



ENVIRONMENTAL IMPACT
STATEMENT

ENVIRONMENTAL IMPACT STATEMENT (EIS)

PROPOSED REGIONAL MUNICIPAL SOLID WASTE
LANDFILL

RANDOLPH COUNTY, NC



Prepared For: Randolph County Public Works
P.O. Box 4728
Asheboro, NC 27204 USA

Submitted By: Golder Associates NC, Inc.
5B Oak Branch Drive
Greensboro, NC 27407 USA

April 2013

Project No. 1039684602

A world of
capabilities
delivered locally





ACRONYMS

AMSL	Above Mean Sea Level
BGS	Below Ground Surface
BMP	Best Management Practices
CFR	Code of Federal Regulations
E&S	Erosion and Sediment Control
EIS	Environmental Impact Statement
FPPA	Farmland Protection Policy Act
GIS	Geographic Information System
GC	Geocomposite
GCL	Geosynthetic Clay Liner
HELP	Hydrologic Evaluation of Landfill Performance
HUC	Hydrologic Unit Code
LFG	Landfill Gas
LOW	Limits of Waste
MSW	Municipal Solid Waste
NC	North Carolina
NCAC	North Carolina Administrative Code
NCDAQ	North Carolina Division of Air Quality
NCDENR	North Carolina Department of Environment and Natural Resources
NCDOT	North Carolina Department of Transportation
NCFMP	North Carolina Floodplain Mapping Program
NCNHP	North Carolina Natural Heritage Program
NCSC	North Carolina State Clearinghouse
NCSWMR	North Carolina Solid Waste Management Rules
NCSWS	North Carolina Solid Waste Section
NCWRC	North Carolina Wildlife Resources Commission
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSPS	New Source Performance Standards
PWR	Partially Weathered Rock
RA	Residential-Agricultural
RJD	Request for Jurisdictional Determination
ROW	Right-of-Way
SCI	Secondary and Cumulative Impacts
SPCC	Spill Prevention Control and Countermeasures
SUP	Special-Use Permit
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey



Table of Contents

EXECUTIVE SUMMARY ES-1

1.0 PROJECT DESCRIPTION..... 1

 1.1 Existing Conditions..... 1

 1.2 Proposed Development..... 2

2.0 PURPOSE AND NEED OF PROPOSED PROJECT 3

3.0 ALTERNATIVES ANALYSIS 4

 3.1 No Action Alternative..... 4

 3.2 Alternative Off Site Locations..... 5

 3.3 Alternative On Site Footprints 6

4.0 EXISTING CHARACTERISTICS OF PROJECT AREA 6

 4.1 Local Geology, Topography, and Hydrology..... 6

 4.2 Soils and Groundwater..... 7

 4.3 Land-Use..... 8

 4.3.1 Other Existing Land-Uses 9

 4.3.1.1 Closed MSW Landfill..... 9

 4.3.1.2 Shooting Range 10

 4.3.1.3 Industrial Landfill 10

 4.3.1.4 Permitted Solid Waste Transfer Station..... 10

 4.4 Wetlands and Waters of the United States 11

 4.5 Prime or Unique Agricultural Lands 12

 4.6 Public Lands and Scenic, Recreational, and State Natural Areas..... 12

 4.7 Areas of Archeological or Historical Value..... 12

 4.8 Air Quality..... 13

 4.9 Noise Levels..... 13

 4.10 Existing Traffic Conditions..... 14

 4.11 Water Resources 14

 4.11.1 Surface Water 14

 4.11.2 Groundwater 15

 4.11.3 Stormwater 16

 4.11.4 Wastewater 17

 4.12 Forest Resources..... 17

 4.13 Fish, Shellfish and Their Habitat 19

 4.14 Wildlife and Natural Vegetation..... 20

 4.14.1 Rare, Threatened, or Endangered Species 20

 4.14.1.1 Schwerin's False Indigo 20

 4.14.1.2 Cape Fear Shiner..... 22

 4.14.1.3 Schweinitz's Sunflower 22





5.0 DIRECT IMPACTS OF THE PROPOSED PROJECT 23

5.1 Topography 23

5.2 Soils..... 23

5.3 Land-Use..... 25

5.3.1 Other Existing Land Uses 26

5.3.1.1 Closed MSW Landfill..... 26

5.3.1.2 Shooting Range 26

5.3.1.3 Industrial Landfill 26

5.3.1.4 Permitted Solid Waste Transfer Station..... 26

5.4 Wetlands 27

5.5 Prime or Unique Agricultural Lands 28

5.6 Public Lands and Scenic, Recreational and State Natural Areas..... 28

5.7 Areas of Archeological or Historical Value..... 29

5.8 Air Quality..... 29

5.9 Noise Levels..... 30

5.10 Traffic Conditions 31

5.11 Water Resources 31

5.11.1 Surface Water 32

5.11.2 Groundwater 32

5.11.3 Stormwater..... 33

5.11.4 Wastewater 34

5.12 Forest Resources..... 34

5.13 Shellfish or Fish and their Habitats 34

5.14 Wildlife and Natural Vegetation..... 35

5.14.1 Rare, Threatened, or Endangered Species 35

5.14.1.1 Schwerin’s False Indigo 35

5.14.1.2 Cape Fear Shiner..... 36

5.14.1.3 Schweinitz’s Sunflower 36

5.15 Potential of the Introduction of Toxic Substances..... 36

6.0 SECONDARY AND CUMULATIVE IMPACTS OF THE PROPOSED PROJECT..... 37

6.1 Topography and Floodplains..... 37

6.2 Soils..... 38

6.3 Land Use 38

6.4 Wetlands and Waters of the United States 38

6.5 Prime or Unique Agricultural Land 39

6.6 Public Lands and Scenic, Recreational, and State Natural Areas..... 39

6.7 Areas of Archaeological or Historical Value..... 39

6.8 Air Quality..... 39



6.9 Noise Levels..... 40

6.10 Traffic Conditions 40

6.11 Water Resources 40

 6.11.1 Surface Water 41

 6.11.2 Ground Water..... 41

6.12 Forest Resources 41

6.13 Shellfish or Fish and their Habitat 41

6.14 Wildlife and Natural Vegetation..... 42

6.15 Introduction of Toxic Substances 42

7.0 PROPOSED MITIGATION..... 42

 7.1 Erosion and Sediment Control Plan 43

 7.2 Stormwater Pollution Prevention Plan 44

 7.3 Wetland and Stream Mitigation Plan..... 44

 7.4 Composite Liner System 46

 7.5 Collection and Treatment of Wastewater..... 47

 7.6 Spill Prevention, Control, and Countermeasures Plan 47

8.0 STATE AND FEDERAL PERMITS REQUIRED 48

9.0 CLOSING 51

10.0 REFERENCES..... 52

List of Tables

Table EIS-1 Summary of Piezometer Construction

Table EIS-2 Summary of Groundwater Elevations

List of Drawings

Drawing EIS-1 Site Location Map

Drawing EIS-2 Aerial Photography Map

Drawing EIS-3 Existing Conditions Map

Drawing EIS-4 Proposed Facility Plan

Drawing EIS-5 Alternate Site Location Map

Drawing EIS-6 Alternate Landfill Footprints Map

Drawing EIS-7 Proposed Landfill Siting Map

Drawing EIS-8 2000-Foot Radius Map

Drawing EIS-9 Stream and Wetland Inventory Map

Drawing EIS-10 Local Watershed Identification Map

List of Appendices

Appendix EIS-A Property Boundary Survey & Deed Book Pages

Appendix EIS-B Alternate Site Evaluation

Appendix EIS-C USDA NRCS Website Data & Soil Sample Results

Appendix EIS-D Phase I and II Cultural Resource Surveys (Golder, 2012)





Appendix EIS-E	Letters of Correspondence with State Agencies
Appendix EIS-F	Jurisdictional Wetland/Stream Determination
Appendix EIS-G	Transportation Study (CDM Smith, 2013)
Appendix EIS-H	Limited Systematic Survey for Amorpha Scherwinii



EXECUTIVE SUMMARY

The State Environmental Policy Act (SEPA) requires the evaluation of direct, secondary, and cumulative impacts related to projects that may have substantial environmental impacts. The SEPA is modeled after the National Environmental Policy Act (NEPA) and was adopted into law by the North Carolina (NC) General Assembly in 1971. The SEPA review process helps decision makers better understand the potential environmental impacts of a proposed project. The following Environmental Impact Statement (EIS) has been prepared within the framework of the NC Department of Environment and Natural Resources (NCDENR) *Secondary and Cumulative Impacts Guidance Manual*. The purpose of this EIS is to address the potential direct, secondary, and cumulative impacts and their effects of the natural resources, ecosystems and human communities associated with the siting and permitting of a proposed regional Municipal Solid Waste (MSW) landfill in Randolph County.

The proposed MSW regional landfill will be located on approximately 667 acres in unincorporated, central Randolph County, NC (*Drawing EIS-1*), on the property adjacent to the existing closed County landfill, active MSW transfer station, and active industrial landfill (owned by Energizer). The facility will include a lined waste footprint of approximately 200 acres and the first phase of the proposed landfill will be designed to contain approximately 10 years of waste as allowed under current law. The County will partner with an experienced private landfill operator to assist with construction and operations.

Prior to final selection of this site, a voluntary Alternate Site Evaluation was performed. During the Alternate Site Evaluation, sixteen potentially suitable sites were identified. Thirteen of the sixteen potential sites were eliminated from consideration during the secondary screening process. The remaining three sites were further evaluated based on more detailed siting criteria within the NC Solid Waste Management Rules (NCSWMR). Based on this tertiary screening, the existing landfill property was considered to be the best suited to support the development of a new landfill. A review of demographic data does not indicate that continued operation of a landfill at the existing landfill property would disparately impact any minority population or disadvantaged socio-economic group.

Given the scope of this proposed project and potential environmental impacts, an EIS was developed by Golder Associates of NC, Inc. to address direct, secondary, and cumulative impacts to the existing site, surrounding human population, and wildlife. The EIS is required as part of the Senate Law 2007-550. The EIS discusses fifteen different matrices that may potentially suffer direct, secondary, or cumulative impacts during the course of the development of the proposed landfill. These fifteen areas of potential impacts include:

- Site Topography
- Soils



- Land Use
- Wetlands
- Prime or Unique Agricultural Lands
- Public Lands and Scenic, Recreational, and State Natural Areas
- Areas of Archeological or Historical Value
- Air Quality
- Noise Levels
- Traffic Conditions
- Water Resources (Surface Water, Groundwater, Stormwater, & Wastewater)
- Forest Resources
- Shellfish or Fish and their Habitat
- Wildlife and Natural Vegetation (Rare, Threatened, or Endangered Species)
- Potential Introduction of Toxic Substances

Upon completing a detailed assessment of the potential direct, secondary, and cumulative impacts related to the development of the proposed MSW, it is our conclusion that the required State and Federally issued permits, existing County ordinances, and best management practices employed by the MSW landfill operators will substantially reduce and/or mitigate many of the potential impacts discussed in the EIS. Additionally, County residents would benefit in long-term cost saving for waste disposal and could also see a possible increase in economic development in and around Randolph County. Funds generated from the facility through tipping fees and host fees, as well as future revenue from landfill gas to energy projects could also support many other County needs for decades to come.



1.0 PROJECT DESCRIPTION

1.1 Existing Conditions

The proposed municipal solid waste (MSW) landfill will be located on approximately 667 acres in unincorporated, central Randolph County, North Carolina (NC) and will include an approximate 200-acre waste footprint (shown on *Drawing EIS-1*). The first phase of the proposed landfill will be designed to contain approximately 10 years of waste disposal and will occupy approximately 31.5 acres of the total 200-acre waste footprint.

The proposed landfill property is bordered by the Deep River to the north, Gabriel's Creek to the east, and relatively undeveloped agricultural and rural residential land on the south and west. A cell tower is also present on the County property. A hydroelectric dam is present along the Deep River adjacent to the property. The County operated an unlined landfill under NC Department of Environment and Natural Resources (NCDENR) Solid Waste Permit No. 76-01, from 1972 to 1997 on the adjacent property and current operates an active MSW transfer station on that property. Energizer also operates an active industrial landfill on the adjacent property under NCDENR Solid Waste Permit No. 76-01.

The proposed landfill site currently consists of agricultural fields and wooded areas. Randolph County owns all except two parcels of the proposed MSW landfill property. These two parcels are under contract and will be purchased prior to submittal of the permit application to the NC Solid Waste Section (SWS). Two power-line rights-of-way (ROWs) transect the proposed MSW landfill property, one running northeast-southwest and the other running northwest-southeast (*Drawing EIS-2*). Asheboro is the closest municipality to the project area, and its municipal boundaries are located approximately 0.5 mile from the proposed landfill unit. A "Site Location Map" is provided as *Drawing EIS-1*; a property survey plat and copies of the associated deed book pages are provided as *Appendix EIS-A*.

Currently, the proposed MSW development tract is accessed by the active transfer station and convenience center entrance located at 1254 County Land Road. The County has proposed an entrance for the MSW landfill that will be located off of Old Cedar Falls Road. The proposed footprint and the location of the entrance of the proposed MSW landfill are shown on *Drawing EIS-2*. Details about the proposed new entrance to the facility are discussed in later sections of this report.

The project site is depicted on the United States Geological Survey (USGS) 7.5-minute quadrangle maps "Randleman, NC," dated 1981; "Grays Chapel, NC," dated 1974; "Asheboro, NC," dated 1994; and "Ramseur, NC," dated 1980 (*Drawing EIS-1*). The elevation in the vicinity of the site ranges from approximately 841 feet above mean sea level (AMSL) in the north-central portion of the site to approximately 550 feet AMSL in the northeastern portion of the site along the Deep River. The topographic highpoints are located in the north-central and south-central portions of the property. Mixed



hardwood-pine bottoms drain in a northerly or easterly direction to Deep River or to Gabriel's Creek, respectively. An unimproved road traverses the central portion of the site. Surface water runoff from the property generally flows east-northeast into the Deep River. The Deep River drainage basin is located in the watershed denoted as 8-digit USGS Hydrologic Unit Code (HUC) #03030003. The existing site conditions, property boundaries, and surrounding topography are shown on *Drawing EIS-3*.

1.2 Proposed Development

The proposed MSW landfill will be located in the eastern limits of the approximate 667 acre site, as shown on *Drawing EIS-2*. The proposed landfill unit will have a lined waste footprint of approximately 200 acres. The landfill liner system includes both primary and secondary liners, a leachate collection system above the primary liner, and a leak detection layer between the primary and secondary liners. Leachate generated at the landfill will be collected, removed from the landfill, stored in on-site tanks, and transported off site to a publicly owned treatment works (POTW) for treatment and disposal via a sewer connection.

At this time, the exact location of the future pump station and sewer lines is unknown; however, the County has been in discussions with the City of Asheboro regarding leachate disposal. Potential future sewer lines are likely to be located on the adjacent County property at the existing active transfer station, where an existing pump station will likely be upgraded. Alternatively, the sewer lines may be located within or immediately adjacent to NC Department of Transportation (NCDOT) right of ways and along on-site facility access roads and on-site sewer lines will be dual-contained as required by law. The existing wastewater treatment plant is well below capacity, with a current permitted flow of 9.0 million gallons per day (Mgal/day) and an average daily flow of 3.3 Mgal/day. There are no moratoriums for new sewer hook-ups and the plant discharges to the Deep River upstream of the proposed facility.

In addition to the lined disposal area, development of the landfill will include construction of access roads, borrow areas, stormwater/sediment and erosion control features, scales and a scale-house, a maintenance building, leachate tanks, and additional infrastructure that may be required to support landfill operations. The proposed landfill has an approximate preliminary design capacity of 48 million cubic yards, which, at an average acceptance rate of 2,000 tons per day over the life of the facility, would result in an active life of between 55 and 65 years, dependent upon the density at which waste is placed, amount of daily cover used, and other operational factors.

While subject to change as the facility develops, the conceptual location of supporting infrastructure is shown on *Drawing EIS-4*. Infrastructure will be relocated at various times as the facility is developed and the need arises. To the extent practicable, infrastructure will be designed to minimize runoff and site disturbance. The landfill will be developed in phases, and inactive portions of the facility will be covered with vegetated intermediate cover (i.e., a minimum of one foot of soil with established grass cover). In



addition, the facility is designed so that it may be closed in phases as cells reach final design elevation, or at intermediate elevations below final design height. It is anticipated that typically no more than 5 to 10 acres of the waste footprint will be open and without vegetative cover, whether intermediate or final capped cover, at any time.

Either during the facility's operational life in the open buffer areas and/or after closure, it is anticipated that portions of the facility will be used for other uses. These uses may include parks, walking trails, nature conservation areas, and educational outreach programs related to landfill operations, recycling, and green energy projects related to landfill gas. Many other post-closure uses for landfills may be considered including but not limited to golf courses, model airplane flying, and parks/walking trails.

