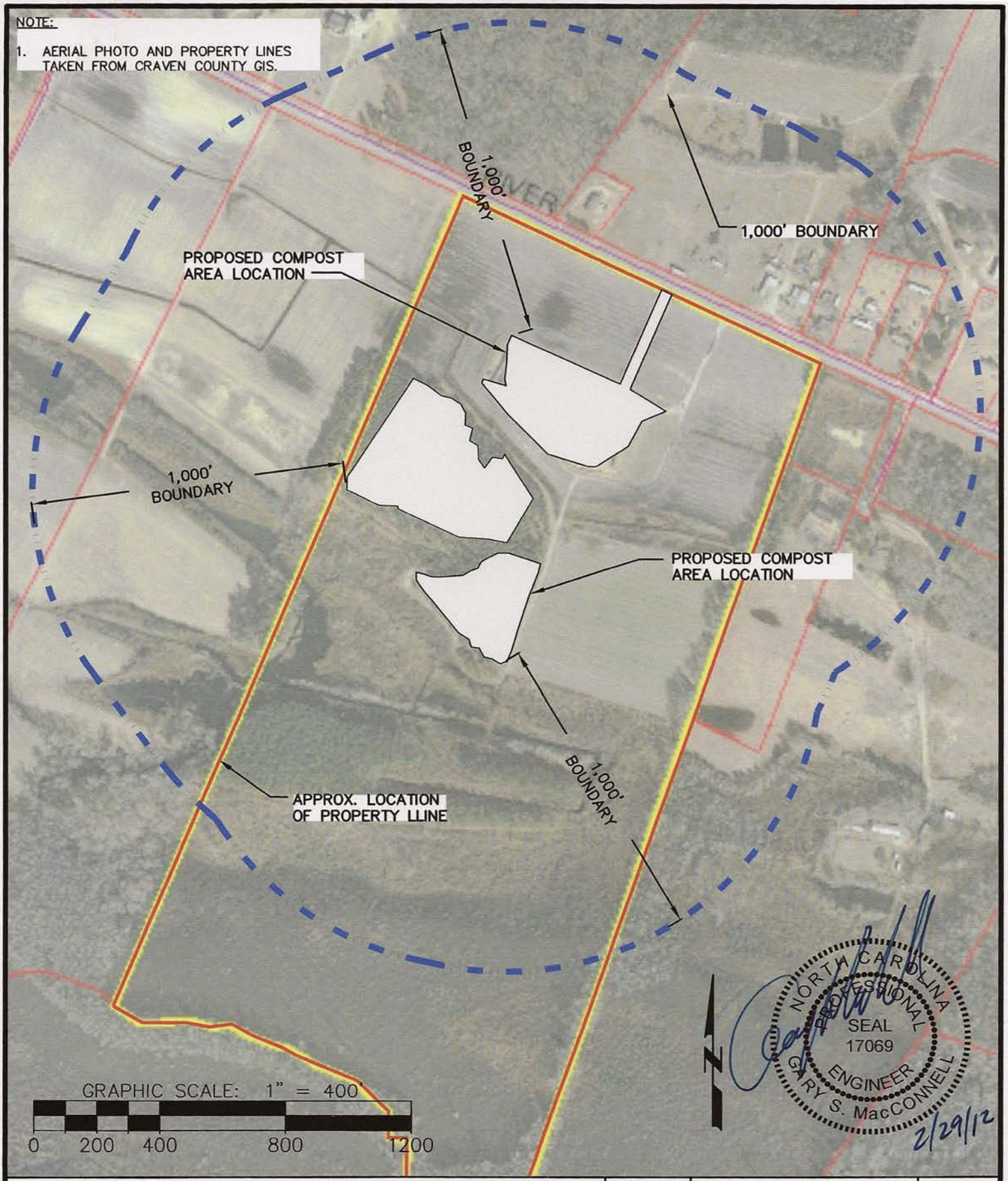
Attachment 5. Equipment Specifications

See Attachment 4

Attachment 6. Buffer Maps

NOTE:

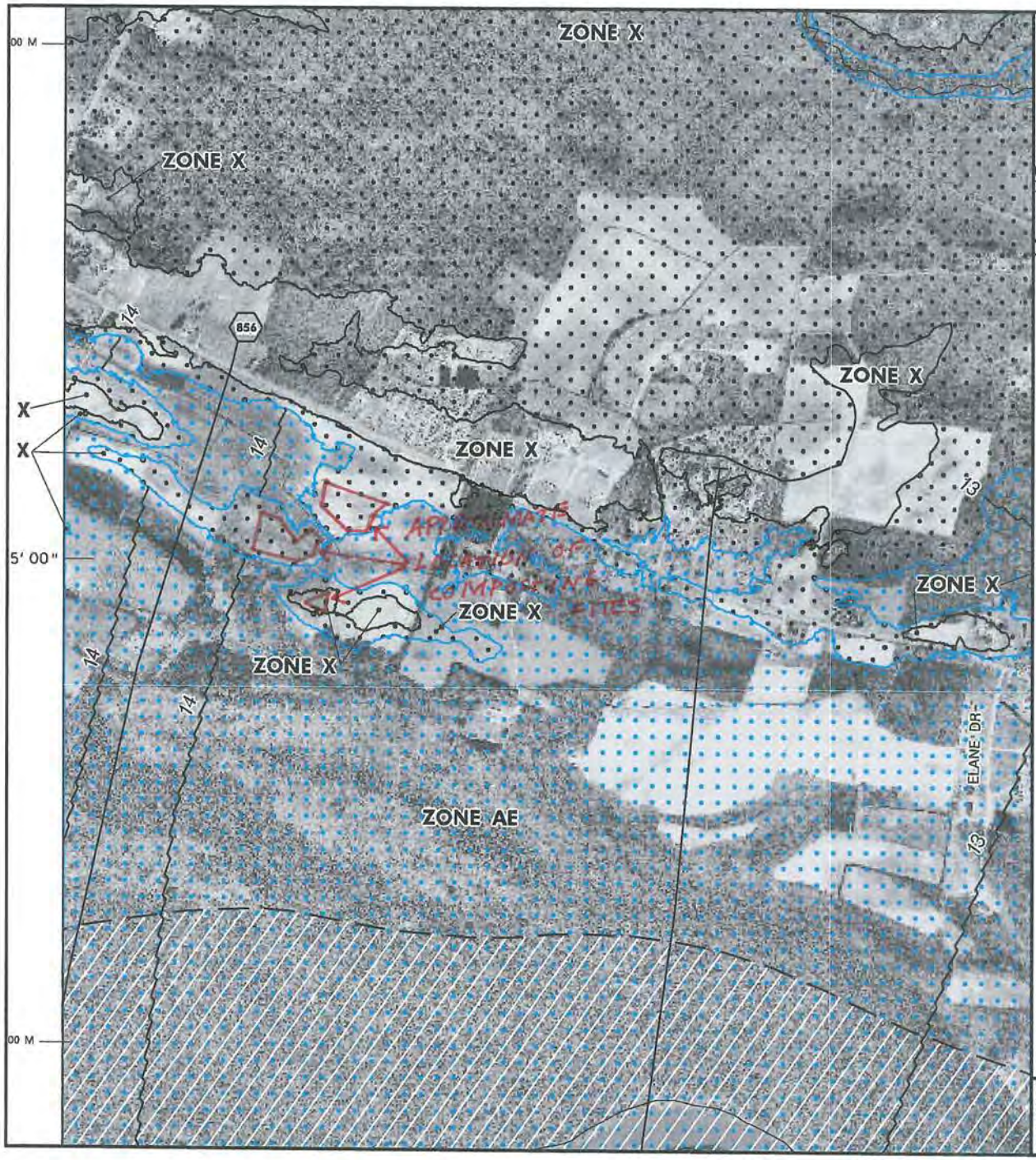
1. AERIAL PHOTO AND PROPERTY LINES TAKEN FROM CRAVEN COUNTY GIS.



MacCONNELL & Associates, P. C.

1903 NORTH HARRISON AVE., SUITE 102
CARY, NORTH CAROLINA 27513
P. O. BOX 129
MORRISVILLE, NORTH CAROLINA 27560
TEL: (919) 467-1239 FAX: (919) 319-6510

BY:	PROJECT:	REFERENCE
MAE	CRAVEN AG SERVICES, INC.	
JOB #: A45201.00	COMPOSTING FACILITY	C—1
DATE: 12/30/11	CRAVEN COUNTY, NC	



GRID NORTH

SCALE 1" = 1000' (1 : 12,000)

0 0 1000 2000 FEET

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 5544J

FIRM

FLOOD INSURANCE RATE MAP

NORTH CAROLINA

PANEL 5544

(SEE LOCATOR DIAGRAM OR MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAVEN COUNTY	370072	5544	J

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

EFFECTIVE DATE
JULY 2, 2004

MAP NUMBER
3720554400J

State of North Carolina
Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

FEMA

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

GRID NORTH

SCALE 1" = 1000' (1 : 12,000)

0 0 1000 2000 FEET

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 5544J

FIRM

FLOOD INSURANCE RATE MAP

NORTH CAROLINA

PANEL 5544

EFFECTIVE DATE
JULY 2, 2004

MAP NUMBER
3720554400J

State of North Carolina
Federal Emergency Management Agency

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Attachment 7. Craven County Zoning Letter

Craven County

Office of Planning
and
Community Development

Donald R. Baumgardner, Director
R. Chad Strawn, Assistant Director
Shelton P. Toler, Chief Building Codes Inspector

1712

Human Services Annex
2828 Neuse Boulevard
New Bern, North Carolina 28562

Planning & CD (252) 636-6618
Fax (252) 636-5190
Inspections (252) 636-4987
Fax (252) 636-4984

May 11, 2011

RE: Parcel ID# 1-057-026

To Whom It May Concern:

The above property located in Craven County, North Carolina does not fall within any municipality and, therefore, is regulated by the county. Craven County has no applicable ordinances regulating development on this property.

Therefore the property is not zoned and could be used for residential or commercial purposes at this time.

If you have any further questions or comments regarding this property or county policies, please do not hesitate to contact me at 252-636-6618.

Thank you,

Don LaVelle Jr.
Planning Technician

Attachment 8. Marketing Information Sheet

CAS Compost Quality, Distribution and Use

Feedstock materials: Craven Ag Service has been producing high quality compost from a variety of waste or by product materials generated in the Coastal Plain of North Carolina. The feedstocks utilized in the compost include regulated waste materials (septage and fats, oils and grease), agribusiness wastes, and yard waste. The compost is tested and monitored and all sampling indicates the compost produced meets the most stringent regulatory requirements imposed by federal and state agencies and the end product is suited for broad use. The end product meets all criteria established in rule for unrestricted use. Unrestricted use does mean that the product is utilized at appropriate rates. Appropriate rate is dependent on the site and soil conditions, the crop to be grown, the season when the compost is used and whether the compost is applied onto the soil surface or lightly incorporated into soil. For most uses, the recommended loading is as described below. For higher applications, a nutrient plan should be developed.

Sample testing: CAS samples the composted material daily to assure compliance with regulatory requirements. Temperatures are important in compost production and all temperature monitoring accomplished indicates the temperatures within the compost windrows exceed 140 degrees F. This assures pathogens and weed seeds are eliminated.

Testing indicates nutrient levels as presented in the table below.

	Test results	Pounds per ton
Nitrogen	3.0%	30 (allows 50% for mineralization)
Phosphorus	0.5%	10
Potassium	1%	20

Typical loadings for the compost should supply nutrients required for specific cropping systems and should be based on soil test data. In general, 3 to 5 tons of compost applied per acre will provide required nutrients for crops typical in the Coastal Plain.

Compost generated at Craven Ag is suitable for use in gardens, landscaped areas, lawn and turf settings, or agricultural production – any application where organic matter or nutrients are required to support plant growth or improve soil quality. If the compost is used in garden settings, the loading is as described above – 3 to 5 tons per acre; this is equivalent to 25 pounds per 100 square feet in garden settings. If used in gardens the compost should be spread uniformly onto the soil surface using a fertilizer spreader and lightly tilled into the soil. Home gardeners are encouraged to test soil annually and add amendments as recommended. The NCDA provides outstanding soil test service and the local or county office of the Extension Service can assist with any garden questions.

If the compost is applied to agricultural lands, the application should be based on a nutrient management plan incorporating information on specific crops and site specific soils information. Assistance with development of a nutrient plan is available through the local Extension Service Office.

Attachment 9. Division of Solid Waste Communications

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Waste Management
Beverly Eaves Perdue
Governor
Dexter R. Matthews
Director
Dee Freeman
Secretary

November 8, 2011

Mr. J.W. (Billy) Dunham
Craven Ag Service
2115 W. Highway 55
New Bern, NC 28562

Re: Application for permit, Craven Ag Service Compost Facility, Craven County

Dear Mr. Dunham:

The North Carolina Solid Waste Section has completed review of your application for permit of the above referenced facility, submitted in July 2011 by your consultants, Gary MacConnell and A.R. Rubin. The following comments should be addressed to complete the application process:

1. Please change Craven Ag Services, LLC to Craven Ag Service, Inc. The Secretary of State's office does not have a listing for Craven Ag Service, LLC.
2. The application should be signed and stamped by a NC registered PE.
3. The application is incomplete in that it is missing all attachments. The zoning letter has not been provided.
4. The two separate sectioned reports should be combined to one.
5. Please provide a copy of the FEMA floodplain map, with the composting site area marked on the copy.
6. Note – The property line setbacks for Area 3 as shown on the site Plan drawing are OK, meeting the 100 foot setback requirement. Future Area 2, as shown on this drawing, does not meet the required 100 foot setback to the property line.
7. Address compliance with the soil texture, depth to seasonal high water table, and pad requirements of 1404(a)(10). How will the area be constructed to meet the requirements? Describe test pad construction and QA/QC testing. Groundwater monitoring for the operation will be required if the soil texture, as required in (B), is reconstructed.
8. Where is the nearest residence to the compost area, and what is the distance to the residence?
9. Are there any wells on the facility property?
10. The Solid Waste Section has concerns that the facility property may contain wetlands. Please provide information regarding the possibility of wetlands on the property.
11. Section G.7 – Please correct facility name, Stanley Environmental Compost Facility.
12. The list of wastes and compost feedstocks should be consistent throughout report – some lists don't include manure, shavings and animal waste from local livestock trailer wash,

seafood processing waste (be more specific), tobacco dust, and wood ash and coal ash. Include in the list each specific vegetative agricultural/agribusiness waste.

13. Section 1.0 and 1.1 - What is the concrete bunker mixing pad? Describe the mixing bin. How is the mixing area arranged? Provide a sketch or drawing of the mixing area. Section 1.2 – Describe the initial receiving bay.
14. Section 1.4 – Please provide more information on the sentence, "Feedstock mixing and blending shall be done on the concrete pad in the final phase, but on the compacted soil pad initially." Is there a concrete pad proposed?
15. How will unacceptable wastes found in the materials be handled, stored, and disposed?
16. How will materials be measured onsite? Will wood or other materials be ground before composting? If yes, provide information.
17. Section 1.1 - How will dry non-composted materials be kept dry before mixing? How will dewatered septage and FOG be stored before mixing? Show storage area on drawing. Provide more information on number and sizes of storage containers for each material. How will wet and dry compost materials be stored after closing for the day?
18. Will the facility continue to accept feedstocks during inclement weather? If so, how will they be stored?
19. Section 1.4 – The curing area is referred to as Area 4, but this should be Area 3.
20. Temperature testing should be every 25 feet, instead of 20, 40, 60, and 80% of length.
21. Text should state what the steps are if the required temperatures are not met for any of the testing times during the 15 day PFRP time period.
22. Section G8 – If the tested fecal coliform fails, the compost should repeat the 131°F/ 15 day cycle, instead of up to 131°F/ 15 days.
23. Section 2.0 – The hours of operation should be consistent with hours listed on page 2.
24. Section 2.6.1 – Please change "should" to "will."
25. Section 2.6.3 – Leachate should not pool on the pads and windrow areas.
26. Section 3.2 – Please confirm that the thermometer will be used in the operation.
27. Section 5.2 – Please change "should" to "will."
28. Table 2 – The test method for foreign matter should list subparagraph (5). The test method for nitrogen, phosphorus, and potassium should be corrected.
29. Please provide the information requested in .1405 (b)(1) (drawing or photo), (2) (zoning letter), and (4)(B) (soil evaluation). A copy of the soil evaluation used for the land application permit on this property should be sufficient for (4)(B).
30. The existing land application permit does not approve the application of composting process water or leachate. A new permit to land apply on separate parcels would be required. Land application of Class B compost will require approval by the Solid Waste Section.
31. Please describe how the age of compost (and 15 day requirement) is tracked for the various mixed compost batches.
32. Please provide the process flow diagram, in accordance with Rule .1405(b)(7).
33. Section 3 should list all equipment used for the composting operation.
34. The application lists different time periods for compost time - 60 days, 21 days, 60 to 120 days, and 45 to 60 days. Also, the application lists different time periods for curing – between 120 and 270 days, between 2 and 3 months, 30 days, and 90 days. The time listed for composting and for curing should be consistent throughout the application.

35. The recommended width of bucket loader turned windrows is 10 to 15 feet.
36. Section 1.5 – How will C:N be measured, how often?
37. How will porosity be tested? How often will porosity and moisture content be tested?
38. What is the frequency of turning in Area 2 and Area 3?
39. In describing the design of the facility, include a description of the air emission and control technologies, addressing how odors and fugitive dust/particulates are controlled.
40. What is the maximum volume of onsite storage of materials in each area? What is the maximum total volume of materials onsite at any time?
41. Describe labels or information sheets provided with compost distribution in accordance with .1407(g).
42. Provide engineering plans and specifications in accordance with .1405(b)(9).
43. Address personnel training.
44. Provide a quality assurance plan, as described in 1405(c)(3).
45. Provide the fact sheet and process flow diagram, in accordance with 1405(c)(4).
46. Section 1.0 and 1.1 – Please provide more information on the infiltration basin. The text also referred to this basin as a wetland cell, which means it would have discharge; please clarify. Will runoff be allowed to infiltrate the ground surface? Will Areas 1, 2, and 3 be sloped to the surface water basin? Provide calculations to show that is sized to collect the runoff from a 25 year 24 hour storm. How will run-off be collected and returned to the composting area? Will the pond be lined? What is considered "clean" run-off?
47. Please provide a signed copy of the application for sedimentation and erosion control permit.
48. Drawings:
    a. Site Plan drawing – Include Zone AE and Zone X in Legend.
    b. Please remove "fill area" and "to be filled" from the drawing, unless a permit will be obtained to fill in the floodplain area.
    c. The floodplain area is shown crossing into compost areas 3 and 4, please correct.
    d. Site layout drawing – Please label/identify the boundaries of the compacted ash pad.
    e. Show storage areas for each type of compost material before mixing.
    f. Show any concrete areas such as the concrete bunker mixing pad. Show details of the mixing area.
    g. Show access roads and details on traffic patterns.
    h. Drawings do not show the surface water retention pond.
    i. Drawings should provide existing contour elevation numbers. Provide proposed contours.
    j. Please show benchmark(s) on site plan drawings.
49. Section G.11 – Typo - "present escape of odor."

Please provide one paper copy and one electronic (pdf) copy, including drawings, of the revised application.

If you have any questions on the above comments, please contact me at (919) 707-8255 or by email at donna.wilson@ncdenr.gov .

Sincerely,

Donna J. Wilson

Donna J. Wilson
Environmental Engineer
Solid Waste Section

Enclosure

cc: Gary MacConnell, PE
A. R. Rubin

Donna Wilson

Environmental Engineer, Solid Waste Section

NCDENR-DWM

1646 Mail Center

Raleigh, NC, 27699-1646

Dear Ms. Wilson:

Subject: Craven Ag Service Compost Application

Thank you for your November, 2011 letter containing the section comments on the compost site application. Representatives from MacConnell and associates and I have been working on the reply. Please find our comments herein and the revised application attached.

1. Craven Ag is Craven Ag Service, Inc.
2. Mr. MacConnell and I have reviewed and signed the application.
3. Attachments are contained in the application.
4. The application and the operations document are combined into the application.
5. FEMA map is included in the attachments.
6. Property lines and compost areas have been adjusted.
7. Soil texture issues will be addressed by addition of fines, compaction, and monitoring.
8. The nearest residence in over 500 feet from the compost areas.
9. No wells are located on the site.
10. No wetlands are on areas proposed to host compost operations.
11. Corrected.
12. Waste and compostable materials have been reviewed for consistency.
13. The concrete pad is described in the plans attached.
14. The existing compost demonstration permit allows mixing and blending on a compacted soil pad; as the system is developed and the concrete mix pad is developed these initial mixing and blending activities will take place on the pad.
15. Materials removed from the compost will be collected in dumpsters and transported to an approved landfill (CRSWMA).
16. Materials will be blended on a "by volume" basis, wood chip, sawdust, and chip is ground before composting – it is received as ground material.
17. Dry materials are stored for short times on the site, if necessary the small volume of dry material will be covered with a tarp to maintain dry feedstock. Dry waste materials will be transported to the site only when the compost mixing and blending activity can take place.
18. The facility will NOT receive materials during inclement weather.
19. Area designations have been corrected on the plans

20. Temperature monitoring as described is referenced in the O and M manual.
21. Steps have been discussed in the O and M manual for handling materials which do not meet the required time and temperature mandates.
22. The O and M manual addresses the necessity to repeat the time/temperature/turning regimen for materials which do not meet the standard.
23. Hours of operation have been reviewed.
24. Changed
25. The O and M manual addresses leachate management; no pooling is not the recommended management option.
26. A 36 inch long dial stem thermometer will be used. Calibration procedures are discussed in the O and M Manual.
27. Changed
28. Methods have been corrected.
29. Zoning letter is contained in the application. The site/soil report is on file in the DWM. The report to permit the compost site was submitted by Mr. Fred Smith with the initial permit application.
30. We understand that the existing septage permit does not allow application of the leachate and initial plans are to reapply the leachate as a liquid to the compost (fully cognizant of the time and temperature issue), to apply for an amended septage permit to allow this land application activity, or to transport liquid off site to an approved wastewater treatment facility such as the City of Kinston. Class B compost has not been produced during the demonstration and there is NO intent to produce that in the future.
31. Compost age, time, temperature and turning is tracked as a discrete batch for each of the materials produced.
32. The process flow diagram is included in the O and M manual.
33. Equipment used in the process is described in the application and the O and M manual.
34. Time periods have been reviewed and adjusted for consistency.
35. Windrow width has been adjusted in the Plans
36. C:N will be measured by NCDA as a routine waste analysis.
37. NCDA waste analysis provides moisture levels, porosity is assessed visually in conjunction with hand or "squeeze method" assessments of quality.
38. Turning is described in the O and M Manual. Active windrows will be turned 5 times in 15 days to meet pathogen reduction requirements. Subsequent turning will be accomplished as needed to adequately cure the material.
39. Odor is controlled by covering the active windrow with mature (odor free) compost. Dust emissions are controlled by addition of a fine moisture layer during dry, windy conditions. The moisture will be imported from an off-site location and will contain no runoff from this facility.
40. Material in the initial phase of the compost operation will remain in active windrows for between 20 and 30 days (time required to increase from ambient temperature to over 131 degrees varies). The volume of material in this phase is estimated to be no more than 5000 cubic yards per quarter. Curing area storage may reach 20,000 cubic yards, and finish compost storage will range between zero and 20,000 cubic yards depending on markets.

41. A label will be developed listing the source of feedstock used in production of the compost and the nutrient (NPK) levels in the material. In addition, the label will provide recommended application rates for the product such as 0.25 pound per square foot in a garden to as much as 10 tons per acre on an agricultural site.
42. Signed, sealed plans and specifications are provided.
43. Personnel have received training through NCSU, the Compost Council, and Bio-Cycle. Continuing training is required for operators and owners. This should be required in the permit.
44. The QA/QC plan is discussed in the O and M manual.
45. Fact sheet for recommended use is provided in the O and M manual
46. The initial plans specified infiltration basins and treatment wetlands. The plans now call for small sinks or basins to collect runoff from the area between windrows. The windrows and curing piles themselves will catch and hold rainwater falling thereon. The anticipated windrow coverage is calculated as 2000 sq feet per windrow and the curing operation is expected to cover 1 acre. Open areas potentially generating runoff from process or curing operations are estimated to cover 40,000 sq ft or 1 acre. This will generate approximately 75,000 gallons of liquid in a storm event. Berms, swales and the basins or sinks are suggested to accommodate this liquid. Liquid collected in these facilities will infiltrate into the soil or be pumped and hauled to an approved wastewater treatment facility.
47. The sedimentation and erosion control plan was developed and forwarded to NCDWQ-WRO.
48. Drawings are provided.
49. Corrected
50. Paper and electronic copies provided.

Thank you for your attention to this request. Mr. MacConnell, Mr. Dunham and I appreciate your assistance on this project.

Sincerely;

A. R. Rubin

Gary MacConnell, P.E.

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Waste Management
Beverly Eaves Perdue
Governor
Dexter R. Matthews
Director
Dee Freeman
Secretary

August 17, 2012

Mr. J.W. (Billy) Dunham
Craven Ag Service
2115 W. Highway 55
New Bern, NC 28562

Re: Application for permit, Craven Ag Service Compost Facility, Craven County

Dear Mr. Dunham:

The Solid Waste Section has completed review of your revised application for permit of the above referenced facility, submitted in March 2012 by your consultants, Gary MacConnell and A.R. Rubin. The following comments should be addressed to complete the application process:

1. The beginning portion of the application describes the proposed compost facility as operating on the existing portion of land, with the statement that an expansion will be developed over the next 2 to 3 years, and it is stated that the expansion area will be developed as compost production dictates. However, the Operating Plan and the engineering drawings state and depict that the proposed operation will be constructed/operated on both the northern area and the southern area. We cannot approve an expansion to the facility now for an expansion that will occur at an unspecified time in the future. The application should be clear as to what is being requested for the proposed operation, that is, what will be constructed and operated at this time. If a future expansion is planned, then that expansion will need to be permitted in the future as a permit modification. The application should refer to the different areas as the northern area, southern area, and western area (or something equally descriptive), instead of expansion area.
2. It appears that the report contains two Operation Plans. For example, the compost equipment is described in G. 10 and again on page 16; compost recipes are described in G.2 and again on page 11; leachate collection is described in G.5 and again on page 13. The duplication makes the application complicated and confusing, especially in that the topics are not entirely consistent with one another. Please consolidate topics to one area.
3. Related to the previous comment, the list of feedstocks in the report should be consistent throughout the report. The report lists the feedstocks in Section A, Section D.1, Section G, and Ops Plan. Not all listings include animal bedding, lime mud from water treatment, seafood processing waste, tobacco dust, coal ash, wood ash, sawdust, yard waste, DAF skimmings, construction debris, pre and post-consumer food waste, animal haul truck wash water, septage, and land clearing debris.

4. Groundwater monitoring for the operation is required because the soil pad is to be constructed in accordance with 1404(a)(1)(B). Provide groundwater monitoring plan, including a map with proposed well locations and depths. Text should indicate that groundwater wells will be installed, instead of groundwater wells are proposed or recommended. See the Solid Waste Section website for guidance on groundwater monitoring:
   http://portal.ncdenr.org/web/wm/sw/envmonitoring
5. Because the property contains wetlands and extensive floodplains, a wetlands determination should be provided by a qualified wetlands professional.
6. The stormwater basin must be lined (permeability 10^{-7} cm/sec) to prevent infiltration of process water. The pond must be designed for the 25 year, 24-hour storm plus 24 inches of freeboard; please address. Show the basin on the engineering drawings. Alternatively, stormwater and process water discharge may be covered under a DWQ permit.
7. A 500-foot buffer is required between compost areas and residences or dwellings not owned and occupied by the permittee. The Site Plan drawing shows there is a house approximately 430 feet from the compost area. Please address.
8. Provide total metals analysis of the coal ash, and include the quantity to be received.
9. For both the northern and southern areas, address compliance with the soil texture, depth to seasonal high water table, and pad requirements of 1404(a)(10). How will the area be constructed to meet the requirements? Describe soil pad construction and testing, including permeability or soil type testing.
10. Section G.1 – In the description of the four site areas, include a sentence clarifying the location of each area as the northern area or the southern area.
11. Section G.3 – Volumes of all feedstocks should be provided.
12. Please add the definition of floodplain terms Zone X and Zone AE to Drawing C101 and to Attachment 7 (separate page OK). Zone AE means the area is within the 100 year floodplain (1% annual chance flood event). Attachment 7 should note that Zone X shaded means the area is outside the 100 year floodplain but within the 500 year floodplain (0.2% annual chance flood), and that Zone X unshaded means the area is outside the 100 year and 500 year floodplain.
13. How will the floodplain boundaries of the northern area and southern area be marked to prevent construction in the floodplain? The western boundary of the northern area should be constructed with permanent markers so that the compost windrows do not cross over the floodplain boundary.
14. The text of the application should contain a table of contents or index outlining the body of the application and the appendices; be paginated consecutively; and identify revised text by noting the date of revision by the page number.
15. Sections G4, 1.0, 1.1, 1.4, and 3.1 - Describe the Knight mixer operation. It is not clear when the materials will be mixed with the mixer and when they will be mixed on the pad. Reference equipment specifications in Appendix 2 of Attachment 4 or Attachement 5.
16. Section E – It is stated that there will be no surface water storage facilities onsite, but the last sentence of the same paragraph states that stormwater is collected onsite. Please clarify.
17. Sections G.7 and G.11 – If the site meets PFRP by the windrow turning compost method (15 days at or above 131 degrees F with at least 5 turnings), then this also satisfies the VAR requirements. Another 14 days to meet VAR is not necessary.

18. Section G – Add the response to comment #40 to the text of the application. Also, add the response to comment #41 to the text of the application.
19. Is there a the difference between the primary compost area and the secondary compost area, as indicated on the drawings?
20. Attachment 11 - The process flow diagram should contain the type, size, and location of all major equipment and feedstock flow streams. The flow streams should indicate the quantity of material on a wet weight and volumetric basis.
21. Address compliance with sign requirements. An inspection of the facility in May 2012 indicated that the facility did not have proper signage at the entrance stating the permit number, prohibited materials, and emergency contact information.
22. Please provide a signed copy of the application for sedimentation and erosion control permit.
23. Operations Guide –
    a. Page 2 – Please change the regulatory DWM contact from Joe Gallo to Ray Williams, phone 252-948-3955.
    b. Is there an on-site office building?
    c. Page 4 – Text should note that excess moisture cannot be land applied onsite without modifying the existing land application permit.
    d. Pages 5, 13, and 14 – Text states that excess liquid will be collected in a tank. How will it be collected, how will it be stored, and what volume can be stored?
    e. Page 7 - For the proposed addition of a new feedstock, the submittal to the Solid Waste Section should also include the specific source of the material, the volumes to be received (per month or year), and confirmation that the additional volumes of the new feedstock will not cause the approved facility tons per year capacity to be exceeded.
    f. Pages 7 and 13 – Liquids and surface water run-off in contact with compost cannot be collected in an unlined area or pond. The pond must be lined to prevent infiltration, or the facility may be approved for wastewater discharge through a DWQ permit.
    g. Page 8 – It is stated that the materials will be fed into a bin. Please clarify.
    h. Page 9 – For PFRP, the Rule requires temperature of at least 131 F for 15 days. There is no average temperature for PFRP.
    i. Page 10 and elsewhere – Please change "IAW" to the unabbreviated words.
    j. Page 10 – Section 1.5 – How will C:N be measured/calculated, how often?
    k. Pages 12 and 15 – Is there an onsite pre-treatment plant and/or onsite treatment facilities? Please clarify.
    l. Page 15 – Windy conditions – The first sentence is confusing in that open areas are more subject to windy conditions.
    m. How will materials be measured onsite? Text should state that wood materials will be ground before being delivered to the site.
    n. Page 18 – A composite sample is required to be <u>analyzed</u> at intervals of every 20,000 tons of compost produced or every 6 months, whichever comes first. The collection and sampling of the compost takes place throughout the sampling period (either the 6 month period or the 20,000 tons produced period). At least 3 samples are to be collected from <u>each batch</u> of compost produced during that time. The samples are added together throughout the period, mixed, and at the

end (end of 6 months or end of 20,000 tons of compost produced), a representative sample is collected for metals analysis. The sample collected for pathogens analysis must be a composite as well; however, the collection and analysis time must within the hold time for the testing procedure.

o. Section 5.2 – 2nd paragraph – Please change "should" to "will."

24. Drawings:
    a. Provide existing contour elevations and proposed elevation contours.
    b. Please show benchmark on site plan drawings, or describe in the application where the nearest benchmark is. Groundwater monitoring wells will need to be surveyed in.
    c. Drawing D102 – Does the mixing area profile drawing show waste on the pad? Please label this on the drawing. The speed bump should be labeled on the plan view.
    d. What is the ground cover for all areas, as shown on the drawings? Site layout drawing should show that the compacted ash liner is to be constructed for the composting and curing areas, Areas 2 and 3 (not optional for these areas).
25. Copies of the soils reports that were submitted for the land application sites on this property are enclosed because you indicated you did not have a copy. You may use this information as part of your certification for the report that the submittal meets the Rule requirements. Please include this as an appendix to the application.

Please provide one paper copy and one electronic copy (pdf) of the revised application, including drawings, and a cover letter that includes responses to comments. The response to comments should include information on the location of revisions in the application. An example response to comment letter has been enclosed for your reference. Responses to comments should be incorporated into the text of the application.

Revised pages should list the date the submittal was prepared, the revision number, and page number. When the staff review and application is complete, the report cover sheet should be modified to include revision or final dates, and the table of contents should be modified, as necessary.

If you have any questions on the above comments, please contact me at (919) 707-8255 or by email at donna.wilson@ncdenr.gov .

Sincerely,

Donna J. Wilson

Donna J. Wilson
Environmental Engineer
Solid Waste Section

cc: Gary MacConnell, PE A. R. Rubin Ray Williams

P.O. Box 129
Morrisville, NC 27560

919-467-1239

MacCONNELL
& ASSOCIATES, P.C.

1903 North Harrison Avenue
Suite 102
Cary, NC 27513

Fax 919-319-6510

Rec'd
1-4-13
DW

December 19. 2012

Ms. Donna J. Wilson
Environmental Engineer
Composting and Land Application Branch
NCDENR - Division of Waste Management
Solid Waste Section
1646 Mail Service Center
Raleigh, North Carolina 27699-1646

Re: Craven Ag Services Compost Facility
Comment Responses
MacConnell & Associates, P.C. Project No.: A45201.00

Dear Ms. Wilson:

In response to your comment letter dated August 17, 2012, relative to the above referenced project, the following additional information and responses are provided. One hard copy and one electronic copy of the revised information is provided for your review to the address above.

1. The beginning portion of the application describes the proposed compost facility as operating on the existing portion of land, with the statement that an expansion will be developed over the next 2 to 3 years, and it is stated that the expansion area will be developed as compost production dictates. However, the Operating Plan and the engineering drawings state and depict that the proposed operation will be constructed/operated on both the northern area and the southern area. We cannot approve an expansion to the facility now for an expansion that will occur at an unspecified time in the future. The application should be clear as to what is being requested for the proposed operation, that is, what will be constructed and operated at this time. If a future expansion is planned, then that expansion will need to be permitted in the future as a permit modification. The application should refer to the different areas as the northern area, southern area, and western area (or something equally descriptive), instead of expansion area.

   Response: The revised application has been modified to reflect an application for the entire area proposed as a part of the compost operation. The concrete pad construction

will begin as soon as the permit is issued and the development of the windrow area will follow.

2. It appears that the report contains two Operation Plans. For example, the compost equipment is described in G. 10 and again on page 16; compost recipes are described in G.2 and again on page 11; leachate collection is described in G.5 and again on page 13. The duplication makes the application complicated and confusing, especially in that the topics are not entirely consistent with one another. Please consolidate topics to one area.

   Response: The permit application and the Operations Guide are separated as appropriate. Issues associated with the permit are addressed in the permit application section. Issues addressing facility operation are addressed in the Operations Guide.

3. Related to the previous comment, the list of feedstocks in the report should be consistent throughout the report. The report lists the feedstocks in Section A, Section D.1, Section G, and Ops Plan. Not all listings include animal bedding, lime mud from water treatment, seafood processing waste, tobacco dust, coal ash, wood ash, sawdust, yard waste, DAF skimmings, construction debris, pre and post-consumer food waste, animal haul truck wash water, septage, and land clearing debris.

   Response: The materials to be composted are included in both sections since the permit is specific to feedstock and the operation and compliance necessitate proper blend in accordance with the prior knowledge gained by Mr. Dunham and his staff through the demonstration.

4. Groundwater monitoring for the operation is required because the soil pad is to be constructed in accordance with 1404(a)(1)(B). Provide groundwater monitoring plan, including a map with proposed well locations and depths. Text should indicate that groundwater wells will be installed, instead of groundwater wells are proposed or recommended. See the Solid Waste Section website for guidance on groundwater monitoring: http://portal.ncdenr.org/web/wm/sw/envmonitoring

   Response: Groundwater monitoring plans are addressed by Mr. Phil Rahn, P.G. He has located the wells on the site plan (see Sheet C-101) and the monitoring well detail is provided in the plans submitted (Detail 8 on Sheet D-102). The proposed groundwater monitoring involves an up-gradient well and two (2) down-gradient wells. See Attachment #15.

5. Because the property contains wetlands and extensive floodplains, a wetlands determination should be provided by a qualified wetlands professional.

   Response: Wetland areas were identified in the attached Smith Site Report (Sep, 2004). No areas considered wetland are included in the area proposed as the compost operation. See Attachment #14.

6. The stormwater basin must be lined (permeability 10^{-7} cm/sec) to prevent infiltration of process water. The pond must be designed for the 25 year, 24-hour storm plus 24 inches of freeboard; please address. Show the basin on the engineering drawings. Alternatively, stormwater and process water discharge may be covered under a DWQ permit.

   Response: No stormwater basins are proposed for the site. Mr Ken Pickle and Mr. Mike Scott visited the site and Mr. Pickle determined no stormwater exited the site and entered adjacent surface water. Small portions on the site will be developed as sediment and erosion control areas and the erosion control structures may hold water for a short time, but these are not considered stormwater basins.

7. A 500-foot buffer is required between compost areas and residences or dwellings not owned and occupied by the permittee. The Site Plan drawing shows there is a house approximately 430 feet from the compost area. Please address.

   Response: The buffer areas have been identified on the site plan. Although portions of the compost site fall within the buffer areas, no compost production is planned for these areas. Haul roads and on-site shed/storage, equipment storage, etc will take place in the buffer; but no compost production. Sheets C-101 and C-102 are revised to show that only finished product may be stored within the 500' buffer.

8. Provide total metals analysis of the coal ash, and include the quantity to be received.

   Response: The total metals analysis for the ash (wood and coal) is provided as Attachment #13 to the report.

9. For both the northern and southern areas, address compliance with the soil texture, depth to seasonal high water table, and pad requirements of 1404(a)(10). How will the area be constructed to meet the requirements? Describe soil pad construction and testing, including permeability or soil type testing.

   Response: Note 4 on Sheet C-102 is added and Part D (2) of the application is revised addressing soil texture compliance in the composting and windrow areas. Per discussion with Michael Scott, depth to seasonal high water is not an issue at this site.

10. Section G.1 – In the description of the four site areas, include a sentence clarifying the location of each area as the northern area or the southern area.

    Response: Please see revised application Part G (1) on page 6.

11. Section G.3 – Volumes of all feedstocks should be provided.

    Response: Please see revised application Part G (3) on page 8.

12. Please add the definition of floodplain terms Zone X and Zone AE to Drawing C101 and to Attachment 7 (separate page OK). Zone AE means the area is within the 100 year floodplain (1% annual chance flood event). Attachment 7 should note that Zone X shaded means the area is outside the 100 year floodplain but within the 500 year floodplain (0.2% annual chance flood), and that Zone X unshaded means the area is outside the 100 year and 500 year floodplain.

    Response: Sheet C-101 and other site plan legends are revised to include floodplain terms from FEMA map. Attachment #6 is revised to include the FEMA map legend.

13. How will the floodplain boundaries of the northern area and southern area be marked to prevent construction in the floodplain? The western boundary of the northern area should be constructed with permanent markers so that the compost windrows do not cross over the floodplain boundary.

    Response: Floodplain boundaries will be identified with marker posts as shown on the Sheet C-102 and Detail 1 on Sheet C-102.

14. The text of the application should contain a table of contents or index outlining the body of the application and the appendices; be paginated consecutively; and identify revised text by noting the date of revision by the page number.

    Response: Please see Table of Contents prior to application body.

15. Sections G4, 1.0, 1.1, 1.4, and 3.1 - Describe the Knight mixer operation. It is not clear when the materials will be mixed with the mixer and when they will be mixed on the pad. Reference equipment specifications in Appendix 2 of Attachment 4 or Attachment 5.

    Response: Please see pages 5 and 6 of the Operations Guide for description of process for mixing and blending feedstocks prior to placement in the active windrow.

16. Section E – It is stated that there will be no surface water storage facilities onsite, but the last sentence of the same paragraph states that stormwater is collected onsite. Please clarify.

    Response: Stormwater will not be collected in a basin, rather it will collect as a result of the sediment and erosion control effort. The stormwater and free liquid generated during mixing and blending will be collected in a tank on the site. No formal effort is planned for stormwater following the decision by Mr. Pickle which states no stormwater exited the site to surface water.

17. Sections G.7 and G.11 – If the site meets PFRP by the windrow turning compost method (15 days at or above 131 degrees F with at least 5 turnings), then this also satisfies the VAR requirements. Another 14 days to meet VAR is not necessary.

    Response: The PFRP/VAR issue is corrected in the application text and in the Operation Guide.

18. Section G – Add the response to comment #40 to the text of the application. Also, add the response to comment #41 to the text of the application.

    Response: The maximum volume to be stored on the site was listed as 50,000 tons. This is a worst case and assumes no material is transported off site. Finish product awaiting disposition may be relocated to the intended receiver site where short term storage may be required before application.

19. Is there a the difference between the primary compost area and the secondary compost area, as indicated on the drawings?

    Response: There is no difference between the primary and secondary compost area.

