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State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES

6 Hazen Drive, P.O. Box 95, Concord, NH 03302-0095
603-271-3503 FAX 603-271-2867
TDD Access: Relay NH 1-800-735-2964



December 6, 1995

Mr. Nick Mike
RFD 1, Box 187
Bethlehem, NH 03574

SUBJECT: MIKE LETTER DATED SEPTEMBER 26, 1995
NCES LANDFILL - BETHLEHEM, NH



TOWN: BETHLEHEM
PROJECT: NCES - STAGE II LF
LETTER/DATA/PERMIT/FA/OTHER

Dear Mr. Mike:

Governor Merrill has requested the Department of Environmental Services (Department) respond to your letter dated September 26, 1995 which raised two issues relating to the North Country Environmental Services, Inc. (NCES) landfill located in Bethlehem, New Hampshire. Please be assured that the Department takes its responsibility for the protection of public health and the environment seriously and does share your concerns relative to the groundwater and surface water impacts at the site. As you may recall, by letter dated November 8, 1994 (copy attached), the Department addressed a number of issues relating to water quality to respond to questions raised by the Bethlehem Board of Selectmen and to respond to a letter received from Mrs. Sarah Mike (9/9/94) by the United States Environmental Protection Agency. Therefore, the Department will not reiterate all that information, but will address specifically the two pressing concerns expressed in your letter, the first of which is that "a private landfill has been illegally spewing a stream of toxic wastes into the Ammonoosuc River"; and the second, that the Department of Environmental Services "refuses to act" in a responsible manner to the first concern. As you will see from the attached graphs, and as further addressed in the body of this correspondence, actions taken at the subject landfill show a measurable improvement on water quality and the Department is indeed acting responsibly in overseeing the facility.

1. Department of Environmental Services' Actions

The Department of Environmental Services (Department) regulates facilities such as NCES with a family of permits. Both of your concerns are apparently based on the presence of volatile organic compounds (VOCs) in groundwater beneath one part of the subject property. (You enclosed bar graphs with your letter showing the concentrations of specific VOCs in three monitoring wells.) The Permit pertaining to groundwater protection for this site is comprised of two parts:

- a. A Groundwater Release Detection Monitoring Permit exists for the double lined landfill which includes monitoring for regulated constituents that might be inadvertently released to groundwater. Monitoring wells (400 series) have been constructed and routinely sampled for this purpose since 1987.

AIR RESOURCES DIV.
64 No. Main Street
P.O. Box 2033
Concord, N.H. 03302-2033
Tel. 603-271-1370
FAX 603-271-1381

WASTE MANAGEMENT DIV.
6 Hazen Drive
Concord, N.H. 03301
Tel. 603-271-2900
FAX 603-271-2456

WATER RESOURCES DIV.
64 No. Main Street
P.O. Box 2008
Concord, N.H. 03302-2008
Tel. 603-271-3406
FAX 603-271-7894

WATER SUPPLY & POLLUTION CONTROL DIV.
P.O. Box 95
Concord, N.H. 03302-0095
Tel. 603-271-3503
FAX 603-271-2181

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b. A Groundwater Management Permit exists for the former unlined and single lined landfills (both were completely removed by October 1993), which includes monitoring for regulated constituents that have caused and continue to cause, a violation of the groundwater quality criteria as specified in the Groundwater Protection Rules (Env-Ws 410.03). A separate series of monitoring wells (100 series) have been constructed and have been routinely sampled for this purpose since 1984. A natural spring (known as the Seep), located about 800 feet down the hydraulic gradient from the former unlined landfill, has also been routinely sampled since 1984.

Another component of the Groundwater Management Permit is the establishment of a Groundwater Management Zone (GMZ). This zone includes the subsurface volume in which groundwater contamination (associated with the former release of regulated contaminants from the unlined and single lined landfills) is contained. The requirement for a GMZ was included in the updated rules adopted in February 1993, and was included as a condition in the revised Permit (dated 4/18/95) for this site. Documentation supporting the delineation for this GMZ was received by the Department on 9/1/95. The Department has approved the GMZ and this approval will be formalized in a letter to NCES in December.

The GMZ is temporary and will remain in effect until the remedial action (the removal of the source of the contamination) and natural flushing of the groundwater system results in improved groundwater quality which meets Ambient Groundwater Quality Standards (AGQS), which are equivalent to the drinking water standards. When AGQS are achieved, the Groundwater Management Permit will no longer be needed, but the site will be monitored with the Groundwater Release Detection Permit to ensure that any potential future release from the double lined landfill is detected.

The sampling/analytical work done to date shows that significant concentrations of VOCs in groundwater have been limited to water taken from monitoring wells in the 100 series and water samples from the Seep (i.e. the sites in the network that monitor contaminated water from the former unlined and single lined landfills). The graphs (see Group 1 Figures) that you included with your letter show concentrations with time of specific VOCs from three wells in this 100 series. (Note that the last value in each graph is dated 9/9/94, but should be dated 7/8/94.)