2.0 PURPOSE AND NEED OF PROPOSED PROJECT

The purpose of the proposed project is to provide Randolph County (the County) residents with a long-term and cost-effective option for the disposal of their MSW. In addition to providing the County with a safe and economical place to dispose of its MSW, the proposed landfill will create a new revenue stream in the form of host fees and a potential source of "green energy" (landfill gas). With revenues generated from the landfill it is probable that the proposed MSW landfill will increase demand for goods/services, lower the cost of doing business, and attract new business to the County.

Counties are required by law to provide waste disposal to the residents of the County. The County closed the unlined landfill in 1997, after the NC Solid Waste Management Rules (NCSWMR) "sunset" provisions from Federal Subtitle D requirements ended. The County did not find that it was economically feasible to build and operate a lined facility for waste from within the County due to the relatively low volume of waste generated within the County. Since closing the County landfill in 1997, the County's waste has been transferred via a transfer station out of the County to privately owned landfills. The County is concerned with increasing disposal costs and began researching the possibility of opening a regional landfill as an opportunity to provide a cost-effective solid waste disposal options to County residents, as well as a potential source of revenue to the County's general fund.

In addition to serving the needs of Randolph County residents, the proposed facility will help the State of North Carolina meet its long-term waste disposal needs. As reported in the *NC Solid Waste Materials Management Annual Report for Fiscal Year 2010-2011*, the total remaining capacity of all NC MSW landfills measures approximately 358 million cubic yards, equating to approximately 221 million tons. Over the next 20 years, NC residents and businesses will landfill an average of approximately 14 million tons of MSW per year. This disposal rate results in a statewide disposal capacity of approximately 16 years, which is less than the standard State planning timeframe for solid waste management of 20 years. It should be noted that increases in recycling rates and other reuse programs may extend the disposal capacity of the existing landfills, and opening the new landfill in Granville County will also



increase the State's available disposal capacity. However, much of the state's capacity is not available statewide due to permit conditions, franchise arrangements, service areas, and hauling distance. No new "greenfield" landfills have been permitted under the stringent location requirements of Senate Law 2007-550.

The proposed regional landfill is centrally located and could economically serve Randolph and surrounding Davidson, Chatham, and Moore Counties, as well as the Raleigh, Durham, Greensboro, and Winston-Salem metropolitan areas, which comprise approximately 26 percent of the state's population (U.S. Census Bureau, 2012). Dependent on transportation costs and gate rates, the facility may also economically serve additional NC counties and municipalities beyond those immediately adjacent to Randolph County. The proposed facility has a design capacity of approximately 48 million cubic yards and would help the State meet its long-term disposal needs, while providing an ideal central location within the state. The County will partner with an experienced private operator to help construct and operate the facility.

3.0 ALTERNATIVES ANALYSIS

Several alternate waste disposal, landfill siting, and landfill design alternatives were developed and evaluated prior to development of the proposed alternative. These various waste disposal and landfill siting/design alternatives are discussed as follows.

3.1 No Action Alternative

The Randolph County Transfer Station accepts MSW (i.e., residential, commercial, and industrial waste) generated within the County. Based upon recent annual waste disposal records, the County anticipates receiving an annual tonnage rate of approximately 45,000 tons per year of MSW at the transfer station. The projected annual tonnage rate yields a daily rate of 160 tons per day based upon 280 operating days a year. The daily tonnage rate is subject to change due to fluctuations in the amount of waste delivered to the facility. The transfer station was designed and built to handle a maximum average tonnage rate of 500 tons per day to account for daily surges in solid waste. The MSW is currently transported to the Uhwarrie Landfill located in Montgomery County, NC for disposal, at an annual total cost to the County of approximately 2 million dollars (transfer station operation, transportation, and disposal).

Continued population growth and development in the service area is anticipated. As discussed above, the State's disposal capacity is limited. Without development of additional landfill capacity, solid waste disposal costs are expected to increase significantly. With a relatively small volume of waste within the County, it may be challenging for the County to find economic options for waste disposal. The development of the proposed regional MSW landfill will help stabilize disposal costs for residents of Randolph County and the surrounding service area by eliminating the need to transport MSW to various landfills across the state. The current MSW landfills that are open for disposal will begin to reach their



respective disposal capacities as population growth continues, thereby increasing transportation distances and cost. For these reasons, a no action alternative is not considered sustainable and is eliminated from further consideration.

3.2 Alternative Off Site Locations

An Alternate Site Evaluation, which provided alternative site options for the location of potential MSW landfills that could serve Randolph County and other nearby counties, was completed voluntarily by the County at the request of NCDENR, and presented at a public meeting to the County Commissioners in February 2011; the study is included as *Appendix EIS-B*.

The Alternate Site Evaluation evaluated individual parcels within the County that are greater than 200 acres in size. Parcels were initially screened using publicly available Geographic Information System (GIS) data based on criteria detailed in the NCSWMR and siting restrictions listed in Senate Law 2007-550. Considering siting restrictions in the NCSWMR and site access criteria, 16 potentially suitable sites were identified (shown on *Drawing EIS-5*).

Secondary screening of the 16 potential sites included preparation of site maps depicting site geometry, perennial streams, topography, 300-foot buffers from the property lines, and 200-foot buffers from perennial streams. These maps were used to evaluate the effects of site geometry and perennial streams on the potential to develop the property as a MSW landfill.

Thirteen sites were eliminated from further consideration based on the screening criteria listed above. Eight of the 13 sites were eliminated because of the presence of perennial streams within the property boundary that would significantly limit the development potential of the sites. Three of the sites were eliminated because of their ownership and/or current use (i.e., Uwharrie National Forest, North Carolina Zoo, Boy Scouts of America). One site was eliminated based on site geometry and access considerations, and one site was eliminated because of site topographic relief.

The remaining three sites were further evaluated with a more detailed evaluation of siting criteria contained in the NCSWMR. Based on this tertiary screening, the existing landfill property owned by the County was considered to be best suited to support development of a new MSW landfill. This site was chosen based on size; land use/zoning; proximity to schools, scenic or recreational areas, or state or city parks; transportation infrastructure; topography; environmental features (e.g., streams, wetlands, and floodplains); and surrounding land use. Further, the County has been utilizing the adjacent property for solid waste disposal and transfer activities since the early 1970s.

A review of demographic data was also included as part of this study. Based on a review of the 2009 US Census data estimates, the population of Randolph County is approximately 142,000. The minority



population of Randolph County is estimated to be approximately 12,000 individuals, or 8.5% of the population. Review of population distribution data does not indicate that the minority population in the vicinity of the landfill site is higher than County average. Therefore, resumed operation of a landfill at the current landfill site is not expected to inequitably impact a minority population.

The median value of owner-occupied homes in the County is approximately \$95,000. Based on review of nearby residential tax valuations, residences in the general vicinity of the proposed landfill were generally at or above the County median value. Therefore, resumed operation of a landfill at the current landfill site is not expected to inequitably impact a disadvantaged socioeconomic group.

3.3 Alternative On Site Footprints

Four potential alternate waste footprints were developed for the proposed facility prior to choosing the current proposed property boundary. Two of the footprints were eliminated to reduce the amount of wetlands disturbance and two of these potential footprints were considered further and are depicted on *Drawing EIS-6*. The purpose of this evaluation of alternate footprints is to minimize impacts to environmentally sensitive site features while maximizing the efficiency of the engineering design. Potential stream impacts range from a maximum of 2,000 linear feet of intermittent stream to a minimum of 1,200 linear feet of intermittent stream. It was determined that a wetland area that occupies approximately 0.06 acre, located in the north-central portion of the property, would be impacted by each of the potential footprints. No impacts to perennial streams are anticipated with the exception of the stream crossing across Gabriel's Creek; impacts will be minimized and required modeling performed as part of the permitting process for this crossing. In order to minimize wetlands impacts the smaller waste footprint but greater fill height was selected for further evaluation. The Proposed Landfill Siting Map included in this report as *Drawing EIS-7* was used to confirm that the facility complied with applicable NCSWMRs with regards to landfill siting.

4.0 EXISTING CHARACTERISTICS OF PROJECT AREA

This section of the EIS describes the current characteristics of the project area to establish a base line for later sections that describe the direct, secondary, and cumulative impacts of the construction and operation of the proposed MSW landfill in Randolph County.

4.1 Local Geology, Topography, and Hydrology

Randolph County is located within the Piedmont physiographic province of NC. The County's physical characteristics are consistent with other piedmont terrain in NC, and can be characterized by rolling hills with occasional boulders and rock outcrops. The area surrounding the proposed landfill drains to one of the three major drainage basins within Randolph County; the Deep River drainage basin. The subject property itself can be described as a large, relatively undisturbed tract of land consisting mainly of older



hardwood and younger pine trees (replanted after logging activities). A large portion of the property was logged as recently as 2009 as seen on the aerial photograph shown on *Drawing EIS-2*.

The proposed landfill is located in a geologic region known as the Carolina Slate Belt, and is mapped within the Uhwarrie Formation (NCGS, 2007). The Uhwarrie Formation in Randolph County can be described generally as mildly deformed, felsic, meta-volcanic rock. The rocks within the Uhwarrie Formation are described as metamorphosed dacitic to rhyolitic flows and tuffs, light gray to greenish gray, and interbedded with mafic and intermediate meta-volcanic rock, meta-argillite, and meta-mudstone. The dominant structures are open folds plunging to the southwest. The regional metamorphism can be described as chlorite to biotite grade in the Barrovian sequence. Because of the low-grade metamorphism, the original textures are generally well preserved and stratigraphic relationships are clear in much of the region.

The topography within the property boundary ranges from 841 feet AMSL in the north-central portion of the site to approximately 550 feet AMSL in the eastern portion of the site along the Deep River. Several distinct drainages traverse the landscape predominantly north to south across the site. The majority of these drainages exist as ephemeral and intermittent streams. Two perennial streams are located on the northern side of the property and discharge directly into the Deep River. A small portion of a principally intermittent stream becomes perennial on the southern side of the property and discharges into Gabriel's Creek.

The Deep River's 100-year flood plain as mapped by the NC Floodplain Mapping Program (NCFMP) is confined to a small area on the northern portion of the site due to significant topographic relief near the northern property boundary (NCFMIS, 2012). On the eastern and southern portion of the project area, the 100-year flood plain associated with Gabriel's Creek is larger and well defined. The average width of the flood plain on the eastern portion of the property is approximately 400 feet. The 100-year flood plain mapped on or adjacent to the subject property is depicted on *Drawing EIS-8*.

4.2 Soils and Groundwater

Using the United States Department of Agriculture's (USDA) Natural Resource and Conservation Services' (NRCS) soils website, soils were mapped and identified on the proposed landfill property. The results of this desktop study, as well as descriptions of the soil samples discussed later in this section, are summarized in *Appendix EIS-C*. Sixteen soil map units were identified within the proposed property boundary. Of the 16 soil map units identified, five (representing three soil series) cover 80 percent of the site. The soils series and soil samples in this section are referred to by their USDA classification. The most abundant soil series mapped on the proposed landfill property is the Georgeville Series, which is characterized as a silt loam. The second most abundant soil series identified on the property is the Bandin-Tarrus complex, which is characterized as a silty clay loam. The final major soil series identified



within the property boundary is the Wynott-Enon complex, which is characterized as a sandy loam or a sandy clay loam. It should be noted that no major clay layers were identified on the proposed landfill property.

As of March 2013, 70 piezometers have been installed and six soil borings have drilled within the proposed landfill property boundary to properly characterize the property for the suitability of a MSW landfill. The locations of these piezometers and borings are shown on *Drawing EIS-3*.

Borings completed on the property generally encountered silt and sandy loams with isolated areas of clay and silty clay loams as well as loamy soils. Minimal amounts of topsoil or forest litter were observed on the subject property; topsoil and forest litter were typically less than 4 inches thick. Near-surface soils are typically fine-grained sandy loams, and grade with depth to silty loams. Subsurface soils typically became denser and coarser grained with depth, and grade into weathered rock. Depth to bedrock varied greatly across the site with rock outcrops present at some locations and, in others, bedrock was encountered at depths as great as 62 feet below ground surface (BGS). Generally, data collected during the subsurface evaluation of the site correlated well with the data provided in the Randolph County Soil Survey Report.

Results of the drilling program completed at the facility showed that the uppermost aquifer underlying the property is an unconfined aquifer that is encountered at depths between 13 and 120 feet BGS. Groundwater was encountered predominantly in partially weathered rock or bedrock; however, groundwater occurs in saprolite across portions of the site. Generally, the water table at the facility mimics site topography, and groundwater flows in a radial pattern from localized highs to the surface water bodies bordering the property.

4.3 Land-Use

The proposed MSW landfill property is primarily zoned residential-agricultural (RA) as indicated on the 2000-Foot Radius Map (*Drawing EIS-8*). The property is characterized as predominantly wooded land and agricultural fields dissected by numerous dirt and gravel roads. A small active cell phone tower is present on the western side of the property. As stated in Section 1.1 of this report, the proposed landfill property is transected by two electric utility lines owned by Progress Energy. One electric utility line ROW transects the center of the property on a northeast-southwest azimuth. The second electric utility line transects a small portion of the southwest corner of the subject property. The areas beneath these utility lines have been intensively altered by heavy equipment and are routinely maintained by Duke Energy (e.g., trees and grass is trimmed, vegetation is mowed, etc.). An older abandoned telephone utility ROW has been identified, during previous site investigations, passing across the proposed facility east of the electric utility line ROW. The telephone ROW is indicated on a 1967 highway map (NC State Highway Commission, 1967). A property survey plat and copies of the associated deed book pages are provided as *Appendix EIS-A*.



As shown on the 2000-Foot Radius Map (*Drawing EIS-8*) Randolph County owns all except two parcels on the southeastern side of the proposed MSW landfill area and parcels are zoned as residential agricultural. A small portion of this area adjacent to Old Cedar Falls Road is zoned as mixed residential. The two parcels not already owned by the County are currently under contract and will be purchased by the County prior to applying for a permit to construct with the NCDENR SWS. The nearest permanent residential structure was measured at a distance greater than 1,000 feet from the proposed limits of waste (LOW), as shown on *Drawing EIS-2*.

Historically, the proposed MSW development tract has been used for pine and hardwood silviculture, including timbering. Recent timber clear-cuts, mechanical site preparation, and re-plantings dominate the interior of the tract. A large section of the proposed MSW landfill property has been timbered and clear-cut since 2008. Examination of older aerial photographs, using Google Earth, reveals a pattern of periodic timbering and cultivated fields reverting to forest since the early 1990s. This land-use pattern has been confirmed by an archeological survey performed by Golder, which documented and detailed the historical land-uses associated with the property. Evidence of the timbering operations, including soil erosion, gulying, terracing, and field rock clearing, is still apparent on the proposed MSW development tract.

4.3.1 Other Existing Land-Uses

Several industrial activities have been or are conducted on properties adjacent to the proposed MSW landfill property. These land-uses of the adjacent parcels are discussed in the following sections in order to have an accurate description of the baseline land use conditions, and to better identify potential secondary and cumulative impacts on the land and natural resources within the proposed MSW landfill development tract as well as the adjacent parcels. Each location discussed within this Section is displayed on *Drawing EIS-2*.

4.3.1.1 Closed MSW Landfill

A closed, unlined MSW landfill is located on an adjacent parcel on the northwest side of the proposed MSW landfill property approximately 325 feet from the property line. The LOW of the closed landfill are approximately 2000 feet from the LOW of the proposed landfill. Randolph County operated a sanitary landfill from 1973 to 1985. In 1985 a second sanitary landfill for MSW, construction and demolition (C&D) materials, and land clearing and inert debris (LCID) materials was operated and eventually closed in 1997 to avoid compliance with the new more stringent and costly Subtitle D regulations. The post 1985 disposal area shown on *Drawing EIS-2* has an approximate footprint of 28 acres. The total disposal area (i.e., the total waste footprint from 1973 to 1997) at the closed Randolph County landfill site is approximately 75 acres. The closed landfill is now maintained by the County in accordance with the post-



closure care requirements of the NCSWMR, including cap maintenance, and routine groundwater, surface water, and landfill gas monitoring and reporting.

4.3.1.2 Active Training Center/Shooting Range

Randolph County operates a training center that includes an outdoor shooting range for training exercises that are periodically conducted by the County Sheriff's Department on an adjacent parcel on the northeast side of the proposed MSW landfill property. The shooting range is located approximately 1,350 feet to the east of the proposed MSW landfill LOW.

4.3.1.3 Industrial Landfill

An active industrial landfill is located approximately 1,350 feet west of the proposed MSW landfill property line on a parcel adjacent to the County's current solid waste facility. The industrial landfill is owned and operated by the Energizer, and is approximately 1.5 acres in size. The industrial landfill has been in operation since 1983 and recently completed an expansion project. The expansion was approved by NCDENR and a permit to operate the new cell was issued in August 2012. This landfill only accepts industrial waste generated by the Energizer Corporation. According to the *2010-2011 NC Solid Waste and Materials Management Annual Report*, the landfill did not accept any waste 2010-2011 reporting year likely because the industrial material was stock-piled awaiting the construction of the new landfill cell. Based on data contained in the current facility permit, the industrial landfill has approximately 110 years of remaining capacity.

