

CRAVEN AG SERVICE COMPOST SITE APPLICATION FOR LARGE TYPE III FACILITY

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
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J.W. DUNHAM
President Craven Ag Service

Craven AG SERVICES, INC.

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Billy Dunham, President
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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 Francis Mills

I, Wes 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

Wes Mills Davis
Notary

My Commission Expires 3-9-2015

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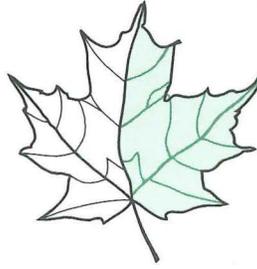
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**MACCONNELL
& ASSOCIATES, P.C.**

1903 North Harrison Avenue
Suite 102
Cary, NC 27513

Fax 919-319-6510

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

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DW*

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 dewateres 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

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- Attachment 1. Site and Topographic Maps of the Compost Facility
- Attachment 2. Design Schematics
- Attachment 3. Compost Analysis Report
- Attachment 4. Composting Operations Manual
- Attachment 5. Equipment Specifications
- Attachment 6. Buffer and FEMA Maps
- Attachment 7. Craven County Zoning Letter
- Attachment 8. Marketing Information Sheets
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Attachment 10. Sediment Trap Calculations

Attachment 11. Flow Diagram CAS

Attachment 12. Ash TCLP

Attachment 13. Metals Analysis - Fly Ash and Coal Ash

Attachment 14. Soil Evaluation for a Proposed Land Treatment of Septage Site (Smith)

Attachment 15. Proposed Monitoring Well Location Map (Waters Edge Environmental)

Attachment 16. Craven Soil and Water Conservation District Letter (Baker)

Attachment 17. Financial Responsibility/Ownership Form (E&SC Application)

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 permitted 3.905 acre demonstration site including a 6.5 acre site west of the current demonstration site for a total of 10.405 acres, creating a new mix/blend area and windrow area, expanding the finish product and blending area and developing 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 southwest containing Area 1, Site 2 is the large 4.7 acre site containing Area 2, and Site 3 is the existing 3.005 acre demonstration site containing Areas 3 and 4 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, LLC 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 over 100 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, LLC 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 haul roads, ingress and egress to storage is within the 500 foot buffer. The applicable buffers are shown on the site map in provided in Attachment 1.

The proposed compost site is located at 5391 River Road in Vanceboro on portions of the Craven Ag Service permitted septage receiver areas and the active septage land application will be halted to allow for the compost windrow. 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: The compost is manufactured from a mixture of hardwood and softwood sawdust, wood shavings, wood chips, animal bedding, ground corn cobs, ground and un-ground yard waste, Septage and FOG wastes (dewatered grease trap residuals and septage) and floating, fatty solids from animal processing or transportation operations (animal haul truck waste) such as Dissolved Air Flotation (DAF) skimmings, poultry litter, field crop residue, construction debris (clean, unfinished wallboard, wood pallets where nails can be removed, clean wood scrap from construction operations), pre and post consumer, source controlled food wastes, vegetative agricultural/agribusiness wastes such as wet, indigestible hay or forage, corn stover, cotton gin trash, or peanut hulls, tobacco scraps/spoilage, tobacco dust, land clearing debris material, lime mud from water treatment operations and non-toxic/non-hazardous coal and wood combustion dust and ash, and seafood processing scraps.
2. Site assessment: The soil evaluations indicate seasonal groundwater elevations at a depth of well over 24 inches. Soil evaluation indicated the predominant soil texture in the western portion of the site proposed as the windrow area as loamy sand. The soil materials in this area will be modified by addition and subsequent incorporation of 2 to 3 inches coal dust/ash/compost fines to introduce fine particles and modify soil texture in the control zone. This will be accomplished with a disk. The current demonstration area has been modified over the last two (2) 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 currently serving as the demonstration site is fine sandy loam to 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. This texture 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.

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 using 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 reported to DWM.

Groundwater monitoring wells are proposed along a compliance boundary between the active site and the down gradient property boundary. A single up-gradient well is proposed to establish and benchmark background levels of groundwater quality. Down gradient wells will be provided. See Rahn Map (Attachment #15).

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

The site plan indicates that NO 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.

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. 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 am 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 metal, 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, LLC 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 - screening and material curing,

Area 4 – Finished Product Storage Area - 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 1500 to 6500 gallons capacity. The proposed area involves development of a concrete mixing/blending pad to be developed once the permit is issued and areas along the western portion of the site to be developed as compost production dictates.

The design team will certify to DWM that the concrete mix/blend pad is developed as permitted and that any expansion of the compost production pads into the expansion area are developed with the ash materials to reduce permeability and prepare a stable working surface. The ash will be applied over the site with a loader, spread evenly to a cumulative depth or 2 to 3 inches and disked into the site proposed for compost production. Groundwater wells are proposed. These will be located by Mr. Phil Rahn, PG and are included in the attachments. The Groundwater monitoring plan is included in the O and M manual.

The compost is to be manufactured from ingredients listed in Section D: Operational Details - Part 1 Waste Types 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 compacted pad on the day of arrival to prevent nuisance problems. As the facility expands, a concrete pad will be developed. 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, LLC, 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 Section D: Operational Details - Part 1 Waste Types 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, transport 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 include hardwood and softwood sawdust from a local manufacturing plants, mixed wood chips and sawdust from ground pallets (nail free), animal transport bedding materials from livestock operations, straw bedding material from the on-site free-stall dairy, horse, or cattle barns, poultry litter from local poultry growers, untreated wallboard from home/mobile home construction/manufacture, pre and post consumer food waste and hay/straw harvested from the land application fields.

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, the compacted mixing pad, the compost production windrows, the curing area and the screening/mixing area and may be described as follows: dry raw materials such as sawdust, wood chips, bedding material and ground pallet materials (wooden pallets) 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). 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. 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 up to 9 months depending on users.

5. Leachate Collection and Recycle System

The site plan indicates that concrete compost mix pad will collect leachate in a tank and transport that to the compost for use in the process or to a permitted wastewater receiver site. The compost production areas are sloped toward a runoff collection area which is intended to hold and treat a small volume of liquid and provide a sink to return liquid to the active compost areas. Runoff collected will be returned to the compost windrow areas as liquid and any excess runoff will be transported off site to permitted wastewater treatment facilities at the City of Kinston or other approved wastewater facility or infiltrated along site perimeters. Contents of the collection area or shallow basin are removed as needed and are normally incorporated back into compost batch as a liquid and nitrogen source or are 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). Table 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 1000 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 (up to 131 degrees Fahrenheit for 15 or more days). 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 present escape of odor. Other component materials such as sawdust, bulking agents such as ground corn cobs or yard waste may be stored for longer periods. The VAR requirements established in rule shall be met through compost temperatures of 105 degrees for 15 days and 115 degrees for 5 of those days as established in 40 CFR Part 503 Rules and these are exceeded through the 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.

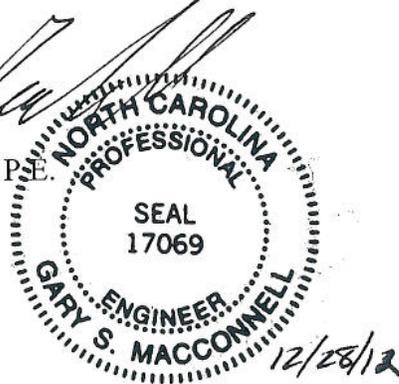
I. SUBMITTAL

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.



attachments



A. R. Rubin

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



Attachment 2. Design Schematics

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

Attachment 3. Compost Analysis Report



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:\cl\compost\Distrib\ 25-craven\Dunham-distrappr0210.doc

Craven **AG SERVICES, INC.**

2115 Hwy 55 West New Bern, NC 28562

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

Mike Scott
Composting 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 CIS 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.



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)																			
		N	P	K	Ca	Mg	S	Fe	Mn	Zn	Cu	B	Mo	Cl	C						
Sample ID:																					
1L1C	Total	7767	1907	2213	94319	2616	763	856	120	57.1	21.1	9.37			167085						
Waste Code:	IN-N																				
PCW	-NH4																				
Description:	-NO3		Na	Ni	Cd	Pb	Al	Se	Li	pH	SS	C:N	DM%	CCE%	ALB(tons)						
Composted Waste - Other	OR-N		1798	13.5	0.24	2.86				9.19	88	21.51	63.13								
	Urea																				
Recommendations:		Nutrients Available for First Crop											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		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)																			
		N	P	K	Ca	Mg	S	Fe	Mn	Zn	Cu	B	Mo	Cl	C						
Sample ID:																					
C1S	Total	9608	1166	1635	18792	832	775	933	94.1	84.9	25.2	9.54			191805						
Waste Code:	IN-N																				
PCW	-NH4																				
Description:	-NO3		Na	Ni	Cd	Pb	Al	Se	Li	pH	SS	C:N	DM%	CCE%	ALB(tons)						
Composted Waste - Other	OR-N		344	2.23	0.32	5.20				7.97	33	19.96	52.47								
	Urea																				
Recommendations:		Nutrients Available for First Crop											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		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			



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



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® **Microbac Laboratories, Inc.**

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

STATE CERT ID.

NC #11 NC #37714 USDA #3787

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

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CERTIFICATE OF ANALYSIS

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

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

Permit No.
Sampler: Dunham

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



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: 02/21/2012

Completed: 02/27/2012

[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						
TD2		Total 27499	2896	30627	27383	5648	4983	3733	377	74.6	22.2	52.9									
Waste Code:		-NH4																			
100		-NO3	Na	Ni	Cd	Pb	Al	Se	Li	pH	SS	C:N	DM%	CCE%	ALB(tons)						
Description:		OR-N	208										64.92								
Indust.-Other		Urea																			
Recommendations:		Nutrients Available for First Crop											Other Elements								
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						
Waste Code:		-NH4																			
FCW		-NO3	Na	Ni	Cd	Pb	Al	Se	Li	pH	SS	C:N	DM%	CCE%	ALB(tons)						
Description:		OR-N	1056							7.31	81	14.85	62.64								
Composted Waste - Other		Urea																			
Recommendations:		Nutrients Available for First Crop											Other Elements								
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						



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 2012

**Prepared for: Craven Ag Service, Inc.
River Road
New Bern, NC**

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

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

Owner: J. W. (Billy) Dunham

Location: Site Location: River Road
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. These include:

Permitted Materials:

- Dewatered Septage (regulated material IN ACCORDANCE WITH 40 CFR Part 503)
- Dewatered Grease trap wastes (regulated material IN ACCORDANCE WITH 40 CFR Part 257)
- Material from permitted and unpermitted agricultural waste sources such as scrapped manure, animal bedding or litter from local animal operations
- DAF Skimmings
- Sawdust from local wood products manufacture
- Ground yard and leaf waste
- Agribusiness residues or vegetative agricultural wastes and by-products (such as waste cotton fiber or gin trash, corn stover, tobacco dust, straw or wet hay)
- Land clearing debris
- Shavings and animal waste from any local livestock trailer wash
- Pre and post consumer food wastes from source controlled operations
- Untreated, unpainted new construction wallboard or gypsum-board, wood pallets
- Seafood processing waste such as crab scrap or fish processing waste
- Lime mud from water treatment operations
- Ash from wood burning operations or coal facilities

Prohibited Materials:

- Municipal sludge
- Hazardous waste
- Infectious waste

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 bunker 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 pad. The Concrete mix/blend pad will be developed as soon as permitted. The pad consists of a mix/blend area located on the expansion area. 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 on the current demonstration site for composting. This area consists of a soil pad compacted by years of compost site operation.

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 existing compacted pads help prevent introduction of undesirable material such as stones into the compost. Liquid or leachate generated during the compost feedstock mixing area will be collected in a tank on the mix pad site and reused as a moisture source in compost. Excess moisture will be treated on a portion of the site currently permitted for land application of septage and FOG and the DWM permit will be modified or excess moisture will be transported off site to an approved wastewater facility. The existing permit will be modified to preclude commingling the liquid waste from the compost site and the septage/FOG.

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 below in the attachment to this report. These processes are accomplished in the areas as listed herein. The raw material storage, receiving area and mix pad; the active windrows and the curing piles are all located along the western portion of the site.

These are receiving area/mix pad: here raw materials are received, this does include the concrete mix bin 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.

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 tank 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 tank 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. Typical windrows shall measure no more than 5 feet in height and no more than 15 feet at the base. 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.

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. 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 berms placed along the down gradient portions of the site are intended to trap this rainfall for at least 48 hours. Runoff collecting in the low areas will infiltrate. The soil material present above the water-table is well suited to treat this runoff during the infiltration process. Groundwater monitoring wells are recommended at down-gradient locations on the site.

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 more dense 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 such as wood-chip, poultry litter, sawdust shavings or gin trash, and cotton waste. 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 into the bin. 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 windrows 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 1/2 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 ratio 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
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	--

¹Nitrogen 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.

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. A small liquid collection basin or sink will be used to handle any leachate from the compost mixing area. This is depicted on the plans. Liquid will flow by gravity gradient into the sink and contents of the sink will be pumped or removed as needed and will normally be incorporated back into compost batch as a liquid and nitrogen source. DWQ has determined no runoff generated in design events exits the site to surface water. The addition of leachate to any of the compost requires the Process to Further Reduce Pathogens (PFRP) to start at the time the leachate is added to the compost. In an emergency, the collected leachate will be transferred to the City Of Kinston, NC WWTP.

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 condition that excess liquid will collect in the sinks located along site boundaries and site operators will pump that liquid into a tank truck for transport to an approved liquid handling facility such as City of Kinston POTW, reincorporated into compost as required moisture (understanding the PFRP requirements) or applied to the CAS site re-permitted to accommodate the site liquid.

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 (Bay 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.

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).

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 Bay 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



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 Yds³

- 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 – Energy – Control – System

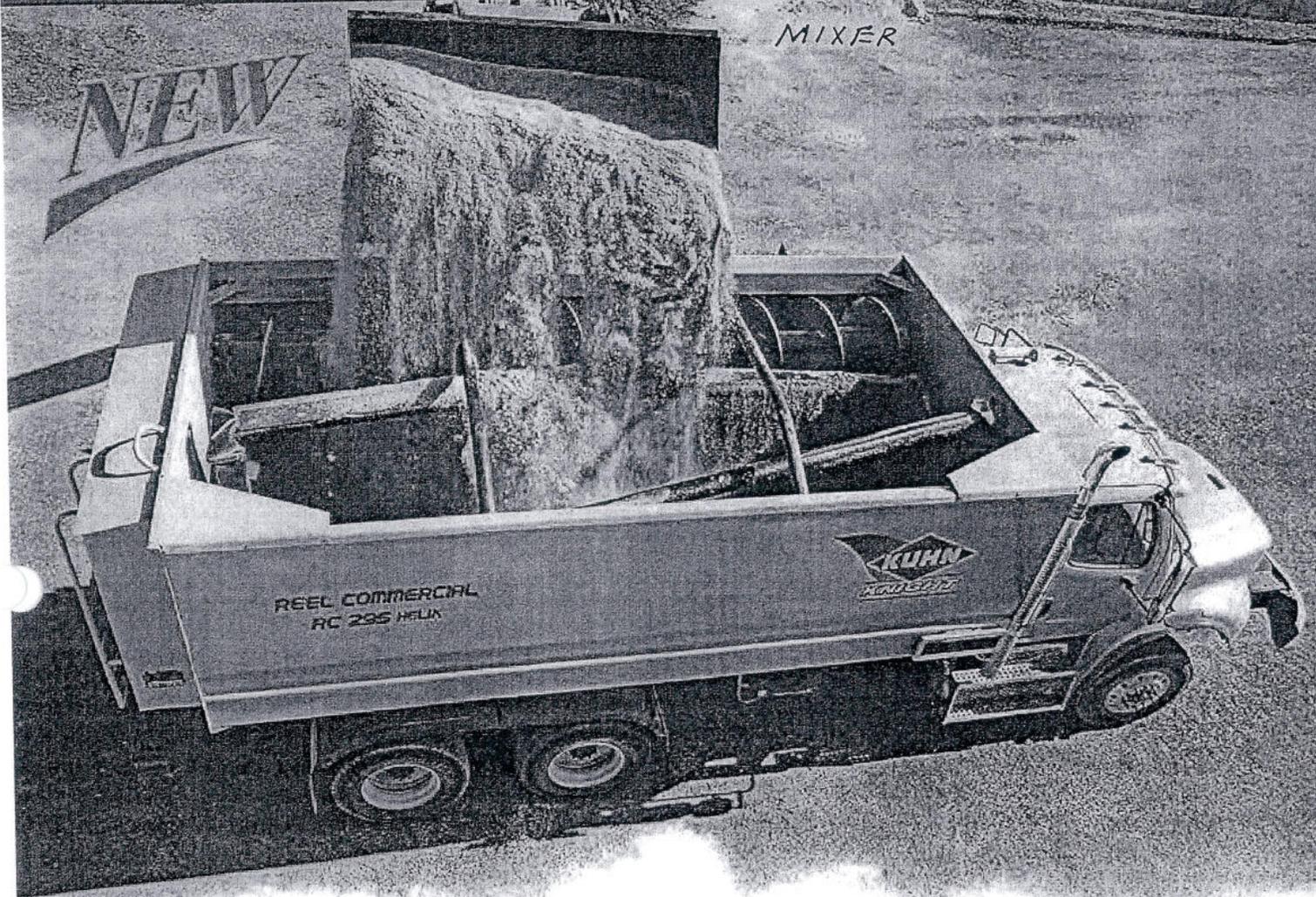
This exclusive control monitors the level of the hopper by means of a sensor. When the hopper is empty, the control automatically stops the screening machine and the engines speed is reduced to idling speed of approximately 700 rpm. When the hopper is filled again, the screen is automatically restarted 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

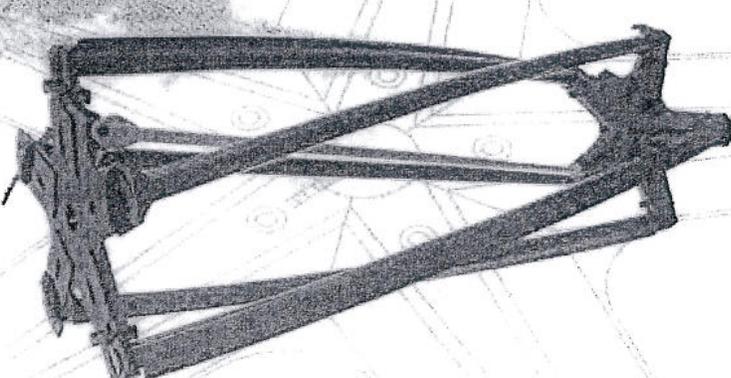
500 - 950 Cubic Feet



NEW

MIXER

REEL COMMERCIAL
RC 295 HELIX



REVOLUTIONARY
HELIX
REEL

WORLD-WIDE LEADER IN TMR MIXERS

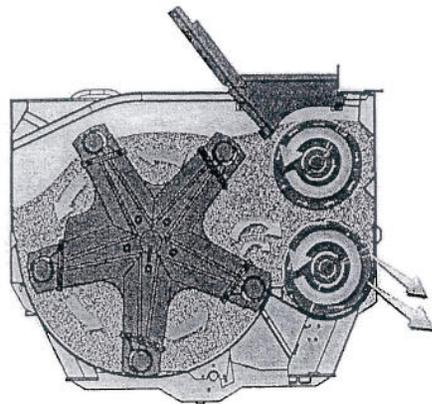
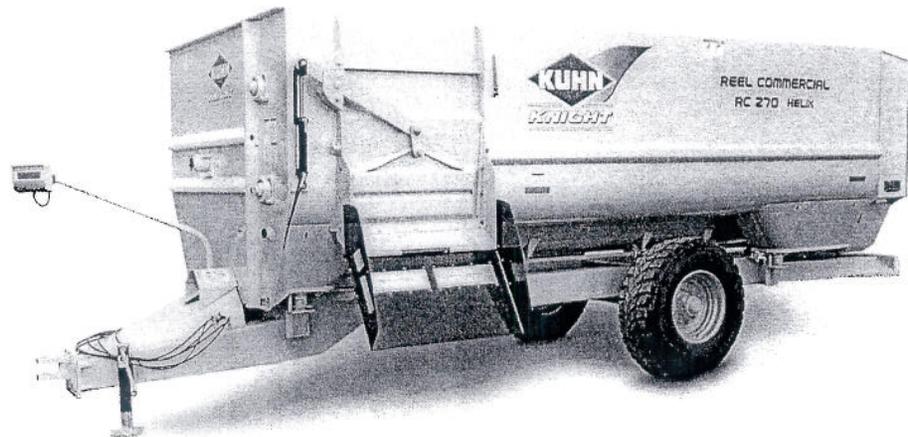
RC 200 SERIES

High-Quality Features



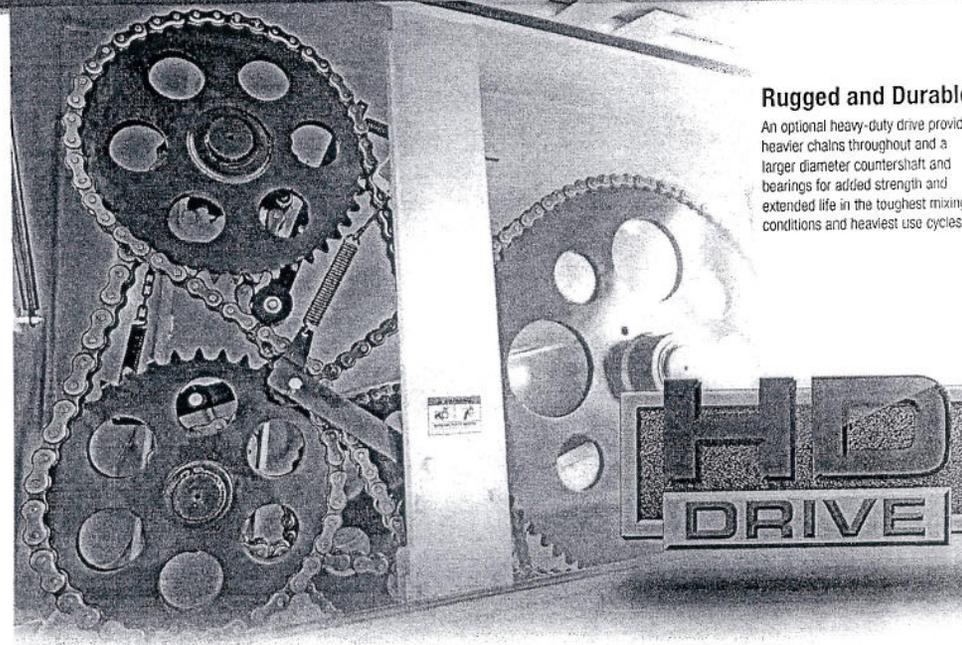
RC 200 SERIES

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.



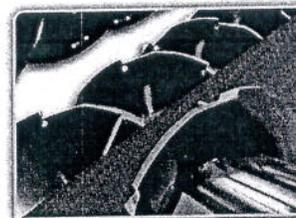
Low Fuel Consumption!

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.



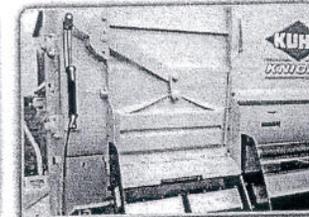
Rugged and Durable

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.



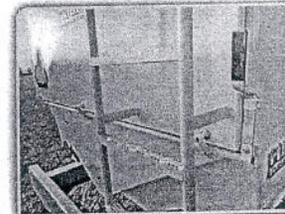
Flexible for Roughage and Grains

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.



