

US EPA ARCHIVE DOCUMENT

**USEPA PROJECT XL
FINAL PROJECT AGREEMENT**

Leachate Recirculation/Gas Recovery (“Bioreactor”) Project

**Buncombe County Solid Waste Management Facility
Alexander, North Carolina**

September 18, 2000

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I. Introduction to the Agreement

A. Description of the Project and Its Purpose

Under this proposed XL Project, Buncombe County, North Carolina proposes to construct the necessary infrastructure and operate a combined leachate recirculation and gas recovery system (commonly referred to as a "bioreactor" system) at its Subtitle D landfill. Research has shown that there are numerous environmental benefits that can result from operating a sanitary landfill in such a manner. The primary goal of this project will be to demonstrate that leachate can be safely recirculated over an alternate liner system at a full-scale level (something that is not currently allowed under the Subtitle D landfill regulations, 40 CFR Part 258), and provide more data to substantiate the expected superior environmental and cost savings benefits. It is further hoped that data from this project can be used to support regulatory changes that will allow this type of project to be implemented at similar facilities across the country. It should be noted that, because the County will be making tremendous capital investments in facilities, it is requesting that it be allowed to expand the system to future cells assuming the project is successful and if enabling regulations are not promulgated in the meantime. This could potentially extend the term of the agreement to more than 25 years. Prior to implementation beyond cells 3, 4 and 5, the parties to the agreement will evaluate the progress to that point to determine whether or not to proceed with the remaining cells.

Buncombe County proposes an accelerated stabilization full-scale landfill pilot. The pilot would potentially encompass all 10 cells of the Buncombe County Municipal Solid Waste Management Facility. While other bioreactor studies have been conducted within this country and in Europe, many of those other bioreactor studies have been developed only at the bench scale or as pilot-scale studies which focused on a smaller, more controlled area. Buncombe County is seeking regulatory flexibility through Project XL. Project XL allows regulated entities to conduct pilot projects, within a specified scope, time, and on a site-specific basis to identify better ways to accomplish environmental benefits. The value in proposing the accelerated stabilization landfill at Buncombe is that it would provide superior environmental benefits (e.g., monitoring, gas collection, available data), in addition to cost savings to the County and the local residents.

First, one of the obvious differences between this pilot and other bioreactor landfills would be the scope of the experiment to be conducted. Buncombe proposes to conduct a large-scale (10 cell), fully controlled bioreactor landfill site. Buncombe County is the only known site to propose a full-scale pilot, in the true sense of the word. There is value in that alone. Second, the value in conducting a bioreactor pilot project at Buncombe County landfill in spite of other existing bioreactor experiments is because there are differences in the geographical context, and in State requirements for most projects. Third, another difference between the Buncombe site and others includes the proposed comparison between several existing and proposed cells on their own site. This comparison

would involve recirculating leachate and comparing Cell 1 and Cell 2 (composite liner), with Cells 3-10 (alternate, State-approved liner).

Buncombe County has developed their proposal for the bioreactor landfill based on the inclusion of all ten cells of the landfill. The infrastructure for the accelerated stabilization would require a substantial investment in the landfill of one million dollars. Buncombe County has conducted their research, has the necessary technical expertise to run such a bioreactor landfill, and is confident of the projected results. If the project were to be scaled-back to be less inclusive than the ten cells (e.g., cells 3-5), much of the cost effectiveness of the project would be lost.

Characteristics of waste streams change over time. As market preferences shift, and consumer interests change, the overall characteristics of waste going in to the landfill over time may change. By allowing a project that contemplates the life of the landfill (as opposed to a few cells) information concerning the behavior and effectiveness of bioreactors, EPA hopes to gain information about impact these types of changes have on the bioreactor.

EPA is also taking into account the long-term fiscal and physical planning necessary to optimally design and run a landfill. Viewing the whole landfill as a system, EPA has determined that this project provides an good opportunity to pilot the use of bioreactor technology over an alternative liner system. All other current safeguards and regulatory requirements that apply to bioreactors will remain in place.

Description of the Project Site:

The Buncombe County Solid Waste Management Facility was opened in September 1997. In addition to a Subtitle D landfill disposal area, the facility has a C&D landfill, a wood waste mulching facility, a convenience center for residential waste disposal and recycling, and drop-off areas for white goods and tires. The Subtitle D landfill disposal area comprises approximately 100 acres of the more than 600-acre site. The landfill has been designed with 10 separate disposal cells that will be constructed sequentially over the estimated 30-year life of the facility. Cells 1 and 2, which comprised Phase I of the landfill, were constructed with the standard Subtitle D composite liner system (i.e., two feet of clay with a permeability less than or equal to 1×10^{-7} cm/sec in combination with a 60-mil HDPE synthetic liner) as described in 40 CFR 258.40(b) and Section 1600 of the North Carolina Solid Waste Management Rules. In 1999, Cell 3 was constructed with an alternate composite liner system (18-inches of 10^{-5} cm/sec clay, a geosynthetic clay liner [GCL], and a 60-mil HDPE synthetic liner). The State of North Carolina did not allow alternate liners until 1998. The County recently bid and expects to begin construction by August, 2000 on Cells 4 and 5 which will also be constructed with the alternate liner system. This agreement is intended to potentially cover all ten cells of the landfill, with a decision point for the parties and stakeholders contingent upon a review and evaluation of data

from cells 1-5 as well as an assessment of project success every five years which will coincide with the decisions to renew the landfill's operating permits.

As noted previously, both the Federal and State regulations allow leachate recirculation over the standard composite liner system prescribed in Subtitle D, however, neither allow it over cells constructed with alternate liners. On Cell 3, the alternate liner system saved Buncombe County nearly \$400,000 as compared with the standard composite system. It is estimated that the County will save a total of \$5 million through build-out of the facility if the alternate liner system is used. Other potential cost savings from the project include:

- \$5 - \$10 million in reduced construction costs for additional landfill capacity if an increase of 20%-30% in additional waste volume can be achieved due to rapid waste decomposition during operations; and,
- \$9 million if leachate hauling and off-site treatment can be eliminated.

Maintaining the region's pristine surface water and groundwater, and clean air, are high priorities for the County's elected officials and staff. The proposed leachate recirculation and gas recovery system will serve to support these goals.

Combining leachate recirculation with gas recovery at a Subtitle D landfill has been shown at the pilot scale to provide numerous environmental benefits. Currently however, the Subtitle D regulations restrict leachate recirculation to only those landfills that have been constructed with the standard composite liner system prescribed in the regulations (i.e., two feet of clay with a permeability of not more than 10^{-7} cm/sec and a 60-mil HDPE synthetic liner). The goal of this XL Project will be to demonstrate that leachate can be safely recirculated over equivalent, alternate liner systems (which in many cases are less expensive than the conventional Subtitle D composite liner system) and thus provide the basis for future regulatory changes that will allow this superior environmental performance to be achieved at similar facilities across the country. The superior environmental benefits that Buncombe County expects to achieve with this project are:

- Rapid organic waste conversion/stabilization leading to rapid settlement, increased gas yield and capture, improved leachate quality, reduced post-closure costs, and reduction in the potential for uncontrolled releases of leachate and/or gas to contaminate the ground water or air during the post-closure phase should a containment system failure occur.
- Maximizing landfill gas capture for better and more efficient energy recovery and reduction of fugitive air emissions. Studies to determine the market and feasibility for use of the enriched gas produced during recirculation of leachate will be conducted as part of

this XL project. Reduction in air quality impacts from the facility is of primary importance since air inversions and the resulting degradation in air quality are common in the mountains.

- Increased landfill disposal capacity due to rapid settlement during the operational period that leads to more economical operations, deferred capital costs for additional landfill capacity, and delay in the siting and construction of a new facility.
- Improved leachate quality and a reduction in leachate quantity. Research has shown that leachate recirculation allows for more time for decomposition of organic contaminants; adsorption of certain inorganic contaminants into the soil/waste matrix; and, enhanced chemical reactions such as metals precipitation. All of these processes will improve the quality of the leachate that is discharged to the local publicly owned treatment works (POTW) which should reduce any strain on the facility caused by the leachate. The quantity of leachate is reduced through adsorption by the waste and soil as well as by consumption during biological activity. Because leachate from the Buncombe County facility is hauled by tanker truck to the POTW, a reduction in the amount of leachate requiring treatment will result in fewer tanker trucks on the roads creating a safer situation for nearby residents.
- Reduction in post-closure care, maintenance, and risk through rapid waste stabilization.

Therefore, to realize these superior environmental benefits as well as the cost savings discussed previously, Buncombe County is requesting that U.S. EPA and the State of North Carolina, Department of Environment and Natural Resources (NCDENR) grant site-specific regulatory flexibility from the prohibition in 40 CFR 258.28, Liquid Restrictions, which prohibits the recirculation of leachate over cells constructed with an alternative liner.

Some studies indicate that the amount of leachate generated at most landfills, even those in wet climates, will not be enough to totally saturate the waste mass thereby not achieving maximum waste decomposition. Buncombe County is requesting additional flexibility in 40 CFR 258.28 to allow the addition of supplemental liquid to the waste mass should the amount of leachate available become limiting at any time during operations. Water diverted from the neighboring French Broad River will be the only source of supplemental liquids circulated. Buncombe County requests similar flexibility from NCDENR for supplemental liquid addition if needed.