4.3.1.4 Permitted Solid Waste Transfer Station & Convenience Center

The County owns a permitted MSW Transfer Station approximately 1,900 feet west of the proposed MSW landfill property line under NCDENR Solid Waste Permit No. 76-03T; the facility is operated by a private waste company. The Solid Waste Transfer Station has been in operation since 1997. This facility serves as a solid waste collection location for residents and businesses of Randolph County as well as for regional commercial MSW haulers. The facility accepts approximately 44,200 tons of solid waste during the 2010-2011 fiscal year (DWM, 2011), and the County transports the waste by tractor-trailer to a private MSW landfill in Montgomery County, NC. An estimated 100 trucks (i.e., incoming and outgoing) visit the facility during each operating day. Adjacent to the MSW Transfer Station is a convenience center available to County residents for the purposed of disposal of household waste and recyclables. An estimated 60 vehicles (i.e., incoming) visit the public convenience center each operating day.

4.3.1.5 Cox Lake Dam

Cox Lake Dam is located along the northern property boundary of the proposed MSW landfill property. According to historical records, Cox Lake Dam was constructed around 1924 (Saville, 1924). Cox Lake Dam was constructed to provide a source of energy via hydroelectric power to areas of Randolph County. Currently, the hydroelectric plant is currently not operational; however, the dam still stands. The dam is



approximately 20 feet high and creates a reservoir or lake (referred to locally as Cox Lake) on the Deep River. An aerial photograph of Cox Lake Dam can be seen in the *Phase I Cultural Resource Survey* included in this report as *Appendix EIS-D*.

4.4 Wetlands and Waters of the United States

An informal stream and wetland delineation was performed in the fall of 2010 during a “fatal flaw” study performed by Golder. The informal delineation was followed by a formal stream and wetland delineation performed in June 2011 at the proposed landfill facility. Based on field reconnaissance, wetland features including forested and scrub-shrub wetlands, perennial streams, and intermittent streams were identified and flagged in the area of anticipated land disturbance. An Approved Jurisdictional Determination Form, routine wetland determination data forms, and NC Department of Water Quality Stream Forms were completed and photographs were taken of the drainage features. A Request for Jurisdictional Determination (RJD) was submitted to the U.S Army Corps of Engineers (USACE) and NCDENR on August 20, 2012.

A site walkover with representatives from the USACE and NCDENR was completed in November and December 2012 and the jurisdictional features identified in the RJD were amended, removing some intermittent streams that were determined to not be jurisdictional. Jurisdictional wetlands, perennial streams, and intermittent streams are detailed on the Stream and Wetland Inventory Map (*Drawings EIS-9*). The RJD was approved on March 12, 2013 by the USACE and a letter from NCDENR, confirms that the State is also in agreement with the final intermittent and perennial stream determinations. The approved RJD and the confirmation letter from NCDENR are included in *Appendix EIS-E* of this report.

The Deep River, a perennial, traditionally navigable, and relatively permanent water body, essentially forms the facility boundary and has well established top-of-bank features. For these reasons, and because it lies well within the proposed buffer for the facility, the Deep River was not flagged during the wetland delineation. A fairly large wetland area is present along the Deep River at the confluence of the Deep River and Stream A (as noted on *Drawing EIS-9*). This wetland was also not flagged due to its presence as an obvious feature and due to the fact that it was well outside of the area of proposed disturbance and within the proposed buffer area.

The results of the wetland delineation are summarized below. A detailed explanation of the wetland delineation results can be found in the RJD submitted to the USACE (found in *Appendix EIS-F* of this report). The final results of the wetland delineation after approval from the USACE concluded that approximately 4,660 linear feet of jurisdictional perennial streams (i.e., not including those located on the property boundary), 5,170 linear feet of jurisdictional intermittent streams, and 920 linear feet of jurisdictional ephemeral streams are present within the proposed MSW landfill development tract. Based on the current design of the proposed MSW landfill waste unit, no perennial stream will be disturbed (as



required by NCSWMR) and approximately 1,200 linear feet of intermittent stream will be disturbed during the development of the proposed MSW landfill. Three wetland areas were identified by the delineation, totaling approximately 1.37 acres (not including the unmapped wetland area discussed above) mapped on the 667 acre property. Of the 1.37 acres of wetlands mapped, 0.06 acre of wetland will be disturbed by the development of the property into a MSW landfill.

Additional studies will be performed along Gabriel's Creek once the entrance road for the facility has been located and graded. At that time, additional field delineation and permitting will be performed with the USACE and NCDENR for the stream crossing. Also, as required any potential impacts to the floodplain on and upstream of the property will be evaluated as part of this additional investigation.

4.5 Prime or Unique Agricultural Lands

No prime or unique agricultural lands have been identified within the proposed MSW landfill property boundary.

4.6 Public Lands and Scenic, Recreational, and State Natural Areas

No federal, state, or local parks, game lands, scenic or recreational areas, or lands protected by a conservation easement are located on, adjacent to, or within 2000 feet of the proposed MSW landfill property. A significant Natural Heritage Area was originally identified on the northwestern highland portion of the property and was identified as a Piedmont Monadnock Forest. Due to recent timbering of the forest the value of the forest considered low and the forest was removed from the significant Natural Heritage Area list in 2011. A portion of the area identified as the Central Falls Slope (also a significant Natural Heritage Area), characterized in Section 4.12 of this report, and is located within the northern property boundary of the proposed landfill property boundary. The significant Natural Heritage Area identified as the Central Falls Slope shown on the NC Natural Heritage Program (NCNHP) website is located within the proposed property line buffer along the facility's northern property line and is not impacted by the current design of the proposed landfill or support structures. The Deep River forms part of the northern and northeastern proposed landfill boundary. Recreational usage of the Deep River may occur by the general public and nearby residents.

4.7 Areas of Archeological or Historical Value

A cultural resources survey was conducted on the proposed MSW landfill property per the recommendation of the NCNHP. The cultural resources survey was completed in two phases. The Phase I cultural resources survey was completed in June 2011. Based on the findings of the Phase I study, it was determined that a Phase II cultural resources survey was necessary; the Phase II survey completed in August 2012. The completed Phase I and Phase II cultural resources survey reports are included in this report as *Appendix EIS-D*.



The Phase I cultural resources survey resulted in the location of 34 cultural resources, including 19 archaeological sites, and 15 isolated artifact finds, as described in Golder's Phase I Report. Archaeological examination conducted during the Phase I archeological report of the proposed MSW landfill development tract yielded four archaeological sites worthy of additional research. These four sites were initially considered as potentially eligible for inclusion in the National Register of Historic Places (NRHP). Golder evaluated two of these sites with Phase II testing and determined them both to be ineligible for the inclusion in NRHP. The other two sites will not be impacted by the proposed landfill project and, therefore, no additional fieldwork or assessment of these resources was warranted.

4.8 Air Quality

The NC Division of Air Quality (NCDAQ) does not operate any ambient air monitoring locations in Randolph County, but has two monitoring stations in Guilford County and one in Montgomery County. For comparison purposes, the populations of each county are as follows (data from U.S. Census Bureau, 2012): Guilford (500,879), Montgomery (27,668), and Randolph (142,466). The most recent air quality data available from these monitoring locations are presented in the following table:

Available 2011 Air Quality Data

Air Pollutant	County	Days Measured	Days > Standard
Ozone (1-Hour)	Guilford	214	0
Ozone (1-Hour)	Montgomery	206	0
Ozone (8-Hour)	Guilford	214	4
PM-10 (24-Hour)	Guilford	57	0
PM-10 (24-Hour)	Montgomery	52	0

NOTE: Data from the United States Environmental Protection Agency's 2011 Air Quality System Quick Look Report (AMP450).

4.9 Noise Levels

Noise levels are subject to established federal, state, and local ordinances. The Federal Noise Control Act of 1972 (42 USC §4901 *et seq.*) established federal noise emission standards for products distributed in commerce, and provides information to the public regarding noise emissions and noise reduction of such products. According to this regulation, the major sources of noise include transportation vehicles and equipment, machinery, appliances, and other products in commerce. There are currently no facilities or equipment located within the proposed MSW landfill site that are subject to federal noise regulations. However, the adjacent shooting range, active industrial landfill and transfer station and associated hauling trucks, and local farm equipment are sources of noise impacts in the immediate area around the proposed site. Any direct, secondary, or cumulative noise impacts that may result from the proposed MSW landfill on surrounding land use will be addressed in later sections of this report.



4.10 Existing Traffic Conditions

The traffic study conducted by CDM Smith (included in this report as *Appendix EIS-G*) details the base traffic conditions present on roads anticipated to be the access routes of the proposed MSW landfill. The existing roads projected as the facility route include: NC Highway 64, Henley Country Road, and Old Cedar Falls Road. The traffic study contains NCDOT current and project traffic and accident data as well as traffic counts conducted by CDM Smith for the projected solid waste disposal route to the proposed landfill. According to the traffic study, the data indicated that the NC Highway 64 is currently at approximately 57-59 percent of its current capacity. By 2016 (i.e., the potential projected opening date of the proposed landfill), traffic on NC-64 is projected to approach 72-74 percent of its capacity (i.e., without the construction of the proposed landfill). Because of this, the NCDOT is already planning to construct a bypass around Asheboro; construction of the bypass is tentatively scheduled to begin in 2014. Currently the two main roads off of NC-64 (i.e., Henley Country Road and Old Cedar Falls Road) are between 8 and 21 percent of their current capacity. These roads are projected to be between 10 and 26 percent of their capacity by 2016 (i.e., without the construction of the proposed landfill). Direct, secondary, and cumulative impacts potentially resulting from the proposed MSW landfill on traffic conditions will be discussed in later Sections of this report.

4.11 Water Resources

The following sections discuss the current hydrology and discharge features that are or could be present on the proposed MSW landfill development tract.

4.11.1 Surface Water

A preliminary hydrogeologic study was conducted in 2011 within the proposed study area. The findings of the initial study pertaining to surface water features are discussed in this section. The proposed MSW landfill is situated in a rugged terrain of knolls and valleys that range from approximately 530 to 835 feet AMSL, as shown on *Drawing EIS-4*. Surface water from the northern half of the site generally travels to ephemeral and intermittent drainages that discharge directly into the Deep River. On the southern half of the site, surface water generally flows to the south and east into tributaries of Gabriel's Creek. Gabriel's Creek flows north into the Deep River at the northeastern corner of the subject property. It is likely that during periods of seasonal high groundwater elevations, the steeply sloped drainages intersect the groundwater table and feed the intermittent streams located across the subject property.

To evaluate the quality and potential environmental regulation with respect to surface water quality, the GIS layer provided by NCDENR illustrating the location of listed 303(d) impaired waters was added to *Drawing EIS-10*. This data layer shows that the adjacent portion of the Deep River (from Haskett Creek to Gabriel's Creek) is listed as a category 5 303(d) impaired water [i.e., one requiring the development of a Total Maximum Daily Load (TMDL)] based on chlorophyll a levels. This type of impairment is common



in reservoirs (and dammed portions of flowing waters, as is the case at the adjacent portion of the Deep River). This type of impairment commonly results in eutrophication in response to the addition of substances such as nitrates and phosphates through fertilizers or sewage (the City of Asheboro POTW is located approximately 2.5 miles upstream of the proposed facility and several farms exist on the properties adjacent to the Deep River). The addition of these substances causes an increase in phytoplankton which causes hypoxia (the decrease of dissolved oxygen) and has the potential to reduce fish and other animal populations in the water body. It should also be noted that the Deep River is also a category 5 303(d) impaired water, from Gabriel's Creek to Bruch Creek (i.e., directly downstream of the proposed facility), based on copper levels. Neither of these contaminants is commonly associated with landfill activities.

4.11.2 Groundwater

A preliminary hydrogeologic investigation was performed in 2010 and 2011 with the focus of assessing the subject property's potential to host a MSW landfill. The NCSWMR require that a *Site Application*, which includes a hydrogeologic investigation, be completed and submitted prior to submittal of an *Application for Permit to Construct* a landfill. Golder conducted a fatal flaw study at the request of the County which included among other siting criteria, a preliminary hydrogeologic evaluation. During this initial investigation, ten piezometers were installed on the proposed landfill property. The results of the preliminary hydrogeologic investigation indicated that the uppermost aquifer was located in bedrock across the majority of the proposed development tract.

In August 2012, 60 additional piezometers were installed on the subject property during the hydrogeologic investigation in preparation of the *Site Application*. The hydrogeologic investigation confirmed that the majority of the uppermost aquifer was located in bedrock with a transition from bedrock to partially weathered rock (PWR)/saprolite only in lower elevation areas across the site. In order to assess and characterize the uppermost aquifer hydraulic conductivity (obtained from slug testing), hydraulic gradients (calculated from a groundwater map), and effective porosities (obtained from soil samples) were used to calculate an estimated groundwater flow velocity using Darcy's Law. A groundwater map was generated for the proposed landfill property showing the direction of groundwater flow.

The hydrogeologic investigation to this date is not complete; however, the preliminary data are summarized below. Bedrock across the proposed MSW property ranges from 4 to 62 feet BGS with an average of 15 feet BGS. The average depth to water across the proposed landfill site ranges from 2 to 95 feet BGS with an average of 40 feet BGS. Horizontal groundwater velocity was estimated at an average of 2.0 feet per year for saprolite/PWR and 1.5 feet per year for bedrock. The general regional flow direction of groundwater underneath the proposed MSW landfill is to the north, toward the Deep River. As anticipated, vertical gradient calculations from piezometers installed within the boundary of the



proposed facility support the conceptual model that groundwater recharge occurs at higher elevations across the site, flows toward the Deep River, and discharges into lower elevation tributaries and the river.

The Proposed Facility Siting Map (*Drawing EIS-7*) shows several public water supply wells within a two mile radius of the proposed MSW landfill property boundary. It is unlikely that these public water supply wells are in jeopardy of being contaminated by the proposed MSW landfill due to its modern design with a double liner, rigorous construction practices required for landfills, and the presence of surface water barriers (i.e., groundwater discharge features) between the proposed landfill and the water supply wells. No surface water intakes were identified on the Deep River or any other tributaries adjacent to the facility within 25 miles of the proposed MSW landfill property boundary.

As noted above, thirteen public water supply wells were identified within a 2-mile radius of the facility, the majority of these well were located to the east and southeast of the proposed landfill. The depths of local public water supply wells ranged from 30 feet BGS to 500 feet BGS with an average depth of approximately 245 feet BGS. The local public water supply well yields ranged from 12 to 200 gallons per minute with an average yield of approximately 55 gallons per minute.

In addition to public water supply wells, several individual residence potable wells are within the immediate vicinity of the proposed project site. As with the public water supply wells, these wells are not anticipated to be impacted by landfill activities due to the proposed liner system. In the unlikely event of a release, which would be detected through the use of the “witness zone” within the liner system and supplemented with a network of groundwater monitoring wells, the average groundwater rates are relatively slow and a large buffer exists around the proposed waste footprint.

4.11.3 Stormwater

During the second phase of subsurface investigation at the subject property, it was determined that, due to the number of acres that needed to be disturbed to construct drilling access roads, an Erosion and Sediment Control (E&S) Plan was necessary. Golder completed an E&S Plan with the assistance of Randolph County in August 2012 prior to commencing road construction activities. After the completion of the drilling activities in October 2012, the disturbed areas were seeded and are currently being monitored in accordance with permit requirements. Once adequate vegetative ground cover is established, monitoring activities will be ceased until further construction activities are commenced. No other industrial activities are being performed on the subject property that would require the monitoring of stormwater at this time. A description of how stormwater will be addressed during construction and operation of the MSW landfill is addressed in Section 5.11.3 of this report.



4.11.4 Wastewater

Currently there are no industrial activities that produce waste water within the proposed MSW landfill property boundary. If landfill construction occurs, waste water will be generated by this industrial activity (i.e., leachate); methods that explain how this wastewater will be addressed are included in Section 5.11.4 of this report.

4.12 Forest Resources

This Section characterizes the forest resources, both natural and silvicultural, within the proposed MSW landfill property boundary. The information presented in this Section has been compiled from the 1999 Randolph County Natural Heritage Inventory. The study area lies within the Deep River Corridor's Central Falls Slopes, as designated in the 1999 Randolph County Natural Heritage Inventory. The inventory goes on to describe the site as follows:

"The Central Falls Slopes is approximately 2 mi south of Worthville Woods; Lake Ramseur Woods is about 4 miles to the east. The Deep River serves as a corridor to connect the three. The Central Falls Slopes contains four natural communities and a large area of aquatic habitat. Cox Dam, a twenty foot dam associated with an abandoned hydroelectric plant has created a small reservoir on the Deep River. Like most impoundments in the Piedmont, the resulting pool is narrow, long, and relatively shallow. At least three points along the margin of the reservoir small marshy wetlands are present. It appears that these developed where small creeks flow into the reservoir through sedimentation of the small cove or inlet that would have existed when the dam was first built and subsequent formation of a small levee at the margin of the reservoir through sediment deposition from the river itself. Though this is not the normal mechanism by which Floodplain Pools develop, these occurrences best fit that community in structure and composition. When visited in September, at the end of an extended dry period, two of the three lacked standing water. It is likely they flood for variable lengths of time in the winter and spring. The Floodplain Pools lack a canopy but scattered individuals and snags of flood tolerant species such as Salix nigra (Black willow) and Fraxinus sp. (Ash) are present in their interior. Wetland shrubs such as Alnus serrulata (tag alder), Cephalanthus occidentalis (Buttonbush) and Cornus amomum (Silky dogwood) are present on the margins. Herbaceous vegetation dominates. Aneilema keisak forms extensive mats and a variety of other herbs are present including Peltandra virginica (Green arrow-arum), Commelina virginica (A dayflower), Impatiens capensis (Orange jewelweed), Leersia oryzoides (Rice cutgrass) and Boehmeria cylindrica (False nettle). Where there is standing water aquatics such as Wolffia papulifera (Water-meal), Lemna perpusilla (Small duckweed) and Myriophyllum brasiliense (Parrotfeather) are present."