20. Attachment 11 - The process flow diagram should contain the type, size, and location of all major equipment and feedstock flow streams. The flow streams should indicate the quantity of material on a wet weight and volumetric basis.

    Response: Please see revised flow diagram (Attachment #11).

21. Address compliance with sign requirements. An inspection of the facility in May 2012 indicated that the facility did not have proper signage at the entrance stating the permit number, prohibited materials, and emergency contact information.

    Response: Note 3 and the location are added to Sheet C-102 identifying the sign and criteria.

22. Please provide a signed copy of the application for sedimentation and erosion control permit.

    Response: Please see Financial Responsibility/Ownership form signed by Billy Dunham (Attachment 17).

23. Operations Guide –

    a. Page 2 – Please change the regulatory DWM contact from Joe Gallo to Ray Williams, phone 252-948-3955.

       Response: Please see revised page 2 of the Operations Guide.

    b. Is there an on-site office building?

       Response: No onsite office is proposed, only a shed for storage of supplies and equipment required in the operation.

    c. Page 4 – Text should note that excess moisture cannot be land applied onsite without modifying the existing land application permit.

Response: Excess moisture will be accommodated through a separate request to re-permit the septage site and with a letter from the POTW.

d. Pages 5, 13, and 14 – Text states that excess liquid will be collected in a tank. How will it be collected, how will it be stored, and what volume can be stored?

Response: Tank storage is addressed in the Operation Guide.

e. Page 7 - For the proposed addition of a new feedstock, the submittal to the Solid Waste Section should also include the specific source of the material, the volumes to be received (per month or year), and confirmation that the additional volumes of the new feedstock will not cause the approved facility tons per year capacity to be exceeded.

Response: New feedstock procedures are addressed in the Operation Guide.

f. Pages 7 and 13 – Liquids and surface water run-off in contact with compost cannot be collected in an unlined area or pond. The pond must be lined to prevent infiltration, or the facility may be approved for wastewater discharge through a DWQ permit.

Response: No pond storage is proposed.

g. Page 8 – It is stated that the materials will be fed into a bin. Please clarify.

Response: Material handling in the mix/blend area states that materials will be mixed and blended initially on the pad and then mixed more thoroughly through the mixer.

h. Page 9 – For PFRP, the Rule requires temperature of at least 131 F for 15 days. There is no average temperature for PFRP.

Response: PFRP requirements are clarified.

i. Page 10 and elsewhere – Please change "IAW" to the unabbreviated words.

Response: IAW is changed to "in accordance with" where detected in the text.

j. Page 10 – Section 1.5 – How will C:N be measured/calculated, how often?

Response: C:N measures addressed in the text (page 11); NCDA waste analysis will be utilized to assess C:N ratios.

k. Pages 12 and 15 – Is there an onsite pre-treatment plant and/or onsite treatment facilities? Please clarify.

Response: No onsite wastewater treatment is planned. The onsite treatment refers to the septage dewatering facility which pre-treats or dewaters the septage, portable toilet, and septage waste proposed for the compost operation.

l. Page 15 – Windy conditions – The first sentence is confusing in that open areas are more subject to windy conditions.

Response: Windy condition operations are addressed in the Operation Guide (page 16).

m. How will materials be measured onsite? Text should state that wood materials will be ground before being delivered to the site.

Response: Material measure will be accomplished on a volumetric basis. Actual weights may be obtained from the various sources providing the feedstocks, but not always.

n. Page 18 – A composite sample is required to be analyzed at intervals of every 20,000 tons of compost produced or every 6 months, whichever comes first. The collection and sampling of the compost takes place throughout the sampling period (either the 6 month period or the 20,000 tons produced period). At least 3 samples are to be collected from each batch of compost produced during that time. The samples are added together throughout the period, mixed, and at the end (end of 6 months or end of 20,000 tons of compost produced), a representative sample is collected for metals analysis. The sample collected for pathogens analysis must be a composite as well; however, the collection and analysis time must within the hold time for the testing procedure.

Response: Composite sampling procedures are described in the sampling section of the Operation Guide (page 19). The section identifies the need for the representative sampling described.

o. Section 5.2 – 2nd paragraph – Please change "should" to "will."

Response: "Should" changed to "will" or "shall" in revised document.

24. Drawings:

a. Provide existing contour elevations and proposed elevation contours.

Response: Existing contours are shown on the site drawings with improved labeling. Proposed contours are expected to remain close to existing. Flow direction arrows are provided to show anticipated post construction runoff patterns.

b. Please show benchmark on site plan drawings, or describe in the application where the nearest benchmark is. Groundwater monitoring wells will need to be surveyed in.

Response: Survey notes are added to Sheet C-101 to reference survey methodology (NAVD 1988 OPUS Derived). Please note that contours shown were taken from NCDOT LIDAR and not field surveyed.

c. Drawing D102 – Does the mixing area profile drawing show waste on the pad? Please label this on the drawing. The speed bump should be labeled on the plan view.

   Response: Detail 7 on Sheet D-102 does not show waste on the concrete pad. Please see revised detail and callouts.

d. What is the ground cover for all areas, as shown on the drawings? Site layout drawing should show that the compacted ash liner is to be constructed for the composting and curing areas, Areas 2 and 3 (not optional for these areas).

   Response: Please see Note 2 on Sheet C-102 for groundcover requirements.

25. Copies of the soils reports that were submitted for the land application sites on this property are enclosed because you indicated you did not have a copy. You may use this information as part of your certification for the report that the submittal meets the Rule requirements. Please include this as an appendix to the application.

    Response: Please see Smith report (Attachment #14).

If you have any questions please call me or Zachary L. Fuller, PE at (919) 467-1239. Thank you for your assistance.

Sincerely,

Gary S. MacConnell, PE
President

A. R. Rubin

Enclosures

cc: J. W. (Billy) Dunham – Craven Ag Services

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Waste Management

Pat McCrory
Governor

Dexter R. Matthews
Director

John E. Skvarla, III
Secretary

April 5, 2013

Mr. J.W. (Billy) Dunham
Craven Ag Service
2115 W. Highway 55
New Bern, NC 28562

Re: Application for permit, Craven Ag Service Compost Facility, Craven County

Dear Mr. Dunham:

The Solid Waste Section has completed review of your revised application for permit of the above referenced facility, submitted in January 2013 by your consultants, Gary MacConnell and A.R. Rubin. The following comments should be addressed to complete the application process:

1. Groundwater:
   a. Prior to development of the groundwater monitoring plan, a field investigation should be conducted at the site. Temporary piezometers should be installed upgradient and downgradient of the composting area, and also between the northern area and the drainage ditch, to accurately determine the potentiometric groundwater surface. Soil boring logs should be prepared for each piezometer well installation to characterize site hydrogeology. The study should include an evaluation of potential groundwater to surface water discharge in the site drainage ditches.
   b. The water quality monitoring plan must be prepared by an environmental consulting firm under the seal of a board certified licensed/professional geologist that has experience with the design and construction of groundwater monitoring wells and plans. Since groundwater monitoring wells are significantly different in design from drinking water wells, the wells should be installed by a certified well driller with experience in the construction of groundwater monitoring wells.
   c. The number, spacing and depths of monitoring wells is determined based upon site specific technical information that should include investigation of aquifer thickness, groundwater flow rate, and groundwater flow direction, including seasonal and temporal fluctuations in groundwater flow.
   d. The groundwater monitoring plan must include a site map showing the location of the composting areas with respect to the entire property; a site specific topographic map with the location of the compost facility; a discussion of the site geology and hydrogeology including the results of the field study; an evaluation of whether there could be groundwater to surface water discharge for the compost areas at the site; and a sampling and analysis plan that describes sample collection and handling. The groundwater monitoring system should have at least one upgradient well. The number of downgradient wells is site specific. Detection monitoring wells are designed to monitor

the upper portion of the aquifer. Groundwater monitoring wells are typically constructed of 2-inch PVC pipe and have a screened interval to allow the infiltration of water. They are installed in a borehole with a sand filter pack around the screen and a bentonite clay seal over the sand filter. The remainder of the borehole is grouted to the ground surface and a protective casing is installed over the riser. Groundwater monitoring wells must be installed in accordance with 15A NCAC 2C, and a well record form GW-1 must be filled out for each groundwater monitoring well and a copy submitted to the Solid Waste Section.

e. The groundwater monitoring plan should describe consistent sampling and analysis procedures that are designed to ensure monitoring results provide an accurate representation of groundwater quality at the background and downgradient wells. The plan must include procedures and techniques for sample collection, sample preservation and shipment, chain-of-custody control, and quality assurance and quality control.

f. An initial baseline groundwater sampling event should be implemented prior to operation of the new areas. Well samples should be analyzed for total metals/Method SW846 (arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc), ammonia, nitrate, nitrite, pesticides and herbicides/Method SW846, and total coliform. Based on results of the baseline sampling event, a site specific list of parameters will be considered for continued semi-annual detection monitoring events. Groundwater monitoring wells must be surveyed and tied to a permanent benchmark of known elevation measured from a USGS Survey benchmark.

2. Some of the text changes and corrections that were made to the application in the second submittal, based on the review comments, have incorrectly returned in this third submittal. For example, in G.11, "present escape of odors" was in the first submittal, and was changed to "prevent escape of odors" in the second submittal, and is now back to "present escape of odors" in the third submittal. It is possible that the review changes were made to the wrong version of the application. Please correct these errors and check entire application.
3. The feedstocks to be received at the facility are listed in three sections of the application: Section D.1, Section G.3, and Section 1.0. The list in all three places should be the same but they are not. For example, clean wood from construction operations is listed as a feedstock in Section D.1, but it is not included in the other two lists. Please correct. Where will the DAF skimmings be coming from?
4. Background and Intro, 2nd paragraph, 1st sentence – The acreages of the areas and total area appear to be incorrect.
5. Section A, 1st paragraph – The text states that the total property is over 100 acres. The property is listed as 89.34 acres on the county property website.
6. Section A – 2nd paragraph – Please clarify the 1st sentence.
7. Sections A and G - Please change Craven Ag Services, LLC to Craven Ag Service, Inc. The Secretary of State's office does not have a listing for Craven Ag Service, LLC.
8. Text and drawings should indicate that permanent makers will be maintained for (1) the curing area boundary along the north side of Area 3, to maintain the 500 foot buffer to the offsite residence, and (2) the boundaries adjacent to the floodplains and property line in all three areas.
9. Section E, 2nd paragraph – Please state that the 500 foot buffer to the residence across the road will be maintained in the northern area (or Site 3) by the placement of buffer line markers.

10. The analysis of the wood ash that was provided in consideration for the compost soil texture amendment is too high in arsenic, for both use in the pad and for a feedstock in the compost process. Is this sample from the wood ash proposed for composting? If yes, the wood ash analysis should be removed from Attachment 13. The wood ash that is proposed for composting should be sampled 4 times, taken over a period of time sufficient to represent variability or uniformity of the ash. The metal results should meet the ceiling concentrations of Table 1 in the 503 Rules (503.13). If wood ash is proposed for composting, please provide the quantity to be received as feedstock. Because of the metals, the quantity should be a small percentage of the overall volume of feedstocks received. Coal ash is not acceptable at a Type 3 compost facility.
11. For the lime mud and the wood ash, please address how the pH will be monitored and managed in the initial mix.
12. Please provide an update to the DWQ stormwater/process wastewater permit application, and the sedimentation and erosion control permit application.
13. In addition to the description of changing the soil texture in the Note #4 on Drawing C-102, it should also be described in the text of the application. The modified soil texture is required for areas used for waste receiving and storage, active composting, and curing (not just composting and curing as stated on drawing). Please provide a sketch or drawing of the boundary of areas that will receive the soil amendment, or state that the entire boundaries of Sites 1, 2, and 3 will receive the amendment in soil texture.
14. How will the reworked areas be tested/soil classified to ensure that the modified soil texture meets the requirements of 1404(a)(10)(B), that is, finer than loamy sand? The depth of soil texture modification should be 9 to 12 inches deep. Will 2 or 3 inches of ash and compost fines be enough to modify the soil texture to that depth? Drawing C-103 indicates the soil texture will be modified to 4 inches.
15. Section G.1 – Please update the sentence that states that the western site area will be developed as compost production dictates. Please update the sentence that states that a concrete pad will be developed as the facility expands.
16. Section G.3 – Please provide the volumes of all feedstocks.
17. The floodplain map in Attachment 6 should show the boundaries for all three areas. There are currently two that are outlined on the figure.
18. In the text describing the mixer, provide a reference to the mixer equipment specifications in Appendix 2 of Attachment 4 or Attachment 5.
19. Section G.5 – Please clarify 1st sentence.
20. Section G.8 – Compost failing the fecal coliform test returning to the compost process should meet the time and temperature requirements (remove the "up to" prior to the temperature).
21. Section G.11 - The temperature and time requirements for VAR in this section are not stated correctly. However, because the facility is following the windrow composting method, 15 days at a minimum temperature of 131 degrees F, with five turnings, the PFRP process will also satisfy the VAR requirement.
22. The report states that the pile size for PFRP composting will be 5 feet high and 15 feet wide. Please provide the maximum pile size for curing piles, finished product piles, and for storage of dry feedstocks. This is an indirect way of determining the maximum capacity for each area of the facility (previous comment #40 in the Nov. 2011 comments). The pile size of dry feedstocks and finished product should be no more than 30 feet high and 50 feet wide. Also, what is the distance between windrows in each of the areas?

23. What is the frequency of turning in the curing area?
24. Operations Guide:
    a. Please clarify where records will be kept.
    b. Page 5 – Please clarify last sentence of first paragraph.
    c. Pages 5 (2nd paragraph) and 8 (last paragraph) - Please change "bin" to "mixer" or "mix pad." I assumed "bin" was a storage container or bunker.
    d. Excess liquid, leachate, and process wastewater/runoff cannot be collected in the sinks or basins along the site boundaries. Please change text to state that the process wastewater/leachate will be diverted to ditches, included with stormwater, and will be regulated by the DWQ permit (or something similar). Drawings and G.5 should also be changed.
    e. Please change "Bay" to "Area."
25. Drawings – In Site 2 and Site 3, the orientation of the compost windrow, curing windrows, and finished product piles are shown in different directions. To prevent ponding of surface water, the windrows and piles should all be oriented parallel to the direction of the slope, or just slightly angled to the slope. Please orient the windrows on the diagram, and indicate the planned slope for the areas.
26. Please provide the location of the nearest USGS survey benchmark. The groundwater wells will have to be surveyed in after installation.

For the groundwater monitoring plan, other rules and requirements may apply. Please refer to NC Solid Waste Rules 15A NCAC 13B Section .0600 Monitoring Requirements, .0601 Groundwater Monitoring, and .0602 Surface Water Monitoring. Additionally, the NC Solid Waste Section has guidance documents available to the public on our portal. A few of the links for information regarding Groundwater Monitoring Plans and SWS Guidelines for Groundwater, Soil, and Surface Water Monitoring may be found at the following links:

http://portal.ncdenr.org/web/wm/sw/newmonitoringplans
http://portal.ncdenr.org/c/document_library/get_file?uuid=d28d4f91-4b6d-4c9d-afd9-47c9ee93615f&groupId=38361
An example groundwater monitoring plan from another site has been included for your reference.

Please provide one paper copy and one electronic copy (pdf) of the revised application, including drawings, and a cover letter that includes responses to comments. Responses to comments should be incorporated into the text of the application. If you have any questions on the above comments, please contact me at (919) 707-8255 or by email at donna.wilson@ncdenr.gov .

Sincerely,

Donna J. Wilson

Donna J. Wilson
Environmental Engineer
Solid Waste Section

cc: Gary MacConnell, PE A. R. Rubin Ray Williams

P.O. Box 129
Morrisville, NC 27560

919-467-1239

MacCONNELL
& ASSOCIATES, P.C.

1903 North Harrison Avenue
Suite 102
Cary, NC 27513

Fax 919-319-6510

August 14, 2013

Ms. Donna J. Wilson
Environmental Engineer
Composting and Land Application Branch
NCDENR - Division of Waste Management
Solid Waste Section
1646 Mail Service Center
Raleigh, North Carolina 27699-1646

Re: Craven Ag Services Compost Facility
Comment Responses
MacConnell & Associates, P.C. Project No.: A45201.00

Dear Ms. Wilson:

In response to your comment letter dated April 5, 2013, relative to the above referenced project, the following additional information and responses are provided. One hard copy and one electronic copy of the revised information is provided for your review to the address above.

1. Groundwater:
   a. Prior to development of the groundwater monitoring plan, a field investigation should be conducted at the site. Temporary piezometers should be installed upgradient and downgradient of the composting area, and also between the northern area and the drainage ditch, to accurately determine the potentiometric groundwater surface. Soil boring logs should be prepared for each piezometer well installation to characterize site hydrogeology. The study should include an evaluation of potential groundwater to surface water discharge in the site drainage ditches.

      Response: Please see attached "Water Quality Monitoring Plan" prepared by Cpec Environmental, Inc.

   b. The water quality monitoring plan must be prepared by an environmental consulting firm under the seal of a board certified licensed/professional geologist that has experience with the design and construction of groundwater monitoring wells and plans. Since groundwater monitoring wells are significantly different in design from drinking water

wells, the wells should be installed by a certified well driller with experience in the construction of groundwater monitoring wells.

Response: Please see attached "Water Quality Monitoring Plan" prepared by Cpec Environmental, Inc.

c. The number, spacing and depths of monitoring wells is determined based upon site specific technical information that should include investigation of aquifer thickness, groundwater flow rate, and groundwater flow direction, including seasonal and temporal fluctuations in groundwater flow.

Response: Please see attached "Water Quality Monitoring Plan" prepared by Cpec Environmental, Inc.

d. The groundwater monitoring plan must include a site map showing the location of the composting areas with respect to the entire property; a site specific topographic map with the location of the composting facility; a discussion of the site geology and hydrogeology including the results of the field study; an evaluation of whether there could be groundwater to surface water discharge for the compost areas at the site; and a sampling and analysis plan that describes sample collection and handling. The groundwater monitoring system should have at least one upgradient well. The number of downgradient wells is site specific. Detection monitoring wells are designed to monitor the upper portion of the aquifer. Groundwater monitoring wells are typically constructed on 2-inch PVC pipe and have a screened interval to allow the infiltration of water. They are installed in a borehole with a sand filter pack around the screen and a bentonite clay seal over the sand filter. The remainder of the borehole is grouted to the ground surface and a protective casing is installed over the riser. Groundwater monitoring wells must be installed in accordance with 15A NCAC 2C, and a well record form GW-1 must be filled out for each groundwater monitoring well and a copy submitted to the Solid Waste Section.

Response: Please see attached "Water Quality Monitoring Plan" prepared by Cpec Environmental, Inc.

e. The groundwater monitoring plan should describe consistent sampling and analysis procedures that are designed to ensure monitoring results provide an accurate representation of groundwater quality at the background and downgradient wells. The plan must include procedures and techniques for sample collection, sample preservation and shipment, chain-of-custody control, and quality assurance and quality control.

Response: Please see attached "Water Quality Monitoring Plan" prepared by Cpec Environmental, Inc.

f. An initial baseline groundwater sampling event should be implemented prior to operation of the new areas. Well samples should be analyzed for total metals/Method SW846 (arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, and

coliform. Based on results of the baseline sampling event, a site specific list of parameters will be considered for continued semi-annual detection monitoring events. Groundwater monitoring wells must be surveyed and tied to a permanent benchmark of known elevation measured from a USGS Survey benchmark.

Response: Please see attached "Water Quality Monitoring Plan" prepared by Cpec Environmental, Inc.

2. Some of the text changes and corrections that were made to the application in the second submittal, based on the review comments, have incorrectly returned in this third submittal. For example, in G.11, "present escape of odors" was in the first submittal, and was changed to "prevent escape of odors" in the second submittal, and is now back to "present escape of odors" in the third submittal. It is possible that the review changes were made to the wrong version of the application. Please correct these errors and check the entire application.

   Response: Application text errors are corrected including replacing LLC with Inc. and "prevent escape of odors."

3. The feedstocks to be received at the facility are listed in three sections of the application: Section D.1, Section G.3, and Section 1.0. The list in all three places should be the same but they are not. For example, clean wood from construction operations is listed as a feedstock in Section D.1, but it is not included in the other two lists. Please correct. Where will the DAF skimmings be coming from?

   Response: Feedstocks are combined into Table 3-1 located in Section G - Part 3 of the Application. The maximum tonnage expected for each item is included. DAF skimmings are from Maola.

4. Background and Intro, 2nd paragraph, 1st sentence - The acreages of the areas and total area appear to be incorrect.

   Response: Paragraph is revised to include acreages provided by surveyor.

5. Section A, 1st paragraph - The text states that the total property is over 100 acres. The property is listed as 89.34 acres on the county property website.

   Response: Please see revised paragraph.

6. Section A - 2nd paragraph - Please clarify the 1st sentence.

   Response: Please see revised paragraph.

7. Sections A and G - Please change Crave Ag Services, LLC to Craven Ag Services, Inc. The Secretary of State's office does not have a listing for Craven Ag Service, LLC.

   Response: Please revised Sections A and G.

8. Text and drawings should indicate that permanent markers will be maintained for (1) the curing area boundary along the north side of Area 3, to maintain the 500 foot buffer to the offsite residence, and (2) the boundaries adjacent to the floodplains and property line in all three areas.

   Response: Please see revised marker location and Note 6 on Sheet C-102. Section A - Paragraph 1 of the application is revised accordingly.

9. Section E, 2nd paragraph - Please state that the 500 foot buffer to the residence across the road will be maintained in the northern area (or Site 3) by the placement of buffer line markers.

   Response: Please see revised paragraph.

10. The analysis of the wood ash that was provided in consideration for the compost soil texture amendment is too high for arsenic, for both use in the pad and for a feedstock in the compost process. Is this sample from the wood ash proposed for composting? If yes, the wood ash analysis should be removed from Attachment 13. The wood ash is proposed for composting, please provide the quantity to be received as feedstock. Because of the metals, the quantity should be a small percentage of the overall volume of feedstocks received. Coal ash is not acceptable at a Type 3 compost facility.

    Response: Please Table 3-1 in Section G Part 3. Wood ash is only added to the finished product. Coal ash is removed from the feedstock list.

11. For the lime mud and the wood ash, please address how the pH will be monitored and managed in the initial mix.

    Response: Lime mud and wood ash are added to the finished product and will not be used in the initial mix.

12. Please provide an update to the DWQ stormwater/process wastewater permit application, and the sedimentation and erosion control permit application.

    Response: A DWQ stormwater/process wastewater permit is not required for this site. Erosion & Sedimentation Control plan is being concurrently resubmitted to the Washington Regional Office.

13. In addition to the description of changing the soil texture in the Note #4 on Drawing C-102, it should also be described in the text of the application. The modified soil texture is required for areas used for waste receiving and storage, active composting, and curing (not just composting and curing as stated on the drawing). Please provide a sketch or drawing of the boundary of areas that will receive soil amendment, or state that the entire boundaries of Sites 1, 2, and 3 will receive the amendment in soil texture.

Response: Please see revised Note #4 on Sheet C-102 and Application Section G - Part 1 - Paragraph 4.

14. How will the reworked areas be tested/soil classified to ensure that the modified soil texture meets the requirements of 1404(a)(10)(B), that is, finer than loamy sand? The depth of soil texture modification should be 9 to 12 inches deep. Will 2 or 3 inches of ash and compost fines be enough to modify the soil texture to that depth? Drawing C-103 indicates the soil texture will be modified to 4 inches.

    Response: Please Application Section G - Part 1 - Paragraph 4. Modified soil texture and depth will be confirmed by the Design Team (Rubin and MacConnell). 2 to 3 inches each of ash and compost blended with the top few inches of native soil should adequately modify the soil texture as required. Please see revised Note #4 on Sheet C-102.

15. Section G.1 - Please update the sentence that states that the western site area will be developed as compost production dictates. Please update the sentence that states that a concrete pad will be developed as the facility expands.

    Response: Please see revised paragraphs 3 and 6.

16. Section G.3 - Please provide the (expected) volumes of all feedstocks.

    Response: Please Table 3-1 in Section G Part 3.

17. The floodplain map in Attachment 6 should show the boundaries for all three areas. There are currently two that are outlined on the figure.

    Response: Please see updated FEMA map.

18. In the text describing the mixer, provide a reference to the mixer equipment specifications in Appendix 2 of Attachment 4 or Attachment 5.

    Response: Section G.4 (Paragraph 1) is updated to reference Attachment 5 for the Knight RC 200 Series mixer.

19. Section G.5 - Please clarify 1st sentence.

    Response: Please see revised paragraph. References to runoff collection areas are removed.

20. Section G.8 - Compost failing the fecal coliform test returning to the compost process should meet the time and temperature requirements (remove the "up to" prior to the temperature).

    Response: Please see revised Section.

21. Section G.11 - The temperature and time requirements for VAR in this section are not stated correctly. However, because the facility is following the windrow composting method, 15 days at a minimum temperature of 131 degrees F, with five turnings, the PFRP process will also satisfy the VAR requirement.

    Response: Please see revised Section.

22. The report states that the pile size for PFRP composting will be 5 feet high and 15 feet wide. Please provide the maximum pile size for curing piles, finished product piles, and for storage of dry feedstocks. This is an indirect way of determining the maximum capacity of each area of the facility (previous comment #40 in the Nov. 2011 comments). The pile size of dry feedstocks and finished product should be no more than 30 feet high and 50 feet wide. Also, what is the distance between windrows in each of these areas?

    Response: Please see chart at bottom of Page 5 in the Operations Guide.

23. What is the frequency of turning in the curing area?

    Response: Compost in the curing area is turned approximately once per week. Please see revised paragraph on page 6 in the Operations Guide.

24. Operations Guide:
    a. Please clarify where records will be kept.

       Response: All records will be kept on site. Please see Section 5.0 - Paragraph 1.

    b. Page 5 - Please clarify last sentence of first paragraph.

       Response: Please see revised sentence in paragraph 2 of Section 1.1.

    c. Pages 5 (2nd paragraph) and 8 (last paragraph) - Please change "bin" to "mixer" or "mix pad." I assumed "bin" was a storage container or bunker.

       Response: Please see revised paragraph 3 of Section 1.1.

    d. Excess liquid, leachate, and process wastewater/runoff cannot be collected in the sinks or basins along the site boundaries. Please change text to state that the process wastewater/leachate will be diverted to ditches, included with stormwater, and will be regulated by the DWQ permit (or something similar). Drawings and G.5 should also be changed.

       Response: References to sinks or basins along the compost site boundaries are removed. Runoff will be treated through vegetated buffers along the compost boundaries.

e. Please change "Bay" to "Area."

Response: Please see revised Operations Guide.

25. Drawings - In Site 2 and Site 3, the orientation of the compost windrow, curing windrows, and finished product piles are shown in different directions. To prevent ponding of surface water, the windrows and piles should all be oriented parallel to the direction of the slope, or just slightly angled to the slope. Please orient the windrows on the diagram, and indicate the planned slope for the areas.

    Response: Please see revised drawings with anticipated compost windrow orientation.

26. Please provide the location of the nearest USGS survey benchmark. The groundwater wells will have to be surveyed in after installation.

    Response: Location of nearest USGS survey benchmark is not known. Surveyor to provide upon installation if monitoring wells.

If you have any questions please call me or Zachary L. Fuller, PE at (919) 467-1239. Thank you for your assistance.

Sincerely,

Gary S. MacConnell, PE
President

A. R. Rubin

Enclosures

cc: J. W. (Billy) Dunham – Craven Ag Services

Wilson, Donna

From: Wilson, Donna
Sent: Wednesday, October 16, 2013 10:01 AM
To: Billy Dunham (cas71@suddenlink.net); Albert Rubin (rubin@ncsu.edu); Gary MacConnell (gsmmacassoc@bellsouth.net); Zachary L. Fuller (zlfmacassoc@bellsouth.net)
Cc: Williams, Ray (Ray.Williams@ncdenr.gov); Michael Scott (michael.scott@ncdenr.gov); Tony Gallagher (tony.gallagher@ncdenr.gov); Ritter, Christine
Subject: Craven Ag Compost Facility staff review comments

Hello – Below are the remaining review comments on the Craven Ag Compost application. Also, there are comments on the water quality monitoring plan that will be sent to you today separately by Christine Ritter.

We would like to suggest or recommend having a conference call this week to discuss any of these comments. Just let me know me know if you would like to.

1. The coal ash that is to be used for the soil texture modification should be tested for total metals again to ensure consistency of the analysis.
2. Please provide a table listing the loading amount and metals concentration for the ash to be used for the soil texture modification, similar to Bob Rubin's email dated 10-2-12.
3. How will the reworked areas be tested/soil classified to ensure that the modified soil texture meets the requirements of 1404(a)(10)(B), that is, finer than loamy sand? What is the process? How many samples will be taken for soil classification? It should be stated that all three areas will be tested.
4. Please add a description of the vegetated buffers to the text of the application, in addition to, or instead of, the description on Drawing C-102. As was discussed with Mr. Dunham, the descriptions should state that the buffer areas will receive a layer of compost (provide thickness), disked in, before being seeded.
5. Please provide an update to the Sedimentation and Erosion Control permit application.
6. Please provide analytical data for the DAF skimmings from Maola.
7. Operations Guide – Page 1, Location – Please add the physical site address for the compost operation. I believe it is 5391 River Road, Vanceboro.
8. Operations Guide - Page 8 (Section 1.2, second paragraph) - Please change "bin" to "mixer" or "mix pad." I assumed "bin" was a storage container or bunker.
9. Section 2.4 – Please remove references to leachate sink and liquid collection basin.
10. The mixing pad detail drawing, 7/D-102, is confusing in that it appears that the mixing area, intended for compost, will be filled in with concrete.
11. Drawing D101 - The distance between curing and finished pile storage should be at least 6 to 8 feet to allow access to firefighting equipment in the event of a fire.
12. If all compost finished product is mixed with wood ash, then the marketing distribution sheet should provide information to the public on the ash, and note any restrictions.
13. The application should contain engineer's signature and seal.

The wood ash sample that was included in the previous appendices cannot be used because of the high levels of arsenic (see email 4-30-13). We will need other ash sampling analysis from Craven County Energy to show that the ash can be acceptable to mix with the compost at the end. I am checking the files here to determine if I can find the acceptable analysis to meet this requirement. The metal results must meet the ceiling concentrations of Table 1 in the 503 Rules (503.13). This is one item I plan to obtain myself, but if I need additional information I will let you know.

Responses to comments should be incorporated into the text of the application. Please provide replacement pages only for the application, one paper copy and one electronic copy (pdf), and a cover letter that includes responses to comments. Revised pages should include the revision date and page number.

If you have any questions on the comments, please let me know.
Thanks, Donna

Donna J. Wilson
Environmental Engineer
Solid Waste Section/Division of Waste Management/NC DENR
Phone 919-707-8255
Email - donna.wilson@ncdenr.gov
Section webpage - http://portal.ncdenr.org/web/wm/sw

Office address - 217 W. Jones St, Raleigh NC 27603
Mailing and delivery address - 1646 Mail Service Center, Raleigh NC 27699-1646

E-mail correspondence to and from this address may be subject to the
North Carolina Public Records Law and may be disclosed to third parties.

P.O. Box 129
Morrisville, NC 27560

919-467-1239

MACCONNELL
& ASSOCIATES, P.C.

1903 North Harrison Avenue
Suite 102
Cary, NC 27513

Fax 919-319-6510

December 12, 2013

Ms. Donna J. Wilson
Environmental Engineer
Composting and Land Application Branch
NCDENR - Division of Waste Management
Solid Waste Section
1646 Mail Service Center
Raleigh, North Carolina 27699-1646

Received
DEC 2013
Waste Management

Re: Craven Ag Services Compost Facility
Comment Responses October 16th
MacConnell & Associates, P.C. Project No.: A45201.00

Dear Ms. Wilson:

In response to your email dated October 16, 2013, relative to the above referenced project, the following additional information and responses are provided. Per Christine Ritter's email dated October 16, 2013, proposed monitoring well #2 is removed from Plan Sheets C-101, C-102, and C-103. On future correspondence please cite the rule for all comments. One hard copy and one electronic copy of the revised information is provided for your review to the address above.

1. The coal ash that is to be used for the soil texture modification should be tested for total metals again to ensure consistency of the analysis.

   Response: Please see attached Memo from A. R. Rubin. Billy Dunham with Craven Ag Services is planning to retest the coal ash.

2. Please provide a table listing the loading amount and metals concentration for the ash to be used for the soil texture modification, similar to Bob Rubin's email dated 10-2-12.

   Response: Please see attached Memo from A. R. Rubin.

3. How will the reworked areas be tested/soil classified to ensure that the modified soil texture meets the requirements of 1404(a)(10)(B), that is, finer than loamy sand? What is the process? How many samples will be taken for soil classification? It should be stated that all three areas will be tested.

   Response: Please see attached Memo from A. R. Rubin.

4. Please add a description of the vegetated buffers to the text of the application, in addition to, or instead of, the description on Drawing C-102. As was discussed with Mr. Dunham, the descriptions should state that the buffer areas will receive a layer of compost (provide thickness), disked in, before being seeded.

   Response: Please see last paragraph on page 7 for vegetative buffer description.

5. Please provide an update to the Sedimentation and Erosion Control permit application.

   Response: Permit was issued by Division of Energy, Mineral, and Land Resources on September 9, 2013. Please see attached copy.

6. Please provide analytical data for the DAF skimmings from Maola.

   Response: DAF Skimmings from Maola will be tested by Craven Ag Services. Table 1 on page 11 is revised to show applicable data from other facilities.

7. Operations Guide – Page 1, Location – Please add the physical site address for the compost operation. I believe it is 5391 River Road, Vanceboro.

   Response: Please see revised Page #2 of the Operations Guide.

8. Operations Guide - Page 8 (Section 1.2, second paragraph) - Please change "bin" to "mixer" or "mix pad." I assumed "bin" was a storage container or bunker.

   Response: Please see revised Page 8 of the Operations Guide, "bin" is changed to "compost mix pad."

9. Section 2.4 – Please remove references to leachate sink and liquid collection basin.

   Response: Please see revised item #7 in Section 2.4 of the Operations Guide.

10. The mixing pad detail drawing, 7/D-102, is confusing in that it appears that the mixing area, intended for compost, will be filled in with concrete.

    Response: Existing concrete pad details provides a section cut that shows the push wall. This push wall is made of concrete block or poured in place concrete and is hatched to appear as concrete. Detail provided is typical of current industry standards and is unchanged.

11. Drawing D101 - The distance between curing and finished pile storage should be at least 6 to 8 feet to allow access to firefighting equipment in the event of a fire.

    Response: Please see revised chart on detail 1, Sheet D-101.

12. If all compost finished product is mixed with wood ash, then the marketing distribution sheet should provide information to the public on the ash, and note any restrictions.

    Response: Please see attached "CAS Compost Quality, Distribution, and Use" Guide that will be distributed to customers.

13. The application should contain engineer's signature and seal.

    Response: Please see signature and seal on revised Operations Guide Cover Page.

If you have any questions please call me or Zachary L. Fuller, PE at (919) 467-1239. Thank you for your assistance.

Sincerely,

Gary S. MacConnell, PE
President

A. R. Rubin

Enclosures

cc: J. W. (Billy) Dunham – Craven Ag Services

From:	Wilson, Donna
To:	Billy Dunham (cas71@suddenlink.net); Robert Rubin (rubin@arrubinandassociates.com); Gary MacConnell (gsmmacassoc@bellsouth.net); Zachary L. Fuller (zlfmacassoc@bellsouth.net); Tom Hinson (cpec@mindspring.com)
Cc:	Michael Scott (michael.scott@ncdenr.gov); Tony Gallagher (tony.gallagher@ncdenr.gov); Ritter, Christine; Williams, Ray (Ray.Williams@ncdenr.gov)
Subject:	Craven Ag Compost Facility application review comments
Date:	Monday, January 27, 2014 5:46:00 PM

Hello,

I've reviewed the last submittal for the Craven Ag Compost Facility, and I have the following comments:

-

1. Please provide analytical data for the DAF skimmings from Maola and another sample of the coal ash that is to be incorporated into the pads, to ensure consistency of the analysis.
2. Ash memo:
    a. It should be stated that the ash and compost application will be incorporated to all three areas, the 3 acre site, the 4.7 acre site, and the 1.8 acre site. It is required at the 3 acre site because it is used for curing and for feedstock storage (Rule 1404 (a)(10)(B)).
    b. The memo describes the placement of 1 to 2 inches of compost fines and 2 inches of ash for incorporation in the compost areas. These numbers are not consistent with the description on Drawing C102, which states that 2 to 3 inches of compost fines and 2 to 3 inches of ash will be incorporated.
    c. It should be stated that the Rule requires the soil texture to be finer than loamy sand, instead of fine sand.
    d. The lifetime loading for nickel should be 18 lb/acre.
    e. Please add units to the metal loading table – monthly average mg/kg, Lifetime, mg/kg, lb/acre.
    f. After incorporation of the ash, soil texture sampling and testing should include at least one lab sample for each area (3 areas). Confirmation sampling should also include field tests for soil texture, as described at these websites, at least ten per acre:
    https://www.osha.gov/doc/outreachtraining/htmlfiles/soiltex.html
    http://www.ndhealth.gov/wq/sw/z1_nps/pdf_files/soil_texture_feel_test.pdf
    For the field tests, provide field documentation, including a sketch of sampling locations and a table listing the soil texture results. What will be the procedure if a field sample fails or a lab sample fails? Ultimately, we are asking for certification (soil scientist) that the three areas were constructed in accordance with the plan and state rules.
3. Drawings C101 and C102– Please re-number the groundwater monitoring wells as 1, 2, and 3 (instead of 1, 3, and 4).
4. Drawing D102 – Please remove the groundwater well schematic drawing because it is not consistent with the groundwater schematic drawing in the water quality monitoring plan.
5. Please provide an update to the revised water quality monitoring plan.

Responses to comments should be incorporated into the text of the application. Please provide replacement pages only for the application, one paper copy and one electronic copy (pdf), and a

cover letter that includes responses to comments. Revised pages should include the revision date and page number.

If you have any questions on the comments, please let me know.

Thanks, Donna

Donna J. Wilson
Environmental Engineer
Solid Waste Section/Division of Waste Management/NC DENR
Phone 919-707-8255
Email - donna.wilson@ncdenr.gov
Section webpage - http://portal.ncdenr.org/web/wm/sw

Office address - 217 W. Jones St, Raleigh NC 27603
Mailing and delivery address - 1646 Mail Service Center, Raleigh NC 27699-1646

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P.O. Box 129
Morrisville, NC 27560

919-467-1239

MacCONNELL
& ASSOCIATES, P.C.

1903 North Harrison Avenue
Suite 102
Cary, NC 27513

Fax 919-319-6510

March 25, 2014

Ms. Donna J. Wilson
Environmental Engineer
Composting and Land Application Branch
NCDENR - Division of Waste Management
Solid Waste Section
1646 Mail Service Center
Raleigh, North Carolina 27699-1646

Re: Craven Ag Services Compost Facility
Comment Responses
MacConnell & Associates, P.C. Project No.: A45201.00

Dear Ms. Wilson:

In response to your email dated January 27, 2014, describing additional information needs for Craven Ag Services, the following additional information and responses are provided. The items listed are addressed herein or on the appropriate document attached. Thank you for your efforts on this project. We all appreciate your thorough and comprehensive review. One hard copy and one electronic copy of the revised information is provided for your review to the address above.

1. Please provide analytical data for the DAF skimmings from Maola and another sample of the coal ash that is to be incorporated into the pads, to ensure consistency of the analysis.

   Response: Samples of the waste from Maola and the ash material were analyzed and the results forwarded to you. The Maola waste will be valuable as a nutrient source for the compost. The BOD (organic carbon), N and P will be used to satisfy nutritional needs of the microorganisms involved in the compost operation. The compacted ash will serve as a good base on which to work when properly mixed, blended, and compacted with other fines and existing soil.

2. Ash Memo:

   a. It should be stated that the ash and compost application will be incorporated to all three areas, the 3 acre site, the 4.7 acre site, and the 1.8 acre site. It is required at the 3 acre site because it is used for curing and for feedstock storage (Rule 1404 (a)(10)(B)).

Response: Ash and compost fines will be placed in each of the areas designated for composting and curing. These are areas 1, 2, and 3 as you specified in the e-mail.

b. The memo describes the placement of 1 to 2 inches of compost fines and 2 inches of ash for incorporation in the compost areas. These numbers are not consistent with the description on Drawing C102, which states that 2 to 3 inches of compost fines and 2 to 3 inches of ash will be incorporated.

Response: The ash loading and the compost fines loadings are consistent between the memo and the plans. The rate of addition is intended to remain flexible since the fines should modify soil texture with very small addition. The texture classifications are based on relative percentages of fine materials and coarser materials. Based on previous analysis, the volume of materials required should be less than the 4 inches of fines proposed for addition.

c. It should be stated that the Rule requires the soil texture to be finer than loamy sand, instead of fine sand.

Response: The addition of the compost fines and the ash fines should increase the level of fines to classify the soil materials as finer than loamy sand. These texture classifications are based on the soil textural triangle and the difference between loamy sand and loamy fine sand is very slight. Similarly, the difference between loamy sand and sandy loam is very slight. The incorporation of 2 inches of each of the fine fractions specified will add 33% by volume to the control layer where texture is determined. This will be adequate to reclassify the material as finer than loamy sand.

d. The lifetime loading for nickel should be 18 lb/acre.

Response: The Nickel load is 420 mg/kg as stated in your January e-mail. Clearly the cumulative metal load is not a significant issue in the development of the pads. No metal is to be applied at the cumulative metal limits imposed through 40 CFR 503 and incorporated into NC Rule.

e. Please add units to the metal loading table – monthly average mg/kg, Lifetime, mg/ kg, lb/acre.

Response: The memo has been modified as requested to list the cumulative loadings consistent with rule.

f. After incorporation of the ash, soil texture sampling and testing should include at least one lab sample for each area (3 areas). Confirmation sampling should also include field tests for soil texture, as described at these websites, at least ten per acre: https://www.osha.gov/doc/outreachtraining/htmlfiles/soiltex.html
http://www.ndhealth.gov/wq/sw/z1_nps/pdf_files/soil_texture_feel_test.pdf
For the field tests, provide field documentation, including a sketch of sampling locations and a table listing the soil texture results. What will be the procedure if a field sample fails or a lab sample fails? Ultimately, we are asking for certification (soil scientist) that the three areas were constructed in accordance with the plan and state rules.