It is recognized that the addition of supplemental liquids may decrease the strength of the waste mass and, if not designed properly, decrease the stability of the landfill. Prior to adding any supplemental liquids to the facility, Buncombe County will prepare a comprehensive landfill stability analysis under recirculation conditions with supplemental liquids. Buncombe County will

submit this analysis to two of the three following university professors who are recognized as experienced in the field of geotechnical engineering in general and landfill slope stability specifically: Dr. Timothy Stark, University of Illinois; Dr. Craig Benson, University of Wisconsin, and, Dr. Robert Koerner, Drexel University. The County will incorporate comments from these professors into a final stability analysis for their final review. The County will forward the analysis along with letters from the reviewing professors stating that the landfill should remain stable under the operating plan developed by the County, to the USEPA and the State of North Carolina for concurrence prior to adding any supplemental liquids. Should two of the professors mentioned above be unable to conduct the review, the County will suggest an alternate that is acceptable to USEPA and the State.

Finally, Buncombe County intends to continue to recirculate leachate consistent with this agreement and in compliance with all applicable regulations throughout the landfill as long as gas generation data shows that biological activity continues and leachate flow and quality data show that improvements in leachate quality and reductions in quantity are occurring. It is expected that this will occur long after each cell has reached its permitted final grade. As long as these processes are ongoing, it is expected that waste decomposition and the resulting settlement will continue to occur. As mentioned above, one of the superior environmental benefits expected from this project is the additional airspace for waste disposal made available by more rapid waste settlement.

B. Description of the Facility and Facility Operations/Community/Geographic Area

The Buncombe County Solid Waste Management Facility (BCSWMF) is an existing Subtitle D landfill permitted by NCDENR, Solid Waste Section. The 600+ acre facility is located in northern Buncombe County about two miles from the Madison County line. NC 251 borders the facility to the south and west. Access to the site is from the northwest off of Panther Branch Road (SR 1745). A prominent physical feature of the facility is the French Broad River that borders the site to the south and west. The BCSWMF accepts non-hazardous municipal solid waste generated within the County for disposal in the Subtitle D landfill portion of the site. Construction and demolition waste is accepted and disposed of in an approved construction and demolition debris landfill also located on the site. Tires and white goods are accepted as well and they are processed prior to being shipped off-site for recycling and/or disposal. Wood and yard wastes are processed into mulch and sold to the public. Common household recyclables are also collected at the facility.

Since opening in September 1997, the Buncombe County Solid Waste Management Facility has received several prestigious awards including:

- 1998 Honors Award for Engineering Excellence from the North Carolina Consulting Engineers Council.

- 1999 Gold Award for Outstanding Integrated Solid Waste Management Program from the North Carolina Chapter of the Solid Waste Association of North America (NC SWANA)
- 1999 Bronze Award for Excellence in Solid Waste Management in North America, Landfill Category, from the Solid Waste Association of North America (SWANA).
- 2000 Award for Outstanding County Program from the North Carolina Association of County Commissioners for its Hazardous Waste Handling, Reduction, and Education Program.

The Subtitle D landfill portion of the BCSWMF comprises 100 acres. The site has been segregated into 10 distinct cells of varying size depending on topography. Cells 1 and 2, which combined are approximately 14 acres in size, were constructed as part of the initial facility construction. Both of these cells were constructed with the standard Subtitle D composite liner system. Two feet of crushed stone was used to construct the protective cover/leachate collection and drainage system. The synthetic liner is protected against abrasion and puncture from the stone and waste by a 28-oz. fabric cushion. Leachate is drained to a sump area located in each of the ten cells and then pumped to an on-site lined, leachate storage lagoon with 1.5 million gallons of capacity. Leachate is currently hauled approximately seven miles by tanker truck to a wastewater treatment plant owned and operated by the Metropolitan Sewerage District of Buncombe County (MSD).

The majority of ground water underlying the BCSWMF lies within a fractured bedrock aquifer system. Depth to ground water varies considerably across the site ranging from about five feet in the low lying areas to as much as 200 feet along the ridge lines. Because of the complexity of the ground water flow regime, it was decided during permitting that a standard perimeter network of ground water monitoring wells would need to be supplemented by an additional monitoring system. The alternative monitoring system agreed upon consists of a synthetically lined collection area located three feet below the bottom of the composite liner system. The lined area mirrors the bottom grades of each cell. The extent of the liner was determined by the wetted perimeter in the cell under precipitation from the 100-year storm. Any water collected in the alternative monitoring system drains to a sump and then out of the landfill through a sealed pipe. Samples are taken from the pipe during each semi-annual ground water monitoring event. There are currently nine ground water monitoring wells located around the perimeter of the site. Additional wells will be added as the Subtitle D portion of the site is expanded.

The BCSWMF is located in a rural part of Buncombe County. Surrounding land uses within one mile of the site are predominantly rural residential with some small agricultural activities. In 1992,

during initial permitting of the site, there were 34 residences located within one-quarter mile of the site. There has not been any widespread development in this area in the intervening years, thus the number of residences is relatively the same. The majority of homes are located to the east and northeast of the site. There are neither water nor sewer utilities near the site nor any industrial buildings. There are four primary roads within one-quarter mile of the site. Each road is a state-designated, two-lane road.

C. Purpose of the Agreement

This Final Project Agreement ("the Agreement") is a joint statement of the plans, intentions, and commitments of the U.S. Environmental Protection Agency ("EPA"), the State of North Carolina, and Buncombe County, North Carolina to carry out this project approved for implementation at the county's solid waste management facility site near Alexander, North Carolina. This Project will be part of EPA's Project XL program to develop innovative approaches to environmental protection.

The Agreement does not create legal rights or obligations and is not an enforceable contract or a regulatory action such as a permit or a rule. This applies to both the substantive and the procedural provisions of this Agreement. While the parties to the Agreement fully intend to follow these procedures, they are not legally obligated to do so. For more detail, please refer to Section VI (Legal Basis for the Agreement).

Federal and State flexibility and enforceable commitments described in this Agreement will be implemented and become effective through a legal implementing mechanism such as a rule or permit modification.

All parties to this Agreement will strive for a high level of cooperation, communication, and coordination to assure successful, effective, and efficient implementation of the Agreement and the Project.

D. List of the Parties that Will Sign the Agreement

The Parties to this Final Project XL Agreement are the United States Environmental Protection Agency (EPA), County of Buncombe General Services Department, and the State of North Carolina.

E. List of the Project Contacts

County of Buncombe
General Services Department
30 Valley Street
Asheville, North Carolina 28801
Contact: Bob Hunter, Director

State of North Carolina
Department of Environment and Natural Resources
Division of Waste Management
Solid Waste Section
401 Oberlin Road, Suite 150
Raleigh, North Carolina 27605
Contact: Dexter Matthews, Section Chief

U. S. Environmental Protection Agency, Region 4
Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303-3104
Contact: Michelle Cook, Region 4 Project XL Coordinator

II. Detailed Description of the Project

A. Summary of the Project

Sanitary landfilling is the dominant method of solid waste disposal in the United States, accounting for about 217 million tons of waste annually (U.S. EPA, 1997). The annual production of municipal solid waste in the United States has more than doubled since 1960. In spite of increasing rates of reuse and recycling, population and economic growth will continue to render landfilling as an important and necessary component of solid waste management.

In a landfill which incorporates combined leachate recirculation and gas recovery, controlled quantities of liquid are added, and circulated through waste as appropriate, to accelerate the natural biodegradation and composting of solid and liquid waste components. This process significantly increases the biodegradation rate of waste and thus decreases the waste stabilization and composting time (5 to 10 years) relative to what would occur within a conventional landfill (30 years, to 50 years or more). If the waste decomposes (i. e., is composted) in the absence of oxygen (anaerobically), it produces landfill gas. Landfill gas is primarily a mixture of methane, a potent greenhouse gas, carbon dioxide, and VOC's, that are local air pollutants. Methane is also a

fuel. This by-product of landfill waste decomposition (composting) can be a substantial renewable energy resource that can be recovered for electricity or other uses. Other benefits of this type of landfill operation include: increased landfill waste settlement (and therefore an increase in landfill capacity and life); improved leachate quality, possible reduction of landfill post-closure efforts required; landfill mining; and, abatement of greenhouse gases through highly efficient methane capture over a much shorter period of time than is typical of waste management through conventional landfilling.

B. Specific project elements

Buncombe County intends to construct and operate a combined leachate recirculation and gas recovery system throughout its 100-acre Subtitle D landfill area. Currently, Cells 1-3 of the 10-cell design are in operation. These cells cover approximately 23 acres. Cells 4 and 5, which will cover approximately 20 acres, are expected to be under construction by mid-summer 2000 and in operation one year later. Cells 1 and 2 were constructed with the standard Subtitle D composite liner while Cells 3-5 were/will be constructed with an alternative liner approved by the NCDENR. Because of the presence of the separate alternative ground water monitoring system beneath each cell, the performance of the two types of liner systems can be evaluated as increased amounts of liquid are introduced to the cells.

DESIGN AND OPERATIONS OF PROPOSED LEACHATE RECIRCULATION/GAS RECOVERY PROJECT

As mentioned previously, two types of liner systems have been installed at the BCSWMF. Cells 1 and 2 (approximately 14 acres in size) were constructed with the standard Subtitle D composite liner system (i.e., two feet of 1×10^{-7} cm/sec clay overlain with a 60-mil HDPE synthetic liner). Cell 3 (approximately 8 acres in size and currently in operation) and the remaining cells yet to be constructed will have an alternate liner designed and constructed in accordance with North Carolina regulations. The alternate liner used in Cell 3 and proposed for all future cells, consists of 18 inches of 1×10^{-5} cm/sec clay overlain by both a geosynthetic clay liner (GCL) and a 60-mil HDPE synthetic liner. The GCL, consisting of a bentonite core and encapsulating polypropylene geotextile, will have a maximum permeability of 5×10^{-9} cm/sec. The HDPE synthetic liner shall conform to all applicable ASTM standards for textured and smooth HDPE liner. Based on groundwater modeling required by the State of North Carolina to demonstrate equivalency it appears that the alternative liner is actually more protective than the standard composite system (reference supporting documentation).