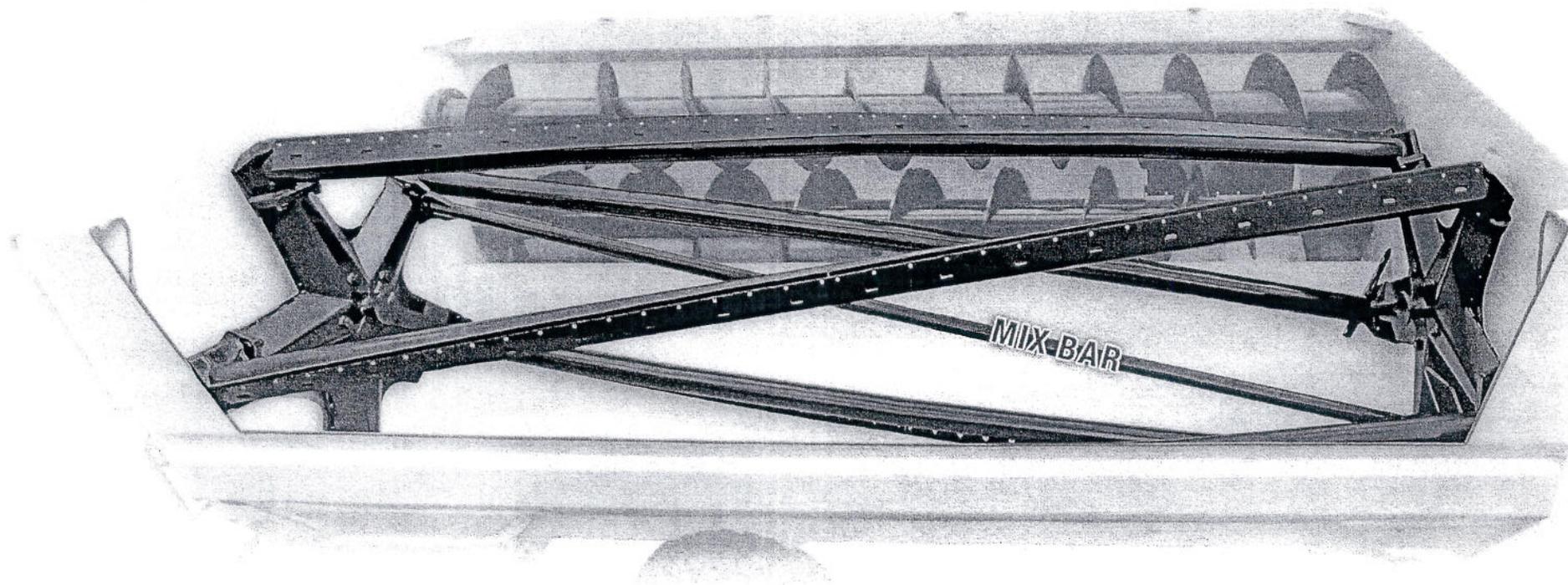
Secure, but Accessible

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.

RC 200 SERIES

Customize an RC to fit your operation

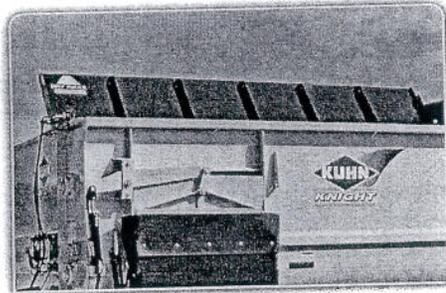


EFFECTIVE HAY HANDLING!



Roughage Maxx

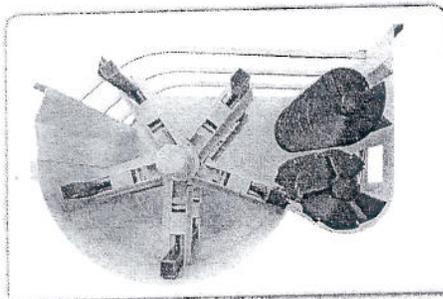
With the Roughage Maxx System, scalloped knives are added to the lower auger to maximize hay processing. The knives provide a more consistent particle length and more even blending of the ration. The result is a more uniform and palatable ration with reduced sorting for overall better feed efficiency.



Hay Maxx

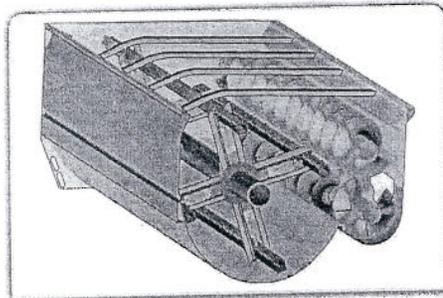
The Hay Maxx System provides enhanced processing of a wide variety of materials. Hay and other bulky materials can be placed on the pan, allowing them to be preprocessed by the upper auger before entering the mixing chamber.

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

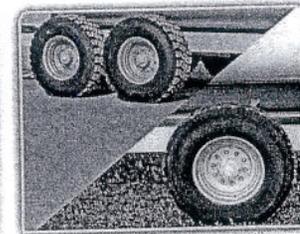
The four-arm reel minimizes the pressure placed on higher-roughage feed and the extra space within the reel enhances hay processing and reduces mixing time. The five-arm reel ensures faster mixing and unloading in heavier grain rations and provides more even load distribution on the reel arms.

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.



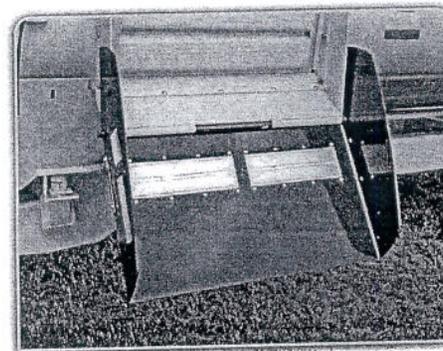
Rugged Undercarriage Options

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.



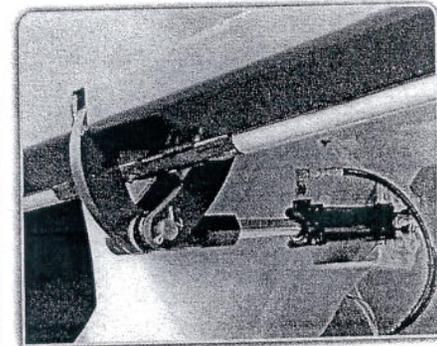
Truck Tire Option

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.

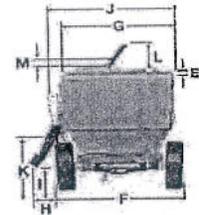
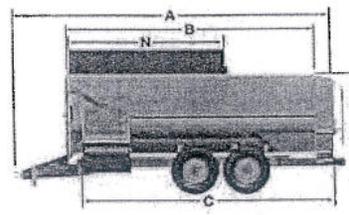
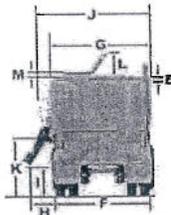
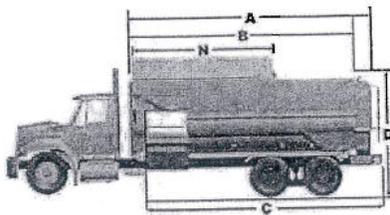


Improved Slide Tray Linkage

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	
	TR	TK	TR	TK	TR	TK	TR	TK
DIMENSIONS (INCHES)								
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			
- 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"	
Hub	HD 10-bolt			HD 10-bolt
Tongue Weight - % gross weight	9%		10%	
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 1/2" 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.



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





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

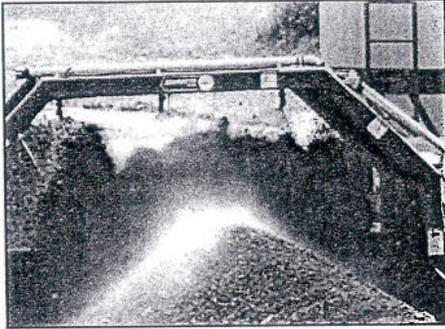


Midwest Bio-Systems • 28933-35 E St. • Tampico, IL 61283
(815) 438-7200 • www.midwestbiosystems.com

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 CO₂ 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

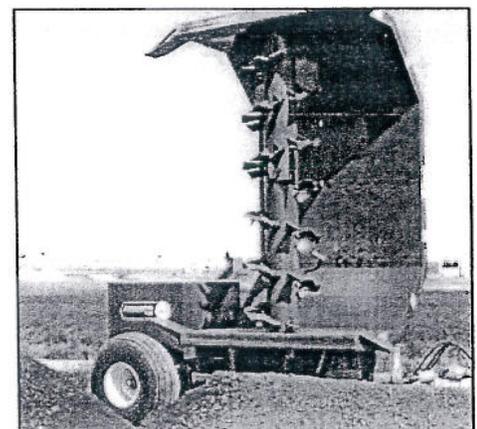
- ACS Compost Workshops
- Compost Microbial Inoculants
- Compost Quality & Feedstock Laboratory Analysis
- Test Instruments
- Fabric Covers

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.



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

Appendix 3. Safety Information



AGRICULTURAL MACHINERY HAZARDS

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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101-75 Farquhar Street, Guelph, Ontario N1H 3N4
(519) 823-5600

Attachment 5. Equipment Specifications



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 Yds³

- 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 – Energy – Control – System

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

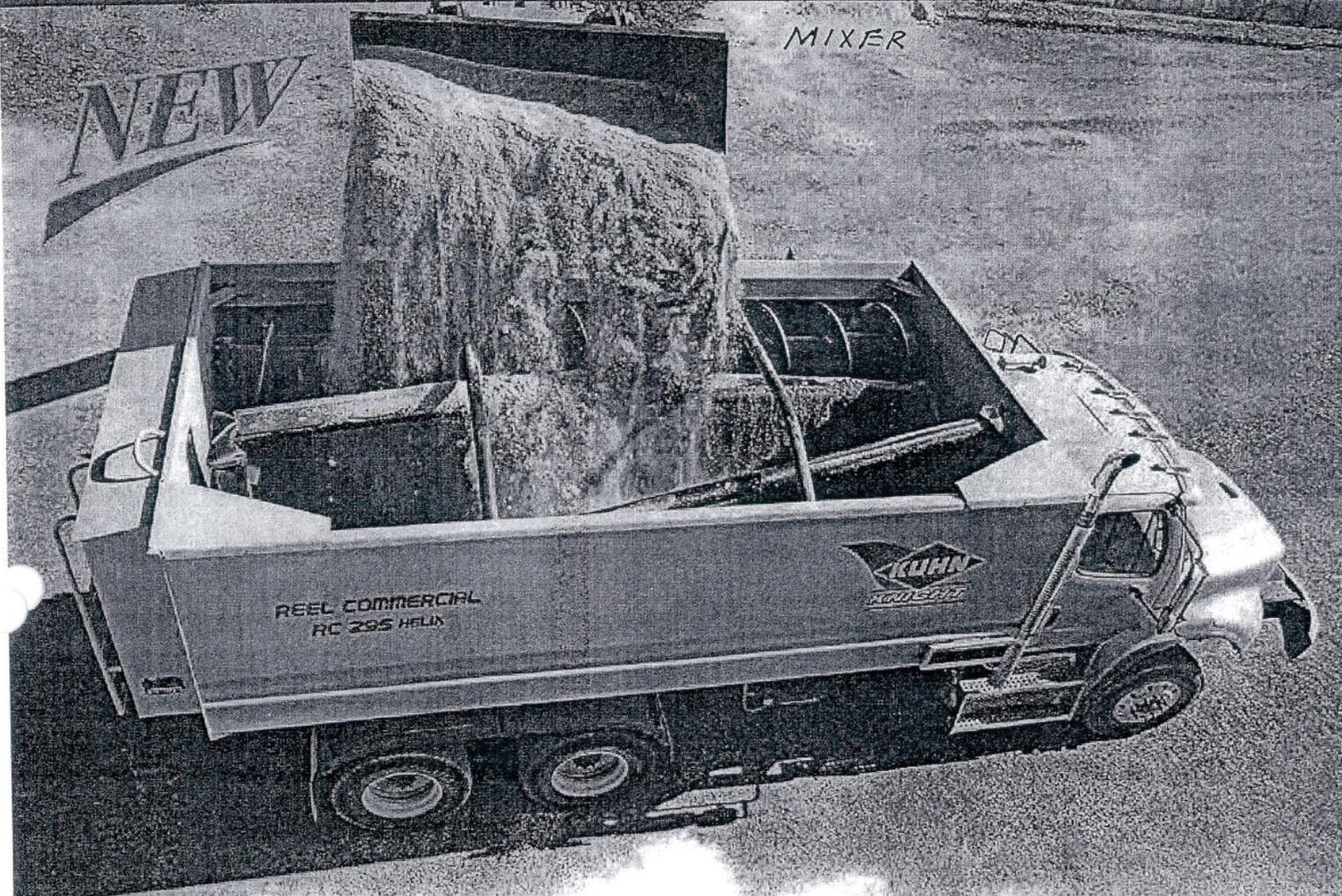
RC 200 SERIES



Reel Commercial

TMR Mixers - with Optional Helix Reel

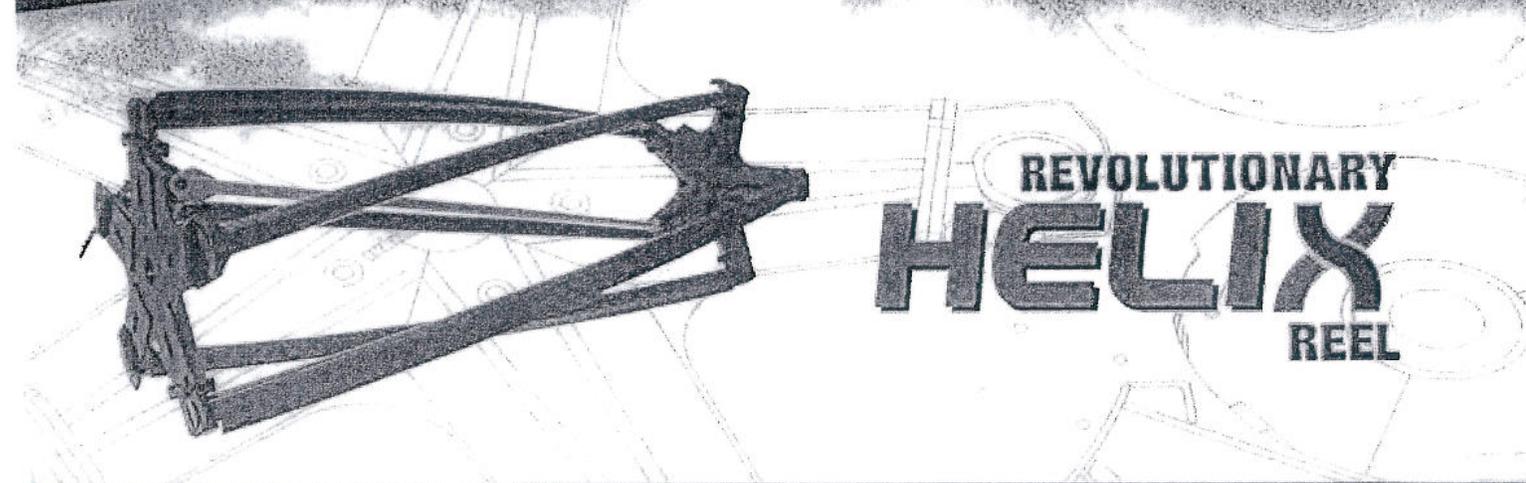
500 - 950 Cubic Feet



NEW

MIXER

REEL COMMERCIAL
RC 295 HELIX



REVOLUTIONARY
HELIX
REEL

WORLD-WIDE LEADER IN TMR MIXERS



RC 200 SERIES

High-Quality Features

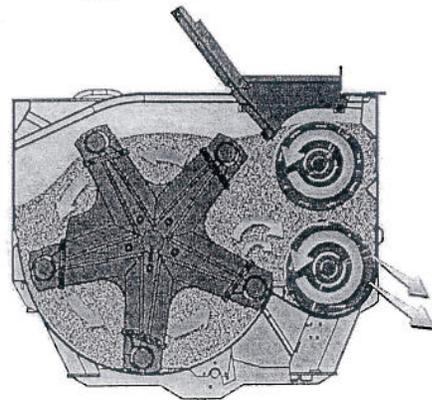
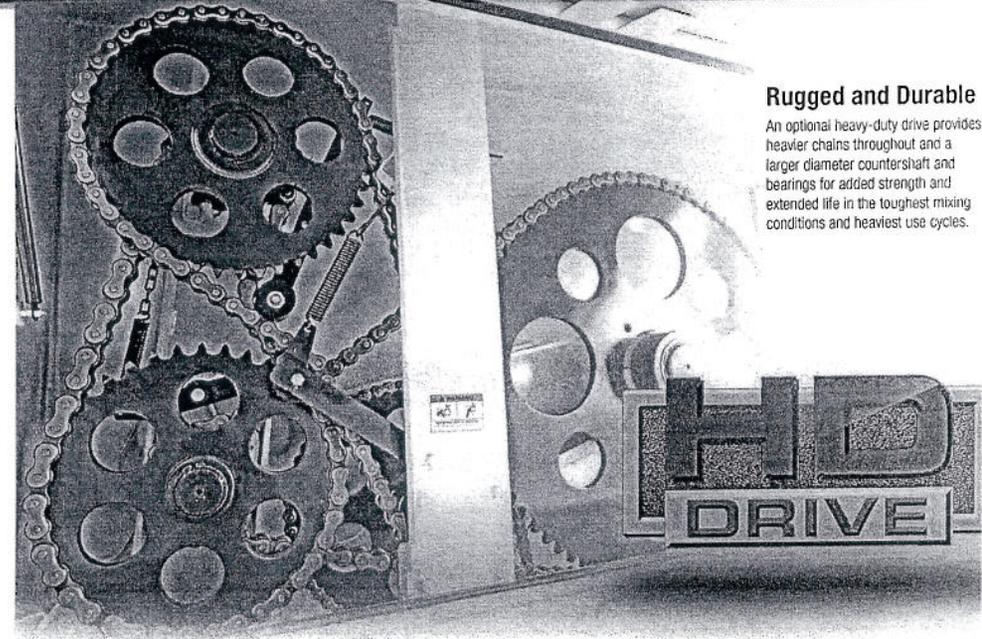
RC 200 SERIES

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.



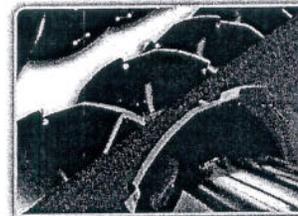
Rugged and Durable

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.



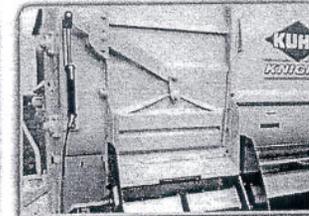
Low Fuel Consumption!

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.



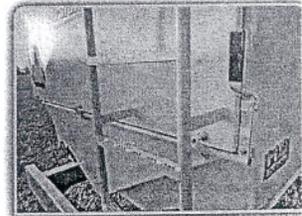
Flexible for Roughage and Grains

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.

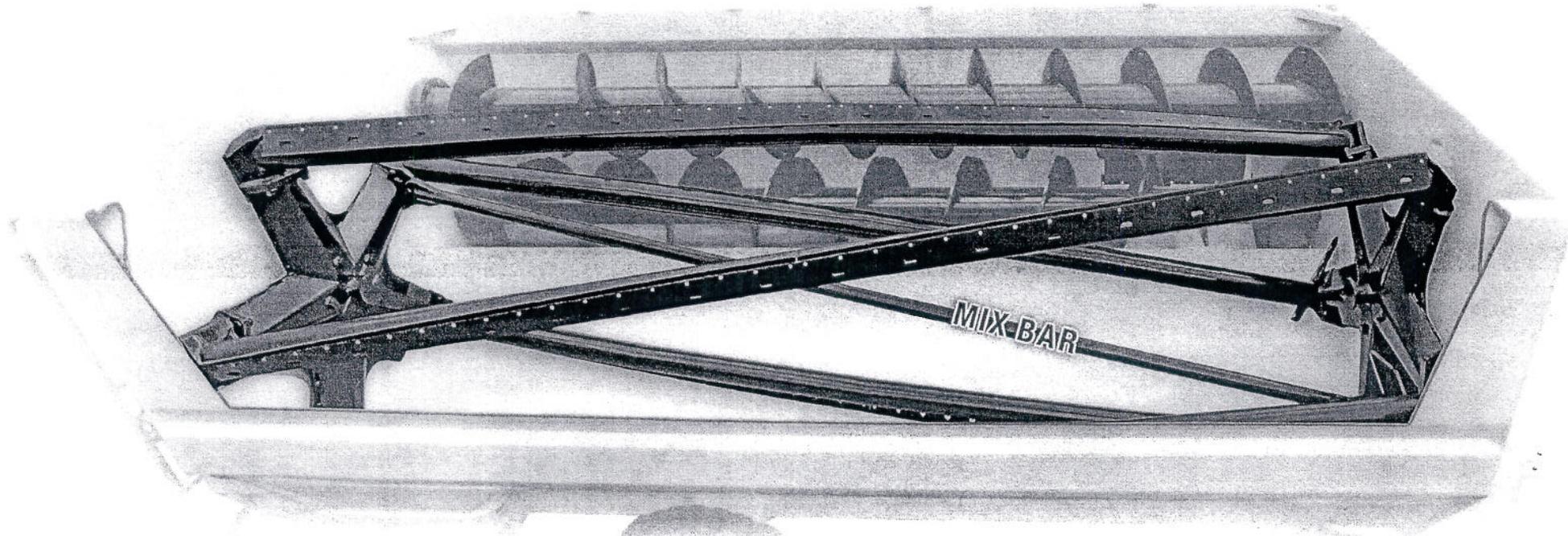


Secure, but Accessible

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.



RC 200 SERIES

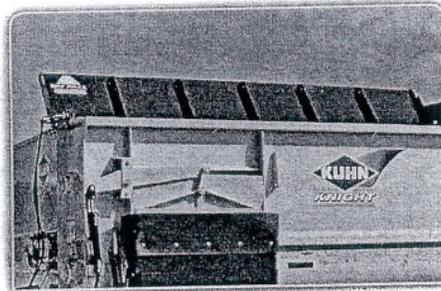
Customize an RC to fit your operation

EFFECTIVE HAY HANDLING!



Roughage Maxx

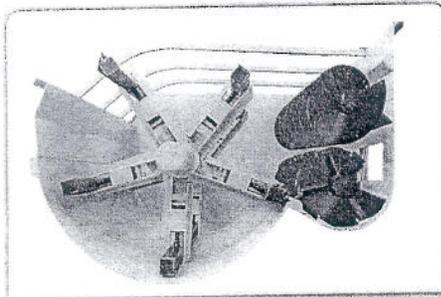
With the Roughage Maxx System, scalloped knives are added to the lower auger to maximize hay processing. The knives provide a more consistent particle length and more even blending of the ration. The result is a more uniform and palatable ration with reduced sorting for overall better feed efficiency.



Hay Maxx

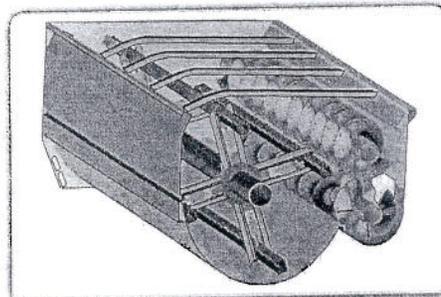
The Hay Maxx System provides enhanced processing of a wide variety of materials. Hay and other bulky materials can be placed on the pan, allowing them to be preprocessed by the upper auger before entering the mixing chamber.

STANDARD REEL OPTION



Large-Diameter Reel

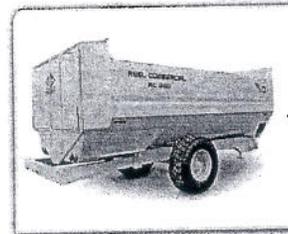
The large-diameter reel gently lifts material up into the side blending augers. The large reel provides ample room for feed movement and quality mixing action. It ensures fast mixing and unloading, which saves time and helps ensure ration quality.



