

New York State Department of Environmental Conservation

Office of General Counsel, Region 8

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Joe Martens
Acting Commissioner

October 19, 2011

Honorable Joseph J. Martens,
Commissioner
New York State Department
Of Environmental Conservation
625 Broadway
Albany, New York 12233

By Email and U.S. Mail

**Re: Decision of the Commissioner dated August 4, 2011 in
Chemung County, DEC No. 8-0728-00004/ 00013**

Dear Commissioner:

This correspondence constitutes Department staff's response to the direction in the above-referenced decision to review whether additional or revised permit conditions or revisions to the landfill's operating procedures are necessary with respect to questions about the disposal of Marcellus Shale drill cuttings. Staff maintains, as set forth in your August 4, 2011 decision, that Marcellus Shale drill cuttings do not present a radiological problem for placement in a 6 NYCRR Part 360 permitted landfill. I have enclosed:

- Copies of recent revisions to the landfill Operations and Maintenance Manual (O&M Manual) and Environmental Monitoring Plan (EMP) which were approved by Staff letters dated October 18, 2011, and copies of those approval letters; and
- A copy of the Department initiated permit modification, including the cover letter dated October 19, 2011, and a draft permit.

Additionally, the following is Staff's further elaboration in response to the specific questions asked and considerations requested by the decision. (The language in italics is from the decision, with numbers inserted for ease of reference.)

Accordingly, [the Commissioner is] directing that Department staff review the alarm levels that NEWSNY has selected for its radiation detection system. Department staff is to consider whether the alarm levels are adequate to:

a. monitor the loads of Marcellus Shale drill cuttings received at the landfill to ensure that such loads do not contain non-drill cutting wastes of higher radioactivity that are prohibited from disposal at the landfill; and

b. Determine whether a load should be investigated or rejected.

Staff's evaluation shall address:

- 1. the level or levels at which the detection system alarms should be set; [and] the level above which the landfill would reject waste for disposal;*

Department staff has evaluated the options for establishing alarm set points for the landfill site radiation portal monitor (monitor) and has determined appropriate investigation and rejection levels. Data collected to date only show radium-226 concentrations in Marcellus Shale drill cuttings (drill cuttings) in the single digit picocuries per gram (pCi/g) range. Modeling done by Argonne National Lab (ANL) shows that an average waste concentration of 50 pCi/g of radium-226 is protective of public health and the environment for non-intrusive future uses of a properly designed, operated, and closed landfill. NEWSNY has agreed to set the maximum average concentration of radium-226 accepted into the landfill at the calculated monitor equivalent of 25 pCi/g, and has established a rejection level equivalent of 50 pCi/g. Only a limited number of truckloads of drill cuttings will be allowed to be accepted per week with concentrations between 25 and 50 pCi/g. Further, NEWSNY has agreed to set their investigation level at a more conservative level of no greater than five times local background, which is below the 15 pCi/g equivalent they had originally proposed. This setting is consistent with recommendations for radiation monitors at solid waste facilities to monitor for a variety of radioactive materials that could potentially be present in various solid waste streams. The sensitivity of the monitor was recently demonstrated by the system's detection of low levels of radioactive iodine (I-131, from a nuclear medicine patient) in a residential waste load and a separate incident of detecting radioactive iodine in the thyroid of a truck driver who recently underwent a medical radionuclide procedure.

This approach is in keeping with the underlying regulatory principle of maintaining potential impacts from the use and handling of radioactive materials "As Low As Reasonably Achievable" (ALARA). Setting a limit at half of the ANL modeled value (i.e., setting the mean acceptance concentration limit at 25 versus 50 pCi/g) is a prudent step, and is adequate to address uncertainties in the concentration levels of naturally occurring radioactive material (NORM) in incoming loads of drill cuttings that might be introduced by slight variations in truck body construction, waste load size, or other related factors.