The leachate collection systems in all ten cells are distinct (i.e., not interconnected) and each drain to a separate sump. The internal slopes of Cells 1-5 are significant and range from 8.5% to 21%. Considering the internal slopes along with the highly permeable crushed stone drainage layer,

almost no head is built up on the liner system except in the sump area. A submersible pump installed in each cell pumps/will pump leachate through a common force main located around the perimeter of the landfill to the lined storage lagoon. The submersible pumps are set to switch on when the head builds up to 12 inches. Given the slopes, the area that actually experiences 12 inches of head before pumping is initiated is quite small. A new pump system will be constructed at the leachate storage lagoon to pump leachate back through a new, dedicated force main to the cells for recirculation.

Liner and Leachate Collection and Removal System (LCRS) Components

As mentioned, Cells 1 and 2 at the Buncombe County SWMF were constructed with the standard Subtitle D composite liner system. Cell 3 was constructed with a GCL/synthetic alternative liner system. Buncombe County, through this XL Project, intends to construct the remaining cells at the landfill with the alternative liner. The leachate collection system in each cell consists of two feet of locally generated crushed stone. In Cells 1 and 2, the internal cell slopes and permeability of the stone were sufficient to convey leachate to the sump areas without the use of collection pipes. The slopes in Cell 3 were somewhat less and thus one central collection line was installed. Collection pipes will be used in Cells 4 and 5. The synthetic liner is protected from the crushed stone drainage layer by a 28-oz. cushion fabric. The literature tends to recommend a 12-oz. fabric in this application, however, Buncombe County has decided to be conservative since the amount of data backing the available research is not significant.

Liner and LCRS Performance

40 CFR Part 258.28 already allows for leachate to be re-circulated in cells constructed with the standard Subtitle D composite liner. Performance of this alternate liner system will be monitored by the leak detection system underlying each cell. The alternative liner system constructed in Cell 3 and proposed for Cells 4-10 was thoroughly researched by the State of North Carolina before being proposed as a prescriptive alternative in the rules. The State's alternate liner design document calculated that the leakage rate through the standard Subtitle D liner system under a set of standard conditions was 1.12 gal/acre/day while through the alternative used in Cell 3 was only 0.53 gal/acre/day. Thus, the alternative liner being used at the Buncombe County MSWLF appears to perform in a manner at least as protective as the standard composite and, most likely, significantly more protective (modeling of both liners indicated the alternative liner would afford almost 50 percent more protection to the underlying aquifer than the composite liner).

Camp, Dresser, and McKee (CDM), under contract to Buncombe County, performed preliminary calculations on the performance of the crushed stone leachate drainage layer under anticipated leachate re-circulation conditions. Due to the high permeability of the crushed stone layer, the expected maximum depth of leachate under non-recirculation conditions is 0.03 feet. Therefore,

there is a significant design cushion to handle additional leachate flows expected under recirculation conditions. The crushed stone drainage layer has tremendous liquid carrying capacity which is why the expected maximum leachate depth is so small, and the slopes on the mountainous site allow rapid conveyance of the leachate to the sump area.

Buncombe County will demonstrate adequate performance of both the liner and leachate collection systems to the State of North Carolina during the permitting of the leachate recirculation/gas recovery system.

Specialized Design Considerations During Operation

Leachate will be applied during operations to provide enhanced conditions for rapid waste decomposition. It is possible that additional water will be needed to achieve and/or maintain optimal moisture levels in the landfill and thus, if needed, Buncombe County intends to supplement leachate recirculation with water withdrawn from the adjacent French Broad River. Cells 1 and 2 are near final grade and thus it is anticipated that leachate recirculation will be accomplished with both horizontal injection trenches and vertical injection wells. Most likely, both types of injection systems will be used to collect landfill gas as well. All leachate will be injected below the landfill surface to prevent contact with employees or users of the landfill. If supplemental river water is used it will either be discharged into the leachate pond and then pumped into the landfill, or applied to the working face of the landfill by a tanker truck. Moisture levels will be monitored and the recirculation system will be designed so that leachate can be applied or discontinued in small, distinct areas as needed. Table 1 identifies the Instrumentation Type and Location for the Bioreactor Project.

Moisture content will be monitored throughout the life of the Project through the use of a network of moisture sensors to be installed during waste placement. Buncombe County officials traveled to Yolo County, CA (the location of a similar, proposed XL Project) on June 29, 2000, to evaluate the moisture detection system that was used successfully on their pilot projects. The County will review what has worked and what has not, and then incorporate the final design of the moisture detection system during the preparation of permitting documents.

The quantity of leachate and supplemental water added back to the landfill will be measured throughout the life of the project. Buncombe County expects to quantify recirculation quantities using flow sensors installed on the leachate discharge line at the leachate storage pond, as well as the individual lines that feed each cell in the landfill. The goal of the system design will be to quantify the amount of leachate recirculated to each cell individually.

Table 1- Instrumentation Type and Location for the Bioreactor Project

Type of Instrumentation	Location	Description
Pressure transducers	Above primary liner and leachate collection system in the landfill cells	A series of pressure transducers will be installed on top of the primary liner in the LCRS trench in the anaerobic landfill cells to measure the head or depth of leachate above the liner. Total of eight pressure transducers will be installed, four in each cell at 200 feet spacing. A gas pressure transducer in each cell will be used to correct the liquid head for gas pressure.
Moisture and Temperature Sensors	Sensors will be placed on top of the primary liner and within the waste mass at three different depths at 20 feet intervals.	A series of moisture and temperature sensors will be installed within the waste mass to monitor the biological activity of each cell. Instrumentation will be installed directly on top of the bottom primary liner and at three different depths within the waste mass at an interval of 20 feet.
Gas Composition, Gas Pressure, and Gas Flowmeter	Gas extraction and collection pipelines using NSPS approved methods.	Chipped tire as part of the gas collection system will be installed at every lift to either collect landfill gas or inject air in the landfill. Pipes will be installed in each lift after placement of waste and chipped tires. Gas will be sampled from either the main collection pipe or each individual lift of waste to determine gas composition or

		measure gas pressure. The gas pressure and composition will be measured manually. Gas flow measurement will be continuous and automated.
Leachate Flow Measurement	Outflow and inflow from each cell is measured at each sump and at the injection manifold.	The quality of leachate added or collected from the LCRS is measured by flowmeters from each cell. The volumes of liquids are monitored from each cell continuously through a data collection system.

As discussed previously, the leachate collection/drainage layer constructed in each cell has been and will continue to be two feet of crushed stone. HELP model analyses show that, due to the internal cell slopes and high permeability of the crushed stone layer, there will be very little head buildup on the liner even when simulating high recirculation levels. The performance of the alternative liner system, especially under recirculation conditions that could produce higher head conditions, is of concern to U.S. EPA. While it can be shown with the HELP model that head buildup within the crushed stone leachate drainage layer will not be a problem, Buncombe County will install devices that can monitor head levels. This will be considered during the preparation of permitting documents. Leachate recirculation will be suspended in any cells where there appears to be head build up.

Improvement in leachate quality during recirculation operations is a claim made by proponents in the literature. This is an important environmental benefit of the project since improving leachate quality should be indicative of a stabilizing waste mass. Since leachate is pumped from each cell individually, Buncombe County intends to sample the leachate from each cell semi-annually for parameters that will be able to establish whether or not leachate quality is indeed improving.

The degradation and gas production of the waste mass is also related to the temperature within the decomposing waste. The effectiveness of the system is dependent on keeping the system within optimum temperature ranges, therefore, Buncombe County will install temperature gauges to aid in operation of the system. As with the moisture sensors, temperature gauges will also be installed as waste operations progress.

The Buncombe County MSWLF lies within a seismic impact zone as defined in 40 CFR Part 258. Adding liquids back into the landfill will increase the moisture content of the waste mass and raises the issue of whether or not this will make the waste mass less stable. Camp Dresser & McKee has re-run stability calculations that were completed during initial permitting of the facility

to assess the stability of the landfill and waste mass under these higher moisture conditions as well as during seismic events. The calculations show that significant increases in moisture content (i.e., within the range expected in a recirculation project) will have essentially no impact on waste mass or landfill stability, even during design seismic events. These calculations will be finalized and submitted as part of the County's permit amendment package that will be necessary to construct the proposed system.

As areas of the landfill reach design grade, Buncombe County will install monuments to monitor settlement caused by the degradation of the waste. These monuments will be checked semi-annually to track settlement. Annual aerial topographic surveys will also be performed to aid in the evaluation of settlement and the effectiveness of the leachate recirculation/gas recovery system.

Landfill gas will be collected from the landfill utilizing the horizontal and vertical trenches to be used for leachate recirculation. The total number of trenches to be installed for the initial phase of construction is 31. The trenches range in length from 150 to 500 feet. Separate header piping will be installed parallel to the leachate recirculation piping and interface at the head of each trench. The components of the system include:

- * Gas Main - the HDPE pipe that conveys the gas from the landfill to the flare station.
- * Header Piping - the HDPE piping that conveys gas from the horizontal collection trenches to the gas main. Plastic valves will be installed at various locations to control the collection process.
- * Horizontal Injection/Collection Trench (HICT) - a perforated HDPE pipe placed in a 2-ft by 3-ft stone trench which is located within the waste; the HICT provide the conduit by which leachate is recirculated and landfill gas is collected.
- * Wellhead Connection - this assembly will connect the header piping to the HICT; the connection includes valving, a flexible connection to accommodate settlement, a sampling port to monitor gas composition and pressure, a temperature gauge, and an orifice plate for measuring flow rate.

