



North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

March 31, 2015

Jean Creech – Residuals Technical Services Manager
Charlotte-Mecklenburg Utilities
12701 Lancaster Highway
Pineville, North Carolina, 28134

Subject: Permit No. WQ0000057
Charlotte-Mecklenburg Utilities
Land Application of Class B
Water Treatment Plant and
Wastewater Treatment Plant
Residuals (Non-Dedicated)
Mecklenburg County

Dear Ms. Creech:

In accordance with your permit renewal request received October 1, 2014, and subsequent additional information received December 12, 2014, we are forwarding herewith Permit No. WQ0000057 dated March 31, 2015, to Charlotte-Mecklenburg Utilities for the continued operation of the subject residuals management program. Please note that this renewed permit shall become effective on April 1, 2015 (i.e. the day after the expiration date of the existing permit), which differs from the date of this letter.

Minor modifications to the subject permit are as follows: Field acreages have been adjusted due to remapping of the application areas. More than 100 sites are being removed from the program. Sites NC-ST-05-24 through 32 have been renamed as NC-ST-09-24 through 32. Sites NC-UN-106-04 through 06 have been renamed as NC-UN-10-04 through 06.

This permit shall be effective from April 1, 2015 until March 31, 2020, shall void Permit No. WQ0000057 issued April 14, 2008, and shall be subject to the conditions and limitations as specified therein. Please pay particular attention to the monitoring requirements listed in Attachments A and B, for they may differ from the previous permit issuance. Failure to establish an adequate system for collecting and maintaining the required operational information shall result in future compliance problems.

Please note that on September 1, 2006, North Carolina Administrative Code Title 15A Subchapter 02T – Waste not Discharged to Surface Waters was adopted. Accordingly, this permit incorporates the requirements of these rules; therefore, please **take the time to review this permit thoroughly**. The following conditions have been added, modified or deleted from those in the last permit issuance:

- Condition I.1. – Describes the procedure for renewing the permit.
- Condition I.2. – requires compliance with notification requirements

Non-Discharge Permitting Unit
1617 Mail Service Center, Raleigh, North Carolina 27699-1617
Phone: 919-807-6464 \ Internet: <http://portal.ncdenr.org/web/wq>

- Condition I.3. – requires submission of an Operation & Maintenance Plan
- Condition I.4. – requires compliance with the site signage requirements
- Condition II.1. – the program shall be properly maintained and operated
- Condition II.5. – lists the ceiling concentrations and cumulative loading rates
- Condition II.7. – requires meeting one of the vector attraction reduction alternatives
- Condition II.10. – agronomic rates are determined by Realistic Yield Expectations
- Condition II.11. – the realistic nitrogen consumption rate is reduced for grazed pastureland
- Condition II.13. – special consideration is given for a high Sodium Adsorption Ratio
- Condition III.1. – the program shall be properly maintained and operated
- Condition III.2. – addresses notification prior to applying residuals on a new site
- Condition III.3. – addresses notification prior to applying residuals on any site
- Condition III.4. – requires submittal of an Operation & Maintenance Plan
- Condition III.5. – requires the appointment of an ORC and backup ORC
- Condition III.6. – copies of the permit and O&M Plan must be present
- Condition III.7. – spill control is required for residuals transport and application vehicles
- Condition III.11. – lists field conditions that disallow bulk residual applications
- Condition III.12. – lists public access restrictions
- Condition III.13. – lists signage requirements on the application fields
- Condition III.15. – requires information about prior applications of nutrient materials
- Condition IV.3. – addresses the analyses of residuals for metals and other substances
- Condition IV.5. – requires a Standard Soil Fertility Analysis for the application fields
- Condition IV.7. – lists minimum requirements for recording residual application events
- Condition IV.8. – requires an annual report each year
- Condition IV.9. – addresses appropriate responses and notification to non-compliance events
- Condition V.1. – adequate inspection and maintenance must be provided to the facilities
- Condition VI.5. – any change in ownership requires a modification of the permit
- Condition VI.6. – the permit may be revoked or modified under certain circumstances

- Condition VI.7. – the permitted facilities may not be expanded if certain conditions prevail

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

One set of approved plans and specifications is being forwarded to you. If you need additional information concerning this matter, please contact David Goodrich at (919) 807-6352 or by email at david.goodrich@ncdenr.gov.

Sincerely,

for S. Jay Zimmerman, Director
Division of Water Resources, NCDENR

cc: Anson County Health Department (Electronic Copy)
Cabarrus County Health Department (Electronic Copy)
Cleveland County Health Department (Electronic Copy)
Mecklenburg County Health Department (Electronic Copy)
Stanly County Health Department (Electronic Copy)
Union County Health Department (Electronic Copy)
Mooresville Regional Office, Water Quality Regional Operations Section (Electronic Copy)
Mecklenburg County Land Use & Environmental Services Agency - Water Quality Program (Electronic Copy)
Marshall Puryear, LSS – Synagro (Electronic Copy)
Beth Buffington – Protection and Enforcement Branch (Electronic Copy)
Digital Permit Archive (Electronic Copy)
Central Files

NORTH CAROLINA
ENVIRONMENTAL MANAGEMENT COMMISSION
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

RALEIGH

**LAND APPLICATION OF CLASS B WATER TREATMENT PLANT AND WASTEWATER
TREATMENT PLANT RESIDUALS PERMIT (NON-DEDICATED)**

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

PERMISSION IS HEREBY GRANTED TO

Charlotte-Mecklenburg Utilities
Mecklenburg County

FOR THE

continued operation of a residuals management program for Charlotte-Mecklenburg Utilities and consisting of the land application of Class B Water Treatment Plant and Wastewater Treatment Plant residuals generated by the approved facilities listed in Attachment A to the approved sites listed in Attachment B with no discharge of wastes to surface waters, pursuant to the application received October 1, 2014, and subsequent additional information received by the Division of Water Resources, and in conformity with other supporting data subsequently filed and approved by the Department of Environment and Natural Resources and considered a part of this permit. The use and disposal of residuals are regulated under Title 40 Code of Federal Regulations Part 503. This permit does not exempt the Permittee from complying with the federal regulations.

This permit shall be effective from April 1, 2015 until March 31, 2020, shall void Permit No. WQ0000057 issued April 14, 2008 and shall be subject to the following specified conditions and limitations:

I. SCHEDULES

1. No later than six months prior to the expiration of this permit, the Permittee shall request renewal of this permit on official Division forms. Upon receipt of the request, the Division will review the adequacy of the facilities described therein, and if warranted, will renew the permit for such period of time and under such conditions and limitations as it may deem appropriate. Please note Rule 15A NCAC 02T .0105(d) requires an updated site map to be submitted with the permit renewal application. [15A NCAC 02T .0108(b)(2), 02T .105(d), 02T .0109]
2. The Permittee shall be in full compliance with the regional office notification requirements established in Condition III.3. within 90 days of the effective date of this permit. [15A NCAC 02T .0108(b)(2)]
3. The Permittee shall submit the Operation and Maintenance (O&M) plan as required in Condition III.4. to the Division within 90 days of the effective date of this permit. [15A NCAC 02T .0108(b)(2)]

4. The Permittee shall be in full compliance with the signage requirements established in Condition III.13. within 180 days of the effective date of this permit. [15A NCAC 02T .0108(b)(2)]

II. PERFORMANCE STANDARDS

1. The subject residuals management program shall be effectively maintained and operated at all times so there is no discharge to surface waters, nor any contravention of groundwater or surface water standards. In the event the facilities fail to perform satisfactorily, including the creation of nuisance conditions due to improper operation and maintenance, the Permittee shall immediately cease land applying residuals to the site, contact the Mooresville Regional office supervisor, and take any immediate corrective actions. [G.S. 143-215.1]
2. This permit shall not relieve the Permittee of their responsibility for damages to groundwater or surface water resulting from the operation of this residuals management program. [15A NCAC 02B .0200, 02L .0100]
3. Only residuals generated by the facilities listed in Attachment A are approved for land application in accordance with this permit. [G.S. 143-215.1]
4. Only the sites listed in Attachment B are approved for residuals land application. [G.S. 143-215.1]
5. Pollutant concentrations in residuals applied to land application sites listed in Attachment B shall not exceed the following **Ceiling Concentrations** (i.e., dry weight basis) or **Cumulative Pollutant Loading Rates (CPLRs)**: [15A NCAC 02T .1105]

Parameter	Ceiling Concentration <i>(milligrams per kilogram)</i>	CPLR <i>(pounds per acre)</i>
Arsenic	75	36
Cadmium	85	34
Copper	4,300	1,338
Lead	840	267
Mercury	57	15
Molybdenum	75	n/a
Nickel	420	374
Selenium	100	89
Zinc	7,500	2,498

The Permittee shall determine compliance with the CPLRs using one of the following methods:

- a. By calculating the existing cumulative level of pollutants using actual analytical data from all historical land application events of residuals, or
 - b. For land where residuals application have not occurred or for which the required data is incomplete, by determining background concentrations through representative soil sampling.
6. Residuals that are land applied shall meet Class B pathogen reduction requirements in 15A NCAC 02T .1106 (a) and (c). Exceptions to this requirement shall be specified in Attachment A. [15A NCAC 02T .1106]

7. Biological residuals (i.e. residuals generated during the treatment of domestic or animal processing wastewater, or the biological treatment of industrial wastewater, and as identified in Attachment A) that are land applied shall meet one of the vector attraction reduction alternatives in 15A NCAC 02T .1107(a). Exceptions to this requirement shall be specified in Attachment A. [15A NCAC 02T .1107]
8. Setbacks for Class B land application sites shall be as follows: [15A NCAC 02T .1108]

Setback Description	Setback by application type (feet)		
	Vehicular Surface Application	Irrigation Surface Application	Injection / Incorporation
Habitable residence or place of public assembly under separate ownership or not to be maintained as part of the project site	400*	400*	200*
Property lines	50	50	50
Public right of way	50	50	50
Private or public water supply source, waters classified as SA or SB, or any Class I or Class II impounded reservoir used as a source of drinking water	100	100	100
Surface waters (streams – intermittent and perennial, perennial waterbodies, and wetlands), any streams classified as WS or B, or any other stream, canal, marsh, coastal waters, or any other lake or impoundment	100	100	50
Upstream interceptor drains or upstream surface water diversions (ephemeral streams, waterways, ditches)	10	10	10
Downslope interceptor drains, downslope surface water diversions, downslope groundwater drainage systems, or downslope drainage ditches	25	25	25

* The setback requirement may be reduced to a minimum of 100 feet upon written consent of the owner and approval from the Water Quality Regional Operations Section of the appropriate Division's regional office in Attachment B of this permit.

9. Land application areas shall be clearly marked on each site prior to and during any residuals application event. [15A NCAC 02T .0108(b)(1)]
10. Bulk residuals and other sources of Plant Available Nitrogen (PAN) shall not be applied in exceedance of agronomic rates. Appropriate agronomic rates shall be calculated using expected nitrogen requirements based on the determined Realistic Yield Expectations (RYE) using any of the following methods: [15A NCAC 02T .1109(b)(1)(k)]
 - a. Division's pre-approved site specific historical data for specific crop or soil types by calculating the mean of the best three yields of the last five consecutive crop harvests for each field.
 - b. North Carolina Historical Data for specific crop and soil types as provided by North Carolina State University Department of Soil Science (<http://nutrients.soil.ncsu.edu/yields/index.php>). A copy shall be kept on file and reprinted every five years in accordance with Condition IV.3.
 - c. If the RYE cannot be determined using methods (a) or (b) above, the Permittee may use the RYE and appropriate nutrient application rates reported in any of the following documents:
 - i. **Crop management plan** as outlined by the local Cooperative Extension Office, the North

Carolina Department of Agriculture and Consumer Services, the Natural Resource Conservation Service, or other agronomist.

- ii. **Waste Utilization Plan** as outlined by the Senate Bill 1217 Interagency Group - Guidance Document: Chapter 1
(http://www.ncagr.gov/SWC/tech/documents/9th_Guidance_Doc_100109.pdf).
 - iii. **Certified Nutrient Management Plan** as outlined by the Natural Resources Conservation Services (NRCS). These plans must meet the USDA-NRCS 590 Nutrient Management Standards (<ftp://ftp-fc.sc.gov.usda.gov/NHQ/practice-standards/standards/590.pdf>).
 - d. If the RYE and appropriate nutrient application rates cannot be determined, the Permittee shall contact the Division to determine necessary action.
11. When residuals are land applied to grazed pasture, hay crop realistic nitrogen rate shall be reduced by 25% in accordance with the USDA-NRCS 590 Nutrient Management Standards. [15A NCAC 02T .0108(b)(1)]
 12. If land application sites are to be over-seeded or double-cropped (e.g., bermuda grass in the summer and rye grass in the winter with both crops to receive residuals), then the second crop can receive an application of PAN at a rate not to exceed 50 pounds per acre per year (lbs/ac/yr). This practice may be allowed as long as the second crop is to be harvested or grazed. If the second crop is to be planted for erosion control only and is to be tilled into the soil, then no additional PAN shall be applied. [15A NCAC 02T .0108(b)(1)]
 13. Prior to land application of residuals containing a sodium adsorption ratio (SAR) of 10 or higher, the Permittee shall obtain and implement recommendations from at least one of the following: the local Cooperative Extension Office; the Department of Agriculture and Consumer Services; the Natural Resource Conservation Service; a North Carolina Licensed Soil Scientist; or an agronomist. The recommendations shall address the sodium application rate, soil amendments (e.g., gypsum, etc.), or a mechanism for maintaining site integrity and conditions conducive to crop growth. The Permittee shall maintain written records of these recommendations and details of their implementation. [15A NCAC 02T .0108(b)(1)]
 14. These residuals land application sites were individually permitted on or after December 30, 1983; therefore, the compliance boundary is established at either 250 feet from the residual land application area, or 50 feet within the property boundary, whichever is closest to the residual land application area. An exceedance of groundwater standards at or beyond the compliance boundary is subject to remediation action according to 15A NCAC 02L .0106(d) (2) as well as enforcement actions in accordance with North Carolina General Statute 143-215.6A through 143-215.6C. Any approved relocation of the COMPLIANCE BOUNDARY will be noted in Attachment B. [15A NCAC 02L .0107(a)]
 15. The review boundary shall be established midway between the compliance boundary and the residual land application area. Any exceedance of groundwater standards at the review boundary shall require action in accordance with 15A NCAC 02L .0106. [15A NCAC 02L .0108]

III. OPERATION AND MAINTENANCE REQUIREMENTS

1. The residuals management program shall be properly maintained and operated at all times. The program shall be effectively maintained and operated as a non-discharge system to prevent any contravention of surface water or groundwater standards. [15A NCAC 02T .1110]

2. The Mooresville Regional Office, telephone number (704) 663-1699, and the appropriate local government official (i.e., county manager, city manager, or health director) shall be notified at least 48 hours prior to the initial residuals land application event to any new land application site. Notification to the regional supervisor shall be made from 8:00 a.m. until 5:00 p.m. on Monday through Friday, excluding State Holidays. [15A NCAC 02T .0108(b)(1)]
3. The Mooresville Regional Office shall be notified via email or telephone, (704) 663-1699, at least 24 hours prior to conducting any land application activity. Such notification shall indicate, at a minimum, the anticipated application times, field IDs, and location of land application activities. If it becomes necessary to apply to additional fields due to unforeseen events, the Regional Office shall be notified prior to commencing the application to those fields. [15A NCAC 02T .0108(b)(1)]
4. The Permittee shall maintain an approved Operation and Maintenance Plan (O&M Plan) Modifications to the O&M Plan shall be approved by the Division prior to utilization of the new plan. The O&M Plan, at the minimum, shall include: [15A NCAC 02T .1100]
 - a) Operational functions;
 - b) Maintenance schedules;
 - c) Safety measures;
 - d) Spill response plan;
 - e) Inspection plan including the following information:
 - i. Names and/or titles of personnel responsible for conducting the inspections;
 - ii. Frequency and location of inspections, including those to be conducted by the ORC, and procedures to assure that the selected location(s) and inspection frequency are representative of the residuals management program;
 - iii. Detailed description of inspection procedures including record keeping and actions to be taken by the inspector in the event that noncompliance is observed pursuant to the noncompliance notification requirements under the monitoring and reporting section of the permit;
 - f) Sampling and monitoring plan including the following information:
 - i. Names and/or titles of personnel responsible for conducting the sampling and monitoring;
 - ii. Detailed description of monitoring procedures including parameters to be monitored;
 - iii. Sampling frequency and procedures to assure that representative samples are being collected. Fluctuation in temperature, flow, and other operating conditions can affect the quality of the residuals gathered during a particular sampling event. The sampling plan shall account for any foreseen fluctuations in residuals quality and indicate the most limiting times for residuals to meet pathogen and vector attraction reduction requirements (e.g. facilities that land apply multiple times per year but have an annual sampling frequency, may need to sample during winter months when pathogen reduction is most likely to be negatively affected by cold temperatures).
5. Upon the Water Pollution Control System Operators Certification Commission's (WPCSOCC) classification of the facility, the Permittee shall designate and employ a certified operator in responsible charge (ORC) and one or more certified operators as back-up ORCs in accordance with 15A NCAC 08G .0201. The ORC or their back-up shall visit the facilities in accordance with 15A NCAC 08G. 0204, or as specified in the most recently approved O&M plan (i.e., see Condition III.4.), and shall comply with all other conditions of 15A NCAC 08G. 0204. For more information regarding classification and designation requirements, please contact the Division of Water Resources' Technical Assistance & Certification Unit at (919) 733-0026. [15A NCAC 02T .0117]
6. When the Permittee land applies bulk residuals, a copy of this permit and a copy of O&M Plan shall be maintained at the land application sites during land application activities. [15A NCAC 02T .0108(b)(1)]