The Department's concern about contaminated groundwater as measured in the 100 series wells entered into the State's requirement for the removal of the waste from the unlined and single lined landfills, and placement of that waste in Stage I of the doubled lined landfill. This was a condition of the Stage II Solid Waste Permit for the expansion of doubled lined landfill operations. The relocation of refuse began in December of 1991 and was completed in October of 1993.

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The concentrations of total VOCs in the 100 series wells generally began to increase in the time period from about October 1992 to April 1993, and continued to increase through July 1994. Concerned over these increases, the Department conducted a detailed review of the hydrogeology of the site and all water quality information in the fall of 1994.

Based on groundwater flow data, the Department concluded that impacts to groundwater quality in the vicinity of the 100-series monitoring wells and Seep were not unexpected. These sampling sites are downgradient from the waste removal operations. The removal of the waste material during relocation resulted in disturbance of the waste. Further, the excavation of waste temporarily resulted in increased infiltration of precipitation into the remaining waste mass, resulting in the generation of additional leachate.

As stated in its November 8, 1994 letter, the Department concluded from review of the water quality data that the former unlined and single lined landfill areas were the sources of the recent increases in contaminant concentrations detected in some of the wells (100 series and MW-406U) and the Seep. The landfill wastes, which constituted the source, have been removed from these areas and placed in the double lined landfill. The soil sampling performed after the unlined/single lined landfill areas were excavated did not detect significant contamination. The Department's experience at other "source" removal projects has been that a short term release of contaminants occurs during the excavation of the source material; and the increase in contaminant concentrations at these sites were shown to be of a relatively short term occurrence. Therefore, the Department expected that contaminant concentrations in the wells and the seep associated with the Subject Facility would ultimately decrease with time. These conclusions were also presented by Department staff at a public meeting you attended in Bethlehem on December 12, 1994.

During the last twelve months, analytical results of four regular sampling rounds, from November 1994 to November 1995, as required by the Groundwater Management Permit, **have shown that VOC concentrations in the 100 series wells and the Seep have consistently decreased.** The graphs you submitted with your letter have been updated to include these results (see Group 1 Figures). In addition, time plots of total VOC concentrations for all the 100 series wells are included as Group 2 Figures. Concentrations of total VOCs in all wells have decreased dramatically since July 1994. Groundwater quality has improved as expected, and the Permit will continue to monitor the performance of the source removal until groundwater quality meets AGQS. Please note, however, that as the cleaning process continues, there may be short term rises in the VOC levels found in any specific sampling round.

In summary, this site has followed the same process as other lined and unlined landfills in the State. The groundwater permits are effectively regulating the landfill impacts to groundwater and surface water quality, and will continue as the primary vehicle to monitor the site until water quality

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standards are met. While we share your concern for the environment, we strongly disagree with your statement that the Department refuses to act.

2. VOCs Entering the Ammonoosuc River

No VOCs were detected in two surveys of the Ammonoosuc River conducted on October 14, 1994 and June 20, 1995 in a reach of the river beginning upstream of the NCES facility and ending at the Wing Road Bridge. Five sites were sampled in each of these surveys.

There is a strong inference in your letter that the concentrations of VOCs detected in the 100 series monitoring wells are the concentrations of VOCs in water discharging to the Ammonoosuc River. While, as discussed above, groundwater quality is a concern and will remain a concern until compliance with AGQS is achieved, the water quality in the 100 series wells is not representative of the quality of water directly discharging to the Ammonoosuc River. The monitoring wells are about 1000 feet from the river bank (800 feet to seep itself). Much lower concentrations of VOCs to no VOCs occur in groundwater near the river, as measured in water which is discharging to the ground surface along the steep slope above the river.

VOCs in the water from the Seep have been monitored since 1984. Since January 1994, water samples have been analyzed monthly. The Seep is the single significant occurrence of VOCs along the slope face. A time plot of total VOC concentrations for the Seep is included as the Group 3 Figure. This plot shows a similar pattern to the 100 series wells for the increase and decrease of total VOC concentrations.

Previous investigations of other seeps (springs) have shown that the main Seep is the only area of significant VOCs. In September 1984, no VOCs were detected in another small spring about 100 feet easterly of the Seep and no VOCs were detected in this spring in May 1995. A detailed survey in April 1995 along the steep slope above the river located nine other very small springs. Six of these springs were analyzed for VOCs. No VOCs were detected in four springs, and only 4 and 5 ug/L of 1,1-Dichloroethane (well below the AGQS of 81 ug/L) were detected in the other two springs.