"At several points the base of the slope supports Piedmont Heath Bluff. The canopy contains trees from the surrounding communities including Fagus grandifolia (Beech), Liriodendron tulipifera (Tuliptree), Nyssa sylvatica (Black gum) and Quercus spp. (Oaks). The subcanopy includes canopy species as well as Ostrya virginiana (Hop-hornbeam), Carpinus caroliniana (Ironwood), Ilex opaca



(American holly) and *Magnolia acuminata* (Cucumber-tree). Areas of Piedmont Heath Bluff are dominated by a dense shrub layer of *Kalmia latifolia* (Mountain laurel); a variety of other shrubs occur intermittently including *Symplocos tinctoria* (Horsesugar), *Viburnum acerifolium* (Mapleleaf arrowwood) and *Calycanthus floridus* (Eastern sweetshrub). Herbs are sparse. Among those present in summer were *Chimaphila maculate* (Pipsissewa), *Mitchella repens* (Partridge berry), *Iris cristata* (Dwarf crested iris), *Galax aphylla* (Galax) and *Hexastylis virginica* (Virginia heartleaf).”

“Other areas along the shore of the reservoir support a strip of alluvial vegetation variable in width. Woody vegetation dominates including species such as *Salix nigra* (Black willow), *Fraxinus* sp. (An ash), *Betula nigra* (River birch), *Platanus occidentalis* (Sycamore), *Acer negundo* (Box elder), *Asimina triloba* (Common pawpaw) and *Ligustrum sinense* (Chinese privet). Herbs and vines present include *Humulus japonicus* (Japanese hops), *Mikania scandens* (Climbing hempvine), *Carex* spp. (Sedges) and grasses.”

The hill south of the reservoir has a small Piedmont Monadnock Forest at the summit. This area is dry and rocky and dominated by *Quercus montana* (Chestnut oak). *Quercus alba* (White oak) and *Carya* sp. (Hickory) are also present in the canopy. The shrub and herb layers are sparse, and it is here that a small population of *Amorpha schwerinii* (Piedmont indigo-bush) occurs. Most of the upland portions of the site contain Dry Oak-Hickory Forest. The canopy contains a variety of oaks (*Quercus montana*, Chestnut oak; *Quercus alba*, White oak; *Quercus stellata*, Post oak; *Quercus falcata*, Spanish oak), *Acer rubrum* (Red maple) and *Oxydendrum arboretum* (Sourwood). Included in the subcanopy are *Cornus florida* (Flowering dogwood), *Acer rubrum* (Red maple) and *Nyssa sylvatica* (Black gum). A variety of shrubs are present including *Vaccinium arboreum* (Sparkleberry), *Viburnum acerifolium* (Mapleleaf arrowwood), *Kalmia latifolia* (Mountain laurel), *Symplocos tinctoria* (Horsesugar) and *Aesculus sylvatica* (Painted buckeye). *Vitis rotundifolia* (Muscadine) is the most common vine. Herbs are sparse. Included here are common Piedmont species such as *Chimaphila maculata* (Pipsissewa), *Tipularia discolor* (Cranefly orchid), *Desmodium nudiflorum* (Woodland tick-trefoil) and *Polystichum acrostichoides* (Christmas fern). The lower slopes are more mesic and support Dry-Mesic Oak-- Hickory Forest. *Liriodendron tulipifera* (Tuliptree), *Fagus grandifolia* (Beech) and *Tilia* sp. (Basswood) appear in the canopy in addition to those present further up slope. Both the subcanopy and shrub layer become more diverse and include *Ostrya virginiana* (Hop-hornbeam), *Amelanchier arborea* (Downy serviceberry), *Ilex opaca* (American holly), *Viburnum dentatum* (Arrowwood) and *Hamamelis virginiana* (Witch-hazel).”

As discussed in Section 4.3 of this report, the proposed MSW development tract has been the source of pine and hardwood silviculture, including timbering in recent years. Recent timber clear-cuts, mechanical site preparation, and re-plantings now dominate the interior of the proposed MSW development tract. A large section of the proposed MSW landfill unit has been timbered and clear-cut since 2008. Examination of older aerial photographs, using Google Earth, reveal a pattern of periodic timbering and cultivated fields reverting to forest since the early 1990s. This land-use pattern has been confirmed by an



archeological survey performed by Golder, which documented and detailed the historical land-use associated with the property. Evidence of the timbering operations including soil erosion, gulying, terracing, and field rock clearing are still very apparent at on the proposed MSW development tract.

4.13 Fish, Shellfish and Their Habitat

The Deep River is adjacent to the proposed MSW property on the north side of the property boundary. The Deep River is approximately 125 miles long and is one of the major tributaries of the Cape Fear River in north central NC. The Deep River ecosystem is split along the northern property boundary of the proposed landfill by an old hydroelectric dam approximately 20 feet tall, referred to as Cox Dam. The dam separates the Deep River ecosystem from a lentic system on the western side to lotic system on the eastern side. The western side of Cox Dam can be described as a long, narrow shaped reservoir that contains steep side slopes and a very narrow flood plain. Wetland areas are present at the confluence streams and the Deep River on the western side of Cox Dam along the northern property boundary. The Deep River is likely used by some recreational kayakers and canoers; however, there are no mapped boat ramps on the upper portions of the Deep River. Recreational fishing also occurs along the Deep River; however, there is no known commercial fishing or aquatic agricultural operations in the vicinity of the proposed facility.

The Deep River in the area of the proposed landfill likely harbors a very diverse aquatic population of benthic invertebrates, fish, shellfish, amphibians, reptiles, waterfowl, and mammals. Extensive environmental study has been done characterizing the ecosystem of lower portions of the Deep River in relation to the removal of the Carbonton Dam which was located 9 miles west of Sanford, NC at the junction of Chatham, Lee, and Moore Counties. Work began in October 2005 to remove the dam and the dam removal was completed in February of 2006. It is likely that most of the common species identified during these ecological studies are present in the portion of the Deep River adjacent to the proposed landfill facility.

The Deep River ecosystem adjacent to the facility likely includes common fish species including shiners (*Notropis* sp.), darters (*Percina* sp.; *Etheostoma* sp.), sunfish (*Lepomis* sp.), speckled killifish (*Fundulus rathbuni*), blueheaded chub (*Nocomis leptocephalus*), eastern pickerel (*Esox americanus*), eastern mosquitofish (*Gambusia holbrooki*), crappie (*Pomoxis* sp.), bullhead (*Ameiurus* sp.), catfish (*Ictalurus punctatus*), longnose gar (*Lepiostteus osseus*), american eel (*Anguilla rostrata*) and the largemouth bass (*Micropterus salmoides*). In addition to a healthy fish population the adjacent section of the Deep River likely hosts a diverse population of mollusks, mussels, crayfish and other common shellfish.

Randolph County accommodates one critically endangered species of fish; the Cape Fear Shiner (*Notropis mekistocholas*). The Cape Fear Shiner was listed as critically endangered by the U.S. Fish and Wildlife Service in 1988. There are only four documented remaining populations of the Cape Fear Shiner



within the Cape Fear River Basin with the strongest community being located at the confluence of the Deep and Rocky Rivers located in Chatham and Lee Counties. The closest recognized Cape Fear Shiner community is located at the confluence of the Deep River and Fork Creek approximately 25 miles downstream from the proposed landfill property. Three dams separate the adjacent portion of the Deep River and the Cape Fear Shiner communities located in the southeastern portion of Randolph County.

4.14 Wildlife and Natural Vegetation

As discussed in Section 4.2 the proposed landfill property is located near the Central Falls Slopes area characterized above in an excerpt from the 1999 Randolph County Natural Heritage Inventory. The excerpt from the Randolph County Natural Heritage Inventory in Section 4.2 gives a general description of the natural vegetation and wildlife present within the Central Falls Slopes including dominant plant, aquatic, and terrestrial wildlife species. This section focuses on rare, threatened, and endangered species with the potential to be present on within the property boundary or species present in Randolph County in general.

4.14.1 Rare, Threatened, or Endangered Species

A letter was drafted to the NCNHP in September 2010 to assess the potential for the existence of threatened or endangered species within the proposed MSW property boundary (included in this report as *Appendix EIS-E*). In a response to the September 2010 letter, the NCNHP indicated the presence of a significant natural community, described as a Piedmont Monadnock Forest, within the proposed landfill property boundary, the letter also indicated the potential presence of a rare vascular plant *A. schwerinii*. In addition to the letter to the NCNHP, the USFWS website, the NCNHP website, and available GIS information was examined to determine the potential of the property to host rare, threatened, or endangered species. Two endangered species, a plant and a small fish, were identified within Randolph County; however, they do not appear to exist within the property boundaries of the proposed MSW landfill based on available data and site surveys. This section of the report summarizes the results of the research described above and addresses each species individually.

4.14.1.1 Schwerin's False Indigo

The State significantly rare piedmont indigo-bush known as Schwerin's False Indigo (*Amorpha schwerinii*) is a plant native to a Piedmont Monadnock Forest community, but its existence is dependent on disturbance regimes that create habitat openings to remain viable, such as fire or storm winds that kill hardwood trees on the thin soils of this forest type, and therefore *A. schwerinii* may not always be present.

In October 2010, in response to the September letter from NCNHP, the County voluntarily hired a Golder ecologist to conduct a brief survey of the proposed landfill site and identified occurrences of *A. schwerinii*. Golder identified and mapped four occurrences of *A. schwerinii*, totaling approximately 16 plants in an



estimated area of 225 square feet, along the north and northwestern slopes of the survey area. Golder returned to the site in June 2011 to conduct a more detailed survey of the site, during the best seasonal period within which to view the plant, when the plants may contain seed and flowers. The results of the June 2011 survey are discussed below.

In June 2011, Golder ecologists performed a limited systematic botanical survey on the 667 acre proposed landfill property; specifically in the area mapped by the NCNHP as Piedmont Monadnock Forest. A large portion of the property was timbered in the winter of 2009 subsequently compromising observations of the natural conditions of the vegetative community due to the presence of debris and re-sprouting vegetation. Since the Piedmont Monadnock Forest is dominated by chestnut oak (*Quercus montana*), Golder determined the limits of the forest type during the course of the field survey based on the presence of chestnut oak saplings ranging from 1 to 3 feet in height. As a summary during the "Limited Systematic Survey for *Amorpha schwerinii*" Golder identified four areas during its survey that contained *A. schwerinii*, and assigned each area a location number within the overall plant community for mapping purposes. At each location, Golder estimated the number of plants, the size of the area containing the plants in square feet, the average height of the plants, the area of canopy created by each of the plants at each site, and whether flowers were present. Three *A. schwerinii* plant communities were identified along north and northwestern slopes of the area identified as a Piedmont Monadnock Forest at approximate elevations of 730 to 830 feet AMSL. A fourth *A. schwerinii* was found on a southwestern facing slope of the area mapped as a Piedmont Monadnock Forest at an elevation of approximately 820 feet AMSL. See *Drawing EIS-3* of this report or review *Appendix EIS-H* to view the mapped locations of *A. schwerinii* within the proposed MSW landfill boundary.

The Piedmont Monadnock forest type at the location of the proposed landfill has been timbered, and contains an estimated 700 *A. schwerinii* individuals located by Golder. The recent timbering of the Piedmont Monadnock Forest portion of the Central Falls Slope natural heritage area has diminished its value as an intact example of a significant natural community, therefore resulting in NCNHP no longer considering the forest type a high protection priority at this site (NCNHP pers. communication, November 23, 2012). NCNHP nonetheless encourages protection of *A. schwerinii* in its natural habitat at the site. Populations of *A. schwerinii* occur nearby at the NC Zoological Park and on the Uwharrie National Forest, where park managers have first-hand experience with the management of the plant species and may be able to offer management recommendations to Randolph County. A review of *Drawing EIS-3* shows the mapped areas of *A. schwerinii* is not located within the proposed LOW or associated development areas; therefore, the *A. schwerinii* populations should not be impacted by development of the property. Details of the limited systematic survey and its findings can be found in "Limited Systematic Survey for *Amorpha schwerinii* Report" included as *Appendix EIS-H*.



4.14.1.2 Cape Fear Shiner

As discussed in Section 4.13 of this report the United States Fish and Wildlife Service (USFWS) lists the Cape Fear Shiner as a critically endangered species native to Randolph County and the Cape Fear River Basin. According to the USFWS's "Cape Fear Shiner Recovery Plan," there are four documented remaining populations of the Cape Fear Shiner within the Cape Fear River Basin with the strongest community being located at the confluence of the Deep and Rocky Rivers located in Chatham and Lee Counties. The closest recognized Cape Fear Shiner community is located at the confluence of the Deep River and Fork Creek approximately 25 miles downstream from the proposed landfill property. Three dams separate the adjacent portion of the Deep River and the Cape Fear Shiner communities located in the southeastern portion of Randolph County.

4.14.1.3 Schweinitz's Sunflower

Schweinitz's Sunflower (*Helianthus schweinitzii*) was listed as federally endangered on May 7, 1991. In 1991 when the species was originally listed there were a total of 13 extant populations (8 in North Carolina and 5 in South Carolina). In 2006, during the USFWS 5-year review of the species records indicated that 165 element occurrences (or 78 distinct populations) in NC. During the initial evaluation of the facility, *H. schweinitzii* was not identified by the NCNHP as being present with a 2-mile radius of the facility.

A recent review of the NCNHP website showed that a population of *H. schweinitzii* has been mapped within the Central Falls Slope area located on the northern side of the Deep River on a property adjacent to the proposed landfill property. A portion of the Central Falls Slope is also shown on the NCNHP within the property boundary of the proposed landfill on the northern side of the facility. The area mapped as the Central Falls Slope will not be disturbed by the development of the proposed landfill and is likely entirely within the proposed 300-foot buffer located along the northern property boundary. During the initial site investigations, this endangered species was not noticed by Golder ecologists as they performed the wetland delineation and "The Limited Systematic Survey for *A. schweinitzii*." Since the species was not identified as a concern at the time of the original notification to the NCNHP, a specific search for the plant was not performed.

Since a population of *H. schweinitzii* was identified close to the area proposed to develop as a MSW landfill, requests were made to the USFWS to obtain additional information about this species' occurrence in Randolph County. The proposed facility is within 0.7 miles of a known occurrence of this species. Therefore, they recommended that a Golder ecologist re-visit the site to perform a search for the endangered plant species during late summer/early fall when the plant is in bloom, with a major focus on the utility ROW and existing road shoulders. They also stated that "the discovery of this species does not preclude the potential to develop the property."



The proposed MSW property does harbor a habitat for the endangered plant species, specifically the utility ROWs that transect the property. According to the “5-Year Review” written by the USFWS, over 90% of the known *H. schweinitzii* populations occur in managed ROWs where the “vegetation management practices occasionally mimic patterns of natural disturbance now largely absent from the present landscape.” While it is possible for the facility to potentially host a population of *H. schweinitzii*, it is not likely that the population is in good condition. Continuous mowing and traffic on the utility ROW have likely limited if not vanquished any population of *H. schweinitzii*. Potential mitigation alternatives (if the species is located in the proposed development area) are discussed in a later section.

5.0 DIRECT IMPACTS OF THE PROPOSED PROJECT

Section 5 of this report discusses the potential direct impacts to the environment, natural resources, and human population located within and around the proposed MSW landfill study area. Secondary and cumulative impacts along with efforts to mitigate these impacts will be discussed in later sections of this report.

5.1 Topography

The existing topography of the proposed MSW landfill development tract will be directly impacted during construction and operation of the of the proposed MSW landfill. Drawings detailing the LOW and supporting structures, base grades and final grades will be submitted to the NCDENR, Solid Waste Section and other State Agencies, as appropriate. Once approval has been granted to begin construction of the proposed MSW landfill, topography across the site will be impacted by grading, cutting, and/or filling operations. Upon closure of the landfill, the top deck of the proposed landfill will be approximately 110 feet higher than the current topographic high point of the site.

Design of the proposed landfill will be completed in a manner to avoid encroaching on the 100-year floodplain. The current design of the proposed MSW landfill presently impacts two intermittent streams (an individual permit will be obtained from the USACE for said disturbance), site grading, including installation of erosion and sediment control features, will maintain a minimum 200-foot buffer from any perennial stream to the LOW.