Gas will also be collected from the leachate collection system by connecting the gas main to the leachate sump. The components of this system that will be utilized for gas collection include the following:

- * Gas Main - the same as described above, the main will be connected to the leachate riser pipe.
- * Leachate Riser Pipe - the HDPE pipe that provides access to the leachate sump for the pumping system.
- * Leachate Sump - a 24-inch diameter, perforated, HDPE pipe that is installed in the low point of each cell.
- * Wellhead Connection - this assembly will connect the gas main to the leachate sump; the wellhead includes valving, a flexible connection to accommodate settlement, a sampling port to monitor gas composition and pressure, a temperature gauge, and an orifice plate for measuring flow rate.

It is anticipated that gas collection will begin sometime during the active filling stage of the landfill as a result of the accelerated generation of landfill gas. Once the gas system begins operation it will run continuously. The HICT will be installed at various elevations in the landfill as filling progresses to provide adequate coverage of the waste mound. It is anticipated that the uppermost tier of HICT, at any given time, will be used only for gas collection to control odors and gas emissions.

The lower tiers of HICT will be used for both leachate recirculation and gas collection. Gas collection from the leachate collection system and uppermost tier of HICT will envelop the gas being generated within the landfill and control release to the atmosphere.

Pressure, temperature, methane and oxygen concentrations at the active extraction points will be monitored at each wellhead on a monthly basis. The gas collection system will require periodic adjustments to maintain optimum performance during operation. During routine inspections, the operator will monitor and adjust the vacuum at the active gas collection trenches as needed to maximize system performance. The vacuum applied at individual extraction points can be adjusted using the valve provided at the wellhead connection. The vacuum can also be adjusted at the blower. However, if the vacuum is adjusted at the blower, the collection points throughout the system must be evaluated for performance. The following steps provide an outline of the system operation:

1. Each trench is equipped to recirculate leachate and collect gas. Since leachate recirculation will cause accelerated quantities of gas to be generated it is important that the gas collection system be ready to operate during the active filling stage. However, these processes should never be operated simultaneously in a HICT. Concurrent operation of leachate recirculation and gas collection at an HICT will result in flooding of the gas collection system.

2. Monitoring of the wellheads at the HICT will be necessary to provide indication of when gas generation begins.

3. In addition to confirming the generation of gas, the following criteria must be met before activating an HICT for gas collection:

- * A minimum of 20-feet of waste must be present over an HICT. This is required to prevent excessive air intrusion into the system.

- * A minimum of 1 week of draining time must be maintained before collecting gas from an HICT that has been used for leachate recirculation. This is to prevent the potential for flooding of the gas header.

4. If the presence of gas is confirmed and there is no sign of positive leachate pressure, then gas collection from an HICT can be operated until the next scheduled recirculation event at that HICT. Important: The wellheads should be installed with clear flexible tubing to allow the operator to visibly check for leachate flow.

5. The leachate collection system will also be utilized to collect gas from the landfill. Well heads will be installed at the riser pipe of each cell. A minimum of 20-feet of waste must be present in a cell before gas collection from the respective riser pipe may begin. It is anticipated that 20-feet of compacted waste will be sufficient to prevent air intrusion. However, the system should be monitored to verify that air intrusion is not occurring during the initial use of a leachate collection system for gas collection.

6. By utilizing the leachate collection system and the uppermost tier of HICT at any given time during the operation of the landfill, the system is designed to promote gas collection at the bottom and top of the waste mass by creating negative pressure in these two zones. The injection of leachate into HICTs in the center of the waste mass will enhance collection in these two zones by filling the void spaces in the waste with leachate (i.e., the gas will be forced to migrate to less saturated zones). However, gas collection will also be performed in the middle zone. Any HICT that has not received a leachate injection for more than 1 week may also be used for gas collection. The rotation of HICT employed for gas collection will be coordinated with the recirculation schedule to be established.

Cover material selection and application requires special consideration when operating a leachate recirculation system. Daily cover material will be sandy soils or some form of permeable alternative cover since clay soils and plastic tarps will block flow paths and inhibit lateral migration of the leachate. In areas in which additional waste will be placed, intermediate cover will be removed before placing the next lift to prevent blocking vertical flow paths and forming perched leachate zones. Removal of intermediate cover will also decrease the chance of leachate

seeps through the side slopes. Intermediate cover placed at final elevations will use clayey soils to block gas migration and leachate seeps. The placement of final cover will occur when filling is complete in a substantial area. However, placing waste to the design elevations will not necessarily constitute a completed filling area. As a result of recirculation, settlement will occur over a shortened time frame causing much of the settlement to occur while the landfill is still active. A significant amount of additional capacity will be obtained by returning to previously filled areas and placing more waste in the settled areas. Final cover will be installed after additional waste is placed and the capacity of the landfill is maximized.

III. How the Project Will Meet the XL Criteria

A. Superior Environmental Performance

1. Tier 1: Is the Project Equivalent?

The literature on landfills conducting combined leachate recirculation and gas recovery identifies no significant adverse environmental impacts relative to those created by conventional landfill practice. Although leachate may be generated/recovered in quantities at times greater than that in conventional landfilling, the leachate collection, pumping, and storage systems are currently designed to handle the additional projected flows. The leachate storage pond is currently sized to handle leachate from the ultimate build-out of the landfill. During design of the leachate recirculation system, calculations will be made to determine if additional storage capacity will be needed when Cells 6-10 are put into operation. It is hoped that, once the system is in full operation, that the need for off-site hauling and treatment of the leachate will be eliminated. The County intends to keep its pre-treatment permit in effect and haul leachate off-site should emergency conditions dictate. It should be noted that leachate will be injected at least several feet below the active working level of the landfill thus there should be no exposure to those using or working at the landfill.

The design capacity of the Buncombe County Subtitle D landfill subjects it to regulation under 40 CFR Part 60 Subpart WWW of the Clean Air Act. Based on a recent Tier I analysis for the landfill, given its current design capacity and waste acceptance rate, it is anticipated that the landfill's emissions of nonmethane organic compounds (NMOC) will exceed 50 Mg/yr in 2001. At that point, the County could either initiate the design of a gas collection and control system, with 30 months allowed for startup of the system, or it could conduct a Tier II analysis to determine the possibility of postponing the installation of a gas collection and control system by at least five years. Because Tier II testing has not been performed, it is unknown how the landfill's NMOC concentration may differ from the default Tier I value. The proposed gas collection system will be designed to comply with Subpart WWW and will be in-place and operational when

recirculation starts and before it would be required under the rule. Therefore, overall and total lifetime fugitive emissions from the site will be reduced. The U.S. EPA is a strong proponent of landfill gas recovery and control through its Landfill Methane Outreach Program, among other initiatives.

This particular XL project will provide environmental performance at least equivalent to Tier 1 in all areas.

2. Tier 2: Superior Environmental Performance

a. Maximizing landfill gas control and minimizing fugitive methane and VOC emissions.

Landfill gas contains roughly 50% methane, a potent greenhouse gas. In terms of climate effects methane is second in importance only to carbon dioxide. Landfill gas also contains volatile organic compounds (VOC's) that are local hazardous air pollutants. At closure, landfill gas capture is maximized by a surface permeable gas collection layer overlain by a cover of soil with embedded membrane. Gas is withdrawn to maintain this permeable layer beneath surface containment at slight vacuum. It is anticipated that the capture of methane is further facilitated and eased by a shortened generation interval, from 30 to 50 years to between 5 to 10 years through enhanced decomposition afforded by leachate recirculation. Buncombe County is proposing to install vertical gas wells in areas that have already reached final grade and horizontal collection trenches in operational areas to collect gas throughout the active life of the site. With this gas capture approach, it is expected that fugitive landfill gas emissions will be reduced for reasons that include:

- Reduction in emissions through installation and operation of gas collection system before the final fill height is reached, and before it would be required by the current Clean Air Act NSPS regulations.
- Collection efficiency improvements with the proposed horizontal gas extraction method over vertical gas well efficiency.
- Reduction in long term emissions, from landfill gas generation occurring slowly beyond 30 years of post-closure, which are not easily controlled.

Other bioreactor demonstration projects have already shown close to a tenfold increase in methane recovery rates, which suggest a tenfold reduction in interval of methane generation. Available indications as well as basic physical principles suggest that capture effectiveness

approaches 100%, so long as vacuum is maintained under the permeable layer, cover integrity is maintained and the collection system is designed and maintained to collect the maximum amount of LFG generated at the site.

b. Expedited methane gas generation/recovery. Methane recovery is maximized by use of permeable gas collection layers as discussed above and also facilitated by methane generation over much shorter terms. This is expected to minimize long-term low-rate methane generation often lost to energy use in conventional landfill practice. The reliability of methane recovery of fuel for energy generation should reduce the uncertainty and improves economics of landfill gas projects. Greater use of methane to full potential can add still more greenhouse benefit by replacing fossil CO₂ otherwise emitted with fossil energy use elsewhere.