Response: The soil texture will be determined in each of the areas where the materials were added. The testing will include both hand texturing and soil texture analysis in the laboratory. The hand texturing will be accomplished at the 10 per acre level as described. These locations will be random at approximately 4,000 square foot areas per sample. The laboratory analysis will be as determined by NCSU Soil Science Department, Soil Test Laboratory or a certified soils laboratory qualified to perform texture analysis. One composite soil sample from each of the areas will be collected to generate three (3) separate texture analyses for the area. The soil scientist (either Mr. Tom Hinson or Mr. Scott Frederick) will certify these areas meet the requirement in rule.

3. Drawings C101 and C102 – Please re-number the groundwater monitoring wells as 1, 2, and 3 (instead of 1, 3, and 4).

Response: Drawings C-101 and C-102 have been modified to reflect well numbers correctly. These conform with those from the CPEC report.

4. Drawing D102 – Please remove the groundwater well schematic drawing because it is not consistent with the groundwater schematic drawing in the water quality monitoring plan.

Response: Monitoring well detail is removed from Drawing Sheet D-102 and a note added to Sheet C-101 that monitoring wells shall be installed in accordance with the CPEC report.

5. Please provide an update to the revised water quality monitoring plan.

Response: The CPEC monitoring plan developed for this project has been updated and forwarded to Ms. Ritter and you. The plan recommendations have been incorporated into this plan and the wells have been renumbered, the well detail is in accord with Mr. Hinson's recommendations.

Thank you again for your comprehensive review. If you have any questions please call me or Zachary L. Fuller, PE at (919) 467-1239. Thank you for your assistance.

Sincerely,

Gary S. MacConnell, PE
President

A. R. Rubin

Enclosures

cc: J. W. (Billy) Dunham – Craven Ag Services

From:	Wilson, Donna
To:	"Billy Dunham"; "Robert Rubin"; "Gary MacConnell"; "Zachary L. Fuller"
Cc:	Scott, Michael; Gallagher, Tony; Ritter, Christine; Williams, Ray
Subject:	Craven Ag Compost Facility review comments
Date:	Tuesday, April 15, 2014 4:23:00 PM

Hello, I've reviewed the latest permit application submittal for the Craven Ag Compost Facility, and I have the following questions and comments:

1. The second page of ash memo should be worded "finer than loamy sand," instead of "finer than fine sand." Two sentences: (1) Metal loadings are not a limitation in the design of the pad system required to create a soil texture finer than fine sand. ", and (2) "These areas have been tested previously and were found to contain soil characterized as fine sand; rule requires soil material classified as finer than fine sand."
2. Please add units to the table headings. For column 1, EPA Clean, "monthly average mg/kg" should be added. For column 2, EPA load (lb/ac), "Lifetime" should be added. For the last column, the numbers listed are pounds per acre of each of the metals, so the heading should be something similar to "Cumulative Metal Load, lb/acre." Alternatively, this information can be added as referenced footnotes to the table, to include that the first two columns are taken from the 503 Rules.
3. The application text should state that soil texture sampling and testing will include at least one lab sample from each of the three areas, as a composite sample of the 20 subsamples per acre collected at varying depths down to 12 inches. The application text should describe documentation of the field tests, including a sketch of sampling locations and a table listing the soil texture results, at a frequency of at least 10 per acre at varying depths down to 12 inches. The application text should state what actions will be taken if a field sample fails or a lab sample fails.
4. The last previous comments stated that the ash memo should state that the ash and compost will be incorporated to all three areas, not just Areas 1 and 2. In the response to these comments, the ash memo has been corrected as requested; however, additional new language has now been added to another part of the application, Section D.2, which directly contradicts this. The new language again states that the ash and compost will be only applied to Areas 1 and 2. You should have discussed this with us before you made this unexpected change, or at least you should have noted this new change in the response letter. We would expect that the soil texture of some portions of the existing compost area has been modified because of the ongoing compost operation, but we would not expect it to be to a depth of 6 to 12 inches or that it would cover the entire area of Area 3. If Area 3 can pass the same field tests and laboratory test as the other areas, as described in comment #3 above, without the additional incorporation, then we can accept that. A description of how this will be accomplished should be described in the application.

Responses to comments should be incorporated into the text of the application. Please provide replacement pages only for the application, one paper copy and one electronic copy (pdf), and a cover letter that includes responses to comments. Revised pages should include the revision date and page number.

If you have any questions or comments please let me know.
Thanks, Donna

Donna J. Wilson
Environmental Engineer
Solid Waste Section/Division of Waste Management/NC DENR
Phone 919-707-8255
Email - donna.wilson@ncdenr.gov
Section webpage - http://portal.ncdenr.org/web/wm/sw

Office address - 217 W. Jones St, Raleigh NC 27603
Mailing and delivery address - 1646 Mail Service Center, Raleigh NC 27699-1646

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P.O. Box 129
Morrisville, NC 27560

919-467-1239

1903 North Harrison Avenue
Suite 102
Cary, NC 27513

Fax 919-319-6510

MacCONNELL
& ASSOCIATES, P.C.

May 15, 2014

Ms. Donna J. Wilson
Environmental Engineer
Composting and Land Application Branch
NCDENR - Division of Waste Management
Solid Waste Section
1646 Mail Service Center
Raleigh, North Carolina 27699-1646

Re: Craven Ag Services Compost Facility
Comment Responses
MacConnell & Associates, P.C. Project No.: A45201.00

Dear Ms. Wilson:

In response to your email dated April 15, 2014, describing additional information needs for Craven Ag Services, the following additional information and responses are provided. The items listed are addressed in the appropriate document attached. Thank you for your efforts on this project. We all appreciate your thorough and comprehensive review. One hard copy and one electronic copy of the revised information is provided for your review to the address above.

1. The second page of ash memo should be worded "finer than loamy sand," instead of "finer than fine sand." Two sentences: (1) Metal loadings are not a limitation in the design of the pad system required to create a soil texture finer than fine sand. ", and (2) "These areas have been tested previously and were found to contain soil characterized as fine sand; rule requires soil material classified as finer than fine sand."

   Response: Please see revised Ash Memo.

2. Please add units to the table headings. For column 1, EPA Clean, "monthly average mg/kg" should be added. For column 2, EPA load (lb/ac), "Lifetime" should be added. For the last column, the numbers listed are pounds per acre of each of the metals, so the heading should be something similar to "Cumulative Metal Load, lb/acre." Alternatively, this information can be added as referenced footnotes to the table, to include that the first two columns are taken from the 503 Rules.

Response: Please see revised Table in Ash Memo.

3. The application text should state that soil texture sampling and testing will include at least one lab sample from each of the three areas, as a composite sample of the 20 subsamples per acre collected at varying depths down to 12 inches. The application text should describe documentation of the field tests, including a sketch of sampling locations and a table listing the soil texture results, at a frequency of at least 10 per acre at varying depths down to 12 inches. The application text should state what actions will be taken if a field sample fails or a lab sample fails.

   Response: Please see revised application, soil texture table (chart), and three sketches of approximate sampling locations.

4. The last previous comments stated that the ash memo should state that the ash and compost will be incorporated to all three areas, not just Areas 1 and 2. In the response to these comments, the ash memo has been corrected as requested; however, additional new language has now been added to another part of the application, Section D.2, which directly contradicts this. The new language again states that the ash and compost will be only applied to Areas 1 and 2. You should have discussed this with us before you made this unexpected change, or at least you should have noted this new change in the response letter. We would expect that the soil texture of some portions of the existing compost area has been modified because of the ongoing compost operation, but we would not expect it to be to a depth of 6 to 12 inches or that it would cover the entire area of Area 3. If Area 3 can pass the same field tests and laboratory test as the other areas, as described in comment #3 above, without the additional incorporation, then we can accept that. A description of how this will be accomplished should be described in the application.

   Response: Please see revised application and "Estimating Soil Texture" Chart.

Thank you again for your comprehensive review. If you have any questions please call me or Zachary L. Fuller, PE at (919) 467-1239. Thank you for your assistance.

Sincerely,

Gary S. MacConnell, PE
President

A. R. Rubin

Enclosures

cc: J. W. (Billy) Dunham – Craven Ag Services

Attachment 10. Sediment Trap Calculations

Client: **A. R. Rubin & Associates**
Project: **Craven Ag Services - Compost Facility**
Project No.: **A45201.00**
Subject: **Stormwater , Soil & Erosion Control - Sediment Trap Calculations**
Date: **March 9, 2012**

DRAINAGE AREA: COMPOST PAD RUNOFF

SEDIMENTATION TRAP #1
DESIGN CRITERIA:

FOR AREAS LESS THAN 5 ACRES
LIMITED LIFE: 2 YEARS
TRAP EFFICIENCY : 75 %
MINIMUM EMBANKMENT WIDTH: 5 FEET
EMBANKMENT SLOPES: 2:1 OR FLATTER
STONE SIZE: CLASS B LINED WITH 1 FOOT #57 ON INSIDE FACE
SIDE SLOPES: 2:1 OR FLATTER
SPILLWAY: LINE WITH STONE MINIMUM OF 21 INCHES THICK UP BANK
SPILLWAY CREST: MINIMUM 1.5 FEET BELOW SETTLED TOP OF EMBANKMENT
SPILLWAY DESIGNED FOR 10 YEAR STORM
LINE BANK WITH FILTER CLOTH BEFORE PLACEMENT OF RIPRAP

GIVEN:

TOTAL AREA	0.21	ACRES:
TOTAL DISTURBED AREA	0.21	ACRES:
10 YEAR FLOW	1.44	CFS

DESIGN CRITERIA:

MINIMUM TRAP VOLUME	3,600	C.F./ACRE
MINIMUM SURFACE AREA	0.01	ACRES/CFS

FIND:

TRAP VOLUME, MAXIMUM DEPTH, SURFACE AREA, AND WEIR LENGTH.
24-HOUR STORM - QP 10, 24

SOLUTION:

MINIMUM VOLUME (MIN. TRAP VOL. * DISTURBED AREA)	756	C.F.
MINIMUM SURFACE AREA (0.01 * PEAK FLOW)	0.0144	ACRES
MINIMUM SURFACE AREA	627	SQ. FEET
MAXIMUM POOL DEPTH	3	FEET
MINIMUM WEIR LENGTH	4	FEET
MINIMUM LENGTH	35	FEET
MINIMUM WIDTH	18	FEET

Client: **A. R. Rubin & Associates**
Project: **Craven Ag Services - Compost Facility**
Project No.: **A45201.00**
Subject: **Stormwater - Runoff Calculations**
Date: **3/12/2012**

Given: **Calculate runoff**
Use Rational Method - Q=CiA
Ref.: NC Erosion and Sediment Control Planning and Design Manual.

Q =	Peak Runoff in CFS
C =	Runoff Coefficient
i =	Average Intensity in Inches/Hour
Tc =	Time of Concentration in Minutes
A =	Drainage Area in acres

Given:
Runoff Coeffcients Used:

Land Use	C Value
Compost Pad:	0.80

Tc =	5 Minutes
Rainfall Intensity:	New Bern
Storm:	10 Year
i =	8.72 Inches/Hour

Description: **Compost Pad Runoff**

Land Use	**Area SF**	**Area Acres**	**Runoff CFS**
Compost Pad:	9,000	**0.2066**	**1.4413**
Total	**9,000**	**0.2066**	**1.4413 CFS**

DESIGN OF RIPRAP OUTLET PROTECTION

User Input Data
Calculated Value
Reference Data

Designed By:	Zachary L. Fuller, PE	**Date:**	March 13, 2012
Checked By:	Gary S. MacConnell, PE	**Date:**	March 13, 2012
Company:	MacConnell & Associates		
Project Name:	Craven Ag Services		
Project No.:	A45201.00		

Site Location (City/Town)	Vanceboro
Culvert Id.	Sediment Trap
Total Drainage Area (acres)	0.21

Step 1. Determine the tailwater depth from channel characteristics below the pipe outlet for the design capacity of the pipe. If the tailwater depth is less than half the outlet pipe diameter, it is classified minimum tailwater condition. If it is greater than half the pipe diameter, it is classified maximum condition. Pipes that outlet onto wide flat areas with no defined channel are assumed to have a minimum tailwater condition unless reliable flood stage elevations show otherwise.

Outlet pipe diameter, D_o (in.)	12
Tailwater depth (in.)	0
Minimum/Maximum tailwater?	Min TW (Fig. 8.06a)
Discharge (cfs)	1.44
Velocity (ft./s)	N/A

Step 2. Based on the tailwater conditions determined in step 1, enter Figure 8.06a or Figure 8.06b, and determine d_{50} riprap size and minimum apron length (L_a). The d_{50} size is the median stone size in a well-graded riprap apron.

Step 3. Determine apron width at the pipe outlet, the apron shape, and the apron width at the outlet end from the same figure used in Step 2.

	Minimum TW	**Maximum TW**
	Figure 8.06a	Figure 8.06b
Riprap d_{50}, (ft.)	0.5	
Minimum apron length, L_a (ft.)	8	
Apron width at pipe outlet (ft.)	3	3
Apron shape	Trapezoidal	
Apron width at outlet end (ft.)	9	1

Step 4. Determine the maximum stone diameter:

Step 4. Determine the maximum stone diameter:

$$d_{max} = 1.5 \times d_{50}$$

	Minimum TW	Maximum TW
Max Stone Diameter, dmax (ft.)	0.75	0

Step 5. Determine the apron thickness:

$$\text{Apron thickness} = 1.5 \times d_{max}$$

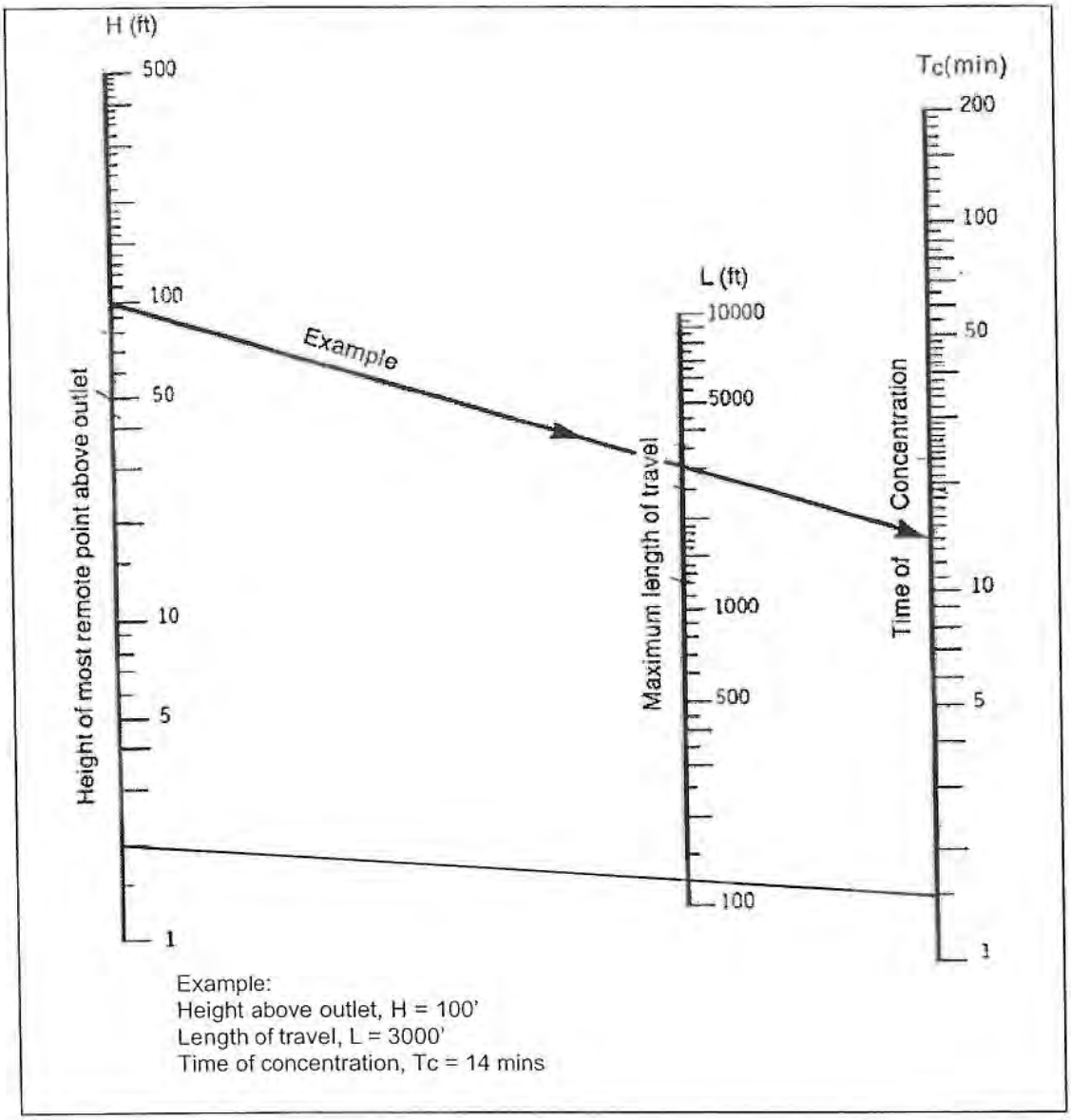
	Minimum TW	Maximum TW
Apron Thickness(ft.)	1.125	0

Step 6. Fit the riprap apron to the site by making it level for the minimum length, L_a, from Figure 8.06a or Figure 8.06b. Extend the apron farther downstream and along channel banks until stability is assured. Keep the apron as straight as possible and align it with the flow of the receiving stream. Make any necessary alignment bends near the pipe outlet so that the entrance into the receiving stream is straight.

Some locations may require lining of the entire channel cross section to assure stability.

It may be necessary to increase the size of riprap where protection of the channel side slopes is necessary (*Appendix 8.05*). Where overfalls exist at pipe outlets or flows are excessive, a plunge pool should be considered, see page 8.06.8.

Figure 2.4 Kirpich Equation
(Source: North Carolina Erosion and Sediment Control Planning and Design Manual)



NOAA Atlas 14, Volume 2, Version 3NEW BERN 3 NW
Station ID: 31-6103
Location name: New Bern, North Carolina, US*
Coordinates: 35.1333, -77.0833
Elevation:
Elevation (station metadata): 10ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF tabular | PF graphical | Maps & aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval(years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	5.74 (5.27-6.28)	6.72 (6.18-7.32)	7.70 (7.07-8.38)	8.72 (7.99-9.49)	9.84 (8.96-10.7)	10.8 (9.79-11.7)	11.7 (10.5-12.7)	12.6 (11.3-13.7)	13.7 (12.2-14.9)	14.7 (13.0-16.1)
10-min	4.58 (4.21-5.01)	5.37 (4.94-5.85)	6.17 (5.66-6.71)	6.97 (6.39-7.59)	7.84 (7.14-8.52)	8.59 (7.80-9.34)	9.28 (8.38-10.1)	9.96 (8.93-10.8)	10.8 (9.62-11.8)	11.6 (10.2-12.7)
15-min	3.82 (3.50-4.18)	4.50 (4.14-4.90)	5.20 (4.78-5.66)	5.88 (5.39-6.40)	6.62 (6.04-7.20)	7.25 (6.58-7.88)	7.82 (7.06-8.50)	8.38 (7.51-9.12)	9.08 (8.07-9.90)	9.69 (8.54-10.6)
30-min	2.62 (2.40-2.86)	3.11 (2.86-3.39)	3.70 (3.39-4.02)	4.26 (3.90-4.64)	4.91 (4.47-5.33)	5.46 (4.96-5.93)	5.99 (5.41-6.51)	6.52 (5.85-7.10)	7.22 (6.42-7.88)	7.84 (6.91-8.57)
60-min	1.63 (1.50-1.79)	1.95 (1.80-2.13)	2.37 (2.18-2.58)	2.77 (2.54-3.02)	3.27 (2.98-3.55)	3.70 (3.36-4.02)	4.12 (3.72-4.48)	4.57 (4.10-4.98)	5.18 (4.61-5.65)	5.73 (5.05-6.26)
2-hr	0.976 (0.890-1.08)	1.18 (1.08-1.29)	1.46 (1.33-1.60)	1.75 (1.59-1.91)	2.11 (1.91-2.31)	2.45 (2.20-2.67)	2.79 (2.50-3.05)	3.16 (2.81-3.45)	3.68 (3.24-4.03)	4.15 (3.62-4.55)
3-hr	0.702 (0.637-0.783)	0.846 (0.769-0.938)	1.06 (0.958-1.17)	1.27 (1.15-1.41)	1.56 (1.40-1.72)	1.82 (1.63-2.01)	2.10 (1.86-2.31)	2.41 (2.12-2.65)	2.85 (2.48-3.14)	3.26 (2.80-3.60)
6-hr	0.425 (0.384-0.478)	0.511 (0.463-0.574)	0.639 (0.577-0.716)	0.770 (0.693-0.863)	0.946 (0.847-1.06)	1.11 (0.986-1.24)	1.29 (1.13-1.43)	1.48 (1.29-1.64)	1.76 (1.51-1.95)	2.02 (1.72-2.25)
12-hr	0.248 (0.223-0.281)	0.299 (0.270-0.337)	0.375 (0.337-0.423)	0.455 (0.407-0.513)	0.563 (0.500-0.632)	0.665 (0.586-0.744)	0.774 (0.675-0.866)	0.897 (0.774-1.00)	1.08 (0.914-1.20)	1.25 (1.04-1.39)
24-hr	0.145 (0.133-0.161)	0.177 (0.162-0.195)	0.229 (0.208-0.252)	0.272 (0.247-0.300)	0.337 (0.304-0.371)	0.393 (0.351-0.432)	0.454 (0.403-0.499)	0.523 (0.457-0.575)	0.625 (0.537-0.689)	0.712 (0.603-0.788)
2-day	0.084 (0.076-0.094)	0.102 (0.092-0.113)	0.131 (0.118-0.146)	0.156 (0.140-0.173)	0.193 (0.173-0.214)	0.226 (0.200-0.250)	0.262 (0.230-0.290)	0.303 (0.263-0.336)	0.365 (0.311-0.406)	0.418 (0.351-0.468)
3-day	0.060 (0.054-0.066)	0.072 (0.066-0.080)	0.092 (0.084-0.102)	0.109 (0.099-0.121)	0.134 (0.121-0.148)	0.156 (0.139-0.171)	0.180 (0.159-0.198)	0.206 (0.180-0.227)	0.245 (0.211-0.272)	0.280 (0.237-0.313)
4-day	0.047 (0.043-0.052)	0.057 (0.052-0.063)	0.073 (0.067-0.080)	0.086 (0.078-0.094)	0.105 (0.095-0.115)	0.121 (0.108-0.132)	0.138 (0.123-0.152)	0.157 (0.138-0.173)	0.186 (0.161-0.205)	0.210 (0.179-0.236)
7-day	0.032 (0.029-0.034)	0.038 (0.035-0.042)	0.048 (0.044-0.052)	0.056 (0.051-0.061)	0.068 (0.062-0.074)	0.077 (0.070-0.084)	0.088 (0.079-0.096)	0.099 (0.088-0.108)	0.115 (0.101-0.127)	0.129 (0.111-0.143)
10-day	0.025 (0.023-0.027)	0.030 (0.028-0.033)	0.037 (0.034-0.041)	0.043 (0.040-0.047)	0.052 (0.047-0.056)	0.059 (0.053-0.064)	0.066 (0.060-0.072)	0.074 (0.066-0.081)	0.086 (0.076-0.095)	0.096 (0.083-0.106)
20-day	0.017 (0.016-0.018)	0.020 (0.019-0.022)	0.024 (0.023-0.026)	0.028 (0.026-0.030)	0.033 (0.030-0.036)	0.037 (0.034-0.040)	0.042 (0.038-0.045)	0.046 (0.042-0.050)	0.053 (0.047-0.057)	0.058 (0.051-0.063)
30-day	0.014 (0.013-0.015)	0.016 (0.015-0.018)	0.020 (0.018-0.021)	0.022 (0.021-0.024)	0.026 (0.024-0.028)	0.029 (0.027-0.031)	0.032 (0.030-0.035)	0.035 (0.032-0.038)	0.040 (0.036-0.043)	0.043 (0.038-0.047)
45-day	0.011 (0.011-0.012)	0.014 (0.013-0.015)	0.016 (0.015-0.017)	0.018 (0.017-0.020)	0.022 (0.020-0.023)	0.024 (0.022-0.026)	0.027 (0.024-0.029)	0.029 (0.027-0.032)	0.033 (0.030-0.036)	0.036 (0.032-0.039)
60-day	0.010 (0.010-0.011)	0.012 (0.011-0.013)	0.014 (0.014-0.015)	0.016 (0.015-0.017)	0.019 (0.017-0.020)	0.021 (0.019-0.022)	0.022 (0.021-0.024)	0.024 (0.022-0.026)	0.027 (0.025-0.029)	0.029 (0.026-0.032)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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Attachment 11. Flow Diagram CAS

Flow Diagram CAS

Grease Trap Wastes (10 - 20 dry tons/day after dewatering)

Septage (10 - 20 dry tons/day after dewatering)

Portable Toilet Wastes (0.5 dry tons/day)

Vegetative Wastes - 10 tons/day

Feedstocks (Municipal, Commercial, Agricultural, and Industrial) - 50 tons/day

			Equipment Used in Area
Area 1:	Receiving Area	Receiving area Mix pad	2, 3, 5, 6
Area 2:	Active Composting Area	Compost Windrow area, active PFRP and VAR compliance	2, 3, 4, 5, 6
Area 3:	Storage/Curing Area	Compost curing and screening area	1, 3, 4, 5, 6
Area 4:	Finished Product Storage Area	Storage area for finished compost	3, 5, 6

Product suitable for unrestricted use

Number	Equipment Type	Size
1	Trommel Screen	Terra Select T7/Ultra Screen 5/8" Trial
2	Mixer (Knight RC 200 Series)	500 - 950 Ft^3
3	Front End Loader	Case 621 (2 Yd^3 Bucket)
4	Compost Tuner	Midwest Biosystems PT-130
5	Tractor	Case 145, Case 5240, John Deere with box blade and bush hog
6	Dump Truck	

Attachment 12. Ash TCLP

Coal Ash TCLP

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NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert No. 37735
VA Certification No. 1287

Case Narrative

02/06/2012

A. R. Rubin & Associates
Bob Rubin
192 Fearrington Post
Pittsboro, NC 27312

Project: CAS

Lab Submittal Date: 01/31/2012
Prism Work Order: 2020013

This data package contains the analytical results for the project identified above and includes a Case Narrative, Sample Results and Chain of Custody. Unless otherwise noted, all samples were received in acceptable condition and processed according to the referenced methods.

Data qualifiers are flagged individually on each sample. A key reference for the data qualifiers appears at the end of this case narrative.

Please call if you have any questions relating to this analytical report.

Coal Ash TCLP

Respectfully,

PRISM LABORATORIES, INC.

President/Project Manager

Reviewed By

Data Qualifiers Key Reference:

BRL	Below Reporting Limit
MDL	Method Detection Limit
RPD	Relative Percent Difference
*	Results reported to the reporting limit. All other results are reported to the MDL with values between MDL and reporting limit indicated with a J.

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Sample Receipt Summary

02/06/2012

Prism Work Order: 2020013

Client Sample ID	Lab Sample ID	Matrix	Date Sampled	Date Received
ASH	2020013-01	Solid	01/15/12	01/31/12

Samples received in good condition at 18.8 degrees C unless otherwise noted.

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Summary of Detections

Prism Work Order:

Prism ID	Client ID	Parameter	Method	Result	Units

There were no detections reported.

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Laboratory Report

02/06/2012

A. R. Rubin & Associates
Attn: Bob Rubin
192 Fearrington Post
Pittsboro, NC 27312

Project: CAS

Sample Matrix: Solid

Client Sample ID: ASH
Prism Sample ID: 2020013-01
Prism Work Order: 2020013
Time Collected: 01/15/12 17:00
Time Submitted: 01/31/12 13:18

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
TCLP Extraction by EPA 1311									
TCLP Extraction	Complete	N/A			1	*1311	2/2/12 8:15	BGM	P2B0039
TCLP Metals									
Mercury	BRL	mg/L	0.010	0.000014	1	*7470A	2/2/12 14:26	BGM	P2B0040
Arsenic	BRL	mg/L	0.050	0.010	1	*6010C	2/3/12 0:59	LTB	P2B0046
Barium	BRL	mg/L	5.0	0.013	1	*6010C	2/3/12 0:59	LTB	P2B0046
Cadmium	BRL	mg/L	0.025	0.00043	1	*6010C	2/3/12 0:59	LTB	P2B0046
Chromium	BRL	mg/L	0.25	0.00085	1	*6010C	2/3/12 0:59	LTB	P2B0046
Lead	BRL	mg/L	0.050	0.0038	1	*6010C	2/3/12 0:59	LTB	P2B0046
Selenium	BRL	mg/L	0.10	0.012	1	*6010C	2/3/12 0:59	LTB	P2B0046
Silver	BRL	mg/L	0.25	0.0017	1	*6010C	2/3/12 0:59	LTB	P2B0046

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A. R. Rubin & Associates
Attn: Bob Rubin
192 Fearrington Post
Pittsboro, NC 27312

Project: CAS

Prism Work Order: 2020013
Time Submitted: 1/31/2012 1:18:00PM

TCLP Metals - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P2B0040 - 7470A										
Blank (P2B0040-BLK1)				Prepared & Analyzed: 02/02/12						
Mercury	BRL	0.010	mg/L							
LCS (P2B0040-BS1)				Prepared & Analyzed: 02/02/12						
Mercury	0.00952	0.010	mg/L	0.009375		102	80-120			
Matrix Spike (P2B0040-MS1)		**Source: 2020013-01**		Prepared & Analyzed: 02/02/12						
Mercury	0.00973	0.010	mg/L	0.009375	BRL	104	80-120			
Matrix Spike Dup (P2B0040-MSD1)		**Source: 2020013-01**		Prepared & Analyzed: 02/02/12						
Mercury	0.00981	0.010	mg/L	0.009375	BRL	105	80-120	0.8	20	
Batch P2B0046 - 3010A										
Blank (P2B0046-BLK1)				Prepared: 02/02/12 Analyzed: 02/03/12						
Arsenic	BRL	0.050	mg/L							
Barium	BRL	5.0	mg/L							
Cadmium	BRL	0.025	mg/L							
Chromium	BRL	0.25	mg/L							
Lead	BRL	0.050	mg/L							
Selenium	BRL	0.10	mg/L							
Silver	BRL	0.25	mg/L							
LCS (P2B0046-BS1)				Prepared: 02/02/12 Analyzed: 02/03/12						
Arsenic	1.16	0.050	mg/L	1.250		93	80-120			
Barium	1.11	5.0	mg/L	1.250		88	80-120			
Cadmium	1.14	0.025	mg/L	1.250		91	80-120			
Chromium	1.05	0.25	mg/L	1.250		84	80-120			
Lead	1.11	0.050	mg/L	1.250		89	80-120			
Selenium	1.21	0.10	mg/L	1.250		96	80-120			
Silver	1.12	0.25	mg/L	1.250		89	80-120			

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A. R. Rubin & Associates
Attn: Bob Rubin
192 Fearrington Post
Pittsboro, NC 27312

Project: CAS

Prism Work Order: 2020013
Time Submitted: 1/31/2012 1:18:00PM

TCLP Metals - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P2B0046 - 3010A										
Matrix Spike (P2B0046-MS1)		**Source: 2020013-01**		Prepared: 02/02/12		Analyzed: 02/03/12				
Arsenic	1.22	0.050	mg/L	1.250	0.0385	94	75-125			
Barium	1.71	5.0	mg/L	1.250	0.571	91	75-125			
Cadmium	1.17	0.025	mg/L	1.250	0.00145	93	75-125			
Chromium	1.08	0.25	mg/L	1.250	BRL	86	75-125			
Lead	1.16	0.050	mg/L	1.250	0.0151	92	75-125			
Selenium	1.23	0.10	mg/L	1.250	0.0179	97	75-125			
Silver	1.14	0.25	mg/L	1.250	BRL	92	75-125			
Matrix Spike Dup (P2B0046-MSD1)		**Source: 2020013-01**		Prepared: 02/02/12		Analyzed: 02/03/12				
Arsenic	1.23	0.050	mg/L	1.250	0.0385	95	75-125	1	20	
Barium	1.71	5.0	mg/L	1.250	0.571	91	75-125	0.3	20	
Cadmium	1.18	0.025	mg/L	1.250	0.00145	95	75-125	1	20	
Chromium	1.10	0.25	mg/L	1.250	BRL	88	75-125	2	20	
Lead	1.18	0.050	mg/L	1.250	0.0151	93	75-125	2	20	
Selenium	1.25	0.10	mg/L	1.250	0.0179	99	75-125	2	20	
Silver	1.16	0.25	mg/L	1.250	BRL	93	75-125	1	20	

Sample Extraction Data

Prep Method: 1311

Lab Number	Batch	Initial	Final	Date/Time
2020013-01	P2B0039	100 g	2000 mL	02/01/12 14:45

Prep Method: 3010A

Lab Number	Batch	Initial	Final	Date/Time
2020013-01	P2B0046	10 mL	50 mL	02/02/12 13:05

Prep Method: 7470A

Lab Number	Batch	Initial	Final	Date/Time
2020013-01	P2B0040	20 mL	30 mL	02/02/12 9:15

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CHAIN OF CUSTODY RECORD

PAGE ___ OF ___ QUOTE # TO ENSURE PROPER BILLING: ___

Client Company Name: A.R. RUBIN & ASSOC
Report To/Contact Name: A.R. RUBIN
Reporting Address: 192 FERRINGTON PLACE PITTSBORO NC 27312
Phone: 919.545.3366 Fax (Yes) (No): ___
Email (Yes) (No) Email Address: RUBINANCSU.EDU
EDD Type: PDF___ Excel___ Other___
Site Location Name: CAS
Site Location Physical Address: RIVER RD

Project Name: CAS
Short Hold Analysis: (Yes) (No) UST Project: (Yes) (No)
*Please ATTACH any project specific reporting (QC LEVEL I II III IV) provisions and/or QC Requirements
Invoice To: ___
Address: ___

Purchase Order No./Billing Reference ___
Requested Due Date ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days ☐ 5 Days
"Working Days" ☐ 6-9 Days ☐ Standard 10 days ☐ Rush Work Must Be Pre-Approved
Samples received after 15:00 will be processed next business day.
Turnaround time is based on business days, excluding weekends and holidays.
(SEE REVERSE FOR TERMS & CONDITIONS REGARDING SERVICES RENDERED BY PRISM LABORATORIES, INC. TO CLIENT)

LAB USE ONLY

	YES	NO	N/A
Samples INTACT upon arrival?	✓		
Received ON WET ICE? Temp 18.8		✓	
PROPER PRESERVATIVES indicated?	✓		
Received WITHIN HOLDING TIMES?	✓		
CUSTODY SEALS INTACT?			✓
VOLATILES rec'd W/OUT HEADSPACE?	✓		✓
PROPER CONTAINERS used?	✓		

TO BE FILLED IN BY CLIENT/SAMPLING PERSONNEL
Certification: NELAC___ USACE___ FL___ NC___ SC___ OTHER___ N/A___
Water Chlorinated: YES___ NO___
Sample Iced Upon Collection: YES___ NO___

CLIENT SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED MILITARY HOURS	MATRIX (SOIL, WATER OR SLUDGE)	SAMPLE CONTAINER *TYPE SEE BELOW	NO.	SIZE	PRESERVATIVES	ANALYSES REQUESTED: TCLP MEMS						REMARKS	PRISM LAB ID NO.
ASH	15JAN	1700	ASH					1							01

Sampler's Signature [signature] Sampled By (Print Name) A.R. Rubin Affiliation ___

PRESS DOWN FIRMLY - 3 COPIES

Upon relinquishing, this Chain of Custody is your authorization for Prism to proceed with the analyses as requested above. Any changes must be submitted in writing to the Prism Project Manager. There will be charges for any changes after analyses have been initialized.

Relinquished By: (Signature)	Received By: (Signature)	Date	Military/Hours
[signature]			
Relinquished By: (Signature)	Received By: (Signature)	Date	
Relinquished By: (Signature)	Received For Prism Laboratories By: [signature]	Date 1/31/12	1318

Method of Shipment: NOTE: ALL SAMPLE COOLERS SHOULD BE TAPED SHUT WITH CUSTODY SEALS FOR TRANSPORTATION TO THE LABORATORY. SAMPLES ARE NOT ACCEPTED AND VERIFIED AGAINST COC UNTIL RECEIVED AT THE LABORATORY.
☐ Fed Ex ☐ UPS ☒ Hand-delivered ☐ Prism Field Service ☐ Other ___
COC Group No. ~~2020~~ 2/1/12 2020013

Additional Comments:

PRISM USE ONLY
Site Arrival Time:
Site Departure Time:
Field Tech Fee:
Mileage:

SEE REVERSE FOR TERMS & CONDITIONS

ORIGINAL

DES:	UST:	GROUNDWATER:	DRINKING WATER:	SOLID WASTE:	RCRA:	CERCLA	LANDFILL	OTHER:
NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC

CONTAINER TYPE CODES: A = Amber C = Clear G = Glass P = Plastic; TL = Teflon-Lined Cap VOA = Volatile Organics Analysis (Zero Head Space)

Attachment 13. Metals Analysis - Fly Ash and Coal Ash

Wood Ash, Coal Ash, and Maola DAF Skimmings Analysis

Wilson, Donna

From: cas71@suddenlink.net
Sent: Tuesday, January 28, 2014 11:27 AM
To: Wilson, Donna
Subject: Fwd: Results
Attachments: Results

Coal Ash

Results from Craven Ag

Wilson, Donna

From: Rhonda <rhonda@environmentalchemists.com>
Sent: Tuesday, January 28, 2014 11:12 AM
To: Cas71@suddenlink.net
Subject: Results
Attachments: CRAVEN AG-COAL ASH-13-14513-11-20-13.PDF

See Attached

Rhonda Stokes
Environmental Chemists, Inc
910-392-0223

envirochem

ANALYTICAL & CONSULTING CHEMISTS

Environmental Chemists, Inc.

6602 Windmill Way • Wilmington, NC 28405
(910) 392-0223 (Lab) • (910) 392-4424 (Fax)

710 Bowsertown Road • Manteo, NC 27954
(252) 473-5702

NCDENR: DWQ CERTIFICATE #94. DLS CERTIFICATE #37729

Craven Ag Services
2115 Hwy 55 W.
New Bern NC 28562
Attention: Bill Dunham

Date of Report: Dec 13, 2013
Customer PO #:
Report #: 2013-14513
Report to: Bill Dunham
Project ID: Coal Ash

Lab ID	Sample ID:	Collect Date/Time	Matrix	Sampled by
13-35543	**Site:** coal ash	11/20/2013 8:00 AM	Solid/Sludge	Bill Dunham

Test	Method	Results	Date Analyzed
Arsenic Reporting limits elevated due to matrix effects.	EPA 200.7	<24.0 mg/kg	12/09/2013
Barium	EPA 200.7	160 mg/kg	12/09/2013
Cadmium Reporting limits elevated due to matrix effects.	EPA 200.7	<24.0 mg/kg	12/09/2013
Chromium Reporting limits elevated due to matrix effects.	EPA 200.7	<24.0 mg/kg	12/09/2013
Lead	EPA 200.7	<24.0 mg/kg	12/11/2013
Selenium	EPA 200.7	<24.0 mg/kg	12/11/2013
Silver Reporting limits elevated due to matrix effects.	EPA 200.7	<24.0 mg/kg	12/09/2013
Total Solids (%)	SM 2540 B	80.8 %	11/25/2013
Mercury	SW846 7471B	<0.025 mg/kg	12/05/2013

Comment: Results reported on a dry weight basis.

Reviewed by: [illegible] / Tammy Duncan

envirochem
Analytical & Consulting Chemists

ENVIRONMENTAL CHEMISTS, INC

NCDENR: DWQ CERTIFICATION # 94 NCDHHS: DLS CERTIFICATION # 37729

6602 Windmill Way Wilmington, NC 28405
OFFICE: 910-392-0223 FAX 910-392-4424
info@environmentalchemists.com

COLLECTION AND CHAIN OF CUSTODY

CLIENT: Craven Ag Services	PROJECT NAME: Coal Ash	REPORT NO: 13-14513
ADDRESS: 2115 Hwy 55 W	CONTACT NAME:	PO NO:
New Bern NC 28562	REPORT TO: Billy Dunham	PHONE/FAX:
	COPY TO:	email:

Sampled By: Billy Dunham

SAMPLE TYPE: I = Influent, E = Effluent, W = Well, ST = Stream, SO = Soil, SL = Sludge, Other:

Sample Identification	Collection Date	Collection Time	Collection Temp	Sample Type	Composite or Grab	Container (P or G)	Chlorine mg/L	LAB ID NUMBER	PRESERVATION NONE	HCL	H2SO4	HNO3	NAOH	THIO	OTHER	ANALYSIS REQUESTED
Coal Ash	11/22/13	8 00			C	P		35543								Total Metals
					G	G										
					C	P										8 RCRA
					G	G										
					C	P										
					G	G										
					C	P										
					G	G										
					C	P										
					G	G										
					C	P										
					G	G										
					C	P										
					G	G										
					C	P										
					G	G										
					C	P										
					G	G										
					C	P										
					G	G										

Transfer	Relinquished By:	Date/Time	Received By:	Date/Time
1.				
2.				

Temperature when Received: ambient Accepted: ✓ Rejected: Resample Requested:

Delivered By: Received By: DB Date: 11/22/13 Time: 1640

Comments: TURNAROUND:

Wilson, Donna

From: Scott, Michael
Sent: Monday, February 24, 2014 10:05 AM
To: Wilson, Donna
Subject: FW: Semi-Annual Final Assembled Report (*.pdf) Report No: 14-050-0240 Cust No: 02986 Lab Id: 00001 2/21/14 15:30
Attachments: Semi-Annual 14-050-0240 20140221 report_far_2861585-148.PDF

Donna,

I am forwarding you additional fly ash data from Craven Wood energy.