5.2 Soils

Construction and operation of the proposed MSW landfill will include clearing and grading of approximately 300 acres, which includes the waste disposal cells, cut and fill areas, as well as the proposed perimeter access road. Additional disturbance would include that associated with support facilities such as the scale house, maintenance shop, leachate tanks, erosion and sediment control basins, etc., and potential on site borrow areas.



Construction will occur in multiple phases in accordance with plans submitted to various State agencies for approval as appropriate. Disturbed areas will be lined, paved or otherwise stabilized with aggregate or seeding as appropriate for the planned use of the area (e.g., waste disposal, access road). E&S Plans will be submitted to NCDENR Land Quality as required to support construction activities and operation of the facility. These plans will detail sediment control features to be built including sediment basins and stormwater control channels to control and prevent transport of sediments.

While final design is not completed as of this date, an estimated 3 to 6 million cubic yards of soil may be transported and compacted during construction, operation, and closure of the proposed landfill. Since sufficient on site soils are not likely to be available, the County is currently in the process of identifying potential off-site borrow areas.

In order to minimize direct, secondary, and cumulative impacts to the environment and natural resources, various plans and engineering control features will be utilized as required by State regulations throughout the site preparation and construction phases. These measures will include E&S plans and constructed features which are discussed in more detail later within this report, both during construction and operation of the facility.

The proposed landfill will be built with a dual composite liner system consisting (from the bottom up) of:

- Gundseal (or equivalent) geosynthetic clay liner (GCL)
- Bonded 60-mil high density polyethylene (HDPE) geomembrane
- Double-sided drainage geocomposite (GC) with a triaxial geonet core (i.e., "witness zone")
- 60 mil high density polyethylene (HDPE) geomembrane
- And an overlying leachate collection/protective cover layer (soil or granular material).

This liner system is designed to minimize potential contamination of subsurface soils and groundwater. Potential contaminants associated with operation of a MSW landfill include organic compounds and inorganic constituents. Operating requirements for an MSW landfill includes semi-annual groundwater and surface water monitoring to detect potential releases to the environment. Groundwater and surface water systems associated with MSW landfills in NC are monitored semi-annually for the compounds listed in Appendix I of Chapter 40 of the Code of Federal Regulations (CFR) Part 258.

The dual composite liner system detailed above is designed to minimize the potential release of contaminants to the environment and includes three synthetic liners that are designed to collect leachate generated by the facility and remove it, preventing its release to the environment. Further, the liner is designed and will be constructed such that leachate seepage through the liner, barring the unlikely failure of all three liner components within a 10 acre area, was calculated to be 0.28 fluid ounces or 0.0018



gallons per day assuming a 10' waste lift, 10 year run, with a 6" base of bare soil cover, and 0% runoff. A second calculation assuming a 150' waste lift, 10 year run, with a 12" base of bare soil cover, and 50% runoff also estimated a maximum seepage rate of 0.28 fluid ounces or 0.0018 gallons per day over a 10 acre area. This results in a 99.96% effectiveness of the total liner system. The calculations performed modeling liner seepage was conducted using conservative estimates in the United States Environmental Protection Agency's (USEPA) Hydrologic Evaluation of Landfill Performance (HELP) model.

In addition, upon final closure, a top liner system will be installed to limit runoff and reduce leachate production. The final cover system will consist of either an 18-inch compacted clay-type soil layer or a clay liner placed on 12 inches of compacted soil that covers the waste. This layer will be directly covered by a 40-mil-thick Low-Density Polyethylene (LDPE) geomembrane, and then covered by a GC drainage layer. The GC drainage layer will be directly covered by an 18-inch-thick protective soil cover layer and 6 inches of topsoil that will be planted with native grasses.

5.3 Land-Use

This project will change the project area from a relatively undeveloped area to an area developed for an industrial use (waste disposal). While the project area is bordered to the south by some residential properties and churches/church properties, the area surrounding the proposed facility is industrialized and two landfills (closed and/or active) and an active MSW transfer station are located within 2,000 feet of the proposed LOW.

The facility will be developed to include large buffer areas along property lines and the perennial streams which border the site. In addition, large portions of the site, potentially as much as half of the site, may remain relatively undeveloped. Since the County also owns some of the adjacent parcels, additional secondary buffers exist.

The proposed development consists of 19 parcels, all of which are zoned RA. Operation of a sanitary landfill is permitted as a special use in a RA district. A Special-Use Permit (SUP) was applied for on February 5, 2013 (i.e., 30 days before the public hearing). The SUP was the subject of a public hearing held on March 7-8, 2013, held by the Randolph County Planning Board. The request for a SUP was voted on and approved by the Planning Board on March 8, 2013 and the permit is scheduled to be approved at the April 9, 2013 meeting.

The project is not intended to promote or induce development beyond that associated with the landfill in the near vicinity of the project. It should be noted that development of the landfill will occur over an extended period of time (potentially in excess of 50 years). The facility will be developed in stages and may also be closed in stages. Development during or after operations may include walking trails or other



minimally intrusive recreational uses so as to preserve ecological balance and minimize impacts of landfill operations on the surrounding resident's quality of life.

5.3.1 Other Existing Land-Uses

In addition to the proposed MSW landfill site, the surrounding land-use includes a closed MSW landfill; a County owned shooting range, an active industrial landfill, an active solid waste transfer station. The following sections discuss the direct impacts that may affect these areas.

5.3.1.1 Closed MSW Landfill

As stated previously the County operated a MSW landfill from 1973 through 1997 on a property adjacent to the proposed development tract. The closed, unlined MSW landfill is located on the northwest side of the proposed MSW landfill property. The closed MSW landfill totals approximately 28 acres and was closed in 1997 to comply with the closure deadlines for non-Subtitle D landfills. Based on site-specific hydrogeologic data, the proposed landfill is a sufficient distance from the closed landfill (i.e., according site hydrogeologic conditions) to provide adequate monitor-ability of both landfills and mitigate the potential for direct impacts.

5.3.1.2 Active Training Center/Shooting Range

Randolph County operates a training facility and shooting range for periodic exercises that are conducted by the Sheriff's Department. No direct impacts are anticipated to occur at the shooting range given that it is located approximately 1,350 feet to the east of the proposed MSW landfill site.

5.3.1.3 Industrial Landfill

The active industrial landfill operated by Energizer located to the west of the proposed MSW landfill will not be directly impacted during the various phases of this project. The industrial landfill is located approximately 3,500 feet from the proposed MSW landfill and does not appear to be significantly connected by hydrology to the proposed landfill.

5.3.1.4 Permitted Solid Waste Transfer Station & Convenience Center

The County currently owns a permitted MSW Transfer Station operated by Republic Services to the west of the proposed MSW landfill site. Upon commencement of disposal activities at the new landfill, the County plans on closing the transfer station. Waste disposal vehicles would be diverted via a new route to the proposed landfill. Eventually the transfer station may be converted to a recycling center; however, there are no specific plans for that transition at this time. The convenience center located adjacent to the transfer station will remain open, providing Randolph County residents a place to dispose of their household waste in a safe manner at a separate entrance from the traffic associated with the new landfill. The direct impacts to this facility would be a reduction in the amount of truck traffic.



5.4 Wetlands and Waters of the United States

As discussed in Section 4.4 of this report a wetland delineation was conducted on the proposed MSW landfill property using the USACE Eastern Mountains and Piedmont Region regional supplement to the 1987 USACE wetland delineation manual. The results of this wetland delineation were detailed in the RJD submitted on August 20, 2012 and modified February 19, 2013 following site walkovers with representatives from the USACE and NCDENR.

As mentioned development of the proposed facility will include the destruction of 0.06 acres wetlands (1.37 acres mapped) and approximately 1,200 linear feet of intermittent streams (5,170 linear feet mapped). No perennial streams will be impacted by the proposed development of the MSW landfill disposal unit (as required by relevant solid waste laws). Currently no specific crossings have been designed for Gabriel's Creek to allow for traffic to enter the facility from the east (i.e., Old Cedar Falls Road). However, the design will limit the overall impacts to Gabriel's Creek where possible and cost-feasible. One potential option is an elevated crossing that has no structural elements placed within the creek bed; therefore, not directly impacting the Gabriel's Creek. Other design options may be considered for a stream crossing; however, the potential environmental impacts of any stream crossing would be evaluated as part of those options. Required modeling of potential floodplain impacts as well as required permitting of the crossing will occur as part of the detailed facility engineering design.

Disturbance of any wetlands or intermittent streams is not necessary during the first Phase of construction and is not expected to occur until the facility has been in operation for at least 30 years (i.e.; during later phases). As the facility expands to the point where wetlands or intermittent streams may be disturbed or destroyed, an Individual Permit application will be prepared detailing the wetlands to be disturbed or destroyed and the proposed mitigation. Since the proposed disturbance is in excess of five years in the future (the life of a typical Individual Permit), the Individual Permit will not be prepared at this time.

Long-term impacts to streams and wetlands from the proposed landfill, other than the disturbances discussed above, are expected to be minimal. The facility has been designed to minimize impacts to the streams and wetlands identified on the site. Minimal site development, except for potential borrow areas, is expected to occur in the drainage basins of other intermittent streams identified on site. While borrow areas will likely be developed on other portions of the site, engineering design and controls will attempt to limit the disturbance of intermittent streams. The borrow areas that are constructed will utilize appropriate E&S control features, as required by land disturbance permits.

No addition to, withdrawal from, or diversion of surface water is expected to be required during development of the site. The current design proposes access to the site from Old Cedar Falls Road. The access road may be designed with an elevated stream crossing (i.e., a bridge) across the Gabriel's Creek floodplain. The elevated crossing has not been designed as of this date, but could potentially span



between 400 and 500 feet. If the County decides on the elevated stream crossing no structural support elements for the bridge will be placed in Gabriel's Creek and no abutments will be built within the 100 year floodplain. If alternative options are considered, a permitted stream crossing will be obtained from the USACE and the floodplain will be modeled to ensure that any abutments will not excessively increase flood hazards in the area, as required.

5.5 Prime or Unique Agricultural Lands

The Farmland Protection Policy Act (FPPA) was established is to minimize to the extent to which Federal programs contribute to the unnecessary and irreversible conversion of important farmland to non-agricultural uses and to encourage alternative actions, if appropriate, that could lessen the adverse effects on farmland. It also assures that Federal programs are operated in a manner that will be compliant with State, local government, and private programs that protect farmland. The NRCS is the agency responsible for ensuring that FPPA is implemented. No prime or unique farmland has been identified within the proposed MSW landfill property boundary, as defined by the FPPA or NRCS, therefore no direct impacts to such lands are anticipated.

5.6 Public Lands and Scenic, Recreational and State Natural Areas

As discussed in Section 4.6, no federal, state, or local parks, game lands, scenic or recreational areas, or lands protected by a conservation easement are located on or adjacent to the proposed MSW landfill property and therefore no impacts are anticipated. A significant Natural Heritage Area was originally identified on the northwestern highland portion of the property and was identified as a Piedmont Monadnock Forest. Due to recent timbering of the forest, the value of the forest considered low and the forest was removed from the significant Natural Heritage Area list in 2011. A portion of the area identified as the Central Falls Slope (also a significant Natural Heritage Area), characterized in Section 4.12 of this report, and is located within the northern property boundary of the proposed landfill property boundary. The significant Natural Heritage Area identified as the Central Falls Slope shown on the NCNHP website is located within the proposed property line buffer along the facility's northern property line and is not impacted by the current design of the proposed landfill or support structures.

As discussed previously in this report, the Deep River forms part of the northern and northeastern property boundary. The proposed landfill site will be constructed with buffers of 300 feet as required by 15A of the North Carolina Administrative Code (NCAC) 13B .1624(b)(3)(A). As discussed, it is likely that the Deep River is used by some County or State residents for recreational purposes. Based on the current design of the landfill, and the location of the dam located to the north of the proposed facility, there is no anticipated loss of recreational use along this portion of the Deep River. The current design of the proposed landfill attempts to limit the aesthetic impacts of the landfill to the Deep River recreational area. As required by the SUP, soil berms will be utilized by the operator to limit the views of the active "working



face” of the landfill as the facility progresses to grades that would be visible from the River. Due to high topographic relief along the northern property boundary it is likely that someone traveling down the river in this area would not even see the landfill until the late stages of development, if at all.

5.7 Areas of Archeological or Historical Value

As discussed in Section 5.7 of this report, a cultural resources survey was conducted on the proposed MSW landfill property per the recommendation of the NCNHP. The cultural resources survey was completed in two phases both of which are included in this report as *Appendix EIS-D*. In summary, the Phase I survey resulted in the identification of 34 cultural resources, 19 archeology sites, and 15 isolated artifact finds. Four of the archeological sites were initially considered as potentially eligible for inclusion in the NRHP. Golder evaluated the two of the selected archeological sites that were anticipated to be disturbed during site development during a second survey (Phase II), and determined that the sites were not eligible for inclusion in the NRHP. The other two sites were located within the proposed buffer area outside of the proposed development area.

Three buildings were identified during the cultural resource study conducted by a Golder archeologist. The three buildings identified were of historical age (i.e., greater than 50 years); however, the buildings were in poor condition. Two of the structures had already fallen completely to the ground. The only remaining standing structure is an old pole barn located on the eastern central portion of the property outside of the current area proposed for development. Based on the condition of the barn, it is likely that the structure will fall to the ground on its own within a few years. Photographs and exact locations of these structures are documented in the *Cultural Resource Surveys* included in *Appendix EIS-D* of this report. As discussed none of these areas were determined to be eligible for inclusion into the NRHP; therefore, development of the proposed landfill will not directly impact areas deemed as valuable archeological or historical sites.

5.8 Air Quality

Air quality will be directly impacted during construction and operation of the proposed landfill. During construction of the proposed facility, air quality will be directly impacted by dust generated during earth work operations and motor vehicle exhaust associated with construction equipment. Mitigation measures such as the use of water trucks and paved roads to suppress dust will be implemented once construction activities are initiated as required by regulation. In addition, during land-clearing associated with construction activities, odors could potentially impact the ambient air quality if open burning is implemented as a land clearing measure. If open burning is implemented, it will be conducted in accordance to the requirement of the NC Division of Air Quality and any necessary permits will be obtained prior to conducting open burning activities.



During operation of the landfill, ambient air quality will be impacted by haul truck traffic bringing wastes to the proposed facility for disposal, equipment associated with landfilling activities (e.g., compactors, haul trucks, etc.) and emissions of landfill gas (LFG) from the waste mass, which would be minimized with LFG collection and control measures. Once on-site MSW landfill units reach approximately 2.7 million tons (i.e., U.S. short tons) of in-place waste, they must comply with Title V of the Clean Air Act, wherein the facility is subject to the collection and destruction of landfill gas to control emissions to the environment. In addition, the New Source Performance Standards (NSPS) of the Clean Air Act restrict air emissions from stationary sources such as landfills, and require pollution control technologies for the abatement of greenhouse gases. It is anticipated that once LFG generations reaches a sufficient quantity, which may occur before 2.7 million tons of waste are in-place, LFG will be collected and used for power generation or alternate beneficial reuse. LFG collection may occur prior to that tonnage if sufficient quantity and quality is present for collection and beneficial re-use and/or LFG odors become a significant issue. However, given the large buffers at the site, it is unlikely that odors would travel off site.

Odors are associated with landfilling activities and they may affect ambient air quality. However the facility will be operated in a manner to minimize odor generation by taking such steps as minimizing the area of the working face, use of daily cover, and collection of LFG. As necessary, environmentally friendly, odor neutralizing agents may be employed to prevent off-site odor migration. In addition, the facility will be designed such that it may be closed in stages as necessary to help reduce emission of LFG, prevent odors associated with operation of the landfill, and reduce the potential for odor complaints.

5.9 Noise Levels

Development of the project will increase noise levels during construction and operation of the proposed facility. During periods of construction, noise impacts to surrounding residents will include those associated with the operation of heavy equipment that will be used during the land-clearing and construction operations at the proposed landfill site. Construction activities are expected to be limited to daylight hours and will occur for only a limited period of time as each phase of the proposed facility is developed.

During operation of the facility, noise impacts to surrounding residents will include that associated with waste hauling activities (e.g., truck traffic on surrounding roads and within the facility) and truck traffic associated with waste hauling and noises associated with waste spreading and compaction equipment. Operational hours for the proposed with the landfill will be limited by permit and typically are limited to 7:30 a.m. to 5:00 p.m. Monday through Friday, from 7:30 a.m. to noon Saturdays, and closed Sundays and major holidays.

Noises generated by landfill construction and operations are attenuated by the use of buffers that provide distance between the source and the property line. Vegetated buffers are especially effective at



attenuating noise, as well as providing a visual barrier and improved aesthetics for off-site individuals. Also, topography can be used effectively as a barrier to noise migration and the topography surrounding many portions of the site is expected to decrease noise migration. Noise from the use of heavy equipment and further mitigation measures pertaining to secondary and cumulative impacts to surrounding residential areas are discussed later in this report. Sound impacts will attenuate with distance from the source and will be mitigated by the presence of vegetation within buffers.