Four- or Five-Arm Reel

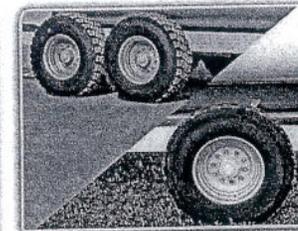
The four-arm reel minimizes the pressure placed on higher-roughage feed and the extra space within the reel enhances hay processing and reduces mixing time. The five-arm reel ensures faster mixing and unloading in heavier grain rations and provides more even load distribution on the reel arms.

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.



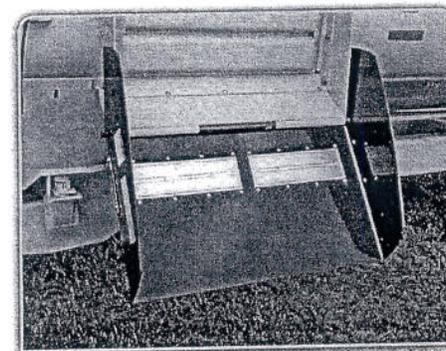
Rugged Undercarriage Options

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.



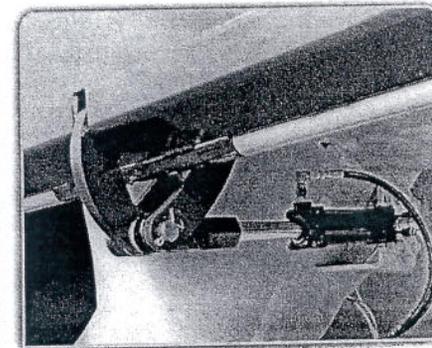
Truck Tire Option

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.

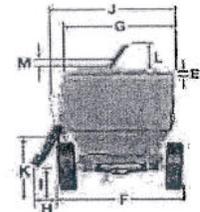
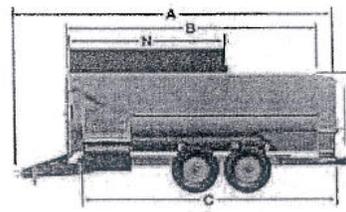
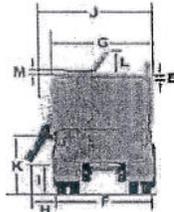
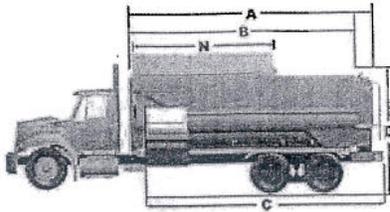


Improved Slide Tray Linkage

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	
	TR	TK	TR	TK	TR	TK	TR	TK
DIMENSIONS (INCHES)								
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
I - 4-Auger Discharge - max. reach 2' / 3'	32/42	NA	32/42	NA	32/42	NA	NA	NA
J - Slide Tray - max. height	35	48	35	48	35	48	50	59
K - 4-Auger Discharge - max. height 2' / 3'	50/56	NA	50/56	NA	50/56	NA	NA	NA
L - Slide Tray - transport width	114	114	114	114	114	114	128	128
M - 4-Auger Discharge - transport width - 2' / 3'	126/130	NA	126/130	NA	126/130	NA	NA	NA
N - Hinge Height for Discharge	47	56	47	56	47	56	56	65
O - Height - haypan up	22	22	22	22	22	22	22	22
P - Height - haypan down	8	8	8	8	8	8	8	8
Q - 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 1/8"	8 7/8"	8 7/8"
- 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 1/2" 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.



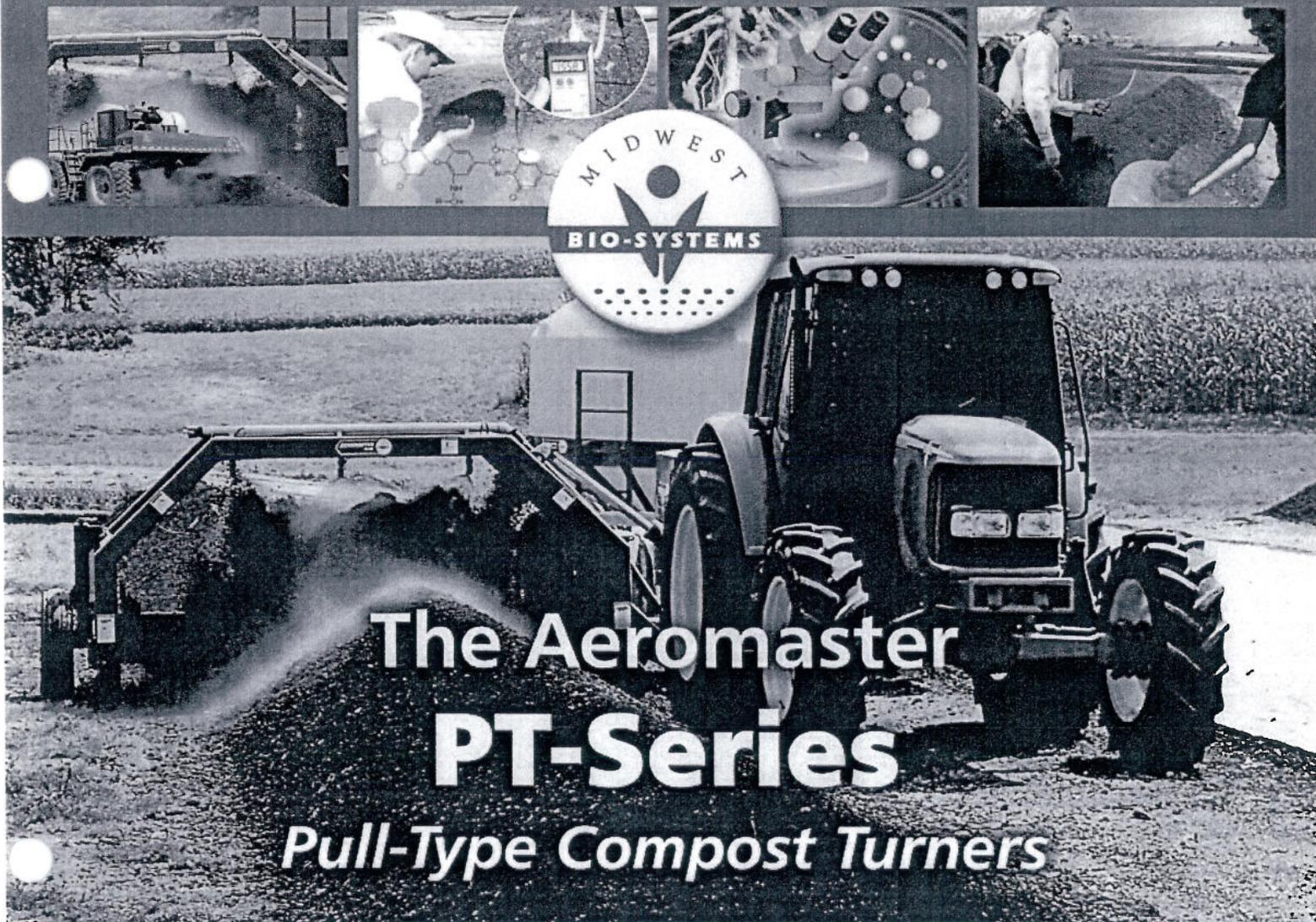
SAFETY FIRST

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

YOUR KUHN KNIGHT DEALER

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





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 CO₂ 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

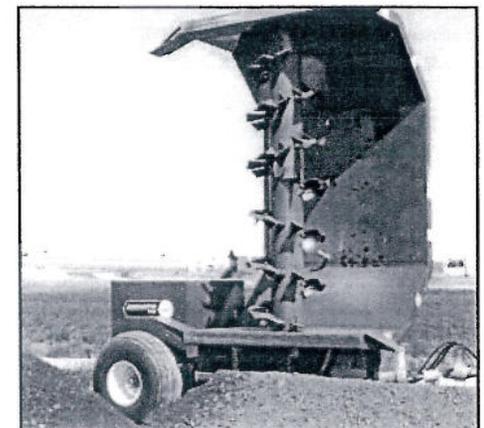
- ACS Compost Workshops
- Compost Microbial Inoculants
- Compost Quality & Feedstock Laboratory Analysis
- Test Instruments
- Fabric Covers

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.

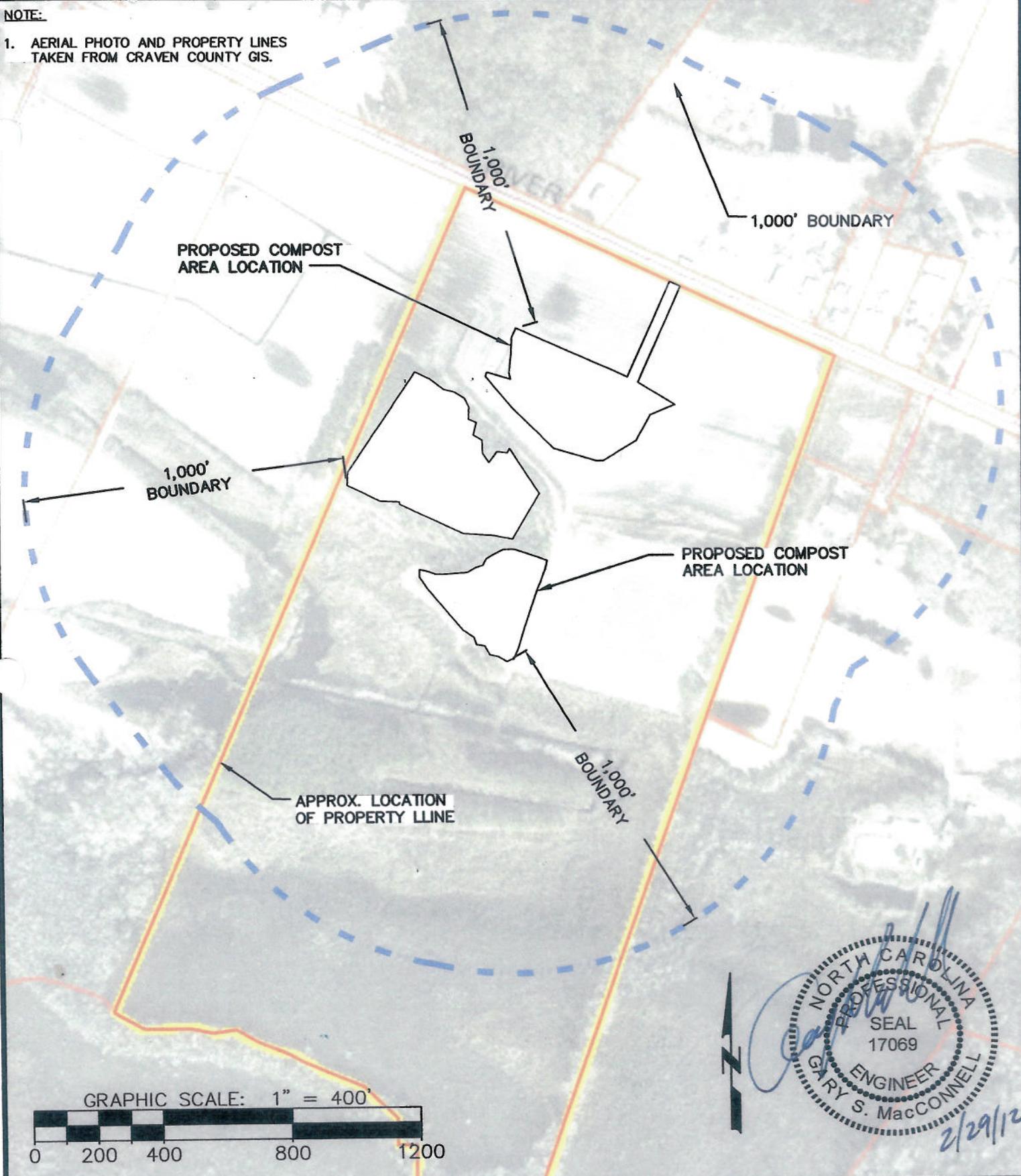


Midwest Bio-Systems • 28933-35 E St. • Tampico, IL 61283
(815) 438-7200 • www.midwestbiosystems.com

Attachment 6. Buffer Maps

NOTE:

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



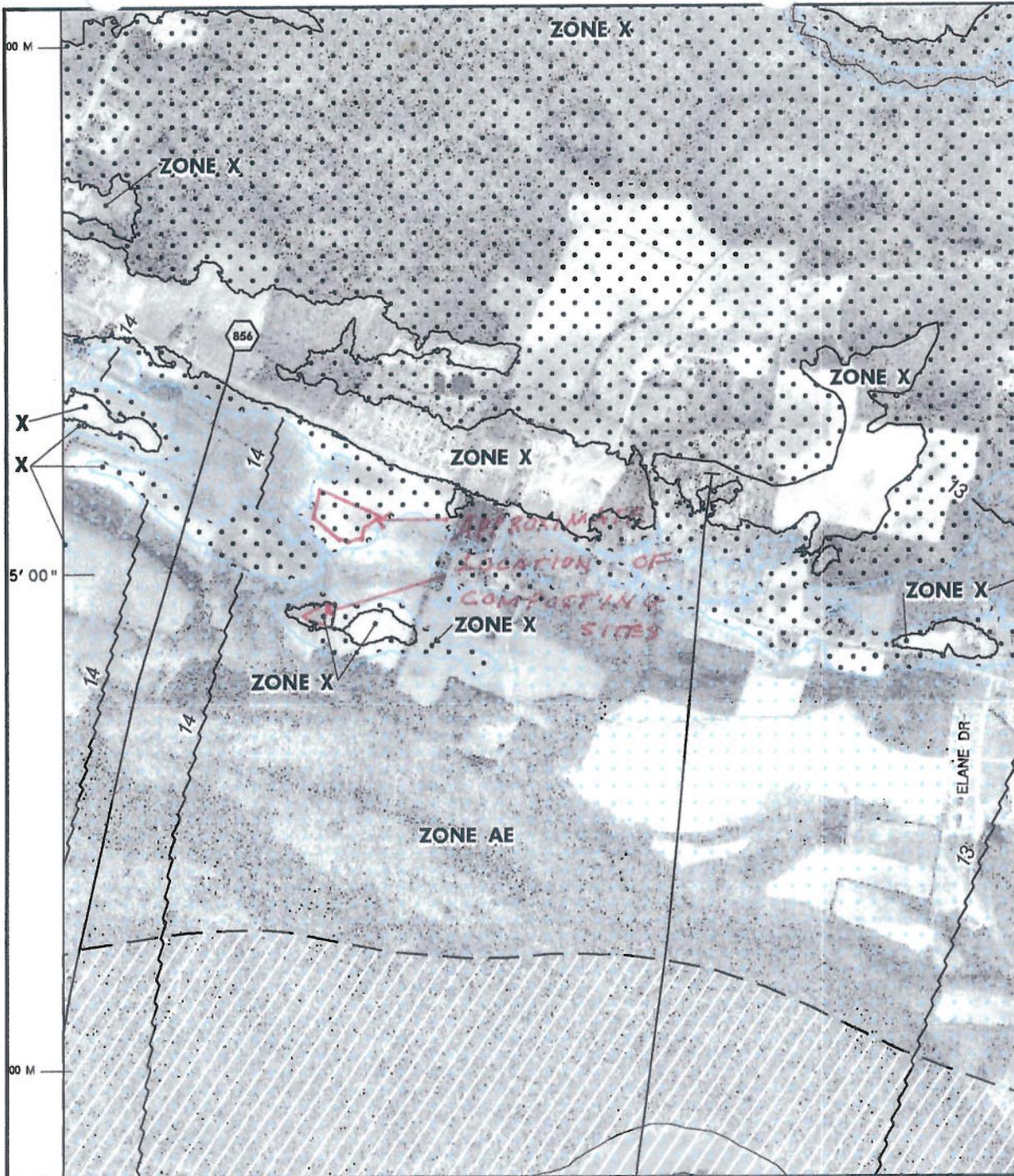
**MacCONNELL
& Associates, P. C.**

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: MAE
JOB #: A45201.00
DATE: 12/30/11

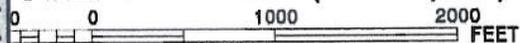
PROJECT: CRAVEN AG SERVICES, INC.
COMPOSTING FACILITY
CRAVEN COUNTY, NC

REFERENCE: C-1



GRID NORTH

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



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

NOTE 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



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 1000 2000 FEET

PANEL 5544J

FIRM
FLOOD INSURANCE RATE MAP
NORTH CAROLINA

PANEL 5544

THE LOCATOR TRIANGULAR SET MAP INDEX FOR THIS PANEL CANNOT BE VIEWED.

<small>CONTRACT</small>	<small>DATE</small>	<small>SCALE</small>	<small>DATE</small>
<small>TRIALS COUNTY</small>	<small>3/2007</small>	<small>1/548</small>	<small>...</small>

Notice: Use the map number from the legend to help find the map sheet. The responsible agency should verify the use of the map number for the correct sheet.

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 FIRM QM software. 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 FIRM Flood Map Store at www.nifs.fema.gov

Attachment 7. Craven County Zoning Letter

Craven County

Office of Planning and Community Development



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

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

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,

A handwritten signature in black ink, appearing to read "Don LaVelle Jr.", written over a horizontal line.

Don LaVelle Jr.
Planning Technician

Attachment 8. Marketing Information Sheet

CAS Compost Quality 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 produce meets the most stringent regulatory requirements imposed by federal and state agencies.

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.

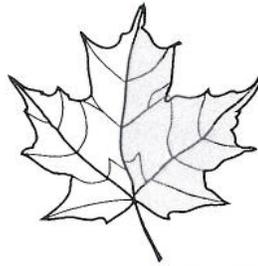
	Test results	Pounds per ton
Nitrogen	3.0%	30 (allows 50% for mineralization)
Phosphorus	0.5%	10
Potassium	1%	20

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.

Attachment 9. Division of Solid Waste Communications

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 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 dewateres 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

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 Coefficients Used:

<u>Land Use</u>	<u>C Value</u>
Compost Pad:	0.80

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

Description: **Compost Pad Runoff**

<u>Land Use</u>	<u>Area SF</u>	<u>Area Acres</u>	<u>Runoff CFS</u>
Compost Pad:	9,000	0.2066	1.4413
Total	9,000	0.2066	<u>1.4413 CFS</u>

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

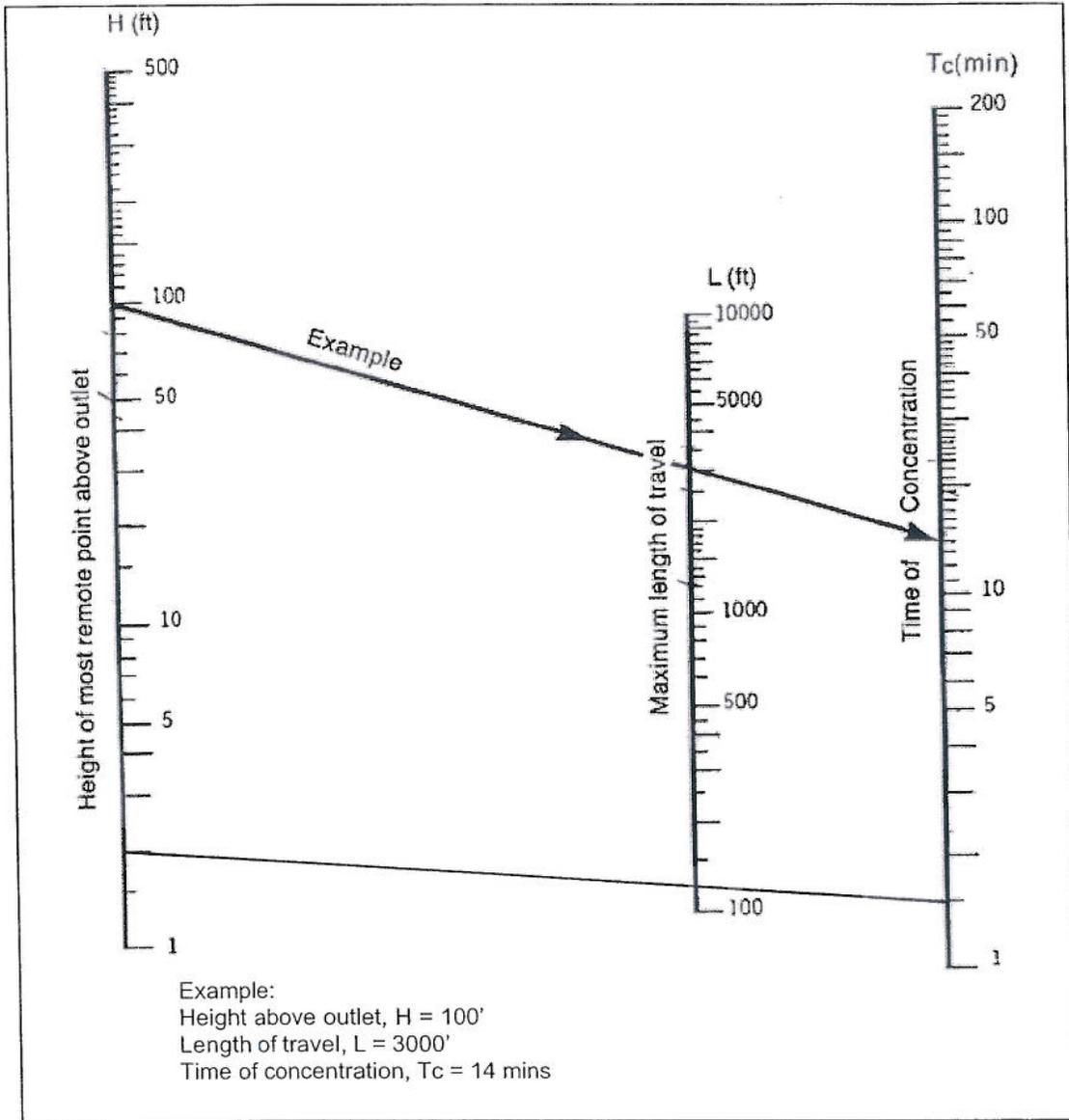
Step 6. Fit the riprap apron to the site by making it level for the minimum length, L_a , from Figure 8.06a or Figure 8.06b. Extend the apron farther downstream and along channel banks until stability is assured. Keep the apron as straight as possible and align it with the flow of the receiving stream. 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)





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 & aerals](#)

PF tabular

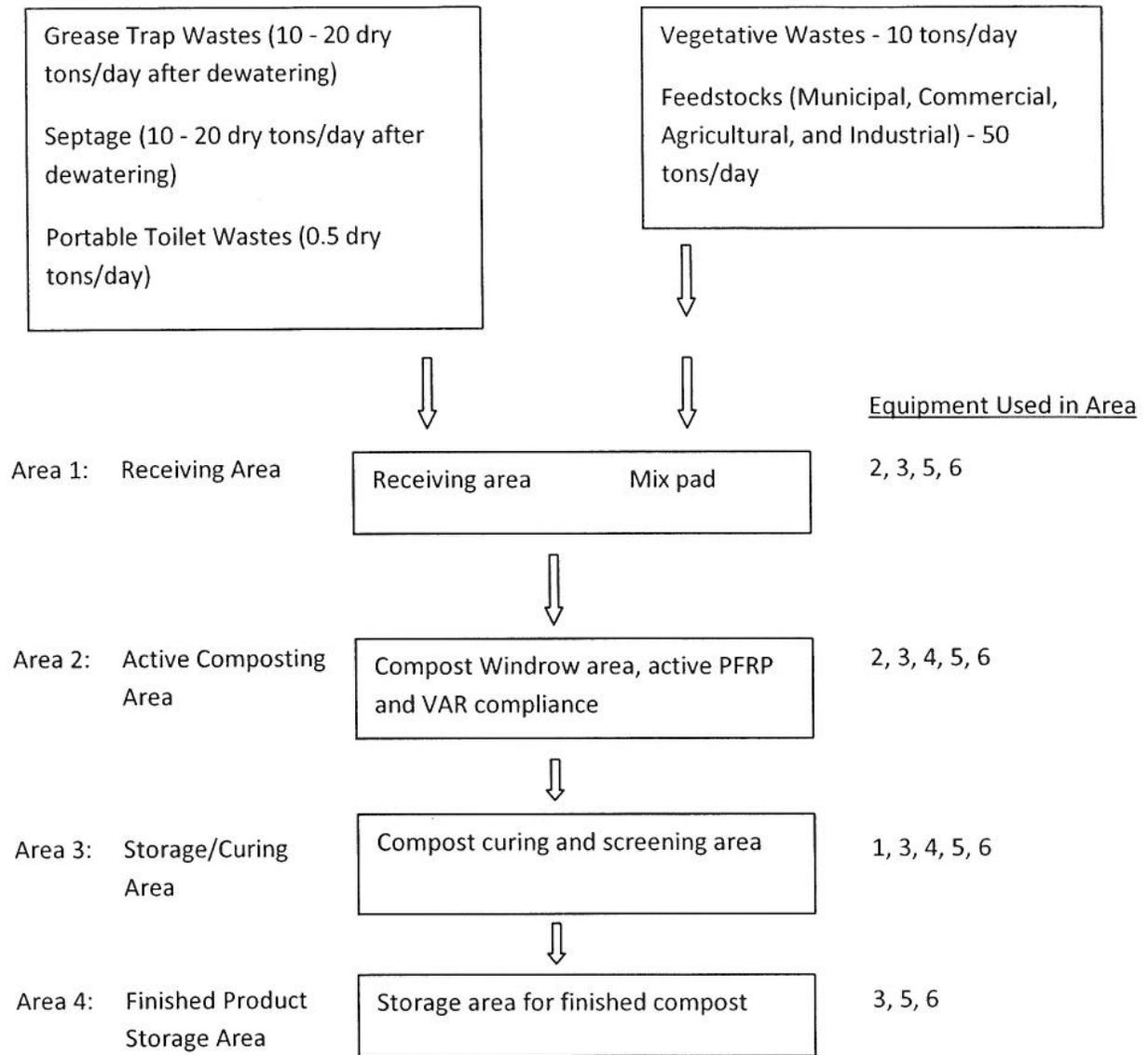
PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)¹										
Duration	Average recurrence interval(years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	5.74 (5.27-6.28)	6.72 (6.18-7.32)	7.70 (7.07-8.38)	8.72 (7.99-9.49)	9.84 (8.96-10.7)	10.8 (9.79-11.7)	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.

