



August 5, 2013

Ms. Jaclynne Drummond  
North Carolina DENR  
Division of Waste Management  
Solid Waste Section  
1646 Mail Service Center  
Raleigh, North Carolina 27699-1646

RE: Proposed Assessment Monitoring Work Plan  
North Mecklenburg C&D Landfill – Infill Expansion  
19300 Holbrooks Road  
Huntersville, North Carolina  
Permit #60-13  
Job No. EP-1442(A)

Dear Ms. Drummond:

On behalf of our client, Greenway Waste Solutions, LLC, Enviro-Pro, P.C. (EP) is submitting this proposed Assessment Monitoring Work Plan for the subject facility. This Plan is in response to the requirements of 15A NCAC 13B .0545 and our telephone discussions regarding VOCs detected in several groundwater monitor wells during the first 2013 semi-annual sampling event for this landfill.

Please contact me if you have any questions or wish to discuss this proposed Plan during your review.

Sincerely,  
ENVIRO-PRO, P.C.

A handwritten signature in black ink, reading "Thomas H. Bolyard", is positioned below the typed name. The signature is written in a cursive, flowing style.

Thomas H. Bolyard, P.G.  
Senior Hydrogeologist



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## PROPOSED ASSESSMENT MONITORING WORK PLAN

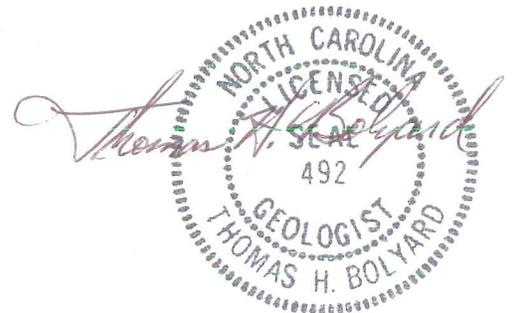
North Mecklenburg C&D Landfill – Infill Area  
15300 Holbrooks Road  
Huntersville, North Carolina  
Permit #60-13

Prepared for:  
Mr. Mike Griffin  
Greenway Waste Solutions, LLC  
19109 West Catawba Avenue, Suite 200  
Cornelius, North Carolina 28031-5613

Prepared by:  
Enviro-Pro, P.C.  
2646 Farmlake Lane  
Fort Mill, South Carolina 29708

Project Number EP-1442(A)

August 5, 2013



## **Background Information**

The North Mecklenburg C&D Landfill-Infill Area was permitted in 2012. Semi-annual sampling of 10 perimeter groundwater monitor wells has been conducted since that time with reports submitted to the North Carolina DENR Solid Waste Section. Approximate well locations are indicated on Figure 1. The first 2013 semi-annual sampling event conducted by Enviro-Pro, P.C. (EP) personnel on April 25, 2013 indicated the presence of the compound vinyl chloride in five (MW-4, MW-5, MW-7, MW-8, and MW-9) of the 10 monitor wells sampled at levels exceeding its 2L Standard of 0.03 parts per billion (ppb). A resampling event conducted by EP personnel on May 30, 2013 confirmed the presence of this volatile organic compound (VOC) at similar concentrations in the same five monitor wells.

The majority of groundwater flow from this landfill facility is to the southeast, south, and southwest towards Cane Creek (Figure 1), which is the potential receptor. Based on the hydrogeology of the site and surrounding area, it does not appear that any water supply wells will be adversely impacted by landfilling operations at this facility. The following is a discussion of proposed assessment activities to determine the extent of impacted groundwater and to evaluate the potential for any off site migration.

## **Proposed Assessment Activities**

Additional groundwater monitor wells will be installed at the landfill to characterize the nature and extent of vinyl chloride levels exceeding its 2L Standard (Figure 1). These additional wells will aid in determining the lithology and hydraulic conductivity of the bedrock aquifer and saprolite, groundwater flow rates, migration routes, the resource value of the aquifer, and the nature, fate and transport of any detected constituents.

### **Monitor Well Installation**

Due to their topographic setting, it will not be feasible to install additional shallow downgradient groundwater monitor wells at the compliance boundary (i.e., 50 feet inside the landfill property boundary) in the vicinity of existing impacted monitor wells MW-4, MW-5, MW-7, MW-8, and MW-9 as indicated on Figure 1. There is insufficient space to install additional assessment wells between the five impacted monitor wells and Cane Creek.

Given the geochemical characteristics of the compound vinyl chloride, it should be determined whether it has migrated vertically into the fractured bedrock at this site and is moving beneath Cane Creek. In order to accomplish this, the installation of Type III bedrock monitor wells is proposed at the five monitor well locations of documented

groundwater impact. The approximate locations of these proposed wells are indicated on Figure 1.