5.10 Traffic Conditions

The increase of traffic in the surrounding residential areas will be a direct impact associated with the construction of the proposed landfill. Additional traffic will occur periodically, especially during the initial land-clearing and construction activities, as heavy equipment will be transported to the proposed site via truck and trailer, and as off-site soils are brought to the facility. The increase in traffic during the initial phases of the project will be sporadic and trend downward after the necessary heavy equipment arrives at the proposed site.

Upon completion of the landfill construction, operation of the facility will begin and traffic that once used Henley Country Road and County Land Road will decrease as a new entrance to the landfill will be used, as shown on the proposed Facility Plan (*Drawing EIS-4*). The secondary and cumulative impacts of traffic associated with waste hauling activities, along with potential mitigation measures are discussed later in this report.

5.11 Water Resources

Direct impacts to the water resources within the proposed study area are discussed within this Section. Water resources that may be used by the surrounding residents and wildlife that could be directly impacted include surface waters, groundwater, stormwater, and wastewater. In order to decrease direct impacts to these water resources and provide protection of riparian buffers, appropriate buffers (i.e., buffers prescribed by the NCSWMR) and erosion control measures will be constructed and implemented at the site. The buffers prescribed by the NCSWMRs (i.e., a 300-foot property line buffer and a 200-foot buffer from perennial streams) are the most stringent buffers required for a facility of this type. A portion of the buffer along the southern property boundary has been conceptually designed with a 400-foot buffer based on a contingency offer to purchase between the County and the current landowner of the property. Based on our review of available data, the proposed MSW landfill facility is not located in a watershed where special buffer rules apply.

The proposed MSW landfill unit will be located on the eastern-central portion of the approximate 667 acre site, as shown on *Drawing EIS-2*. The proposed MSW landfill has a waste footprint of approximately 200 acres. Development of the proposed landfill will include construction of access roads, borrow areas, stormwater/E&S control features, scales and a scale-house, a maintenance building, leachate tanks, and



additional infrastructure that may be required to support landfill operations. Stormwater runoff will be controlled during construction and operation of proposed facility in accordance with State permit requirements as discussed below to minimize/prevent impacts to surrounding water bodies. Final design of the facility is not completed as of this date, but impervious areas associated with the proposed facility are expected to be limited to approximately 2,500 linear feet of road, less than 1 acre of parking lot/miscellaneous paved areas, and relatively minor amounts of roofed area (associated with scale house, maintenance/office building, and leachate tanks). These impervious features discussed above represent 0.5 percent of the total property area which currently contains no impervious surfaces. The waste disposal area will be capped and covered with vegetation and is not considered to represent an impervious area for purposes of stormwater control.

Potential impacts to water resources, including surface water, groundwater, stormwater, and waste water, by siting and development of the proposed solid waste disposal facility are discussed as follows.

5.11.1 Surface Water

The proposed landfill facility is located within the 12-digit HUC basin identified as Hasketts Creek-Deep River (i.e., #030300030203). The proposed facility is not expected to significantly impact hydrology, channel stability, water quality, and biodiversity in any of the perennial water bodies which surround or bisect the site. While development of the proposed facility will impact approximately 0.06 acres wetlands and approximately 1,200 linear feet of intermittent stream, no development beyond site grading will occur within 200 feet of a perennial stream, with the potential exception of Gabriel's Creek. One design option of an elevated crossing would not call for site grading activities to occur within the 100-year flood plain of any perennial stream bordering the facility nor would it call for structural elements for the crossing of Gabriel's Creek will be placed within the creek bed. The design of this facility is still in the conceptual stages and if design conditions change so that grading activities do occur in the 100-year flood plain or structural elements for the crossing of Gabriel's Creek do become required, the appropriate permits will be obtained and industrial standards will be utilized to mitigate potential impacts to surface water features and quality.

In addition, erosion and sediment control features and storm water discharge controls will be designed in accordance with NCDENR permit requirements as discussed below such that stormwater discharges will not impact hydrology, channel stability, water quality, and biodiversity in any of the perennial water bodies which surround or bisect the site. Surface water will be monitored as part of the facility's semi-annual water quality monitoring program under 15A NCAC 13B .0602.

5.11.2 Groundwater

Potential contaminants associated with operation of a MSW landfill include organic compounds and inorganic constituents. Operating requirements for an MSW landfill includes semi-annual groundwater



monitoring in a network of wells to detect potential releases to the environment. Monitoring wells will be placed between the waste unit and the property line within the buffer and the network will be designed on site-specific hydrogeologic features. Groundwater is monitored for the compounds listed in Appendix I of 40 CFR Part 258 in accordance with 15A NCAC 13B .1632.

As discussed in Section 5.2, the landfill itself will be built with a dual composite liner system equipped with a witness zone between the two composite liner systems. The liner system is designed to minimize the potential release of contaminants to the environment and includes two layers with which to collect leachate generated by the facility and remove it, preventing its release to the environment. The primary leachate collection layer will be composed of a soil or stone layer complete with perforated HDPE pipes used to collect leachate produced by the decomposing waste. A secondary zone referred to as the “witness zone” (i.e., the dual sided GC drainage layer between the two layers of 60 mil HDPE) will drain to a sump where if there is any seepage or leakage from the first geosynthetic liner system it will be discovered and evacuated. This “witness zone” will serve as the primary means of detecting a potential threat to groundwater and will be supplemented with additional monitoring as described later in this report. As discussed in Section 5.2 of this report, the USEPA’s HELP model was run to estimate landfill liner seepage. Under two conservative scenarios, the model estimated a maximum seepage rate of 0.28 fluid ounces per day or 0.0018 gallons per day across a 10 acre area, which results in a 99.96% effectiveness of the total liner system. Upon final closure, a top liner system will be installed to limit leachate production, further reducing potential impacts to groundwater. Based on site-specific data, horizontal groundwater flow rates are relatively slow, further limiting any potential groundwater impacts.

5.11.3 Stormwater

Stormwater will be directly impacted during the land-clearing and construction phases of the proposed landfill. During these phases additional sediment loads to the stormwater are a concern. The site will implement erosion control measures and construct erosion control features such as sediment ponds to mitigate the potential increase of sediment in the stormwater. These features and control structures will be designed by a professional engineer, approved by the State of NC Division of Land Quality, and implemented prior to disturbing greater than one acre of land.

Upon completion of the landfill prior to accepting MSW a Stormwater Pollution Prevention Plan (SWPPP) will be developed per the requirements of the general discharge permit that is part of the National Pollution Discharge Elimination System (NPDES) rules. The SWPPP will assist in controlling any direct, secondary, or cumulative impacts to stormwater once the landfill is in operation and address the required mitigation measures if stormwater analytical results are greater than established ranges. As part of the general stormwater permit requirements, stormwater will be analyzed semi-annually and inspected weekly.



5.11.4 Wastewater

Leachate will be generated as a wastewater from the proposed facility. However, based on the design criteria presented above, no direct impacts related to water resources within the proposed study area due to wastewater are anticipated. Wastewater will be stored and treated (if necessary) on site, before being transported via sanitary sewer connection to the local POTW for treatment and disposal. Leachate volumes will vary over the life of the facility and will be highest when approximately 10 feet of waste are in place. Based on HELP model predictions, a 10-acre cell with 10 feet of waste produces approximately 10,000 gallons per day while a 10-acre cell with 150 feet of waste produces 1,000 gallons per day. Since the current nearby POTW facility is well under its design capacity, no significant impacts are anticipated as a result of site development.

5.12 Forest Resources

The existing forest resources characterized in Section 4.12 will be directly impacted during the initial site development for the proposed landfill. As discussed previously, pine and hardwood silviculture has historically occurred on the proposed landfill development tract. Recent timber clear cuts and mechanical site preparation and replanting dominate the interior of the tract. A large area of the proposed landfill tract was clear-cut from late 2007-2009. Periodic timbering of the proposed landfill tract and surrounding area have been documented since the early 1990s.

During the initial site development, prior to construction, is when the bulk of the direct impacts to forest resources will occur. An estimated 300 acres of land will be cleared and/or graded over the life of the facility. The construction will occur in phases in accordance with the required plans approved by various State agencies. The contractor selected to harvest the trees prior to construction of the proposed landfill will be responsible for using best management practices (BMPs) that conform to the industry standard for timbering operations. As discussed in previous sections, of this report no disturbance will occur within 200 feet of a perennial stream. The disturbances to intermittent streams and wetlands will be limited. The necessary permits will be obtained prior to impacting onsite intermittent streams and wetlands, as detailed in other sections of this report.

5.13 Shellfish or Fish and their Habitats

No shellfish, fish, or their habitat will be impacted during the construction of the proposed landfill. As noted in Section 5.11.1, no development beyond site grading will occur within 200 feet of a perennial stream/river and any stream crossings may be elevated. Lastly, stormwater runoff will be controlled and transport of sediments prevented such that no detrimental impacts to the perennial streams which surround/bisect the site are anticipated.



5.14 Wildlife and Natural Vegetation

As discussed in previous sections of this report approximately 300 acres of land will be directly impacted by this project. The remaining 367 acres of the total property may see some direct impacts during the proposed life of the facility. A major portion of the total property is forest (i.e., older deciduous hardwood or young evergreens) or recently timbered hardwood forest. The development of the property will likely displace some wildlife; however, since the facility is to be developed in phases with a minimal disturbance at any given time it is likely that some wildlife may just migrate to inactive portions of the property. The buffers required by NCSWMR are greater than or equal to the buffers typically recommended by the USFWS which should give wildlife room to travel within and around the property.

Approximately 1,200 linear feet of intermittent stream and 0.06 acres of wetlands will be impacted by the proposed development; however, no perennial streams within the proposed waste footprint development tract will be impacted. The most likely stream crossing option for the access road is an elevated stream crossing of Gabriel's Creek. Other options may also be considered. However, neither the elevated stream crossing nor other potential options will significantly affect the stream bed and therefore will have little impact to the aquatic habitat of Gabriel's Creek. Due to the controls prescribed above, it is not anticipated that this project will impact the diversity or number of species of plants or animals within the proposed development tract. Based on our review, this project complies with local policies and ordinances protecting natural resources.

5.14.1 Rare, Threatened, or Endangered Species

The necessary research and ecological surveys have been conducted to ensure that no rare, threatened, or endangered species will be directly impacted by the development of the subject property into a MSW landfill with one exception. Based on a recent listing, the Schweinitz's Sunflower survey is tentatively scheduled for late summer/early fall during the blooming season. If species are found in areas of the property where site disturbance is anticipated, relocation of these plants is a likely scenario based on information received by the USFWS. If conditions change, Golder and the County intend to keep the NCNHP and the USFWS informed and will notify these agencies if any direct impacts to rare, threatened, or endangered species become a possibility, which is unlikely as site development progresses.

5.14.1.1 Schwerin's False Indigo

As discussed in Section 4.14.1.1 of this report the significantly rare plant known as Schwerin's False Indigo (*Amorpha schwerinii*) was discovered within the proposed MSW landfill property boundary on the northwestern facing slopes of the large hill located on the northwestern portion of the property. The County completed a voluntary "Limited Systematic Survey for *A. schwerinii*" and noted the location, size, number, and maturity of the *A. schwerinii* within the proposed MSW property boundary. The selected alternative footprint of the proposed MSW landfill excludes the portion of the facility that hosts the



populations of *A. schwerinii*; therefore, there will be no direct impacts to the surveyed populations of the plant.

5.14.1.2 Cape Fear Shiner

Though it is lotic in nature, the area of the Deep River adjacent to the proposed landfill is a deeper water environment than that necessary to accommodate the Cape Fear Shiner. Because there is a lack of natural habitat and a great distance and physical barriers between known Cape Fear Shiner populations, no further study was necessary with respect to this critically endangered species since even if present, this species would not be impacted by site development. Runoff from the facility will be controlled and regulated by an approved E&S Plan and discharges from E&S features will be monitored under the State of North Carolina's general stormwater permit for landfills.

5.14.1.3 Schweinitz's Sunflower

To date no known populations of Schweinitz's Sunflower (*H. schweinitzii*) exist within the proposed MSW development tract. The plant was not noted during other ecological surveying of the facility nor during a limited search for the species conducted in March 2013. An additional survey is tentatively scheduled for a time between August and October 2013 (the flowering period of the plant) to confirm that the species is in fact not located within the proposed MSW development tract. *H. schweinitzii* requires a very specific habitat conditions to flourish. While the plant species has been identified in other locations within Randolph County, the Charlotte region has been identified as the area with the most frequent occurrences. If a population of the species is found within the proposed development tract in the ROW, it may be possible to relocate the species off of the ROW and out of the proposed development tract as described in the "Recovery Plan" and the "5-Year Review" published by the USFWS. If this were done, a conservation area could be constructed and the transplanted species could be protected and managed. This action is not unprecedented as the USFWS's "5-Year Review" specifically discusses the need to transplant this endangered plant species from ROWs to areas that are less likely to be impacted by mowing and other potential hazards stating:

"recovery efforts are now focused upon relocating plants from these inherently vulnerable ROW habitats into adjacent areas with the potential for adequate management and the appropriate suite of associated native vegetation though to comprise the natural plant communities of the Carolina piedmont eco-region"

5.15 Potential of the Introduction of Toxic Substances

Construction of the proposed landfill will involve the operation of a large number of earth moving equipment all of which use petroleum products (e.g., diesel fuel, motor oil, hydraulic fluid, etc.) and other fluids (e.g., antifreeze) during their operation. The use of petroleum products will be done in accordance with 40 CFR 112 and a site specific Spill Prevention, Control, and Countermeasures (SPCC) Plan. Any



petroleum products that are spilled during fueling or maintenance activities will be cleaned up in accordance with the SPCC Plan. The equipment and trucks used during the construction and operation of the facility are standard factory produced equipment and trucks constructed to comply with NC emission standards.

Upon completion of construction and the issuance of a permit to operate, the landfill will accept household MSW and potentially special wastes (e.g., construction and demolition debris, etc.) that are permitted to be disposed of in a Subtitle D MSW landfill. The landfill will be constructed in accordance with the requirements of Subtitle D and thus will be constructed with a composite liner system (to minimize the potential of impacts to soil and groundwater), a leachate collection system, and a landfill gas collection system. Mitigation measures pertaining to potential secondary and cumulative impacts are discussed later in this report.

6.0 SECONDARY AND CUMULATIVE IMPACTS OF THE PROPOSED PROJECT

In order to determine the significance of secondary and cumulative impacts (SCI), the relationship between particular environmental features and how natural resources respond to change must be evaluated. Determination of SCI to the environment usually falls under three categories:

- Those that describe or model the cause-and-impact relationships of interest, often through matrices or flow diagrams
- Those that analyze the trends of impacts or changes in a natural resource over time
- Those that overlay landscape features to identify areas of sensitivity, value or past losses (maps and GIS analysis)

The following sections discuss the SCIs associated with the proposed study area.

6.1 Topography and Floodplains

As described in Section 5, topography will be impacted during the construction of the landfill by cutting, filling, and grading per the approved Facility Plan and base grade maps. The final elevation of the landfill upon closure will be approximately 110 feet higher than the existing topography.

Throughout the construction, active life, and closure of the landfill approved buffers and set-back distances will be adhered to for floodplains. The buffer and set-back distances have been established, recommended, and approved by the appropriate agencies and are considered to be effective minimal distances to minimize secondary and cumulative impacts. The stream crossing will be designed in a way to minimize impacts to the floodplain and to Gabriel's Creek. Further mitigation measures are discussed later within this report.



6.2 Soils

The majority of impacts to the soils in the proposed study area will be direct impacts associated with clearing, grading, and filling operations during the initial construction of the landfill. Off-site soil borrow activities are anticipated due to the limited availability of on-site soils, and would represent a secondary impact. Secondary and cumulative impacts will be minimized and/or eliminated during the operational life of the landfill by the use of State and/or Federal issued permits. Over the active life of the landfill, various forms of alternative daily covering material may be used to decrease the amount of soil that would have to be excavated from other areas within the permitted landfill area. Soils on the waste unit will be stabilized with vegetation during partial closures over the life of the facility and at final closure. A truck wash will be utilized on site to minimize dirt that leaves the facility on the tires of hauling vehicles and the public roads around the facility entrance will be cleaned as necessary.

6.3 Land Use

The construction and operation of the proposed landfill will not impact the immediate surrounding land uses, (i.e., transfer station, closed MSW landfill, industrial landfill, and shooting range) that were discussed in Section 4 of this report. Because of existing land uses in the immediate vicinity of the proposed facility, we do not anticipate that future zoning or land use plans would be inconsistent with the proposed facility. A SUP is required from the Randolph County Planning Board as part of the permitting process; a public hearing was held on March 7-8, 2013, and the Board voted to approve the SUP. As part of the SUP, it was determined that the location and character of the use, if developed according to the plan as submitted and approved, will be in harmony with the area in which it is to be located and that the location and character of the use, if developed according to the plan as submitted and approved, will be in general conformity with the Growth Management Plan for Randolph County. The SUP is scheduled to be approved during the April 9, 2013, meeting.

6.4 Wetlands and Waters of the United States

A total of 1,200 linear feet of wetlands will be directly impacted during the construction of the proposed landfill. However, based on the current construction and operation plans for the facility this area will not be impacted for the next 30 years. Once disturbed, an Individual or Nationwide Permit will be prepared and the wetland area will be mitigated in accordance to the requirements set forth by the USACE. No additional diversion or withdrawal of surface waters is anticipated during future development of the site.