Wood Ash Analysis

Michael

From: Ashby W. Tippett [mailto:ASHBY.TIPPETT@cmsenergy.com]
Sent: Monday, February 24, 2014 9:03 AM
To: Scott, Michael
Cc: Robert J. Suida; Wesley J. Manspeaker; Ted Behrendt
Subject: FW: Semi-Annual Final Assembled Report (*.pdf) Report No: 14-050-0240 Cust No: 02986 Lab Id: 00001 2/21/14 15:30

Billy Dunham Fly Ash Pile Results.

A.Wade Tippett
252-633-9525 ext 236

From: Environmental Testing and Consulting, Inc. [mailto:emailetc@etcmemphis.com]
Sent: Friday, February 21, 2014 4:31 PM
To: Ashby W. Tippett
Subject: Semi-Annual Final Assembled Report (*.pdf) Report No: 14-050-0240 Cust No: 02986 Lab Id: 00001 2/21/14 15:30

Your report(s) are attached.

This report is provided in Acrobat PDF format and requires the latest version of Acrobat Reader which can be downloaded free of charge at http://www.adobe.com/products/acrobat/readstep2.html. If you have any problems downloading or installing Acrobat Reader, please contact Customer Service by emailing support@lmpcorp.com or by calling 800-494-2750 and ask for Support. Please verify receipt of the attached data.

This e-mail including attached files is confidential. Its transmission is solely as an accommodation for the benefit of the recipient. The recipient bears the responsibility for checking its accuracy against corresponding originally signed documents provided by the laboratory.

If you received this e-mail in error, its use is prohibited. Please destroy it and immediately notify us.

We appreciate your business. Please contact us with any questions.

Thanks.
Client Services
support@etcmemphis.com

Help us to serve you better. We appreciate your business and value your opinions on our performance. Please take a moment to
fill out this on-line survey. Click on the following link and go to Client Feedback Survey.

Client FeedbackSurvey

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2790 Whitten Road Memphis, Tennessee 38133 (901) 213-2400 Fax (901) 213-2440
"A Laboratory Management Partner"

2/21/2014

Craven County Wood Energy
Mr. Wade Tippett
201 Executive Parkway
Newbern, NC, 28562

Ref: Analytical Testing
ETC Report Number: 14-050-0239
Client Project Description: Semi-annual
"Attorney Client Privlege"
Project Number: Metals

Dear Mr. Wade Tippett:

Environmental Testing and Consulting, Inc. received sample(s) on 2/19/2014 for the analyses presented in the following report.

The above referenced project has been analyzed per your instructions. The analyses were performed in accordance with the applicable analytical method.

The analytical data has been validated using standard quality control measures performed as required by the analytical method. Quality Assurance, method validations, instrumentation maintenance and calibration for all parameters (NELAP and non-NELAP) were performed in accordance with guidelines established by the USEPA (including 40 CFR 136 Method Update Rule May 2012) and NELAC unless otherwise indicated. Any parameter for which the laboratory is not officially NELAP accredited is indicated by a '~' symbol. These are not included in the scope because NELAP accreditation is either not available or has not been applied for. Additional certifications may be held/are available for parameters, where NELAP accreditation is not required or applicable. A full list of certifications is available upon request.

Per EPA Methods Update Rule (May 2012), all methods from Standard Methods for the Examination of Water and Wastewater are reported to include the year of approval.

The results are shown on the attached Report of Analysis(s). Results for solid matrices are reported on an as-received basis unless otherwise indicated. This report shall not be reproduced except in full and relates only to the samples included in this report.

Please do not hesitate to contact me or client services if you have any questions or need additional information.

Sincerely,

Randell H. Thomas

Randy Thomas
Project Manager

Laboratory's liability in any claim relating to analyses performed shall be limited to, at laboratory's option, repeating the analysis in question at laboratory's expense, or the refund of the charges paid for performance of said analysis.

Alabama	#40750	Louisiana	#04015	VA NELAP	#460181	Texas	#T104704180-11-6	Arkansas	#88-0650
Mississippi		California	#09267CA	NC	#415	Oklahoma	#9311	Virginia	#00106
Kentucky	#90047	Tennessee	#TN02027	EPA	#TN00012	Kentucky UST	#41	Kansas	#E-10396

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02986
Craven County Wood Energy
Mr. Wade Tippett
201 Executive Parkway
Newbern , NC 28562

Project ID :
Project Information : Semi-annual "Attorney Client Privlege"

Report Date : 02/21/2014
Received : 2/19/2014

Randell H. Thomas

Randy Thomas
Project Manager

Report Number : **14-050-0239**

REPORT OF ANALYSIS

Lab No : **94473**
Sample ID : **Wood Fly Ash (WA-1)**

Matrix: **Solids**
Sampled: **2/18/2014 15:00**

Test	Results	Units	MQL	DF	Date / Time Analyzed	By	Analytical Method
Total Arsenic	**47.0**	mg/Kg	0.500	1	02/21/14 12:16	BKN	6010B
Total Cadmium	**2.03**	mg/Kg	0.100	1	02/20/14 16:04	BKN	6010B
Total Copper	**209**	mg/Kg	0.250	1	02/20/14 16:04	BKN	6010B
Total Lead	**30.8**	mg/Kg	0.300	1	02/20/14 16:04	BKN	6010B
Total Mercury	**0.195**	mg/Kg	0.0133	1	02/20/14 14:44	JRS	7471A
Total Molybdenum	**3.25**	mg/Kg	0.250	1	02/20/14 16:04	BKN	6010B
Total Nickel	**16.3**	mg/Kg	0.250	1	02/20/14 16:04	BKN	6010B
Total Selenium	<10.0	mg/Kg	10.0	10	02/20/14 15:37	BKN	6010B
Total Zinc	**473**	mg/Kg	0.500	1	02/20/14 16:04	BKN	6010B

Qualifiers/ Definitions

*	Outside QC limit	DF	Dilution Factor
MQL	Method Quantitation Limit		

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Cooler Receipt Form

Customer Number: **02986**
Customer Name: **Craven County Wood Energy**
Report Number: **14-050-0239**

Shipping Method

● Fed Ex ○ UPS ○ US Postal ○ Client ○ Lab ○ Courier ○ Other :

Shipping container/cooler uncompromised?	● Yes	○ No	
Custody seals intact on shipping container/cooler?	○ Yes	○ No	● Not Required
Custody seals intact on sample bottles?	○ Yes	○ No	● Not Required
Chain of Custody (COC) present?	● Yes	○ No	
COC agrees with sample label(s)?	● Yes	○ No	
COC properly completed	● Yes	○ No	
Samples in proper containers?	● Yes	○ No	
Sample containers intact?	● Yes	○ No	
Sufficient sample volume for indicated test(s)?	● Yes	○ No	
All samples received within holding time?	● Yes	○ No	
Cooler temperature in compliance?	● Yes	○ No	
Cooler/Samples arrived at the laboratory on ice. Samples were considered acceptable as cooling process had begun.	○ Yes	● No	
Water - Sample containers properly preserved	○ Yes	○ No	● N/A
Water - VOA vials free of headspace	○ Yes	○ No	● N/A
Trip Blanks received with VOAs	○ Yes	○ No	● N/A
Soil VOA method 5035 – compliance criteria met	○ Yes	○ No	● N/A

☐ High concentration container (48 hr) ☐ Low concentration EnCore samplers (48 hr)
☐ High concentration pre-weighed (methanol -14 d) ☐ Low conc pre-weighed vials (Sod Bis -14 d)

Special precautions or instructions included?	○ Yes	● No

Comments:

Any regulatory non-compliance issues will be recorded on non-compliance report.

Signature: Rebekah Ross

Date & Time: 02/19/2014 12:19:31

Environmental Testing & Consulting, Inc. Chain of Custody

Page _ of _

14-050-0239
02986
02-19-2014
12:18:45

Craven County Wood Energy
Semi-annual

Client Name	Client Project Manager/Contact	Phone #
CRAVEN Co. Wood Energy	A. WADE TIPPETT	252-633 9525 X236

Project/ Site Location	email Address
CRAVEN Co. WOOD ENERGY	ASHBY.TIPPETT@CMS ENERGY.COM

Project Number	FID #	Purchase Order Number
—	—	

Type of Event: Single Daily Weekly Monthly Quarterly Semi-Annual

Method of Shipment: FEDX

- [ ] NPDES
- [ ] Wastewater
- [ ] UST
- [ ] Other Program

- [x] RUSH - Additional charges apply.
- [ ] The following require a Statement of Work
- [ ] Special Report Requirements
- [ ] Special Detection Limit(s)
- [ ] Special Method Requirements

Environmental Testing & Consulting, Inc.
2790 Whitten Road
Memphis, TN 38133
(901) 213-2400 (phone)
(901) 213-2440 (fax)
www.etcmemphis.com

Required Analysis:

Date:	Time:	Sample Identification:	Number of Containers	Matrix	(G)rab or (C)omposite	ARSENIC mg/Kg	CADMIUM "	COPPER "	LEAD "	MERCURY "	molybdenum "	Nickel "	SELENIUM "	ZINC "				
2/18/14	1500	WOOD FLY ASH (WA-1)	1															

Matrix: WW - Wastewater GW - Groundwater DW-Drinking Water S-Soil O-Oil L-Non aqueous liquid
Other WOOD ASH

Sampled by (Name/Affiliation): (Print): Billy DUNHAM

Client Remarks/Comments: TEST FOR METALS ON 1/4

For Laboratory Use Only

Ice	Cooler Temp	Lab Comments
Y / N	NA	

Relinquished by: (SIGNATURE)	Date	Time	Received by: (SIGNATURE)	Date	Time
A. Wade Tippett	2/18/14	1500			
Relinquished by: (SIGNATURE)	Date	Time	Received by: (SIGNATURE)	Date	Time
Relinquished by: (SIGNATURE)	Date	Time	Received for lab by: (SIGNATURE)	Date	Time
			[illegible]	2/19/14	0832

* PLEASE PUT ON REPORT → ATTORNEY CLIENT PRIVILEGE

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2790 Whitten Road Memphis, Tennessee 38133 (901) 213-2400 Fax (901) 213-2440
"A Laboratory Management Partner"

2/21/2014

Craven County Wood Energy
Mr. Wade Tippett
201 Executive Parkway
Newbern, NC, 28562

Ref: Analytical Testing
ETC Report Number: 14-050-0240
Client Project Description: Semi-Annual
"Attorney Client Privlege"
Project Number: Metals

Dear Mr. Wade Tippett:

Environmental Testing and Consulting, Inc. received sample(s) on 2/19/2014 for the analyses presented in the following report.

The above referenced project has been analyzed per your instructions. The analyses were performed in accordance with the applicable analytical method.

The analytical data has been validated using standard quality control measures performed as required by the analytical method. Quality Assurance, method validations, instrumentation maintenance and calibration for all parameters (NELAP and non-NELAP) were performed in accordance with guidelines established by the USEPA (including 40 CFR 136 Method Update Rule May 2012) and NELAC unless otherwise indicated. Any parameter for which the laboratory is not officially NELAP accredited is indicated by a '~' symbol. These are not included in the scope because NELAP accreditation is either not available or has not been applied for. Additional certifications may be held/are available for parameters, where NELAP accreditation is not required or applicable. A full list of certifications is available upon request.

Per EPA Methods Update Rule (May 2012), all methods from Standard Methods for the Examination of Water and Wastewater are reported to include the year of approval.

The results are shown on the attached Report of Analysis(s). Results for solid matrices are reported on an as-received basis unless otherwise indicated. This report shall not be reproduced except in full and relates only to the samples included in this report.

Please do not hesitate to contact me or client services if you have any questions or need additional information.

Sincerely,

Randell H. Thomas

Randy Thomas
Project Manager

Laboratory's liability in any claim relating to analyses performed shall be limited to, at laboratory's option, repeating the analysis in question at laboratory's expense, or the refund of the charges paid for performance of said analysis.

Alabama	#40750	Louisiana	#04015	VA NELAP	#460181	Texas	#T104704180-11-6	Arkansas	#88-0650
Mississippi		California	#09267CA	NC	#415	Oklahoma	#9311	Virginia	#00106
Kentucky	#90047	Tennessee	#TN02027	EPA	#TN00012	Kentucky UST	#41	Kansas	#E-10396

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02986
Craven County Wood Energy
Mr. Wade Tippett
201 Executive Parkway
Newbern , NC 28562

Project ID : Metals
Project Information : Semi-Annual "Attorney Client Privlege"

Report Date : 2/21/2014

Report Number : **14-050-0240**

REPORT OF ANALYSIS

Received : 2/19/2014

Lab No : **94474**
Sample ID : **Wood Fly Ash (WA-2)**

Matrix: **Solids**
Sampled: **2/18/2014 15:00**

Test	Results	Units	MQL	DF	Date / Time Analyzed	By	Analytical Method
Total Arsenic	**47.4**	mg/Kg	0.500	1	02/21/14 12:20	BKN	6010B
Total Cadmium	**2.02**	mg/Kg	0.100	1	02/20/14 16:08	BKN	6010B
Total Copper	**250**	mg/Kg	0.250	1	02/20/14 16:08	BKN	6010B
Total Lead	**31.3**	mg/Kg	0.300	1	02/20/14 16:08	BKN	6010B
Total Mercury	**0.206**	mg/Kg	0.0133	1	02/20/14 14:49	JRS	7471A
Total Molybdenum	**4.28**	mg/Kg	0.250	1	02/20/14 16:08	BKN	6010B
Total Nickel	**16.4**	mg/Kg	0.250	1	02/20/14 16:08	BKN	6010B
Total Selenium	<10.0	mg/Kg	10.0	10	02/20/14 15:41	BKN	6010B
Total Zinc	**523**	mg/Kg	0.500	1	02/20/14 16:08	BKN	6010B

Qualifiers/ Definitions

*	Outside QC limit	DF	Dilution Factor
MQL	Method Quantitation Limit		

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2790 Whitten Road Memphis, Tennessee 38133 (901) 213-2400 Fax (901) 213-2440
"A Laboratory Management Partner"

Cooler Receipt Form

Customer Number: **02986**
Customer Name: **Craven County Wood Energy**
Report Number: **14-050-0240**

Shipping Method

● Fed Ex ○ UPS ○ US Postal ○ Client ○ Lab ○ Courier ○ Other :

Shipping container/cooler uncompromised?	● Yes	○ No	
Custody seals intact on shipping container/cooler?	○ Yes	○ No	● Not Required
Custody seals intact on sample bottles?	○ Yes	○ No	● Not Required
Chain of Custody (COC) present?	● Yes	○ No	
COC agrees with sample label(s)?	● Yes	○ No	
COC properly completed	● Yes	○ No	
Samples in proper containers?	● Yes	○ No	
Sample containers intact?	● Yes	○ No	
Sufficient sample volume for indicated test(s)?	● Yes	○ No	
All samples received within holding time?	● Yes	○ No	
Cooler temperature in compliance?	● Yes	○ No	
Cooler/Samples arrived at the laboratory on ice. Samples were considered acceptable as cooling process had begun.	○ Yes	● No	
Water - Sample containers properly preserved	○ Yes	○ No	● N/A
Water - VOA vials free of headspace	○ Yes	○ No	● N/A
Trip Blanks received with VOAs	○ Yes	○ No	● N/A
Soil VOA method 5035 – compliance criteria met	○ Yes	○ No	● N/A

☐ High concentration container (48 hr) ☐ Low concentration EnCore samplers (48 hr)
☐ High concentration pre-weighed (methanol -14 d) ☐ Low conc pre-weighed vials (Sod Bis -14 d)

Special precautions or instructions included?	○ Yes	● No

Comments:

Any regulatory non-compliance issues will be recorded on non-compliance report.

Signature: Rebekah Ross

Date & Time: 02/19/2014 12:21:57

Environmental Testing & Consulting, Inc. Chain of Custody

Page _ of _

14-050-0240
02986
02-19-2014
12:21:34

Craven County Wood Energy
Semi-Annual

Client Name	Client Project Manager/Contact	Phone #
CRAVEN Co. Wood Energy	A. WADE TIPPETT	252-633-9525 X236

Project/ Site Location	email Address
CRAVEN Co. WOOD ENERGY	ASHBY.TIPPETT@CMS ENERGY.COM

Project Number	FID #	Purchase Order Number
—	—	

Type of Event: Single Daily Weekly Monthly Quarterly Semi-Annual

Method of Shipment: FEDX

- ☐ NPDES
- ☐ Wastewater
- ☐ UST
- ☐ Other Program

- ☑ RUSH - Additional charges apply.
- ☐ The following require a Statement of Work
- ☐ Special Report Requirements
- ☐ Special Detection Limit(s)
- ☐ Special Method Requirements

Environmental Testing & Consulting, Inc.
2790 Whitten Road
Memphis, TN 38133
(901) 213-2400 (phone)
(901) 213-2440 (fax)
www.etcmemphis.com

Required Analysis:

Date:	Time:	Sample Identification:	Number of Containers	Matrix	(G)rab or (C)omposite	ARSENIC mg/kg	CADMIUM "	COPPER "	LEAD "	mercury "	molybdenum "	Nickel "	SELENIUM "	ZINC "				
2/19/14	1500	WOOD FLY ASH (WA-2)	1															

Matrix
WW - Wastewater GW - Groundwater DW-Drinking Water S-Soil O-Oil L-Non aqueous liquid
Other WOOD ASH

Sampled by (Name/Affiliation): (Print): Billy DUNHAM

Client Remarks/Comments: TEST FOR METALS ON 1/4

For Laboratory Use Only

Ice	Cooler Temp	Lab Comments
Y (N)	NA	

Relinquished by: (SIGNATURE)	Date	Time	Received by: (SIGNATURE)	Date	Time
A. Wade Tippett	2/19/14	1500			
Relinquished by: (SIGNATURE)	Date	Time	Received by: (SIGNATURE)	Date	Time
Relinquished by: (SIGNATURE)	Date	Time	Received for lab by: (SIGNATURE)	Date	Time
			RRO	2/19/14	0832

* PLEASE Put ON Report → ATTORNEY Client Privlege

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ENVIRONMENTAL TESTING & CONSULTING, INC.
2790 Whitten Road Memphis, Tennessee 38133 (901) 213-2400 Fax (901) 213-2440
"A Laboratory Management Partner"

2/21/2014

Craven County Wood Energy
Mr. Wade Tippett
201 Executive Parkway
Newbern, NC, 28562

Ref: Analytical Testing
ETC Report Number: 14-050-0241
Client Project Description: Semi-Annual
"Attorney Client Privlege"
Project Number: Metals

Dear Mr. Wade Tippett:

Environmental Testing and Consulting, Inc. received sample(s) on 2/19/2014 for the analyses presented in the following report.

The above referenced project has been analyzed per your instructions. The analyses were performed in accordance with the applicable analytical method.

The analytical data has been validated using standard quality control measures performed as required by the analytical method. Quality Assurance, method validations, instrumentation maintenance and calibration for all parameters (NELAP and non-NELAP) were performed in accordance with guidelines established by the USEPA (including 40 CFR 136 Method Update Rule May 2012) and NELAC unless otherwise indicated. Any parameter for which the laboratory is not officially NELAP accredited is indicated by a '~' symbol. These are not included in the scope because NELAP accreditation is either not available or has not been applied for. Additional certifications may be held/are available for parameters, where NELAP accreditation is not required or applicable. A full list of certifications is available upon request.

Per EPA Methods Update Rule (May 2012), all methods from Standard Methods for the Examination of Water and Wastewater are reported to include the year of approval.

The results are shown on the attached Report of Analysis(s). Results for solid matrices are reported on an as-received basis unless otherwise indicated. This report shall not be reproduced except in full and relates only to the samples included in this report.

Please do not hesitate to contact me or client services if you have any questions or need additional information.

Sincerely,

Randell H. Thomas

Randy Thomas
Project Manager

Laboratory's liability in any claim relating to analyses performed shall be limited to, at laboratory's option, repeating the analysis in question at laboratory's expense, or the refund of the charges paid for performance of said analysis.

Alabama	#40750	Louisiana	#04015	VA NELAP	#460181	Texas	#T104704180-11-6	Arkansas	#88-0650
Mississippi		California	#09267CA	NC	#415	Oklahoma	#9311	Virginia	#00106
Kentucky	#90047	Tennessee	#TN02027	EPA	#TN00012	Kentucky UST	#41	Kansas	#E-10396

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02986
Craven County Wood Energy
Mr. Wade Tippett
201 Executive Parkway
Newbern , NC 28562

Project ID : Metals
Project Information : Semi-Annual "Attorney Client Privlege"

Report Date : 2/21/2014

Report Number : **14-050-0241**

REPORT OF ANALYSIS

Received : 2/19/2014

Lab No : **94475**
Sample ID : **Wood Fly Ash (WA-3)**

Matrix: **Solids**
Sampled: **2/18/2014 15:00**

Test	Results	Units	MQL	DF	Date / Time Analyzed	By	Analytical Method
Total Arsenic	**30.7**	mg/Kg	0.500	1	02/21/14 12:24	BKN	6010B
Total Cadmium	**1.78**	mg/Kg	0.100	1	02/20/14 16:12	BKN	6010B
Total Copper	**119**	mg/Kg	0.250	1	02/20/14 16:12	BKN	6010B
Total Lead	**24.5**	mg/Kg	0.300	1	02/20/14 16:12	BKN	6010B
Total Mercury	**0.171**	mg/Kg	0.0133	1	02/20/14 14:51	JRS	7471A
Total Molybdenum	**3.69**	mg/Kg	0.250	1	02/20/14 16:12	BKN	6010B
Total Nickel	**16.9**	mg/Kg	0.250	1	02/20/14 16:12	BKN	6010B
Total Selenium	<10.0	mg/Kg	10.0	10	02/20/14 15:44	BKN	6010B
Total Zinc	**342**	mg/Kg	0.500	1	02/20/14 16:12	BKN	6010B

Qualifiers/ Definitions

*	Outside QC limit	DF	Dilution Factor
MQL	Method Quantitation Limit		

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Cooler Receipt Form

Customer Number: **02986**
Customer Name: **Craven County Wood Energy**
Report Number: **14-050-0241**

Shipping Method

● Fed Ex ○ UPS ○ US Postal ○ Client ○ Lab ○ Courier ○ Other :

Shipping container/cooler uncompromised?	● Yes	○ No	
Custody seals intact on shipping container/cooler?	○ Yes	○ No	● Not Required
Custody seals intact on sample bottles?	○ Yes	○ No	● Not Required
Chain of Custody (COC) present?	● Yes	○ No	
COC agrees with sample label(s)?	● Yes	○ No	
COC properly completed	● Yes	○ No	
Samples in proper containers?	● Yes	○ No	
Sample containers intact?	● Yes	○ No	
Sufficient sample volume for indicated test(s)?	● Yes	○ No	
All samples received within holding time?	● Yes	○ No	
Cooler temperature in compliance?	● Yes	○ No	
Cooler/Samples arrived at the laboratory on ice. Samples were considered acceptable as cooling process had begun.	○ Yes	● No	
Water - Sample containers properly preserved	○ Yes	○ No	● N/A
Water - VOA vials free of headspace	○ Yes	○ No	● N/A
Trip Blanks received with VOAs	○ Yes	○ No	● N/A
Soil VOA method 5035 – compliance criteria met	○ Yes	○ No	● N/A

☐ High concentration container (48 hr) ☐ Low concentration EnCore samplers (48 hr)
☐ High concentration pre-weighed (methanol -14 d) ☐ Low conc pre-weighed vials (Sod Bis -14 d)

Special precautions or instructions included?	○ Yes	● No

Comments:

Any regulatory non-compliance issues will be recorded on non-compliance report.

Signature: Rebekah Ross

Date & Time: 02/19/2014 12:26:32

Environmental Testing & Consulting, Inc. Chain of Custody

Page _ of _

14-050-0241
02986
02-19-2014
12:26:08

Craven County Wood Energy
Semi-Annual

Client Name	Client Project Manager/Contact	Phone #
CRAVEN Co. Wood Energy	A. WADE TIPPETT	252-633 9525 X236

Project/ Site Location	email Address
CRAVEN Co. WOOD ENERGY	ASHBY.TIPPETT@RMS energy.com

Project Number	FID #	Purchase Order Number
—	—	

Type of Event: Single Daily Weekly Monthly Quarterly Semi-Annual

Method of Shipment: FEDX

- ☐ NPDES
- ☐ Wastewater
- ☐ UST
- ☐ Other Program

- ☑ RUSH - Additional charges apply.
- ☐ The following require a Statement of Work
- ☐ Special Report Requirements
- ☐ Special Detection Limit(s)
- ☐ Special Method Requirements

Environmental Testing & Consulting, Inc.
2790 Whitten Road
Memphis, TN 38133
(901) 213-2400 (phone)
(901) 213-2440 (fax)
www.etcmemphis.com

Required Analysis:

Date:	Time:	Sample Identification:	Number of Containers	Matrix	(G)rab or (C)omposite	ARSENIC mg/KG	CADMIUM "	COPPER "	LEAD "	MERCURY "	Molybdenum "	Nickel "	SELENIUM "	ZINC "				
2/18/14	1500	WOOD F/A ASH	1															
		(WA-3)																

Matrix
WW - Wastewater GW - Groundwater DW-Drinking Water S-Soil O-Oil L-Non aqueous liquid
Other WOOD ASH

Sampled by (Name/Affiliation): (Print): Billy DUNHAM

Client Remarks/Comments: TEST FOR METALS ON 1/4

For Laboratory Use Only

Ice	Cooler Temp	Lab Comments
Y (N)	NA	

Relinquished by: (SIGNATURE)	Date Time	Received by: (SIGNATURE)	Date Time
A. Wade Tippett	2/18/14 1500		
Relinquished by: (SIGNATURE)	Date Time	Received by: (SIGNATURE)	Date Time
Relinquished by: (SIGNATURE)	Date Time	Received for lab by: (SIGNATURE) RRO	Date Time 2/19/14 0832

* PLEASE PUT ON REPORT → ATTORNEY Client Privlege

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"A Laboratory Management Partner"

2/21/2014

Craven County Wood Energy
Mr. Wade Tippett
201 Executive Parkway
Newbern, NC, 28562

Ref: Analytical Testing
ETC Report Number: 14-050-0242
Client Project Description: Semi-Annual
"Attorney Client Privlege"
Project Number: Metals

Dear Mr. Wade Tippett:

Environmental Testing and Consulting, Inc. received sample(s) on 2/19/2014 for the analyses presented in the following report.

The above referenced project has been analyzed per your instructions. The analyses were performed in accordance with the applicable analytical method.

The analytical data has been validated using standard quality control measures performed as required by the analytical method. Quality Assurance, method validations, instrumentation maintenance and calibration for all parameters (NELAP and non-NELAP) were performed in accordance with guidelines established by the USEPA (including 40 CFR 136 Method Update Rule May 2012) and NELAC unless otherwise indicated. Any parameter for which the laboratory is not officially NELAP accredited is indicated by a '~' symbol. These are not included in the scope because NELAP accreditation is either not available or has not been applied for. Additional certifications may be held/are available for parameters, where NELAP accreditation is not required or applicable. A full list of certifications is available upon request.

Per EPA Methods Update Rule (May 2012), all methods from Standard Methods for the Examination of Water and Wastewater are reported to include the year of approval.

The results are shown on the attached Report of Analysis(s). Results for solid matrices are reported on an as-received basis unless otherwise indicated. This report shall not be reproduced except in full and relates only to the samples included in this report.

Please do not hesitate to contact me or client services if you have any questions or need additional information.

Sincerely,

Randell H. Thomas

Randy Thomas
Project Manager

Laboratory's liability in any claim relating to analyses performed shall be limited to, at laboratory's option, repeating the analysis in question at laboratory's expense, or the refund of the charges paid for performance of said analysis.

Alabama	#40750	Louisiana	#04015	VA NELAP	#460181	Texas	#T104704180-11-6	Arkansas	#88-0650
Mississippi		California	#09267CA	NC	#415	Oklahoma	#9311	Virginia	#00106
Kentucky	#90047	Tennessee	#TN02027	EPA	#TN00012	Kentucky UST	#41	Kansas	#E-10396

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2790 Whitten Road Memphis, Tennessee 38133 (901) 213-2400 Fax (901) 213-2440
"A Laboratory Management Partner"

02986
Craven County Wood Energy
Mr. Wade Tippett
201 Executive Parkway
Newbern , NC 28562

Project ID : Metals
Project Information : Semi-Annual "Attorney Client Privlege"

Report Date : 2/21/2014

Report Number : **14-050-0242**

REPORT OF ANALYSIS

Received : 2/19/2014

Lab No : **94476**
Sample ID : **Wood Fly Ash (WA-4)**

Matrix: **Solids**
Sampled: **2/18/2014 15:00**

Test	Results	Units	MQL	DF	Date / Time Analyzed	By	Analytical Method
Total Arsenic	**28.8**	mg/Kg	0.500	1	02/21/14 12:29	BKN	6010B
Total Cadmium	**1.93**	mg/Kg	0.100	1	02/20/14 16:16	BKN	6010B
Total Copper	**103**	mg/Kg	0.250	1	02/20/14 16:16	BKN	6010B
Total Lead	**27.3**	mg/Kg	0.300	1	02/20/14 16:16	BKN	6010B
Total Mercury	**0.206**	mg/Kg	0.0133	1	02/20/14 14:53	JRS	7471A
Total Molybdenum	**2.63**	mg/Kg	0.250	1	02/20/14 16:16	BKN	6010B
Total Nickel	**16.3**	mg/Kg	0.250	1	02/20/14 16:16	BKN	6010B
Total Selenium	<10.0	mg/Kg	10.0	10	02/20/14 16:00	BKN	6010B
Total Zinc	**341**	mg/Kg	0.500	1	02/20/14 16:16	BKN	6010B

Qualifiers/ Definitions

*	Outside QC limit	DF	Dilution Factor
MQL	Method Quantitation Limit		

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2790 Whitten Road Memphis, Tennessee 38133 (901) 213-2400 Fax (901) 213-2440
"A Laboratory Management Partner"

Cooler Receipt Form

Customer Number: **02986**
Customer Name: **Craven County Wood Energy**
Report Number: **14-050-0242**

Shipping Method

● Fed Ex ○ UPS ○ US Postal ○ Client ○ Lab ○ Courier ○ Other :

Shipping container/cooler uncompromised?	● Yes	○ No	
Custody seals intact on shipping container/cooler?	○ Yes	○ No	● Not Required
Custody seals intact on sample bottles?	○ Yes	○ No	● Not Required
Chain of Custody (COC) present?	● Yes	○ No	
COC agrees with sample label(s)?	● Yes	○ No	
COC properly completed	● Yes	○ No	
Samples in proper containers?	● Yes	○ No	
Sample containers intact?	● Yes	○ No	
Sufficient sample volume for indicated test(s)?	● Yes	○ No	
All samples received within holding time?	● Yes	○ No	
Cooler temperature in compliance?	● Yes	○ No	
Cooler/Samples arrived at the laboratory on ice. Samples were considered acceptable as cooling process had begun.	○ Yes	● No	
Water - Sample containers properly preserved	○ Yes	○ No	● N/A
Water - VOA vials free of headspace	○ Yes	○ No	● N/A
Trip Blanks received with VOAs	○ Yes	○ No	● N/A
Soil VOA method 5035 – compliance criteria met	○ Yes	○ No	● N/A

☐ High concentration container (48 hr) ☐ Low concentration EnCore samplers (48 hr)
☐ High concentration pre-weighed (methanol -14 d) ☐ Low conc pre-weighed vials (Sod Bis -14 d)

Special precautions or instructions included?	○ Yes	● No

Comments:

Any regulatory non-compliance issues will be recorded on non-compliance report.

Signature: Rebekah Ross

Date & Time: 02/19/2014 12:28:21

Environmental Testing & Consulting, Inc. Chain of Custody

Page _ of _

14-050-0242
02986
02-19-2014
12:28:00

Craven County Wood Energy
Semi-Annual

Client Name	Client Project Manager/Contact	Phone #
CRAVEN Co. Wood Energy	A-WADE TiPPett	252-633 9525 X236

Project/ Site Location	email Address
CRAVEN Co. WOODENERGY	ASHBY.TIPPETT@CMS ENERGY.COM

Project Number	FID #	Purchase Order Number
—	—	

Type of Event: Single Daily Weekly Monthly Quarterly Semi-Annual

Method of Shipment: FEDX

- ☐ NPDES
- ☐ Wastewater
- ☐ UST
- ☐ Other Program

- ☒ RUSH - Additional charges apply.
- ☐ The following require a Statement of Work
- ☐ Special Report Requirements
- ☐ Special Detection Limit(s)
- ☐ Special Method Requirements

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Memphis, TN 38133
(901) 213-2400 (phone)
(901) 213-2440 (fax)
www.etcmemphis.com

Required Analysis:

Date:	Time:	Sample Identification:	Number of Containers	Matrix	(G)rab or (C)omposite	ARSENIC mg/kg	CADMIUM "	COPPER "	LEAD "	Mercury "	Molybdenum "	Nickel "	SELENIUM "	ZINC "				
2/18/14	1500	WOOD FLY ASH (WA-4)	1															

Matrix: WW - Wastewater GW - Groundwater DW-Drinking Water S-Soil O-Oil L-Non aqueous liquid
Other WOOD ASH

Sampled by (Name/Affiliation): (Print): Billy DUNHAM

Client Remarks/Comments: TEST FOR METALS ONLY

For Laboratory Use Only

Ice	Cooler Temp	Lab Comments
Y N	NA	

Relinquished by: (SIGNATURE)	Date	Time	Received by: (SIGNATURE)	Date	Time
A Wade Tippett	2/18/14	1500			
Relinquished by: (SIGNATURE)	Date	Time	Received by: (SIGNATURE)	Date	Time
Relinquished by: (SIGNATURE)	Date	Time	Received for lab by: (SIGNATURE) RRO	2/19/14	0832

* PLEASE Put ON Report → ATTORNEY Client Privlege

Craven
AG SERVICES, INC.
2115 Hwy 55 West New Bern, NC 28562

BILLY DUNHAM, PRESIDENT
(252) 633-5334
(252) 670-8530

RECEIVED
MAR 10 2014
SOLID WASTE SECTION

3-4-14

Donna J. Wilson
Environmental Engineer
Solid Waste Section/Division of Waste Management/NCDENR
1646 Mail Service Center,
Raleigh, NC 27699-1646

Dear Donna:

I am sending you the NCDA waste report on the Maola DAF skimmings. I sent you coal ash metal reports in December 2013 and in Feb. 2014. Do I still need to get more tests done?. I am also sending you NCDA reports of wood ash and compost. Mike Scott should have four metal reports taken in February of 2014 for wood ash.
Is there anything else I need to do?

Sincerely,
Billy Dunham
Billy Dunham
Craven Ag Services, Inc

Diagnostic

Waste Report

Client: Craven Ag Services, Inc.
2115 Hwy 55 W
New Bern, NC 28562
Craven County

Advisor: ,

Sampled: 02/04/2014 **Received:** 02/14/2014 **Completed:** 02/25/2014 *Farm:* Durham

Links to Helpful Information

Sample Information

Sample ID: MILK
Waste Code: FCD
Description:
Composted Dairy Waste
Comments:

Nutrient and Other Measurements

Nitrogen (N) (ppm)	
Total N	
Total Kjeldahl N	3520
Inorganic N	8.16
NH_4-N	7.21
NO_3-N	0.94
Organic N	3510
Urea	

P (ppm)	K (ppm)	Ca (ppm)	Mg (ppm)	S (ppm)	Fe (ppm)	Mn (ppm)	Zn (ppm)	Cu (ppm)	B (ppm)	Na (ppm)	C (ppm)
710	1030	1060	99.8	217	0.65	0.05	4.61	0.17	0.09	229	

pH	DM (%)	SS (10^{-5}S/cm)	EC (mS/cm)	CCE (%)	ALE (1000 gal.)	C:N
5.43		845	8.45			

Ni (ppm)	Cd (ppm)	Pb (ppm)	Al (ppm)	Se (ppm)	Li (ppm)	As (ppm)	Cr (ppm)	Co (ppm)	Cl (ppm)	Mo (ppm)
0.03	0.07	0.07								

Estimate of Nutrients Available for First Crop (lb / 1000 gal.)

Application Method	N	P_2O_5	K_2O	Ca	Mg	S	Fe	Mn	Zn	Cu	B	Mo
Broadcast		8.14	8.25	5.29	0.50	1.09	T	T	0.02	T	T	
Soil Incorporated		10.2	9.28	6.61	0.62	1.36	T	T	0.03	T	T	

Other Elements (lb / 1000 gal.)

Application Method	Cl	Na	Ni	Cd	Pb	Al	Se	Li
Broadcast		1.91	T	T	T			
Soil Incorporated		1.91	T	T	T			

Agronomist's Comments:

Aaron Pettit 2/25/2014 9:03 AM

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.

Sample Information

Sample ID: ASH1
Waste Code: FCD
Description:
Composted Dairy Waste
Comments:

Nutrient and Other Measurements

Nitrogen (N) (ppm)		P (ppm)	K (ppm)	Ca (ppm)	Mg (ppm)	S (ppm)	Fe (ppm)	Mn (ppm)	Zn (ppm)	Cu (ppm)	B (ppm)	Na (ppm)	C (ppm)
Total N	584	9860	31500	80300	16600	7550	24200	1840	995	432	370	4680	
Total Kjeldahl N													
Inorganic N													
NH_4-N													
NO_3-N													
Organic N													
Urea													

pH	DM (%)	SS (10^{-5}S/cm)	EC (mS/cm)	CCE (%)	ALE (tons)	C:N
9.76	63.5			27.5	5.15	

Ni (ppm)	Cd (ppm)	Pb (ppm)	Al (ppm)	Se (ppm)	Li (ppm)	As (ppm)	Cr (ppm)	Co (ppm)	Cl (ppm)	Mo (ppm)
23.4	3.81	37.3								

Estimate of Nutrients Available for First Crop (lb / ton)

Application Method	N	P_2O_5	K_2O	Ca	Mg	S	Fe	Mn	Zn	Cu	B	Mo
Broadcast	0.30	17.2	38.4	61.2	12.6	5.75	18.5	1.40	0.76	0.33	0.28	
Soil Incorporated	0.37	21.5	43.2	76.5	15.8	7.19	23.1	1.76	0.95	0.41	0.35	

Other Elements (lb / ton)

Application Method	Cl	Na	Ni	Cd	Pb	Al	Se	Li
Broadcast		5.95	0.03	T	0.05			
Soil Incorporated		5.95	0.03	T	0.05			

Sample Information

Sample ID: COM1
Waste Code: FCD
Description:
Composted Dairy Waste
Comments:

Nutrient and Other Measurements

Nitrogen (N) (ppm)		P (ppm)	K (ppm)	Ca (ppm)	Mg (ppm)	S (ppm)	Fe (ppm)	Mn (ppm)	Zn (ppm)	Cu (ppm)	B (ppm)	Na (ppm)	C (ppm)
Total N	7950	1260	1530	34600	999	1000	2710	80.9	106	33.5	7.76	598	117000
Total Kjeldahl N													
Inorganic N	29.1												
NH_4-N	5.66												
NO_3-N	23.5												
Organic N	7920												
Urea													

pH	DM (%)	SS (10^{-5}S/cm)	EC (mS/cm)	CCE (%)	ALE (tons)	C:N
7.90	55.7	157	1.57			14.7 : 1

Ni (ppm)	Cd (ppm)	Pb (ppm)	Al (ppm)	Se (ppm)	Li (ppm)	As (ppm)	Cr (ppm)	Co (ppm)	Cl (ppm)	Mo (ppm)
4.67	0.61	6.36								

Estimate of Nutrients Available for First Crop (lb / ton)

Application Method	N	P_2O_5	K_2O	Ca	Mg	S	Fe	Mn	Zn	Cu	B	Mo
Broadcast	3.54	1.93	1.64	23.2	0.67	0.67	1.81	0.05	0.07	0.02	0.01	
Soil Incorporated	4.43	2.42	1.84	29.0	0.84	0.84	2.26	0.07	0.09	0.03	0.01	

Other Elements (lb / ton)

Application Method	Cl	Na	Ni	Cd	Pb	Al	Se	Li
Broadcast		0.67	0.01	T	0.01			
Soil Incorporated		0.67	0.01	T	0.01			

Attachment 14. Soil Evaluation for a Proposed Land Treatment of Setpage Site (Smith)

Fred D. Smith **Licensed Soil Scientist**
209 E. Cedar St. Nashville, NC 27856 Phone/Fax 252-459-7798

September 6, 2004

Mr. Billy Dunham
Craven Ag Services, Inc
2115 Hwy 55 West
New Bern, NC 28562

Received
NOV
Solid Waste
Section

Subject: Soil Evaluation for a Proposed Land Treatment of Septage Site
River Road Tract
Craven County

Dear Mr. Dunham:

This report concerns the tract of land that you wish to use for septage disposal. It presents the information provided to us, a description of our study methods, our results, and sketch of soil suitability for septage application. The purpose of this report is to provide the information required in NCAC 15A.13B.0821(a)(1)-(3).

Craven Ag Services, Inc requested soils information on approximately 30 cleared acres and 10 acres of long leaf pines for suitability of septage disposal. The tract of land is located on River Road in Craven County. Mr. Dunham provided a copy of aerial photography.

Hand auger borings were advanced at the site to evaluate soil characteristics in accordance with the State rules governing septage application to agricultural land. The soils were classified into groups according to their texture and depth to wetness. Soil boundary locations were estimated in the field by observing soil differences, relative elevation, measuring distances, and aerial photo interpretation. They were sketched on the enclosed drawing to separate these groups. Normally, soils change on landscapes and merge into another soil as their characteristics gradually change. Therefore, these soil lines are only accurate to that degree.

The site is located in the Coastal Plain region where soils are formed from the deposition of marine sediments. Slopes at the site range from 0 to 10%. The site is covered in soybeans and long leaf pines.

The soils at the site were classified into the following groups:

SOIL GROUP 1

Soils in this group have gray sand surface layers, usually about 12 to 15 inches thick. Beneath the surface layer is yellowish brown sand to at least 42 inches below the surface. Soil depth to seasonal wetness is at least 42 inches below the surface. This soil group is also present on the steeper slope adjacent to the pond. These soils are considered suitable for septage application.