Use of a 5 pCi/g limit as recommended by Residents for the Preservation of Lowman and Chemung is overly conservative. The 5 pCi/g value was set by the EPA for remediating radium-contaminated surface soils for unrestricted use. Unrestricted means there are no limitations to property use, including residential use, gardening, or farming. It is not

necessary to limit disposal of NORM to this level at a landfill permitted pursuant to the State solid waste management regulations at 6 NYCRR Part 360.

2. *and how often the calibration of the radiation detection system should be checked to ensure that the system performs its intended function.*

Annual calibration is the standard frequency for radiation detection and monitoring equipment, including equipment utilized by the Department. Accordingly, the monitor will be calibrated annually in accordance with the O&M Manual. Further, NEWSNY performs daily background checks to verify the monitor is operating properly, and to ensure that no sources of additional radiation (from other sources of NORM, operator nuclear medicine treatments, etc.) have been introduced into the vicinity. Finally, at the request of the Department, NEWSNY will perform weekly system challenge tests by introduction of a sealed radiation source within the detection volume of the monitor to verify continued proper operation of the system.

3. *Department staff shall consider whether the comparison of radiation portal monitor readings to waste load concentrations represents an appropriate approach in setting the site specific exclusion or alarm limits on the detector.*

The approach of making direct comparisons between actual concentration values of NORM in incoming waste loads to actual monitor readings was not proposed by NEWSNY but rather mandated by the Department as a means of verifying the calculations performed by NEWSNY's health physics consultant. Making a direct comparison is a conservative means of validating the calculated correlation between waste load concentrations and monitor readings.

It should be noted that the consistently low levels of NORM concentration in incoming loads of drill cuttings, as evidenced by the lack of noticeable increases in monitor readings, has not yet allowed comparisons over a wide range of waste load concentrations as originally requested by the Department. At the Department's request, NEWSNY has agreed to collect several composite samples from loads of incoming drill cuttings at these low levels to establish comparison data at the low monitor readings that have been seen to date.

In its review of the radiation monitoring/detection system, Department staff review shall also consider:

4. *whether any adjustments to the detection system may be necessary to account for disposal truck body thickness or other truck body characteristics;*

Department staff has reviewed this issue and finds that concerns expressed regarding a possible need to adjust alarm set points due to truck body thickness or other characteristics is addressed by the comparison of the readings to the sample concentrations and the conservative investigation and average concentration limits (as discussed in item 1 above) set in the O&M Manual.

5. *the range of accuracy of the detection system where materials of higher radioactivity may be shielded or otherwise contained within the rest of the waste load;*

Department staff has evaluated this issue and concluded that it reinforces the need for the investigative set point to be no greater than five times local background. This set point is consistent with recommendations to detect radiation sources in incoming loads of solid waste established by the Council of Radiation Control Program Directors (CRCPD). The CRCPD consists of the heads of government radiation control programs (including New York). The CRCPD publication 98-3, "Detection and Prevention of Radioactive Contamination in Solid Waste Facilities" recommends a solid waste facility radiation detector setting of from two to five times the local background. By setting the investigation level at less than 25% of the maximum allowable concentration in a load of drill cuttings, the monitoring system would be able to detect the presence of any significant amount of higher concentration waste *.

*Local Background (monitor reading) = 4.2 kcps (kilocounts per second).
Investigation alarm set at 5 x local background = 21.0 kcps.
Maximum allowable concentration set at 50 pCi/g = 101 kcps.
(21 kcps/101 kcps) x 100 = 21%.

6. *the degree of operator training for the detection system that may be necessary;*

Department staff has concluded that training should consist of training by the manufacturer of the monitor or the equivalent in system operation and trouble shooting, and NEWSNY training in site operational procedures. There should also be a periodic review of those procedures as part of annual refresher training for system operators. NEWSNY has committed to this level of training. See O&M Manual at page 15.