7. When the Permittee transports or land applies bulk residuals, the spill control provisions shall be maintained in all residuals transport and application vehicles. [15A NCAC 02T .1110]
8. Residuals shall not be stored at any land application site, unless written approval has been requested and received from the Division. [G.S. 143-215.1]
9. When the Permittee land applies bulk residuals, adequate measures shall be taken to prevent wind erosion and surface runoff from conveying residuals from the land application sites onto adjacent properties or into surface waters. [G.S. 143-215.1]
10. When the Permittee land applies bulk residuals, a suitable vegetative cover shall be maintained on land application sites onto which residuals are applied, or application shall be in accordance with the crop management plan outlined by the local Cooperative Extension Office, the Department of Agriculture and Consumer Services, the Natural Resource Conservation Service, or an agronomist and as approved by the Division. [15A NCAC 02T .1109(b)(1)]
11. Bulk residuals shall not be land applied under the following conditions: [15A NCAC 02T .1109]
 - a. If the residuals are likely to adversely affect a threatened or endangered species listed under section 4 of the Endangered Species Act or its designated critical habitat;
 - b. If the application causes prolonged nuisance conditions;
 - c. If the land fails to assimilate the bulk residuals or the application causes the contravention of surface water or groundwater standards;
 - d. If the land is flooded, frozen or snow-covered, or is otherwise in a condition such that runoff of the residuals would occur;
 - e. Within the 100-year flood elevation, unless the bulk residuals are injected or incorporated within a 24-hour period following a residuals land application event;
 - f. During a measurable precipitation event (i.e., greater than 0.01 inch per hour), or within 24 hours following a rainfall event of 0.5 inches or greater in a 24-hour period;
 - g. If the slope is greater than 10% for surface applied liquid residuals, or if the slope is greater than 18% for injected or incorporated bulk liquid residuals;
 - h. If the soil pH is not maintained at 6.0 or greater, unless sufficient amounts of lime are applied to achieve a final soil pH of at least 6.0, or if an agronomist provides information indicating that the pH of the soil, residuals and lime mixture is suitable for the specified crop. Any approved variations to the acceptable soil pH (6.0) will be noted in this permit;
 - i. If the land does not have an established vegetative cover unless the residuals are incorporated or injected within a 24-hour period following a residuals land application event. Any field that is in a USDA no-till program shall be exempted from meeting this vegetative cover requirement;
 - j. If the vertical separation between the seasonal high water table and the depth of residuals application is less than one foot;
 - k. If the vertical separation of bedrock and the depth of residuals application is less than one foot;
 - l. Application exceeds agronomic rates.
12. The following **public access** restrictions apply to residual land application sites: [15A NCAC 02T .1109(b)(2)]
 - a. Public access to public contact sites (e.g., golf courses, parks, ball fields, etc.) shall be restricted for 365 days after a residuals land application event;
 - b. Public access to non-public contact sites shall be restricted for 30 days after a residuals land application event.

13. Public access controls shall include the posting of signs with a minimum area of 3 square feet (e.g., 1.5' x 2'). Each sign shall indicate the activities conducted at each site, permit number, and name and contact information, including the Permittee or applicator's telephone number. Signs shall be posted in a clearly visible and conspicuous manner at the entrance to each land application site during a land application event, and for as long as the public access restrictions required under III.12 apply. [15A NCAC 02T .0108(b)(1)]
14. The following **harvesting and grazing** restrictions apply to residual land application sites after each land application event: [15A NCAC 02T .1109(b)(3)]

Harvesting and Grazing Description	Restricted Duration
Animals shall not be allowed to graze during land application activities and restricted period. Sites that are to be used for grazing shall have fencing to prevent access after each land application event.	30 days
Food crops, feed crops and fiber crops shall not be harvested for:	30 days
Turf grown on land where residuals have been applied shall not be harvested for:	12 months
Food crops with harvested parts that touch the residual/soil mixture and are totally above the land surface (e.g., tobacco, melons, cucumbers, squash, etc.) shall not be harvested for:	14 months
When the residuals remain on the land surface for four months or longer prior to incorporation into the soil, food crops with harvested parts below the land surface (e.g., root crops such as potatoes, carrots, radishes, etc.) shall not be harvested for:	20 months
When the residuals remain on the land surface for less than four months prior to incorporation into the soil, food crops with harvested parts below the land surface shall not be harvested for:	38 months

15. The Permittee shall acquire from each landowner or lessee/operator a statement detailing the volume of other nutrient sources (i.e., manufactured fertilizers, manures, or other animal waste products) that have been applied to the site, and a copy of the most recent Nutrient Management Plan (NMP) for those operations where a NMP is required by the US Department of Agriculture – National Resources Conservation Service (NRCS) or other State Agencies. The Permittee shall calculate allowable nutrient loading rates based on the provided information and use appropriate reductions.

For the purpose of this permit condition, a Crop Management Plan (CMP), Waste Utilization Plan (WUP) or Certified Nutrient Management Plan (CNMP) shall also be considered a Nutrient Management Plan. [15A NCAC 02T .0108(b) (1), 02T .1104(c) (4)]

16. No residuals shall be land applied unless the submitted Land Owner Agreement Attachment (LOAA) between the Permittee and landowners or lessees/operators of the land application site is in full force and effect. These agreements shall be considered expired concurrent with the permit expiration date, and shall be renewed during the permit renewal process. [15A NCAC 02T .1104(c)(4)]

IV. MONITORING AND REPORTING REQUIREMENTS

1. Any Division required monitoring (including groundwater, plant tissue, soil and surface water analyses) necessary to ensure groundwater and surface water protection shall be established, and an acceptable sample reporting schedule shall be followed. [15A NCAC 02T .0108(c)]

2. Residuals shall be analyzed to demonstrate they are non-hazardous under the Resource Conservation and Recovery Act (RCRA). The analyses [**corrosivity, ignitability, reactivity, and toxicity characteristic leaching procedure (TCLP)**] shall be performed at the frequency specified in Attachment A, and the Permittee shall maintain these results for a minimum of five years. Any exceptions from the requirements in this condition shall be specified in Attachment A.

The TCLP analysis shall include the following parameters (the regulatory level in milligrams per liter is in parentheses): [15A NCAC 13A .0102(b), 02T .1101, 02T .1105]

Arsenic (5.0)	1,4-Dichlorobenzene (7.5)	Nitrobenzene (2.0)
Barium (100.0)	1,2-Dichloroethane (0.5)	Pentachlorophenol (100.0)
Benzene (0.5)	1,1-Dichloroethylene (0.7)	Pyridine (5.0)
Cadmium (1.0)	2,4-Dinitrotoluene (0.13)	Selenium (1.0)
Carbon tetrachloride (0.5)	Endrin (0.02)	Silver (5.0)
Chlordane (0.03)	Hexachlorobenzene (0.13)	Tetrachloroethylene (0.7)
Chlorobenzene (100.0)	Heptachlor (and its hydroxide) (0.008)	Toxaphene (0.5)
Chloroform (6.0)	Hexachloro-1,3-butadiene (0.5)	Trichloroethylene (0.5)
Chromium (5.0)	Hexachloroethane (3.0)	2,4,5-Trichlorophenol (400.0)
m-Cresol (200.0)	Lead (5.0)	2,4,6-Trichlorophenol (2.0)
o-Cresol (200.0)	Lindane (0.4)	2,4,5-TP (Silvex) (1.0)
p-Cresol (200.0)	Mercury (0.2)	Vinyl chloride (0.2)
Cresol (200.0)	Methoxychlor (10.0)	
2,4-D (10.0)	Methyl ethyl ketone (200.0)	

Once the residuals have been monitored for two years at the frequency specified in Attachment A, the Permittee may submit a permit modification request to reduce the frequency of this monitoring requirement. In no case shall the monitoring frequency be less than once per permit cycle.