The main access to the proposed facility may occur via elevated stream crossing. The final design of the crossing has not been decided but it is estimated that the elevated crossing would span approximately 400 to 500 linear feet. The secondary and cumulative impacts to the wetland areas and waters of the United States are expected to be minimal. The landfill will be designed to minimize impacts to wetlands or waters of the US by following required setback distances and minimum buffers that are outlined in the



required State or Federal issued permits. If other designs are considered, they will also be designed to minimize impacts to the creek and floodplain, and modeled in accordance with applicable requirements.

6.5 Prime or Unique Agricultural Land

There are no prime or unique agricultural lands located within the proposed study area. Therefore no secondary or cumulative impacts will occur.

6.6 Public Lands and Scenic, Recreational, and State Natural Areas

As discussed in Section 4.6, no federal, state, or local parks, game lands, scenic or recreational areas, or lands protected by a conservation easement are located on or adjacent to the proposed MSW landfill property and therefore no impacts are anticipated. The Piedmont Monadnock Forest formerly present on site prior to timbering activities is no longer listed as a significant Natural Heritage Area. No secondary or cumulative impacts are anticipated for the Central Falls Slope (also a significant Natural Heritage Area), which is located within the northern property boundary of the proposed landfill property boundary.

As discussed previously in this report, the Deep River forms part of the northern and northeastern property boundary. Based on the proposed design, which includes a 300 foot buffer between the waste unit and the river, and the operational measures of utilizing soil berms to limit views of the active “working face” of the landfill, it is not anticipated that secondary or cumulative impacts to the Deep River will exist. There are no anticipated losses of recreational use along this portion of the Deep River. Due to high topographic relief along the northern property boundary and operational measures including the use of soil berms, it is likely that someone traveling down the river in this area would not see the landfill until the late stages of development.

6.7 Areas of Archaeological or Historical Value

Four sites were identified as potentially eligible for inclusion in the NRHP. After further evaluation, two of the sites were determined to be ineligible for inclusion in the NRHP and the remaining two sites are not located within the landfill development area. Therefore, no secondary or cumulative impacts are anticipated for areas of archaeological or historical value.

6.8 Air Quality

Secondary and cumulative impacts to air quality during the operational phases of the landfill will primarily occur from motor vehicle traffic that transports MSW to the landfill, as well as, emissions of landfill gas from the waste mass. Subtitle D regulated landfills are required to comply with Title V and NSPS of the Clean Air Act (CAA) in order to operate. These portions of the CAA require collection and destruction of landfill gas to control emissions to the environment.



Secondary and cumulative impacts to ambient air quality from other miscellaneous odors that result from the placing of waste into the landfill cell will be controlled by operational permit requirements and BMPs. The landfill operators will cover the exposed working face of the landfill with soil or other alternate cover material by the end of each operating day. Other measures such as environmentally friendly odor neutralizing agents may be employed to further control the migration of miscellaneous odors as necessary.

Other potential air quality impacts relate to the truck traffic associated with the landfill. The net increase in truck traffic is anticipated to be approximately 75 trucks per day. Diesel exhaust pollutants are considered to be the main air quality impact from truck traffic. These impacts are minimized based on the chosen traffic route, which was chosen in part because residences were located further from the road than other proposed alternatives and were more sparsely developed, and these potential pollutants attenuate with distance from the source.

6.9 Noise Levels

The primary sources of noise will be from heavy equipment used during the daily operation of the landfill and from vehicular traffic (e.g., hauling trucks). Secondary and cumulative impacts from noise generated by the operation of the landfill will be minimal to surrounding residential or commercial areas. The topography and vegetative buffers will be maintained to effectively attenuate nuisance noise from migrating off-site. These impacts are minimized based on the chosen traffic route, which was chosen in part because residences were located further from the road than other proposed alternatives and were more sparsely developed, and noise will attenuate with distance from the source.

6.10 Traffic Conditions

The proposed traffic route for waste hauling trucks from NC Highway 64 is via Henley Country Road to Old Cedar Falls Road. The facility entrance will be off Old Cedar Falls Road between Foxworth Road and Training Center Drive. This prescribed route will be enforced by the landfill operator, with consequences for violators, and routine trash pickup along the roads. The current traffic patterns to the existing convenience center and transfer station are anticipated to change. After the landfill opens, the customer convenience center will remain open so that residents can drop off recyclables and waste at a separate entrance from larger trucks. Although the current proposed roads are underutilized based on NCDOT data, key intersections may be widened and/or reinforced and a left turn lane with cautionary signage installed at the facility entrance off Old Cedar Falls Road.

6.11 Water Resources

No secondary or cumulative impacts are anticipated for groundwater as a result of this proposed development. Although this facility would be in close proximity to two existing landfills (one active and one closed), no cumulative impacts are anticipated. The active industrial landfill is lined with leachate



collection with no documented groundwater issues as a result of that activity. The closed unlined landfill is currently being assessed for the nature and extent of groundwater contamination; no surface water contamination has been documented for the closed landfill. Based on preliminary data collected by the County for the closed landfill, the groundwater impacts are limited to parts per billion levels of volatile organic constituents in four relatively small plumes, all of which do not extend further than approximately 700 feet beyond the waste boundary and appear to be naturally attenuating to some degree; no off-site impacts to groundwater are documented for the closed landfill. Due to the relatively slow groundwater flow velocity, large buffer on the County property, and the types and concentrations of contaminants, groundwater impacts are limited in both severity and extent. The County will submit the required reports and follow groundwater corrective action for the closed facility as required in NCAC Subchapter 13B.1634 through 1637. Therefore, there are no cumulative or secondary impacts anticipated for water resources.

6.11.1 Surface Water

No secondary or cumulative impacts are anticipated for surface water.

6.11.2 Ground Water

No secondary or cumulative impacts are anticipated for groundwater.

6.12 Forest Resources

As described in Section 4.12, forest resources are anticipated to be directly impacted by the site development. No secondary impacts are anticipated for forest resources. However, there are cumulative impacts of this area being timbered intermittently since the 1990s, along with timbering activities in other areas in the immediate vicinity of the proposed regional landfill. However, given that the timbering activities will likely occur in phases and significant buffers will remain along with facility property lines including along the Deep River, it is not anticipated that cumulative impacts to forest resources will be significant. Further, some of the undisturbed areas in the southwestern portion of the property include some mature hardwood forest that will be preserved with no harvesting anticipated.

6.13 Shellfish or Fish and their Habitat

The Deep River runs along the eastern border of the proposed landfill location. The Deep River provides natural habitat for various fish species and/or shellfish. The proposed landfill unit will be constructed to minimize, or eliminate when possible, potential impacts to wetlands and waters of the US which include fish habitat. These impacts will be limited by adhering to approved State and Federal permit requirements such as vegetative buffers, set-backs, erosion and sedimentation control features, engineering controls, and BMPs which are protective of wetlands and waters of the US. Therefore, secondary and cumulative impacts to fish and/or shellfish habitat are not anticipated.



6.14 Wildlife and Natural Vegetation

The cumulative effects on the existing wildlife and natural vegetation will be minimal. As discussed in Section 5.14 there will be some direct impacts to wildlife and natural vegetation; however, these impacts will not result in secondary or cumulative impacts. As previously mentioned the impacts to wildlife will be minimized because of the large buffers prescribed for the proposed landfill and due to the phased construction approach required under NCSWMRs. Existing buffers are well vegetated in most areas and may be enhanced with additional vegetation and/or berms in areas of the property as required under the SUP. Also, based on the surrounding industrial land uses (e.g., shooting range, active landfill and transfer station, farming) and hunting that occurs on the property currently, the wildlife occurrences on the proposed site may already be limited.

It is possible that the proposed landfill may attract new wildlife to the facility, this has the potential to impact the current populations of species native to the property; however, these impacts are anticipated to be minimal at this time. Due to its modern design, the impacts to natural vegetation and natural plant communities on the property will be a direct impact; there should be no secondary or cumulative impacts due to the construction and operation of the proposed landfill. No endangered, threatened, rare, migratory, or species of special concern are anticipated to be impacted by this project. Species listed as endangered, threatened, and rare that are known to occur in Randolph County are discussed in detail in Section 4.14 and 5.14 of this report.

6.15 Introduction of Toxic Substances

Toxic substances will not be introduced to the study during the construction of the site. Diesel fuel and hydraulic fluids will be stored in appropriate tanks or containers within secondary containment structures to minimize the potential of an accidental release of these materials into the environment.

Once constructed the MSW landfill will accept only those wastes that are permitted to be disposed of in a Subtitle D landfill. Based on the effectiveness of the liner system proposed for this site, no toxic substances are anticipated to be introduced in the waste disposal area. Hazardous or infectious wastes or liquid materials will not be permitted for disposal at the proposed landfill. Therefore secondary and cumulative impacts from toxic substances to the environment are not anticipated.

7.0 PROPOSED MITIGATION

Direct environmental impacts related to the proposed MSW landfill site and surrounding are the easiest to quantify and mitigate, given that they are generally associated with construction activities. The direct impacts identified for the construction of the proposed MSW landfill will be minimized and/or eliminated if possible by using approved engineering controls and devices. As stated above, approximately half of the property will be left as buffer and in many areas includes natural vegetation which will be maintained and/or enhanced where necessary.



The secondary and cumulative impacts are more difficult to quantify given that they are not directly related to the construction of the proposed landfill; but are a result of the landfill being constructed. The effects of indirect secondary and cumulative impacts generally correlate to the expansion of industry and growth of other developmental indicators, such as population and traffic increases. Secondary and cumulative impacts associated with a project are most effectively controlled by local and county ordinances, as well as, state and federal laws and permits. The following sections discuss mitigation measures that will be used to decrease or remove direct, secondary, and cumulative impacts to the environment, natural resources, and human population in and around the proposed MSW landfill site.

7.1 Erosion and Sediment Control Plan

Direct impacts to the topographic features of the proposed MSW landfill and associated soils will be minimized by implementing and following an approved sediment and erosion control plan. This plan will include BMPs, sedimentation traps (often with skimmers), and barriers that will be used to limit impacts to soils and surrounding streams, wetlands, and riparian buffers. Also re-vegetation will occur using native species; invasive and/or exotic species will not be used for site re-vegetation. Disturbed areas will be stabilized as soon as possible during construction and operation of the facility; if an area of the landfill is inactive for more than a week, it will be seeded per regulatory requirements. The monitoring and record-keeping requirements of the erosion and sedimentation plan will continue through the active life of the landfill operations. A truck wash will be utilized on site to minimize dirt that leaves the facility on the tires of hauling vehicles and the public roads around the facility entrance will be cleaned as necessary.

7.2 Land Use

As discussed in Sections 5 and 6, the project area will change from a relatively undeveloped area to an area for industrial use. The 19 parcels within the proposed development are zoned RA. A SUP was applied for on February 5, 2013 and was the subject of a public hearing held by the Randolph County Planning Board on March 7-8, 2013. Operation of a sanitary landfill is permitted as a special use within an RA district. The request for a SUP was voted on and approved by the Planning Board on March 8, 2013.

Mitigation measures associated with the development of the landfill per the SUP will be accomplished by not promoting or inducing development beyond that associated with the landfill (i.e., leaving and preserving large buffers). Also the landfill will be developed in stages over an extended period of time (potentially in excess of 50-years). All buffers that have been discussed in previous Sections of this report will also help to mitigate future changes in land use in and around the proposed landfill development.



7.3 Stormwater Pollution Prevention Plan

Permitted MSW landfills are required to implement and follow a stormwater pollution prevention plan (SWPPP). The SWPPP will be composed per the required NPDES General Permit. The purpose of the NPDES regulations is to control point source discharges to surface waters and provide BMPs for site operations. Prior to discharging stormwater to surface waters the effluent will be subjected to qualitative (visual) and quantitative (analytical) monitoring. If the discharge exceeds established concentrations or bench marks additional measures must be taken to meet the general permit requirements.

The General Permit also requires where wetlands are located on or nearby landfilling operations, that discharges meet applicable wetland standards, as recorded in 15A NCAC 2B .0230 and .0231. Once construction of the landfill has been completed and begins to accept solid waste, a SWPPP will be developed and implemented by County personnel.

7.4 Wetland and Stream Mitigation Plan

The proposed landfill was designed to minimize direct, secondary, and cumulative impacts to wetland areas and streams to the greatest extent possible. However an estimated 1,200 linear feet of intermittent streams and 0.06 acres of wetlands will still be directly impacted. These impacts in the northeast corner of the landfill boundary were unable to be avoided. Direct impacts related to the crossing of Gabriel's Creek are not quantified at this time, but will be minimized by choosing a crossing point at a narrow part of the floodplain and choosing a crossing alternative by utilizing the required modeling of potential floodplain impacts.

Direct, secondary, and cumulative impacts to the other 1.32 acres of wetlands and 4,000 linear feet of intermittent streams will be minimal. The impacts to these areas will be controls by implementing design features and BMPs that are recommended by the NC Wildlife Resources Commission (NCWRC). Wetland and stream mitigation options may include enhancement, restoration, and/or preservation on-site.

The primary mitigation measure will be using certified/experienced private contractors during the construction of the landfill. As recommended by the NCWRC for sites greater than 25 acres, construction will be completed in phases. A sediment and erosion control plan will be prepared, and once approved by the State of NC, implemented as construction begins. As part of the sediment and erosion control plan the following BMPs will be implemented to further reduce the impacts to wetland areas and streams, as well as the riparian buffers: minimize clearing near water bodies, stabilize drainages, stabilize disturbed soils within 7 days, and construct advanced settling devices across the site, and follow the required inspection schedule for erosion and sediment control devices.



7.5 Air Quality

The direct, secondary, and cumulative impacts related to air quality from the construction and operation of the proposed regional landfill is discussed in Sections 5 and 6. The primary potential sources of air quality impacts identified in Sections 5 and 6 are dust and diesel particulates from heavy equipment use, vehicular traffic, greenhouse gas emissions, and odor from the waste mass within the landfill.

Various mitigation measures will be used during the construction and operation of the landfill to control potential sources of air quality impacts. Water may be used on roadways and graded surfaces during construction to help minimize dust generation. Approved natural buffers and undeveloped woodlands around the proposed site will also help minimize dust and particulate matter from migrating off-site.

Mitigation of odors originating from the landfill unit will be controlled by following the operational permit, which will require soil or other alternate cover to be placed on exposed trash by the end of each operating day. The landfill will also be required to comply with the New Source Performance Standards of the Clean Air Act which requires the use of pollution control devices for the abatement of greenhouse gas emissions from the landfill, as well as, the Title V regulations of the Clean Air Act which require the collection and destruction of landfill gas to control emissions to the environment. In addition to the pollution control and destructive technologies that will be required by State and Federal Law, odor neutralizing agents may also be used as a mitigation measure if necessary.

Air impacts from hauling traffic will be minimized by the use of a prescribed traffic route as described below. This route was chosen based on the relatively great distances from residences to the road as opposed to other considered routes, as well as a lower overall density of residences.

7.6 Noise Levels

As described in earlier Sections of the report, nuisance noise levels are not expected to migrate off-site. The site topography and natural vegetative buffers are expected to be effective mitigation controls to prevent adverse effects on the surrounding residential and commercial areas. As an additional mitigation measure during construction of the landfill, the use of heavy equipment will only be permitted during a certain span of time during the day. Operational hours for the proposed landfill will be limited by the operational permit (issued by the NCDENR) and the SUP (issued by the Randolph County Planning Board). Typically hours of operation for landfills in NC are from 7:30 a.m. to 5:00 p.m. Monday through Friday, from 7:30 a.m. to noon on Saturdays, and closed on Sundays and major holidays.

Noise impacts from hauling traffic will be minimized by the use of a prescribed traffic route as described below. This route was chosen based on the relatively great distances from residences to the road as opposed to other considered routes, as well as a lower overall density of residences.



7.7 Traffic Conditions

Increased traffic patterns along Henley County Road and Old Cedar Falls Road were identified as a direct impact to the residential area near the proposed landfill. This route was chosen since fewer houses exist and because in general houses are further from the road along this route, as compared to other potential direct routes from the highway. Both factors will help limit potential noise and air pollution issues that may be associated with secondary traffic impacts. Also, truck hours will generally be coincident with landfill operational days and hours (7:30 a.m. to 5:00 p.m. Monday through Friday, from 7:30 a.m. to noon Saturdays, and closed Sundays and major holidays), with peak traffic patterns anticipated from mid-morning to early afternoon based on patterns at other similar facilities.