These additional bedrock monitor wells will be completed utilizing 6-inch schedule 40 PVC casing set to depths of approximately 15 to 20 feet below the bottom of the nearest shallow monitor well. This casing will be grouted into place and allowed to set up for 24 hours. At that time a 5.5-inch rotary air hammer bit will be used to drill to the depth of the next water-bearing fracture. A 2-inch schedule 40 PVC well with a 5-foot screen will then be constructed inside the 6-inch casing to intercept this fracture. A sandpack will be installed two feet above the screen top and a minimum 2-foot bentonite seal will be placed on top of the sand. The remainder of the annular space will be filled with cement grout to near the ground surface and a lockable metal protective cover and 2-foot x 2-foot cement pad will complete the well installation. Well tags displaying relevant well construction information will be fastened to the outside of each protective cover.

All wells will be constructed in accordance with the Standards of Well Construction specified in 15A NCAC 02C.0108 and will be developed via surging and pumping after completion.

#### Aquifer Characteristics

In-situ permeability testing will be performed by EP personnel on selected shallow and bedrock monitor wells to determine the hydrogeologic characteristics of the saprolite and bedrock aquifers. Parameters including vertical and horizontal hydraulic gradients, hydraulic conductivities, and groundwater flow rates will be calculated. The calculation of vertical gradients from paired shallow/deep monitor wells on both sides of Cane Creek should enable the identification of the source of groundwater impact along the Creek. This data will also help confirm that Cane Creek is a discharge feature for both this active landfill facility and the closed North Mecklenburg C&D Landfill facility located on the opposite side of the Creek.

The majority of groundwater flow from this landfill facility is to the southeast, south, and southwest towards Cane Creek (Figure 1), which is the potential receptor. Based on the hydrogeology of the site and surrounding area, it does not appear that any water supply wells will be adversely impacted by landfilling operations at this facility.

Based on the results of proposed assessment activities, the resource value of the bedrock aquifer will be determined. Available construction information from the four existing water supply wells located to the southeast and south of this landfill facility will also be incorporated in this aquifer evaluation.

### Well Sampling Analysis

EP personnel will utilize either dedicated bailers or submersible pumps to collect groundwater samples from the existing and newly installed monitor wells. During the initial sampling event after the additional assessment wells have been installed, all wells will be analyzed for Appendix II constituents in accordance with DENR requirements under the 40 CFR Part 258 regulations. QA/QC procedures will include changing disposable gloves between sampling locations and analyzing a laboratory supplied trip blank for VOCs for each sampling event.

For any constituent detected in the proposed additional bedrock monitor wells, a minimum of four independent samples from both the background and newly installed wells will be collected and analyzed in order to establish background concentrations for the newly detected constituents. EP will coordinate with the DENR to establish groundwater protection standards for any newly detected constituents that do not have an established 2L Standard.

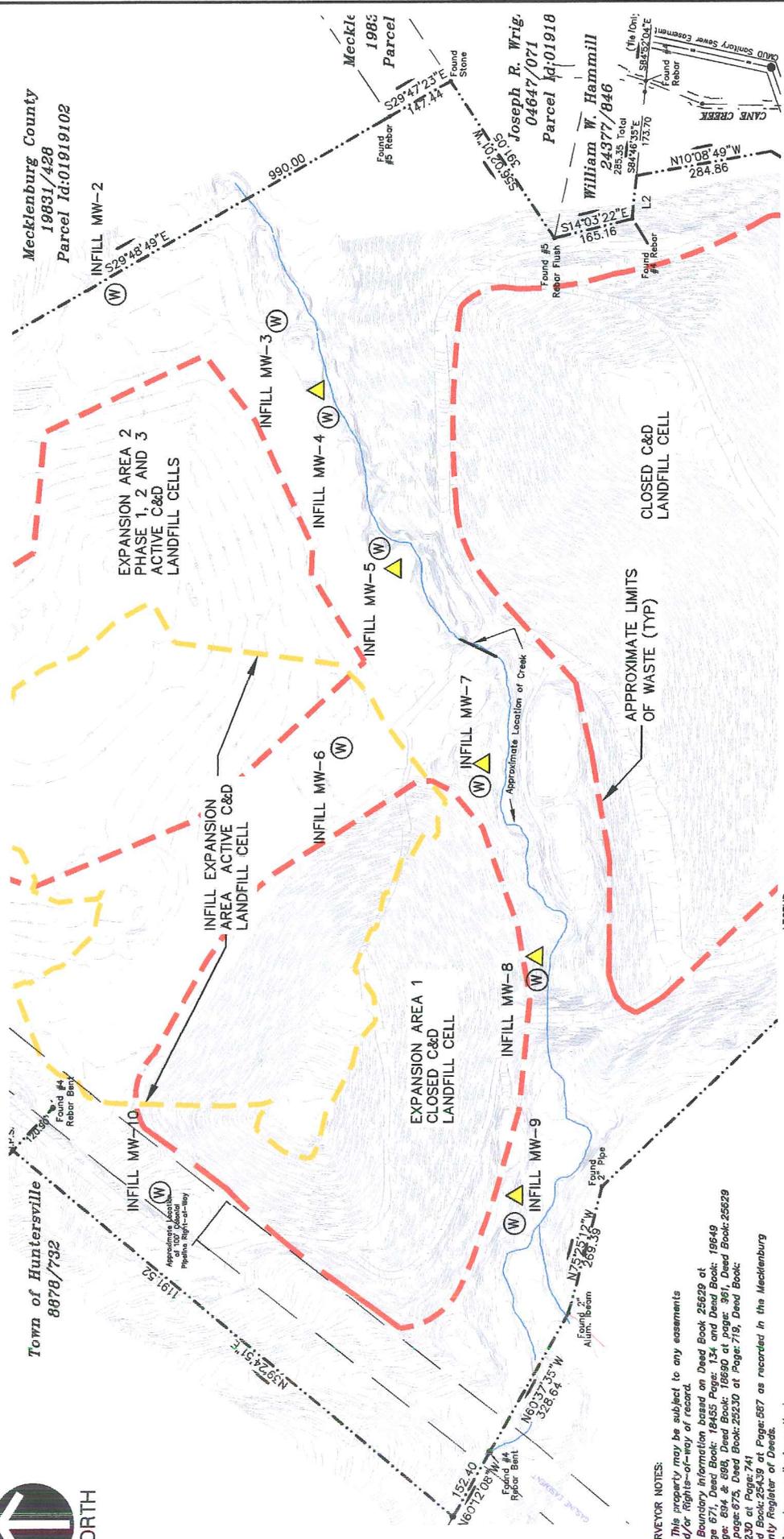
Groundwater sampling will be performed on a semi-annual frequency unless otherwise directed by the DENR. All analytical work will be conducted by Shealy Environmental Services, a North Carolina certified laboratory, located in West Columbia, South Carolina. An Assessment Monitoring Report, certified by a Licensed NC Geologist, will be submitted to the DENR summarizing the results of each semi-annual sampling event.