3. An analysis shall be conducted on residuals from each source generating facility at the frequency specified in Attachment A, and the Permittee shall maintain the results for a minimum of five years. The analysis shall include the following parameters: [15A NCAC 02T .1101]

Aluminum	Mercury	Potassium
Ammonia-Nitrogen	Molybdenum	Selenium
Arsenic	Nickel	Sodium
Cadmium	Nitrate-Nitrite Nitrogen	Sodium Adsorption Ratio (SAR)
Calcium	Percent Total Solids	TKN
Copper	pH	Zinc
Lead	Phosphorus	
Magnesium	Plant Available Nitrogen (by calculation)	

4. Residuals shall be monitored for compliance with pathogen and vector attraction reduction requirements at the frequency specified in Attachment A, and at the time indicated in the sampling and monitoring sections of the approved O&M plan. The required data shall be specific to the stabilization process utilized, and sufficient to demonstrate compliance with the Class B pathogen reduction requirements in 15A NCAC 02T .1106 (a) and (c), and one vector attraction reduction requirement in 15A NCAC 02T .1107 (a) shall be met. Any exceptions from the requirements in this condition shall be specified in Attachment A. [15A NCAC 02T .1106, 02T .1107, 02T .1111(c)]

5. An annual representative soils analysis (i.e., Standard Soil Fertility Analysis) shall be conducted on each land application site listed in Attachment B on which a residuals land application event will occur in the respective calendar year. This analysis shall be in accordance with the “Guidance on Soil Sampling” located in the Sampling Instructions section of the NC Department of Agriculture & Consumer Services’ website (<http://www.ncagr.gov/agronomi/pubs.htm>). The Permittee shall maintain these results and a description of the sampling methodologies used to determine soil fertility for a period of no less than five years, and shall be made available to the Division upon request. At a minimum, the Standard Soil Fertility Analysis shall include the following parameters: [15A NCAC 02T .1111(d)]

Acidity	Exchangeable Sodium Percentage	Phosphorus
Base Saturation (by calculation)	Magnesium	Potassium
Calcium	Manganese	Sodium
Cation Exchange Capacity	Percent Humic Matter	Zinc
Copper	pH	

6. Laboratory parameter analyses shall be performed on the residuals as they are land applied, and shall be in accordance with the monitoring requirements in 15A NCAC 02B .0505.

7. The Permittee shall maintain records tracking all residual land application events. At a minimum, these records shall include the following: [15A NCAC 02T .0109(a)]
 - a. Source of residuals;
 - b. Date of land application;
 - c. Location of land application (i.e., site, field, or zone number as listed in Attachment B);
 - d. Approximate areas applied to (acres);
 - e. Method of land application;
 - f. Weather conditions (e.g., sunny, cloudy, raining, etc.);
 - g. Predominant Soil Mapping Unit (e.g., CbB2);
 - h. Soil conditions (e.g., dry, wet, frozen, etc.);
 - i. Type of crop or crops to be grown on field;
 - j. Nitrogen Application Rate based on RYEs (if using data obtained from the North Carolina State University Department of Soil Science Website, the printout page shall be kept on file and reprinted every five years);
 - k. Volume of residuals land applied in gallons per acre, cubic yard per acre, dry tons per acre, or wet ton per acre;
 - l. Volume of animal waste or other nutrient source applied in gallons per acre, dry ton per acre, or wet tons per acre;

- m. Volume of soil amendments (e.g., lime, gypsum, etc.) applied in gallons per acre, dry ton per acre, or wet tons per acre; and
 - n. Annual and cumulative totals in dry tons per acre of residuals as well as animal waste and other sources of nutrients (e.g., if applicable), annual and cumulative pounds per acre of each heavy metal (e.g., shall include, but shall not be limited to, arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc), annual pounds per acre of PAN, and annual pounds per acre of phosphorus applied to each field.
8. Three copies of an annual report shall be submitted on or before March 1st. The annual report shall meet the requirements described in the Instructions for Residuals Application Annual Reporting Forms. Instructions for reporting and annual report forms are available at <http://portal.ncdenr.org/web/wq/aps/lau/reporting>, or can be obtained by contacting the Land Application Unit directly. The annual report shall be submitted to the following address: [15A NCAC 02T .1111(a)]

Division of Water Resources
Information Processing Unit
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

9. **Noncompliance Notification**

The Permittee shall report by telephone to the Mooresville Regional Office, telephone number (704)663-1699, as soon as possible, but in no case more than 24 hours or on the next working day following the occurrence or first knowledge of the occurrence of any of the following: [15A NCAC 02T .0105(l), 02T .0108(b)(1)]

- a. Any occurrence with the land application program resulting in the land application of significant amounts of wastes that are abnormal in quantity or characteristic.
- b. Any failure of the land application program resulting in a release of material to surface waters.
- c. Any time self-monitoring indicates the facility has gone out of compliance with its permit limitations.
- d. Any process unit failure, due to known or unknown reasons, rendering the facility incapable of adequate residual treatment.
- e. Any spill or discharge from a vehicle or piping system during residuals transportation.

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

V. INSPECTIONS

1. The Permittee shall provide adequate inspection and maintenance to ensure proper operation of the subject facilities and shall be in accordance with the approved O&M Plan. [15A NCAC 02T .0108(b)]
2. Prior to each bulk residuals land application event, the Permittee or his designee shall inspect the residuals storage, transport and application facilities to prevent malfunctions, facility deterioration and operator errors resulting in discharges, which may cause the release of wastes to the environment, a threat to human health or a public nuisance. The Permittee shall maintain an inspection log that includes, at a minimum, the date and time of inspection, observations made, and any maintenance, repairs, or corrective actions taken. The Permittee shall maintain this inspection log for a period of five years from the date of inspection, and this log shall be made available to the Division upon request. [15A NCAC 02T .0108(b)]
3. Any duly authorized Division representative may, upon presentation of credentials, enter and inspect any property, premises or place on or related to the land application sites or facilities permitted herein at any reasonable time for the purpose of determining compliance with this permit; may inspect or copy any records required to be maintained under the terms and conditions of this permit; and may collect groundwater, surface water or leachate samples. [G.S. 143-215.3(a)(2)]

VI. GENERAL CONDITIONS

1. Failure to comply with the conditions and limitations contained herein may subject the Permittee to an enforcement action by the Division in accordance with North Carolina General Statutes 143-215.6A to 143-215.6C.
2. This permit shall become voidable if the residuals land application events are not carried out in accordance with the conditions of this permit. [15A NCAC 02T .0110]
3. This permit is effective only with respect to the nature and volume of residuals described in the permit application and other supporting documentation. [G.S. 143-215.1]
4. The issuance of this permit does not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances, which may be imposed by other jurisdictional government agencies (e.g., local, state, and federal). Of particular concern to the Division are applicable river buffer rules in 15A NCAC 02B .0200; erosion and sedimentation control requirements in 15A NCAC Chapter 4 and under the Division's General Permit NCG010000; any requirements pertaining to wetlands under 15A NCAC 02B .0200 and 02H .0500; and documentation of compliance with Article 21 Part 6 of Chapter 143 of the General Statutes.
5. In the event the residuals program changes ownership or the Permittee changes their name, a formal permit modification request shall be submitted to the Division. This request shall be made on official Division forms, and shall include appropriate documentation from the parties involved and other supporting documentation as necessary. The Permittee of record shall remain fully responsible for maintaining and operating the residuals program permitted herein until a permit is issued to the new owner. [15A NCAC 02T .0104]
6. This permit is subject to revocation or unilateral modification upon 60 days' notice from the Division Director, in whole or part for the requirements listed in 15A NCAC 02T .0110.
7. Unless the Division Director grants a variance, expansion of the permitted residuals program contained herein shall not be granted if the Permittee exemplifies any of the criteria in 15A NCAC 02T .0120(b).

8. The Permittee shall pay the annual fee within 30 days after being billed by the Division. Failure to pay the annual fee accordingly shall be cause for the Division to revoke this permit. [15A NCAC 02T .0105(e)(3)]

Permit issued this the 31st day of March 2015, effective April 1, 2015

NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

DRAFT

for S. Jay Zimmerman, Director
Division of Water Resources

By Authority of the Environmental Management Commission

Permit Number WQ0000057

Owner	Facility Name	County	Permit Number	Biological Residuals	Maximum Dry Tons Per Year ¹	Monitoring Frequency for Non-hazardous Characteristics ²	Monitoring Frequency for Metals and Nutrients ^{3, 5}	Monitoring Frequency for Pathogen & Vector Attraction Reductions ^{4, 5, 6}	Approved Mineralization Rate [Raw = 0.4; Aerobic = 0.3; Anaerobic = 0.2; Compost = 0.1]
Charlotte Mecklenburg Utilities	McAlpine Creek WWTP	Mecklenburg	NC0024970	Yes	18,500	Annually	See Footnote 5	See Footnote 5	0.2
Charlotte Mecklenburg Utilities	Irwin Creek WWTP	Mecklenburg	NC0024945	Yes	5,500	Annually	See Footnote 5	See Footnote 5	0.2
Charlotte Mecklenburg Utilities	Mallard Creek WWTP	Mecklenburg	NC0030210	Yes	1,500	Annually	See Footnote 5	See Footnote 5	0.2
Charlotte Mecklenburg Utilities	Sugar Creek WWTP ⁷	Mecklenburg	NC0024937	Yes	1,000	See Footnote 7	See Footnotes 5 & 7	See Footnotes 5 & 7	0.2
Charlotte Mecklenburg Utilities	McDowell Creek WWTP	Mecklenburg	NC0036277	Yes	1,000	Annually	See Footnote 5	See Footnote 5	0.2
Charlotte Mecklenburg Utilities	Walter M. Franklin WTP	Mecklenburg	01-60-010	No	1,500	Annually	See Footnote 5	See Footnote 5	0.4
Charlotte Mecklenburg Utilities	Vest WTP ⁸	Mecklenburg	01-60-010	No	0	See Footnote 8	See Footnotes 5 & 8	See Footnotes 5 & 8	0.4
Charlotte Mecklenburg Utilities	Lee S. Dukes WTP	Mecklenburg	01-60-010	No	300	Annually	See Footnote 5	See Footnote 5	0.4
Total					29,300				

1. Maximum Dry Tons per Year is the amount of residuals approved for land application from each permitted facility.
2. Analyses to demonstrate that residuals are non-hazardous (i.e., TCLP, ignitability, reactivity, and corrosivity) as stipulated under permit Condition IV.2.
3. Testing of metals and nutrients as stipulated under permit Condition IV.3.
4. Analyses of pathogen and vector attraction reductions as stipulated under permit Condition IV.4.
5. Monitoring frequencies are based on the actual dry tons applied per year using the table below, unless specified above.