[Back to Top](#)

Attachment 11. Flow Diagram CAS

Flow Diagram CAS



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



Full-Service Analytical &
Environmental Solutions

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 Fearington 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.

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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449 Springbrook Road - P.O. Box 240543 - Charlotte, NC 28224-0543
Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409



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.

Prism Work Order:

Prism ID	Client ID	Parameter	Method	Result	Units
----------	-----------	-----------	--------	--------	-------

There were no detections reported.

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449 Springbrook Road - P.O. Box 240543 - Charlotte, NC 28224-0543
Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409

A. R. Rubin & Associates
Attn: Bob Rubin
192 Fearington 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 Fearington 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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Attachment 13. Metals Analysis - Fly Ash and Coal Ash



®

Fayetteville Division

2592 Hope Mills Rd
Fayetteville, NC 28306
910.864.1920 Phone
910.864.8774 Fax

Certificate of Analysis

Craven Ag Services
Mr. Billy Dunham
2115 Hwy 55 W.
New Bern NC, 28562

Project: Ash Samples - Craven County

Date Reported: September 07, 2012
Date Received: August 22, 2012
Date Sampled: August 22, 2012
Sampled By: B. Dunham

Wood Ash 1208517-01

Analyte	Result	Units	Analyzed	Analyzed By	Method	Qualifier
Analyzed by: Microbac Laboratories, Inc. - Chicagoland						
Aluminum	4200	mg/Kg	8/31/12 16:17	RPL	SW-846 6020A	
Antimony	1.6	mg/Kg	8/30/12 20:08	RPL	SW-846 6020A	
Arsenic	210	mg/Kg	8/30/12 20:08	RPL	SW-846 6020A	
Barium	610	mg/Kg	8/31/12 16:17	RPL	SW-846 6020A	
Beryllium	<0.20	mg/Kg	8/30/12 20:08	RPL	SW-846 6020A	
Cadmium	3.0	mg/Kg	8/30/12 20:08	RPL	SW-846 6020A	
Calcium	62000	mg/Kg	8/31/12 16:17	RPL	SW-846 6020A	
Chromium	94	mg/Kg	8/30/12 20:08	RPL	SW-846 6020A	B
Cobalt	3.3	mg/Kg	8/30/12 20:08	RPL	SW-846 6020A	
Copper	200	mg/Kg	8/30/12 20:08	RPL	SW-846 6020A	
Iron	16000	mg/Kg	8/31/12 16:17	RPL	SW-846 6020A	
Lead	80	mg/Kg	8/30/12 20:08	RPL	SW-846 6020A	B
Magnesium	8000	mg/Kg	8/30/12 20:08	RPL	SW-846 6020A	
Manganese	1700	mg/Kg	8/31/12 16:17	RPL	SW-846 6020A	
Nickel	17	mg/Kg	8/31/12 16:23	RPL	SW-846 6020A	
Potassium	15000	mg/Kg	8/31/12 16:17	RPL	SW-846 6020A	
Selenium	1.0	mg/Kg	8/30/12 20:08	RPL	SW-846 6020A	B
Silver	<0.50	mg/Kg	8/31/12 16:23	RPL	SW-846 6020A	
Sodium	1000	mg/Kg	8/31/12 16:23	RPL	SW-846 6020A	
Thallium	0.48	mg/Kg	8/30/12 20:08	RPL	SW-846 6020A	
Titanium	400	mg/Kg	8/30/12 20:08	RPL	SW-846 6020A	
Vanadium	8.0	mg/Kg	8/30/12 20:08	RPL	SW-846 6020A	
Zinc	470	mg/Kg	8/30/12 20:08	RPL	SW-846 6020A	B
Mercury	0.27	mg/Kg	8/30/12 13:47	RPL	SW-846 7471A	

State Certifications:
NCDNR #11
NCDOH #37714
USDA #3787

Respectfully Submitted

Bonnie K. Sanders, Administrative Assistant



®

Fayetteville Division

2592 Hope Mills Rd
Fayetteville, NC 28306
910.864.1920 Phone
910.864.8774 Fax

Certificate of Analysis

Craven Ag Services
Mr. Billy Dunham
2115 Hwy 55 W.
New Bern NC, 28562

Project: Ash Samples - Craven County

Date Reported: September 07, 2012
Date Received: August 22, 2012
Date Sampled: August 22, 2012
Sampled By: B. Dunham

Coat Ash
1208517-02

Analyte	Result	Units	Analyzed	Analyzed By	Method	Qualifier
Analyzed by: Microbac Laboratories, Inc. - Chicagoland						
Aluminum	950	mg/Kg	9/5/12 13:16	RPL	SW-846 6020A	
Antimony	0.79	mg/Kg	9/4/12 16:36	RPL	SW-846 6020A	
Arsenic	2.1	mg/Kg	9/4/12 16:36	RPL	SW-846 6020A	
Barium	56	mg/Kg	9/4/12 16:36	RPL	SW-846 6020A	
Beryllium	0.68	mg/Kg	9/4/12 16:36	RPL	SW-846 6020A	
Cadmium	<0.20	mg/Kg	9/4/12 16:36	RPL	SW-846 6020A	
Calcium	500	mg/Kg	9/4/12 16:36	RPL	SW-846 6020A	
Chromium	2.2	mg/Kg	9/4/12 16:36	RPL	SW-846 6020A	B
Cobalt	3.2	mg/Kg	9/4/12 16:36	RPL	SW-846 6020A	
Copper	7.4	mg/Kg	9/4/12 16:36	RPL	SW-846 6020A	
Iron	1300	mg/Kg	9/4/12 16:36	RPL	SW-846 6020A	
Lead	2.1	mg/Kg	9/4/12 16:36	RPL	SW-846 6020A	
Magnesium	79	mg/Kg	9/4/12 16:36	RPL	SW-846 6020A	
Manganese	5.6	mg/Kg	9/4/12 16:36	RPL	SW-846 6020A	
Nickel	6.0	mg/Kg	9/4/12 16:36	RPL	SW-846 6020A	
Potassium	120	mg/Kg	9/4/12 16:36	RPL	SW-846 6020A	
Selenium	0.96	mg/Kg	9/4/12 16:36	RPL	SW-846 6020A	B
Silver	<0.50	mg/Kg	9/4/12 16:36	RPL	SW-846 6020A	
Sodium	<25	mg/Kg	9/4/12 16:36	RPL	SW-846 6020A	
Thallium	0.34	mg/Kg	9/4/12 16:36	RPL	SW-846 6020A	
Titanium	68	mg/Kg	9/4/12 16:36	RPL	SW-846 6020A	
Vanadium	7.2	mg/Kg	9/4/12 16:36	RPL	SW-846 6020A	
Zinc	2.9	mg/Kg	9/4/12 16:36	RPL	SW-846 6020A	
Mercury	<0.041	mg/Kg	8/31/12 11:33	RPL	SW-846 7471A	

State Certifications:
NCDNR #11
NCDOH #37714
USDA #3787

Respectfully Submitted

Bonnie K. Sanders, Administrative Assistant



Analytical Results

Date: Friday, September 7, 2012

Client: Microbac - Fayetteville Division
 Client Project: 1208517 - General
 Client Sample ID: 1208517-01
 Sample Description:
 Matrix: Solid

Work Order/ID: 12H1210-01
 Sampled: 08/22/2012 8:00
 Received: 08/29/2012 9:45

Analyses AT Result RL Qual Units DF Analyzed

Method: SW-846 6020A Analyst: RPL
 Prep Method: SW846 3050B Prep Date/Time: 08/30/2012 13:32

Total Metals by ICP/MS

Element	AT	Result	RL	Qual	Units	DF	Analyzed
Aluminum	A	4200	500		mg/Kg	1000	08/31/2012 16:17
Antimony	A	1.6	0.20		mg/Kg	20	08/30/2012 20:08
Arsenic	A	210	0.50		mg/Kg	20	08/30/2012 20:08
Barium	A	610	9.9		mg/Kg	1000	08/31/2012 16:17
Beryllium	A	< 0.20	0.20		mg/Kg	20	08/30/2012 20:08
Cadmium	A	3.0	0.20		mg/Kg	20	08/30/2012 20:08
Calcium	A	62000	1200		mg/Kg	1000	08/31/2012 16:17
Chromium	A	94	0.20	B	mg/Kg	20	08/30/2012 20:08
Cobalt	A	3.3	0.20		mg/Kg	20	08/30/2012 20:08
Copper	A	200	0.50		mg/Kg	20	08/30/2012 20:08
Iron	A	16000	990		mg/Kg	1000	08/31/2012 16:17
Lead	A	80	0.38	B	mg/Kg	20	08/30/2012 20:08
Magnesium	A	8000	25		mg/Kg	20	08/30/2012 20:08
Manganese	A	1700	9.9	B	mg/Kg	1000	08/31/2012 16:17
Nickel	A	17	0.50		mg/Kg	20	08/31/2012 16:23
Potassium	A	15000	1200		mg/Kg	1000	08/31/2012 16:17
Selenium	A	1.0	0.50	B	mg/Kg	20	08/30/2012 20:08
Silver	A	< 0.50	0.50		mg/Kg	20	08/31/2012 16:23
Sodium	A	1000	25	B	mg/Kg	20	08/31/2012 16:23
Thallium	A	0.48	0.20		mg/Kg	20	08/30/2012 20:08
Titanium	A	400	1.5		mg/Kg	20	08/30/2012 20:08
Vanadium	A	8.0	0.40		mg/Kg	20	08/30/2012 20:08
Zinc	A	470	1.0	B	mg/Kg	20	08/30/2012 20:08

Method: SW-846 7471A Analyst: RPL
 Prep Method: SW-846 7471 Prep Date/Time: 08/30/2012 10:43

Total Mercury by CVAA

Element	AT	Result	RL	Qual	Units	DF	Analyzed
Mercury	A	0.27	0.039		mg/Kg	1	08/30/2012 13:47



Analytical Results

Date: Friday, September 7, 2012

Client: Microbac - Fayetteville Division
 Client Project: 1208517 - General
 Client Sample ID: 1208517-02
 Sample Description:
 Matrix: Solid

Work Order/ID: 12H1210-02
 Sampled: 08/22/2012 8:00
 Received: 08/29/2012 9:45

Analyses AT Result RL Qual Units DF Analyzed

Method: SW-846 6020A Analyst: RPL
 Prep Method: SW846 3050B Prep Date/Time: 09/04/2012 08:01

Total Metals by ICP/MS

Element	AT	Result	RL	Qual	Units	DF	Analyzed
Aluminum	A	950	93		mg/Kg	200	09/05/2012 13:16
Antimony	A	0.79	0.20		mg/Kg	20	09/04/2012 16:36
Arsenic	A	2.1	0.50		mg/Kg	20	09/04/2012 16:36
Barium	A	56	0.20		mg/Kg	20	09/04/2012 16:36
Beryllium	A	0.68	0.20		mg/Kg	20	09/04/2012 16:36
Cadmium	A	< 0.20	0.20		mg/Kg	20	09/04/2012 16:36
Calcium	A	500	25		mg/Kg	20	09/04/2012 16:36
Chromium	A	2.2	0.93	B	mg/Kg	20	09/04/2012 16:36
Cobalt	A	3.2	0.20		mg/Kg	20	09/04/2012 16:36
Copper	A	7.4	0.50		mg/Kg	20	09/04/2012 16:36
Iron	A	1300	20		mg/Kg	20	09/04/2012 16:36
Lead	A	2.1	0.38		mg/Kg	20	09/04/2012 16:36
Magnesium	A	79	25		mg/Kg	20	09/04/2012 16:36
Manganese	A	5.6	0.20		mg/Kg	20	09/04/2012 16:36
Nickel	A	6.0	0.50		mg/Kg	20	09/04/2012 16:36
Potassium	A	120	25		mg/Kg	20	09/04/2012 16:36
Selenium	A	0.96	0.93	B	mg/Kg	20	09/04/2012 16:36
Silver	A	< 0.50	0.50		mg/Kg	20	09/04/2012 16:36
Sodium	A	< 25	25		mg/Kg	20	09/04/2012 16:36
Thallium	A	0.34	0.20		mg/Kg	20	09/04/2012 16:36
Titanium	A	68	1.5		mg/Kg	20	09/04/2012 16:36
Vanadium	A	7.2	0.40		mg/Kg	20	09/04/2012 16:36
Zinc	A	2.9	1.0		mg/Kg	20	09/04/2012 16:36

Method: SW-846 7471A Analyst: RPL
 Prep Method: SW-846 7471 Prep Date/Time: 08/31/2012 08:05

Total Mercury by CVAA

Element	AT	Result	RL	Qual	Units	DF	Analyzed
Mercury	A	< 0.041	0.041		mg/Kg	1	08/31/2012 11:33

Attachment 14. Soil Evaluation for a Proposed Land Treatment of Setpage Site (Smith)

September 6, 2004

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

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.

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 seepage 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



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



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 borders 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 borders after the final hay cutting in September or early October of each year. Commercial fertilizers will be used to keep the borders 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.

<u>MONTH</u>	<u>GALLONS</u>
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	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	52 lbs
b. Total Organic Nitrogen @ 2.6 lbs per 1000 gallons	20.8 lbs
c. PAN @ 40 %	31.2 lbs
d. Carry over N to be mineralized	39.2lbs
e. Additional N needed	

Coastal Bermuda April-September Needs 200 lbs N

a. Application Rate @ 60,000 gallons per acre	156 lbs
b. Total Organic Nitrogen @ 2.6 lbs per 1000 gallons	62.4 lbs
c. PAN @ 40%	93.6 lbs
d. Carry over N to be mineralized	37.6 lbs
e. Additional N needed	

2. 2006

Cereal Rye October-March Needs 60 lbs N

a. Application Rate @ 20,000 gallons per acre	52 lbs
b. Total Organic Nitrogen @ 2.6 lbs per 1000 gallons	20.8 lbs
c. PAN @ 40 %	31.2 lbs
d. Carry over N to be mineralized	6.24 lbs
e. Residual N from Year 1 @ 20 %	27.04 lbs
f. Total PAN	32.96 lbs
g. Additional N needed	

Coastal Bermuda April-September Need 200 lbs N

a. Application Rate @ 60,000 gallons per acre	156 lbs
b. Total Organic Nitrogen @ 2.6 lbs. Per 1000	62.4 lbs
c. PAN @ 40 %	93.6 lbs
d. Carry over N to be mineralized	18.72 lbs
e. Residual N from year 1 @ 20 %	81.12 lbs
f. Total PAN from septage	18.88 lbs
g. Additional N needed	

3. 2007

Cereal Rye October – March Needs 60 lbs N

a. Application Rate @ 20,000 gallons per acre	52 lbs
b. Total Organic Nitrogen @ 2.6 lbs per 1000 gallons	20.8 lbs
c. PAN @ 40 %	31.2 lbs
d. Carry over N to be mineralized	2.50 lbs
e. Residual N from year 1 @ 10 %	6.24 lbs
f. Residual N from year 2 @ 20 %	29.54 lbs
g. Total PAN from septage	30.46 lbs
h. Additional N needed	

Coastal Bermuda April – September Needs 200 lbs of N

a. Application Rate @ 60,000 gallons per acre	156 lbs
b. Total Organic N @ 2.6 lbs per 1000 gallons	62.4 lbs
c. PAN @ 40 %	93.6 lbs
d. Carry over N to be mineralized	7.48 lbs
e. Residual N from year 1 @ 10 %	18.72 lbs
f. Residual N from year 2 @ 20 %	88.60 lbs
g. Total PAN from septage	111.4 lbs
h. Additional Commercial N needed	

4. 2008

Cereal Rye October – March Need 60 lbs N

a. Application Rate @ 20,000 gallons per acre	52 lbs
b. Total Organic N 2.6 lbs per 1000 gallons	20.8 lbs
c. PAN @ 40 %	31.2 lbs
d. Carry over N to be mineralized	1.12 lbs
e. Residual N from year 1 @ 5 %	2.50 lbs
f. Residual N from year 2 @ 10 %	

- 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 156 lbs
- b. Total Organic N @ 2.6 lbs per 1000 gallons 62.4 lbs
- c. PAN @ 40 % 93.6 lbs
- d. Carry over N to be mineralized 3.37 lbs
- e. Residual N from Year 1 @ 5 % 7.48 lbs
- f. Residual N from Year 2 @ 10 % 18.72 lbs
- g. Residual N from Year 3 @ 20 % 91.97 lbs
- h. Total PAN from septage 108.03 lbs
- i. Additional N needed

5. 2009

Cereal Rye October – March Need 60 lbs N

- a. Application Rate @ 20,000 gallons per acre 52 lbs
- b. Total Organic N @ 2.6 lbs pr 1000 gallons 20.8 lbs
- c. PAN @ 40 % 31.2 lbs
- d. Carry over N to be mineralized .63 lbs
- e. Residual N from Year 1 @ 3 % 1.12 lbs
- f. Residual N from Year 2 @ 5 % 2.50 lbs
- g. Residual N from year 3 @ 10 % 6.24 lbs
- h. Residual N from year 4 @ 20 % 31.29 lbs
- i. Total PAN from septage 28.71 lbs
- j. Additional N needed

Coastal Bermuda April – September Need 200 lbs N

- a. Application Rate @ 60,000 gallons per acre 156 lbs
- b. Total Organic N @ 2.6 lbs per 100 gallons 62.4 lbs
- c. PAN @ 40 % 93.6 lbs
- d. Carry over N to be mineralized 1.91 lbs
- e. Residual N from year 1 @ 3 % 3.37 lbs
- f. Residual N from year 2 @ 5 % 7.48 lbs
- g. Residual N from year 3 @ 10 % 18.72 lbs
- h. Residual N from year 4 @ 20 %

- | | |
|---------------------------|------------|
| 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 % | 9.36 lbs |
| 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

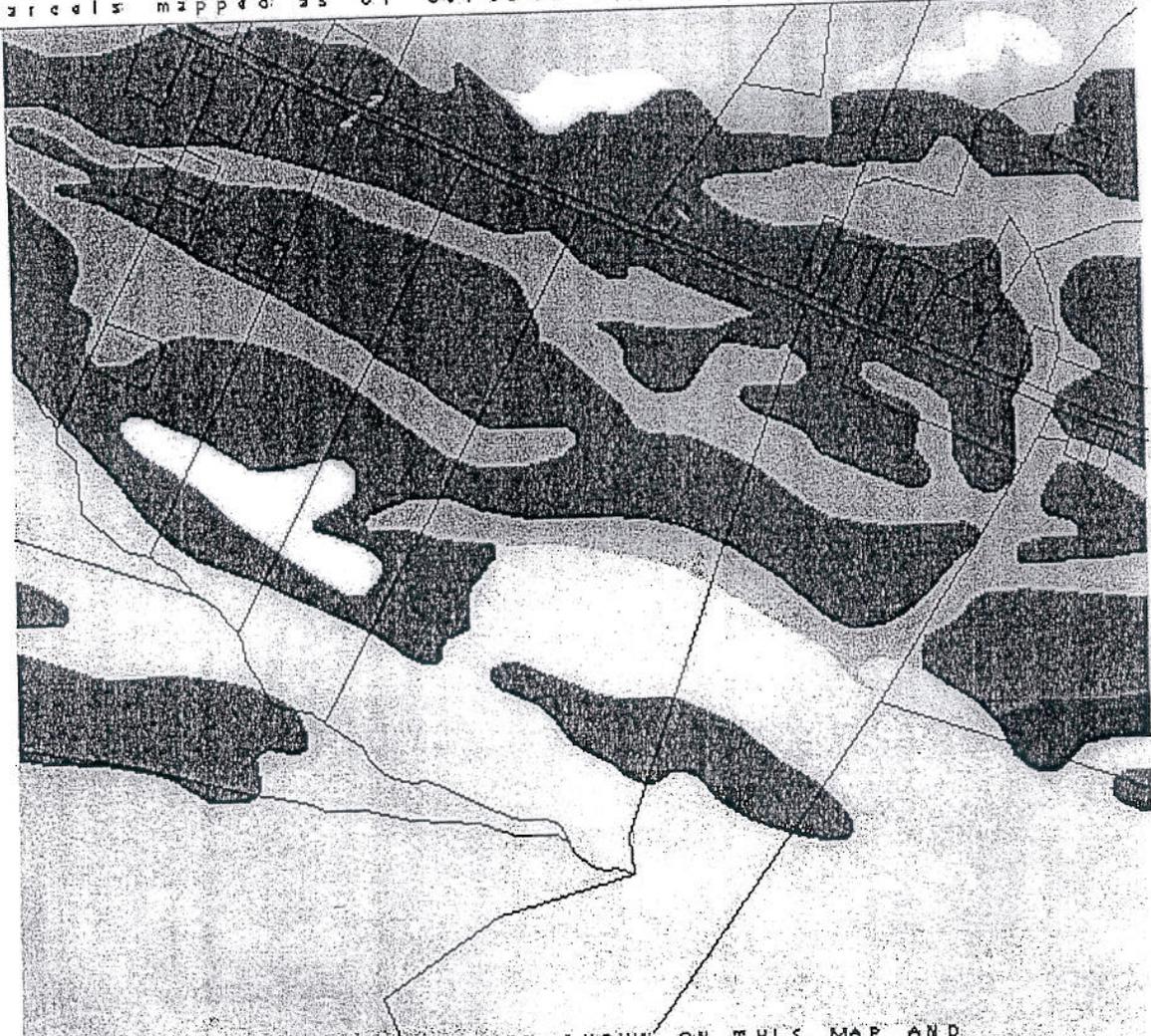
Plan Prepared By: Date John W. Durham 11-21-04

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
- AoA
 - Ag
 - Ap
 - CnB
 - De
 - MH
 - Mu
 - Se
 - ToB

CRAVEN COUNTY DOES NOT WARRANT THE INFORMATION SHOWN ON THIS MAP AND SHOULD BE USED ONLY FOR TAX ASSESSMENT PURPOSES. PRINTED OCTOBER 30, 2003



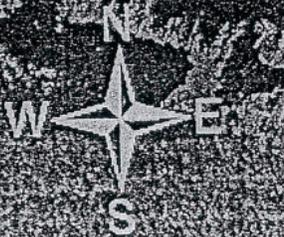
SLAS 2509

Craven Ag Services Inc.