The groundwater analytical results along with the calculated aquifer characteristics will be utilized to determine the need for any additional site assessment activities, including the installation of additional monitor wells that may be necessary to fully delineate the extent of groundwater impact. Upon completion of the proposed Work Plan activities, adjacent property owners will be notified if it appears the contaminants have migrated or are likely to migrate onto their property.



Town of Huntersville  
8878/732

Mecklenburg County  
19831/428  
Parcel Id:01919102



**LEGEND**

	APPROXIMATE LIMITS OF WASTE
	APPROXIMATE INFILL LIMITS OF WASTE
	BOUNDARY
	EXISTING CREEK
	APPROXIMATE LOCATION OF EXISTING MONITORING WELL
	APPROXIMATE LOCATION OF PROPOSED SHALLOW MONITORING WELL
	APPROXIMATE LOCATION OF PROPOSED BEDROCK MONITORING WELL

**SURVEYOR NOTES:**

- 1) This property may be subject to any easements and/or Rights-of-way of record.
- 2) Boundary information based on Deed Book 25629 at Page 671, Deed Book: 18455 Page: 134 and Deed Book: 19849 Page: 694 & 698, Deed Book: 18690 at page: 391, Deed Book: 25629 at page: 675, Deed Book: 25230 at Page: 719, Deed Book: 25230 at Page: 741
- 3) Area by coordinate method.
- 4) This survey is a recombinant survey of the following Parcel Id. numbers, 0191907, 0191009, 0191912, 0191202, 0191913, 0191012, 0191914, 0191002, 0191017 and 01934107.

**REFERENCE**

1. 2013 TOPOGRAPHIC INFORMATION PROVIDED BY PATTERSON LAND SURVEYING, PA - DATE OF AERIAL PHOTOGRAPHY JUNE 1, 2013
2. EXISTING TOPOGRAPHIC CONTOUR INFORMATION PROVIDED BY INDEPENDENT MAPPING CONSULTANTS - FEBRUARY 7, 2008
3. EXISTING AND PROPOSED WELL LOCATIONS PROVIDED BY PATTERSON LAND SURVEYING AND TOM BOLYARD, P.C. FROM ENVIRO-PRO, P.C.

**Civil & Environmental Consultants, Inc.**  
2030 S. Tryon Street - Suite 3E - Charlotte, NC 28203  
Ph: 980.224.8104 - Fax: 980.224.8172  
www.cechnc.com

GREENWAY WASTE SOLUTIONS OF  
NORTH MECK, LLC.  
NORTH MECKLENBURG LANDFILL  
HUNTERSVILLE, NC  
INFILL EXPANSION AREA  
MONITORING WELL LOCATION MAP

SCALE IN FEET  
0 200 400

TMG CHECKED BY: SLB APPROVED BY: 111-370-0001  
DATE: AUG. 2013 DWG SCALE: 1"=200' PROJECT NO: 1



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