

Paul Gildersleeve



North Country Environmental Services, Inc.

May 15, 2009

3 Pitkin Court  
Montpelier, Vermont 05602

Ms. Karlee Kenison, P.G.  
New Hampshire Department of Environmental Services  
Waste Management Division  
29 Hazen Drive, P.O. Box 95  
Concord, New Hampshire 03302-0095

(802) 223-7221  
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**Re: North Country Environmental Services, Inc.  
Landfill Facility – Bethlehem, New Hampshire  
Groundwater Performance Standards Work Plan**

Dear Ms. Kenison:

NCES (North Country Environmental Services, Inc.) is in receipt of your April 14, 2009 letter requesting a comprehensive work plan relative to performance standards for select monitoring points at our facility in Bethlehem, New Hampshire. In response to the NHDES (New Hampshire Department of Environmental Services) request we have prepared this submittal, which, as described below details the proposed work plan.

We wish to preface this submittal with the observation that, while we are prepared to work with NHDES in a sincere and good-faith effort to achieve background conditions in the release detection wells, we believe that the scientific evidence demonstrates beyond serious question that conditions observed in the downgradient monitoring wells are not related to a release from the containment system of landfill. We also make this submission without prejudice to the claims NCES has asserted or may later assert against NHDES or any other party arising from NHDES denial of NCES's applications for modification of its Stage IV standard permit.

### History

This comprehensive work plan incorporates the findings of over 3 years of investigation of the source of low concentrations of certain VOCs (volatile organic compounds) that have been detected in groundwater samples from 8 of the 38 monitoring wells at our site. While there are 6 VOCs that have recently been detected in the samples from one or more of the wells that are the subject of this work plan we note that there are approximately 75 additional VOCs that are analyzed and have not been detected in site groundwater.

Early correspondence relative to detection of certain compounds was focused on subsurface soils in the area adjacent to monitoring wells MW-402 and MW-403, as the likely source of the VOCs (and bromide) detected in the groundwater samples from these monitoring wells. At present, the detection of bromide at concentrations above background levels is generally limited to four of our monitoring wells.

Discussions and correspondence took place with Mr. John Cotton of the NHDES who specialized in hydrogeology. Based on these discussions, we proposed to combine a soil removal project with a project that would expand the landfill, thereby exposing and removing a large quantity of material along with many underground tanks and piping that we believe is the source of the low concentrations of the VOCs and bromide detected in monitoring wells. Initially the NHDES concurred with this approach.

The NHDES later requested, however, that a detailed work plan be implemented separately. NCES agreed and sought the necessary permits expeditiously so that construction could begin. A detailed timeline is presented below for reference.

On July 21, 2008 NCES had the necessary approvals from the NHDES and initiated the work on August 4, 2008.

On September 10, 2008 the NHDES issued correspondence requiring further analysis of groundwater at selected monitoring locations and requested NCES to establish performance standards for groundwater monitoring and indicated that a source of the contamination needed to be identified.

This comprehensive work plan is a culmination of the permitted Leachate Improvements project relative to evaluation for contaminated soils and more recent correspondence relative to groundwater performance standards.

#### Historical Timeline

October 5, 1994 – NCES proposes Bromide as a tracer to distinguish unlined landfill impact from a lined landfill release. The unlined landfill was located beneath and adjacent to the Stage II area. Bromide application began in 1995.

August 3, 2001 – NCES requests elimination of Bromide application to Stage II.

December 10, 2001 – NHDES approves elimination of Bromide application to Stage II.

September 15, 2005 - NHDES correspondence requests assessment of soil conditions upgradient of MW-402U.

January 6, 2006 – NHDES approves proposed scope of work relative to soil assessment adjacent to MW-402U.

June 6, 2006 – NCES commences with soil investigation adjacent to MW-402U.

November 10, 2006 – NCES submits Soil Assessment Report.

March 30, 2007 – NCES submits original Stage IV Phase II Application. Application includes horizontal and vertical expansion and components of what later became the Leachate Improvements project.

April 11, 2007 – NHDES issues revised Groundwater Management and Release Detection Permit. Special Condition #13 outlines guidelines for Bromide monitoring in Stage II and continued application of Bromide in Stage III. Special condition #16 requires a June 1, 2007 submittal for a plan for remedial activities near monitoring well couplets MW-402 and MW-403.

May 31, 2007 – NCES submits to the NHDES a plan entitled "Leachate Management Modifications and Improvements." This project would have taken place as a component of the Stage IV Phase II application.

July 31, 2007 – NHDES requests that the "Leachate Management Modifications and Improvements" project be separated from the Stage IV Phase II application. Deadline for submittal of separate plan is September 15, 2007.