A recently completed study for the Federal Energy Technology Center (FETC, presently becoming the National Energy Technology Laboratory, NETL) of the U. S. Department of Energy indicates that wide application of controlled landfilling could reduce US greenhouse gas emissions by 50-100 million tons of CO₂ equivalent when both emission prevention and fossil CO₂ offsets are taken into account. This major reduction in CO₂ emissions is also cost-effective. In the analysis for FETC (JEM, 1999), over a range of representative landfill conditions, greenhouse gas abatement was estimated as attainable at a cost of \$1-5/ton CO₂ equivalent which represents extremely low (by more than tenfold) cost compared to most other options presented in the recent EIA Report (USDOE Energy Information Agency, 1998).

Buncombe County currently intends to flare the recovered gas in an approved control device while it seeks feasible reuse opportunities. It should be noted that the County currently extracts and sells landfill gas from its closed landfill to an adjacent wastewater treatment plant. The County is committed to trying to find a feasible re-use project for the landfill gas generated at its current facility.

c. Landfill life extension and/or reduced landfill use. The more rapid conversion of greater quantities of solid waste to gas reduces the volume of the waste. Settlement in a test cell in Yolo County, California is already over 18% in three years. Volume reduction translates into either landfill life extension and/or less landfill use. Thus, landfills that recirculate leachate and recover gas are able to accept more waste over their working lifetime. Alternatively, fewer landfills are needed to accommodate the same inflows of waste from a given population.

d. Leachate-associated benefits: Leachate recirculation promises more rapid leachate stabilization in terms of pollutant load, reduced leachate environmental impact, and elimination of

need for most discharges to treatment facilities. The biological processes, both anaerobic and aerobic, which are enhanced by the recirculation of leachate, have been shown in studies at many scales to reduce the content of many leachate pollutants. These include organic acids and other soluble organic pollutants. Since a biologically active landfill operation brings pH to near-neutral conditions, metals of concern are largely precipitated and sequestered/ immobilized in waste. Thus free liquid concentrations and mobility of metals are reduced compared to "conventional" landfill practices, where more contaminated lower-pH leachate is often observed to be generated slowly for years. For example, in the aforementioned Yolo County test cell demonstration, leachate reached near-neutral (pH 7) conditions within four months after liquid additions and recirculation commenced.

The need for off-site leachate treatment should be reduced as long as waste landfilling continues concurrently with leachate recirculation/gas recovery operations. Additional leachate that would have to be treated at a wastewater treatment facility could be avoided. Because this type of operation sometimes requires extra liquid for optimum performance, and leachate and condensate re-introduction are permissible under specified circumstances (40 CFR 258.28), continuing liquids recirculation allows generated leachate and condensate to be reintroduced so long as new dry waste continues to flow into the landfill.

Improvements in leachate quality are expected to consist of organic compound reduction through increased biological activity and inorganic reductions by adsorption to the waste mass and soil, and by chemical reactions, such as metals precipitation.

e. Lessened long-term risk and need for monitoring. The leachate recirculation/gas recovery mode of landfill operation offers potential for substantial reductions in post-closure care needs and costs. With present conventional practice, it is highly likely that gas management will be required for at least a mandated 30-year post-closure period. This entails all of the associated expense of continuing monitoring and gas well adjustment. A number of other management needs occur as waste continues to decompose, including dealing with subsidence, gas collection line breakage caused by subsidence, and the like. Rapid decomposition of the waste during and shortly after disposal operations cease will likely reduce the potential for the facility to generate significant quantities of high strength leachate or landfill gas. This will reduce the long-term risk of ground water contamination and gas migration should there be a breach in either the top or bottom containment systems.

f. Landfill gas energy project potential. The recirculation of leachate and other liquids has been demonstrated to increase the rate and quantity of gas generation. Increased quantities of gas can make a gas-to-energy project more feasible. Since the current plan is to flare the gas at the

Buncombe County SWMF, identifying and constructing a beneficial reuse project could eliminate the use of another fuel on another project and its emissions. Buncombe County is currently in the initial stages of evaluating possible greenhouse projects as well as converting the gas to a fuel usable by county vehicles.

g. Landfill Mining Potential. The removal and re-use of waste for beneficial purposes, such as compost or landfill daily cover is a distinct possibility in the future. If landfill mining is carried out, it would occur when stabilization has sufficiently been achieved. Because the cells will be operated anaerobically, this could be beyond the expected term of the XL agreement.

3. How We Will Measure Superior Environmental Performance

Superior Environmental Performance will be measured using the baseline (Tier 1, without Project XL) against the actual results of the project (Tier 2, proposed Project XL). To determine specific project performance, the County plans to conduct monitoring as outlined in Table 2. Performance measurement against project goals is discussed further below:

a. Maximizing landfill gas control and minimizing fugitive methane /VOC emissions. The design capacity of the Buncombe County Subtitle D landfill exceeds the NSPS thresholds and thus the facility will have to comply with 40 CFR Subpart WWW. However, based on a recent Tier I analysis, installation and startup of a gas collection and control system might not be required until the year 2004. Although a Tier II test has not been performed to determine a specific NMOC concentration for this landfill, it is conceivable that a NMOC concentration significantly lower than the Tier I default value could allow the County to postpone the installation and operation of a gas collection and control system for at least five years and possibly indefinitely (see Section III. A. 1. above). Therefore, any gas collection before that time will be a significant environmental benefit. The gas collection and control system will be designed and operated to meet all Subpart WWW criteria. Monitoring of system performance will include surface methane emissions testing to track and confirm the collection effectiveness of the system. Because bioreactors generate more landfill gas earlier in the lifespan of the facility compared to standard MSW landfills, it will be necessary for gas collection and monitoring to be required prior to the time frame set out in subpart WWW, which does not contemplate bioreactor scenarios. Monitoring will continue for the duration of the project.

b. Expedited methane generation/recovery. It is well documented in the literature and from operating leachate recirculation/gas recovery landfills that expedited gas generation will occur in these types of landfills. The gas recovery system for the Buncombe County SWMF will be

designed to account for this enhanced generation. Gas flow rates will be monitored at the control device and will be compared with gas generation rates from non-recirculating landfills.

c. Additional waste disposal airspace through settlement. This will be based on annual topographical surveys. Total volume loss occurring within this time interval will be calculated as well as in-place waste density to see if actual densities can exceed those calculated at non-recirculating landfills.

d. Leachate contamination risk. Buncombe County will measure leachate quality over time to examine trends in leachate quality and whether or not quality is improving. The County will compare its results with similar, non-recirculating landfills.

e. Landfill gas energy project potential. Buncombe County is a strong proponent of beneficial reuse of landfill gas. The County currently recovers landfill gas from its old, closed landfill and sells it to the MSD wastewater treatment plant which is located immediately adjacent to the site. The County is a partner and active participant in U.S. EPA's Landfill Methane Outreach Program.

B. Other Benefits

As noted, results from other projects and the literature show that leachate recirculation combined with gas recovery have demonstrated a significant increase in landfill gas generation, increased landfill settlement, improved leachate quality, and highly cost-effective abatement of greenhouse gases. Preliminary economic analyses of the project show that implementing leachate recirculation/gas recovery operations can have significant cost savings and environmental benefits for the Buncombe County Solid Waste Management Facility.

C. Stakeholder Involvement and Support

Stakeholder involvement is considered essential by Buncombe County and has been an important part of the County's solid waste program since the initial siting of the Buncombe County Solid Waste Management Facility in the early 1990's. Stakeholder involvement and support are critical for the success of this project. Buncombe County has already begun providing the public with information about the project via a televised (and re-aired) presentation at the Buncombe County Commissioners' Annual Planning Retreat. The State of North Carolina has been included and consulted on the project to date, and was a participant via phone during the County's proposal presentation to EPA Region 4 in February, 2000, and subsequent open meetings (May 2, June 12). The County has identified the following list of stakeholders.

Buncombe County General Services Department
Buncombe County Board of Commissioners
U.S. Environmental Protection Agency
Buncombe County Environmental Affairs Board
The North Carolina Chapter of the Solid Waste Association of North America (NC SWANA)
The Western North Carolina Regional Air Pollution Control Agency (Title V Permit Issuer)
The State of North Carolina, Department of Environment and Natural Resources, Waste Management Division
Blue Ridge Environmental Defense League
local residents

The County conducted a 30-minute briefing at the County Commissioners 2000 annual retreat which was televised and re-broadcast on numerous occasions on the County's local access government cable channel. In addition, on June 12, 2000, the County held a three-hour educational workshop on the bioreactor technology that was highlighted by a presentation by one of the foremost experts in the field, Dr. Debra Reinhart of the University of Central Florida.

Stakeholders include any individuals, government organizations, neighborhood organizations, academic centers, and companies with an interest in the progress of the Buncombe County Solid Waste Management Facility Bioreactor Project. The identification of Stakeholders was based on inviting those who are already involved in other environmental issues in the Asheville/Buncombe County area, contacting others with related interests, and by general invitation to the local population. Stakeholders provide information on the preferences of the community and may also identify un-addressed issues.

Stakeholders in the XL program typically fall into three categories; direct participants (EPA, Buncombe County, and North Carolina DENR), Commentors (citizens living adjacent to the facility, Western North Carolina Air Pollution Control Agency, the Buncombe County Environmental Affairs Board, the Blue Ridge Environmental Defense League, Sierra Club, SWANA, Quality Forward, etc.), and the general public. Additional information on proposed stakeholder involvement is available in the draft stakeholder involvement plan, dated June 2000. This document is available from any of the contacts listed in this EPA or from the EPA Project XL website at "www.epa.gov/projectxl".

Buncombe County will convene periodic meetings of stakeholders to obtain comments on the Project as well as to report on the progress during the duration of the XL Agreement. These periodic meetings will be open to the public.