In summary, the Seep is the significant occurrence of VOCs and only a few VOCs have been detected in Seep water; acetone, MEK and toluene have been the primary ones. MEK has been the only detected VOC above AGQS. These higher values have only occurred after the removal of wastes from the unlined and single lined landfills, and concentrations of MEK have decreased dramatically since June of this year. **Concentrations of MEK were below the detection limit in water sampled at the seep in September, October, and November of this year.**

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While the water quality at the Seep is a primary concern of the Department, it is not indicative of the quality of water from the Seep area as it drains into the Ammonoosuc River. The Seep is about 200 feet laterally from and about 80 feet vertically higher than the river. As water from the Seep area flows turbulently down the steep slope to the river, VOC concentrations are greatly reduced by aeration. No VOCs were detected in river water on July 13 or November 14, 1995 where the Seep discharge enters the river. The approval of the GMZ includes the requirement for periodic sampling of the surface flow from the Seep just before it enters the river; continued sampling of the river 25 feet downstream from where Seep flow enters the river; and sampling of the river at the upstream and downstream GMZ boundaries.

Conservative estimates of the potential impact to the Ammonoosuc River can be made using streamflow measurements from the U. S. Geological Survey gaging station (about 1100 feet upstream from Pierce Bridge) for prior times when higher concentrations of VOCs at the Seep were measured. Even assuming no reduction in VOC concentrations through aeration in water from the Seep before it discharged to the river, any potential VOC impact was very unlikely because of rapid dilution by river water. Nonetheless, the Department is committed to ensuring that groundwater quality continues to improve to meet AGQS, and, consequently, that impact to Seep water and any potential impact to surface water is eliminated over time.

The Department would like to remind you that NCES has offered financial support for technical assistance, such as the collection and analysis of duplicate water samples at a laboratory chosen by the Town.

3. Other recent activities at NCES

This past spring, in response to concerns raised regarding odors thought to originate from the NCES facility, the Department requested NCES investigate the cause for the odor and review the existing odor control program. NCES hired a consultant to undertake an odor investigation and identify potential sources on-site which could be contributing to an increased level of odor coming from the site. The investigation revealed several potential source areas including the access ports to the facility's leachate collection system. After identification of the sources, NCES implemented measures to minimize the odors that included installation of gas flares, use of odor neutralizers, and increased application of daily cover. Also, because of the Department's concern regarding odor complaints associated with the facility, the Department denied a request by NCES to utilize wastewater treatment plant sludge as an alternate daily cover.

With regard to stormwater runoff, during the design of Stage II, NCES included a stormwater control system to minimize future possible impacts to abutters from stormwater generated on-site. Prior to construction of the new stormwater system, representatives of the Town's Conservation

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Commission toured the site to view the proposed location for a new drainage swale to assess the impacts it may have on the environment. The stormwater management system required permits from the Department's Water Supply and Pollution Control Division (Site Specific) and the Water Resources Division (Wetland's), and has since been built.

This past fall, NCES took measures to apply topsoil and vegetate the slopes of Stage I to improve stability and minimize erosion and potential siltation of the stormwater management system. This effort to maintain soil cover on the slopes will further reduce the potential for exposure of the refuse to precipitation, and should further reduce possible odor sources.

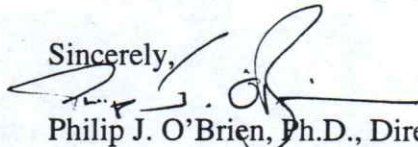
4. Department Responsibilities

The Department works closely with representatives from all the facilities it oversees whether they are privately or municipally owned. Department staff are available each day to answer questions regarding the operation, monitoring and compliance of all solid waste facilities and remain committed to keeping the public informed. The Department does rely on local officials and facility owners to assist with the dissemination of information, and feels that NCES has taken a responsible role in working with the residents of Bethlehem to keep them informed of the facilities operation and compliance programs.

Representatives from the Department have been to the NCES facility on a number of occasions during the past year to observe/monitor the facilities operations and construction activities and does not take lightly the implication that it is not acting responsible in its obligation to protect the environment and human health. The Department will continue to responsibly meet its obligation to oversee compliance on matters pertaining to the NCES solid waste facilities and all other solid waste facilities permitted in the State of New Hampshire.

Questions you may have regarding the NCES facility can be addressed to Mr. James Berg, District Inspector at 863-1125 (M, W & F) or 271-2925 (T & Th). He will either address the issues directly, or put you in touch with the person in the Department best equipped to respond to your concern.

Sincerely,



Philip J. O'Brien, Ph.D., Director
Waste Management Division

Enclosure: NHDES Letter of November 8, 1994

PJO/RSR/JWB/neo/letters:mikech.ltr

cc: Governor Stephen Merrill
Commissioner Robert Varney, DES
Richard S. Reed, SWCS

Pamela Sprague, PA&DRS

John Regan, GPB/Bethlehem Board of Selectmen/Larry Lackey, P.E., NCES
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