Dry Tons Generated (short tons per year)	Monitoring Frequency (Established in 40 CFR 503 and 15A NCAC 02T .1111)
<319	1/Year
=>319 - <1,650	1/ Quarter (4 times per year)
=>1,650 - <16,500	1/60 Days (6 times per year)
=>16,500	1/month (12 times per year)

Charlotte-Mecklenburg Utilities

6. Water Treatment Plant residuals are exempt from meeting the pathogen & vector attraction reduction requirements in Condition IV.4, provided they are not mixed with residuals that have been generated during the treatment of domestic wastewater, the treatment of animal processing wastewater, or the biological treatment of industrial wastewater. The Water Treatment Plant residuals must be treated and processed in a manner as to not meet the definition of “Biological Residuals” as defined in 15A NCAC 02T .1102(6).
7. The residuals from the Sugar Creek Wastewater Treatment Plant (Sugar Creek WWTP) are added to and mixed with those of the McAlpine Creek Wastewater Treatment Plant (McAlpine creek WWTP) prior to sampling at the McAlpine Creek Wastewater Treatment Plant.
8. The residuals from the Vest Water Treatment Plant (Vest WTP) are added to and mixed with those from the Walter M. Franklin Water Treatment Plant (Walter M. Franklin WTP) prior to sampling at the Walter M. Franklin Water Treatment Plant.

If no land application events occur during a required sampling period (e.g. no land application occur during an entire year when annual monitoring is required), then no sampling data is required during the period of inactivity. The annual report shall include an explanation for missing sampling data. Those required to submit the annual report to EPA may be required to make up the missed sampling, contact the EPA for additional information and clarification.

ATTACHMENT B - Approved Land Application Sites
Charlotte-Mecklenburg Utilities

Certification Date: April 1, 2015
Permit Number: WQ0000057 Version: 2.0

Field/ Site	Owner	Lessee	County	Latitude	Longitude	Net Acreage	Dominant Soil Series	Footnotes
NC-AN-001-01	Tucker, James A.		Anson	34°53'19"	80°09'58"	27.2	MgB - Mayodan	
NC-AN-001-02	Tucker, James A.		Anson	34°53'13"	80°10'09"	4.2	MgB - Mayodan	
NC-AN-001-03	Tucker, James A.		Anson	34°53'06"	80°10'12"	8.0	MgB - Mayodan	
NC-AN-001-04	Tucker, James A.		Anson	34°53'09"	80°09'58"	24.6	MgB - Mayodan	
NC-AN-001-05	Tucker, James A.		Anson	34°51'21"	80°10'04"	4.7	BaB - Badin	
NC-AN-001-06	Tucker, James A.		Anson	34°51'16"	80°10'00"	10.7	BaB - Badin	
NC-AN-001-07	Tucker, James A.		Anson	34°51'15"	80°09'49"	13.2	BaB - Badin	
NC-AN-001-08	Tucker, James A.		Anson	34°51'28"	80°09'45"	6.0	BaB - Badin	
NC-AN-001-09	Tucker, James A.		Anson	34°51'16"	80°09'34"	3.8	BaB - Badin	
NC-AN-001-10	Tucker, James A.		Anson	34°51'05"	80°09'53"	25.8	BaB - Badin	
NC-AN-001-12	Tucker, James A.		Anson	34°50'56"	80°09'53"	19.4	BaB - Badin	
NC-AN-001-13	Tucker, James A.		Anson	34°51'10"	80°09'40"	11.7	BaB - Badin	
NC-AN-001-14	Tucker, James A.		Anson	34°51'10"	80°09'22"	8.9	BaB - Badin	
NC-AN-001-15	Tucker, James A.		Anson	34°51'04"	80°09'33"	16.9	BaB - Badin	
NC-AN-001-16	Tucker, James A.		Anson	34°51'17"	80°09'08"	9.7	BaB - Badin	
NC-AN-003-01	Morgan, Michael Ryan		Anson	34°51'01"	80°02'33"	29.0	AeB – Ailey	
NC-AN-003-02	Morgan, Michael Ryan		Anson	34°51'19"	80°02'17"	49.6	CaB – Candor	
NC-AN-003-03	Morgan, Michael Ryan		Anson	34°51'29"	80°02'23"	3.1	CaB – Candor	
NC-AN-003-04	Morgan, Michael Ryan		Anson	34°51'34"	80°02'21"	2.9	AeB – Ailey	
NC-AN-003-05	Morgan, Michael Ryan		Anson	34°51'24"	80°02'34"	7.9	AeB – Ailey	
NC-AN-003-06	Morgan, Michael Ryan		Anson	34°50'20"	80°02'37"	7.2	AeB – Ailey	
NC-AN-003-07	Morgan, Michael Ryan		Anson	34°50'10"	80°02'37"	4.0	PnB – Pelion	
NC-AN-003-08	Morgan, Michael Ryan		Anson	34°50'24"	80°02'31"	2.8	AeB – Ailey	

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NC-AN-003-09	Morgan, Michael Ryan		Anson	34°50'18"	80°02'30"	6.8	AeB – Ailey	
NC-AN-003-10	Morgan, Michael Ryan		Anson	34°50'08"	80°02'31"	7.3	PnB – Pelion	
NC-AN-003-11	Morgan, Michael Ryan		Anson	34°50'11"	80°02'23"	35.8	AeB – Ailey	
NC-AN-003-12	Morgan, Michael Ryan		Anson	34°50'53"	79°58'39"	7.7	EmB – Emporia	
NC-AN-003-13	Morgan, Michael Ryan		Anson	34°50'46"	79°59'04"	64.6	EmB - Emporia	
NC-AN-004-01	Martin, Fincher L.		Anson	35°00'12"	80°05'56"	9.9	PwB3 – Polkston-White Store Complex	
NC-AN-004-02	Martin, Fincher L.		Anson	35°00'05"	80°05'50"	8.1	PwC3 –Polkston-White Store Complex	
NC-AN-004-03	Martin, Fincher L.		Anson	34°59'55"	80°06'04"	20.2	PwC3 –Polkston-White Store Complex	
NC-AN-004-04	Martin, Fincher L.		Anson	34°59'46"	80°05'54"	16.3	PwC3 –Polkston-White Store Complex	
NC-AN-004-05	Martin, Fincher L.		Anson	34°59'46"	80°05'38"	4.8	PwC3 –Polkston-White Store Complex	
NC-AN-004-06	Martin, Fincher L.		Anson	34°59'31"	80°05'54"	49.7	PwC3 –Polkston-White Store Complex	
NC-AN-004-07	Martin, Fincher L.		Anson	35°07'00"	80°05'46"	7.5	BaC – Badin	
NC-AN-004-08	Martin, Fincher L.		Anson	35°07'05"	80°06'01"	22.0	BaC – Badin	
NC-AN-004-09	Martin, Fincher L.		Anson	35°07'00"	80°06'10"	25.7	BaB – Badin	
NC-AN-004-10	Martin, Fincher L.		Anson	35°07'15"	80°06'11"	41.5	BaB – Badin	
NC-AN-004-11	Martin, Fincher L.		Anson	35°07'06"	80°06'57"	42.1	GoB – Goldston	
NC-AN-004-12	Martin, Fincher L.		Anson	35°07'15"	80°06'33"	14.7	BaB – Badin	
NC-AN-004-13	Martin, Fincher L.		Anson	35°07'13"	80°06'41"	23.8	GoB – Goldston	
NC-AN-004-14	Martin, Fincher L.		Anson	35°07'38"	80°06'19"	16.8	BaB - Badin	
NC-AN-004-15	Martin, Fincher L.		Anson	35°08'01"	80°06'20"	4.9	BaB - Badin	
NC-AN-004-16	Martin, Fincher L.		Anson	35°07'34"	80°06'08"	40.1	BaB - Badin	
NC-AN-004-17	Martin, Fincher L.		Anson	35°07'49"	80°06'13"	11.3	BaB - Badin	
NC-AN-004-18	Martin, Fincher L.		Anson	35°07'51"	80°06'06"	12.7	BaB - Badin	
NC-AN-004-19	Martin, Fincher L.		Anson	35°07'52"	80°05'53"	31.1	BaB - Badin	