A transportation study was performed in January 2013 by CDM Smith to assess how additional traffic would affect public safety. Recommendations from this transportation study may be used as potential traffic mitigation measures during the construction and operation of the proposed landfill. Many of these suggestions were supported and expanded by the Randolph County Planning Board during the SUP hearing. These include but are not limited to:

- Post and strictly enforce a speed limit of 45 miles per hour on Henley Country Road between Presnell Street and Old Cedar Falls Road (through coordination with NCDOT)
- Widen and reinforce intersections along the proposed route along Henley Country and Old Cedar Falls Road
- Construct eastbound left turn lane and cautionary signage/signals at the proposed facility entrance or at Training Center Drive that is designed with sufficient stopping distance for heavy vehicles (note that the entrance was chosen based on safety factors for significant sight distances in both directions along Old Cedar Falls Road)
- Establish the entrance to the facility a sufficient distance away from the roadway to accommodate trucks staging prior to the facility opening
- Maintain the existing transfer station entrance as a customer convenience area to keep trucks at the new entrance and citizens at the existing entrance for safety reasons
- Operator will enforce the traffic route with penalties for violators and perform daily trash pickup along the route
- Operator will provide truck wash to help prevent dirt and mud from leaving the site

The complete transportation study is included as *Appendix EIS-G* to this report.

7.8 Dual Composite Bottom Liner System

Details about the proposed dual composite liner system can be found in Section 5.3 of this report. A dual composite liner system will be utilized in the construction of the proposed landfill. The dual composite liner system proposed is designed to minimize the potential of contamination to subsurface soils, groundwater, and the environment. The dual composite liner system includes two layers with which to collect leachate generated by the facility and remove it, preventing or minimizing its release top the environment. A final cover system will also be installed at closure to further limit leachate production.



Potential contaminants associated with operation of a MSW landfill include organic and inorganic constituents. A discussion about the seepage rate of liner including the results of the USEPA HELP model seepage calculations can also be found in Section 5.3 of this report. As discussed previously, operating requirements for a MSW landfill includes semi-annual groundwater and surface water monitoring to detect potential releases to the environment.

7.9 Collection and Treatment of Wastewater

Permitted MSW landfills are required to be constructed to collect leachate (liquid that comes into direct contact with the MSW). The proposed MSW landfill will be constructed with a leachate collection system that will collect and pump the liquid that permeates from the top down through the landfill into a leachate collection tank. The liquid that is stored in the tanks will be periodically pumped via an on-site pump station (to be constructed) and disposed of at the local POTW. On-site leachate lines will be dual-contained. The leachate will be treated either on site (if necessary) and/or along with other waste waters at the POTW to acceptable levels to be discharged.

7.10 Spill Prevention, Control, and Countermeasures Plan

Owners or operators of non-transportation related onshore facilities that have an above ground aggregate storage capacity greater than 1,320 gallons that engage in the drilling, producing, gathering, storing, processing, refining, transferring, distributing, using, or consuming oil and oil products, which due to their location could reasonably be expected to discharge oil in quantities that may be harmful into or upon navigable waters of the United States or adjoining shorelines, or into or upon the waters of the contiguous zone must establish procedures and methods to prevent discharges into or upon the navigable waters of the United States.

The proposed MSW landfill, once permitted and operational, will have an above ground aggregate storage capacity of oil greater than 1,320 gallons, and will therefore develop and implement a Spill Prevention, Control, and Countermeasure (SPCC) Plan as outlined in 40 CFR 112. The SPCC Plan requires but is not limited to having above ground oil storage containers with a volume greater than 55gallons to be located inside secondary containment structures, implementation of a routine inspection schedule of such containers, train facility personnel in spill response procedures, and have a written agreement with an environmental contractor to provide emergency services if necessary.

7.11 Wildlife and Natural Vegetation

The impacts to wildlife and natural vegetation have been discussed in Sections 5 and 6 of this report. As previously discussed, approximately 300 acres of land will be directly impacted by this project. The existing natural vegetation will be maintained and/or enhanced as necessary. The primary mitigation measure during the development of the proposed landfill will be phased construction. Constructing the proposed landfill in specific phases will have the least amount of impact to the wildlife and natural



vegetation in and around the project area. The development of the landfill likely will displace some wildlife. However by phasing the construction of the landfill, it is anticipated to take approximately 50+ years for the entire 300 acres to be developed. Some of these buffer areas may also be used as possible critical habitat preservation areas (e.g., for existing rare plants on site).

Sections 5 and 6 also discuss the identified rare, threatened, or endangered species in or around the proposed landfill location. Additional mitigation measures outside of those discussed earlier in this report are not thought to be required at this time.

8.0 STATE AND FEDERAL PERMITS REQUIRED

Multiple permits will be required prior to the facility beginning operations or during the life of the facility, dependent on how the facility is developed. These required permits include, but are not limited to:

8.1 Solid Waste Permit

A solid waste permit needs to be granted by the NCDENR prior to constructing and operating a MSW landfill in NC. The solid waste management facility permit has two parts. Prior to submitting an *Application for Permit to Construct*, NCDENR must review and approve a site suitability demonstration, which includes siting restrictions from applicable NCSWMR and NC state law. The first part of the solid waste permit, a permit to construct a solid waste management facility, shall be issued by the NC Division of Waste Management after site and construction plans have been approved and it has been determined that the facility can be operated in accordance with the NCSWMR and other applicable state, federal and local laws. An applicant shall not clear or grade land or commence construction for a solid waste management facility until a construction permit has been issued. The second part consists of a permit to operate a solid waste management facility which may not be issued unless it has been determined that the facility has been constructed in accordance with the construction permit, that any pre-operative conditions of the construction permit have been met, and that the construction permit has been recorded.

An *Application for a Permit to Construct* includes submission of a Site Suitability Report, a Design Hydrogeologic Report, a Facility Plan, an Engineering Plan, a Construction Quality Assurance/Quality Control Plan, Environmental Monitoring Plans, and a Closure/Post Closure Care Plan. Preparation of an *Application for Permit to Construct* and the Site Suitability Report requires an evaluation of surrounding land uses, site subsurface conditions, site hydrogeology/hydrology, and the ability to construct a landfill at the site and meet regulatory buffer requirements. A minimum of one boring per acre within the waste footprint and 1 boring per 10 acres outside the waste footprint must be completed within the landfill facility boundary to evaluate site conditions including depth to water and geotechnical site conditions.

The Site Suitability report evaluates the suitability study area to physically site the proposed landfill (e.g., provides a preliminary review of the site geology, hydrogeology, and geotechnical conditions), the



presence or absence of cultural / historical resources, threatened or endangered plants or animals, seismic impact zones, water supply watersheds, streams, wetlands, and floodplains; and evaluates larger scale siting criteria such as the distance between the proposed facility and private residences, State nature and historic preserves, national wildlife refuges, State game lands, State parks, airports and similar resources/uses.

The Design Hydrogeologic Report presents the results of the borings and testing completed at the site, evaluates the site geology, and also presents estimated groundwater contour and bedrock surface maps for design and monitoring purposes. The Facility Plan details the anticipated life of the facility and provides drawings projecting the sequence of landfill cell development over the life of the facility. Detailed engineering evaluation, including evaluation of landfill stability, stormwater control, base grades, liner design and leachate system (collection, storage, and force main) design of a 10 year phase of development are presented in the Engineering Plan. Environmental monitoring plans are also required to detail the proposed explosive gas and water quality monitoring programs. Other Plans contained in the Application provide details regarding construction quality control/quality assurance testing to be completed during construction of the landfill, closure design, and operational procedures to be followed during the life of the facility.

Once a permit to construct has been granted, the owner must construct the facility and demonstrate to NCDENR – Division of Waste Management that the facility has been constructed in accordance with the approved plans and specifications. This demonstration includes documenting that the approved quality assurance testing demonstrating that the landfill components will perform as designed are completed and that the lines and grades of the facility were built in accordance with the approved plans. Following that demonstration, the owner will be granted a permit to operate and waste disposal operations may begin.

8.2 Wetlands (404) Permit

At some point during the operation of the facility, an individual or nationwide wetlands permit as required by Section 404 of the Clean Water Act will be sought from the USACE for the proposed taking of wetlands, including intermittent streams. Since approximately 1,200 linear feet of intermittent streams are to be disturbed during the life of the facility, an individual permit will need to be prepared for the taking. This permit will detail the stream(s) to be disturbed, their quality, and the proposed mitigation for the taking. However, since such a permit is only valid for 5 years and the taking will not occur for an estimated 30 to 40 years, application for the permit will occur at a later date.

Concurrently with the USACE permit, a permit for the taking will be submitted to NCDENR's Division of Water Quality. In addition, a permit will be required for the crossing of Gabriel's Creek, once designed.



8.3 Driveway Permit

Connection of the proposed landfill entrance with Old Cedar Falls Road will require driveway permit and a right of way encroachment permit from NCDOT. The driveway permit includes drawings detailing the proposed access road design, the connection with Old Cedar Falls Road and an agreement to construct and maintain the driveway/entrance in conformance with the current NCDOT policy. These permits also require that, during construction, proper signs, signal lights, flaggers and other warning devices for the protection of traffic will be used as required by NCDOT policy. In addition to these requirements, as part of the SUP, access roads and intersections may be widened, the speed limit reduced on Old Cedar Falls Road, and a left turn lane and cautionary signage be installed in cooperation with NCDOT.

8.4 Erosion and Sediment Control Permit

Disturbance of more than 1 acre requires an Erosion and Sediment Control permit from NCDENR Division of Land Quality. The permit shall detail the area to be disturbed and the measures taken to control stormwater run-off and prevent transport of sediments off site or to any surface water bodies. The permit shall also require that all disturbed areas be non-erosive and stable within 15 working days or 90 calendar days after completion of the activity, whichever period is shorter. Since the facility is a landfill, the storm water control measures will be designed to provide protection from a rainfall event equivalent in magnitude to the 25-year peak runoff, instead of the 10-year peak generally required.

8.5 Stormwater Permit

The facility will be subject to the requirements of NCDENR's general permit NCG120000 (the NPDES permit applicable to sanitary landfills). Prior to operations, a notice of intent to comply with the coverage of this permit will be submitted to the NCDENR Division of Water Quality.

8.6 Title V and New Source Performance Standards (NSPS) Air Permits

Once the waste unit reaches approximately 2.7 million tons (U.S. short tons) of in-place waste, the facility will comply with Title V of the Clean Air Act, wherein the facility is subject to the collection and destruction of landfill gas to control emissions to the environment. In addition, the NSPS of the Clean Air Act restrict air emissions from stationary sources such as landfills, and require pollution control technologies for the abatement of greenhouse gases. Today's pollution control technologies include destroying air pollutants found in landfill gas through open and enclosed flare systems or through other means such as internal combustion engines and/or boilers when used as an energy source. The County will pursue "green energy" options including beneficial re-use of the landfill gas as an energy source.

Under the regulatory requirements of NSPS and Title V operating permits, once a landfill gas collection and control system is constructed, the collection and control system will be monitored on a routine basis to ensure the system is functioning properly. This includes monitoring for landfill gas in the soil through



monitoring probes placed between the landfill unit and the property boundary, monitoring landfill gas emissions along the surface of the landfill, monitoring on-site structures for the presence of landfill gas, and emissions monitoring of control and destruction devices such as flares. In addition, annual reporting of these emissions monitoring activities will be performed as required under the various regulatory requirements.

8.7 Other Applicable Permits

In addition to the permits listed above, several local permits may also be required including but not limited to: building permits for on-site structures, occupancy permits, potable well permit, and a septic field permit. Also, depending on the agreement with the City of Asheboro's POTW, a permit may be required to dispose of the facility's leachate.

9.0 CLOSING

The proposed MSW regional landfill will be located on approximately 667 acres in unincorporated, central Randolph County, NC (*Drawing EIS-1*) and will include a lined waste footprint of approximately designed 200 acres. The first phase of the proposed landfill will be designed to contain approximately 10 years of waste as allowed under current law, depending on many factors including density of waste placement, types and amounts of daily and intermediate covers, and available waste volumes. The County will partner with an experienced private landfill operator to assist with construction and operations.

Given the scope of this proposed project and potential environmental impacts, an EIS was developed by Golder Associates of NC, Inc. to address direct, secondary, and cumulative impacts to the existing site, surrounding human population, and wildlife. The EIS is required as part of the Senate Law 2007-550. The EIS discusses fifteen different matrices that may potentially suffer direct, secondary, or cumulative impacts during the course of the development of the proposed landfill.

Upon completing a detailed assessment of the potential direct, secondary, and cumulative impacts related to the development of the proposed MSW, it is our conclusion that the required State and Federally issued permits, existing County ordinances, and best management practices employed by the MSW landfill operators will substantially reduce and/or mitigate many of the potential impacts discussed in the EIS. Further, a review of demographic data does not indicate that continued operation of a landfill at the existing landfill property would disparately impact any minority population or disadvantaged socio-economic group. Additionally, County residents would benefit in long-term cost saving for waste disposal and could also see a possible increase in economic development in and around Randolph County. Funds generated from the facility through tipping fees and host fees, as well as future revenue from landfill gas to energy projects could also support many other County needs for decades to come.



10.0 REFERENCES

- Bates, Moni C. and Coomans, Roy, 1999. *Randolph County Natural Heritage Inventory*. NCDENR Division of Parks and Recreation - The NC Natural Heritage Program, Raleigh, NC. pp. 187-190.
- Butler, J.R., and D.T. Secor, Jr., 1991. The Central Piedmont (Chapter 4) in J.W. Horton, Jr. and V.A. Zullo, eds., *The Geology of the Carolinas* (Carolina Geological Society Fiftieth Anniversary Volume): The University of Tennessee Press, pp. 66-71.
- DWM (Division of Waste Management), 2011. *Randolph County Transfer Station Annual Report*. NCDENR DWM and Randolph County Public Works, Raleigh, NC. 2 pp.
- DWQ (Division of Water Quality), 2010. *Methodology for Identification of Intermittent and Perennial Streams and their Origins, Version 4.11*. NC Department of Environment and Natural Resources, Division of Water Quality. Raleigh, NC. 41 pp.
- Hazen and Sawyer, 1994. *Randolph County Landfill Transition Plan, April 1994*. Raleigh, NC: Hazen and Sawyer.
- National Cooperative Soil Survey, 2006. *Soil Survey of Randolph County, NC*. USDA, NCARS (NC Agricultural Research Service), and various other Federal, State, and Local Agencies. Washington, DC. 331 pp.
- NCFMIS (NC Floodplain Mapping Information System), 2012. FEMA (Federal Emergency Management Agency) and NC Flood Insurance Study No. 37151CV001A. Raleigh, NC. Online: <http://floodmaps.nc.gov/fmis/Download.aspx> (Geodatabase: Randolph_Effective_PGDB_Final.mxb)
- NCGS (NC Geological Survey), 2007. *State Geologic Map*. NCGS. Raleigh, NC. Online: <http://data.nconemap.com/geoportal/catalog/main/home.page> (Shapefile: geo.shp)
- NC State Highway Commission, 1967. *NC State Highway Commission Map*. NC State Highway Commission. Raleigh, NC. Online: <http://dc.lib.unc.edu>
- Randolph County Board of County Commissioners, Amended 2010. *Unified Development Ordinance*. Board of County Commissioners, Asheboro, NC. 300 pp.
- Rogers, John J.W., 1999. *History and Environment of NC's Piedmont*. Online: <http://www.geosci.unc.edu/page/john-j-w-rogers->
- Rogers, John J.W., 2006. *Stone Quarries and Sourcing in the Carolina Slate Belt (Chapter 2)*. Research Laboratories of Archeology and University of NC Chapel Hill, Chapel Hill, NC. pp. 10-15.
- Saville, Thorndike, 1924. *Water Power Investigations of Deep River. Economic Paper Number 54*. NC Department of Conservation and Development, NC Geological Survey (NCGS) and Economic Survey. Raleigh, NC. 43 pp.
- SEPA (State Environmental Policy Act), 2003. *Guidance for Preparing SEPA Documents and Addressing Secondary and Cumulative Impacts*. NCDENR State Environmental Policy Act (SEPA) Program, Raleigh, NC. 123 pp.
- U.S. Census Bureau, 2012. *State and County Quickfacts*. U.S. Department of Commerce, Wastington, DC. Online: <http://www.census.gov>



U.S. Fish and Wildlife Service, 1988. *Cape Fear Shiner Recovery Plan*. U.S. Fish and Wildlife Service, Atlanta, Georgia. 18 pp.

U.S. Fish and Wildlife Service, 1994. *Schweinitz's Sunflower Recovery Plan*. U.S. Fish and Wildlife Service, Atlanta, Georgia. 28 pp.

United States Army Corps of Engineers, 2010. *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region, ERDC/EL TR-12-9*. USACE Wetlands Regulatory Assistance Program. Washington, DC. 163 pp.

At Golder Associates we strive to be the most respected global group of companies specializing in ground engineering and environmental services. Employee owned since our formation in 1960, we have created a unique culture with pride in ownership, resulting in long-term organizational stability. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees now operating from offices located throughout Africa, Asia, Australasia, Europe, North America and South America.

Africa	+ 27 11 254 4800
Asia	+ 852 2562 3658
Australasia	+ 61 3 8862 3500
Europe	+ 356 21 42 30 20
North America	+ 1 800 275 3281
South America	+ 55 21 3095 9500

solutions@golder.com
www.golder.com

Golder Associates NC, Inc.
5B Oak Branch Drive
Greensboro, NC 27407 USA
Tel: (336) 852-4903
Fax: (336) 852-4904