D. Innovative Approaches and Multi-media Pollution Prevention

Buncombe County intends to invest a portion of the projected savings from this project into its successful solid and hazardous waste education efforts. Buncombe County's solid waste program is the only one in the state of North Carolina that has a full-time hazardous waste officer. This person is responsible for educating local businesses and citizens about the proper handling and disposal of hazardous wastes. The hazardous waste officer conducts business inspections and in-plant consulting, as well as in home visits to residents. The hazardous waste officer also conducts an annual household hazardous waste collection day and is responsible for conducting educational programs in the schools. The goal of the hazardous waste program is to keep as much hazardous waste out of the Subtitle D and construction/demolition landfills at the new BCSWMF. The North Carolina Association of County Commissioners recently recognized the County's hazardous waste program as one of three outstanding county programs for the year 2000.

E. Transferability of the Approach to Other Entities or Sectors

Buncombe County believes that following the evaluation and approval of this proposed leachate recirculation/gas recovery landfilling concept by U.S. EPA and the State of North Carolina, many other public and private landfill owners and operators should be able to implement this type of technology. The technology is expected to yield substantial economic and environmental benefits for nearly all regions of the U. S., and, as noted, worldwide.

Following an evaluation of this XL Project by EPA, and assuming the overall success of the Project, the leachate recirculation/gas recovery landfill technology used in this project could be transferable to a subset of landfills where conditions are favorable for actively managing the decomposition process and where groundwater protection and gas control are ensured.

F. Feasibility of the Project

The project sponsor and regulatory agencies as designated in the Final Project Agreement, agree to support the project, subject to any review procedures necessary to implement the legal mechanism for this project. Further, the XL sponsor, Buncombe County, has the financial

capability, personnel and senior management commitment necessary to implement the elements of this XL Project.

G. Monitoring, Reporting, Accountability, and Evaluation of Methods to be Used

The parties intend to implement as enforceable commitments, federal and state regulatory flexibility, monitoring, record-keeping, and reporting provisions of this FPA through site-specific rulemaking to implement this project. Table 2 identifies the Monitoring Parameters and Frequency for Monitoring for this project.

The enforceable requirement to initiate NSPS compliant gas collection and monitoring concurrently with recirculation activities will be implemented via a Federally Enforceable State Operating Permit (FESOP) provision. This FPA describes both enforceable and aspirational requirements, and it establishes certain limits and goals for Buncombe County's performance. The County will ensure compliance with legal requirements and ensure implementation of processes seeking to meet aspirational goals. The project sponsor will establish a record-keeping system to ensure compliance, as well as accurate reporting of environmental performance. Buncombe County will make any such reports available publicly and will specifically discuss project performance with interested stakeholder groups.

The legal mechanisms that would apply to this project include a Federally Enforceable State Operating Permit for gas collection, and site-specific rule for liquid additions. The Western North Carolina Regional Air Pollution Control Agency is the regulatory agency that has permitting authority for the Buncombe County landfill. The FESOP would contain enforceable parameters and requirements with respect to gas collection and monitoring. It would require a public notice and comment period. In addition, EPA will be issuing a proposed rule for liquid additions at Buncombe County landfill. It would also require a public comment period. Either the FESOP or the site-specific rule (as appropriate) would contain the following enforceable project monitoring requirements listed in Table 2.

Table 2- Monitoring Parameters and Frequency for the Bioreactor Project

Monitoring Parameter	Frequency	Description
Leachate:		
pH	Weekly	Leachate samples will be collected from each cell sump and tested. For the first six
Conductivity	Weekly	

Dissolved Oxygen Dissolved Solids Biochemical Oxygen Demand Chemical Oxygen Demand Organic Carbon Nutrients(Ammonia Nitrogen, Total Nitrogen, and Total Phosphorus) Common Ions Heavy Metals Organic Priority Pollutants	Monthly, Quarterly Monthly, Quarterly Monthly, Quarterly Monthly, Quarterly Monthly, Quarterly Monthly, Quarterly Monthly, Quarterly Monthly, Quarterly Monthly, Quarterly	months starting from the initiation of recirculation. Tests will be done monthly and the next six months will be done quarterly. After the first year test will be done on semi-annually.
Landfill Gas: CH ₄ , CO ₂ , O ₂ , and N ₂ NMOCs N ₂ O Surface Emissions Well Head Gas Temperatures	Weekly Semi-annually Semi-annually Semi-annually Monthly	Landfill gas will be tested routinely from the anaerobic cell. Semi-annually other gas emissions will be measured by using NSPS approved methods. Surface emissions will be monitored for compliance with the 500 ppm CH ₄ limit in Subpart WWW.
Solid Waste Stabilization and decomposition: Volume of Gas Generation Landfill surface topographic survey Moisture Content Biochemical Methane Potential Cellulose Lignin Hemi-cellulose Volume of gas	Hourly Annually Annually Annually Annually Annually Annually	In the anaerobic cell the total volume of CH ₄ and CO ₂ will be measured continuously to determine the degree of solid waste stabilization. Another means to measure the degree of decomposition will be to conduct a topographic survey of the two cells to determine the total percent change in volume over time. Annual topographic survey will be done on the top surface of each cell. If funding is available solid waste samples may be

		collected to determine the degree of stabilization. Samples of waste may also be tested for heavy metals and organic pollutants.
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Additionally, Buncombe County voluntarily commits to providing the following information to project stakeholders and regulators in order to facilitate the project's evaluation:

- Quantities of leachate recirculated in each cell, and the amount of supplementary liquids added to each cell.
- Quarterly reporting on the data collected by the moisture sensors located within each cell.
- Semi-annual reports on changes in the quality of the leachate subsequent to recirculation in each cell.
- Quarterly reporting on the data collected by temperature gauges installed in each cell.
- Semi-annual reporting on settlement in each cell as measured against monuments installed for this purpose.
- Annual reporting and assessment of the settlement in the cells based upon topographic surveys.
- Annual reporting on studies and efforts made by Buncombe County to identify a means of utilizing, or the feasibility of selling, landfill gas as an energy source.
- Annual comparisons of gas flow rates from the bioreactor cells which have the standard double liners and the alternative liners.

Information submitted for both the mandatory and voluntary reporting elements for this project will be considered and assessed annually by EPA and the State .

H. Avoidance of Shifting of Risk Burden to Other Areas or Media

It is expected that there will be enforceable monitoring requirements in place which will ensure that no shifting of risk burden to other environmental media associated with this project. Should the alternate liner system not perform sufficiently under recirculation conditions, the underlying groundwater monitoring zone (i.e., the lined area beneath the sump areas and liner systems in each cell) will be able to detect a release early, collect the release, and form the basis for halting the project. The monitoring zone will serve to collect any release of contaminants before they reach the

underlying groundwater regime. The County agrees to conduct periodic surface emissions monitoring conducted analytically in compliance with Subpart WWW to demonstrate compliance with NSPS as well as that no additional burden of air emissions has occurred.

IV. Description of the Requested Flexibility and Implementing Mechanisms

A. Requested Flexibility

In general, Buncombe County proposes to be able to undertake a leachate recirculation/gas recovery project that falls within the limitations established in this XL Agreement. Buncombe County is requesting specific flexibility under the current federal and state regulations for liquid addition to the landfill. Buncombe County is requesting that U.S. EPA grant site-specific regulatory flexibility from the prohibition in 40 CFR 258.28, Liquid Restrictions, which currently precludes the recirculation of leachate in Subtitle D landfill cells not constructed with the standard Subtitle D composite liner system. Buncombe County desires to construct the remainder of its landfill cells with an approved alternative liner while implementing this leachate recirculation/gas recovery project. Buncombe County is also requesting that U.S. EPA grant site-specific regulatory flexibility from the prohibition in 40 CFR 258.28, Liquid Restrictions, which currently precludes the addition of useful bulk or non-containerized liquid amendments. During periods of low leachate generation, Buncombe County desires to supplement the leachate flow with water from the adjoining French Broad River to maintain moisture levels in the landfill. Buncombe County requests that the State of North Carolina provide similar flexibility.

B. Legal Implementing Mechanisms

To implement this Project, the parties intend to take the following steps:

1. EPA expects to propose for public comment and promulgate a site-specific rule amending 40 CFR 258.28 for Buncombe County's Solid Waste Management Facility. This site-specific rule will describe the project requirements and any other aspects of the rulemaking. It is expected that the site-specific rule will provide for Withdrawal or Termination and a Post-Project Compliance Period consistent with Section VII, and will address the Transfer procedures included in Section X. The standards and reporting requirements set forth in Section II (and any attachments to this EPA) will be implemented in this site-specific rulemaking.

2. Requisite permits for each projected five year phase of the project constitute the State legal mechanisms for the XL project. Buncombe County will submit to the Division of Waste Management of the North Carolina Department of Environment and Natural Resources a permit application for the first five-year phase of the proposed leachate recirculation and gas collection system. As described in Section IV.B.2 of this Agreement, the Division will review the application in accordance with relevant law. Upon determination by the Division that the application meets all applicable requirements, the Division will issue a permit to construct, followed by a permit to operate, the leachate recirculation and gas collection system.
3. Except as provided in any rule(s), permit provisions or other implementing mechanisms that may be adopted to implement the Project, the parties do not intend that this FPA will modify or otherwise alter the applicability of existing or future laws or regulations to Buncombe County's Solid Waste Management Facility.
4. By signing this FPA, EPA, Buncombe County, the State of North Carolina Department of Environment and Natural Resources acknowledge and agree that they have the respective authorities and discretion to enter into this FPA and to implement the provisions of this project, to the extent appropriate.