7. *the appropriateness, as noted in the updated protocol, to have the same backlit indicator (yellow) to warn of a low alarm level and a low battery;*

An evaluation of the landfill's radiation portal monitor by Department staff found the monitor's display panel has four separate backlit indicators. There is a separate, independent backlit indicator for each of the following: Channel 1 alarm, Channel 2 alarm, Detector failure, and Low battery. The low battery indicator (LOW BAT) is the only one of the backlit indicators that lights up yellow when activated; all other indicators light up red when activated. The monitor's internal batteries' only function is to provide power for the operation of the monitor in case of a failure of the electrical power grid. If the monitor is operated on battery power, the low battery indicator warns the operator when there is less than two (2) hours of battery life remaining. A low battery warning also triggers the red "DET FAIL" backlit indicator.

8. *and whether the landfill's operating procedures adequately address the situation where waste loads continue to trigger the alarm even where the steps to check the load (as set forth in the operating protocol) are performed,*

Landfill operational protocols, as described in the O&M Manual, call for all loads that trigger an investigation alarm (low alarm) to be investigated further to determine the origin and nature of the radiation source. The course of action followed is dependent on the results of this investigation. Landfill protocol is for the Department to be notified when an investigation alarm sounds, and to be kept informed of the investigation and the result.

9. *and whether the waste would be returned to the site of generation or sent to another location for disposal.*

The O&M Manual outlines the steps to be taken when an investigation alarm is triggered, including that Department staff be notified. As such, staff has knowledge of the alarm, the investigation, and the results of the investigation. If after investigation the source is determined to be NORM or medical radionuclides in patient waste from a non-hospital setting (patient diapers, tissues, etc. in residential loads), that load is acceptable for disposal in a 6 NYCRR Part 360 permitted municipal solid waste landfill. If the alarm is determined to be caused by waste that is not acceptable for disposal in such a solid waste landfill, including processed and concentrated NORM or regulated radioactive waste, Department staff will be involved in determining where the rejected load will be sent. Additionally, a shipment approval (DOT-SP11406) is required to be issued for the vehicle hauling the rejected waste prior to moving it off the landfill site. Appropriate landfill operator staff will notify the Department and State Police if a vehicle with a rejected load leaves the landfill site without authorization.

10. *Department staff shall also consider the extent of notifications that NEWSNY and the County must provide Department staff with respect to any rejected waste loads.*

Department staff has reviewed the operating procedures and discussed their implementation with NEWSNY representatives and is confident the procedures adequately address the issues noted in the Commissioner's directive. NEWSNY has committed to a process of notifying the County and the Department of any load of waste confirmed to exceed the investigation level.

As noted above, part of the standard operating procedures outlined in the facility O&M Manual requires Department staff to be notified when an investigation alarm is triggered and to be fully informed of the investigation steps and results as well as any necessary subsequent actions. This conservative approach may be reassessed as the permittee gains experience in responding to alarms. Information on rejected loads is also included in the landfill's routine monthly report submitted to regional Department staff.

11. *Pursuant to Department staff's authorization, NEWSNY has been disposing drill cuttings which had been in a water-based medium in Chemung County's onsite construction and demolition debris landfill (see, e.g., Tr, at 141-142). Department Staff is directed to review the sufficiency of the procedures that NEWSNY has established to ensure compliance with Department staff's direction that drill cuttings from an oil-based medium are not disposed in the onsite construction and demolition debris landfill.*

Department staff has reviewed the waste acceptance procedures and believes they are sufficient to ensure that any oil-based drill cuttings received are appropriately directed to the municipal solid waste (MSW) landfill portion of the site. NEWSNY requires all generators wanting to dispose of waste from oil and gas exploration and production sites to obtain NEWSNY approval prior to bringing waste to either the construction and demolition debris (C&D) landfill or the MSW landfill. As part of the procedures, a NEWSNY representative reviews information specific to the waste and determines if it is acceptable for disposal at the C&D landfill and/or the MSW landfill. If acceptable, the waste stream is issued a "profile number." The profile number ties the waste to the generator and the waste's point of origin. When the waste is delivered to the landfill, the driver of the hauling vehicle presents the scale operator "shipping paper" which contains the profile number. The scale operator uses the profile number to identify the waste and direct it to the approved landfill. Regional Department staff also receives monthly reports that contain information on the weight of drill cuttings disposed in the C&D and MSW landfills.