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NC-AN-004-20	Martin, Fincher L.		Anson	35°07'50"	80°05'48"	18.7	BaC - Badin	
NC-AN-004-21	Martin, Fincher L.		Anson	35°07'47"	80°05'34"	7.6	GeB2 – Georgeville	
NC-AN-004-22	Martin, Fincher L.		Anson	35°07'39"	80°05'20"	5.7	ChA – Chewacla	
NC-AN-004-23	Martin, Fincher L.		Anson	35°07'49"	80°05'23"	22.8	HeB2 – Hiwassee	
NC-AN-004-24	Martin, Fincher L.		Anson	35°08'01"	80°05'25"	23.5	NaB – Nanford	
NC-AN-004-25	Martin, Fincher L.		Anson	35°08'01"	80°05'34"	19.3	GeB2 – Georgeville	
NC-AN-004-26	Martin, Fincher L.		Anson	35°07'59"	80°05'47"	14.7	BaB – Badin	
NC-AN-004-27	Martin, Fincher L.		Anson	35°08'06"	80°05'19"	26.0	BaB – Badin	
NC-AN-004-28	Martin, Fincher L.		Anson	35°08'13"	80°05'15"	8.1	BaB - Badin	
NC-AN-004-29	Martin, Fincher L.		Anson	35°08'08"	80°04'49"	6.1	RmA - Riverview	
NC-AN-004-30	Martin, Fincher L.		Anson	35°08'09"	80°04'40"	15.8	RmA - Riverview	
NC-AN-004-31	Martin, Fincher L.		Anson	35°07'43"	80°04'30"	32.0	RmA - Riverview	
NC-AN-004-32	Martin, Fincher L.		Anson	35°07'40"	80°04'45"	22.9	RmA - Riverview	
NC-AN-004-33	Martin, Fincher L.		Anson	35°07'39"	80°04'57"	34.7	GeB2 - Georgeville	
NC-AN-004-34	Martin, Fincher L.		Anson	35°07'44"	80°05'01"	20.3	MrB – McQueen	
NC-AN-006-01	Cox Brothers Farms		Anson	34°54'15"	80°16'40"	27.2	CnA - Claycreek	
NC-AN-006-02	Cox Brothers Farms		Anson	34°54'00"	80°16'30"	10.0	CnA – Claycreek	
NC-AN-006-03	Cox Brothers Farms		Anson	34°54'13"	80°16'22"	101.9	CnA - Claycreek	
NC-AN-006-04	Cox Brothers Farms		Anson	34°54'05"	80°16'04"	24.8	HoA - Hornsboro	
NC-AN-008-01	Trexler, Glenn		Anson	34°53'41"	80°06'03"	15.2	AeB – Ailey	
NC-AN-008-02	Trexler, Glenn		Anson	34°53'35"	80°06'13"	10.5	AeB – Ailey	
NC-AN-008-03	Trexler, Glenn		Anson	34°53'43"	80°06'24"	12.2	AeB – Ailey	
NC-AN-008-04	Trexler, Glenn		Anson	34°53'35"	80°06'57"	16.4	AeB – Ailey	
NC-AN-008-05	Trexler, Glenn		Anson	34°53'27"	80°06'38"	25.5	AeB – Ailey	
NC-AN-010-01	Long, Ray C.	Long, Ray C. & Jeff	Anson	34°52'48"	80°08'03"	49.5	EmB - Emporia	

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NC-AN-013-02	Lee, Billy Franklin		Anson	35°09'06"	80°05'06"	13.4	ShA – Shellbluff	
NC-AN-013-04	Lee, Billy Franklin		Anson	35°08'49"	80°05'40"	23.7	BaB – Badin	
	Total for Anson County					1435.2		
NC-CB-003-01	Harris, Joe		Cabarrus	35°17'41"	80°36'26"	22.9	CcB2 – Cecil	
NC-CB-003-2A	Harris, Joe		Cabarrus	35°17'37"	80°36'36"	7.7	ChA – Chewacla	
NC-CB-003-2C	Harris, Joe		Cabarrus	35°17'54"	80°36'04"	3.8	MeB – Mecklenburg	
NC-CB-003-03	Harris, Joe		Cabarrus	35°17'52"	80°35'51"	36.8	EoB – Enon-Urban	
NC-CB-003-04	Harris, Joe		Cabarrus	35°15'25"	80°36'57"	4.6	CcB2 – Cecil	
NC-CB-003-05	Harris, Joe		Cabarrus	35°17'30"	80°37'30"	16.8	ChA – Chewacla	
NC-CB-009-01	Flowe, John Locklin	Ramsey, Barney	Cabarrus	35°17'17"	80°33'07"	4.9	CcB2 – Cecil	
NC-CB-009-02	Flowe, John Locklin	Ramsey, Barney	Cabarrus	35°17'27"	80°33'12"	2.7	CcB2 – Cecil	
NC-CB-009-03	Flowe, John Locklin	Ramsey, Barney	Cabarrus	35°17'23"	80°33'06"	3.0	CcB2 – Cecil	
	Total for Cabarrus County					103.2		
NC-CL-021-01	Beam, Joshua Bart & Luke		Cleveland	35°28'14"	81°37'16"	18.0	CaB2 – Cecil	
NC-CL-021-03	Beam, Jacqueline Davenport	Beam, Luke	Cleveland	35°28'43"	81°38'26"	18.7	CaB2 – Cecil	
NC-CL-021-04	Beam, Jacqueline Davenport	Beam, Luke	Cleveland	35°28'41"	81°38'29"	6.9	CaB2 – Cecil	
NC-CL-021-05	Beam, Jacqueline Davenport	Beam, Luke	Cleveland	35°28'28"	81°38'27"	10.5	CaB2 – Cecil	
NC-CL-021-06	Beam, Luke		Cleveland	35°28'08"	81°38'38"	9.8	CaB2 – Cecil	
NC-CL-021-07	Beam, Jacqueline Davenport	Beam, Luke	Cleveland	35°28'20"	81°38'24"	12.0	CaB2 – Cecil	
NC-CL-021-08	Beam, Jacqueline Davenport	Beam, Luke	Cleveland	35°27'59"	81°39'02"	4.0	PaC2 – Pacolet	
NC-CL-021-09	Beam, Jacqueline Davenport	Beam, Luke	Cleveland	35°27'57"	81°38'45"	2.2	CaB2 – Cecil	
	Total for Cleveland County					82.1		

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NC-MG-007-02	Miller, James R.		Mecklenburg	35°05'25"	80°54'45"	5.3	MeB – Mecklenburg	
NC-MG-007-04	Miller, James R.		Mecklenburg	35°05'29"	80°54'45"	28.3	MeB – Mecklenburg	
NC-MG-007-05	Miller, James R.		Mecklenburg	35°05'38"	80°54'45"	42.2	MeB – Mecklenburg	
NC-MG-007-06	Miller, James R.		Mecklenburg	35°05'53"	80°54'45"	22.4	IrB – Iredell	
NC-MG-007-07	Miller, James R.		Mecklenburg	35°05'45"	80°54'33"	28.9	IrB - Iredell	
NC-MG-007-08	Miller, James R.		Mecklenburg	35°05'47"	80°54'26"	8.8	IrB - Iredell	
NC-MG-007-09	Miller, James R.		Mecklenburg	35°05'46"	80°54'20"	2.8	IrB - Iredell	
NC-MG-007-11	Miller, James R.		Mecklenburg	35°05'25"	80°54'54"	7.1	MeB – Mecklenburg	
NC-MG-007-13	Miller, James R.		Mecklenburg	35°03'32"	80°54'36"	12.1	MeB – Mecklenburg	
NC-MG-018-01	Harley, James Lee		Mecklenburg	35°06'04"	80°54'59"	8.6	MeB - Mecklenburg	
NC-MG-018-02	Harley, James Lee		Mecklenburg	35°05'56"	80°54'41"	18.4	IrB - Iredell	
NC-MG-018-03	Harley, James Lee		Mecklenburg	35°05'59"	80°54'26"	5.3	IrB - Iredell	
NC-MG-018-04	Harley, James Lee		Mecklenburg	35°05'54"	80°54'26"	6.9	MeB - Mecklenburg	
NC-MG-018-05	Harley, James Lee		Mecklenburg	35°06'07"	80°54'46"	12.2	IrB - Iredell	
NC-MG-018-06	Harley, James Lee		Mecklenburg	35°06'18"	80°54'48"	2.8	IrB - Iredell	
NC-MG-018-07	Harley, James Lee		Mecklenburg	35°06'14"	80°54'50"	14.9	IrB - Iredell	
NC-MG-035-01	City of Charlotte		Mecklenburg	35°25'52"	80°53'43"	4.7	CeB2 - Cecil	
NC-MG-035-02	City of Charlotte		Mecklenburg	35°25'50"	80°53'45"	7.0	CeB2 - Cecil	
NC-MG-035-03	City of Charlotte		Mecklenburg	35°25'40"	80°53'32"	4.4	CeB2 - Cecil	
NC-MG-035-04	City of Charlotte		Mecklenburg	35°25'40"	80°53'25"	4.9	EnB - Enon	
NC-MG-035-06	City of Charlotte		Mecklenburg	35°25'28"	80°53'30"	3.0	CeB2 - Cecil	
NC-MG-035-07	City of Charlotte		Mecklenburg	35°25'35"	80°53'45"	16.9	CeB2 - Cecil	
NC-MG-036-01	City of Charlotte		Mecklenburg	35°16'48"	80°53'30"	2.2	CuB – Cecil-Urban	
NC-MG-036-02	City of Charlotte		Mecklenburg	35°16'46"	80°53'26"	1.7	CuB – Cecil-Urban	
NC-MG-036-04	City of Charlotte		Mecklenburg	35°16'43"	80°53'12"	2.8	CuB – Cecil-Urban	