50 ft Buffer

Pine Plantation
6.85 acres

Bermuda Field
4.34 acres



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.



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 2115 HWY 55 WEST
Address NEW BERN N.C. 28562
Phone 252-633-5334 252-670-8530

2. Landowner JOHN W. & JENE H. DUNHAM
Address _____

3. Site Location: County CRAWFORD 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 information:
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. 27964
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 ^{Roach} Rouse Tract, Rouse Tract (Field 1), ^{Roach} Rouse 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 inches 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.

Reach ~~Reuse~~ 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 

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 (2.5Y 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 to 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.

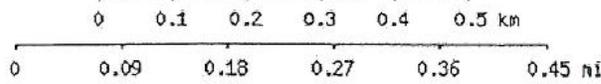
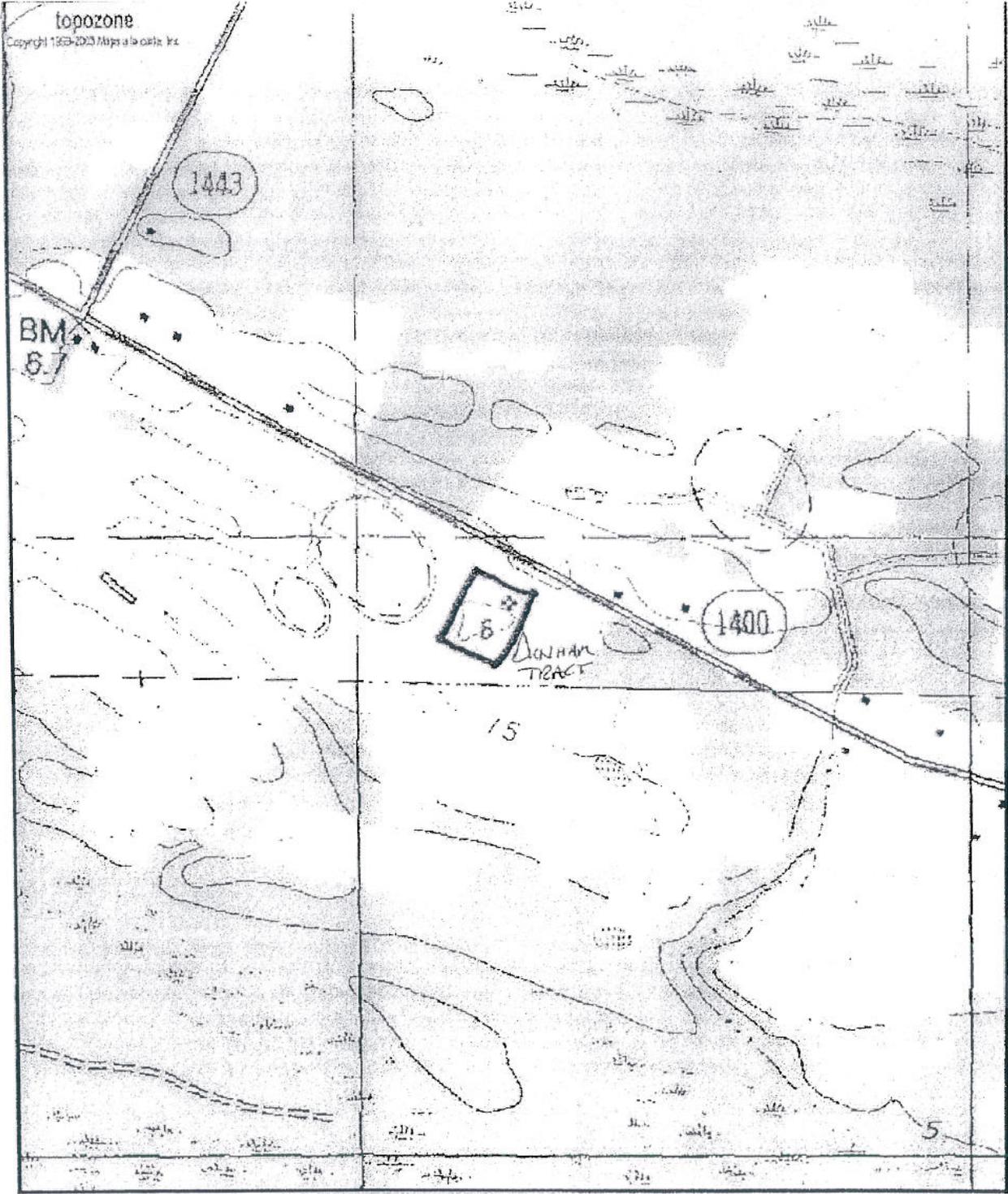
Respectfully Submitted,

Scott Stone

Scott Stone
Licensed Soil Scientist
Registered Sanitarian



Enclosures



Map center is 35° 15' 05"N, 77° 11' 03"W (WGS84/NAD83)
Vanceboro quadrangle
 Projection is UTM Zone 18 NAD83 Datum

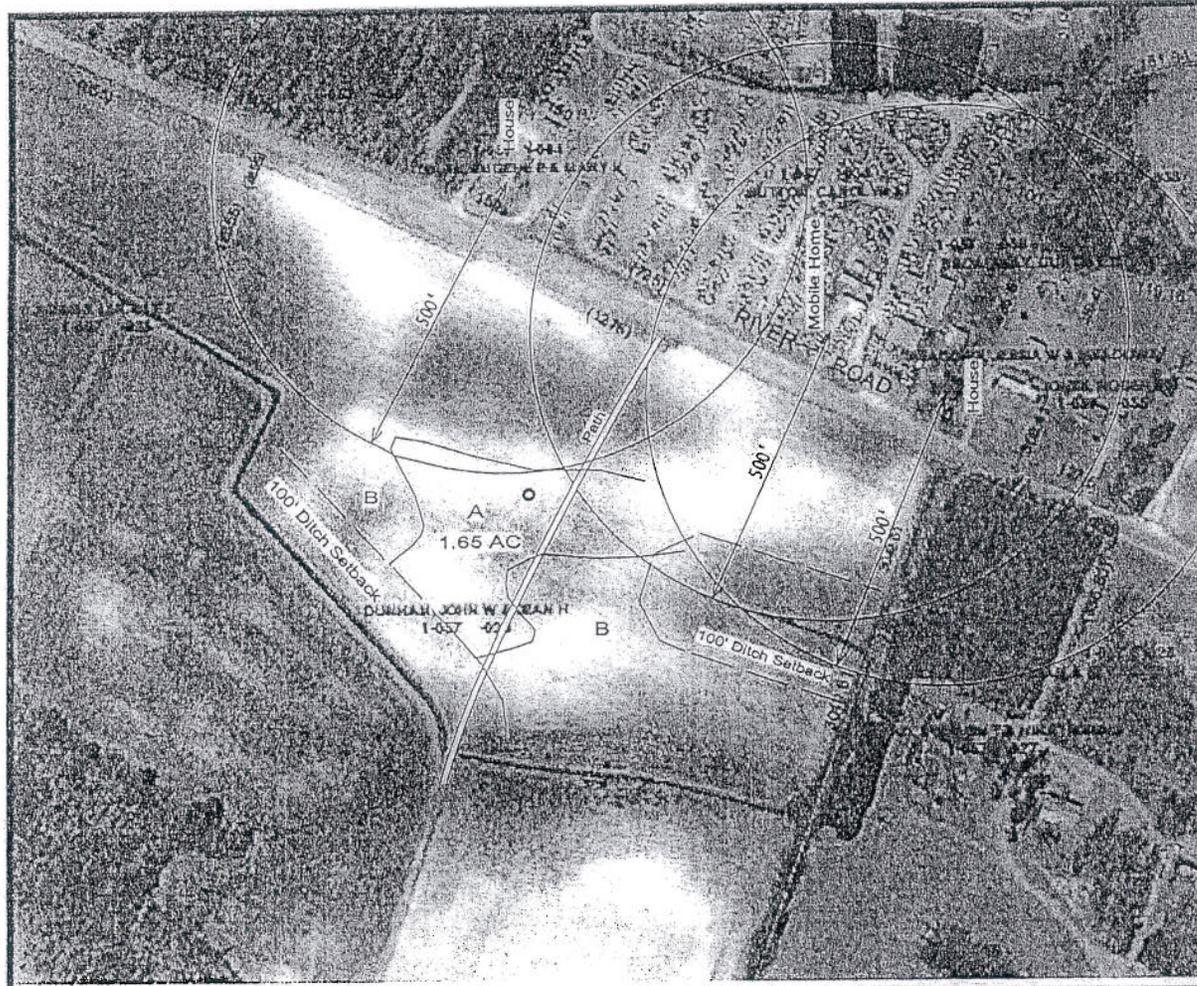
M*
 6
 M=-9.737
 G=-1.261

SITE



Craven Ag Services
Soil Map For Septage Application Site

LAYOUT



Owner Names (Blue text)
 Dimensions 300
 Dimensions 350
 Road Names
 Geodetic Monuments
 Fences
 Railroad
 Parcels
 2A
 Ortho Photographs
 USGS Topo DRGs
 Water

A - Suitable For Land Application Of Septage (Group 1)
 B - Unsuitable For Land Application Of Septage

○ Soil Boring Used For Soil Description

c:\ppro1\1976-1d.pla 03-17-2006

Environmental & Soil Service, Inc.
 P.O. Box 82
 Pinetops, NC 27864

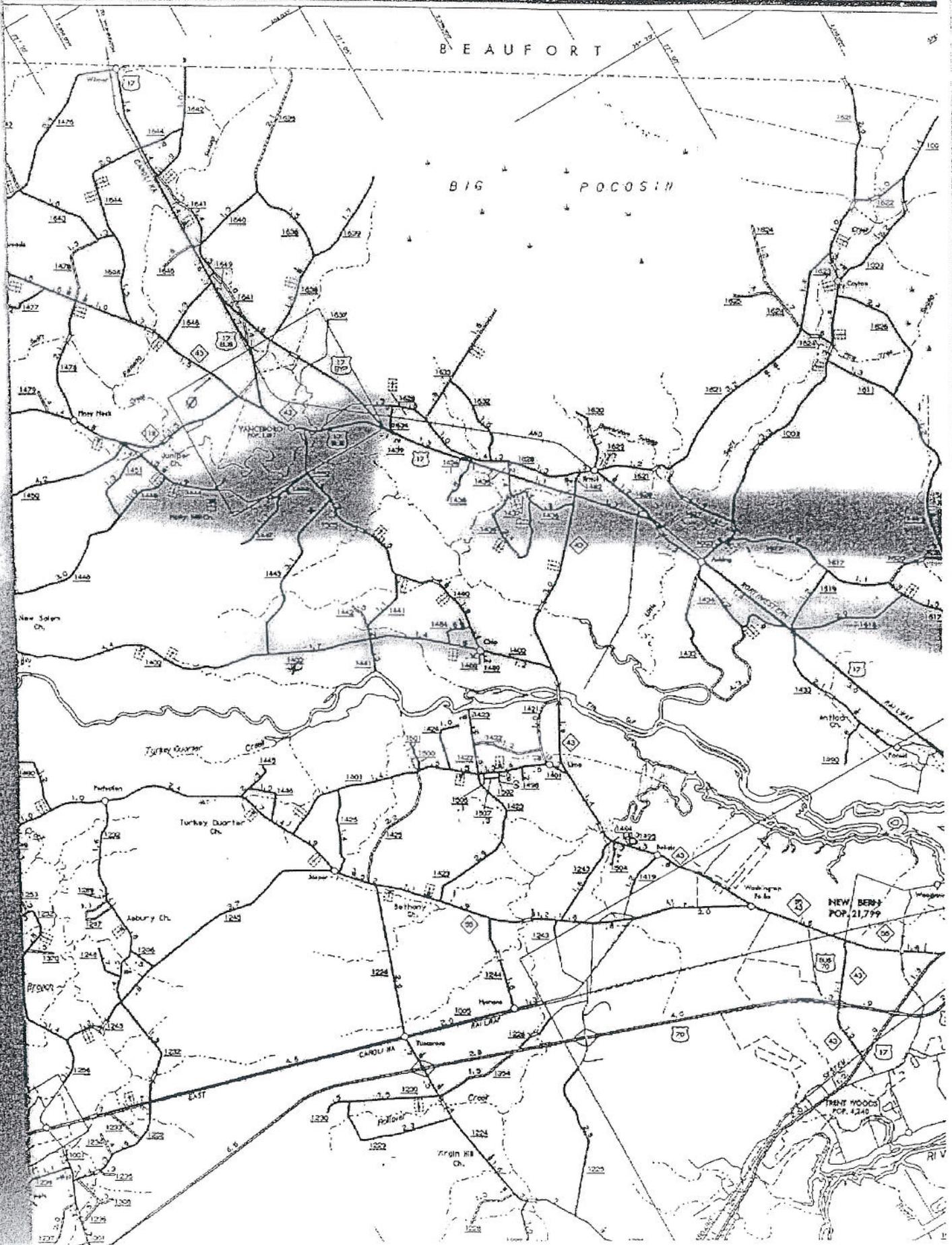
Dunham Tract

CRAVEN COUNTY
 NORTH CAROLINA



BEAUFORT

BIG POCOSIN



Affidavit of Publication
New Bern Sun Journal
New Bern, NC

Personally appeared before me, a Notary Public of the County of ^{Onslow} Craven, State of North Carolina, on this the 1st day of May, 2006

Kevin Maylock

of The Sun Journal, who being duly sworn, states that the advertisement entitled **PUBLIC NOTICE** THIS Notice is required by 15 NCAC 13b.0819 (d)(17) is to let the interested public know that Craven Ag Services Inc. 2115 Hwy 55 West, New Bern NC 28562 has requested permission from the NC Division of Solid Waste Management to apply b.a true copy of which is printed herewith, appeared in The Sun Journal, a newspaper published in the City of New Bern, NC, County of Craven, State of North Carolina; 1 day a week for One weeks on the following dates:

May 1, 2006

NORTH CAROLINA
CRAVEN COUNTY

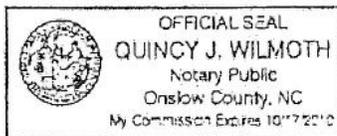
PUBLIC NOTICE

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May 1, 2006

Subscribed and sworn to this 1st day of May, 2006

x Quincy J. Wilmoth
Notary Public



Affidavit of Publication
New Bern Sun Journal
New Bern, NC

Personally appeared before me, a Notary Public of the County of Onslow, State of North Carolina, on this the 20th day of June, 2006

Kevin Blaylock

of The Sun Journal, who being duly sworn, states that the advertisement entitled PUBLIC NOTICE THIS Notice is required by 15 NCAC 13b.0819 (d)(17) is to let the interested public know that Craven Ag Services Inc. 2115 Hwy 55 West, New Bern NC 28562 has requested permission from the NC Division of Solid Waste Management to apply b a true copy of which is printed herewith, appeared in The Sun Journal, a newspaper published in the City of New Bern, NC, County of Onslow, State of North Carolina, 1 day a week for one weeks on the following dates:

June 20, 2006

NORTH CAROLINA
ONSLOW COUNTY

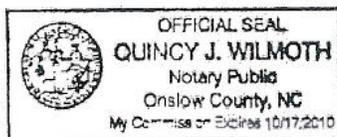
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June 20, 2006

Subscribed and sworn to this 20th day of June, 2006

x Quincy J. Wilmoth
Notary Public





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

Copies To:

Farm:

Craven County

C -- 12, 3, 5

Agronomist Comments

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	P ₂ O ₅	K ₂ O	Mg	S	Cu	Zn	B	Mn	See Note
CA1	Roach				1st Crop: Millet Berm 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	NO ₃ -N	NH ₄ -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	P ₂ O ₅	K ₂ O	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	NO ₃ -N	NH ₄ -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	P ₂ O ₅	K ₂ O	Mg	S	Cu	Zn	B	Mn	See Note
CA3	Roach Tract 1				1st Crop: Millet Berm 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	NO ₃ -N	NH ₄ -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

NCDAA&CS Agronomic Division		Phone: (919)733-2655		Web Site: www.ncagr.com/agronomi/		Grower: Craven Ag Service					Report No: 30955			Pg 2							
Field Information		Applied Lime		Recommendations																	
<i>Sample No.</i>	<i>Last Crop</i>	<i>Mo</i>	<i>Yr</i>	<i>T/A</i>	<i>Crop or Year</i>	<i>Lime</i>	<i>N</i>	<i>P2O5</i>	<i>K2O</i>	<i>Mg</i>	<i>S</i>	<i>Cu</i>	<i>Zn</i>	<i>B</i>	<i>Mn</i>	<i>See Note</i>					
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																					
<i>Soil Class</i>	<i>HM%</i>	<i>W/V</i>	<i>CEC</i>	<i>BS%</i>	<i>Ac</i>	<i>pH</i>	<i>P-I</i>	<i>K-I</i>	<i>Ca%</i>	<i>Mg%</i>	<i>Mn-I</i>	<i>Mn-AI(1)</i>	<i>Mn-AI(2)</i>	<i>Zn-I</i>	<i>Zn-AI</i>	<i>Cu-I</i>	<i>S-I</i>	<i>SS-I</i>	<i>NO3-N</i>	<i>NH4-N</i>	<i>Na</i>
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																	
<i>Sample No.</i>	<i>Last Crop</i>	<i>Mo</i>	<i>Yr</i>	<i>T/A</i>	<i>Crop or Year</i>	<i>Lime</i>	<i>N</i>	<i>P2O5</i>	<i>K2O</i>	<i>Mg</i>	<i>S</i>	<i>Cu</i>	<i>Zn</i>	<i>B</i>	<i>Mn</i>	<i>See Note</i>					
CA5	Dunham				1st Crop: Millet Berm Hay/Pas,M	0	180-220	0	100-120	0	0	0	0		pH\$	12					
					2nd Crop:						0										
Test Results																					
<i>Soil Class</i>	<i>HM%</i>	<i>W/V</i>	<i>CEC</i>	<i>BS%</i>	<i>Ac</i>	<i>pH</i>	<i>P-I</i>	<i>K-I</i>	<i>Ca%</i>	<i>Mg%</i>	<i>Mn-I</i>	<i>Mn-AI(1)</i>	<i>Mn-AI(2)</i>	<i>Zn-I</i>	<i>Zn-AI</i>	<i>Cu-I</i>	<i>S-I</i>	<i>SS-I</i>	<i>NO3-N</i>	<i>NH4-N</i>	<i>Na</i>
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																	
<i>Sample No.</i>	<i>Last Crop</i>	<i>Mo</i>	<i>Yr</i>	<i>T/A</i>	<i>Crop or Year</i>	<i>Lime</i>	<i>N</i>	<i>P2O5</i>	<i>K2O</i>	<i>Mg</i>	<i>S</i>	<i>Cu</i>	<i>Zn</i>	<i>B</i>	<i>Mn</i>	<i>See Note</i>					
CA6	Rirkman				1st Crop: Millet Milo (Grain Sorg)	.8T	80-100	0	30-50	0	0	0	0	.0	0	3					
					2nd Crop:						0										
Test Results																					
<i>Soil Class</i>	<i>HM%</i>	<i>W/V</i>	<i>CEC</i>	<i>BS%</i>	<i>Ac</i>	<i>pH</i>	<i>P-I</i>	<i>K-I</i>	<i>Ca%</i>	<i>Mg%</i>	<i>Mn-I</i>	<i>Mn-AI(1)</i>	<i>Mn-AI(2)</i>	<i>Zn-I</i>	<i>Zn-AI</i>	<i>Cu-I</i>	<i>S-I</i>	<i>SS-I</i>	<i>NO3-N</i>	<i>NH4-N</i>	<i>Na</i>
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																	
<i>Sample No.</i>	<i>Last Crop</i>	<i>Mo</i>	<i>Yr</i>	<i>T/A</i>	<i>Crop or Year</i>	<i>Lime</i>	<i>N</i>	<i>P2O5</i>	<i>K2O</i>	<i>Mg</i>	<i>S</i>	<i>Cu</i>	<i>Zn</i>	<i>B</i>	<i>Mn</i>	<i>See Note</i>					
CAB1					1st Crop: Berm Hay/Pas,E	.8T	60-80	0	0-20	\$	0	0	0		0	12					
					2nd Crop:						0										
Test Results																					
<i>Soil Class</i>	<i>HM%</i>	<i>W/V</i>	<i>CEC</i>	<i>BS%</i>	<i>Ac</i>	<i>pH</i>	<i>P-I</i>	<i>K-I</i>	<i>Ca%</i>	<i>Mg%</i>	<i>Mn-I</i>	<i>Mn-AI(1)</i>	<i>Mn-AI(2)</i>	<i>Zn-I</i>	<i>Zn-AI</i>	<i>Cu-I</i>	<i>S-I</i>	<i>SS-I</i>	<i>NO3-N</i>	<i>NH4-N</i>	<i>Na</i>
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

Report #: 30955

MEHLICH-3 EXTRACTION

Craven Ag Service
ATTN: Mike Carrol
2115 Hwy 55 West
New Bern, NC 28562
Craven County

Questions concerning these analyses should be referred to the Agronomic Division, Soil Testing

Sample ID	<i>Cd</i> Cadmium	<i>Ni</i> Nickel	<i>Pb</i> Lead	<i>Se</i> Selenium	<i>Cr</i> Chromium	<i>As</i> Arsenic	<i>Al</i> Aluminum	<i>Fe</i> Iron
	-----mg/dm ³ (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)



<i>Job No.</i> R12-42	<i>Image/Photo</i> Bing Maps	<i>Date</i> 12.4.2012	<i>Title</i> Proposed Monitoring Well Location Map
<i>File Name</i> R12-42.xls	<i>Figure</i> 1	<i>Scale</i> unknown	<i>Project</i> Proposed Composting Site Craven County, North Carolina

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,

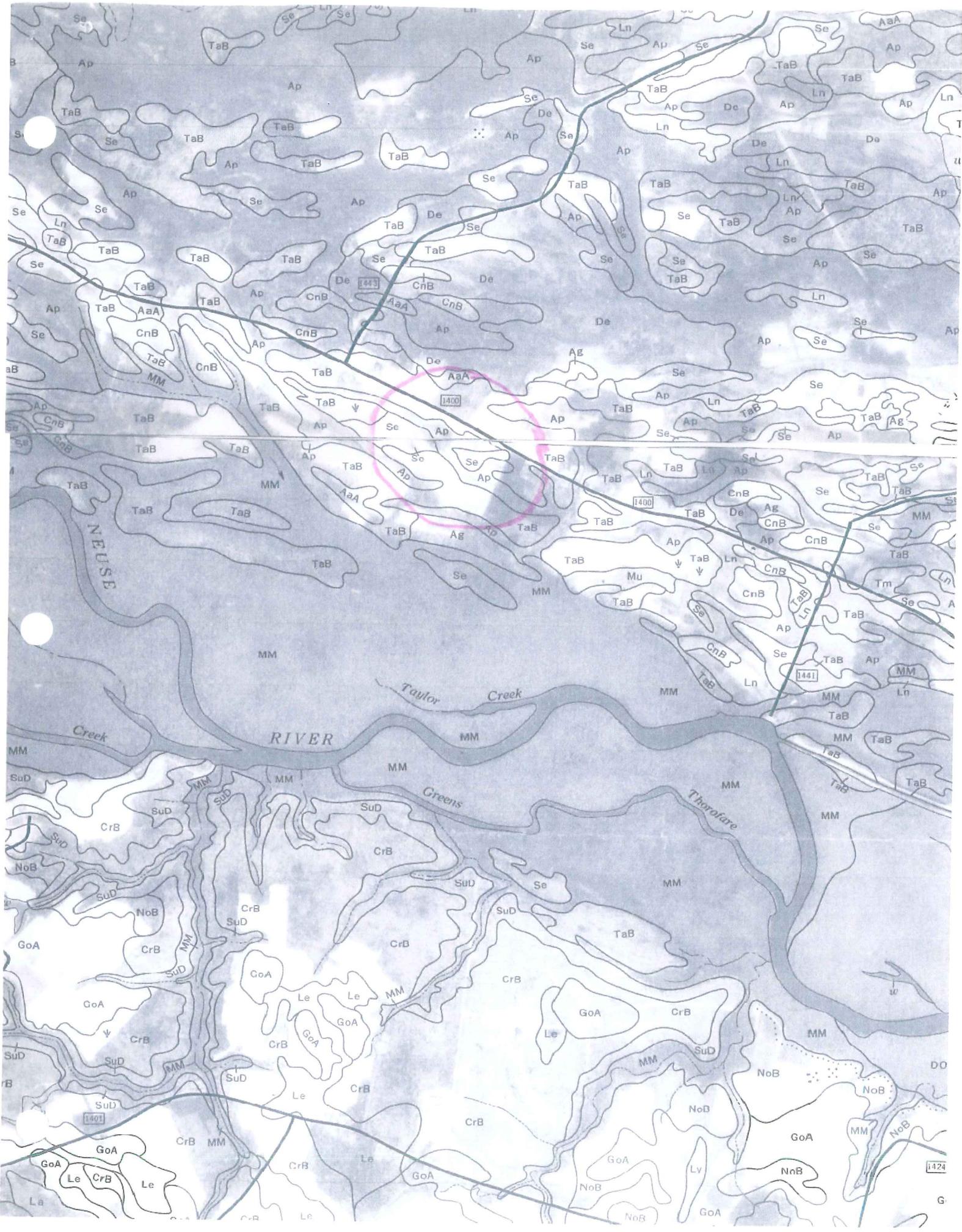
We have reviewed the ditch on your property located off of River Road (parcel # 1-057-026) to determine its potential for being a perennial/intermediate (Blue Line) stream. Based on our review of the USGS topographic map and the printed NRCS soil survey map, a small portion of this ditch, approximately 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.