September 13, 2007 - NCES submits to the NHDES an Alternative Leachate Management Modifications corrective actions plan that includes proposed remedial activities near monitoring well couplets MW-402 and MW-403 independent of Stage IV Phase II application.

November 9, 2007 – NHDES issues revised Groundwater Management and Release Detection Permit. Special Conditions 15 requires submittal of quarterly progress reports relative to the remedial activities near monitoring well couplets MW-402 and MW-403. Bromide application is no longer required by revised permit.

November 30, 2007 – NCES submits a substitute Stage IV Phase II modification application to the NHDES.

May 8, 2008 – NCES submits a permit modification request for the Leachate Improvements Project.

May 28, 2008 – NHDES approves corrective action plan.

July 21, 2008 – NHDES issues approval to construct Leachate Improvements Project.

September 10, 2008 – NHDES issues a letter to NCES requiring changes to corrective action plan.

October 13, 2008 – NCES submits a response to the September 10, 2008 letter from NHDES establishing a groundwork for performance criteria for certain wells downgradient of the landfill.

December 12, 2008 - NHDES denies the Stage IV Phase II application.

December 23, 2008 - NHDES responds to NCES October 13, 2008 letter relative to establishing performance criteria for wells downgradient of the landfill. NHDES requires response by February 22, 2009.

February 12, 2009 - NCES submits revised Stage IV Phase II Permit modification request.

February 20, 2009 - NCES submits response to December 23, 2008 letter proposing performance standards.

March 25, 2009 - NHDES denies revised Stage IV Phase II application

April 14, 2009 - NHDES requests a "comprehensive work plan" summarizing soil and groundwater performance standards relative to release detection wells. Response is required by May 15, 2009.

### **Work Plan**

The work plan detailed below includes a soil restoration and groundwater restoration component. Several aspects of this plan have been accomplished.

#### **Soil Restoration (Leachate Improvements project)**

The objective of the Soil Restoration scope of work detailed below is to remove soils in the area north of the primary underground leachate conveyance and storage areas, leachate handling and transfer facilities area, and north of the Stage I disposal area.

The actual soil restoration activities will take place before, during and after the completion of the first phase of the Leachate Improvements Project which involves the removal of leachate tanks, piping, valve pits and the leachate loading system. This work also includes the replacement of similar functioning mechanicals.

The Leachate Improvements Project will be conducted under the guidance and supervision of CMA (CMA Engineers, Inc.) of Portsmouth, New Hampshire.

The following details the Soil Restoration scope of work:

1. Remove the leachate structures and remove the underground storage tanks and leachate force main piping. Demolition involves excavation of soil, protection of existing utilities and other facilities, and segregation of clean and impacted soils as

- determined by CMA. Any usable equipment will be salvaged. Waste materials will be hauled off site for disposal or recycled.
2. All soil removed for the project will be transported to the landfill and used as daily cover.
  3. CMA will inspect and document the condition of all underground storage tanks and piping relative to evidence of damage, corrosion or leakage. Documentation will include photographs and a written assessment of each tank and length of piping.
  4. After all impacted soils are removed; soils samples will be collected from the excavation side walls and bottom for the presence of leachate impacts. Two discrete samples will be obtained from each tank excavation, and one sample will be obtained for each 100-foot length of piping removed. Additional samples will be obtained at the discretion of CMA.
  5. In addition to the samples taken of the soil exposed in the excavations, samples will be obtained from the clean soil stockpile to document the quality and appropriate use of those soils. The clean soil stockpile will be sampled at a rate of one composite sample for every 200 tons of soil up to 2,000 tons, and at a rate of one composite sample per 500 tons thereafter.
  6. Soil samples will be collected in accordance with NHDES Env-Or 600 and Env-Or 700. Samples will be obtained by a trowel, scoop or spade. All samples will be identified, handled, shipped, tracked and maintained under chain of custody.
  7. Each soil sample will be analyzed by a laboratory certified by the State of New Hampshire. Samples may be analyzed for one or more of the following compounds, chloride, bromide, NHDES full list of volatile organic compounds using Method 8260B.
  8. The excavations will not be backfilled until the results of confirmatory laboratory tests indicate the remaining soils are not impacted above NHDES Risk Characterization and Management Policy (RCMP) Method 1 Soil Standards, Category S-1, revised in April 2007. Backfilling of all excavations, and placement, compaction and grading of fill materials will be conducted in accordance with the Filling specifications. Clean excavated soil can be used for backfill subject to the provisions of those specifications.
  9. The work will be conducted in compliance with all applicable provisions of federal, state and local health and safety statutes,

codes and regulations, including 29 CFR Parts 1910 and 1926. A health and safety plan will be prepared.