9/6/04
River Rd Tract p-2

SOIL GROUP 2

These soils have dark gray or black sand surface textures that range from 8 to 12 inches beneath the surface. Beneath the surface layer is gray and black partially cemented sand to a depth of at least 36 inches below the surface. Some borings had reddish brown sand at lower depths. Seasonal water tables are from the surface in the lowest elevations to about 36 inches deep in the higher elevations. These soils are considered unsuitable for septage application due to their relatively shallow depth to seasonal wetness (<36 inches) and sand textures according to the rules.

The attached aerial photograph presents the extent and location of each of the soil groups encountered at the site. Soil area 1 is located in fields "A", "B", and "C". The suitable soil area shown on the aerial map as "C" has dimensions of approximately 200 feet by 400 feet. Buffer zones will be required beside the pond at the rear of the property, along ditches between the fields, and from the homes across the highway from the site.

I appreciate the opportunity to provide you with these services. Please contact me if you have questions about the report.

Cordially,

Fred D. Smith, LSS

LICENSED SOIL SCIENTIST
Fred D. Smith
1059
STATE OF NORTH CAROLINA

I

NUTRIENT MANAGEMENT PLAN
SEPTAGE APPLICATIONS TO COASTAL BERMUDA
DUNHAM SITE ON RIVER ROAD
FOR
CRAVEN AG SERVICES, INC.
2115 HWY 55 WEST NEW BERN, N.C.
(252) 633-5334

Received NOV 2007

A. General Information:

1. If possible a waste analysis of the septic being applied will be taken before each application to determine nutrient values.
2. Soil analysis will be conducted in the fall for nutrient needs as well as metals.
3. The site will have ~~three~~ two fields. Field 1 Long Leaf Pine, Field 2 Coastal Bermuda, ~~Field 3 Coastal Bermuda~~.
4. The dominant soil series is Tarboro with cuts of Augusta around it.
5. The landowner is John W. Dunham
6. Septage will only be applied when soil moisture is such that application equipment will not leave a depression in the sod greater than 3 inches.
7. Septage storage will be provided to account for the average volume of septage and grease pumped per week. (100,000 gallons of storage on site)
8. No Septage will be applied to any field 30 days prior to harvest.
9. A Maximizer will be used to screen some solids and trash from the septic and grease before it is stored or applied on fields. The solids separated from the screen will be collected and disposed at the landfill.
10. Waste application rates will be based on the quantity of plant available nitrogen from the waste and the nitrogen requirements of the crop to be grown. The operator of the site has waste applicators certification for land applicator of municipal and animal waste. **Certification numbers from the N. C. Water Pollution Control System Operators Certification commission are: AW 19891 and LA 13203.**
11. All boarders of field 1 will have long leaf pine and fields 2 ~~and 3~~ will be planted in permanent Coastal Bermuda. Cereal rye will be seeded at the rate of three (3) bushels per acre over the entire field and boarders after the final hay cutting in September or early October of each year. Commercial fertilizers will be used to keep the boarders maintained according to soil sample analysis.

B. Crops to be grown and approximate planting and harvesting times:

a. Field 1: Is an established long leaf pine plantation approximately 15 years old and will be managed as a pine plantation. Travel lanes will be kept open through bush hogging and limb pruning. Application of the septage will be with a tractor drawn applicator. Harvesting of the pines will be done according to recommendations of a certified forester.

b. Fields 2 ~~and 3.~~ Will be treated the same. They will be sprigged with Coastal Bermuda at the rate of 35 bushels per acre in March or April of 2005. Harvest schedules will depend upon established growth of the Bermuda during the season. It is estimated that we will get at least one harvest in late summer of 2005 and two in the summer of 2006. It is hoped that by 2007 the Bermuda will be well established and we will be able to get three cutting per season. Cereal Rye will be planted on the fields in the fall of 2004 prior to planting the Bermuda. It will be harvested prior to sprigging the Bermuda if it gets large enough. The following years will have Cereal Rye over seeded in September/October of each year and harvested in the Spring of the following year. Rye seeding rates will be 3 bushels per acre.

C. Nitrogen needs for crops Grown: (if nitrogen needs are not met with septage commercial nitrogen will be used to meet crop needs except for the pines. No commercial nitrogen will be applied to the pines.)

a. COASTAL BERMUDA (HAY)

1. Realistic Yield Expectation is 2 tons per acre the first two years and 4 tons after the Bermuda is established.
2. Nitrogen requirements per ton of hay is 50 lbs = 100 lbs N per acre the first two years and 200lbs after establishment.
3. Maximum uptake period April-September
4. Will maintain an 80% stand. If areas die out will replace with sprigs at the rate of 35 bushels per acre.

b. ANNUAL CEREAL RYE (HAY)

1. Realistic Yield Expectation 2 tons per acre.
2. Nitrogen requirements per ton of Hay is 30 lbs = 60 lbs per acre.
3. Maximum uptake period September- October & February- April.
4. Will maintain an 80 % stand by reseeding if necessary.

c. Long Leaf Pine Plantation (Timber)

1. Craven County Soils Survey shows a production of 95 cubic feet of growth per acre

from long leaf pines on a Tarboro soil.

2. Principles and Management of Forest Nutrition by Dr. Dan Keiting, NCSU Dept. of Forestry, shows the Nitrogen utilization for 95 cubic feet per acre production to be around 60 lbs per acre. This plan will utilize 30,000 gallons of septage/grease per acre in order to apply approximately 40 to 46 lbs of nitrogen per acre per year.

D. Relative Application Rate, gallons per acre, and Harvest Schedule

c. Field 1: Long Leaf Pine Plantation will receive a total of 30,000 gallons of septage/grease per acre per year.

MONTH	GALLONS
January	6000
February	6000
March	6000
April	6000
May	6000
June	6000
July	6000
August	6000
September	6000
October	6000
November	6000
December	6000

d. Fields 2 and 3: Coastal Bermuda and Cereal Rye

MONTH	CROP	FIELD 2	FIELD 3
January	Rye	5000	5,000
February	Rye	5000	5,000
March	Rye	10,000	10,000
April	Bermuda	15,000	15,000
May	Bermuda	30,000	30,000
June	Bermuda	30,000	30,000
July	Bermuda	30,000	30,000
August	Bermuda	20,000	20,000
September	Bermuda	15,000	15,000
October	Rye	5,000	10,000
November	Rye	5,000	5,000
December	Rye	5,000	5,000

1. Total gallons per acre applied on Rye will be 20,000
2. Total gallons per acre applied on Bermuda will be 60,000
3. Depending upon crop growth and hay cutting conditions the Rye will be cut for hay once and the Bermuda a minimum of twice during the growing season. The hay will be feed to cattle.
4. No septage will be applied on either field 30 days prior to harvest.

E. Application Method:

Septage will be evenly broadcast over the permitted fields with a tractor drawn vacuum applicator.

F. Residual Plant Available Nitrogen (PAN) and Supplemental Nitrogen Determinations:

a. Field 1: Productivity for established long leaf pine on a Tarboro soil is 95 cubic feet per acre per year. Dr. Dan Keiting's, NCSU Dept. of Forestry, "Principles and Management of Forest Nutrition" shows the actual nitrogen utilization of 15 year old pines to be from 60 to 80 lbs per year. This nutrient plan will provide approximately 45 lbs of nitrogen per year from septage after the first year. No additional nitrogen will be added.

b. Fields 2 ~~& 3~~: Will be seeded with rye in the fall of 2004. In the spring of 2005 they will be sprigged with coastal Bermuda at the rate of 35 bushels per acre. We estimate an annual yield of 2 tons per acre the first two years and then 4 tons there after. The minimum amount of nitrogen needed the first two years will be 100 lbs per acre therefore

we will use 60,000 gallons of septage/grease per acre per year for all five years. You will note that the amount of commercial nitrogen increases after the first two years.

c. The methodology for calculating residual Plant Available Nitrogen (PAN) and the determination of the need for supplemental nitrogen herein described is based upon the following assumptions.

1. The Organic Nitrogen content of domestic septage is 2.6 pounds per 1,000 gallons of septage
2. The Mineralization Rate (MR) of domestic septage is 40 percent in the year of application and decreases to 20 percent in the second year, 10 percent in the third year, 5 percent in the fourth year and 3 percent in the fifth year. Residual Nitrogen is added to the total nitrogen each year.
3. Residual Plant Available Nitrogen (PAN) Calculations. Based on Organic Nitrogen at .0026 lbs per 1000 gallons of septic. Using 20,000 gallons per acre for Cereal Rye 60,000 gallons for Coastal Bermuda, and 30,000 gallons for Pines.

Application Year	Lbs Residual N for C. Rye
2005 Carry over N to be mineralized @ 40 % = 31.2	0
2006 (31.24) (.20)	6.24
2007 (31.24 – 6.24) (.10)	2.50
2008 (31.24 – 6.24 –2.50) (.05)	1.12
2009 (31.24 –6.24 – 2.50 –1.12) (.03)	.63

Total Residual N over 5 years from first application of 20,000 gallons = 10.49 lbs

Application Year	Lbs. Residual N for C. Bermuda
2005 Carry over N to be mineralized @ 40 % =93.6 lbs	0
2006 (93.6) (.20)	18.72
2007 (93.6 –18.72) (.10)	7.48
2008 (93.6 –18.72- -7.48) (.05)	3.37
2009 (93.6 – 18.72 –7.48 –3.37)	1.97

Total Residual N over 5 years from first application of 60,000 gallons = 31.49 lbs

Total Residual N over 5 years from first Application of 80,000 gallons = 41.98 lbs

Application Year	Lbs. Residual N for Pines
2005 Carry over N to mineralized @ 40 % 31.20 lbs	
2006 (46.80) (.20)	9.36
2007 (46-9.36) (.10)	3.74
2008 (46.9 – 9.36 –3.74) (.05)	1.72
2009 (46.9 – 9.36 – 3.74 – 1.72) (.03)	.96
Total Residual N over 5 years from first application of 30,000 gallons	15.78

RESIDUAL PLANT AVAILABLE NITROGEN CEREAL RYE/BERMUDA @ 80,000 GALLONS PER ACRE PER YEAR

1. 2005

   Cereal Rye October-March Needs 60 lbs N

   a. Application Rate @ 20,000 gallons per acre
   b. Total Organic Nitrogen @ 2.6 lbs per 1000 gallons — 52 lbs
   c. PAN @ 40 % — 20.8 lbs
   d. Carry over N to be mineralized — 31.2 lbs
   e. Additional N needed — 39.2lbs

   Coastal Bermuda April-September Needs 200 lbs N

   a. Application Rate @ 60,000 gallons per acre
   b. Total Organic Nitrogen @ 2.6 lbs per 1000 gallons — 156 lbs
   c. PAN @ 40% — 62.4 lbs
   d. Carry over N to be mineralized — 93.6 lbs
   e. Additional N needed — 37.6 lbs

2. 2006

   Cereal Rye October-March Needs 60 lbs N

   a. Application Rate @ 20,000 gallons per acre
   b. Total Organic Nitrogen @ 2.6 lbs per 1000 gallons — 52 lbs
   c. PAN @ 40 % — 20.8 lbs
   d. Carry over N to be mineralized — 31.2 lbs
   e. Residual N from Year 1 @ 20 % — 6.24 lbs
   f. Total PAN — 27.04 lbs
   g. Additional N needed — 32.96 lbs

Coastal Bermuda April-September Need 200 lbs N

a. Application Rate @ 60,000 gallons per acre	
b. Total Organic Nitrogen @ 2.6 lbs. Per 1000	156 lbs
c. PAN @ 40 %	62.4 lbs
d. Carry over N to be mineralized	93.6 lbs
e. Residual N from year 1 @ 20 %	18.72 lbs
f. Total PAN from septage	81.12 lbs
g. Additional N needed	18.88 lbs

3. 2007

Cereal Rye October – March Needs 60 lbs N

a. Application Rate @ 20,000 gallons per acre	
b. Total Organic Nitrogen @ 2.6 lbs per 1000 gallons	52 lbs
c. PAN @ 40 %	20.8 lbs
d. Carry over N to be mineralized	31.2 lbs
e. Residual N from year 1 @ 10 %	2.50 lbs
f. Residual N from year 2 @ 20 %	6.24 lbs
g. Total PAN from septage	29.54 lbs
h. Additional N needed	30.46 lbs

Coastal Bermuda April – September Needs 200 lbs of N

a. Application Rate @ 60,000 gallons per acre	
b. Total Organic N @ 2.6 lbs per 1000 gallons	156 lbs
c. PAN @ 40 %	62.4 lbs
d. Carry over N to be mineralized	93.6 lbs
e. Residual N from year 1 @ 10 %	7.48 lbs
f. Residual N from year 2 @ 20 %	18,72 lbs
g. Total PAN from septage	88.60 lbs
h. Additional Commercial N needed	111.4 lbs

4. 2008

Cereal Rye October – March Need 60 lbs N

a. Application Rate @ 20,000 gallons per acre	
b. Total Organic N 2.6 lbs per 1000 gallons	52 lbs
c. PAN @ 40 %	20.8 lbs
d. Carry over N to be mineralized	31.2 lbs
e. Residual N from year 1 @ 5 %	1.12 lbs
f. Residual N from year 2 @ 10 %	2.50 lbs

g. Residual N from Year 3 @ 20 % 6.24 lbs
h. Total PAN from septage 30.66 lbs
i. Additional N needed 29.34 lbs

Coastal Bermuda April – September Need 200 lbs N
a. Application Rate @ 60,000 gallons per acre
b. Total Organic N @ 2.6 lbs per 1000 gallons 156 lbs
c. PAN @ 40 % 62.4 lbs
d. Carry over N to be mineralized 93.6 lbs
e. Residual N from Year 1 @ 5 % 3.37 lbs
f. Residual N from Year 2 @ 10 % 7.48 lbs
g. Residual N from Year 3 @ 20 % 18.72 lbs
h. Total PAN from septage 91.97 lbs
i. Additional N needed 108.03 lbs

5. 2009
Cereal Rye October – March Need 60 lbs N
a. Application Rate @ 20,000 gallons per acre
b. Total Organic N @ 2.6 lbs pr 1000 gallons 52 lbs
c. PAN @ 40 % 20.8 lbs
d. Carry over N to be mineralized 31.2 lbs
e. Residual N from Year 1 @ 3 % .63 lbs
f. Residual N from Year 2 @ 5 % 1.12 lbs
g. Residual N from year 3 @ 10 % 2.50 lbs
h. Residual N from year 4 @ 20 % 6.24 lbs
i. Total PAN from septage 31.29 lbs
j. Additional N needed 28.71 lbs

Coastal Bermuda April – September Need 200 lbs N
a. Application Rate @ 60,000 gallons per acre
b. Total Organic N @ 2.6 lbs per 100 gallons 156 lbs
c. PAN @ 40 % 62.4 lbs
d. Carry over N to be mineralized 93.6 lbs
e. Residual N from year 1 @ 3 % 1.91 lbs
f. Residual N from year 2 @ 5 % 3.37 lbs
g. Residual N from year 3 @ 10 % 7.48 lbs
h. Residual N from year 4 @ 20 % 18.72 lbs

i. Total PAN from septage 93.88 lbs
j. Additional N needed 106.12 lbs

RESIDUAL PLANT AVAILABLE NITROGEN LONG LEAF PINE @ 30,000 GALLONS PER ACRE PER YEAR

1. 2005

   a. Total Organic Nitrogen 78 lbs
   b. PAN @ 40 % 31.20 lbs
   c. Carry over N to be mineralized 46.80 lbs

2. 2006

   a. Total Organic Nitrogen 78 lbs
   b. PAN @ 40 % 31.20 lbs
   c. Carry over N to be mineralized 46.80 lbs
   d. Residual N from Year 1 @ 20 % 9.36lbs
   e. Total PAN 40.56 lbs

3. 2007

   a. Total Organic Nitrogen 78 lbs
   b. PAN @ 40 % 31.20 lbs
   c. Carry over N to be mineralized 46.80 lbs
   d. Residual N from Year 1 @ 10 % 3.74 lbs
   e. Residual N from Year 2 @ 20 % 9.36 lbs
   f. Total PAN 44.30 lbs

4. 2008

   a. Total Organic Nitrogen 78 lbs
   b. PAN @ 40 % 31.20 lbs
   c. Carry over N to be mineralized 46.80 lbs
   d. Residual N from year 1 @ 5 % 1.72 lbs
   e. Residual N from year 2 @ 10 % 3.74 lbs
   f. Residual N from year 3 @ 20 % 9.36 lbs
   h. Total PAN from septage 46.02 lbs

5. 2009

   a. Total Organic Nitrogen 78 lbs
   b. PAN @ 40 % 31.20 lbs
   c. Carry over N to be mineralized 46.80 lbs

d. Residual N from year 1 @ 3 %	.96 lbs
e. Residual N from year 2 @ 5 %	1.72 lbs
f. Residual N from year 3 @ 10 %	3.74 lbs
g. Residual N from year 4 @ 20 %	9.36 lbs
h. Total PAN from septage	46.98 lbs

G. Additional Fertility Requirements

1. Cereal Rye: Soil samples will be taken each fall. Any nutrient needs other than nitrogen will be applied according to soil analysis recommendation. Crops will be monitored for nitrogen and other nutrient needs through plant tissue analysis. If there is a shortage of any nutrient we will use commercial sources of fertilizer to provide needed nutrients.

2. Bermuda: Soils samples will be taken each summer. Any nutrient needs other than nitrogen will be applied according to soils analysis recommendation. Crops will be monitored for nitrogen and other nutrient needs through plant tissue analysis. If there is a shortage of any nutrient we will use commercial sources of fertilizer to provide needed nutrients.

3. Boarders: All boarders will be maintained with commercial fertilizers. Rye will be planted on all boarders for winter cover.

4. Soil pH will be kept at or above 6.0

5. Long leaf Pines: Soil samples will be taken each fall. Any nutrient needs other than nitrogen will be applied according to soil analysis recommendation. No additional nitrogen will be applied.

F. Harvest of crops and their use (a 30 day waiting period will be observed between the last application of septage and the first day of harvest date). Both the Cereal Rye and Bermuda will be cut for hay and feed to cattle. Depending upon the weather this plan calls for one (1) cutting of Rye in the spring and two (2) cuttings of Bermuda in the summer and Early fall. Long leaf pines will be managed and harvested with the assistance of a certified forester.

G. Planting and Seeding Rates: The site has established coastal Bermuda. We will keep an 80 % stand of Bermuda. In any area that does not have an 80% stand we will re-sprig with 35 bushels of Bermuda per acre. Cereal Rye will be over seeded at 3 bushels per acre with a no-till drill each fall after the last harvest of Bermuda. Long leaf pines will maintain a stem count of 400 stems per acre to be considered as a full stand of trees.

H. Erosion Plan: Given that slopes on this site do not exceed five percent, the 50 foot buffer planted in Bermuda/Cereal Rye or Long leaf pines should suffice to prevent septage waste from migrating off of the fields. Each application event will be applied at hydrological rates to allow for soil absorption and prevent run off. Annual high water table for the Tarboro is greater than 6 feet therefore there should be no problem with any seasonal high water tables.

Site Operator: Date John W. Durham 11-21-04

Plan Prepared By: Date John W. Durham 11-21-04

Address: 2115 Hwy 55 West New Bern, N.C. 28562

Phone: (252) 633-5334

Phone: (252)670-8530
mobile

Parcels mapped as of October 30, 2003 AS400 Year: 2004

SOILS
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FEET

CRAVEN COUNTY DOES NOT WARRANT THE INFORMATION SHOWN ON THIS MAP AND SHOULD BE USED ONLY FOR TAX ASSESSMENT PURPOSES. PRINTED OCTOBER 30, 2003

SLAS 2509
Craven Ag Services Inc.
50 ft Buffer
Pine Plantation
6.85 acres
Bermuda Field
4.34 acres
N
W
E
S

Craven
AG SERVICES, INC.
2115 Hwy 55 West New Bern, NC 28562

BILLY DUNHAM, PRESIDENT
OFFICE – 252-633-5334
CELL- 252-670-8530

Mr. Mike Scott
Division Of Solid Waste
P O Box 27687
Raleigh NC 27611

Enclosed please find:

Modified nutrient plan for the four Roach sites.

The new Affidavits for the public notices for Roach, Jones, and Dunham sites.

I decided to leave the Dunham site nutrient plan as is.

Received
JUL 2006
Solid Waste Section

APPLICATION FOR A PERMIT TO APPLY SEPTAGE ON LAND

North Carolina Department of Environment and Natural Resources
Division of Waste Management – Solid Waste Section
401 Oberlin Rd., Ste. 150, Raleigh, N.C. 27605

I. Site and Operator Information

1. Operator Address: 2115 HWY 55 WEST
NEW BERN N.C. 28562

   Phone: 252-633-5334 252-670-8530

2. Landowner Address: John W. & Jene H. Dunham

3. Site Location: County Craven State Road Number 1400
   Directions to site: See Attachment 1 & for ESS soils survey Report

4. Indicate whether request is: new ✓ renewal____ modification____
   For a permit renewal or modification indicate, give the following infromation:
   Existing Site Permit Number:____ and, expiration date:____

5. Number of acres meeting the requirements of the N.C. Septage Management Rules:
   1.65 acres.

6. Substances other than septage or grease trap pumpings previously disposed of at this location:
   (a) None ✓, or (b) Attach a list indicating other substances, the amounts discharged, and the dates of discharge.

7. Attach written, notarized landowner authorization to operate a septage disposal site signed by the landowner (if the permit applicant does not own the property). Applicant owns property

8. Attach site evaluation report, including aerial photograph and soil analysis results, unless prepared by the Division. ✓

9. Attach a vicinity map (county road map showing site location). ✓

II. Site Management Information:

The following information shall be included with the application form:

1. Nutrient Management Plan. ✓

2. Soil erosion and run-off control plan. ✓

3. Alternative plan for disposal (detention facility permit number or wastewater treatment plant authorization): 100,000 gallons of storage

4. Types of septage proposed to be discharged at the site (check all that apply).
   (a) Domestic septage pumped from septic tanks ✓
   (b) Grease trap pumpings ✓
   (c) Portable toilet waste ✓
   (d) Commercial / Industrial septage ✓

5. Proposed treatment method of each type of septage to be land applied (use additional paper to explain if necessary): See Attachment II

6. Proposed method of applying septage to land, including septage distribution plan if required * (use additional paper to explain if necessary: See Attachment II

7. Demonstration from the appropriate state or federal government agency that the land application site complies with the Endangered Species Law ** or if any part of the site specified is not agricultural land (use additional paper to explain if necessary): All ag land

III. Certification

I hereby certify that:

1. The information provided on this application is true, complete, and correct to the best of my knowledge.
2. I have read and understand the N.C. Septage Management Rules, and
3. I am aware of the potential consequences, including penalties and permit revocation, for failing to follow all applicable rules and the conditions of a Septage Land Application Site permit.

John W. Durham — Permit Applicant

4-27-06 — Date

Note: This application will not be reviewed until all parts of the application are complete.

*** Refer to Section .0821(e) of the NC Septage Management Rules.**
**** Refer to Section .0821(g) of the NC Septage Management Rules.**

ATTACHMEENT II

5. **PROPOSED TREATMENT METHOD:** Septage and Grease will be pumped from the pumper trucks into a receiving tank. From the receiving tank it will inter a Maximizer for screening of trash and some septage and grease solids. The liquid will flow to a 1500 gallon receiving tank where it is transferred by a three (3) inch pump into one of five holding tanks. We have 100,000 gallons of storage capacity. When we have enough septage/grease to cover one application site we began preparing it for land application. Each storage tank has two three inch houle pumps which are used for mixing. When we get ready to land apply the septage/grease we add enough hydrate lime to the tank of septage and grease to bring the ph up to 12. We hold the ph at 12 for two hours. Once we have met the ph requirements we transfer septage/grease to 6,000 gallon tankers and carry them to the application site.

6. **PROPOSED METHOD OF APPLYING SEPTAGE TO LAND:** Once the tankers are loaded they are carried to the application site where the septage/grease is transferred to a vacuum applicator. As the applicator moves across the field it discharges the septage/grease evenly to the surface of the land in such a manner as to have no standing liquid or soil disturbance resulting from the waste flow after the discharge is complete.

During the screening process the trash and solids are deposited in bags. When the bags are full they are carried to the landfill for disposal.

Environmental and Soil Service, Inc.

P.O. 82
Pinetops, N.C 27864
Ph (252) 827-4348
Fax (252) 827-1382

ESS

March 20, 2006

Billy Dunham
Craven Ag Services, Inc.
2115 Hwy 55 West
New Bern, NC 28562

Subject: Soil information for six proposed septage application sites located in Craven County, NC.

Dear Billy:

As requested, I have evaluated six locations to determine suitability of the soils for the land application of septage. The soils were evaluated using the Septage Management 0.800 Rules as a reference. Soils were analyzed and mapped by observing soil samples from hand augured borings.

Please find enclosed

1. Five vicinity maps (USGS Topo Maps) showing the location of each site
2. Three Craven County Soil Survey maps that show the location of each site
3. Six maps with aerial photo overlay that show the proposed septage application fields

Most of the usable soils (soil "A" on the enclosed maps) on the ~~Rouse~~ Roach Tract, Rouse Tract (Field 1), ~~Rouse~~ Roach Tract (Field 2), Jones Tract and Dunham Tract were typical of the Tarboro soil series. The soils shown as soil group "A" have group 1 (sand) soils to a depth of least 36 inches. The seasonal soil wetness condition in areas designated "A" was found at a depth of a least 36 inches based on soil color. There were minor inclusions of soils that had sandy clay loam texture in the subsoil (group 2) and seasonal soil wetness conditions as shallow as 24 inches. These soils are shown as "A1" on the enclosed maps. The soil on the Kirkman Tract was typical of the Conetoe and Wagram soil series. The texture of the subsoil on the Kirkman tract ranged from sandy loam to sandy clay loam (group 2) and the seasonal soil wetness condition was greater than 36 inhces over the entire usable area. The landscape on each site was gently rolling with slopes ranging from 0 to 4%. The usable areas on each site were in convex landscape positions. Each site was an agricultural field at the time of this investigation. Only the Dunham tract had any vegetation, which was in the form of Rye Grass.

The soils designated "B" on the enclosed maps were unsuitable for septage application due to the presence of a seasonal soil wetness condition at less than 36 inches from the soil surface in group 1 (sand or loamy sand texture) and less than 24 inches in group 2 (sandy loam and sandy clay loam texture). Soil color and morphological features were used in the field to determine the depth to the soil wetness condition. Several tracts had ditches that have affected the soil wetness condition. The ditches in many cases have lowered the soil wetness condition. The actual effect of the ditches on the soil wetness condition to determine if the standards for application of septage is

difficult to determine without monitoring and possibly modeling the water table in the area of the ditches. On most of the tracts the affect of the ditches on the water table would not come into play due to the fact that most of the unsuitable soil lie within 100' of the ditches; however on the Rouse Tract (Field 1) it appears there may be an area that can be used due to the effect of drainage. The area designated "A/B" on Rouse Tract (Field 1) has a group 1 soils and the seasonal soil wetness condition is about 30 inches below the surface. Due to the proximity of the parallel ditches to the proposed application area and the landscape position, I feel certain the seasonal soil wetness condition has been lowered to a depth of least 36 inches. Therefore, I am recommending the area designated "A/B" be included in the septage application area.

Designated soil borings were used for soil descriptions in each field. The location of these borings is shown on the enclosed soil/aerial maps. The following are soil description taken from each of the borings.

Roach Tract, B1

Ap – 0 to 5 inches; dark olive brown (2.5Y 3/3) loamy sand/sand; very friable; granular
C1 – 5 to 50 inches; dark yellowish brown (10YR 4/6) sand; loose; single grained
C2 – 50 to 60 inches; yellowish brown (10YR 5/6) sand; common, fine, distinct reddish yellow (7.5YR 7/6) mottles; loose; single grained

Note: Seasonally saturated soil condition greater than 60 inches based on the presence of chroma 2 mottles.

Roach ~~Rouse~~ Tract, B2

Ap – 0 to 8 inches; black (10YR 2/1) loamy sand; very friable; granular
C1 – 8 to 28 inches; black (2.5Y 2.5/1) loamy sand; very friable; granular
C2 – 28 to 48 inches; dark gray (10YR 4/1) loamy sand; very friable; weak subangular blocky

Note: Seasonally saturated soil condition less than 12 inches based on the presence of chroma 2 soil color.

Roach ~~Rouse~~ Tract Field 1, B1

Ap – 0 to 3 inches; olive brown (2.5Y 4/4) loamy sand; very friable; granular
C1 – 3 to 15 inches; yellowish brown (10YR 5/6) fine sand; loose, single grained
C2 – 15 to 30 inches; light yellowish brown (2.5Y 6/4) fine sand; loose; single grained
C3 – 30 to 46 inches; brownish yellow (10YR 6/6) sand; loose; single grained
C4 – 46 to 60 inches; yellowish brown (10YR 5/6) fine sand; common, fine, distinct strong brown (7.5YR 5/6) and few, medium, distinct light brownish gray (2.5Y 6/2) mottles; very friable; massive

Note: Seasonally saturated soil condition at 46 inches based on the presence of chroma 2 mottles.

Roach ~~Rouse~~ Tract Field 1, B2

Ap – 0 to 6 inches; very dark gray (10YR 3/1) loamy sand; very friable; granular
C1 – 6 to 15 inches; olive brown (2.5Y 4/3) fine sand; loose; single grained
C2 – 15 to 20 inches; light olive brown (2.5Y 5/3) fine sand; loose; single grained
C3 – 20 to 24 inches; light yellowish brown (2.5Y 6/3) fine sand; loose; single grained
C4 – 24 to 48 inches; light yellowish brown (2.5Y 6/3) fine sand; dark grayish brown (10YR 4/2) streaks; loose; single grained

C5 – 48 to 60 inches; light brownish gray (2.5Y 6/2) loamy sand/sandy loam; dark grayish brown (10YR 4/2) streaks; friable; weak subangular blocky

Note: Seasonally saturated soil condition at 24 inches based on the presence of chroma 2 mottles.

Roach ~~Rouse~~ Tract Field 2, B1

Ap – 0 to 2 inches; light olive brown (2.5Y 5/4) loamy sand; very friable; granular
C1 – 2 to 26 inches; yellowish brown (10YR 5/6) fine sand; loose; single grained
C2 – 26 to 38 inches; brownish yellow (10YR 6/6) sand; loose; single grained
C3 – 38 to 45 inches; yellow (2.5Y 7/6) sand; dark brownish gray (10YR 4/2) streaks; loose; single grained
C4 – 45 to 60 inches; yellowish brown (10YR 5/6) sand; yellow (2.5Y 7/6) and dark brownish gray (10YR 4/2) mottles; loose; single grained

Note: Seasonally saturated soil condition at 38 inches based on the presence of chroma 2 mottles.

~~Jones~~ Tract, B1 [redacted]

Ap – 0 to 4 inches; dark grayish brown (2.5Y 4/2) loamy sand; very friable; granular
C1 – 4 to 18 inches; light olive brown (2.5Y 5/4) fine sand; loose; single grained
C2 – 18 to 30 inches; light yellowish brown (2.5Y 6/4) fine sand; loose; single grained
C3 – 30 to 37 inches; mottled light yellowish brown (2.5Y 6/4), brownish yellow (10YR 6/6) and pale yellow (2.5Y 7/3) fine sand; loose; single grained
C4 – 37 to 44 inches; pale yellow (2.5Y 7/3) sand; loose; single grained
C5 – 44 to 53 inches; olive yellow (2.5Y 6/6) sand; common, medium, distinct yellowish brown (10YR 5/8) mottles; loose; single grained
C6 – 53 to 60 inches; brownish yellow (10YR 6/6) sandy loam; common, medium, distinct light brownish gray (10YR 6/2) mottles; very friable; weak subangular blocky

Note: Seasonally saturated soil condition at 53 inches based on the presence of chroma 2 mottles.

Dunham Tract, B1

Ap – 0 to 5 inches; dark olive brown (2.5Y 3/3) loamy sand; very friable; granular
C1 – 5 to 28 inches; light olive brown 92.5Y 5/4) fine sand; very friable; granular
C2 – 28 to 42 inches; yellowish brown (10YR 5/6) sand; loose; single grained
C3 – 42 to 54 inches; yellowish brown (10YR 5/6) sand; common, medium, distinct strong brown 97.5YR 4/6) and light gray (10YR 7/2) mottles; loose; single grained

Note: Seasonally saturated soil condition at 42 inches based on the presence of chroma 2 mottles.

~~Kirkman~~ Tract, B1 Backed out

Ap – 0 to 8 inches; olive brown (2.5Y 4/4) loamy sand; very friable; granular
B – 8 to 16 inches; yellowish brown (10YR 5/6) loamy sand; very friable; weak subangular blocky
Bt – 16 to 28 inches; strong brown (7.5YR 4/6) sandy clay loam; friable; weak subangular blocky
C1 – 28 to 42 inches; yellowish brown (10YR 5/6) loamy sand; very friable; weak subangular blocky

C2 – 42 to 54 inches; yellowish brown (10YR 5/8) sand; loose; single grained

Note: Seasonally saturated soil condition at +54 inches based on the presence of chroma 2 mottles.

Kirkman Tract, B2 Backed out

Ap – 0 o 6 inches; olive brown (2.5Y 4/3) loamy sand; Very friable; granular
E – 6 to 13 inches; light olive brown (2.5Y 5/4) loamy sand/sandy loam; very friable; weak subangular blocky
Bt – 13 to 40 inches; yellowish brown (10YR 5/6) sandy clay loam; friable; weak subangular blocky
C1 – 40 to 50 inches; olive yellow (2.5Y 6/8) fine sand; very friable; weak subangular blocky
C2 – 50 to 55 inches; olive yellow (2.5Y 6/8) sand; loose; single grained.

Note: Seasonally saturated soil condition at +55 inches based on the presence of chroma 2 mottles.

If you have any questions, please contact me at 252-827-4348.

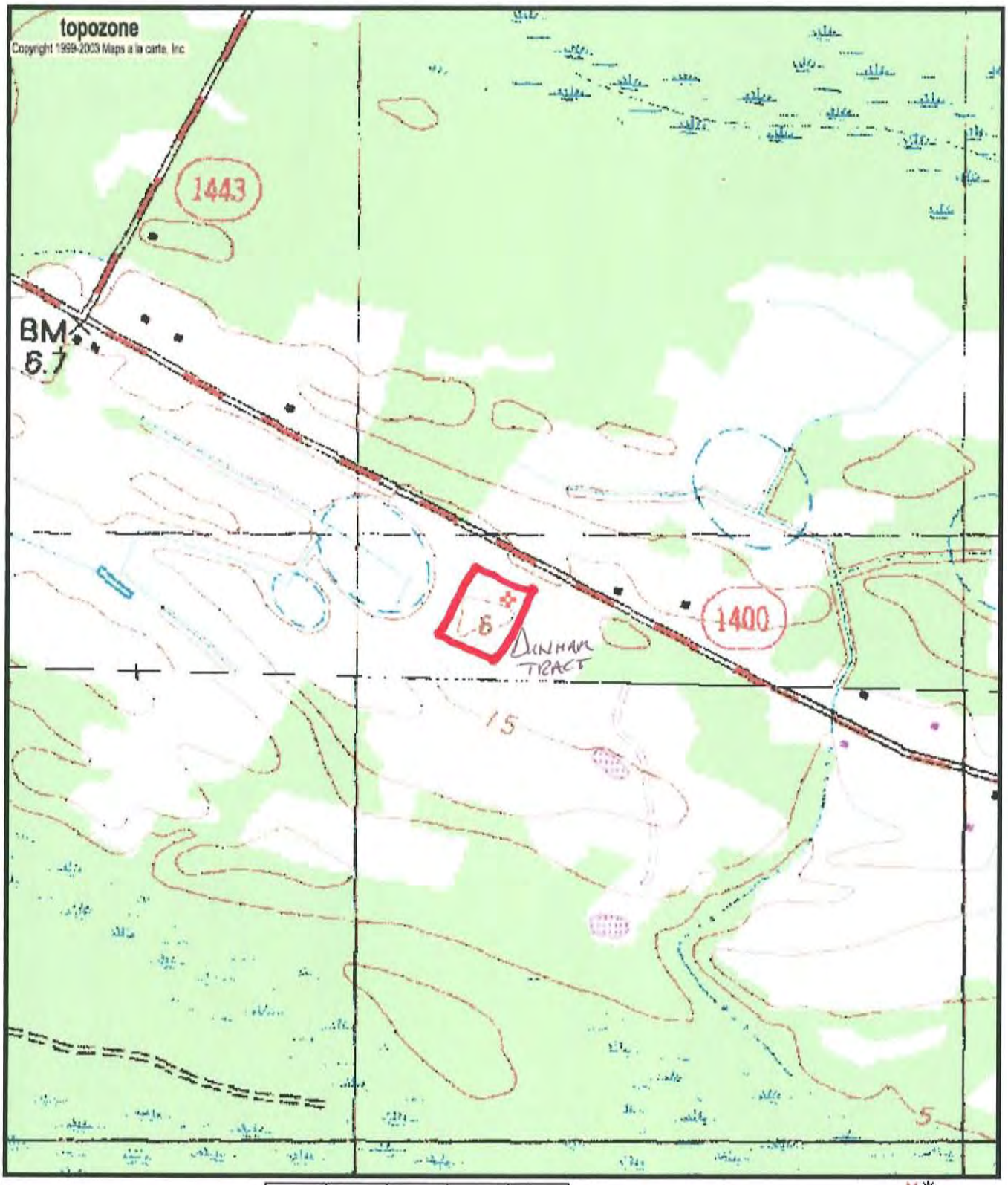
Respectfully Submitted,

LICENSED SOIL SCIENTIST
E. SCOTT STONE
1038
STATE OF NORTH CAROLINA

Scott Stone
Licensed Soil Scientist
Registered Sanitarian

Enclosures

1976-1-06



0 0.1 0.2 0.3 0.4 0.5 km

0 0.09 0.18 0.27 0.36 0.45 mi

Map center is 35° 15' 05"N, 77° 11' 03"W (WGS84/NAD83)
Vanceboro quadrangle
Projection is UTM Zone 18 NAD83 Datum

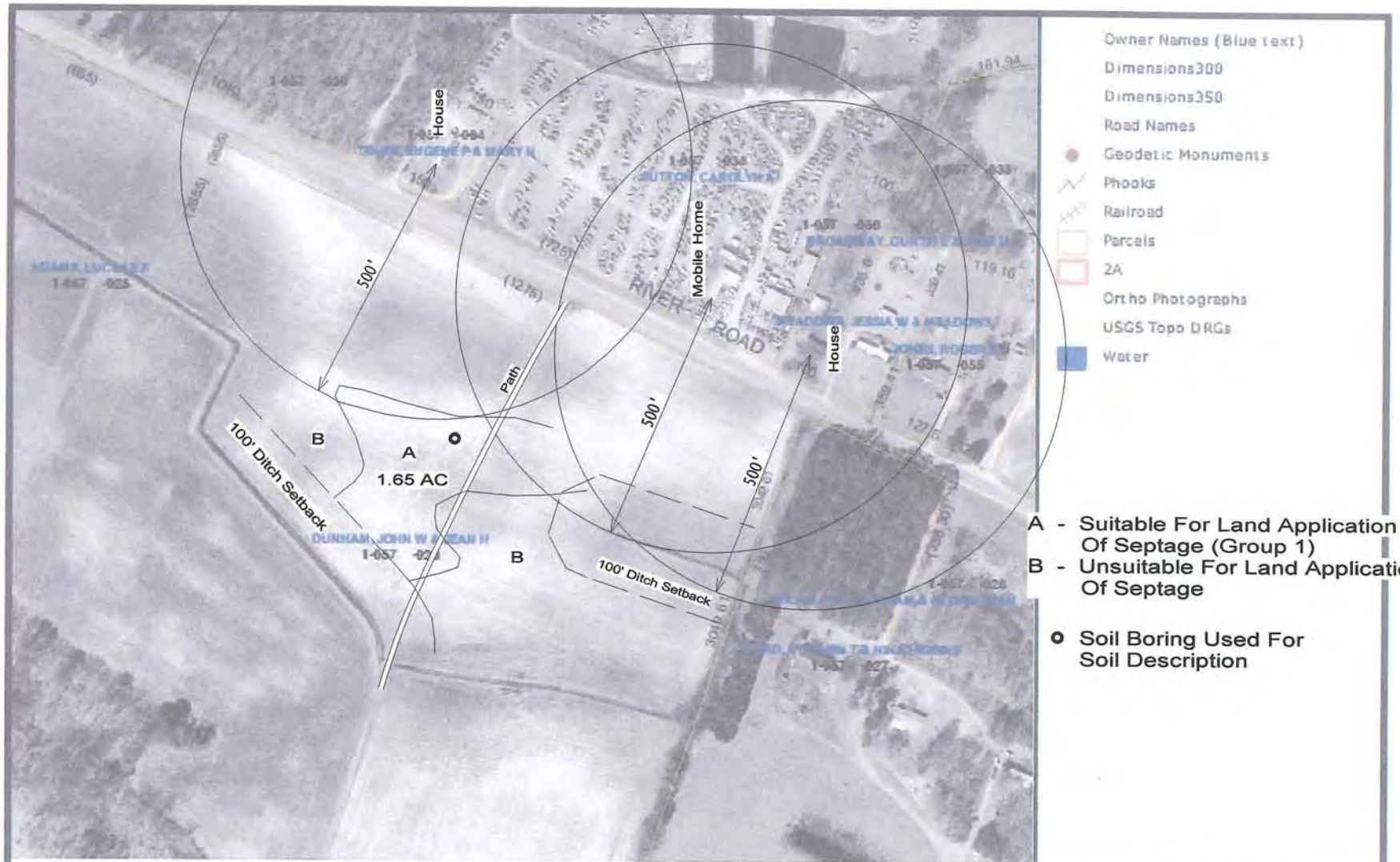
M*
M=-9.737
G=-1.261

Dunham Site

(Joins sheet 3)
NEUSE
RIVER
Taylor Creek
Creek
Greens
Theodore
Jasper
1400
1441
1401
1426
1425
1424
55

Craven Ag Services
Soil Map For Septage Application Site

LAYOUT



A - Suitable For Land Application Of Septage (Group 1)

B - Unsuitable For Land Application Of Septage

o Soil Boring Used For Soil Description

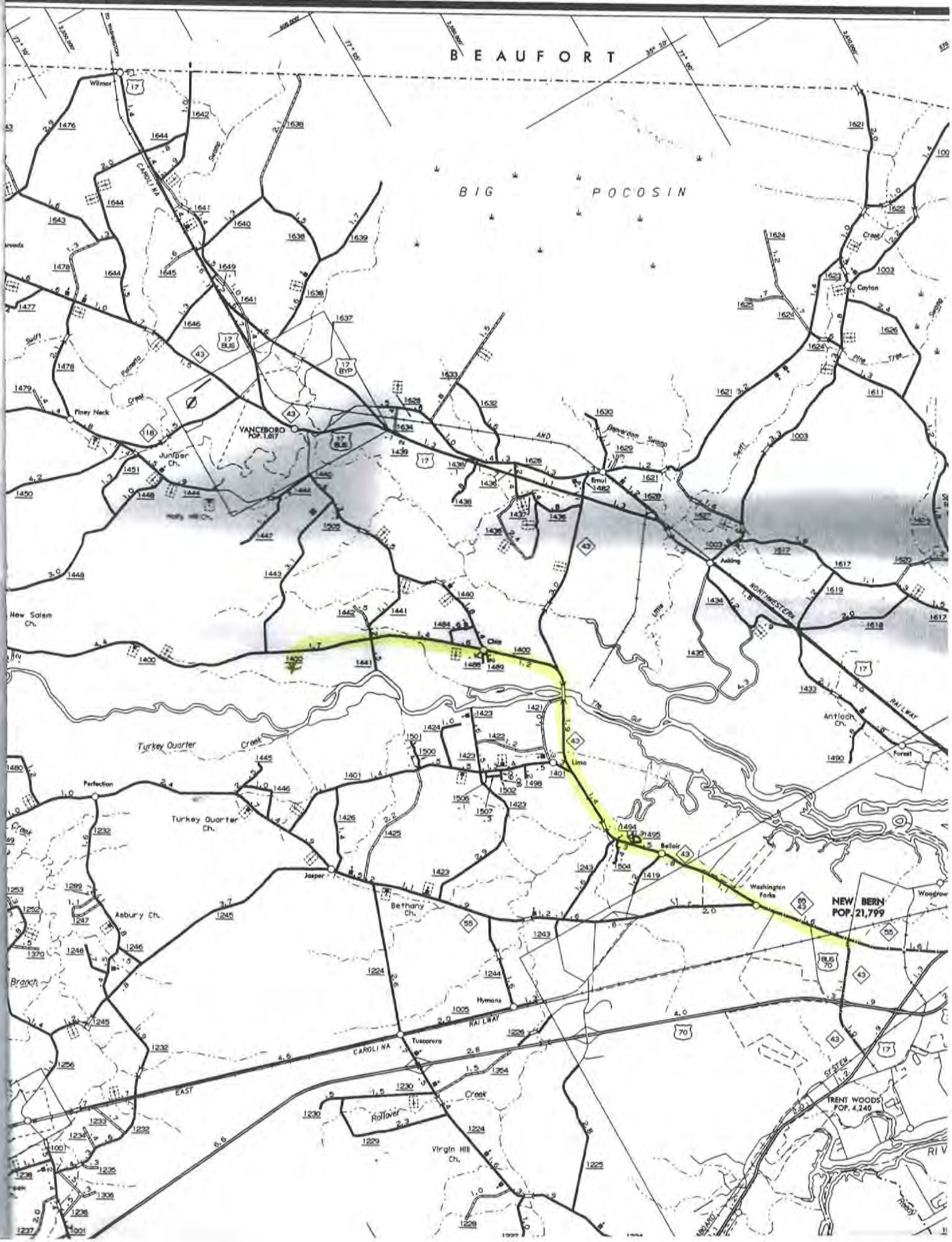
Environmental & Soil Service, Inc.
P.O. Box 82
Pinetops, NC 27864

Dunham Tract

CRAVEN COUNTY
NORTH CAROLINA

0 300 ft

c:\qppro11\976-1d.pla 03-17-2006


BEAUFORT
BIG POCOSIN
Wilmar
Piney Neck
Juniper Ch.
VANCEBORO POP. 1,017
New Salem Ch.
Turkey Quarter Creek
Perfection
Turkey Quarter Ch.
Asbury Ch.
Jasper
Bethany Ch.
Tuscarora
Hymans
Rollover Creek
Virgin Hill Ch.
Clio
Lima
Bellair
Washington Forks
NEW BERN POP. 21,799
Woodrow
TRENT WOODS POP. 4,240
Coxton
Antioch Ch.
Forest
Ernul
Dawson Swamp
CAROLINA EAST RAILWAY
NORTHWESTERN RAILWAY
SYSTEM

NCDA&CS Agronomic Division Phone: (919)733-2655 Web Site: www.ncagr.com/agronomi/ Report No: 30955

Soil Test Report

4/24/2006

SERVING N.C. RESIDENTS FOR OVER 60 YEARS

Grower: **Craven Ag Service**
ATTN: Mike Carrol
2115 Hwy 55 West
New Bern, NC 28562

Farm: **Craven County**

Copies To:

Agronomist Comments

C -- 12, 3, $

The heavy metal report is found on a separate page. Using Mehlich 3 as a soil test extractant, background levels of these metals typically seen in NC soils when analyzed are as follows: arsenic (As)- 5.0 ppm, cadmium (Cd)- 0.2 ppm, chromium (Cr)- 0.3 ppm, lead (Pb)- 4.0 ppm, nickel (Ni)- 0.7 ppm, & selenium (Se)- 0.2 ppm (FY2003-2005). Although the above metals here are not believed to pose a concern for plant growth, continue to monitor these and note where elevated above background levels.