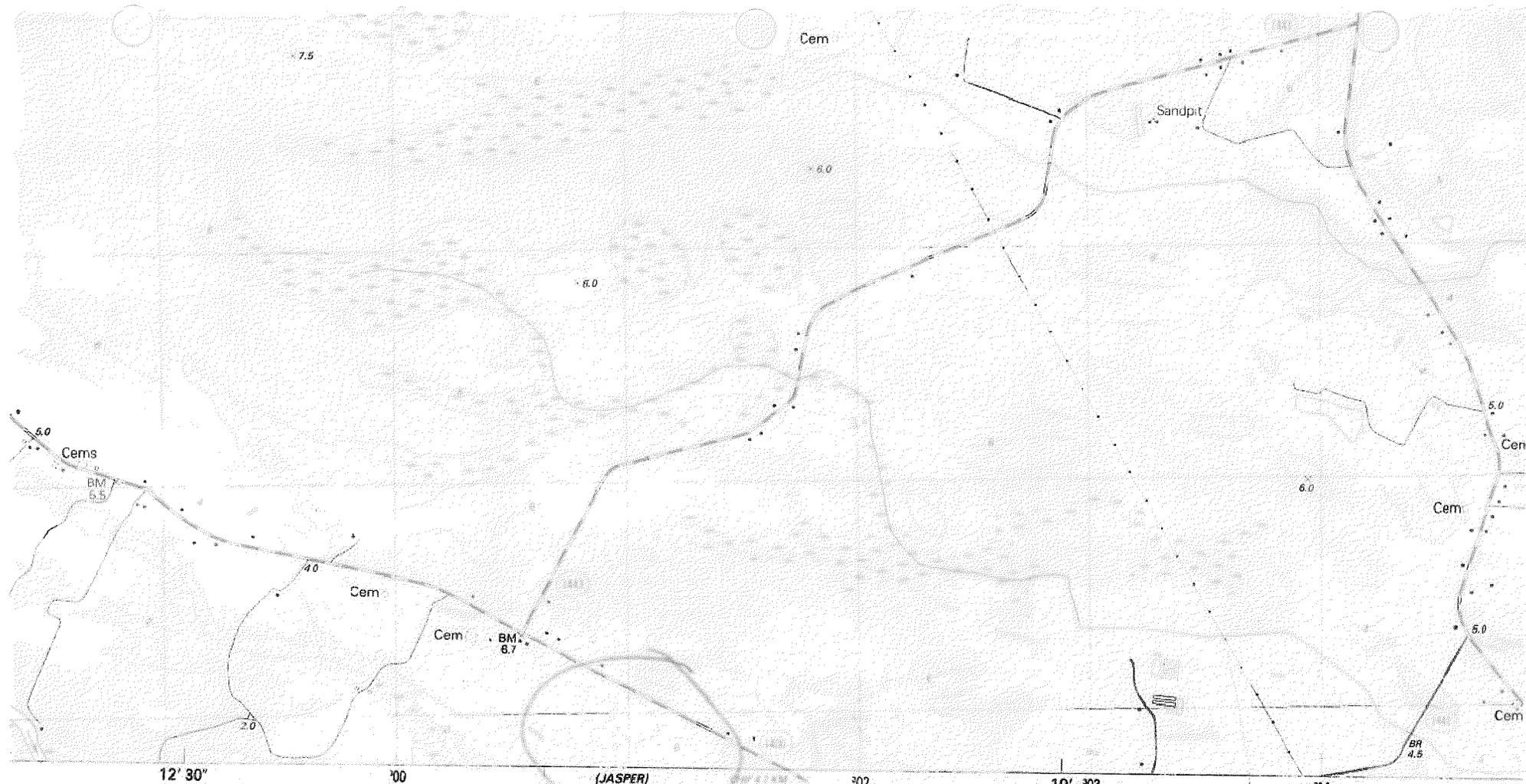
Enclosed you will find copies of the soil survey and the topographical map we used to make this determination. Also enclosed is an aerial photo and topographical map from the Craven County GIS website which is intended to help you better locate the stream segment.

If you have any questions please don't hesitate to give Andy or myself a call at 252-637-2547, ext. 3.

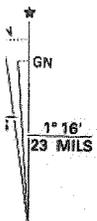
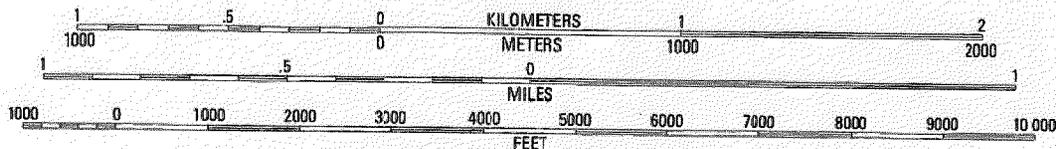
Thank You,

Patrick K. Baker
Natural Resource Conservationist II
Craven Soil and Water Conservation District





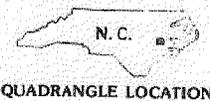
(JASPER)
5554 II NW
SCALE 1:24 000



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



QUADRANGLE LOCATION

CONTOURS AND ELEVATIONS
 IN METERS

Primary
hard surf
Secondary
hard surf

II

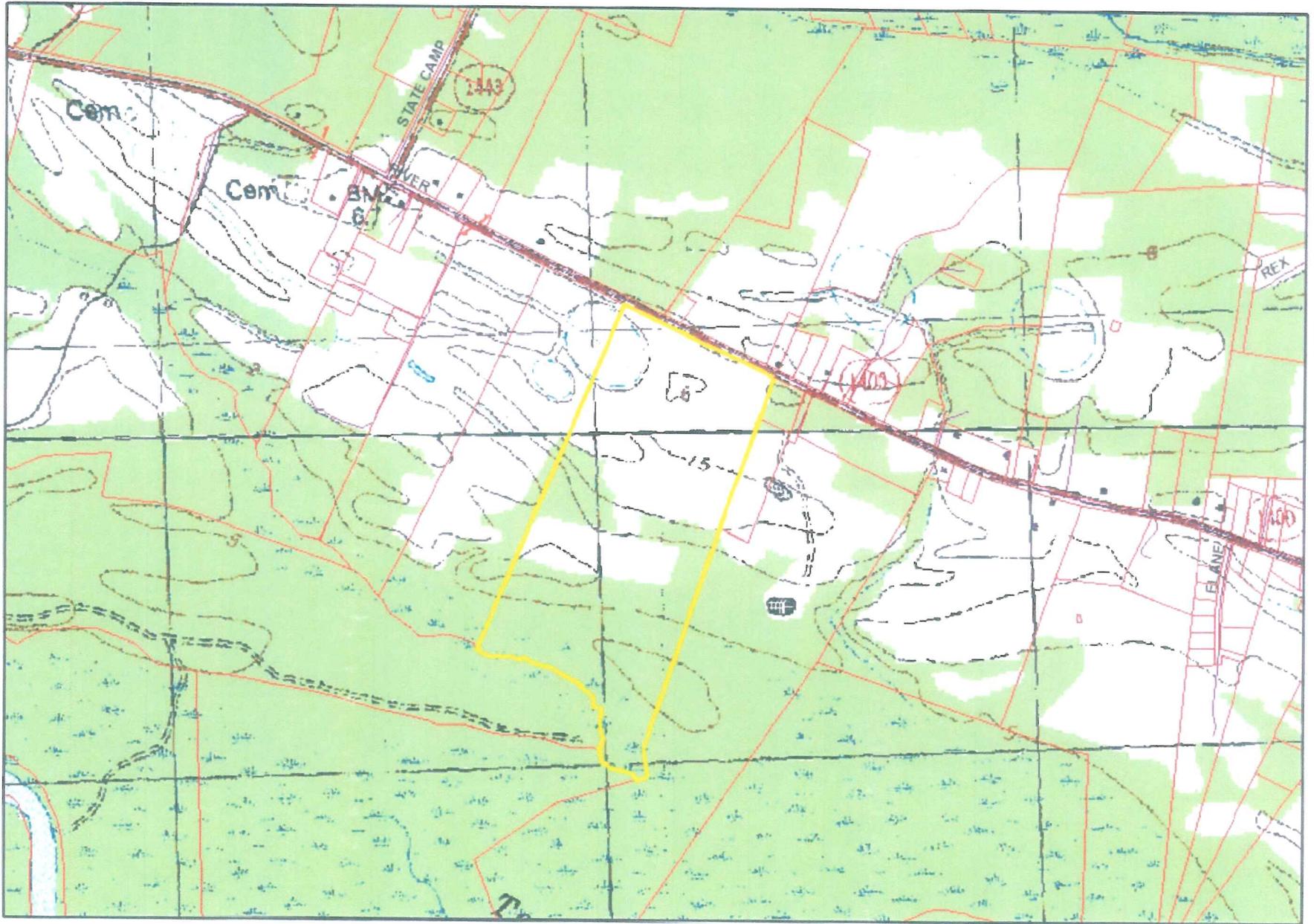


John W. "Billy" Dunham

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





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



Attachment 17. Financial Responsibility/Ownership Form (E&SC Application)

**FINANCIAL RESPONSIBILITY/OWNERSHIP FORM
SEDIMENTATION POLLUTION CONTROL ACT**

No person may initiate any land-disturbing activity on one or more acres as covered by the Act before this form and an acceptable erosion and sedimentation control plan have been completed and approved by the Land Quality Section, N.C. Department of Environment and Natural Resources. (Please type or print and, if the question is not applicable or the e-mail and/or fax information unavailable, place N/A in the blank.)

Part A.

1. Project Name Craven AG Services, Inc. - Compost Facility
2. Location of land-disturbing activity: County Craven City or Township Vanceboro
Highway/Street River Road Latitude 35° 15' 07" Longitude 77° 11' 2.08"
3. Approximate date land-disturbing activity will commence: 2/12
4. Purpose of development (residential, commercial, industrial, institutional, etc.): commercial
5. Total acreage disturbed or uncovered (including off-site borrow and waste areas): 7.85
6. Amount of fee enclosed: \$195.00 (325.00 previously submitted). The application fee of \$65.00 per acre (rounded up to the next acre) is assessed without a ceiling amount (Example: a 9-acre application fee is \$585).
7. Has an erosion and sediment control plan been filed? Yes _____ No _____ Enclosed X
8. Person to contact should erosion and sediment control issues arise during land-disturbing activity:
Name Gary S. MacConnell, PE E-mail Address gsmmacassoc@bellsouth.net
Telephone (919) 467-1239 Cell # (919) 523-2248 Fax # (919) 319-6510
9. Landowner(s) of Record (attach accompanied page to list additional owners):

<u>John W. and Jean H. Dunham</u> Name	<u>(252) 633-5334</u> Telephone	<u>(252) 633-6005</u> Fax Number
<u>2115 W. Highway 55</u> Current Mailing Address	<u>(see mailing address)</u> Current Street Address	
<u>New Bern</u> <u>NC</u> <u>28562</u> City State Zip	<u>(see mailing address)</u> City State Zip	
10. Deed Book No. 2199 Page No. 808 Provide a copy of the most current deed.

Part B.

1. Person(s) or firm(s) who are financially responsible for the land-disturbing activity (Provide a comprehensive list of all responsible parties on an attached sheet):

<u>Craven Ag Services, Inc.</u> Name	<u>cas71@suddenlink.net</u> E-mail Address
<u>2115 W. Highway 55</u> Current Mailing Address	<u>(see mailing address)</u> Current Street Address
<u>New Bern</u> <u>NC</u> <u>28562</u> City State Zip	<u>(see mailing address)</u> City State Zip
Telephone <u>(252) 633-5334</u>	Fax Number <u>(252) 633-6005</u>

2. (a) If the Financially Responsible Party is not a resident of North Carolina, give name and street address of the designated North Carolina Agent:

_____			_____		
Name			E-mail Address		
_____			_____		
Current Mailing Address			Current Street Address		
_____	_____	_____	_____	_____	_____
City	State	Zip	City	State	Zip
_____			_____		
Telephone			Fax Number		

(b) If the Financially Responsible Party is a Partnership or other person engaging in business under an assumed name, **attach a copy of the Certificate of Assumed Name**. If the Financially Responsible Party is a Corporation, give name and street address of the Registered Agent:

_____			_____		
Name of Registered Agent			E-mail Address		
_____			_____		
Current Mailing Address			Current Street Address		
_____	_____	_____	_____	_____	_____
City	State	Zip	City	State	Zip
_____			_____		
Telephone			Fax Number		

The above information is true and correct to the best of my knowledge and belief and was provided by me under oath (This form must be signed by the Financially Responsible Person if an individual or his attorney-in-fact, or if not an individual, by an officer, director, partner, or registered agent with the authority to execute instruments for the Financially Responsible Person). I agree to provide corrected information should there be any change in the information provided herein.

_____	_____
John W. Dunham	Owner
Type or print name	Title or Authority
<u>John W. Dunham</u>	_____
Signature	Date

I, Melissa T. Thomas, a Notary Public of the County of Jones

State of North Carolina, hereby certify that John W. 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 21 day of December, 2012

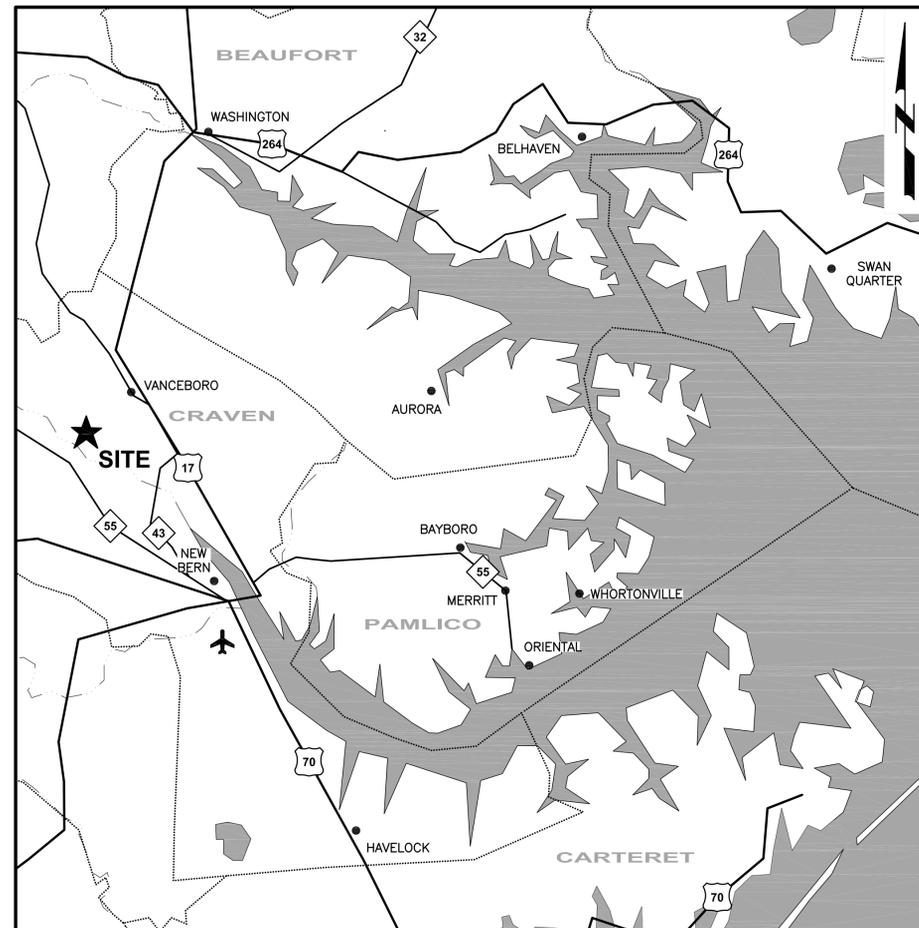
Seal

Melissa T. Thomas
Notary

My commission expires 7/21/15

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

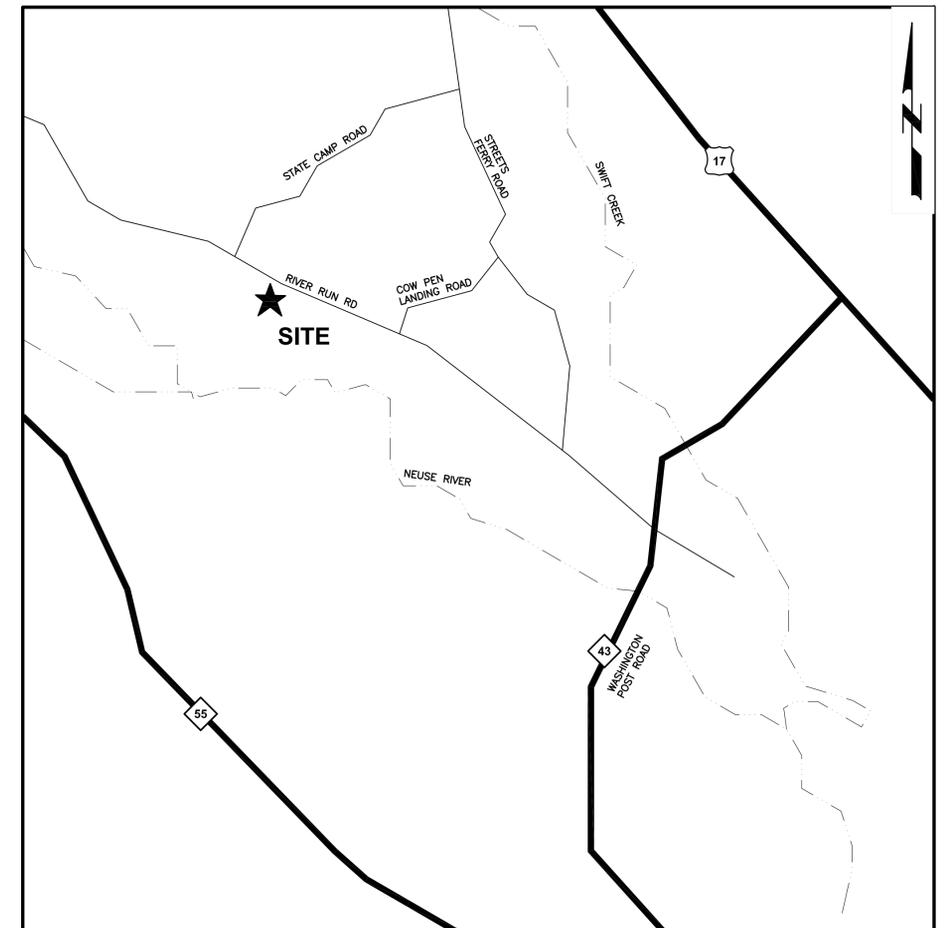
A. R. Rubin, Ed.D.
President



A. R. Rubin and Associates
sustainable environmental solutions

192 fearrington post
pittsboro, nc, 27312

919 545 3066
919 270 0344



LOCATION MAP

THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY GARY S. MACCONNELL, L-17069, ON DECEMBER 03, 2012. THIS ELECTRONIC MEDIUM IS NOT CONSIDERED A CERTIFIED DOCUMENT.

21-56.1103(G)
BOARD RULES
NORTH CAROLINA
ADMINISTRATIVE CODE
TITLE 21, CHAPTER 56
BOARD OF EXAMINERS FOR ENGINEERS
AND SURVEYORS

PROJECT MANAGEMENT

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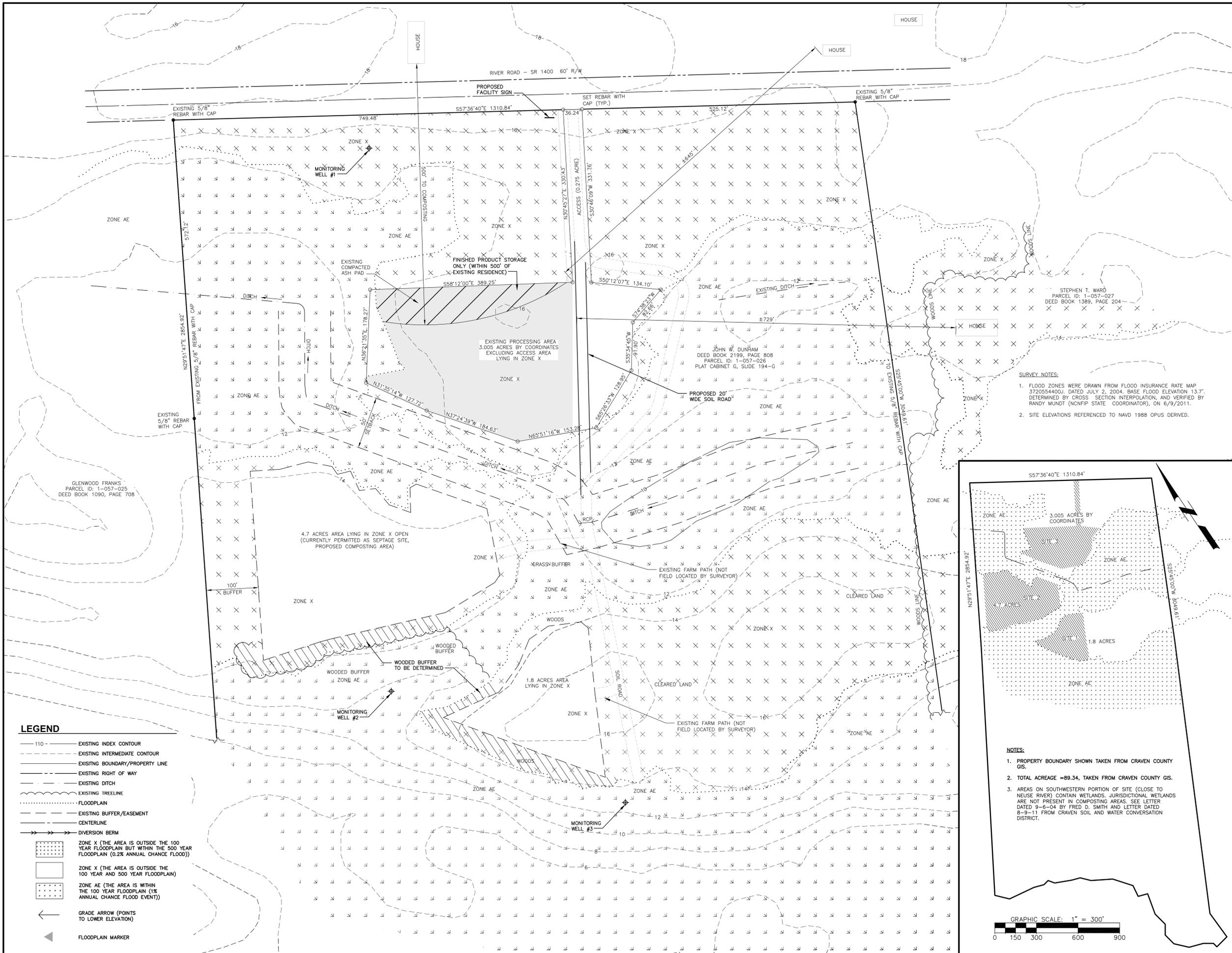


**MacCONNELL
& Associates, P. C.**

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

JUNE 28, 2011

REVISIONS				
NO.	DATE	DESCRIPTION	REV. PER LOS	SHEET
1	08/08/11	REV. PER LOS		ALL
2	02/29/12	REV. PER SWS		ALL
3	12/03/12	REV. PER SWS		ALL



NOTES

1. SURVEY PROVIDED BY: MAYO & ASSOCIATES, P.A. LAND SURVEYING
10121 US HWY 17 SOUTH
WAKEFORD, NC 28566
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.