V. Discussion of Intentions and Commitments for Implementing the Project

A. Buncombe County's Intentions and Commitments

Buncombe County proposes to operate, as specifically allowed by rulemaking and permitting procedures, its existing cells (Cells 1-3) and its future cells (Cells 4-10) near Asheville, North Carolina as a leachate recirculation/gas collection landfill to attain a number of superior environmental and cost savings benefits. The county is committed to working with federal, state, and local governments to demonstrate, with regulatory flexibility allowing recirculation over cells constructed with alternative liners and the addition of supplemental water (if needed), how a leachate recirculation/gas collection landfill can demonstrate more desirable environmental results than a conventional landfill. Further, the County is seeking possible delay in the closure rule requirements allowing it to continue to recirculate leachate even after a cell has reached its permitted final grade so that it may return and place additional waste when the expected settlement occurs.

B. EPA's and the State of North Carolina's Intentions and Commitments

EPA intends to propose and issue (subject to applicable procedures and review of public

comments) a site-specific rule, amending 40 CFR Part 258.28 for Buncombe County to allow recirculation of leachate over cells constructed with an alternative liner and to allow the addition of supplemental water from the French Broad River should leachate availability become limited, that applies specifically to the Buncombe County Solid Waste Management Facility. The site-specific rule will also provide for withdrawal or termination and a post-Project compliance period consistent with Section XII of this Agreement, and will address the transfer procedures included in Section IX. The standards and reporting requirements set forth in Section V.E. will be implemented in the site-specific rule.

EPA will propose a site-specific rule to facilitate the implementation of this pilot project by providing regulatory flexibility for liquid additions into existing Cell 3, and future Cells 4 and 5. Based on periodic review of the pilot project the parties, in consultation with the stakeholders, determine that the pilot program is successfully exhibiting the superior environmental performance anticipated at this time and that no detrimental results (such as the alternative liner failing to perform as anticipated, or unsatisfactory performance of the gas collection or monitoring strategy) have been exhibited during the pilot project, then EPA may extend the regulatory flexibility described under this FPA to future cells at the Buncombe County project site. EPA will also take into account any relevant amendments to the regulations in 40 CFR Part 258 that concern addition of liquids to MSWLFs or landfill gas collection/ monitoring requirements. EPA expects that such amendments would supercede the site-specific rule and would apply to future landfill cells at the Buncombe site.

The Department of Environment and Natural Resources, Division of Waste Management, is the statutorily designated agency for permitting and regulation of municipal solid waste landfills in North Carolina. The Buncombe County landfill is currently operating under a permit to construct and a permit to operate the first five year phase³ of its municipal solid waste landfill facility with a projected total operational period of 34 years. Upon receipt of a permit application from Buncombe County for the first five year phase of the proposed leachate recirculation and gas recovery system at the landfill, the Division of Waste Management will review the application in accordance with applicable State statutes and rules and consistency with the site-specific rule promulgated by EPA for this XL project. If the Division determines that the application meets all of the applicable requirements, the Division will issue a permit to construct the first five-year phase of the project. A permit to operate will be issued following receipt and review of appropriate construction quality assurance and quality control documentation. Application for subsequent five-year phases of the project may be made to the Division for review in accordance with statutes and rules in effect at the time and the periodic assessment of the project performance described above.

C. Project XL Performance Targets

The performance targets of this project will be to achieve the superior environmental performance described in Section III, G of this FPA in Table 2. It describes some of the measures that will be used. Others may be developed as part of the permitting processes and the associated stakeholder involvement.

D. Proposed Schedule and Milestones

This project will be developed and implemented over a time period necessary to complete its desired major objectives, beginning from the date that the final legal mechanism becomes effective, unless it is terminated earlier or extended by agreement of all Project Signatories. Assuming that a Final Project Agreement is executed by October, 2000, the County intends to begin final design of the system and have it complete by the end of 2000. At that time, the appropriate permitting documents will be submitted to the State of North Carolina for permitting and to the USEPA for verification of consistency with the Final Project Agreement. It is expected that final permitting can be accomplished within six months at which time construction of the leachate recirculation/gas recovery system will commence. It is expected that the system will be operational by the beginning of 2002.

The current estimated build-out schedule for the Buncombe County Landfill is provided below. The actual schedule will depend mainly on the amount of waste received each year.

	Opening Date	Expected Life
Cells 4-5	Summer 2001	4.7 years
Cell 6	Winter 2006	5.6 years
Cell 7	Fall 2011	4.3 years
Cell 8	Fall 2015	4.1 years
Cells 9-10	Fall 2019	5.5 years

E. Project Tracking, Reporting and Evaluation

The project tracking, reporting and evaluation will be accomplished by the project sponsor in accordance with EPA requests. The County also agrees to provide periodic updates of project performance at nationally recognized solid waste symposiums, subject to acceptance by those symposia.

The County will prepare semi-annual reports which will include all monitoring data commencing with the execution of the Final Project Agreement and deliver them to USEPA and the stakeholders. An annual meeting will be held to review the project progress and results to date for as long as Buncombe County continues to recirculate leachate at its site under the provisions of the site specific rule(s) promulgated to implement this XL project.

F. Periodic Review by the Parties to the Agreement

The Parties will hold periodic performance review conferences to assess their progress in implementing this Project. Unless they agree otherwise, the date for those conferences will be concurrent with annual Stakeholder Meetings. No later than thirty (30) days following a periodic performance review conference, Buncombe County will provide a summary of the minutes of that conference to all Direct Stakeholders. Any additional comments of participating Stakeholders will be reported to EPA.

G. Duration of the Project

If the project, which is currently expected to cover Cells 1-5 at the facility, is deemed successful when evaluated against the expected superior results three years from the date of the Final Project Agreement, the County will request that they be able to expand the system to future cells under similar terms. This assumes that the current regulations for which the County is seeking flexibility are not changed in the meantime to allow the activities requested herein. In the event that EPA and North Carolina promulgate changes to the generally applicable requirements for leachate recirculation or landfill gas collection/ monitoring at municipal solid waste landfills like the Buncombe County landfill, and the stakeholders involved in this XL Project agree that no reason exists to have the project continue to be in effect, then this FPA may be terminated

according to the procedures set forth within this document. The site specific rule mechanism(s) will contain a "sunset" provision ending authorization for this Project 25 years after the effective date of the final implementing mechanism(s). It will also address withdrawal or termination conditions and procedures (as described in Section XI). This Project will not extend past the agreed upon date, and Buncombe County will comply with all applicable requirements following this date (as described in Section XII), unless all parties agree to an amendment to the Project term (as provided in Section VIII).

The average duration for a conventional landfill with a geosynthetic membrane can be 20-50 years. The design life of the Buncombe County landfill is 35 years. The County proposes to conduct the bioreactor pilot over a period of twenty-five years. During that period, the County will to conduct specified monitoring at designated intervals during the life of the project. The data from the project monitoring will benefit EPA, State and local regulatory agencies, and will also be available to all other stakeholders who are interested in the environment, and safety at the site and in the project vicinity. The implementation of the pilot will be permissible through the promulgation of a site-specific rule. The County recognizes that the State permit will be valid for a period of five years. Prior to the the permit expiration, the site will be required to undergo an evaluation to ensure that there have been no instances of non-compliance, and to determine whether or not revisions need to be made to the permit prior to issuance of a new one. EPA evaluation would occur either during the same period of evaluation for the State permit review, or during the annual assessment for the project under the XL program.

If, during the 25 year period, EPA develops a new rule or rule modification addressing recirculation of leachate, Buncombe County and/or EPA could make the determination to cancel or terminate the pilot project and continue the recirculation consistent with the new regulations. At any point during the pilot project, if either party chooses to terminate the project, they may do so. However, it is expected that the implementation and operation of the bioreactor landfill site at Buncombe County will provide useful data in the for the evaluation of EPA rules as initiated by the April 6, 2000 Federal Register Notice (65FR, 18014).

VI. Legal Basis for the Project

A. Authority to Enter into the Agreement

By signing this Agreement, all signatories acknowledge and agree that they have the respective authorities, discretion, and resources to enter into this Agreement and to implement all applicable provisions of this Project, as described in this Agreement.

B. Legal Effect of the Agreement

This Agreement states the intentions of the Parties with respect to Buncombe County's XL Project. The Parties have stated their intentions seriously and in good faith, and expect to carry out their stated intentions. This Agreement in itself does not create or modify legal rights or obligations, is not a contract or a regulatory action, such as a permit or a rule, and is not legally binding or enforceable against any Party. Rather, it expresses the plans and intentions of the Parties without making those plans and intentions binding requirements. This applies to the provisions of this Agreement that concern procedural as well as substantive matters. Thus, for example, the Agreement establishes procedures that the parties intend to follow with respect to dispute resolution and termination (see Sections X and XI). However, while the parties fully intend to adhere to these procedures, they are not legally obligated to do so.

EPA intends to propose for public comment a site-specific rule needed to implement this Project. Any rules, permit modifications or legal mechanisms that implement this Project will be effective and enforceable as provided under applicable law.

This Agreement is not a "final agency action" by EPA or the State, because it does not create or modify legal rights or obligations and is not legally enforceable. This Agreement itself is not subject to judicial review or enforcement. Nothing any Party does or does not do that deviates from a provision of this Agreement, or that is alleged to deviate from a provision of this Agreement, can serve as the basis for any claim for damages, compensation or other relief against any Party.

C. Other Laws or Regulations That May Apply

Except as provided in the site specific rule for this Project, the parties do not intend that this Final Project Agreement will modify the applicability of any other existing or future laws or regulations.