Note any lime and fertilizer recommendations. Where soil test phosphorus (P) is very high (P-I > 100), crops will not respond to additional P applied.

David H. Hardy, Agronomist

Field Information		Applied Lime			Recommendations													
Sample No.	Last Crop	Mo	Yr	T/A	Crop or Year		Lime	N	P2O5	K2O	Mg	S	Cu	Zn	B	Mn	See Note
CA1	Roach				1st Crop:	Millet ~~Bermu Hay/Pas~~,M	.9T	180-220	0	150-170	0	0	0	0		0	12
					2nd Crop:							0					

Test Results

Soil Class	HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-AI(1)	Mn-AI(2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO3-N	NH4-N	Na
MIN	0.66	1.50	3.8	74.0	1.0	5.9	218	29	59.0	11.0	53	41		130	130	40	27				0.1

Field Information		Applied Lime			Recommendations													
Sample No.	Last Crop	Mo	Yr	T/A	Crop or Year		Lime	N	P2O5	K2O	Mg	S	Cu	Zn	B	Mn	See Note
CA2	Roach Tract 2				1st Crop:	Millet ~~Milo (Grain~~ Sorg)	0	80-100	0	80-100	0	20-25	0	0	.0	0	3
					2nd Crop:							20-25					

Test Results

Soil Class	HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-AI(1)	Mn-AI(2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO3-N	NH4-N	Na
MIN	0.92	1.43	3.7	70.0	1.1	5.9	96	25	54.0	12.0	48	47		55	55	39	23				0.1

Field Information		Applied Lime			Recommendations													
Sample No.	Last Crop	Mo	Yr	T/A	Crop or Year		Lime	N	P2O5	K2O	Mg	S	Cu	Zn	B	Mn	See Note
CA3	Roach Tract 1				1st Crop:	Millet ~~Bermu Hay/Pas~~,M	1.5T	180-220	0	150-170	$	0	$	0		0	12
					2nd Crop:							0					

Test Results

Soil Class	HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-AI(1)	Mn-AI(2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO3-N	NH4-N	Na
MIN	0.81	1.49	2.9	45.0	1.6	5.3	117	29	34.0	8.0	30	27		28	28	23	28				0.1

Field Information	Applied Lime			Recommendations													
Sample No.	Last Crop	Mo	Yr	T/A	Crop or Year		Lime	N	P2O5	K2O	Mg	S	Cu	Zn	B	Mn	See Note
CA4	Jones				1st Crop:	Millet ~~Berm Hay/Pas,M~~	.3T	180-220	10-30	170-190	0	20-25	$	$		0	12
					2nd Crop:							20-25					

Test Results

Soil Class	HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-AI(1)	Mn-AI(2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO3-N	NH4-N	Na
MIN	0.41	1.53	2.8	82.0	0.5	6.3	54	24	61.0	17.0	40	33		24	24	22	19				0.0

Field Information	Applied Lime			Recommendations													
Sample No.	Last Crop	Mo	Yr	T/A	Crop or Year		Lime	N	P2O5	K2O	Mg	S	Cu	Zn	B	Mn	See Note
CA5	Durham				1st Crop:	Millet ~~Berm Hay/Pas,M~~	0	180-220	0	100-120	0	0	0	0		pH$	12
					2nd Crop:							0					

Test Results

Soil Class	HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-AI(1)	Mn-AI(2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO3-N	NH4-N	Na
MIN	1.02	1.48	5.5	89.0	0.6	6.8	162	51	69.0	16.0	46	32		168	168	51	27				0.1

Field Information	Applied Lime			Recommendations													
Sample No.	Last Crop	Mo	Yr	T/A	Crop or Year		Lime	N	P2O5	K2O	Mg	S	Cu	Zn	B	Mn	See Note
CA6	Kirkman				1st Crop:	Millet ~~Milo (Grain Sorg)~~	.8T	80-100	0	30-50	0	0	0	0	.0	0	3
					2nd Crop:							0					

Test Results

Soil Class	HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-AI(1)	Mn-AI(2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO3-N	NH4-N	Na
MIN	0.56	1.48	3.4	59.0	1.4	5.2	330	48	40.0	12.0	146	105		86	86	88	40				0.1

Field Information	Applied Lime			Recommendations													
Sample No.	Last Crop	Mo	Yr	T/A	Crop or Year		Lime	N	P2O5	K2O	Mg	S	Cu	Zn	B	Mn	See Note
CAB1					1st Crop:	Berm Hay/Pas,E	.8T	60-80	0	0-20	$	0	0	0		0	12
					2nd Crop:							0					

Test Results

Soil Class	HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-AI(1)	Mn-AI(2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO3-N	NH4-N	Na
MIN	1.19	1.41	5.6	82.0	1.0	6.2	193	71	67.0	9.0	65	48		128	128	65	27				0.1

Heavy Metal Soil Test Report

MEHLICH-3 EXTRACTION

Craven Ag Service
ATTN: Mike Carrol
2115 Hwy 55 West
New Bern, NC 28562
Craven County

Report #: 30955

Questions concerning these analyses should be referred to the Agronomic Division, Soil Testing

Sample ID	*Cd Cadmium*	*Ni Nickel*	*P b Lead*	*Se Selenium*	*Cr Chromium*	*As Arsenic*	*Al Aluminum*	*Fe Iron*
	mq/dm3 (ppm)							
CA4	0.10	0.50	0.00	0.50	0.20	4.00	785.30	116.50
CA3	0.10	1.20	0.00	0.40	0.20	5.10	945.30	134.70
CA6	0.10	1.10	2.90	0.00	0.40	6.50	1,252.00	181.80
CA2	0.10	1.00	0.00	0.00	0.10	6.30	1,107.00	108.70
CA1	0.00	1.00	0.80	0.60	0.20	6.60	1,237.00	147.20
CA5	0.10	0.40	3.30	1.00	0.20	6.20	1,041.00	114.90
CAB1	0.10	1.30	0.00	0.20	0.20	5.40	1,140.00	136.80

Attachment 15. Proposed Monitoring Well Location Map (Waters Edge Environmental)

See separate Water Quality Monitoring Plan, Doc ID 20787

Attachment 16. Craven Soil and Water Conservation District Letter (Baker)

Craven Soil and Water Conservation District
302 Industrial Drive - New Bern, NC 28562 - Phone (252) 637-2547 - Fax (252) 514-2009

August 9, 2011

John W. "Billy" Dunham
2115 Hwy 55 W
New Bern, NC 28562

Billy,

We have reviewed the ditch on your property located off of River Road (parcel # 1-057-026) to determine its potential for being a perennial/intermediate (Blue Line) stream. Based on our review of the USGS topographic map and the printed NRCS soil survey map, a small portion of this ditch, approximately 377', where it outlets your property, appears as a blue line stream on the topographical map. The remainder of this ditch does not appear on either map as a blue line stream. Please note that this is not an official stream determination. You should contact the NC Division of Water Quality at 252-946-6481 for an official determination.

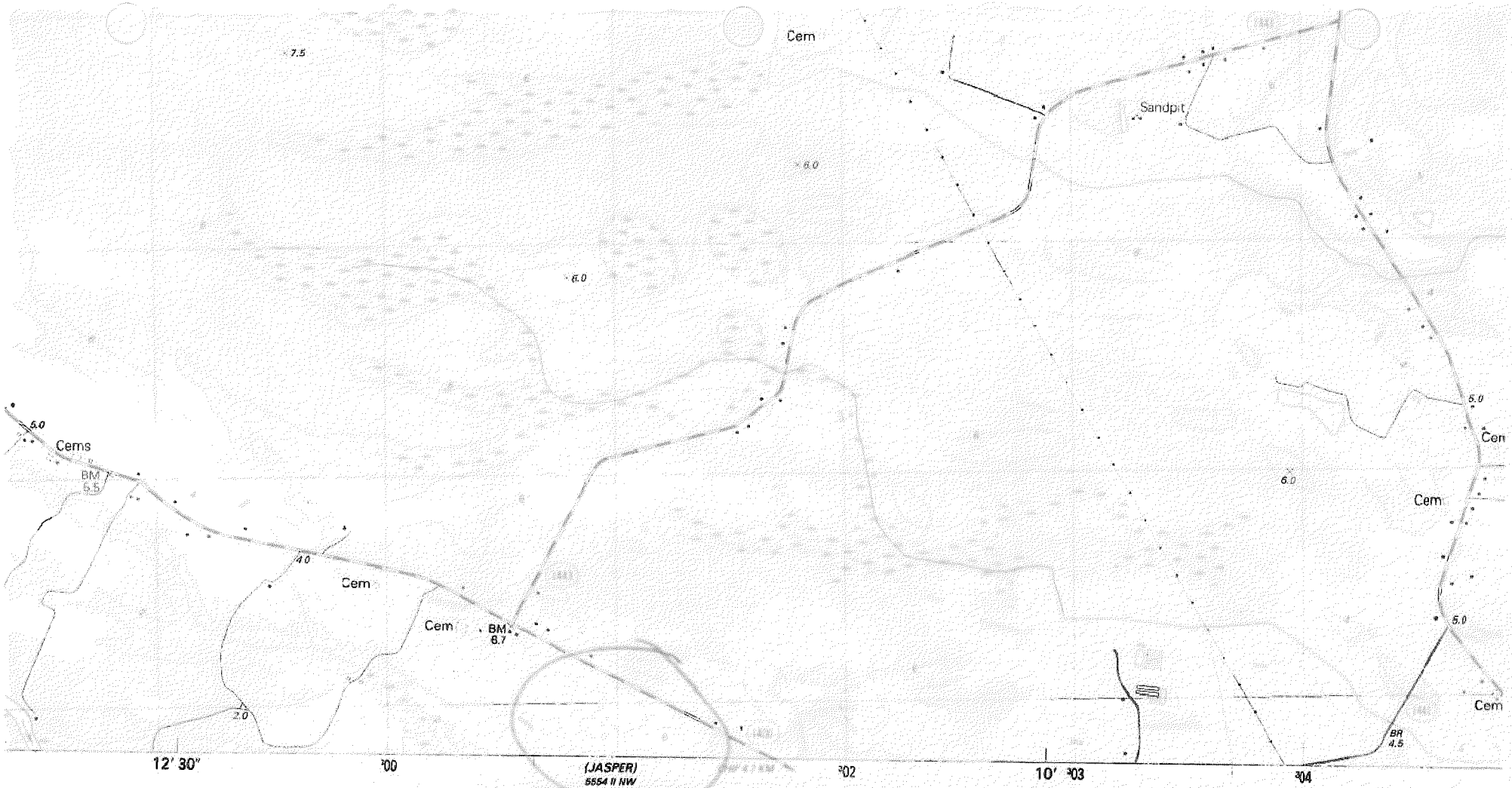
Enclosed you will find copies of the soil survey and the topographical map we used to make this determination. Also enclosed is an aerial photo and topographical map from the Craven County GIS website which is intended to help you better locate the stream segment.

If you have any questions please don't hesitate to give Andy or myself a call at 252-637-2547, ext. 3.

Thank You,

Patrick K. Baker
Natural Resource Conservationist II
Craven Soil and Water Conservation District

NEUSE
RIVER
Taylor Creek
Greens
Thorofare
1400
1441
1401
1424



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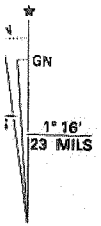
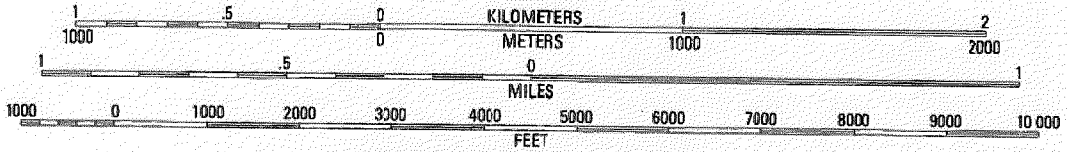


983 MAGNETIC NORTH
T CENTER OF SHEET



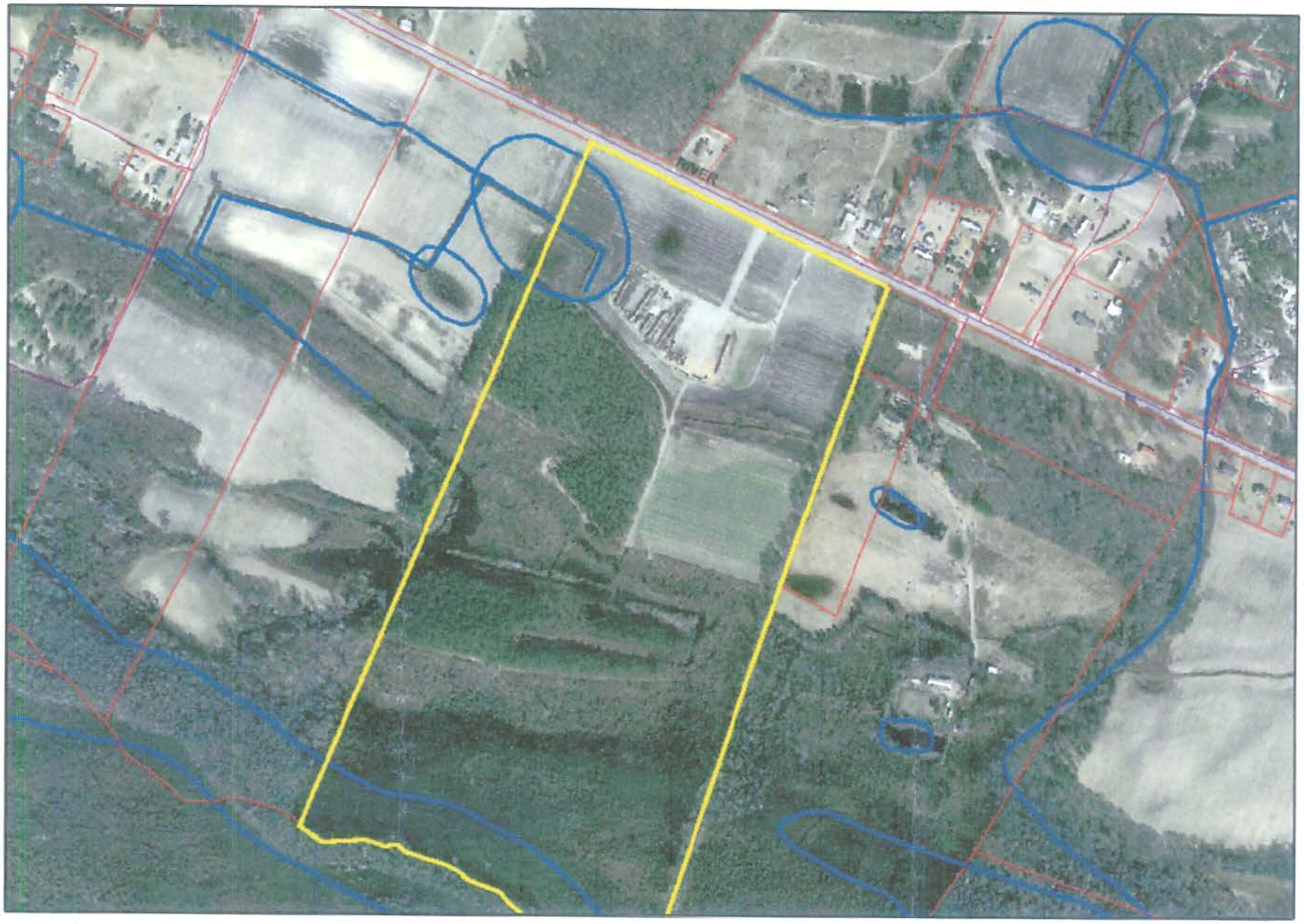
CONTOUR INTERVAL 2 METERS
SUPPLEMENTARY CONTOUR INTERVAL 1 METER
NATIONAL GEODETIC VERTICAL DATUM OF 1929
CONTROL ELEVATIONS SHOWN TO THE NEAREST 0.1 METER
OTHER ELEVATIONS SHOWN TO THE NEAREST 0.5 METER

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

Primary
hard surf
Secondar
hard surf

QUADRANGLE LOCATION

CONTOURS AND ELEVATIONS
IN METERS

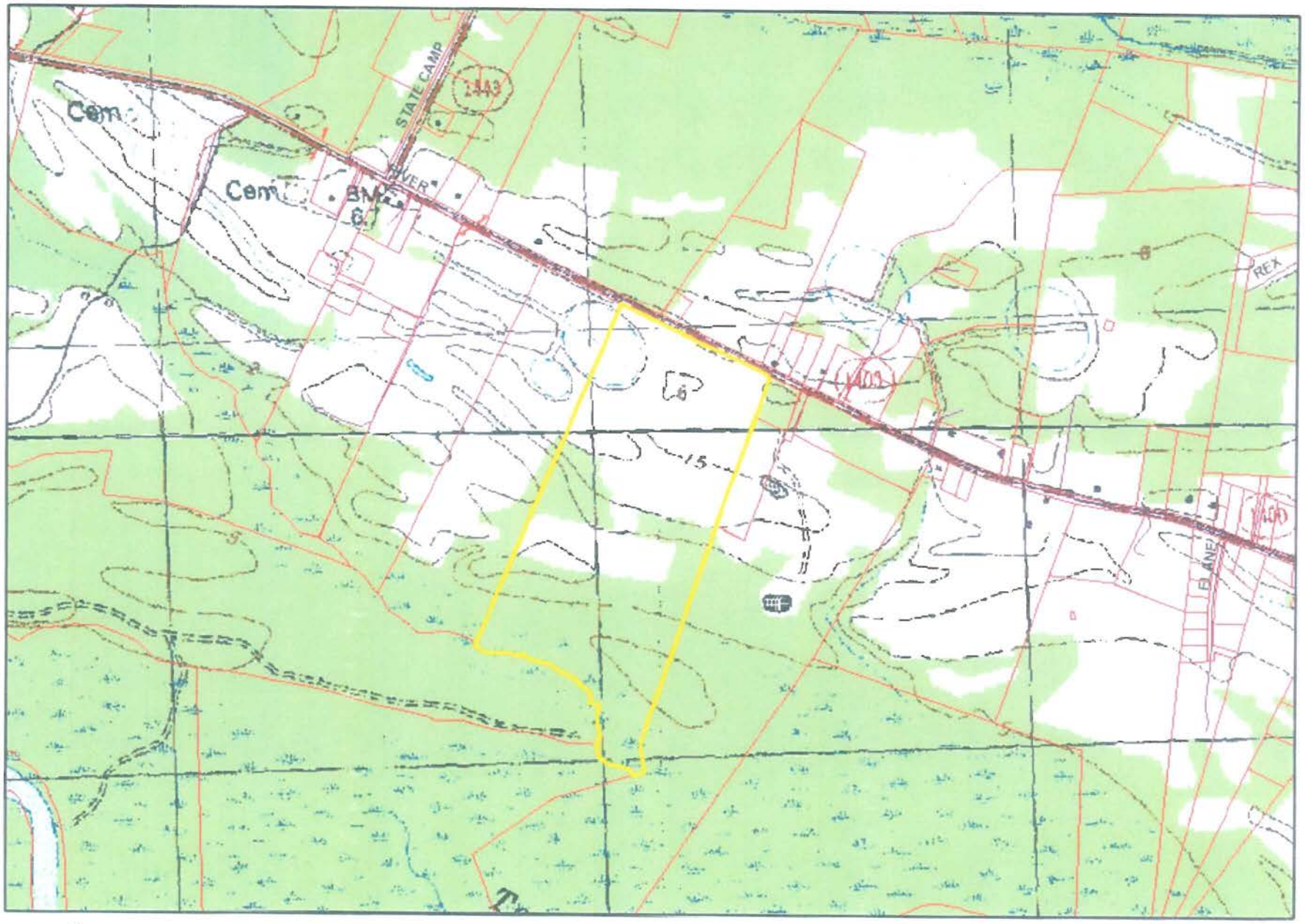


John W. "Billy" Dunham

Craven County does NOT warrant the information shown on this map and should be used ONLY for tax assessment purposes.

1 inch equals 500 feet

N



John W. "Billy" Dunham

Craven County does NOT warrant the information shown on this map and should be used ONLY for tax assessment purposes.

1 inch equals 1000 feet

N

Attachment 17. Financial Responsibility/Ownership Form (E&SC Application)

Erosion & Sedimentation Control Approval

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Energy, Mineral, and Land Resources
Land Quality Section

Tracy E. Davis, PE, CPM
Director

Pat McCrory, Governor
John E. Skvarla, III, Secretary

September 9, 2013

LETTER OF APPROVAL WITH MODIFICATIONS

RECEIVED 9-10-13

Craven Ag Services, LLC
ATTN: Mr. John W. Dunham, President
2155 West Highway 55
New Bern, North Carolina 28562

RE: Erosion and Sedimentation Control Plan No. Crave-2012-003
Project Name: Craven Ag Services Composting Facility
Location: River Road (SR 1400) County: Craven
River Basin: Neuse
Date Received by LQS: August 27, 2013
Acres Approved: 7.9 Project Type: Revised
Project Description: Grading associated with the development of a composting facility, as shown on the plan received by this office on August 27, 2013.

Dear Sir:

This office has reviewed the subject erosion and sedimentation control plan. We find the plan to be acceptable and hereby issue this Letter of Approval with Modifications. The modifications required for approval are listed on the attached pages. This plan approval shall expire three (3) years following the date of approval, if no land-disturbing activity has been undertaken, as required by 15A NCAC 4B.0129, unless modified by other legislation.

Please be advised that 15A NCAC 4B.0118(a) requires that a copy of the approved erosion and sedimentation control plan be on file at the job site. Also, you should consider this letter as giving the Notice required by G.S. 113A-61.1(a) of our right of periodic inspection to ensure compliance with the approved plan.

North Carolina's Sedimentation Pollution Control Program is performance oriented, requiring protection of existing natural resources and adjoining properties. If, following the commencement of this project, it is determined that the erosion and sedimentation control plan is inadequate to meet the requirements of the Sedimentation Pollution Control Act of 1973 (G.S. 113A-51 through 66), this office may require revisions to the plan and implementation of the revisions to ensure compliance with the Act.

Acceptance and approval of this plan is conditioned upon your compliance with Federal and State water quality laws, regulations and rules. In addition, local city or county ordinances or rules may also apply to this land-disturbing activity. This approval does not supersede any other permit or approval.

Please note that this approval is based in part on the accuracy of the information provided in the Financial Responsibility/Ownership Form, which you have submitted. You are required to file an amended form if there is any change in the information included on the form. NOTE: Neither this approval nor the financial responsibility/liability cited in it automatically transfer with a change in project ownership. In addition, 15A NCAC 4B.0127(c) requires that you notify this office of the proposed starting date for this project (using the enclosed Project Information Sheet). Please notify us if you plan to have a preconstruction conference.

Please be advised that a rule to protect and maintain existing buffers along watercourses in the Neuse River Basin became effective on July 22, 1997. The Neuse River Riparian Area Protection and Maintenance Rule (15A NCAC 2B.0233) applies to the 50-foot wide zone directly adjacent to surface waters (intermittent streams, perennial streams, lakes, ponds, and estuaries) in the Neuse River Basin. For more information about this riparian area rule, please contact the Division of Water Quality's Wetland/401 Unit at 919-807-6300, or DWQ in our regional office at 252-946-6481.

Please be aware that your project will be covered by the enclosed NPDES General Stormwater Permit NCG010000 (Construction Activities). You should first become familiar with all of the requirements for compliance with the enclosed permit.

Sincerely,

Richard Peed, CPESC
Assistant Regional Engineer

Enclosures

cc w/o enc: Gary S. MacConnell, P.E., MacConnell & Associates, P.C.
WaRO Water Quality Supervisor, Division of Water Resources

1. **AS THE DECLARED RESPONSIBLE PARTY, YOUR LEGAL RESPONSIBILITY** is to understand the Act and comply with the following minimum requirements of the Act:

   A. In the event of a conflict between the requirements of the Sedimentation Pollution Control Act, the submitted plan and/or the contract specifications, the more restrictive requirement shall prevail;

   B. The land-disturbing activity shall be conducted in accordance with the approved erosion and sedimentation control plan;

   C. The **LATEST APPROVED** erosion and sediment control plan will be used during periodic unannounced inspections to determine compliance and a copy of the plan must be on file at the job site. If it is determined that the implemented plan is inadequate, this office may require the installation of additional measures and/or that the plan be revised to comply with state law;

   D. All revisions, including those required by other local, state or federal agencies, which affect site layout, drainage patterns, limits of disturbance and/or disturbed acreage must be submitted to this office for approval a minimum of 15 days prior to the start of construction;

   E. Revisions exceeding the approved scope of this project without prior approval of the plan showing the changes can be considered a violation. Failure to comply with any part of the approved plan or with any requirements of this program could result in appropriate legal action (civil or criminal) against the financially responsible party. Legal actions include Stop Work Orders and the assessing of a civil penalty of up to $5000 for the initial violation plus an additional penalty of up to $5000 per day for each day the site is out of compliance;

   F. The **CERTIFICATE OF PLAN APPROVAL must be posted** at the primary entrance to the job site and remain until the site is permanently stabilized;

   G. In cases of natural disaster related changes to the proposed land disturbing activity, all appropriate actions and adequate measure installations may be performed to prevent sediment damage, prior to submitting and receiving approval of the revised plan. A revised plan must be submitted for approval as soon as possible, but no later than 15 days after all emergency actions have been performed;

H. Erosion and sediment control measures or devices are to be constructed and/or installed to safely withstand the runoff resulting from a 10 year storm event (25 year storm event in High Quality Zones). The 10 year storm event is generally equivalent to a storm producing 6.5 - 7 inches of rain in 24 hours or at the rate of 6.5 - 7 inches of rain in 1 hour, depending on the location of the project within the region;

I. No earthen material is to be brought on or removed from the project site, until the off-site borrow and/or disposal sites are identified as part of the erosion control plan. If an off-site borrow and/or disposal site is to be utilized, prior to the start of construction submit the name and identification number (E&SCP # or Mine Permit #) using the enclosed Project Information Sheet;

J. Buffer zone, sufficient to restrain visible sedimentation within the 25% of the width closest to the land disturbance, must be provided and maintained between the land-disturbing activity and any adjacent property or watercourse;

K. In order to comply with the intent of the Act, the scheduling of the land-disturbing activities is to be such that both the area of exposure and the time between the land disturbance and the providing of a ground cover is minimized;

L. Unless a temporary, manufactured, lining material has been specified, a clean straw mulch must be applied, at the minimum rate of 2 tons/acre, to all seeded areas. The mulch must cover at least 75% of the seeded area after it is either tacked, with an acceptable tacking material, or crimped in place;

M. New or affected cut or filled slopes must be at an angle that can be retained by vegetative cover, AND **must be provided with a ground cover** sufficient to restrain erosion **within 21 calendar days of completion of any phase (rough or final) of grading** (ANNUAL RYE GRASS IS NOT in the APPROVED seeding specifications NOR is it an ACCEPTABLE substitute for the providing of a temporary ground cover);

N. A **permanent ground cover**, sufficient restrain erosion, **must be provided** within the shorter of 15 working or 90 calendar days (if in a High Quality Zone, the shorter of 15 working or 60 calendar days) after completion of construction or development on any portion of the tract (ANNUAL RYE GRASS IS NOT in the APPROVED seeding specifications NOR is it an ACCEPTABLE substitute for the providing of a nurse cover for the permanent grass cover);

O. All sediment and erosion control details for this project must conform to the standards as shown in the current Erosion & Sediment Control Planning and Design Manual; these details must be utilized for construction and incorporated in the plan. The manual can be found online at http://portal.ncdenr.org/web/lr/publications

2. Adequate and appropriate measures must be properly installed downstream, within the limits of disturbance, of any land disturbing activity to prevent sediment from leaving the limits of disturbance, entering existing drainage systems, impacting an on-site natural watercourse or adjoining property.

PROJECT INFORMATION SHEET

APPROVAL DATE: September 9, 2013

RESPONSIBLE PARTY: Craven Ag Services, LLC

PROJECT NAME: Craven Ag Services Composting Facility

COUNTY: Craven NO.: Crave-2012-003

OFF-SITE BORROW
AND/OR DISPOSAL SITE: _____ NO.: _____

START-UP DATE: _____

CONTRACTOR: _____

ON-SITE CONTACT: _____

ON-SITE PHONE NO.: _____

OFFICE PHONE NO.: _____

COMPLETE & RETURN THIS FORM
PRIOR TO THE START OF CONSTRUCTION TO:

N.C.D.E.N.R.
LAND QUALITY SECTION
ATTN: *Allison Ward*
943 WASHINGTON SQUARE MALL
WASHINGTON, NORTH CAROLINA 27889

CERTIFICATE OF PLAN APPROVAL

The posting of this certificate certifies that an erosion and sedimentation control plan has been approved for this project by the North Carolina Department of Environment and Natural Resources in accordance with North Carolina General Statute 113A – 57 (4) and 113A – 54 (d) (4) and North Carolina Administrative Code, Title 15A, Chapter 4B.0107 (c). This certificate must be posted at the primary entrance of the job site before construction begins and until establishment of permanent groundcover as required by North Carolina Administrative Code, Title 15A, Chapter 4B.0127 (b).

SR 1400 - CARVON AG COMPOSTING FACILITY - CARVON COUNTY

Project Name and Location

9/9/2013

Date of Plan Approval

P.H. McCLAIN

Regional Engineer

NCDENR

CARVE-2012-003

Attachment 18 Ash Details, Pad Construction, Sampling Table and Sampling Diagrams

Memo from: A. R. Rubin

Subject: CAS permit requests from Donna Wilson

To: Zach Fuller and Billy Dunham

Ms. Wilson requested additional information to complete the permit. I have included a table listing the characteristic of the ash and the metal load with a 2 inch lift of the ash applied per acre. I have also described the procedure to follow with the ash and fine compost incorporation to achieve the "finer than loamy sand" designation required. Lastly, I have made required changes to the operations manual.

Coal ash and associated metal loading Criteria:

The coal ash collected on the site was tested to determine the levels of regulated metal and the TCLP metal levels as required. The total regulated metal levels are higher than the TCLP metal levels simply because the rigor of the test is greater for a total metal analysis than for a TCLP extraction. For purposes of creating a layer of material "finer than loamy sand" a layer of ash approximately 2 inches thick and a layer of fine compost between 1 and 2 inches thick will be added to the compost windrow areas designated in the application.

For purposes of this application, the weight of the ash is assumed as 80 pounds per cubic foot. The ash load required to apply a lift 2 inches in dept to an acre of pad area is calculated as:

a. Each cubic yard of ash applied to achieve a 2 inch lift will cover an area of –
    1. Each cubic foot of ash applied as a 2 inch lift will cover 6 square feet
    2. Each cubic yard of ash will cover 27 ft cu/yd x 6 ft sq/ft cu = 162 square ft/yd
    3. Each acre of pad area will require 43560 sq ft/ac/162 ft sq/yd = 269 yds cu/ac or 295 tons/ac at a density of 80 lb/ft cu.
b. Testing indicates the metal concentrations are low. Based on the MicroBac test results utilized previously the metal loading in a 295 ton/ac application is provided in the table below.

Coal Ash Metal testing and Loading if applied at 295 T/Ac– Craven Ag

Metal	EPA Clean Sludge level (mg/kg)**	Allowed EPA cumulative Load kg/ha (lb/ac)***	EPA Annual load as(kg/ha/y)	Coal Ash Level (mg/kg)	Mass (as lb)/T	Cumulative Metal load as kg/h and (lb/ac) @ 295 T/A*
As	41	41 (37)	2.0	2.1	0.004	1.39 (1.24)
Cd	39	39 (35)	1.9	0.2	0.0004	0.13 (0.12)
Cr*	1200	NA	NA	2.2	0.004	NA (1.30)
Cu	1500	1500 (1339)	75	7.4	0.015	4.89 (4.37)
Pb	300	300 (268)	15	2.1	0.004	1.39 (1.24)
Hg	17	17 (15)	0.85	0.04	0.0001	0.02 (0.02)
Ni	420	420 (375)	21	6	0.012	3.96 (3.54)
Se	36	100 (89)	5.0	0.96	0.002	0.66 (0.59)
Zn	2800	2800 (2500)	140	2.9	0.006	1.92 (1.71)

* chromium eliminated as pollutant from 40 CFR Part 503
** Monthly Average mg/kg (taken from the 503 rules)
*** Lifetime (taken from the 503 rules)

Clearly all metal loadings are well below the cumulative metal loading allowed in the EPA Rules and in NC DWM Rule. Metal loadings are not a limitation in the design of the pad system required to create a soil texture finer than loamy sand. The cumulative loading is for this single event. No additional ash is assumed as necessary and the cumulative load is the annual load.

Incorporation of compost fines and coal ash

Areas requiring addition of coal ash fines and compost fines are:

1. The site to be used as the compost feedstock pad is listed as a portion of the 1.8 acre area intended to store incoming feedstock and potentially serve as an initial compost production area and the mix pad.

2. The large 4.7 acre area intended to support the bulk of the compost activity constitutes that portion of the overall site on which windrows will be constructed and managed to achieve the PFRP and VAR designation required in rule.

3. The large area at the front of the site along River Road containing approximately 3.5 acres will serve as final curing and product storage.

These areas have been tested previously and were found to contain soil characterized as fine sand; rule requires soil material classified as finer than loamy sand. To achieve that both compost fines and coal ash will be added to the site in accord with the following procedure:

a. Compost fines will be applied to the site in a lift of 1 to 2 inches and these compost fines will be incorporated into the topsoil to a depth of approximately 4 inches using standard implements – disk, plow, roto-tiller. The areas may be covered with a nursery cloth if the site owner deems this is necessary to facilitate operation.
b. Once the compost fines are incorporated to the recommended depth, layers or lifts of the coal ash will be placed on the soil surface and incorporated into the soil to a depth of 6 inches using standard implements-disk, plow, roto-tiller. The lift proposed in a series of two operations, each applying and incorporating a 1 inch lift.
c. Once these fine materials are incorporated, soil material will be assessed by sampling the amended soil to a depth of 12 inches and determining soil texture using ASTM procedure (D 422.63). A series of 20 sub-samples will be collected from each acre prepared to serve as a compost pad. Each subsample will be collected randomly from the site with a minimum distance between samples of 25 feet. these sub-samples will be "hand textured" to determine the soil texture and the Sub-samples will be composited and laboratory tested at the Soil Science Department at NCSU or an approved laboratory. The field sampling and testing will be accomplished by Thomas Hinton, CPSS or Scott Frederick, CPSS.

