NHDES

State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES
6 Hazen Drive, P.O. Box 95, Concord, NH 03302-0095
(603) 271-2900 FAX (603) 271-2456

July 31, 1998

Mr. Robert A. Watts
Permits, Compliance and Engineering
North Country Environmental Services, Inc.
16 State Street
Montpelier, Vermont 05602

SUBJECT: BETHLEHEM - North Country Environmental Services (NCES) Landfill, April 1998 Groundwater Quality Monitoring (DES #198704033)

Dear Mr. Watts:

The Department of Environmental Services (Department) has received your letters, dated June 18, 1998 and July 17, 1998, which present additional data (including the letter from Sanborn, Head & Associates, Inc. dated June 30, 1998) and discussion regarding the recent water quality history of monitor well MW-406U. In these letters, you suggest that the most likely sources of the volatile organic compounds (VOCs) detected in monitor wells MW-406U and L were the "overfills" of the Stage I/Phase I area by the previous owner and leachate outbreaks. Information provided in these and previous letters and reports supports this conclusion and strongly indicates that all waste from previous "overfills" has been discovered and removed. Based on our review of the letters, the April 1998 results and file material, the Department offers the following discussion and comments:

The wells MW-405U and L and MW-406U and L have been sampled on a quarterly or tri-annual basis since September 1987. Very low levels of VOCs (6 ug/L total VOCs) were first detected in MW-406U in July 1993. This was during the time period when wastes from the former unlined landfill were being relocated and very large increases in VOC concentrations were being measured in the 100-series management wells. Three ug/L of VOCs were detected in MW-405U in April 1995, the first detection of VOCs in that well since July of 1989.

Following removal of all waste from the former unlined landfill in the fall of 1993, the well couplets MW-405U and L and MWB-406U and L were in a small undrained, linear depression. Boulders had also been moved into this depression. Precipitation and surface drainage ponded in this depression as evidenced by visual inspection and iron-stained rings around the boulders. Infiltration of this water resulted in extra recharge to groundwater directly around the wells. Any VOCs remaining in the soils at the margin of the former unlined landfill should have been flushed to groundwater by that repeated process.

Concentrations of VOCs in these wells should have decreased by now if the only source was residual VOCs from the unlined landfill, as evidenced by the significant decrease in VOCs in wells MWB-601U and L and MW-602U and L which are located in the central part of the former unlined landfill.

The last of the waste from the overfilling of Stage I/Phase I was removed in the summer of 1997. If VOCs in MW-405 and MW-406 monitor wells were from this waste, then the concentration of VOCs in these wells should now begin to decrease.

As you suggest, some of the VOCs in wells MWB-405U and MW-406U and L may be from gaseous diffusion through the liner of Stage I/Phase I. If this is so, it is important to understand that it still represents a release from the landfill. In this regard, the installation of an active gas extraction trench in Stage II/Phase I in the spring of 1998 is recognized as a proactive measure for gas control.

In your June 18, 1998 letter, you explain that data from leachate analyses from Stage I and II indicate that the lined landfill leachate is not a source of the VOCs. However, it is not clear that by comparing the detected VOCs in water from the MW-405 and MW-406 wells with the VOCs in existing analyses of leachate from Stage I or Stage II, we can dismiss the possibility that leachate is also a potential source. Some VOCs - such as acetone, methylene chloride and toluene - occur in both the affected wells and in the leachate. More important, the detection limits for most VOCs in leachate analyses are 200 ug/L. Thus, many VOCs are likely present in the leachate, but are not detected. In fact, of course, we know that all the VOCs found at the site originally came from some waste.

You indicate that a detailed analysis of VOCs in MW-406U (also include MW-406L and MW-405U&L) will be included in the annual report which is due in September. To help in assembling pertinent data for consideration, the Department requests that the following three items be included in the annual report.

1. Spreadsheets with individual VOCs detected over the last three years for MW-405U&L, MW-406U&L, all the management wells, MW-601U&L and MW-602U&L. Where appropriate, individual VOCs should be arranged in their degradation series.

2. Addition of "overfill" areas to the Map included in the June 30, 1998 letter to you from Sanborn, Head & Associates, Inc.

3. Analyses of VOCs with lowest possible detection limits for primary and secondary leachate from Stage I/Phase I and Stage II/Phase I.

Should you have any questions please contact me at the Department at 271-2925.

Sincerely,

John Cotton

John Cotton, Hydrogeologist
Waste Management Division

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cc: Richard Reed, SWMB
Pamela Sprague, P&DRS
John Regan, HWRB
R. Scott Shillaber, Sanborn, Head & Associates
Town of Bethlehem, Board of Selectmen
HWRB File