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
1	08/08/11	PER LQS
2	02/29/12	PER SWS
3	12/03/12	PER SWS

PROJECT MANAGER: GSM	PROJECT ENGINEER: ZLF
DRAWN BY: MAE	CHECKED BY: GSM

DATE:
JUNE 28, 2011

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MacCONNELL & Associates, P. C.

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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

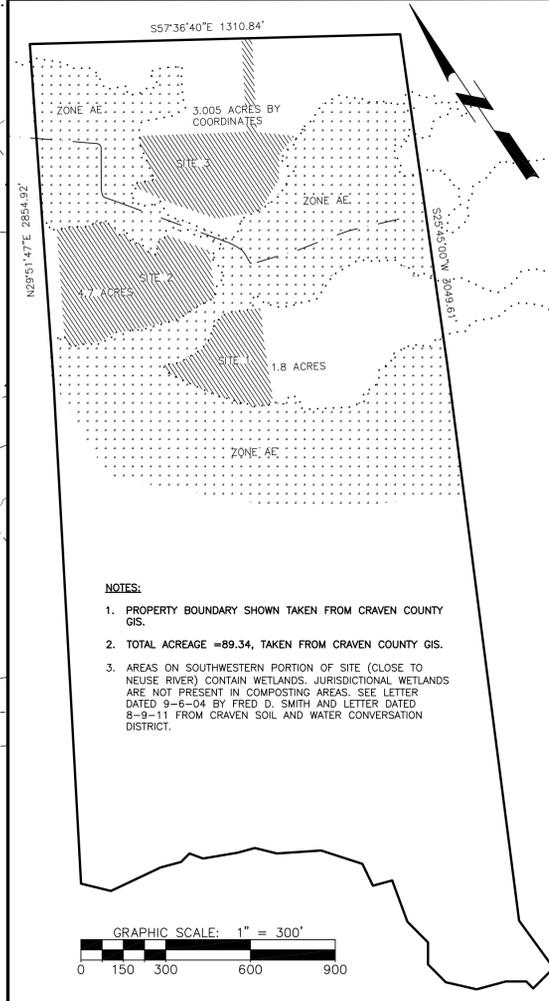
CRAVEN COUNTY, NC

SITE PLAN

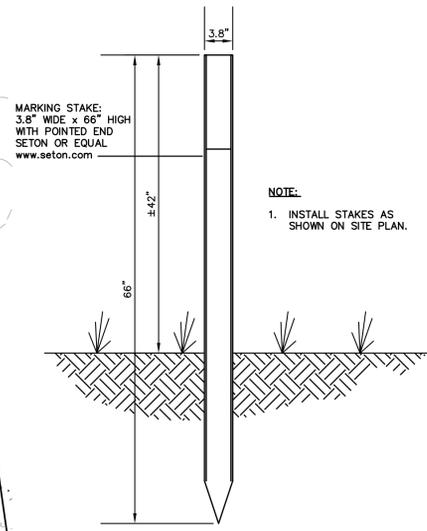
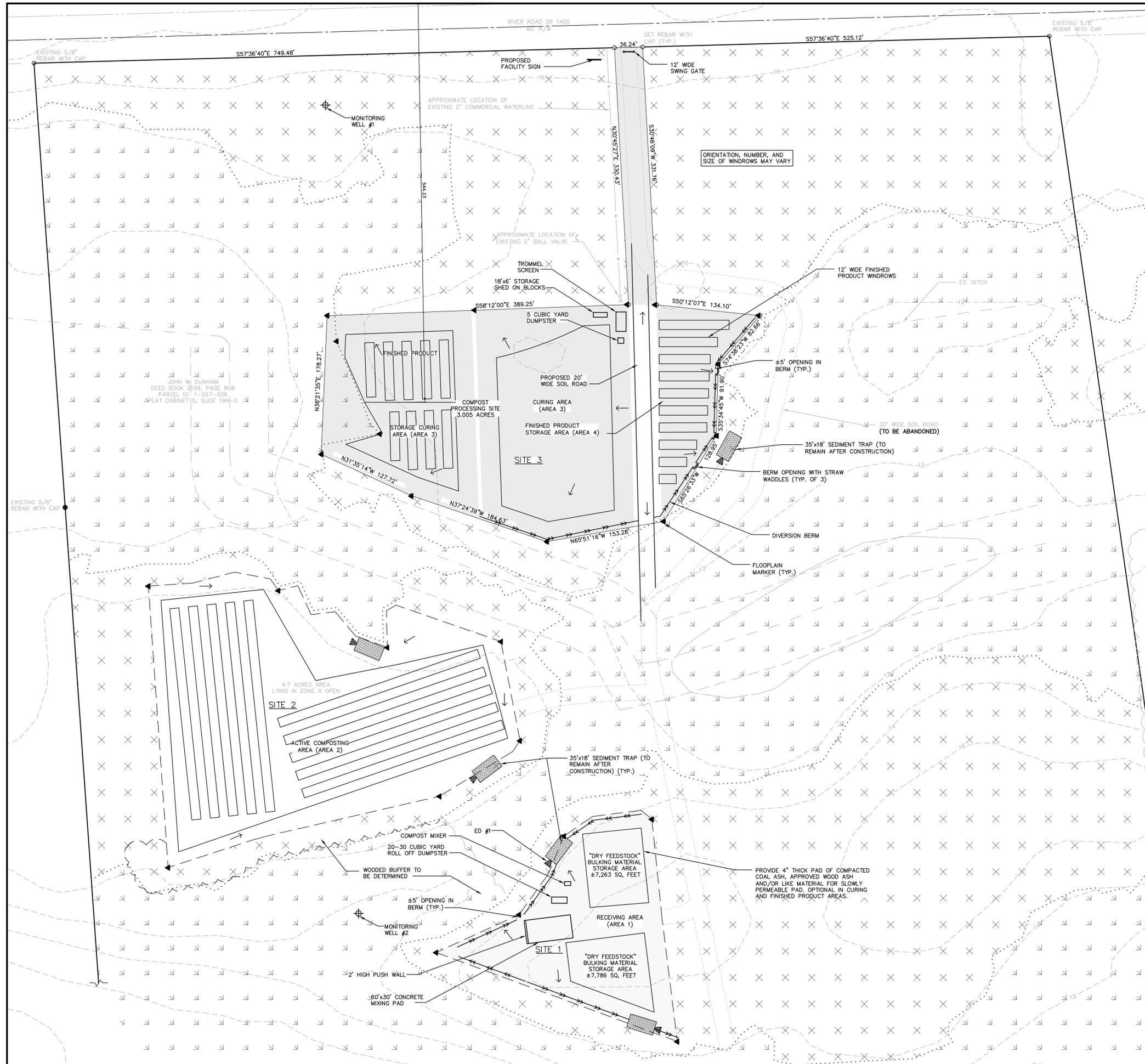
PROJECT NUMBER A45201.00	DRAWING NUMBER C-101
------------------------------------	--------------------------------

LEGEND

- 110 --- EXISTING INDEX CONTOUR
- - - - - EXISTING INTERMEDIATE CONTOUR
- EXISTING BOUNDARY/PROPERTY LINE
- EXISTING RIGHT OF WAY
- - - - - EXISTING DITCH
- EXISTING TIE LINE
- FLOODPLAIN
- EXISTING BUFFER/EASEMENT
- CENTERLINE
- DIVERSION BERM
- 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.



1 FLOODPLAIN MARKER
SCALE: NTS

LEGEND

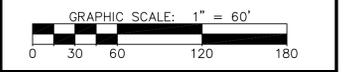
- 110 — EXISTING INDEX CONTOUR
- - - - EXISTING INTERMEDIATE CONTOUR
- — — — EXISTING BOUNDARY/PROPERTY LINE
- - - - EXISTING RIGHT OF WAY
- — — — EXISTING DITCH
- — — — EXISTING TREELINE
- — — — EXISTING BUFFER/EASEMENT
- — — — CENTERLINE
- — — — DIVERSION BERM
- ZONE X (THE AREA IS OUTSIDE THE 100 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**
- SEE C-101 FOR GENERAL NOTES.
 - DISTURBED AREAS NOT COVERED BY SLOWLY PERMEABLE PAD OR CONCRETE SHALL BE SEEDED WITH COASTAL BERMUDA, RYE GRASS, OR NATURAL GRASS.
 - FACILITY SIGN SHALL BE A MINIMUM 2'x3' AND INCLUDE THE PERMIT NUMBER, PROHIBITED MATERIALS, AND EMERGENCY CONTACT INFORMATION.
 - BLEND 2"-3" OF COMPOST FINES, 2"-3" OF ASH, WITH NATIVE SOIL FOR A TOTAL THICKNESS OF 8" IN COMPOSTING AND CURING AREAS. MODIFIED SOIL TEXTURE SHALL BE FINER THAN LOAMY SAND IN ACCORDANCE WITH RULE .1404 (a) (10) (B).

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
1	08/08/11	PER LQS
2	02/29/12	PER SWS
3	12/03/12	PER SWS

PROJECT MANAGER: _____ PROJECT ENGINEER: ZLF
DRAWN BY: MAE CHECKED BY: GSM

DATE: JUNE 28, 2011

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CRAVEN AG SERVICES, INC.

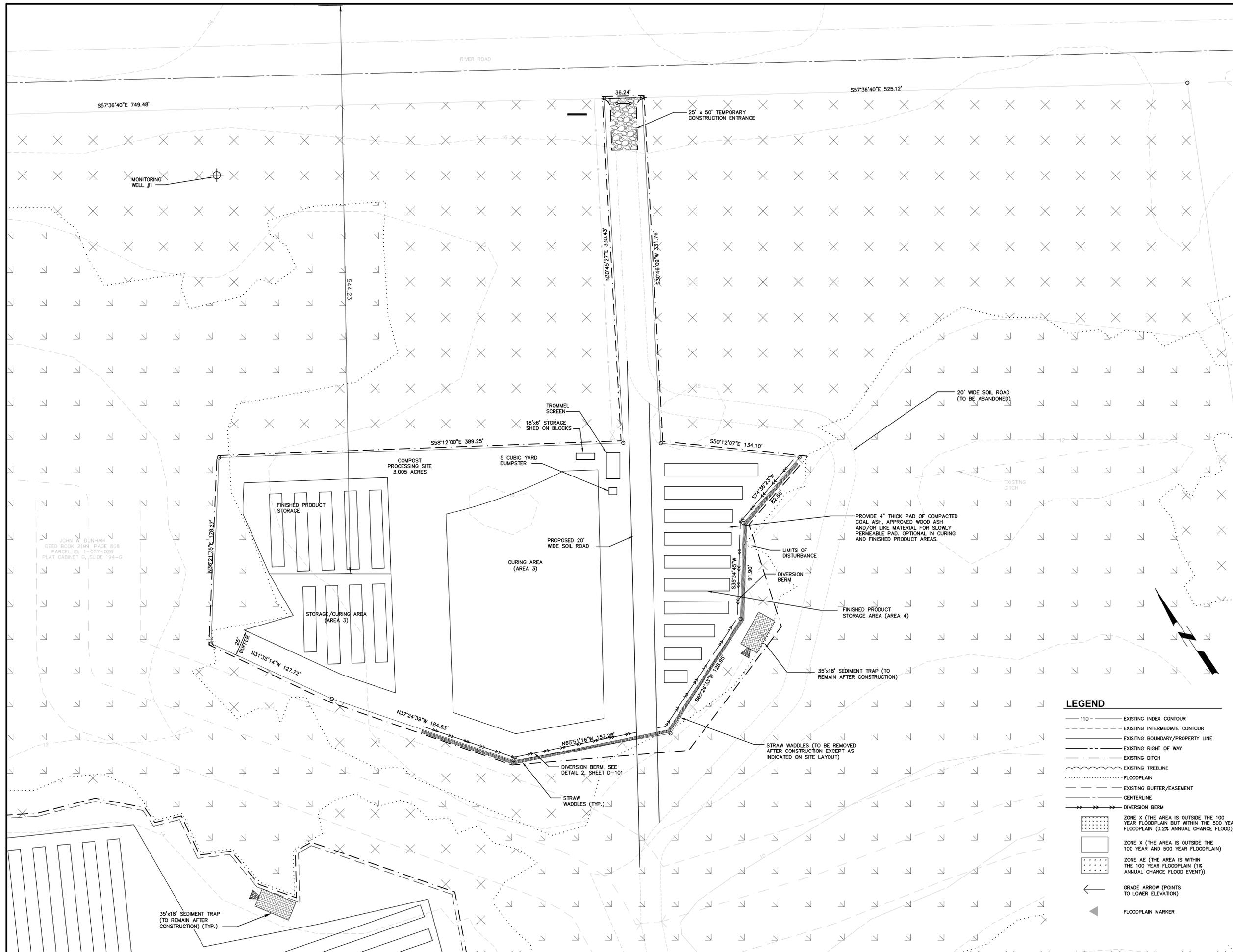
COMPOSTING FACILITY

CRAVEN COUNTY, NC

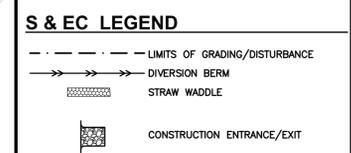
SITE LAYOUT

PROJECT NUMBER: **A45201.00** DRAWING NUMBER: **C-102**

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- NOTES**
- SEE C-101 FOR GENERAL NOTES.
 - FILL IN OPENINGS IN BERM AFTER CONSTRUCTION IS COMPLETE AND SITE IS STABILIZED.
 - ALL EXCAVATED SOILS WILL BE USED FOR CONSTRUCTION OF DIVERSION BERMS AND GRADING OF COMPOST PAD.
 - HAY BALES (OPTIONAL) MAY BE PLACED DOWN SLOPE (OUTSIDE) OF STRAW WADDLES.

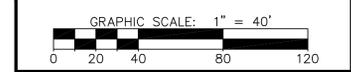


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919 545 3066
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REVISIONS

NO.	DATE	DESCRIPTION
1	08/08/11	PER LQS
2	02/29/12	PER SWS
3	12/03/12	PER SWS

PROJECT MANAGER: GSM	PROJECT ENGINEER: ZLF
DRAWN BY: MAE	CHECKED BY: GSM

DATE:
JUNE 28, 2011

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BOARD RULES
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TITLE 21, CHAPTER 56
BOARD OF EXAMINERS FOR ENGINEERS AND SURVEYORS

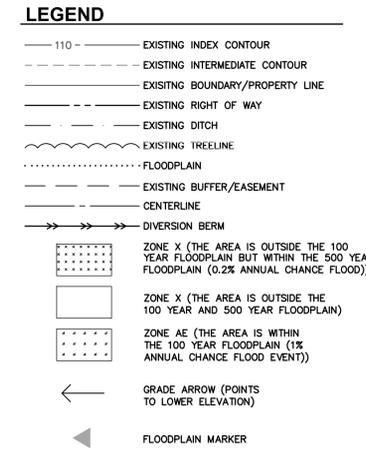
MacCONNELL & Associates, P. C.
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CRAVEN AG SERVICES, INC.

COMPOSTING FACILITY
CRAVEN COUNTY, NC

STORMWATER/ SEDIMENTATION & EROSION CONTROL PLAN LAYOUT
1 OF 2

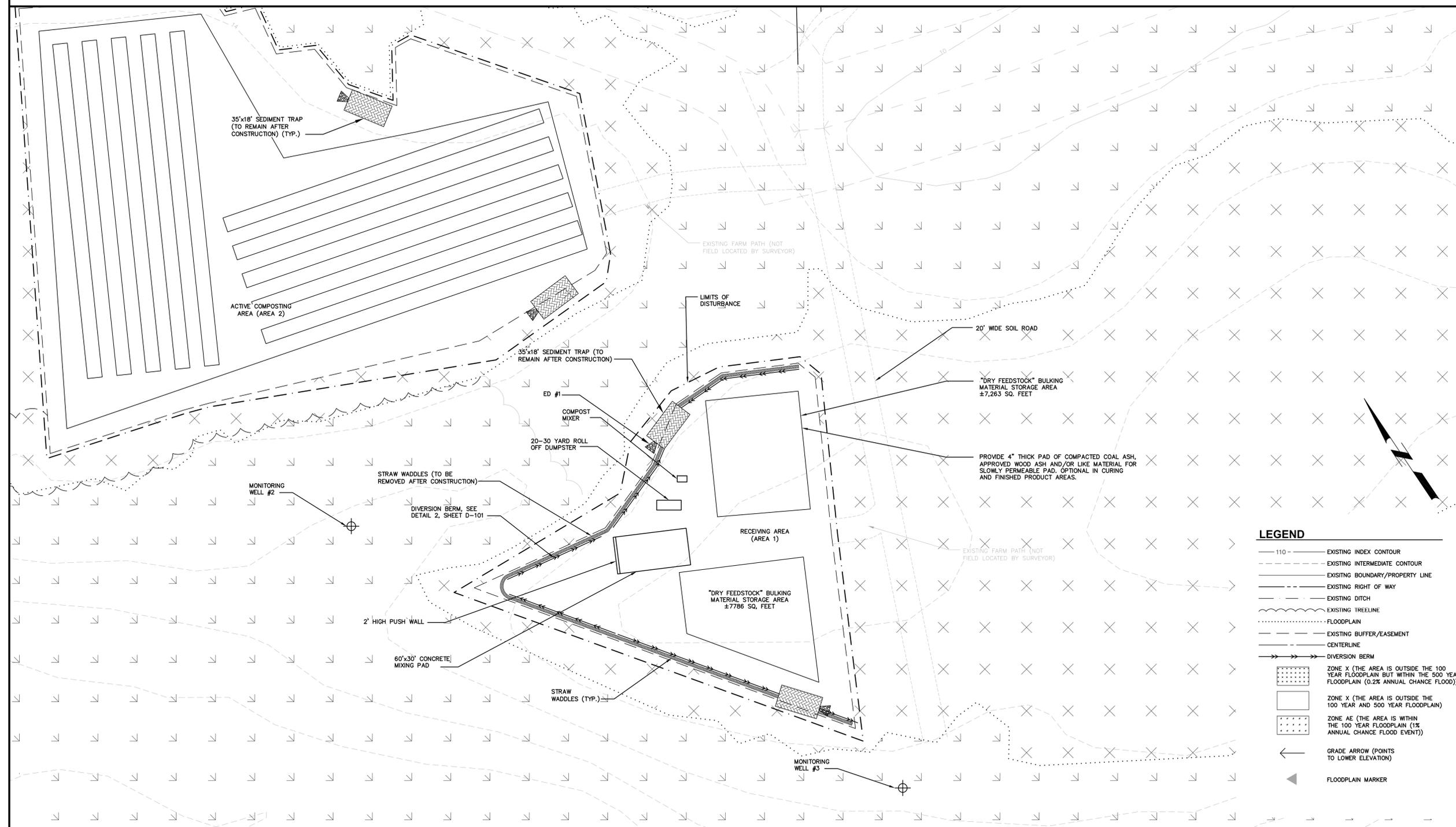
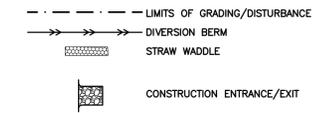
PROJECT NUMBER A45201.00	DRAWING NUMBER C-103
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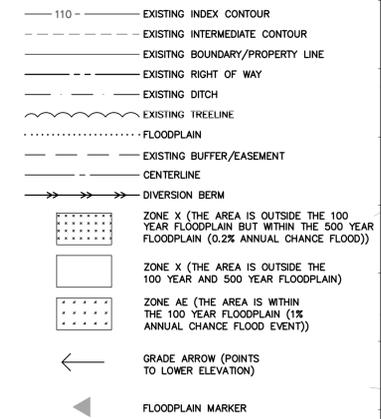
NOTES

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S & EC LEGEND



LEGEND

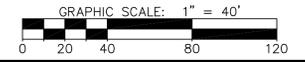


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CRAVEN AG SERVICES, INC.

COMPOSTING FACILITY

CRAVEN COUNTY, NC

STORMWATER/ SEDIMENTATION & EROSION CONTROL PLAN LAYOUT
2 OF 2

PROJECT NUMBER A45201.00	DRAWING NUMBER C-104
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SEEDING SPECIFICATIONS

- PERMANENT SEEDING: PERMANENT SEEDING IS REQUIRED FOR ALL AREAS DISTURBED BY CONSTRUCTION EXCEPT FOR AREAS COVERED BY STRUCTURES, PAVEMENTS, ETC.
- 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 SEED. THE FORCE MAIN SHALL BE SEED AT THE END OF EACH WORKING DAY TO MINIMIZE CONSTRUCTION DISTURBANCE ACTIVITIES.