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NC-MG-036-05	City of Charlotte		Mecklenburg	35°16'33"	80°53'18"	2.6	CuB – Cecil-Urban	
	<i>Total for Mecklenburg County</i>					<i>277.2</i>		
NC-ST-005-01	Lee, Billy Franklin		Stanly	35°09'34"	80°12'37"	23.3	BaB – Badin	
NC-ST-005-06	Lee, Billy Franklin		Stanly	35°09'42"	80°11'28"	43.5	BaB – Badin	
NC-ST-005-07	Lee, Billy Franklin		Stanly	35°09'27"	80°11'09"	48.4	BaB – Badin	
NC-ST-005-08	Lee, Billy Franklin		Stanly	35°09'42"	80°10'56"	25	BaB – Badin	
NC-ST-005-09	Lee, Billy Franklin		Stanly	35°09'10"	80°10'56"	12.6	BaB – Badin	
NC-ST-005-10	Lee, Billy Franklin		Stanly	35°05'22"	80°10'57"	8.5	GoC - Goldston	
NC-ST-005-11	Lee, Billy Franklin		Stanly	35°05'30"	80°10'55"	5.8	BaB – Badin	
NC-ST-005-12	Lee, Billy Franklin		Stanly	35°09'35"	80°10'48"	5.1	BaB – Badin	
NC-ST-005-13	Lee, Billy Franklin		Stanly	35°09'41"	80°10'41"	5.4	BaB – Badin	
NC-ST-005-14	Lee, Billy Franklin		Stanly	35°09'40"	80°10'35"	6.8	BaB – Badin	
NC-ST-005-15	Lee, Billy Franklin		Stanly	35°09'48"	80°10'33"	7.9	BaB – Badin	
NC-ST-005-17	Lee, Billy Franklin		Stanly	35°09'29"	80°10'39"	6.5	BaB – Badin	
NC-ST-005-18	Lee, Billy Franklin		Stanly	35°09'23"	80°10'38"	4.4	BaB – Badin	
NC-ST-005-19	Lee, Billy Franklin		Stanly	35°09'13"	80°10'33"	6.5	BaB – Badin	
NC-ST-005-20	Lee, Billy Franklin		Stanly	35°09'13"	80°10'42"	16.1	BaB – Badin	
NC-ST-005-21	Lee, Billy Franklin		Stanly	35°09'04"	80°10'44"	11.2	ChA - Chewacla	
NC-ST-005-22	Lee, Billy Franklin		Stanly	35°10'55"	80°06'24"	28.6	GmC – Georgeville	
NC-ST-005-34	Lee, Billy Franklin		Stanly	35°11'37"	80°09'10"	6.1	BaB – Badin	
NC-ST-005-35	Lee, Billy Franklin		Stanly	35°11'43"	80°09'17"	21.7	GoC – Goldston	
NC-ST-005-36	Lee, Billy Franklin		Stanly	35°11'33"	80°09'36"	7.0	BaB – Badin	
NC-ST-009-24	Fork L Farms, Inc.	Lowder, Nathan	Stanly	35°11'23"	80°05'59"	16.2	BaB – Badin	
NC-ST-009-25	Fork L Farms, Inc.	Lowder, Nathan	Stanly	35°11'32"	80°05'37"	1.1	GmC - Georgeville	

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NC-ST-009-26	Fork L Farms, Inc.	Lowder, Nathan	Stanly	35°11'33"	80°05'23"	20.3	GmC – Georgeville	
NC-ST-009-27	Fork L Farms, Inc.	Lowder, Nathan	Stanly	35°11'33"	80°05'23"	22.3	BaB – Badin	
NC-ST-009-28	Fork L Farms, Inc.	Lowder, Nathan	Stanly	35°11'21"	80°05'15"	22.1	BaB – Badin	
NC-ST-009-29	Fork L Farms, Inc.	Lowder, Nathan	Stanly	35°11'02"	80°05'14"	31.2	BaB – Badin	
NC-ST-009-30	Fork L Farms, Inc.	Lowder, Nathan	Stanly	35°11'27"	80°05'20"	3.8	BaB – Badin	
NC-ST-009-31	Fork L Farms, Inc.	Lowder, Nathan	Stanly	35°11'15"	80°05'23"	6.0	BaB – Badin	
NC-ST-009-32	Fork L Farms, Inc.	Lowder, Nathan	Stanly	35°11'19"	80°05'36"	24.4	BaB – Badin	
	Total for Stanly County					447.8		
NC-UN-010-04	Howey, Frank W. & Alison S.		Union	35°03'22"	80°23'00"	83.5	BaB – Badin	
NC-UN-010-05	Howey, Frank W. & Alison S.		Union	35°03'46"	80°22'25"	16.4	BaB – Badin	
NC-UN-010-06	Howey, Frank W. & Alison S.		Union	35°03'35"	80°22'42"	39.0	GoC – Goldston	
NC-UN-010-08	Howey, Frank W. & Alison S.		Union	34°57'49"	80°39'10"	15.7	TaB - Tarrus	
NC-UN-010-09	Howey, Frank W. & Alison S.		Union	34°57'50"	80°38'55"	12.9	LdB2 – Lloyd	
NC-UN-010-10	Howey, Frank W. & Alison S.		Union	34°57'56"	80°38'51"	29.3	TbB2 – Tarrus	
NC-UN-010-11	Howey, Frank W. & Alison S.		Union	34°57'53"	80°38'31"	29.2	BaB – Badin	
NC-UN-010-13	Howey, Frank W. & Alison S.		Union	34°58'07"	80°38'35"	11.0	BaB – Badin	
NC-UN-010-15	Howey, Frank W. & Alison S.		Union	34°58'18"	80°38'36"	48.0	MeB2 – Mecklenburg	
NC-UN-010-18	Howey, Frank W. & Alison S.		Union	34°55'42"	80°37'40"	101.0	GoC – Goldston	
NC-UN-010-19	Howey, Frank W. & Alison S.		Union	34°55'57"	80°37'42"	28.9	GoC – Goldston	
NC-UN-010-22	Howey, Frank W. & Alison S.		Union	34°58'02"	80°38'35"	23.4	CmB – Cid	
NC-UN-010-24	Howey, Frank W. & Alison S.		Union	34°57'44"	80°38'16"	26.5	GoC – Goldston	
NC-UN-010-37	Howey, Frank W. & Alison S.		Union	34°56'09"	80°37'12"	12.1	GsB – Goldston-Badin Complex	
NC-UN-010-39	Howey, Frank W. & Alison S.		Union	34°57'26"	80°39'54"	7.3	TbB2 – Tarrus	
NC-UN-010-40	Howey, Frank W. & Alison S.		Union	34°57'49"	80°40'09"	13.6	TbB2 – Tarrus	