10. Existing monitoring wells and gas probes will be protected throughout the course of the work. Any wells that are modified through lowering, extension, decommissioning or replacement of monitoring wells will be completed by a licensed New Hampshire well contractor.
11. Within two months of the final soil removal, NCES will provide a final construction CQA (construction quality assurance) report summarizing the work completed and documenting all test results.

CMA prepared a CQA report for the first phase of the Leachate Improvements Project which was provided to the Department on March 5, 2009.

The second phase of the Leachate Improvements Project is ongoing and will include further excavation north of Stage I, installation of the new leachate load out system and installation of piping to connect the new above ground tank.

#### Groundwater Restoration

The objective of the groundwater restoration plan is to achieve specific background concentrations in the Release Detection wells north of the lined landfill. We do not believe the conditions observed in the monitoring wells are the result of releases from the landfill liner system; rather, they are attributable to releases of leachate that occurred in the leachate management area being addressed as part of the Leachate Improvements Project, as a result of releases which occurred during construction of Phase I of Stage IV which were previously reported to NHDES, or due to the overflow discovered in 1997 along the north edge of Stage I. Improvements in water quality conditions reflect the transitory effects associated with a release and will continue to confirm that the source is not a release through the liner system.

We have three categories within the restoration plan that include the establishment of **background conditions** for individual parameters, **monitoring frequency** and **most recent concentrations** measured at each location for the individual parameters.

**Background Conditions**

The table below references the established background concentrations reflected as an absolute concentration or at an established QL (quantitation limit).

Parameter	Performance Standard Concentration
Bromide	Non-detect (< 0.1) mg/l
Dichloroethane 1,1	Non-detect (< 2.0) ug/l
Diethyl Ether	Non-detect (< 5.0) ug/l
Dichlorodifluoromethane	QL 5.0 ug/l
Dioxane 1,4	Non-detect (< 1.0) ug/l
Butanol	Non-detect (< 30.0) ug/l
Tetrahydrofuran	Non-detect (< 10.0) ug/l

**Monitoring Frequency**

Unless less frequent sampling is approved by the Department, sampling for the monitoring wells indicated below will be conducted on a monthly basis.

**Current Concentrations**

The following tables reflect the most recent (April 2009 monitoring round) concentrations at the identified monitoring wells along with the established monitoring target or background concentration.

Bromide		
Location	Target Concentration Performance Standard (mg/l)	April 2009 Concentration (mg/l)
MW-402U	Non-detect (< 0.1)	0.1
B-913M	Non-detect (< 0.1)	0.3
B-921U	Non-detect (< 0.1)	0.4
B-304UR	Non-detect (< 0.1)	0.2

VOCs at MW -402U			
Dichloroethane 1,1 Quantitation Limit (ug/l)	April 2009 Concentration (ug/l)	Diethyl Ether Quantitation Limit (ug/l)	April 2009 Concentration (ug/l)
2.0	5.0	5.0	10.0

VOCs at MW-913M			
Dioxane (1,4) Quantitation Limit (ug/l)	April 2009 Concentration (ug/l)	Butanol Quantitation Limit (ug/l)	April 2009 Concentration (ug/l)
1.0	6.0	30.0	0.0

VOCs at MW - 913M (cont'd)	
Tetrahydrofuran Quantitation Limit (ug/l)	Latest Concentration (ug/l)
10.0	30.0

VOCs at MW-919U	
Dichlorodifluoromethane Quantitation Limit (ug/l)	Latest Concentration (ug/l)
5.0	0.0

VOCs at MW-921M	
Dichlorodifluoromethane Quantitation Limit (ug/l)	Latest Concentration (ug/l)
5.0	21.0



VOCs at B-304 DR			
Dichloroethane 1,1 Quantitation Limit (ug/l)	Latest Concentration (ug/l)	Dichlorodifluorometh ane Quantitation Limit (ug/l)	Latest Concentration (ug/l)
2.0	2.0	5.0	21.0

VOCs at B-304 UR	
Dichlorodifluoromethane Quantitation Limit (ug/l)	Latest Concentration (ug/l)
5.0	6.0

If we have incorrectly represented any of the agreed upon background concentrations, please let us know and we will make the necessary corrections.

As mentioned above, NCES will provide to the Department a CQA report for the completion of the Leachate Improvements Project within two months of its completion. We currently project that the Leachate Improvements Project will be completed by the end of the 2009 construction season. Should you have any questions or require additional information, please contact me at (802) 223 - 7221.

Sincerely,

NORTH COUNTRY ENVIRONMENTAL SERVICES, INC.

  
John Gay, E.I.  
Engineering, Permitting, Compliance & Construction

- c. Wayne Wheeler, NHDES Waste Management Division  
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