Craven Ag Service
Compost Facility
Soil Sampling Chart

Sample ID Number	Soil Texture Area #1	Soil Texture Area #2	Soil Texture Area #3
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LEGEND

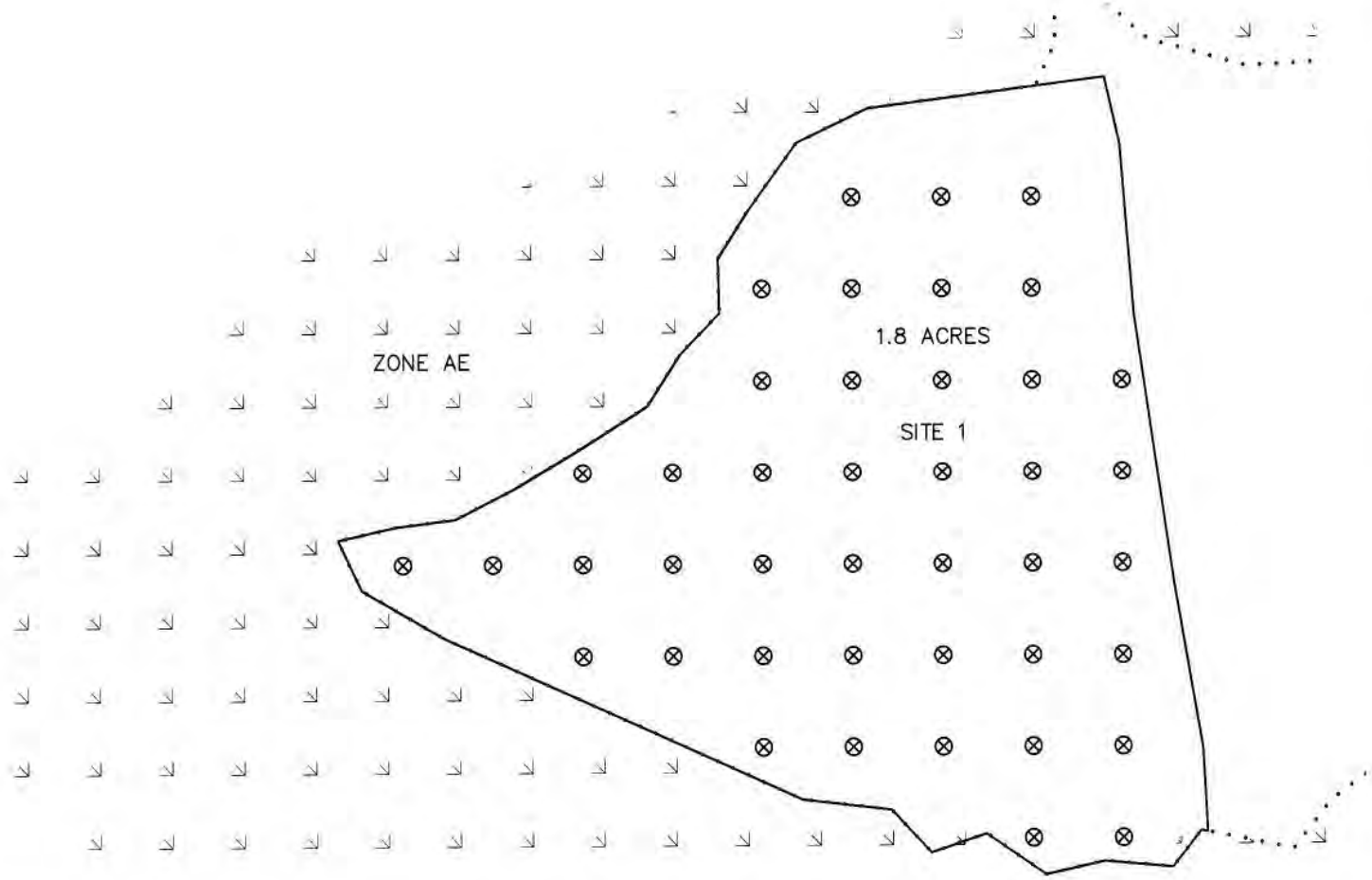
⊗ APPROXIMATE TEST LOCATION

GRAPHIC SCALE: 1" = 80'

0 40 80 160 240

NOTES

1. TEST LOCATION MAY BE ADJUSTED AS NEEDED FOR FIELD CONDITIONS.
2. PROVIDE MINIMUM 25' SEPARATION BETWEEN TEST LOCATIONS.



REFERENCE: SITE 1

PROJECT: CRAVEN AG SERVICES, INC.
COMPOSTING FACILITY
CRAVEN COUNTY, NC

BY: MAE
JOB #: A45201.00
DATE: 04/18/14

MacCONNELL & Associates, P. C.
1903 NORTH HARRISON AVE., SUITE 102
CARY, NORTH CAROLINA 27513
P. O. BOX 129
MORRISVILLE, NORTH CAROLINA 27560
TEL.: (919) 467-1239 FAX: (919) 319-6510

LEGEND

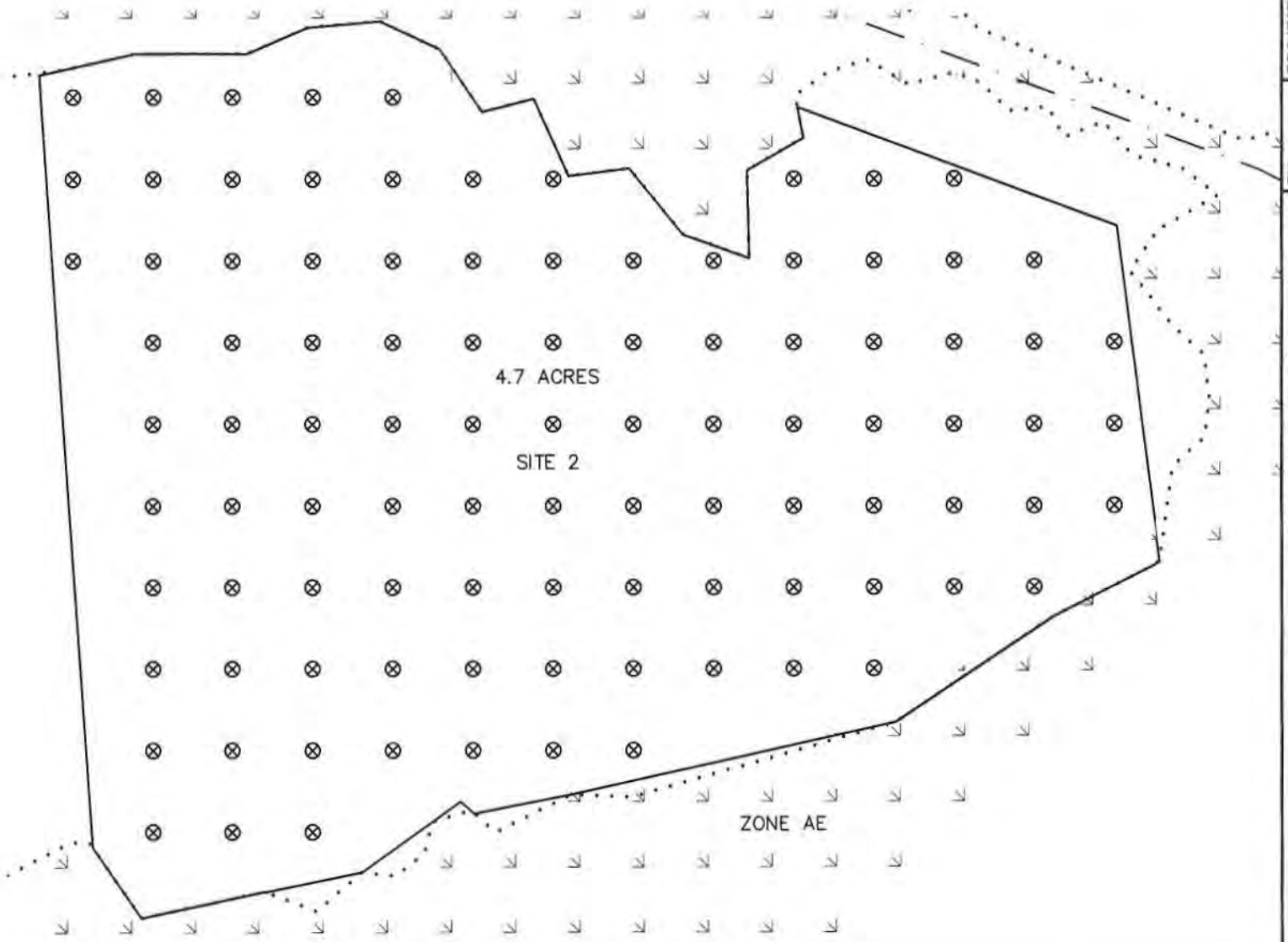
⊗ APPROXIMATE TEST LOCATION

GRAPHIC SCALE: 1" = 80'

0 40 80 160 240

NOTES

1. TEST LOCATION MAY BE ADJUSTED AS NEEDED FOR FIELD CONDITIONS.
2. PROVIDE MINIMUM 25' SEPARATION BETWEEN TEST LOCATIONS.

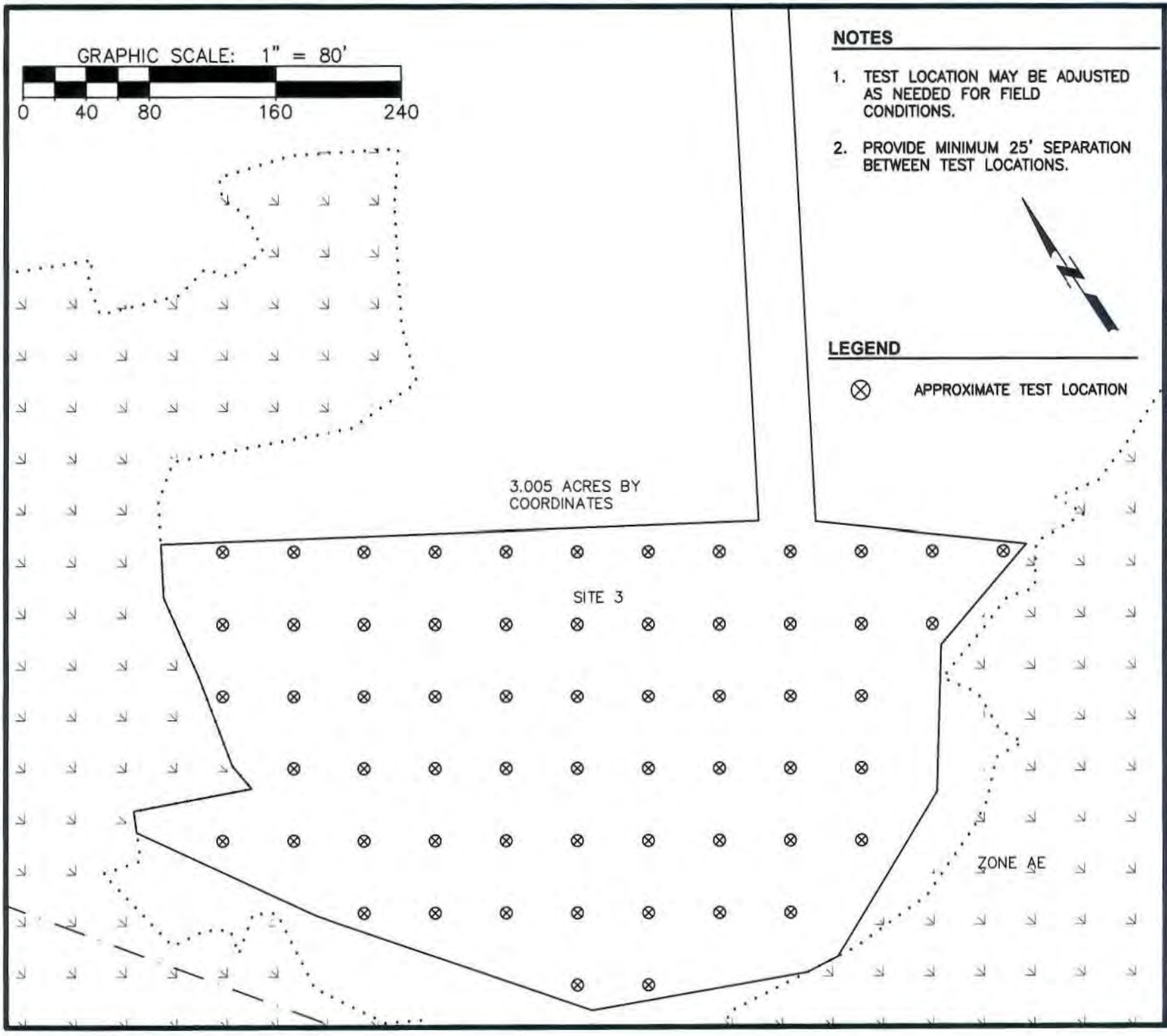


REFERENCE: SITE 2

PROJECT: CRAVEN AG SERVICES, INC.
COMPOSTING FACILITY
CRAVEN COUNTY, NC

BY: MAE
JOB #: A45201.00
DATE: 04/18/14

MacCONNELL & Associates, P. C.
1903 NORTH HARRISON AVE., SUITE 102
CARY, NORTH CAROLINA 27513
P. O. BOX 129
MORRISVILLE, NORTH CAROLINA 27560
TEL: (919) 467-1239 FAX: (919) 319-6510



NOTES

1. TEST LOCATION MAY BE ADJUSTED AS NEEDED FOR FIELD CONDITIONS.
2. PROVIDE MINIMUM 25' SEPARATION BETWEEN TEST LOCATIONS.

LEGEND

⊗ APPROXIMATE TEST LOCATION

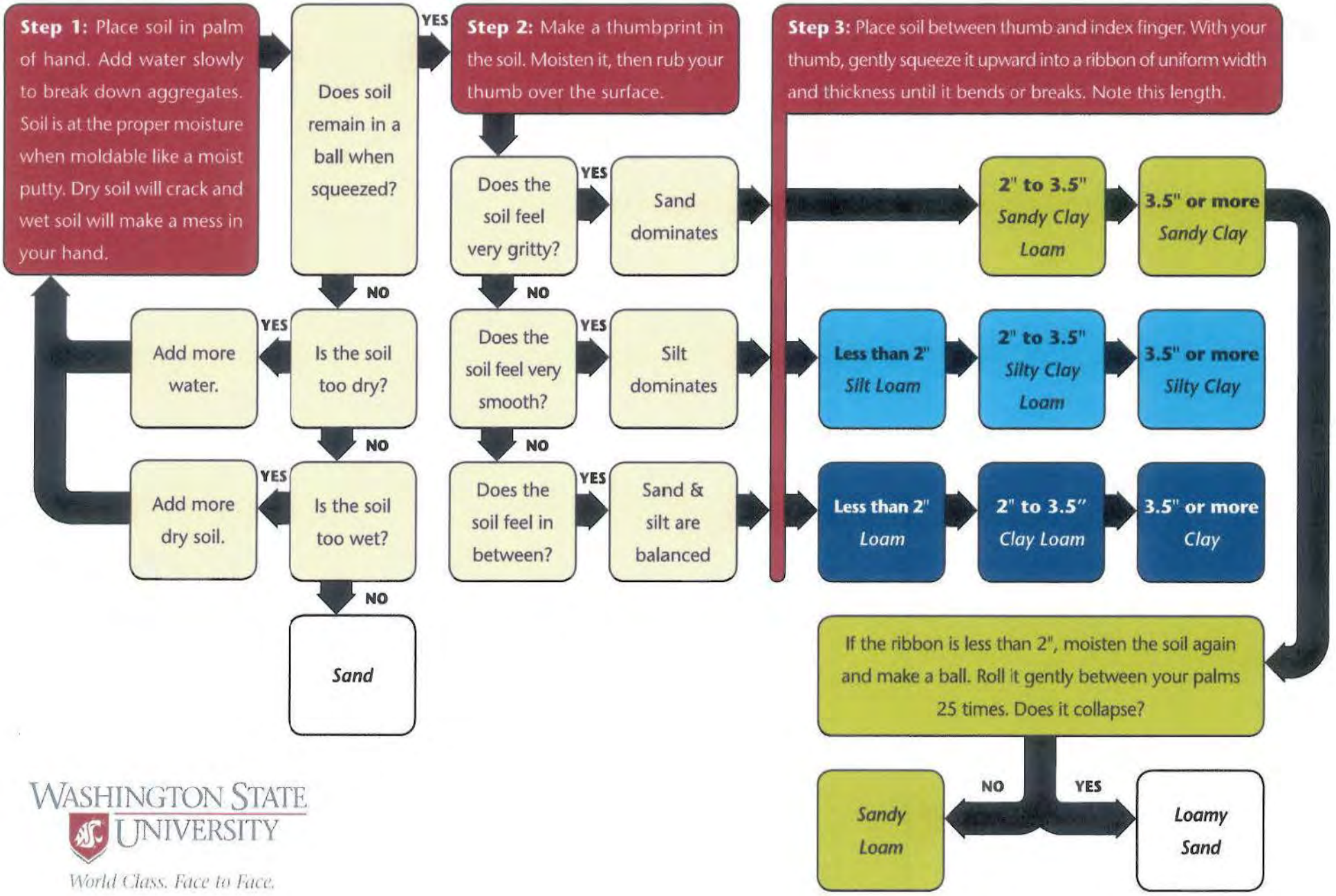
REFERENCE: SITE 3

PROJECT: CRAVEN AG SERVICES, INC.
COMPOSTING FACILITY
CRAVEN COUNTY, NC

BY: MAE
JOB #: A45201.00
DATE: 04/18/14

MacCONNELL & Associates, P. C.
1903 NORTH HARRISON AVE., SUITE 102
CARY, NORTH CAROLINA 27513
P. O. BOX 129
MORRISVILLE, NORTH CAROLINA 27560
TEL: (919) 467-1239 FAX: (919) 319-6510

Estimating Soil Texture



WASHINGTON STATE UNIVERSITY

World Class. Face to Face.

Attachment 19 Land Deed

Work Flow No: 9999-0020[illegible]

Craven NC - Document Stamp
Becky Thompson, Register of Deeds
Date 06/23/2004 Time 11:36:00 1 of 5 Pgs
No: 2004-00103231
Book 2199 Page 808
Fee Amt : 26.00
Excise Tax: 174.00

NORTH CAROLINA

CRAVEN COUNTY

Parcel # 1 057 026
Stamps $_____

WARRANTY DEED

THIS DEED, made and entered into this the 17th day of June, 2004, by and between SUSAN R. KING and husband, JAMIE H. KING, JR., LUANNE R. SANDLIN and husband, JAMES D. SANDLIN, III, and DOUGLAS McRAY ROBINSON, II (separated), hereinafter referred to as Grantors and JOHN W. DUNHAM and wife, JENE H. DUNHAM, whose address is 708 Lilliput Drive, New Bern, NC 28562 hereinafter referred to as Grantees;

WITNESSETH:

That the Grantors, for a valuable consideration paid by the Grantees, the receipt of which is hereby acknowledged, have and by these presents do grant, bargain, sell and convey unto the Grantees, their heirs and assigns, in fee simple, all that certain lot or parcel of land situated in Number One Township, Craven County, North Carolina and more particularly described as follows:

See attached Exhibit "A".

TO HAVE AND TO HOLD the aforesaid lot or parcel of land and all privileges and appurtenances thereto belonging to the Grantees in fee simple.

HENDERSON, BAXTER, TAYLOR & GATCHEL, P.A.
PO DRAWER U, NEW BERN, NC 28563

29621

Date 06/23/2004 Time 11:36:00 2 of 5 Pgs
No: 2004-00103231
Book 2199 Page 809

And the Grantors covenant with the Grantees, that Grantors are seized of the premises in fee simple, have the right to convey the same in fee simple, that title is marketable and free and clear of all encumbrances, except all encumbrances or restrictions mentioned above, and that Grantors will warrant and defend the title against the lawful claims of all persons whatsoever.

The designation Grantor and Grantee as used herein shall include all parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine or neuter as required by context.

IN WITNESS WHEREOF, the Grantors have hereunto set their hands and adopted as their seals the typewritten word "SEAL" appearing after their signatures hereinbelow this the day and year first above written.

Susan R. King (SEAL)
SUSAN R. KING

James H. King Jr. (SEAL)
JAMIE H. KING, JR.

NORTH CAROLINA

CRAVEN COUNTY

I, Yvonne E Shockney, a Notary Public of the County and State aforesaid, certify that SUSAN R. KING and husband, JAMIE H. KING, JR., personally appeared before me this day and acknowledged the due execution of the foregoing document.

WITNESS my hand and notarial seal, this the 22nd day of July, 2004.

Yvonne E Shockney
Notary Public

YVONNE E. SHOCKNEY
MY COMM. EXP.
NOTARY
PUBLIC
04/30/2005
CRAVEN COUNTY, NC

My Commission Expires:
4-30-2005

Date 06/23/2004 Time 11:36:00 3 of 5 Pgs
No: 2004-00103231
Book 2199 Page 810

Luanne R Sandlin (SEAL)
LUANNE R. SANDLIN

James D. Sandlin, III (SEAL)
JAMES D. SANDLIN, III

NORTH CAROLINA

JOHNSTON COUNTY

I, EMILY J. DRIVER, a Notary Public of the County and State aforesaid, certify that LUANNE R. SANDLIN and husband, JAMES D. SANDLIN, III, personally appeared before me this day and acknowledged the due execution of the foregoing document.

WITNESS my hand and notarial seal, this the 18 day of June, 2004.

Emily J Driver
Notary Public

My Commission Expires:

10-16-2007

EMILY J. DRIVER
NOTARY
PUBLIC
JOHNSTON COUNTY, N.C.

Date 6/23/2004 Time 11:36:00 4 of 5 Pgs
Book 2004-0010325
Book 2199 Page 811

DOUGLAS McRAY ROBINSON (SEAL)

NORTH CAROLINA

Transylvania COUNTY

I, Monique S. Flynn, a Notary Public of the County and State aforesaid, certify that DOUGLAS McRAY ROBINSON, II (separated), personally appeared before me this day and acknowledged the due execution of the foregoing document.

WITNESS my hand and notarial seal, this the 17th day of June, 2004.

Monique S. Flynn
Notary Public

My Commission Expires:

02/28/09

NORTH CAROLINA

CRAVEN COUNTY

The foregoing certificates of Monique S. Flynn are certified to be correct. This instrument was presented for registration this day and hour, and duly recorded in the Office of the Register of Deeds of Craven County, North Carolina, in Book 2199, at Page 808.

This the 23rd day of June, 2004, at 11:36 o'clock A.m.

Becky Thompson
REGISTER OF DEEDS

By: Anna Strange
DEPUTY REGISTER OF DEEDS

Date 06/23/2004 Time 11:36:00 5 of 5 Pgs
No: 2004-00103231
Book 2199 Page 812

All that certain lot or parcel of land lying and being situate in Number One Township, Craven County, North Carolina, and being more particularly described as follows:

Being all of Tract 1, as the same is shown and delineated on Map entitled "Survey for John W. Dunham and wife, Jene H. Dunham", prepared by H.C. Harris, Jr., Engineering & Surveying, P.A., dated June 14, 2004, and recorded in Plat Cabinet G, Slide 194G, Craven County Registry, reference to said Map being hereby made for a more perfect description of said property.

Said property is hereby conveyed subject to the rights of the parties to that certain Timber Deed recorded in Book 2049, Page 1, Craven County Registry.

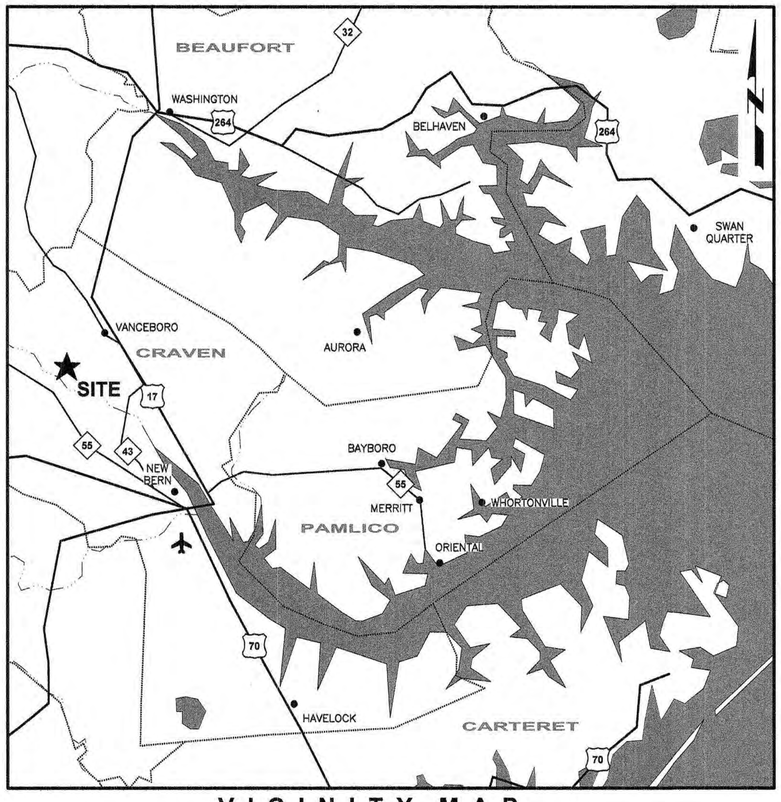
Said property is conveyed together with all governmental agricultural allotments, quotas, production incentives and buyouts including but not limited to those related to corn, wheat, cotton, tobacco, and soybeans.

CRAVEN AG SERVICES, INC.

COMPOST FACILITY

CRAVEN COUNTY, NC

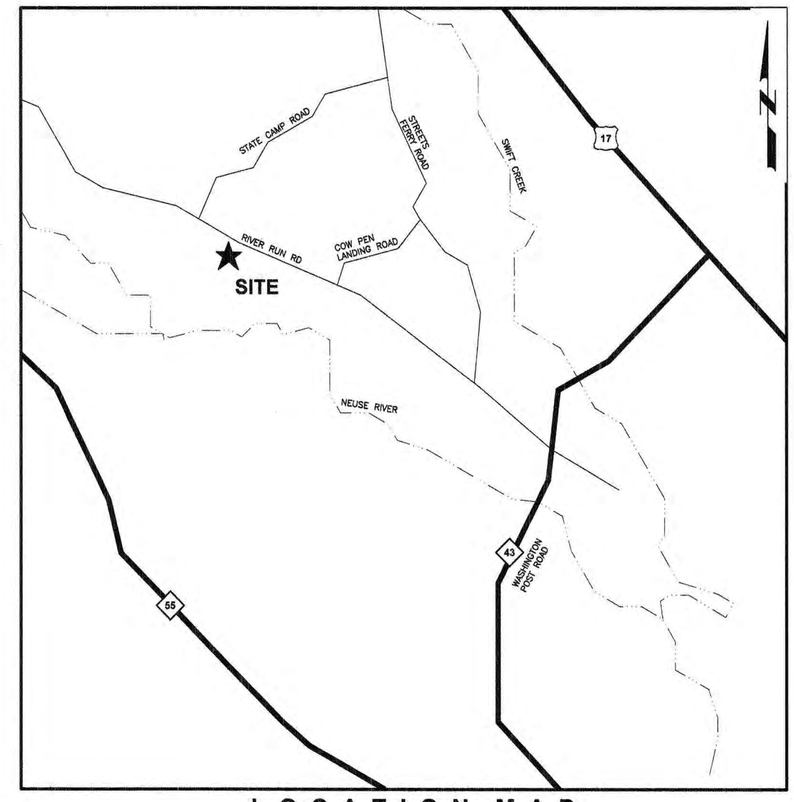
PROJECT No. A45201.00



VICINITY MAP

SCHEDULE OF DRAWINGS:

	COVER SHEET
C-101	SITE PLAN
C-102	SITE LAYOUT
C-103	STORMWATER/SEDIMENTATION & EROSION CONTROL PLAN LAYOUT 1 OF 2
C-104	STORMWATER/SEDIMENTATION & EROSION CONTROL PLAN LAYOUT 2 OF 2
D-101	DETAILS
D-102	MIXING PAD DETAILS



LOCATION MAP

A. R. Rubin, Ed.D.
President

A. R. Rubin and Associates
sustainable environmental solutions

192 fearrington post
pittsboro, nc, 27312

919 545 3066
919 270 0344

MacCONNELL & Associates, P. C.
1903 NORTH HARRISON AVE., SUITE 102
CARY, NC 27513
P. O. BOX 129
MORRISVILLE, NC 27560
TEL: (919) 467-1239 FAX: (919) 319-6510

NORTH CAROLINA PROFESSIONAL SEAL 17069 ENGINEER GARY S. MacCONNELL
3/20/14

PROJECT MANAGEMENT

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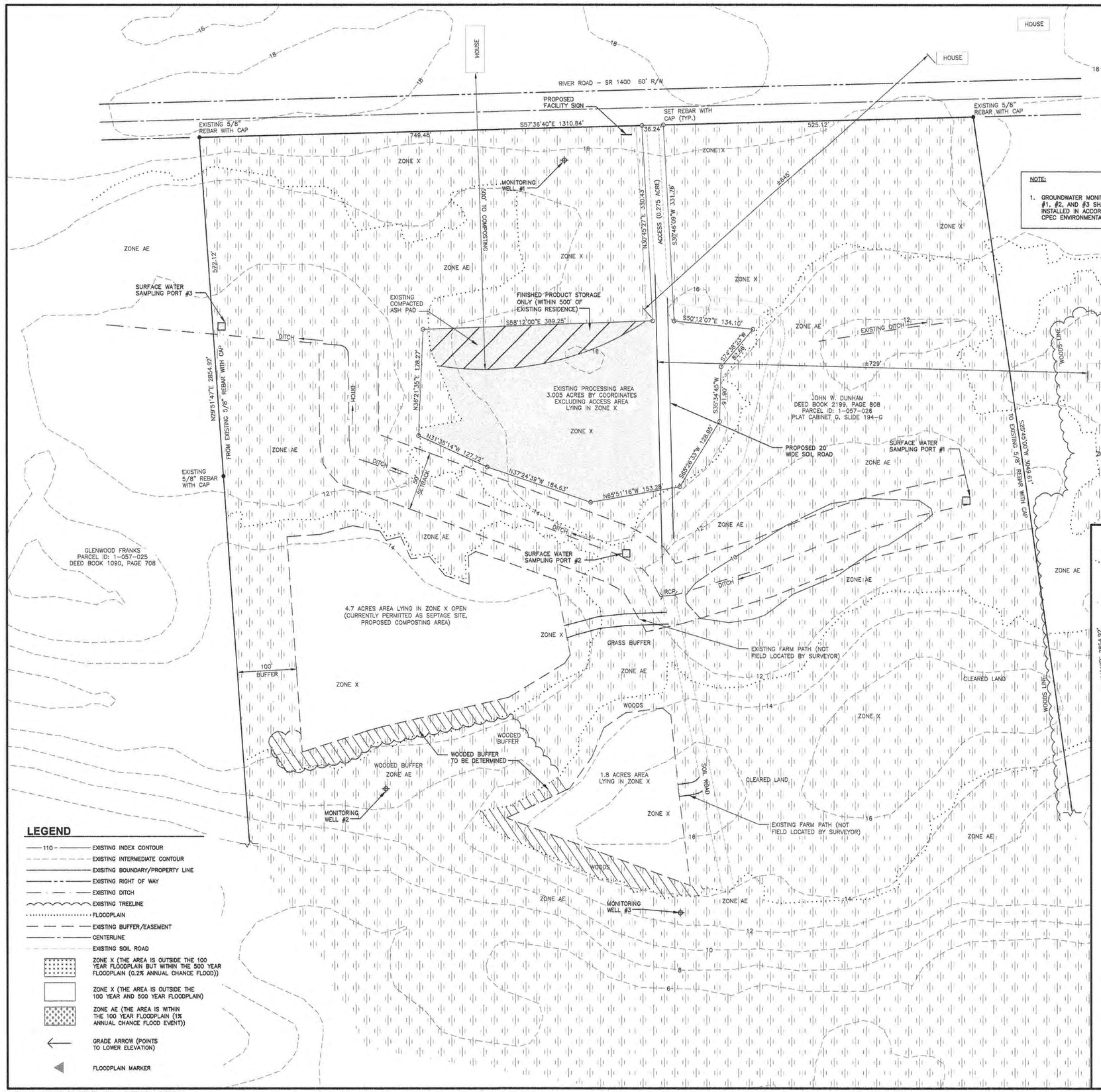
JUNE 28, 2011

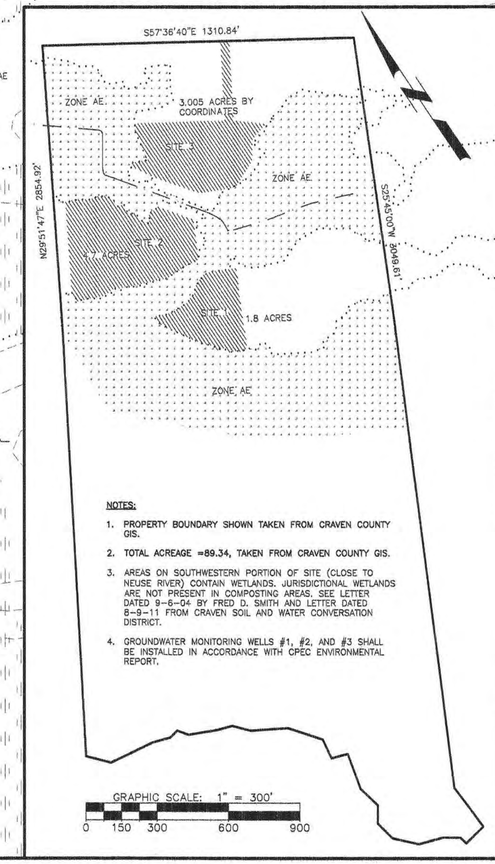
REVISIONS			
NO.	DATE	DESCRIPTION	SHEET
1	08/08/11	REV. PER LQS	ALL
2	02/29/12	REV. PER SWS	ALL
3	12/03/12	REV. PER SWS	ALL
4	08/14/13	REV. PER LQS, SWS	C-101,2,3,4 D-101
5	11/21/13	REV. PER SWS	C-101,2,3,D-101
6	1/29/14	REV. PER SWS	C-101,2,4, D-102

A45201.00 – CRAVEN AG SERVICES, INC. – COMPOST FACILITY



LEGEND

- 110 — EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- EXISITNG BOUNDARY/PROPERTY LINE
- EXISTING RIGHT OF WAY
- EXISTING DITCH
- EXISTING TREELINE
- FLOODPLAIN
- EXISTING BUFFER/EASEMENT
- CENTERLINE
- EXISTING SOIL ROAD
- ZONE X (THE AREA IS OUTSIDE THE 100 YEAR FLOODPLAIN BUT WITHIN THE 500 YEAR FLOODPLAIN (0.2% ANNUAL CHANCE FLOOD))
- ZONE X (THE AREA IS OUTSIDE THE 100 YEAR AND 500 YEAR FLOODPLAIN)
- ZONE AE (THE AREA IS WITHIN THE 100 YEAR FLOODPLAIN (1% ANNUAL CHANCE FLOOD EVENT))
- GRADE ARROW (POINTS TO LOWER ELEVATION)
- FLOODPLAIN MARKER



NOTES:

1. PROPERTY BOUNDARY SHOWN TAKEN FROM CRAVEN COUNTY GIS.
2. TOTAL ACREAGE =89.34, TAKEN FROM CRAVEN COUNTY GIS.
3. AREAS ON SOUTHWESTERN PORTION OF SITE (CLOSE TO NEUSE RIVER) CONTAIN WETLANDS. JURISDICTIONAL WETLANDS ARE NOT PRESENT IN COMPOSTING AREAS. SEE LETTER DATED 9-6-04 BY FRED D. SMITH AND LETTER DATED 8-9-11 FROM CRAVEN SOIL AND WATER CONVERSATION DISTRICT.
4. GROUNDWATER MONITORING WELLS #1, #2, AND #3 SHALL BE INSTALLED IN ACCORDANCE WITH CPEC ENVIRONMENTAL REPORT.

NOTES

1. SURVEY PROVIDED BY:
   MAYO & ASSOCIATES, P.A. LAND SURVEYING
   10121 US HWY 17 SOUTH
   VANCEBORO, NC 28586
   DATED: JUNE 17, 2011
2. TOPOGRAPHY TAKEN FROM NCDOT LIDAR.
3. MACCONNELL & ASSOCIATES UTILIZED THE DATA AND THE EQUIPMENT INFORMATION TO DESIGN SITE DETAILS FOR THIS FACILITY. CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, AND UTILITIES BEFORE BEGINNING ANY CONSTRUCTION.
4. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SOIL EROSION AND SEDIMENTATION CONTROL REQUIREMENTS OF THE COUNTY AND STATE.
5. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE OSHA AND SAFETY REQUIREMENTS OF THE COUNTY AND STATE.
6. ADJACENT RESIDENCE LOCATIONS ARE APPROXIMATE AND WERE LOCATED USING THE CRAVEN COUNTY GIS WEBSITE.

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A. R. Rubin, Ed.D.
President

A. R. Rubin and Associates
sustainable environmental solutions

192 fearrington post
pittsboro, nc, 27312
919 545 3066
919 270 0344

GRAPHIC SCALE: 1" = 80'
0 40 80 160 240

REVISIONS

NO.	DATE	DESCRIPTION
1	08/08/11	PER LQS
2	02/29/12	PER SWS
3	12/03/12	PER SWS
4	08/14/13	PER LQS, SWS
5	11/21/13	PER SWS
6	01/29/14	PER SWS

PROJECT MANAGER: GSM	PROJECT ENGINEER: ZLF
DRAWN BY: MAE	CHECKED BY: GSM

DATE: JUNE 28, 2011

NORTH CAROLINA PROFESSIONAL SEAL 17069 ENGINEER GARY S. MacCONNELL 3/6/14

MacCONNELL & Associates, P. C.
1903 NORTH HARRISON AVE., SUITE 102
CARY, NORTH CAROLINA 27513
P. O. BOX 129
MORRISVILLE, NORTH CAROLINA 27560
TEL: (919) 467-1239 FAX: (919) 319-6510

CRAVEN AG SERVICES, INC.

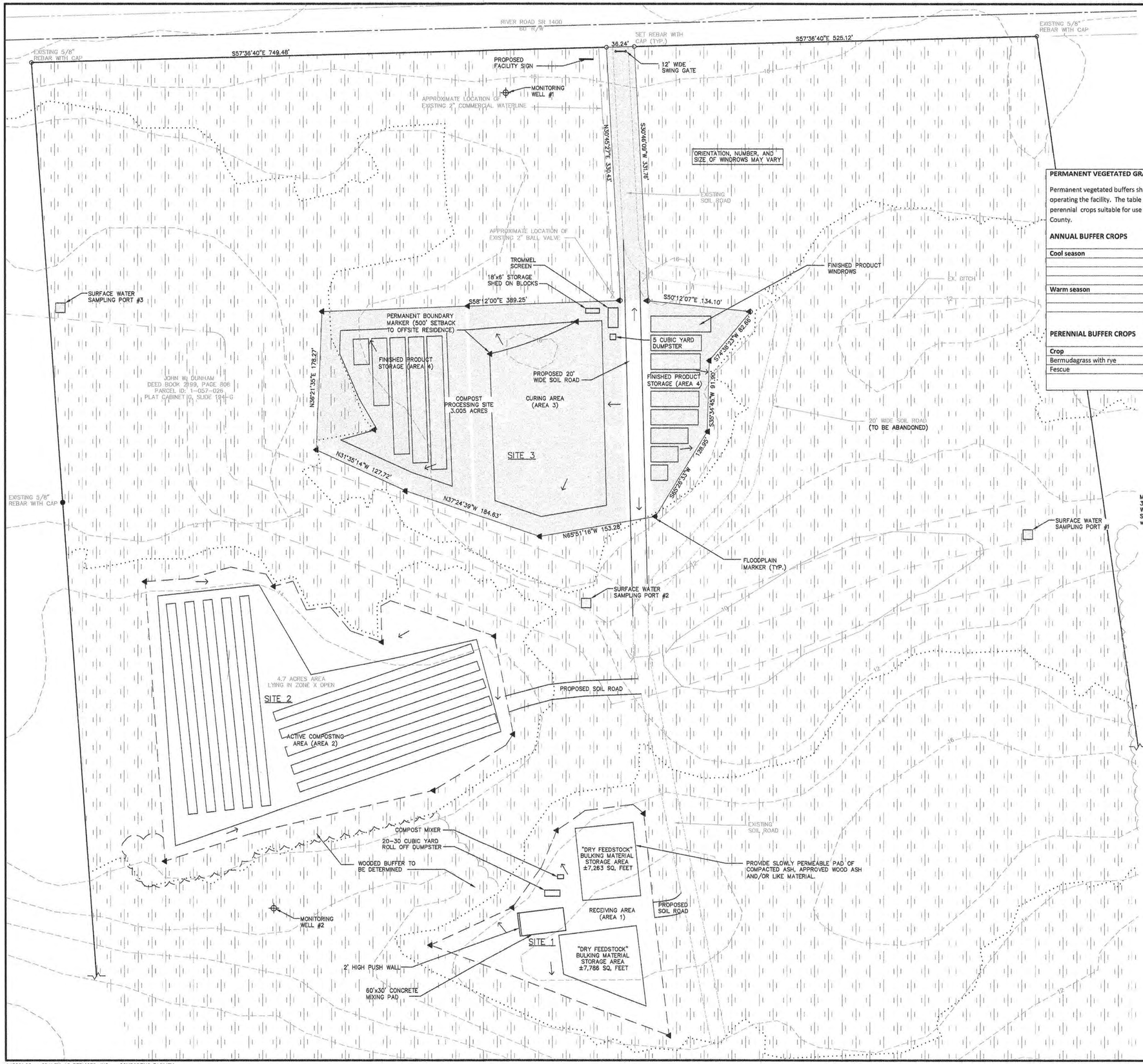
COMPOSTING FACILITY

CRAVEN COUNTY, NC

SITE PLAN

PROJECT NUMBER	DRAWING NUMBER
A45201.00	C-101

A45201.00 – CRAVEN AG SERVICES, INC. – COMPOSTING FACILITY



NOTES

1. SEE C-101 FOR GENERAL NOTES.
2. DISTURBED AREAS NOT COVERED BY SLOWLY PERMEABLE PAD OR CONCRETE SHALL BE SEEDED WITH COASTAL BERMUDA, RYE GRASS, OR NATURAL GRASS.
3. FACILITY SIGN SHALL BE A MINIMUM 2'x3' AND INCLUDE THE PERMIT NUMBER, PROHIBITED MATERIALS, AND EMERGENCY CONTACT INFORMATION.
4. BLEND A MIN. 1"–2" OF COMPOST FINES, MIN. 2" OF ASH, WITH NATIVE SOIL FOR AN ADDITIONAL THICKNESS OF 3"–4" WITHIN THE ENTIRE BOUNDARIES OF SITES 1, 2, AND 3. MODIFIED SOIL TEXTURE SHALL BE FINER THAN LOAMY SAND IN ACCORDANCE WITH RULE .1404 (c) (10) (B).
5. COMPOST WINDROWS WILL BE ORIENTED TO PROVIDE SHEET FLOW TO RUNOFF PER FINAL GRADING WITH ASH MIXTURE.
6. FLOODPLAIN AND BOUNDARY MARKERS SHALL BE MAINTAINED AT SITE.
7. PROVIDE 50' MINIMUM VEGETATED BUFFER (WOODLAND OR CROPS) AROUND PERIMETER OF SITES 1, 2, AND 3.