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NC-UN-010-41	Howey, Frank W. & Alison S.		Union	34°58'04"	80°04'00"	17.6	TbB2 – Tarrus	
NC-UN-010-42	Howey, Frank W. & Alison S.		Union	34°58'03"	80°39'45"	58.3	TbB2 – Tarrus	
NC-UN-010-43	Howey, Frank W. & Alison S.		Union	34°58'07"	80°39'31"	33.7	TbB2 – Tarrus	
NC-UN-010-44	Howey, Frank W. & Alison S.		Union	34°58'02"	80°39'05"	6.0	TbB2 – Tarrus	
NC-UN-010-45	Howey, Frank W. & Alison S.		Union	34°57'57"	80°39'10"	7.0	TbB2 – Tarrus	
NC-UN-010-61	Howey, Frank W. & Alison S.		Union	34°53'58"	80°33'21"	114.1	TbB2 – Tarrus	
NC-UN-010-62	Howey, Frank W. & Alison S.		Union	34°53'46"	80°33'21"	47.9	TbB2 – Tarrus	
NC-UN-010-63	Howey, Frank W. & Alison S.		Union	34°53'50"	80°32'41"	105.9	TbB2 – Tarrus	
NC-UN-010-64	Howey, Frank W. & Alison S.		Union	34°54'00"	80°37'07"	119.8	BaB – Badin	
NC-UN-010-65	Howey, Frank W. & Alison S.		Union	34°55'34"	80°36'45"	17.6	BaB – Badin	
NC-UN-010-66	Howey, Frank W. & Alison S.		Union	34°53'51"	80°32'42"	21.0	BaB – Badin	
NC-UN-010-67	Howey, Frank W. & Alison S.		Union	34°53'54"	80°33'18"	57.7	TbB2 – Tarrus	
NC-UN-010-68	Howey, Frank W. & Alison S.		Union	34°53'38"	80°33'25"	24.1	TbB2 – Tarrus	
NC-UN-010-69	Howey, Frank W. & Alison S.		Union	34°53'55"	80°28'04"	83.3	TbB2 – Tarrus	
NC-UN-010-70	Howey, Frank W. & Alison S.		Union	34°54'03"	80°28'37"	26.4	BaB – Badin	
NC-UN-010-74	Howey, Frank W. & Alison S.		Union	34°53'39"	80°28'25"	14.5	BaB – Badin	
NC-UN-010-81	Howey, Frank W. & Alison S.		Union	34°58'48"	80°41'31"	65.7	GoC – Goldston	
NC-UN-010-82	Howey, Frank W. & Alison S.		Union	34°58'16"	80°36'57"	132.1	TbB2 – Tarrus	
NC-UN-022-30	Cox Brothers Farms		Union	34°51'57"	80°21'48"	91.2	TbB2 – Tarrus	
NC-UN-022-31	Cox Brothers Farms		Union	34°51'44"	80°22'00"	206.2	Cmb – Cid	
NC-UN-022-32	Cox Brothers Farms		Union	34°51'02"	80°22'12"	217.2	BaB – Badin	
NC-UN-022-33	Cox Brothers Farms		Union	34°50'29"	80°21'26"	54.4	GoC – Goldston	
NC-UN-022-34	Cox Brothers Farms		Union	34°50'46"	80°21'12"	35.6	GoC – Goldston	
NC-UN-022-35	Cox Brothers Farms		Union	34°50'20"	80°21'22"	25.9	CrB – Creedmoor	
NC-UN-022-36	Cox Brothers Farms		Union	34°50'13"	80°21'33"	27.4	WhB – White Stone	

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NC-UN-022-37	Cox Brothers Farms		Union	34°50'31"	80°20'55"	186.8	WhB – White Stone	
NC-UN-022-38	Cox Brothers Farms		Union	34°50'30"	80°20'24"	16.3	CrB – Creedmoor	
NC-UN-022-39	Cox Brothers Farms		Union	34°50'16"	80°20'47"	34.6	WhB – White Stone	
NC-UN-022-40	Cox Brothers Farms		Union	34°53'01"	80°21'45"	93.2	TbB2 – Tarrus	
NC-UN-022-41	Cox Brothers Farms		Union	34°52'49"	80°21'50"	38.4	TbB2 – Tarrus	
NC-UN-022-42	Cox Brothers Farms		Union	34°52'51"	80°22'05"	35.1	CmB – Cid	
NC-UN-026-01	Long, Ray C.		Union	34°51'17"	80°29'38"	30.1	BaB – Badin	
NC-UN-026-02	Long, Ray C.		Union	34°51'44"	80°29'44"	58.4	TbB2 – Tarrus	
NC-UN-032-01	Baucom, Allan		Union	35°09'09"	80°25'00"	35.1	BaB – Badin	
NC-UN-032-02	Baucom, Allan		Union	35°08'52"	80°25'01"	82.8	BaB – Badin	
NC-UN-032-03	Baucom, Allan		Union	35°08'52"	80°24'54"	16.4	BaB – Badin	
NC-UN-032-05	Baucom, Allan		Union	35°08'24"	80°24'50"	12.6	BaB – Badin	
NC-UN-032-06	Baucom, Allan		Union	35°08'35"	80°24'47"	66.5	BaB – Badin	
NC-UN-032-08	Baucom, Allan		Union	35°09'09"	80°24'41"	34.2	BaB – Badin	
NC-UN-032-10	Baucom, Allan		Union	35°04'08"	80°23'50"	42.9	BaB – Badin	
NC-UN-032-21	Baucom, Allan		Union	34°54'52"	80°21'46"	89.7	GoC – Goldston	
NC-UN-032-22	Baucom, Allan		Union	34°54'13"	80°23'01"	121.6	GoC – Goldston	
NC-UN-033-01	Hucks, Paul		Union	34°51'30"	80°47'30"	66.9	CeB2 – Cecil	
NC-UN-113-01	Griffin, Richard		Union	35°02'58"	80°30'03"	29.2	BdB2 – Badin	
NC-UN-113-02	Griffin, Richard		Union	35°02'56"	80°29'51"	5.2	BdB2 – Badin	
NC-UN-113-03	Griffin, Richard		Union	35°03'19"	80°29'52"	6.1	BdB2 – Badin	
NC-UN-113-04	Griffin, Richard		Union	35°03'43"	80°30'13"	26.9	TbB2 – Tarrus	
NC-UN-113-05	Griffin, Richard		Union	35°03'31"	80°30'16"	32.4	TbB2 – Tarrus	
NC-UN-113-07	Griffin, Richard		Union	35°03'11"	80°30'12"	40.5	TbB2 – Tarrus	
NC-UN-125-01	Duncan, Donald		Union	35°01'48"	80°26'19"	10.8	CmB – Cid	

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NC-UN-125-02	Duncan, Donald		Union	35°02'03"	80°26'02"	6.7	BaB – Badin	
NC-UN-125-03	Duncan, Donald		Union	35°01'57"	80°26'01"	14.2	TaB – Tarrus	
NC-UN-125-04	Duncan, Donald		Union	35°02'01"	80°25'21"	34.8	BaB – Badin	
NC-UN-125-05	Duncan, Donald		Union	35°01'49"	80°25'57"	12.2	TaB – Tarrus	
NC-UN-126-01	Ratliff, Robert M. & Randy		Union	34°51'05"	80°21'08"	19.6	GoC – Goldston	
NC-UN-126-02	Ratliff, Robert M. & Randy		Union	34°51'11"	80°21'16"	19.7	GoC – Goldston	
NC-UN-126-03	Ratliff, Robert M. & Randy		Union	34°51'17"	80°21'06"	22.7	GoC – Goldston	
NC-UN-126-04	Ratliff, Robert M. & Randy		Union	34°51'01"	80°20'10"	50.6	CrB – Creedmoor	
NC-UN-126-05	Ratliff, Robert M. & Randy		Union	34°50'54"	80°19'53"	32.4	ChA – Chewacla	
NC-UN-126-06	Ratliff, Robert M. & Randy		Union	34°50'46"	80°19'47"	36.4	ChA – Chewacla	
NC-UN-126-07	Ratliff, Robert M. & Randy		Union	34°51'07"	80°20'03"	51.3	CrB – Creedmoor	
NC-UN-126-08	Ratliff, Robert M. & Randy		Union	34°51'18"	80°20'15"	20.7	WhB – White Stone	
NC-UN-126-09	Ratliff, Robert M. & Randy		Union	34°50'43"	80°20'11"	12.5	ChA – Chewacla	
NC-UN-126-10	Ratliff, Robert M. & Randy		Union	34°50'46"	80°20'17"	9.9	ChA – Chewacla	
NC-UN-126-11	Ratliff, Robert M. & Randy		Union	34°50'40"	80°20'17"	26.3	CrB - Creedmoor	
NC-UN-126-12	Ratliff, Robert M. & Randy		Union	34°50'37"	80°20'29"	6.1	CrB - Creedmoor	
NC-UN-126-13	Ratliff, Robert M. & Randy		Union	34°50'40"	80°20'38"	8.0	CrB - Creedmoor	
NC-UN-126-14	Ratliff, Robert M. & Randy		Union	34°50'49"	80°20'30"	5.6	CrB - Creedmoor	
NC-UN-130-01	Staton, Edward B.		Union	35°05'10"	80°19'37"	81.5	BaB - Badin	
NC-UN-130-02	Staton, Edward B.		Union	35°05'35"	80°19'20"	70.7	GsB – Goldston-Badin	
NC-UN-130-03	Staton, Edward B.		Union	35°07'25"	80°18'42"	24.6	BdB2 - Badin	
	Total for Union County					3887.6		
Total						6233.1		

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