***PRODUCTS:**

MATERIALS:

- FERTILIZER: PROVIDE 10-10-10 COMMERCIAL FERTILIZER CONFORMING TO STATUTORY REQUIREMENTS AND ALL RULES AND REGULATIONS ADOPTED BY THE NORTH CAROLINA DEPARTMENT OF AGRICULTURE.
- LIMESTONE: PROVIDE LIMESTONE CONFORMING TO ALL STATUTORY REQUIREMENTS AND ALL RULES AND REGULATIONS ADOPTED BY THE NORTH CAROLINA DEPARTMENT OF AGRICULTURE.
- 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.
- TEMPORARY MIXTURE:
 - FOR DECEMBER 1st THROUGH APRIL 15th, THE MIXTURE SHALL CONSIST OF 120 lbs./ac. RYE (GRAIN) AND 50 lbs./ac. KOBE.
 - FOR APRIL 15th THROUGH AUGUST 15th, THE MIXTURE SHALL CONSIST OF 40 lbs./ac. GERMAN MILLET.
 - FOR AUGUST 15th THROUGH DECEMBER 30th, THE MIXTURE SHALL CONSIST OF 120 lbs./ac. RYE (GRAIN).
- PERMANENT MIXTURE:
 - 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.
 - OTHER MIXTURES: OTHER MIXTURES, AS APPROVED OR RECOMMENDED BY THE SOIL CONSERVATION SERVICE OR THE NORTH CAROLINA AGRICULTURAL EXTENSION OFFICE MAY BE USED.
- MULCH: MULCH ALL SEEDS 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**

- 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.
- SPREAD A MINIMUM OF FOUR (4) INCHES OF TOP SOIL OVER ALL DISTURBED AREAS TO THE FINISHED GRADE.
- REMOVE ALL GRASS AND WEEDS AND SHAPE THE OVERALL AREA TO EVEN OUT HIGH AND LOW SPOTS.
- 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.
- THE PREPARATION OUTLINED ABOVE SHALL NOT BE DONE WHEN THE SOIL IS FROZEN, WET, OR OTHERWISE IN AN UNFAVORABLE CONDITION.
- BEGIN AND COMPLETE SEEDING OPERATIONS, AS OUTLINED BELOW, AS SOON AS POSSIBLE AFTER FINAL OR INTERMEDIATE GRADING IS COMPLETED.
- DISTRIBUTE LIME AND FERTILIZER, AS REQUIRED, UNIFORMLY OVER THE SEED BED. HARROW RAKE OR OTHERWISE WORK THESE ADDITIONS INTO THE SEED BED.
- 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.
- COMPACT THE SEED BED WITH AN APPROVED ROLL OR DRAG AFTER COVERING THE SEED.
- 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.
- 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:

- APPLY LIME ACCORDING TO THE SOIL TESTS OR AT A RATE OF 2000 lbs./ac. BEFORE SEEDING.
- APPLY FERTILIZER ACCORDING TO THE SOIL TESTS OR AT A RATE OF 750 lbs./ac.
- SEED THE SEED BED WITH THE SPECIFIED SEED MIXTURE AT THE SPECIFIED RATE FOR THE RECOMMENDED PLANTING SEASON.
- 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.
- 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:

- APPLY LIME ACCORDING TO THE SOIL TESTS OR AT A RATE OF 2000 lbs./ac. BEFORE SEEDING.
- APPLY FERTILIZER ACCORDING TO THE SOIL TESTS OR AT A RATE OF 1000 lbs./ac.
- SEED THE SEED BED WITH THE SPECIFIED SEED MIXTURE AT THE SPECIFIED RATE FOR THE RECOMMENDED PLANTING SEASON.
- 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.
- 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:

- WHERE A NEAT APPEARANCE IS DESIRED, OMIT SERICEA.
- USE COMMON BERMUDAGRASS ONLY ON ISOLATED SITES WHERE IT CANNOT BECOME A PEST. BERMUDAGRASS MAY BE REPLACED WITH 5 lbs./ac. CENTIPEDEGRASS.
- 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.
- 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.
- 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.
- 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:

- INSTALL EROSION CONTROL MEASURES AS REQUIRED, SUCH AS THE CONSTRUCTION ENTRANCE, DIVERSION BERMS, AND STRAW WADDLES.
- CLEAR AND GRUB THE WOODED AREAS TO BE DEVELOPED. STOCKPILE TOPSOIL AND SUITABLE FILL MATERIAL IN AREAS DESIGNATED AS STOCKPILES.
- BEGIN EXCAVATION AND GRADING ACTIVITIES AFTER ALL REQUIRED EROSION CONTROL MEASURES HAVE BEEN INSTALLED AND CONSTRUCTED. SALVAGE ANY TOPSOIL THAT MAY BE USED AFTER CONSTRUCTION.
- SEED TEMPORARY AREAS THAT HAVE BEEN LEFT DORMANT FOR LONGER THAN 15 DAYS.
- ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED WEEKLY AND AFTER EACH HEAVY RUNOFF PRODUCING RAINFALL. NEEDED REPAIRS SHALL BE MADE IMMEDIATELY.
- AFTER CONSTRUCTION REMOVE ALL TEMPORARY STRUCTURES AND ENSURE ALL SEEDING IS COMPLETED FOR AREAS DISTURBED.

MAINTENANCE PLAN

- 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.

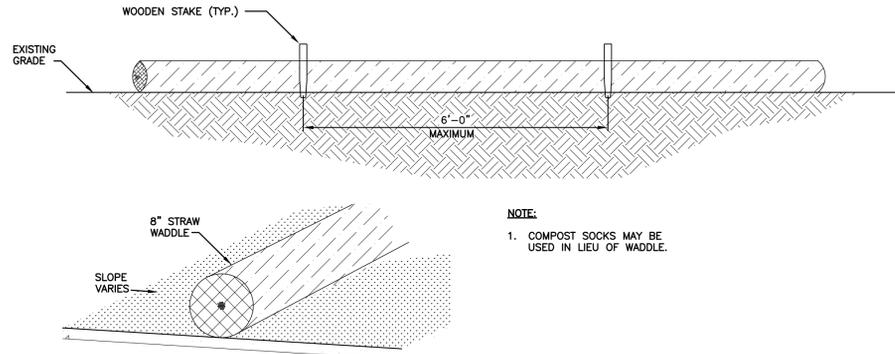
STRAW WADDLE: CLEAN OUT SEDIMENT, STRAW, LIMBS, OR OTHER DEBRIS THAT COULD CLOG THE CHANNEL WHEN NEEDED. ANTICIPATE SUBMERGENCE AND DEPOSITION ABOVE THE STRAW WADDLE AND EROSION FROM HIGH FLOWS AROUND THE EDGES OF THE STRAW WADDLE. CORRECT ALL DAMAGE IMMEDIATELY. IF SIGNIFICANT EROSION OCCURS BETWEEN STRAW WADDLES, ADDITIONAL MEASURES CAN BE TAKEN SUCH AS, INSTALLING A PROTECTIVE RIPRAP LINER IN THAT PORTION OF THE CHANNEL.

REMOVE SEDIMENT ACCUMULATED BEHIND THE STRAW WADDLES AS NEEDED TO PREVENT DAMAGE TO CHANNEL VEGETATION, ALLOW THE CHANNEL TO DRAIN THROUGH THE STRAW WADDLES, AND PREVENT LARGE FLOWS FROM CARRYING SEDIMENT OVER THE STRAW WADDLE.

SEEDING, FERTILIZING, AND MULCHING: SEEDS AREAS SHALL BE INSPECTED FOR FAILURE AND NECESSARY REPAIRS SHALL BE MADE WITHIN THE SAME SEASON, IF POSSIBLE.

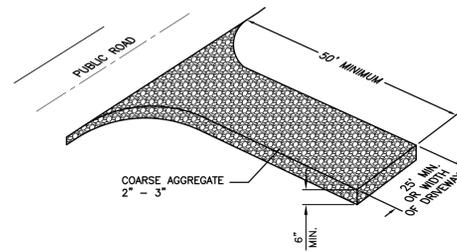
- THE ANGLE FOR GRADED SLOPES AND FILLS SHALL BE NO GREATER THAN THE ANGLE THAT CAN BE RETAINED BY VEGETATIVE COVER OR OTHER ADEQUATE EROSION CONTROL DEVICES OR STRUCTURES. IN ANY EVENT, SLOPES LEFT EXPOSED WILL, WITHIN 21 CALENDAR DAYS OF COMPLETION OF ANY PHASE OF GRADING, BE PLANTED OR OTHERWISE PROVIDED 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: 7.85 AC.



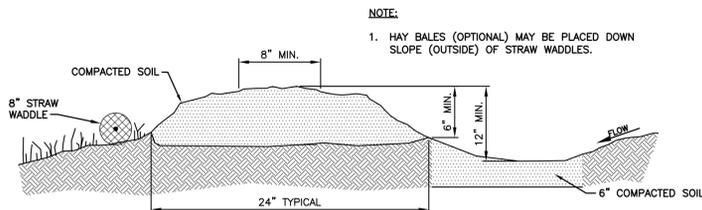
2 STRAW WADDLE DETAIL

D-101 NTS



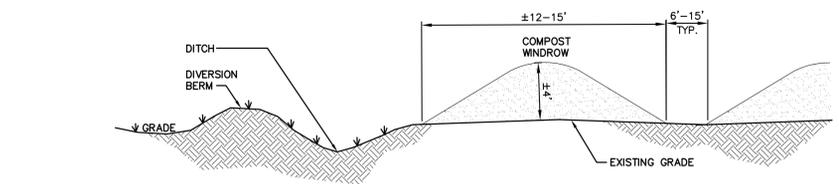
3 TEMPORARY CONSTRUCTION ENTRANCE

D-101 NTS



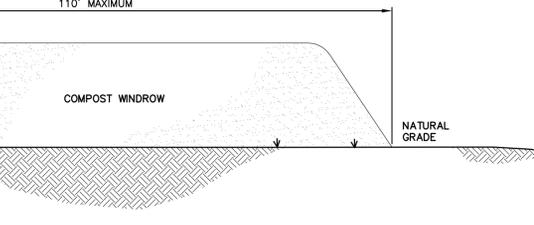
4 DIVERSION BERM

D-101 NTS



1 COMPOST WINDROW

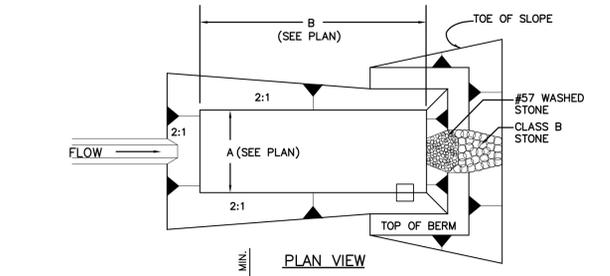
D-101 NTS



5 ENERGY DISSIPATOR AND SCHEDULE

D-101 SCALE: NTS

ENERGY DISSIPATOR TABLE	
CRITERIA	ED #1
CONDUIT SYMBOL	NA
CULVERT SIZE (IN.)	NA
DESIGN FLOW QP 10,24 (C.F.S.)	1.44
D50 OF STONE (FT.)	0.5
APRON LENGTH (FT.)	8
UPSTREAM APRON WIDTH (FT.)	3
DOWNSTREAM APRON WIDTH (FT.)	9
MAXIMUM STONE DIAMETER (FT.)	0.75
APRON THICKNESS (FT.)	1.125
FILTER NECESSARY	NO



6 SEDIMENT TRAP

D-101 NTS

SEDIMENT TRAP	
CRITERIA	TRAP #1
DISTURBED AREA (ACRES)	0.21
DESIGN FLOW QP 10,24 (C.F.S.)	1.44
MINIMUM TRAP VOLUME (C.F.)	756
MINIMUM SURFACE AREA (S.F.)	627
MINIMUM WEIR LENGTH (FEET)	4
MINIMUM DEPTH (FEET)	3
MAXIMUM DEPTH (FEET)	4
MINIMUM LENGTH (FEET)	35
MINIMUM WIDTH (FEET)	18

MAINTENANCE:

- INSPECT SEDIMENT TRAPS AFTER EACH PERIOD OF SIGNIFICANT RAINFALL. REMOVE SEDIMENT AND RESTORE TRAP TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ONE-HALF THE DESIGN DEPTH OF THE TRAP. PLACE THE SEDIMENT THAT IS REMOVED IN A DESIGNATED DISPOSAL AREA AND REPLACE THE CONTAMINATED PART OF THE GRAVEL FACING.
- CHECK THE STRUCTURE FOR DAMAGE FROM EROSION OR PIPING. PERIODICALLY CHECK THE DEPTH OF THE SPILLWAY TO ENSURE IT IS A MINIMUM OF 1.5 FT. BELOW THE LOW POINT OF THE EMBANKMENT. IMMEDIATELY FILL ANY SETTLEMENT OF THE EMBANKMENT TO SLIGHTLY ABOVE DESIGN GRADE. ANY RIP RAP DISPLACED FROM THE SPILLWAY MUST BE REPLACED IMMEDIATELY.
- STABILIZE THE EMBANKMENT AND ALL DISTURBED AREAS ABOVE THE SEDIMENT POOL AND DOWNSTREAM FROM THE TRAP IMMEDIATELY AFTER CONSTRUCTION WITH SEEDING.

NOTES

- SEE C-101 FOR ALL GENERAL NOTES.

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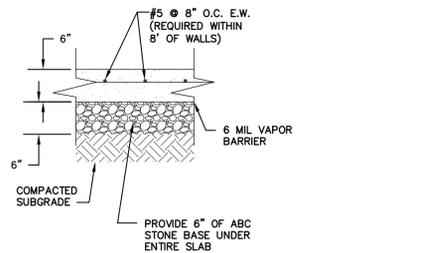
CRAVEN AG SERVICE, INC.

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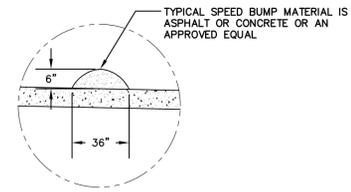
CRAVEN COUNTY, NC

DETAILS

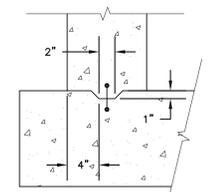
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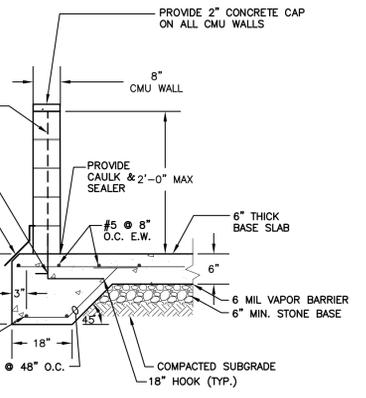
1 TYPICAL CONCRETE PAD DETAIL
D-102 NTS



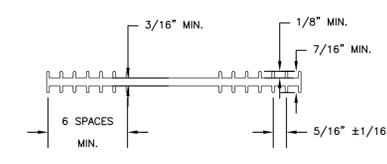
3 SPEED BUMP DETAIL
D-102 NTS



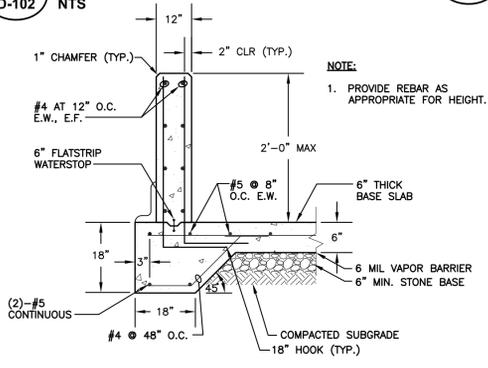
4 KEY DETAIL
D-102 NTS



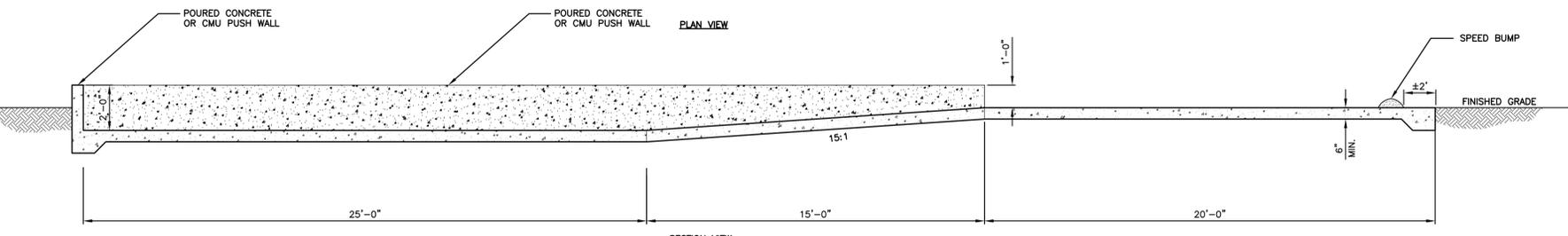
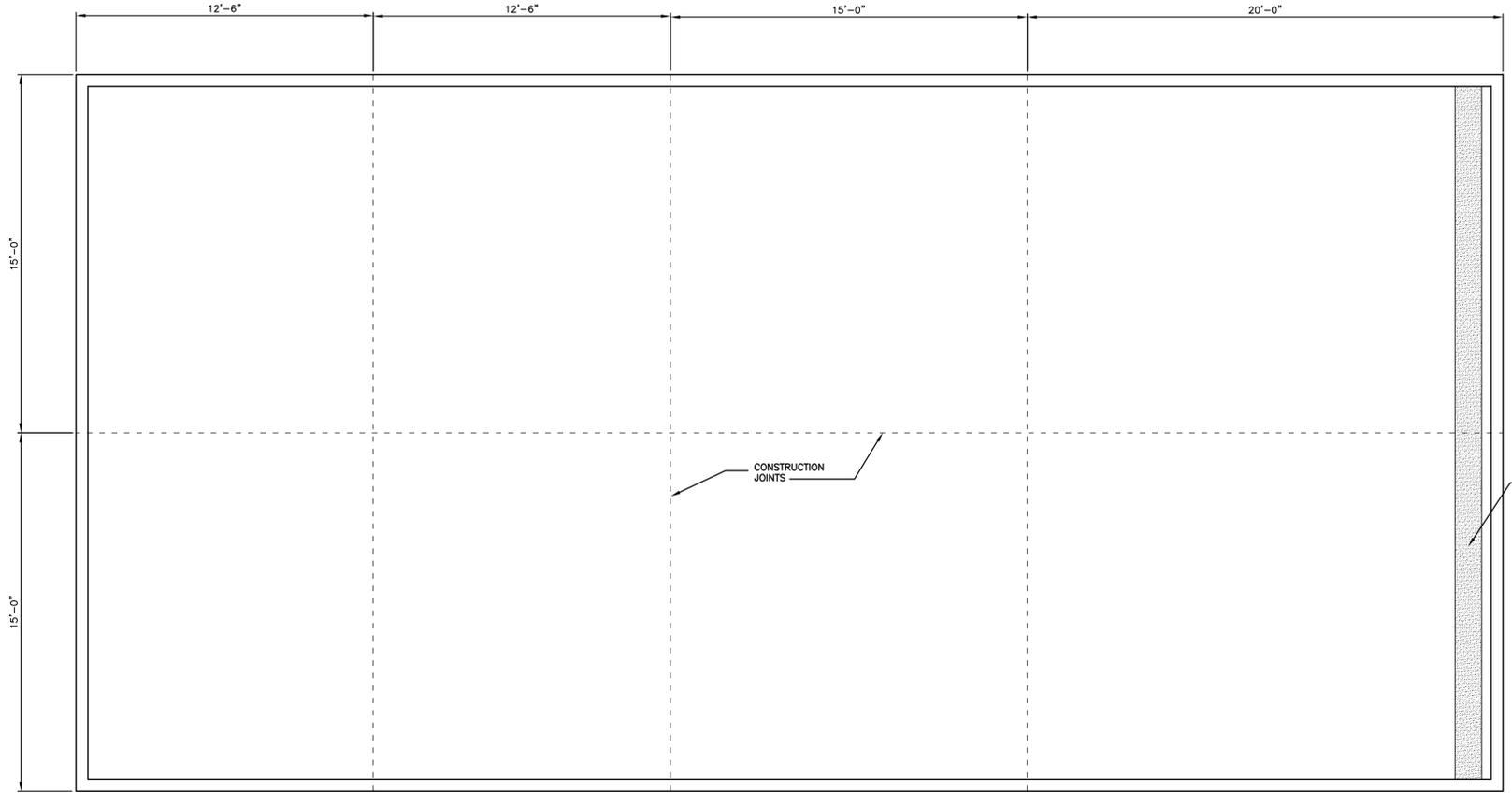
6 TYPICAL SLAB AND CMU WALL DETAIL
D-102 NTS



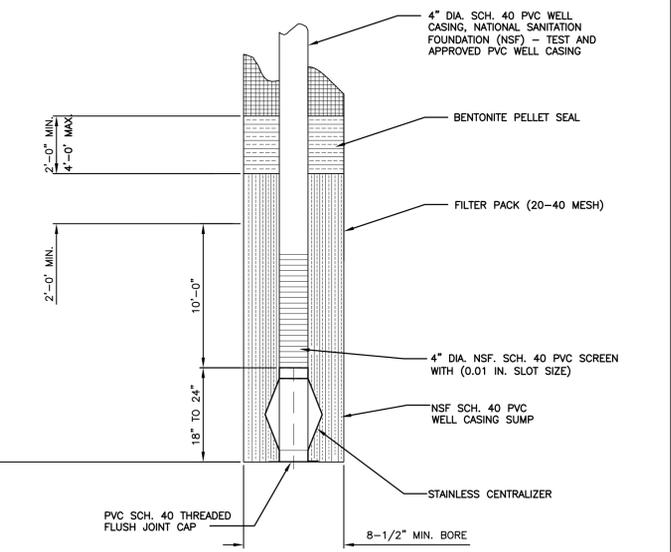
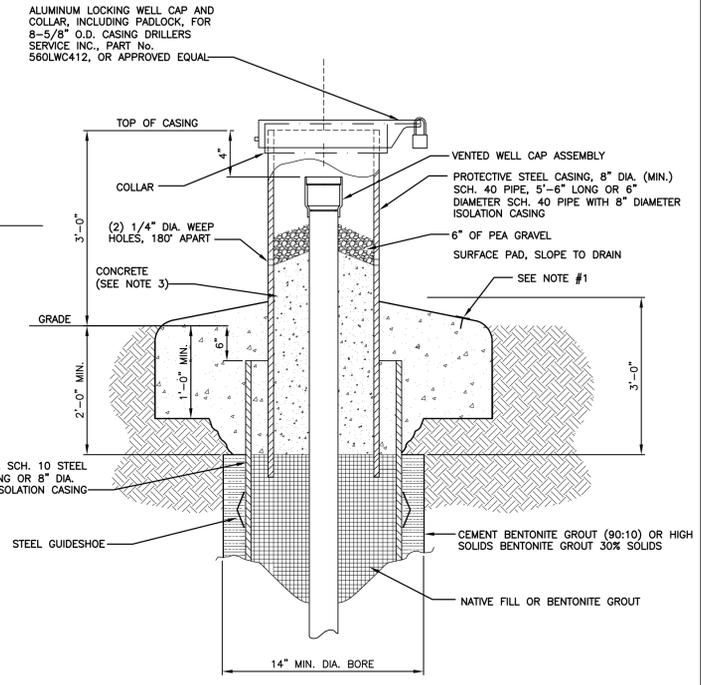
2 6" FLATSTRIP WATERSTOP
D-102 NTS



5 WALL POURED SECTION
D-102 NTS



7 MIXING PAD DETAIL
D-102 NTS



- NOTES:**
- SUB-CONTRACTOR SHALL STAMP WELL NUMBER (MIN. OF 1/2" SIZE LETTERS) IN BRASS PLATE. BRASS PLATE SHALL BE DOMED SURVEY MARKER 3" DIA. LIETZNUMBER 8134-18 OR APPROVED EQUAL.
 - PROTECTIVE CASING SHALL BE CLEANED ACCORDING TO SSPC-SP6 AND PRIMED WITH TNEPEC SERIES 37-77W @ 3-5 MILS AND FINISHED WITH TNEPEC SERIES 82-BW56 @ 2-3 MILS, OR CONTRACTOR ACCEPTED EQUAL.
 - CONCRETE FOR PAD FOR PROTECTIVE WELL CASINGS SHALL BE MIN. 2500 PSI @ 28 DAYS.
 - ISOLATION CASING TO BE INSTALLED IN CONFINING LAYER ABOVE GROUNDWATER.
 - FIELD INSTALL SPACERS ON PADLOCK SHACKLE AS REQUIRED TO MINIMIZE CAP OPENING ACCESS. PADLOCKS AND SPACERS SHALL BE SUPPLIED BY THE CONTRACTOR.
 - EACH PROTECTIVE CASING SHALL BE LABELED WITH BLACK LETTERS. LABEL SHALL INCLUDE THE PREFIX MW FOR MONITORING WELLS, THE PREFIX PZ FOR PIEZOMETERS AND THE NUMBER ASSIGNED BY THE CONTRACTOR. LETTERS SHALL BE A MINIMUM OF 3 INCHES HIGH.

8 GROUNDWATER MONITORING WELL
D-102 NTS

NOTES

1. SEE C-101 FOR ALL GENERAL NOTES.

A. R. Rubin, Ed.D.
President



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

PROJECT MANAGER: GSM
PROJECT ENGINEER: ZLF
DRAWN BY: MAE
CHECKED BY: GSM

DATE:
JUNE 28, 2011

THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY GARY S. MACCONNELL, L-17069, ON DECEMBER 03, 2012. THIS ELECTRONIC MEDIUM IS NOT CONSIDERED A CERTIFIED DOCUMENT.



CRAVEN AG SERVICE, INC.
COMPOSTING FACILITY
CRAVEN COUNTY, NC

MIXING PAD DETAILS
PROJECT NUMBER: **A45201.00**
DRAWING NUMBER: **D-102**