PERMANENT VEGETATED GRASS BUFFERS

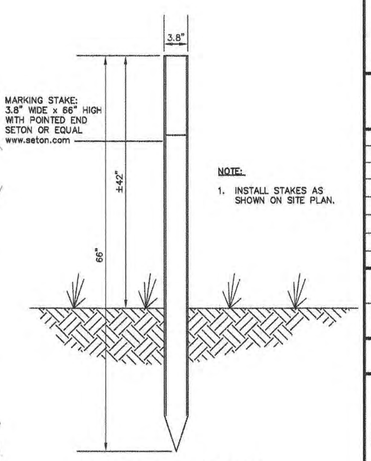
Permanent vegetated buffers shall be established downslope of the compost production site prior to operating the facility. The table below lists a variety of cool season and warm season annual and perennial crops suitable for use in the buffer areas and the recommended seeding rate for Craven County.

ANNUAL BUFFER CROPS

Cool season	Crop	Seeding Recommendation
	Annual rye	Broadcast @ 20 lb/ac, drill @10 lb/ac
	Wheat	40 lb/ac
	Oats	Broadcast@ 110 lb/ac, drill @ 80 lb/ac
Warm season		
	Sudan/sorghum	30 lb/ac
	Millet	Broadcast @20 lb/ac, drill @ 10 lb/ac

PERENNIAL BUFFER CROPS

Crop	Seeding Recommendation
Bermudagrass with rye	Bermuda broadcast @ 8 lb/ac, drill @ 5 lb/ac, rye as above
Fescue	Broadcast @ 15 lb/ac, drill @ 10 lb/ac



NOTE:

1. INSTALL STAKES AS SHOWN ON SITE PLAN.

FLOODPLAIN AND BOUNDARY MARKER

1 / C-102 SCALE: NTS

LEGEND

- 110 — EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- EXISITNG BOUNDARY/PROPERTY LINE
- EXISTING RIGHT OF WAY
- EXISTING DITCH
- EXISTING TREELINE
- FLOODPLAIN
- EXISTING BUFFER/EASEMENT
- CENTERLINE
- EXISTING SOIL ROAD
- ZONE X (THE AREA IS OUTSIDE THE 100 YEAR FLOODPLAIN BUT WITHIN THE 500 YEAR FLOODPLAIN (0.2% ANNUAL CHANCE FLOOD))
- ZONE X (THE AREA IS OUTSIDE THE 100 YEAR AND 500 YEAR FLOODPLAIN)
- ZONE AE (THE AREA IS WITHIN THE 100 YEAR FLOODPLAIN (1% ANNUAL CHANCE FLOOD EVENT))
- GRADE ARROW (POINTS TO LOWER ELEVATION)
- FLOODPLAIN MARKER

A. R. Rubin, Ed.D.
President

A. R. Rubin and Associates
sustainable environmental solutions

192 fearrington post
pittsboro, nc, 27312
919 545 3066
919 270 0344

GRAPHIC SCALE: 1" = 60'
0 30 60 120 180

REVISIONS

NO.	DATE	DESCRIPTION
1	08/08/11	PER LQS
2	02/29/12	PER SWS
3	12/03/12	PER SWS
4	08/14/13	PER LQS, SWS
5	11/21/13	PER SWS
6	01/29/14	PER SWS

PROJECT MANAGER: GSM	PROJECT ENGINEER: ZLF
DRAWN BY: MAE	CHECKED BY: GSM

DATE: JUNE 28, 2011

NORTH CAROLINA PROFESSIONAL SEAL 17069 ENGINEER GARY S. MacCONNELL 3/4/14

MacCONNELL & Associates, P. C.
1903 NORTH HARRISON AVE., SUITE 102
CARY, NORTH CAROLINA 27513
P. O. BOX 129
MORRISVILLE, NORTH CAROLINA 27560
TEL: (919) 467-1239 FAX: (919) 319-8510

CRAVEN AG SERVICES, INC.

COMPOSTING FACILITY

CRAVEN COUNTY, NC

SITE LAYOUT

PROJECT NUMBER	DRAWING NUMBER
A45201.00	C-102

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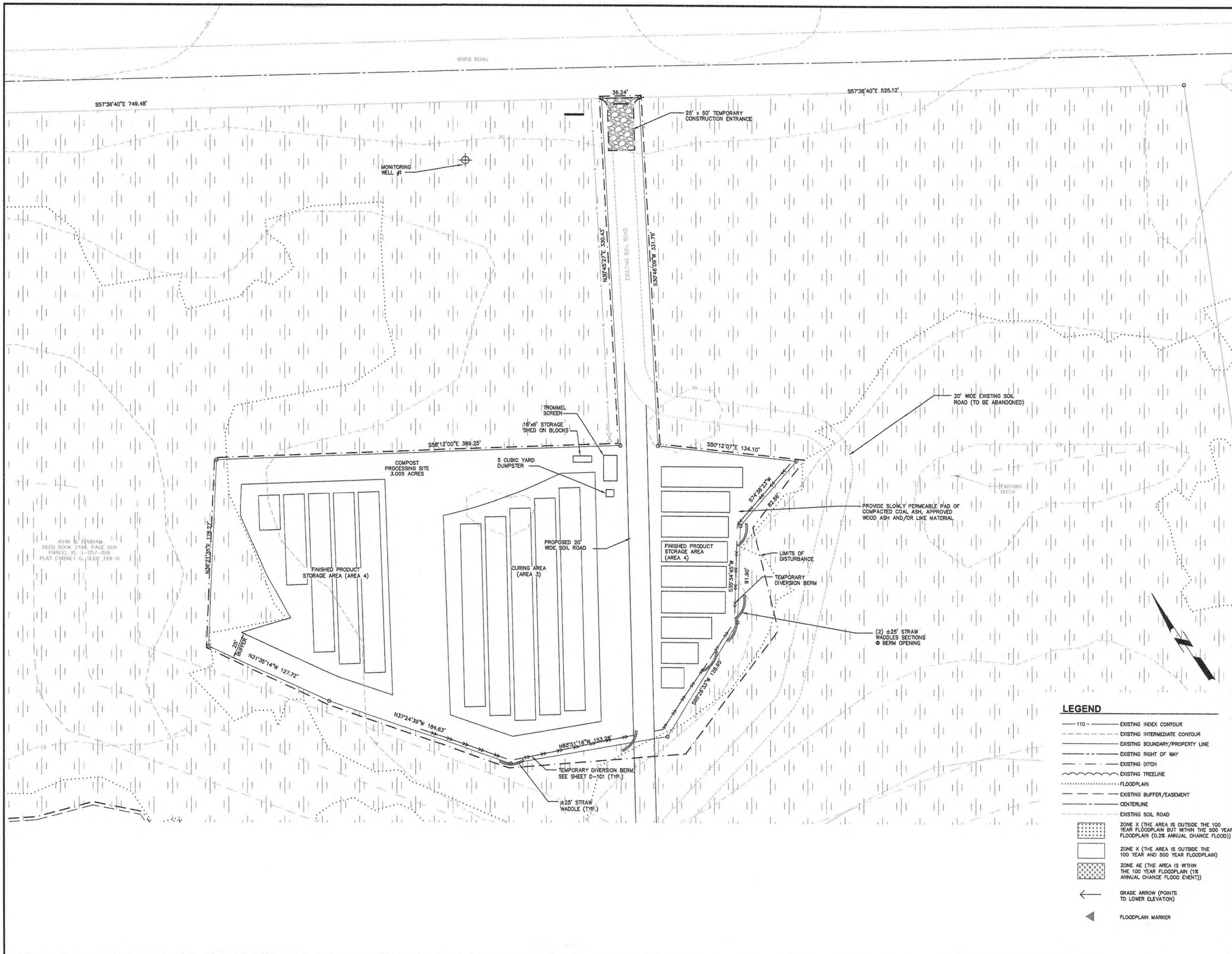

NOTES

1. SEE C-101 FOR GENERAL NOTES.
2. ALL DISTURBED SOILS WILL BE USED FOR CONSTRUCTION OF DIVERSION BERMS AND GRADING OF COMPOST PAD.
3. HAY BALES (OPTIONAL) MAY BE PLACED DOWN SLOPE (OUTSIDE) OF STRAW WADDLES.
4. LOCATION OF STRAW WADDLE OUTLETS IN TEMPORARY DIVERSION BERM MAY BE ADJUSTED AS REQUIRED TO MEET SITE CONDITIONS.

S & EC LEGEND

- LIMITS OF GRADING/DISTURBANCE
- TEMPORARY DIVERSION BERM
- STRAW WADDLE
- CONSTRUCTION ENTRANCE/EXIT

LEGEND

- 110 — EXISTING INDEX CONTOUR
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President

A. R. Rubin and Associates
sustainable environmental solutions

192 fearrington post
pittsboro, nc, 27312
919 545 3066
919 270 0344

GRAPHIC SCALE: 1" = 40'
0 20 40 80 120

REVISIONS

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4	08/14/13	PER LQS, SWS
5	11/21/13	PER SWS

PROJECT MANAGER:	PROJECT ENGINEER:
GSM	ZLF
DRAWN BY: MAE	CHECKED BY: GSM

DATE: JUNE 28, 2011

NORTH CAROLINA PROFESSIONAL SEAL 17069 ENGINEER ZACH S. MacCONNELL

MacCONNELL & Associates, P. C.
1903 NORTH HARRISON AVE., SUITE 102
CARY, NORTH CAROLINA 27513
P. O. BOX 129
MORRISVILLE, NORTH CAROLINA 27560
TEL: (919) 467-1239 FAX: (919) 319-6510

CRAVEN AG SERVICES, INC.

COMPOSTING FACILITY

CRAVEN COUNTY, NC

STORMWATER/ SEDIMENTATION & EROSION CONTROL PLAN LAYOUT 1 OF 2

PROJECT NUMBER	DRAWING NUMBER
A45201.00	C-103

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NOTES

1. SEE C-101 FOR GENERAL NOTES.
2. ALL DISTURBED SOILS WILL BE USED FOR CONSTRUCTION OF DIVERSION BERMS AND GRADING OF COMPOST PAD.
3. HAY BALES (OPTIONAL) MAY BE PLACED DOWN SLOPE (OUTSIDE) OF STRAW WADDLES.
4. LOCATION OF STRAW WADDLE OUTLETS IN TEMPORARY DIVERSION BERM MAY BE ADJUSTED AS REQUIRED TO MEET SITE CONDITIONS.

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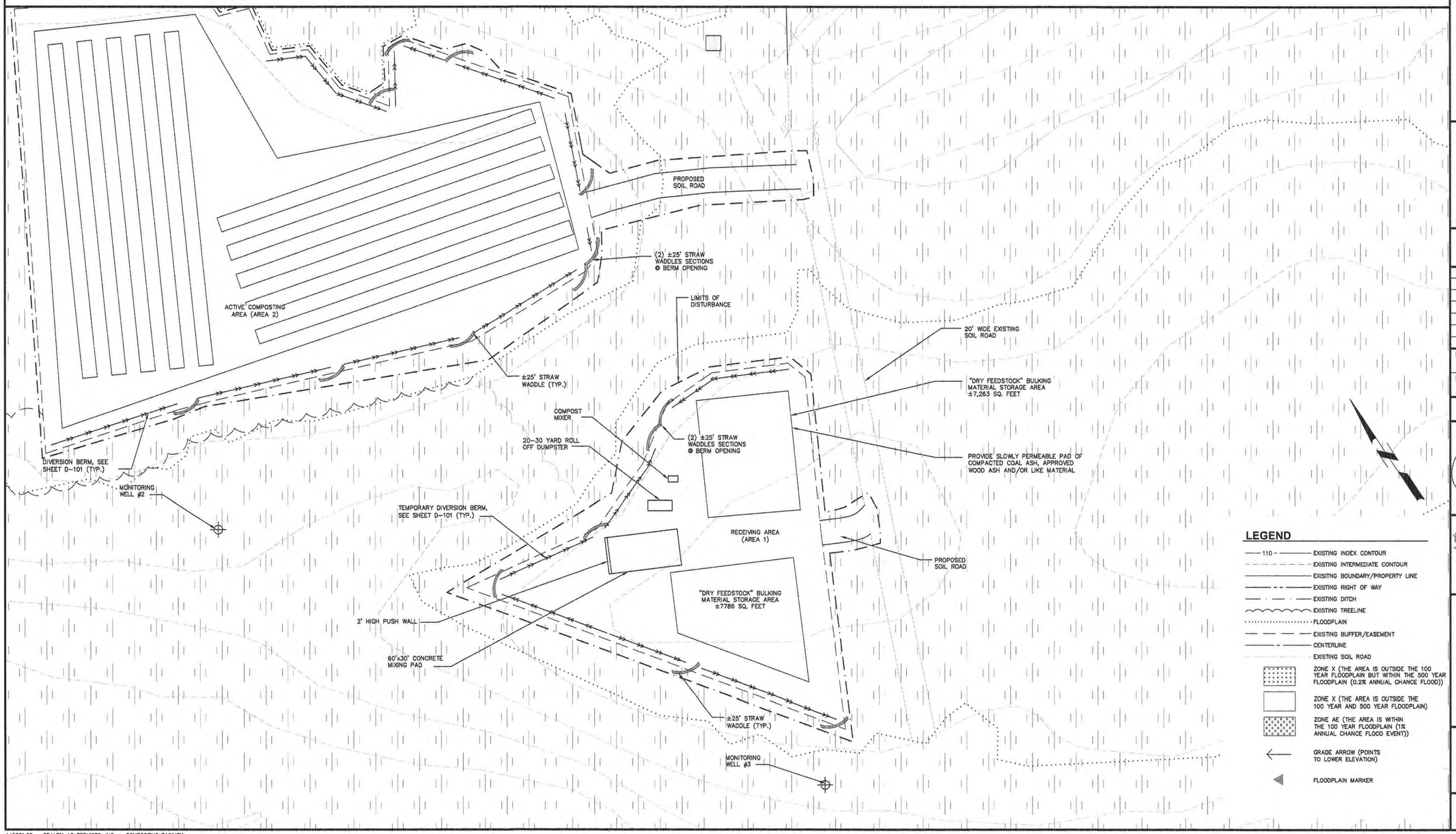
S & EC LEGEND

- LIMITS OF GRADING/DISTURBANCE
- TEMPORARY DIVERSION BERM
- STRAW WADDLE
- CONSTRUCTION ENTRANCE/EXIT



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sustainable environmental solutions

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PROJECT MANAGER:	PROJECT ENGINEER:
GSM	ZLF
DRAWN BY: MAE	CHECKED BY: GSM

DATE: JUNE 28, 2011

NORTH CAROLINA PROFESSIONAL SEAL 17069 ENGINEER ZARY S. MacCONNELL 3/25/14

MacCONNELL & Associates, P. C.
1903 NORTH HARRISON AVE., SUITE 102
CARY, NORTH CAROLINA 27513
P. O. BOX 129
MORRISVILLE, NORTH CAROLINA 27560
TEL: (919) 467-1239 FAX: (919) 319-8510

CRAVEN AG SERVICES, INC.

COMPOSTING FACILITY

CRAVEN COUNTY, NC

STORMWATER/ SEDIMENTATION & EROSION CONTROL PLAN LAYOUT 2 OF 2

PROJECT NUMBER	DRAWING NUMBER
A45201.00	C-104

A45201.00 – CRAVEN AG SERVICES, INC. – COMPOSTING FACILITY

SEEDING SPECIFICATIONS

1. PERMANENT SEEDING: PERMANENT SEEDING IS REQUIRED FOR ALL AREAS DISTURBED BY CONSTRUCTION EXCEPT FOR AREAS COVERED BY STRUCTURES, PAVEMENTS, ETC.
2. TEMPORARY SEEDING: TEMPORARY SEEDING IS REQUIRED FOR THOSE AREAS DISTURBED BY CONSTRUCTION AND LEFT EXPOSED FOR PERIODS OF 15 DAYS OR MORE BEFORE BEING BROUGHT TO FINAL GRADE AND PERMANENTLY SEEDED. THE FORCE MAIN SHALL BE SEEDED AT THE END OF EACH WORKING DAY TO MINIMIZE CONSTRUCTION DISTURBANCE ACTIVITIES.

*PRODUCTS:

MATERIALS:

1. FERTILIZER: PROVIDE 10-10-10 COMMERCIAL FERTILIZER CONFORMING TO STATUTORY REQUIREMENTS AND ALL RULES AND REGULATIONS ADOPTED BY THE NORTH CAROLINA DEPARTMENT OF AGRICULTURE.
2. LIMESTONE: PROVIDE LIMESTONE CONFORMING TO ALL STATUTORY REQUIREMENTS AND ALL RULES AND REGULATIONS ADOPTED BY THE NORTH CAROLINA DEPARTMENT OF AGRICULTURE.
3. SEEDING: PROVIDE SEED CONFORMING TO ALL STATUTORY REQUIREMENTS AND ALL RULES AND REGULATIONS ADOPTED BY THE NORTH CAROLINA DEPARTMENT OF AGRICULTURE. PROVIDE SEED MIXTURES AS TABULATED BELOW. DELIVER SEED TO THE SITE IN ORIGINAL CONTAINERS BEARING THE APPROPRIATE GUARANTEED MIXTURES. SEED SHALL SHOW A PURITY OF NOT LESS THAN 90 PERCENT AND GERMINATION QUALITY OF NOT LESS THAN 85 PERCENT.

3A. TEMPORARY MIXTURE:

A. FOR DECEMBER 1st THROUGH APRIL 15th, THE MIXTURE SHALL CONSIST OF 120 lbs./ac. RYE (GRAIN) AND 50 lbs./ac. KOBE.

B. FOR APRIL 15th THROUGH AUGUST 15th, THE MIXTURE SHALL CONSIST OF 40 lbs./ac. GERMAN MILLET.

C. FOR AUGUST 15th THROUGH DECEMBER 30th, THE MIXTURE SHALL CONSIST OF 120 lbs./ac. RYE (GRAIN).

3B. PERMANENT MIXTURE:

A. THE PERMANENT SEED MIXTURE FOR GENERAL AREAS SHALL CONSIST OF MINIMUM RATE OF 50 lbs./ac. PENSACOLA BAHIAGRASS, 30 lbs./ac. SERICEA LESPEDEZA, 10 lbs./ac. COMMON BERMUDA GRASS, AND 10 lbs./ac. GERMAN MILLET. THE BEST SEEDING DATES FOR THIS MIXTURE ARE FROM APRIL 1st TO JULY 15th.

B. OTHER MIXTURES: OTHER MIXTURES, AS APPROVED OR RECOMMENDED BY THE SOIL CONSERVATION SERVICE OR THE NORTH CAROLINA AGRICULTURAL EXTENSION OFFICE MAY BE USED.

4. MULCH: MULCH ALL SEEDED AREAS, EXCEPT WHERE JUTE MESH IS REQUIRED AND DURING PERMANENT SEEDING. USE UNDAMAGED, AIR-DRIED, THRESHED SMALL GRAIN STRAW FREE OF UNDESIRABLE WEED SEED. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, BY ROVING, OR THROUGH USE OF A MULCH ANCHORING TOOL.

*EXECUTION

1. FOLLOW PROCEDURES SET FORTH IN THE PUBLICATION "GUIDE FOR SEDIMENT CONTROL ON CONSTRUCTION SITES IN NORTH CAROLINA" BY THE SOIL CONSERVATION SERVICE OF THE UNITED STATES DEPARTMENT OF AGRICULTURE, AND AS SPECIFIED HEREIN.
2. SPREAD A MINIMUM OF FOUR (4) INCHES OF TOP SOIL OVER ALL DISTURBED AREAS TO THE FINISHED GRADE.
3. REMOVE ALL GRASS AND WEEDS AND SHAPE THE OVERALL AREA TO EVEN OUT HIGH AND LOW SPOTS.
4. SCARIFY SOIL TO A DEPTH OF THREE (3) INCHES AND WORK INTO A SATISFACTORY SEED BED BY DISKING OR THROUGH THE USE OF CULTIPACKERS, HARROWS, DRAGS, OR OTHER APPROVED MEANS.
5. THE PREPARATION OUTLINED ABOVE SHALL NOT BE DONE WHEN THE SOIL IS FROZEN, WET, OR OTHERWISE IN AN UNFAVORABLE CONDITION.
6. BEGIN AND COMPLETE SEEDING OPERATIONS, AS OUTLINED BELOW, AS SOON AS POSSIBLE AFTER FINAL OR INTERMEDIATE GRADING IS COMPLETED.
7. DISTRIBUTE LIME AND FERTILIZER, AS REQUIRED, UNIFORMLY OVER THE SEED BED. HARROW RAKE OR OTHERWISE WORK THESE ADDITIONS INTO THE SEED BED.
8. DISTRIBUTE SEED UNIFORMLY OVER THE ESTABLISHED SEED BED. LIGHTLY RAKE THE SURFACE OF THE SEED BED IN ORDER TO COVER SEED TO A MAXIMUM DEPTH OF 0.25 INCH.
9. COMPACT THE SEED BED WITH AN APPROVED ROLL OR DRAG AFTER COVERING THE SEED.
10. NO LIME, FERTILIZER, OR SEED SHALL BE APPLIED DURING A STRONG WIND, WHEN THE SOIL IS WET, OR WHEN THE SOIL IS OTHERWISE UNWORKABLE. SHOULD RAIN FOLLOW SEEDING BEFORE ROLLING IS INITIATED, THE SEED BED SHALL NOT BE ROLLED.
11. NO RIP-RAP IS TO BE PLACED ALONG THE BANKS OF NEW FILL. MAINTAIN THE AREA AND REPAIR ANY EROSION DAMAGE UNTIL A PERMANENT GROUND COVER IS ESTABLISHED. USE MULCH OR MESH AS REQUIRED.

*APPLICATION

TEMPORARY SEEDING: FOR DECEMBER 1st THROUGH AUGUST 15th:

1. APPLY LIME ACCORDING TO THE SOIL TESTS OR AT A RATE OF 2000 lbs./ac. BEFORE SEEDING.
2. APPLY FERTILIZER ACCORDING TO THE SOIL TESTS OR AT A RATE OF 750 lbs./ac.
3. SEED THE SEED BED WITH THE SPECIFIED SEED MIXTURE AT THE SPECIFIED RATE FOR THE RECOMMENDED PLANTING SEASON.
4. APPLY GRAIN STRAW AT A RATE OF 4000 lbs./ac. OR PROVIDE EQUIVALENT COVER OF ANOTHER SUITABLE COVER. MULCH SHALL BE ANCHORED IN A SUITABLE WAY. WHERE JUTE MESH IS REQUIRED, APPLY THE PRODUCT ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS AND ANCHOR WITH STEEL HAIRPIN-SHAPED WIRE STAPLES.
5. REFERTILIZE SEED BED IF GROWTH IS NOT FULLY ADEQUATE, AS DETERMINED BY THE ENGINEER. RE-SEED, FERTILIZE, AND MULCH ALL DAMAGED, BARE, AND ERODED AREAS IMMEDIATELY AND UNTIL A SUITABLE COVER IS ESTABLISHED.

TEMPORARY SEEDING: FOR AUGUST 15th THROUGH DECEMBER 30th:

1. APPLY LIME ACCORDING TO THE SOIL TESTS OR AT A RATE OF 2000 lbs./ac. BEFORE SEEDING.
2. APPLY FERTILIZER ACCORDING TO THE SOIL TESTS OR AT A RATE OF 1000 lbs./ac.
3. SEED THE SEED BED WITH THE SPECIFIED SEED MIXTURE AT THE SPECIFIED RATE FOR THE RECOMMENDED PLANTING SEASON.
4. APPLY GRAIN STRAW AT A RATE OF 4000 lbs./ac. OR PROVIDE EQUIVALENT COVER OF ANOTHER SUITABLE COVER. MULCH SHALL BE SUITABLY ANCHORED. WHERE JUTE MESH IS REQUIRED, APPLY THE PRODUCT ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS AND ANCHOR WITH STEEL HAIRPIN-SHAPED WIRE STAPLES.
5. REFERTILIZE SEED BED IF GROWTH IS NOT FULLY ADEQUATE, AS DETERMINED BY THE ENGINEER. RE-SEED, FERTILIZE, AND MULCH ALL DAMAGED, BARE, AND ERODED AREAS IMMEDIATELY AND UNTIL A SUITABLE COVER IS ESTABLISHED.

PERMANENT SEEDING: APPLICATION OF LIME, FERTILIZER, SEED, AND MULCH:

1. WHERE A NEAT APPEARANCE IS DESIRED, OMIT SERICEA.
2. USE COMMON BERMUDAGRASS ONLY ON ISOLATED SITES WHERE IT CANNOT BECOME A PEST. BERMUDAGRASS MAY BE REPLACED WITH 5 lbs./ac. CENTIPEDEGRASS.
3. SOIL AMENDMENTS: APPLY LIME AND FERTILIZER ACCORDING TO SOIL TESTS, OR APPLY 3000 lbs./ac. GROUND AGRICULTURAL LIMESTONE AND 500 lbs./ac. 10-10-10 FERTILIZER.
4. SEED THE SEED BED WITH THE SPECIFIED SEED MIXTURE AT THE SPECIFIED RATE DURING RECOMMENDED PLANTING SEASONS. IF GRADING IS COMPLETED AT TIMES OTHER THAN THE RECOMMENDED SEASON, PROVIDE TEMPORARY SEEDING OR OTHER EROSION AND SEDIMENTATION PROTECTION APPROVED BY THE ENGINEER UNTIL THE APPROPRIATE PLANTING SEASON BEGINS.
5. MULCH: APPLY 4000 lbs./ac. GRAIN STRAW OR EQUIVALENT COVER OF ANOTHER SUITABLE MULCH. ANCHOR BY TACKING ASPHALT, ROVING, OR NETTING OR BY CRIMPING WITH A MULCH ANCHORING TOOL. A DISC WITH BLADES SET NEARLY STRAIGHT MAY BE USED AS A MULCH ANCHORING TOOL.
6. MAINTENANCE: REFERTILIZE THE FOLLOWING APRIL WITH 50 lbs./ac. NITROGEN. REPEAT AS GROWTH REQUIRES. MOW ONLY ONCE PER YEAR. WHERE A NEAT APPEARANCE IS DESIRED, OMIT SERICEA AND MOW AS OFTEN AS NEEDED.

CONSTRUCTION SCHEDULE

THE CONTRACTOR MUST COMPLY WITH THE REQUIREMENTS HEREIN:

1. INSTALL EROSION CONTROL MEASURES AS REQUIRED, SUCH AS THE CONSTRUCTION ENTRANCE, DIVERSION BERMS, AND STRAW WADDLES.
2. CLEAR AND GRUB ANY WOODED AREAS TO BE DEVELOPED WITHIN LIMITS OF DISTURBANCE. STOCKPILE TOPSOIL AND SUITABLE FILL MATERIAL IN AREAS DESIGNATED AS STOCKPILES.
3. BEGIN GRADING ACTIVITIES AFTER ALL REQUIRED EROSION CONTROL MEASURES HAVE BEEN INSTALLED AND CONSTRUCTED. SALVAGE ANY TOPSOIL THAT MAY BE USED AFTER CONSTRUCTION.
4. SEED TEMPORARY AREAS THAT HAVE BEEN LEFT DORMANT FOR LONGER THAN 15 DAYS.
5. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED WEEKLY AND AFTER EACH HEAVY RUNOFF PRODUCING RAINFALL. NEEDED REPAIRS SHALL BE MADE IMMEDIATELY.
6. AFTER CONSTRUCTION REMOVE ALL TEMPORARY STRUCTURES AND ENSURE ALL SEEDING IS COMPLETED FOR AREAS DISTURBED.

MAINTENANCE PLAN

1. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED WEEKLY AND AFTER EACH HEAVY STORMWATER-PRODUCING RAINFALL. ALL NEEDED REPAIRS SHALL BE MADE IMMEDIATELY TO PREVENT FURTHER DAMAGE AND EROSION. STRUCTURES THAT WILL BE MAINTAINED WILL INCLUDE:

   CONSTRUCTION ENTRANCE/EXIT: INSPECT CONSTRUCTION ROAD SURFACE REGULARLY, MAINTAIN IN A CONDITION TO PREVENT SEDIMENT FROM LEAVING THE SITE, AND TOP-DRESS WHEN NEEDED. SEDIMENT TRANSPORTED TO PUBLIC ROADS SHALL BE REMOVED DAILY.

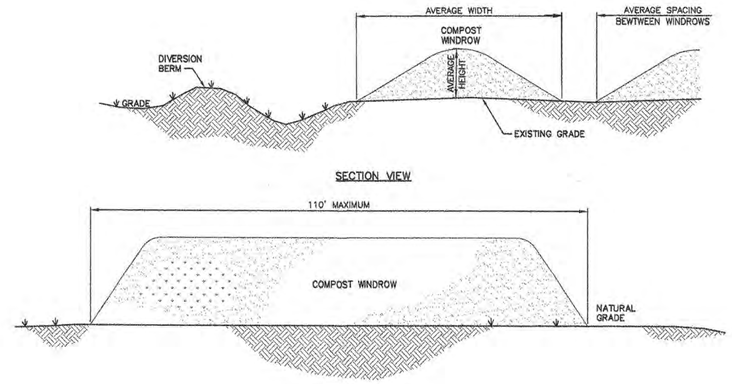
   STRAW WADDLE: CLEAN OUT SEDIMENT, STRAW, LIMBS, OR OTHER DEBRIS WHEN NEEDED. ANTICIPATE SUBMERGENCE AND DEPOSITION ABOVE THE STRAW WADDLE AND EROSION FROM HIGH FLOWS AROUND THE EDGES OF THE STRAW WADDLE. CORRECT ALL DAMAGE IMMEDIATELY. IF SIGNIFICANT EROSION OCCURS BETWEEN STRAW WADDLES, ADDITIONAL MEASURES CAN BE TAKEN SUCH AS, INSTALLING ADDITIONAL WADDLES AT BERM OUTLETS.

   SEEDING, FERTILIZING, AND MULCHING: SEEDED AREAS SHALL BE INSPECTED FOR FAILURE AND NECESSARY REPAIRS SHALL BE MADE WITHIN THE SAME SEASON, IF POSSIBLE.

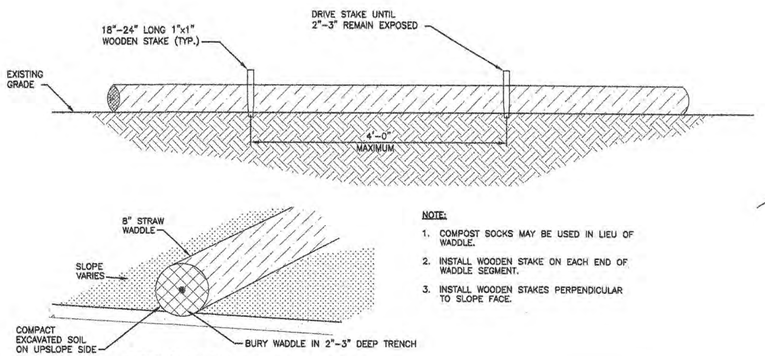
2. THE ANGLE FOR GRADED SLOPES AND FILLS SHALL BE NO GREATER THAN THE ANGLE THAT CAN BE RETAINED BY VEGETATIVE COVER OR OTHER ADEQUATE EROSION CONTROL DEVICES OR STRUCTURES. IN ANY EVENT, SLOPES LEFT EXPOSED WILL, WITHIN 21 CALENDAR DAYS OF COMPLETION OF ANY PHASE OF GRADING, BE PLANTED OR OTHERWISE PROVIDED WITH TEMPORARY GROUND COVER, DEVICES OR STRUCTURES SUFFICIENT TO RESTRAIN EROSION. PERMANENT GROUND COVER SHALL BE PROVIDED FOR ALL DISTURBED AREAS WITHIN 15 WORKING DAYS OR NO MORE THAN 90 CALENDAR DAYS.

TOTAL DISTURBED AREA: 7.95 AC.

WINDROW TYPE	AVERAGE HEIGHT	AVERAGE WIDTH	AVERAGE SPACING
ACTIVE	8'	10'	8'
CURING	15'	20'	6'-8'
FINISHED PRODUCT	30'	50' (MAX)	6'-8'



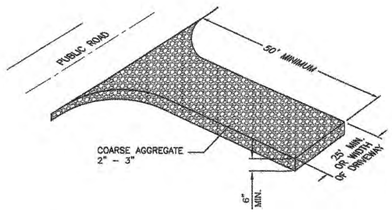
1 / D-101 **COMPOST WINDROW**
NTS



NOTE:

1. COMPOST SOCKS MAY BE USED IN LIEU OF WADDLE.
2. INSTALL WOODEN STAKE ON EACH END OF WADDLE SEGMENT.
3. INSTALL WOODEN STAKES PERPENDICULAR TO SLOPE FACE.

2 / D-101 **STRAW WADDLE DETAIL**
NTS



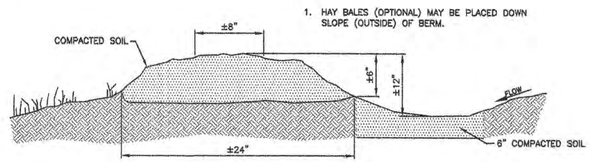
NOTES:

1. GRAVEL PAD TO BE 25'-0" x 50'-0" AND 8" THICK MINIMUM
2. TURNING RADIUS SUFFICIENT TO ACCOMMODATE LARGE TRUCKS IS TO BE PROVIDED.
3. ENTRANCE(S) SHOULD BE LOCATED TO PROVIDE FOR MAXIMUM UTILITY BY ALL CONSTRUCTION VEHICLES.
4. MUST BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR DIRECT FLOW OF MUD ONTO STREETS. PERIODIC TOP DRESSING WITH STONE SHALL BE NECESSARY.
5. ANY MATERIAL DEPOSITED ONTO THE ROAD MUST BE CLEANED UP IMMEDIATELY.
6. APPLICABLE AT ALL POINTS OF INGRESS AND EGRESS UNTIL SITE IS STABILIZED. FREQUENT CHECKS AND TIMELY MAINTENANCE OF THIS DEVICE MUST BE PROVIDED.

3 / D-101 **TEMPORARY CONSTRUCTION ENTRANCE**
NTS

NOTE:

1. HAY BALES (OPTIONAL) MAY BE PLACED DOWN SLOPE (OUTSIDE) OF BERM.



4 / D-101 **DIVERSION BERM**
NTS

NOTES

1. SEE C-101 FOR ALL GENERAL NOTES.

A. R. Rubin, Ed.D.
President

A. R. Rubin and Associates
sustainable environmental solutions

192 fearrington post
pittsboro, nc, 27312
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919 270 0344

REVISIONS

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PROJECT MANAGER: GSM	PROJECT ENGINEER: ZLF
DRAWN BY: MAE	CHECKED BY: GSM

DATE: JUNE 28, 2011

NORTH CAROLINA PROFESSIONAL SEAL 17069 ENGINEER GARY S. MacCONNELL 10/21/13

MacCONNELL & Associates, P. C.
1903 NORTH HARRISON AVE., SUITE 102
CARY, NORTH CAROLINA 27513
P. O. BOX 129
MORRISVILLE, NORTH CAROLINA 27560
TEL: (919) 467-1239 FAX: (919) 319-6510

CRAVEN AG SERVICE, INC.

COMPOSTING FACILITY

CRAVEN COUNTY, NC

DETAILS

PROJECT NUMBER	DRAWING NUMBER
A45201.00	D-101

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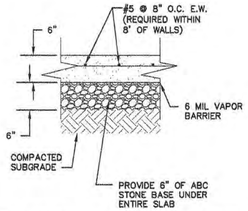
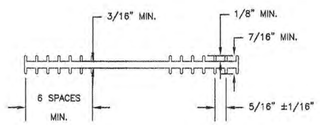
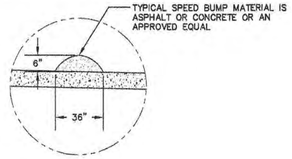


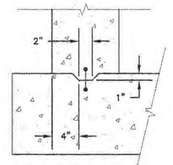
1 D-102 **TYPICAL CONCRETE PAD DETAIL**
NTS



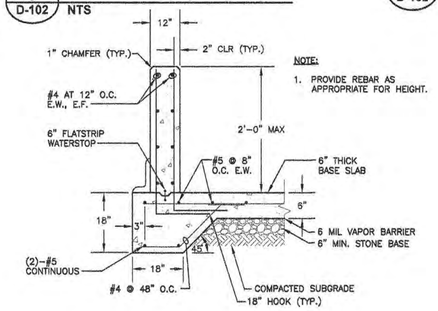
2 D-102 **6" FLATSTRIP WATERSTOP**
NTS



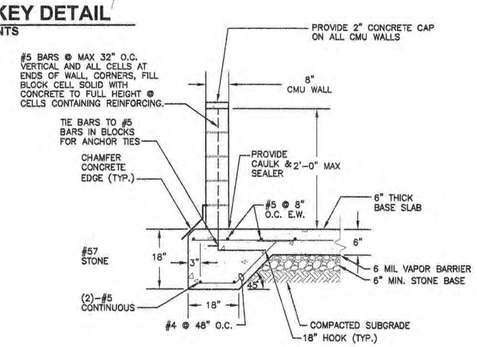
3 D-102 **SPEED BUMP DETAIL**
NTS



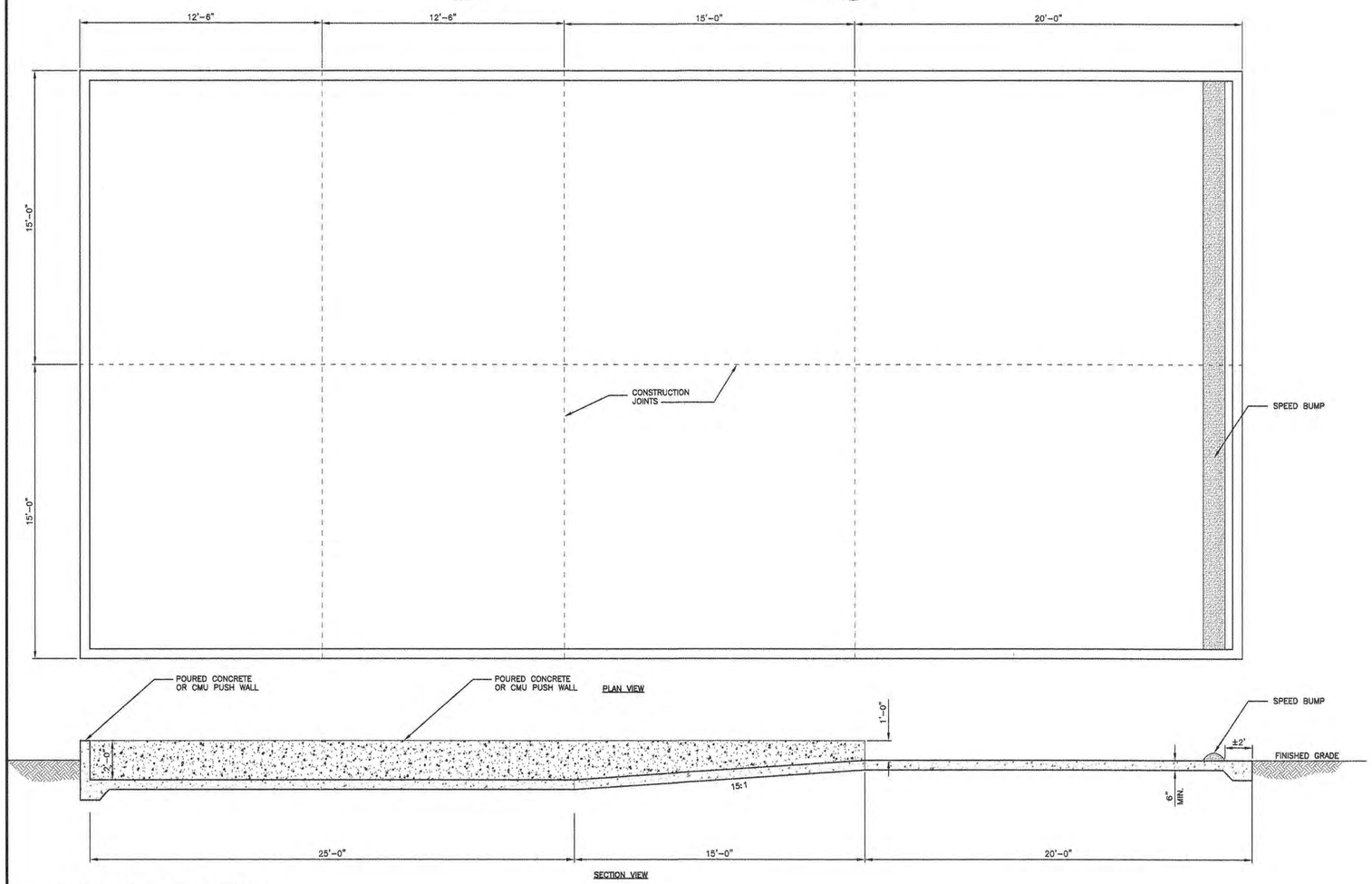
4 D-102 **KEY DETAIL**
NTS



5 D-102 **WALL POURED SECTION**
NTS



6 D-102 **TYPICAL SLAB AND CMU WALL DETAIL**
NTS



7 D-102 **MIXING PAD DETAIL**
NTS

NOTES

1. SEE C-101 FOR ALL GENERAL NOTES.

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A. R. Rubin, Ed.D.
President

A. R. Rubin and Associates
sustainable environmental solutions

192 fearrington post
pittsboro, nc, 27312
919 545 3066
919 270 0344

REVISIONS

NO.	DATE	DESCRIPTION
2	02/29/12	PER SWS
3	12/03/12	PER SWS
6	01/29/14	PER SWS

PROJECT MANAGER: GSM	PROJECT ENGINEER: ZLF
DRAWN BY: MAE	CHECKED BY: GSM

DATE: JUNE 28, 2011

NORTH CAROLINA PROFESSIONAL SEAL 17069 ENGINEER GARY S. MacCONNELL 3/28/14

MacCONNELL & Associates, P. C.
1903 NORTH HARRISON AVE., SUITE 102
CARY, NORTH CAROLINA 27513
P. O. BOX 129
MORRISVILLE, NORTH CAROLINA 27560
TEL: (919) 467-1239 FAX: (919) 319-9510

CRAVEN AG SERVICE, INC.

COMPOSTING FACILITY

CRAVEN COUNTY, NC

MIXING PAD DETAILS

PROJECT NUMBER	DRAWING NUMBER
A45201.00	D-102

A45201.00 – CRAVEN AG SERVICES, INC. – COMPOSTING FACILITY