D. Retention of Rights to Other Legal Remedies

Nothing in this Agreement affects or limits Buncombe County's, EPA's, or the State of North Carolina's legal rights. These rights include legal, equitable, civil, criminal or administrative claims or other relief regarding the enforcement of present or future applicable federal and state laws, rules, regulations or permits with respect to the facility.

VII. Amendments or Modifications to the Agreement

This Project is an experiment designed to test new approaches to environmental protection and there is a degree of uncertainty regarding the environmental benefits and costs associated with activities to be undertaken in this Project. Therefore, it may be appropriate to amend this Agreement at some point during its duration.

This Final Project Agreement may be amended by mutual agreement of all parties at any time during the duration of the Project. The parties recognize that amendments to this Agreement may also necessitate modification of legal implementation mechanisms or may require development of new implementation mechanisms. If the Agreement is amended, EPA and Buncombe County expect to work together with other regulatory bodies and stakeholders to identify and pursue any necessary modifications or additions to the implementation mechanisms in accordance with applicable procedures (including public notice and comment). If the parties agree to make a substantial amendment to this Agreement, the general public will receive notice of the amendment and be given an opportunity to participate in the process, as appropriate.

In determining whether to amend the Agreement, the parties will evaluate whether the proposed amendment meets Project XL acceptance criteria and any other relevant considerations agreed on by the parties. All parties to the Agreement will meet within ninety (90) days following submission of any amendment proposal (or within a shorter or longer period if all parties agree) to discuss evaluation of the proposed amendment. If all parties support the proposed amendment, the parties will (after appropriate stakeholder involvement) amend the Agreement.

VIII. Transfer of Project Benefits and Responsibilities to a New Owner

The parties expect that the site specific rule will allow for a transfer of Buncombe County's benefits and responsibilities under the Project to any future owner or operator upon request of Buncombe County and the new owner or operator, provided that the following conditions are met:

- A. Buncombe County will provide written notice of any such proposed transfer to the EPA, the State of North Carolina, and all applicable local agencies at least ninety (90) days before the effective date of the transfer. The notice is expected to include identification of the proposed new owner or operator, a description of its financial and technical capability to assume the obligations associated with the Project, and a statement of the new owner or operator's intention to take over the responsibilities in the XL Project of the existing owner or operator.

- B. Within forty-five (45) days of receipt of the written notice, the parties expect that EPA, the State of North Carolina, and all applicable local agencies in consultation with all stakeholders, will determine whether: (1) the new owner or operator has demonstrated adequate capability to meet EPA's requirements for carrying out the XL Project; (2) is willing to take over the responsibilities in the XL Project of the existing owner or operator; and, (3) is otherwise an appropriate Project XL partner. Other relevant factors, including the new owner or operator's record of compliance with Federal, State and local environmental requirements, may be considered as well. It is expected that the site specific rule will provide that, so long as the demonstration has been made to the satisfaction and unreviewable discretion of EPA, the State of North Carolina, and all applicable local agencies and upon consideration of other relevant factors, the FPA will be modified to allow the proposed transferee to assume the rights and obligations of Buncombe County. In the event that the transfer is disapproved by any agency, withdrawal or termination may be initiated, as provided in Section XI.

It will be necessary to modify the Agreement to reflect the new owner and it may also be necessary for EPA to amend appropriate rules (subject to applicable public notice and comment) to transfer the legal rights and obligations of Buncombe County under this Project to the proposed new owner or operator. The rights and obligations of this Project remain with Buncombe County prior to their final, legal transfer to the proposed transferee.

Landfill permits are not transferable in North Carolina. A proposed new owner of the landfill is required under State rules to obtain a new permit for the landfill.

IX. Process for Resolving Disputes

Any dispute that arises under or with respect to this Agreement will be subject to informal negotiations between the parties to the Agreement. The period of informal negotiations will not exceed twenty (20) calendar days from the time the dispute is first documented, unless that period is extended by a written agreement of the parties to the dispute. The dispute will be considered documented when one party sends a written Notice of Dispute to the other parties.

If the parties cannot resolve a dispute through informal negotiations, the parties may invoke non-binding mediation by describing the dispute with a proposal for resolution in a letter to the Regional Administrator for EPA Region 4, with a copy to all parties. The Regional Administrator will serve as the non-binding mediator and may request an informal mediation meeting to attempt

to resolve the dispute. He or she will then issue a written opinion that will be non-binding and does not constitute a final EPA action. If this effort is not successful, the parties still have the option to terminate or withdraw from the Agreement, as set forth in Section XI below.

This dispute resolution process is not applicable to State permitting and enforcement actions.

X. Withdrawal From or Termination of the Agreement

A. Expectations

Although this Agreement is not legally binding and any party may withdraw from the Agreement at any time, it is the desire of the parties that it should remain in effect through the expected duration of 25 years, or until changes in generally applicable regulations make the requested flexibility unnecessary, or until the Subtitle D landfill portion of the BCSWMF reaches capacity, which ever occurs sooner. The agreement will be implemented as fully as possible, unless one of the conditions below occurs:

1. Failure by any party to: (a) comply with the provisions of the enforceable implementing mechanisms for this Project, or (b) act in accordance with the provisions of this Agreement. The assessment of the failure will take its nature and duration into account.
2. Failure of any party to disclose material facts during development of the Agreement.
3. Failure of the Project to provide superior environmental performance consistent with the provisions of this Agreement.
4. Enactment or promulgation of any environmental, health or safety law or regulation after execution of the Agreement, which renders the Project legally, technically or economically impracticable.
5. Decision by an agency to reject the transfer of the Project to a new owner or operator of the facility.

Buncombe County will be given notice and a reasonable opportunity to remedy any substantial failure before EPA's withdrawal. If there is a disagreement between the parties over whether a substantial failure exists, the parties will use the dispute resolution mechanism identified in Section X of this Agreement. EPA, the State of North Carolina, and all applicable local agencies retain their discretion to use existing enforcement authorities, including withdrawal or termination of this Project, as appropriate. Buncombe County retains any existing rights or abilities to defend itself against any enforcement actions, in accordance with applicable procedures.

B. Procedures

The parties agree that the following procedures will be used to withdraw from or terminate the Project before expiration of the Project term. They also agree that the implementing mechanism(s) will provide for withdrawal or termination consistent with these procedures.

1. Any party that wants to terminate or withdraw from the Project is expected to provide written notice to the other parties at least sixty (60) days before the withdrawal or termination.
2. If requested by any party during the sixty-(60) day period noted above, the dispute resolution proceedings described in this Agreement may be initiated to resolve any dispute relating to the intended withdrawal or termination. If, following any dispute resolution or informal discussion, a party still desires to withdraw or terminate, that party will provide written notice of final withdrawal or termination to the other parties.

If any agency withdraws or terminates its participation in the Agreement, the remaining agencies will consult with Buncombe County to determine whether the Agreement should be continued in a modified form, consistent with applicable federal or State law, or whether it should be terminated.

3. The procedures described in this Section apply only to the decision to withdraw or terminate participation in this Agreement. Procedures to be used in modifying or rescinding any legal implementing mechanisms will be governed by the terms of those legal mechanisms and applicable law. It may be necessary to invoke the implementing mechanism's provisions that end authorization for the Project (called "sunset provisions") in the event of withdrawal or termination.

XII. Compliance After the Project is Over

The parties intend that there be an orderly return to compliance upon completion, withdrawal from, or termination of the Project, as follows:

A. Orderly Return to Compliance with Otherwise Applicable Regulations, if the Project Term is Completed

Buncombe County is expected to anticipate and plan for all activities to return to compliance sufficiently in advance of the end of the Project term. Buncombe County may request a meeting with EPA, the State of North Carolina, and all applicable local agencies to discuss the timing and nature of any actions that they will be required to take. The parties should meet within thirty days of receipt of Buncombe County's written request for such a discussion. At and following such a meeting, the parties should discuss in reasonable, good faith, which of the requirements deferred under this Project will apply after termination of the Project.

B. Orderly Return to Compliance with Otherwise Applicable Regulations in the Event of Early Withdrawal or Termination

In the event of a withdrawal or termination not based on the end of the Project term and where Buncombe County has made efforts in good faith, the parties to the Agreement will determine an interim compliance period to provide sufficient time for Buncombe County to return to compliance with any regulations deferred under the Project. The interim compliance period will extend from the date on which EPA, the State of North Carolina, and all applicable local agencies provide written notice of final withdrawal or termination of the Project, in accordance with Section XI of this Project Agreement. By the end of the interim compliance period, Buncombe County will comply with the applicable deferred standards set forth in 40 CFR Part 258.28 and 40 CFR 258.60(f). During the interim compliance period, EPA, the State of North Carolina, and any applicable local agency may issue an order, permit, or other legally enforceable mechanism establishing a schedule for Buncombe County to return to compliance with otherwise applicable regulations as soon as practicable. This schedule cannot extend beyond 6 months from the date of withdrawal or termination. Buncombe County intends to be in compliance with all applicable Federal, State, and local requirements as soon as is practicable, as will be set forth in the new schedule.

XII. Signatories and Effective Date



A. Stanley Meiburg, Deputy Regional Administrator
EPA, Region 4



C. Thomas Sobol
Chairman
Buncombe County Board of Commissioners



Robin Smith
Assistant Secretary for Environment
North Carolina Department of the Environment and Natural Resources

Supporting Signatories

The Buncombe County XL Project enjoys the support of a broad range of public and private organizations and individuals. The project incorporates both public/private and federal/local partnerships and will serve as an example that will benefit the economy, the community, and the environment.

Our signatures below express our support for this project and the contribution it will make to the environment and the community.

Signed: _____

Affiliation:

WNC Regional Air Quality Agency