It should also be noted the landfill's radiation monitor is a portal type monitoring system, which is located at the entrance to the landfill site's scale. All vehicles delivering waste for disposal at the MSW landfill or C&D landfill are weighed at this one scale. As such, all loads destined for disposal at the C&D and MSW landfills are screened for radiation. The same acceptance and rejection limits for the monitor apply to both the C&D and MSW landfill.

12. *Part 360 municipal solid waste landfills are required to have a leachate management plan (see, 6 NYCRR 360-2.9[j]), which must address the leachate collection, storage, removal and treatment systems to be utilized and discuss operational requirements including leachate monitoring. [The Commissioner is] directing Department staff to review leachate management practices at the landfill to determine whether the current landfill procedures are sufficiently explained in the landfill's operation and maintenance manual and its leachate management plan.*

Leachate management practices at the landfill are addressed throughout the O&M Manual and the EMP. Department staff has reviewed the leachate management practices at the landfill, and has determined these procedures are adequately explained and reflective of site operations. The O&M Manual addresses procedures used to operate and maintain the leachate collection system. This includes collection of leachate in the lined landfill, conveyance of leachate from the landfill to the lined leachate storage lagoon, temporary storage of leachate in the lagoon, and the loading of the tanker trailers used to transport the leachate to an approved waste water treatment plant. The O&M Manual also provides information on how the weight of the tankers is used to track the volume of leachate sent to the waste water treatment plant for treatment. These procedures are unaffected by the disposal of drill cuttings. Department staff believes that the procedures and descriptions in the O&M Manual are adequate. See also the Department staff response concerning the EMP component of the O&M Manual below at item 14.

Department staff does not anticipate that the acceptance of drill cuttings will result in any significant increase in the levels of NORM in landfill leachate. However, should the ongoing testing of the leachate for radioactivity (as explained in item 14 below) identify an appreciable increase, Department Division of Water staff will be consulted to determine whether the leachate may continue to be disposed of at a publicly owned waste water treatment plant.

13. *Accordingly, Staff is to consider whether a specific separation distance between the leachate collection system and the first layer of Marcellus Shale drill cuttings is necessary for any reason. This review should consider whether, due to the physical attributes of the drill cuttings, including the extent to which these are finely-grained, such a separation distance is appropriate to avoid potential clogging or other operational impacts to the leachate collection and removal system;*

Department staff has assessed this issue and determined that the 6 NYCRR Part 360 solid waste management regulations, existing special permit conditions in the landfill's permit, and existing landfill operational procedures adequately address concerns of sediment buildup in the leachate collection system.

6 NYCRR 360-2.17(b)(3) requires the first layer of refuse placed above the leachate collection layer to be a minimum of five feet in compacted thickness and of a select nature to prevent physical damage to the landfill's leachate collection system. The landfill's O&M Manual calls for drill cuttings to be excluded from the select fill layer and to be placed no closer than six feet from the leachate collection layer. Like all waste in the MSW landfill, drill cuttings would be covered with a minimum of six inches of approved landfill cover at the end of each working day. These operational controls minimize the potential for small particles of drill cuttings to migrate into the leachate collection system.

Potential sediment buildup in the leachate collection system is addressed by special permit condition #56 and #59 of the landfill's permit. Condition #56 requires annual removal of sediment from, and inspection of, the leachate collection pond, while condition #59 requires annual inspection and cleaning of the leachate collection system piping.

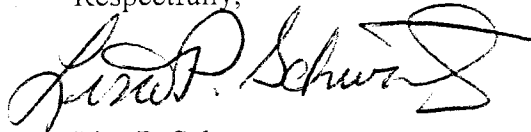
14. *and whether any circumstances exist that support adding parameters to the landfill's current leachate testing protocol.*

Department staff has reviewed the EMP and evaluated whether additional parameters should be added to the landfill's leachate testing protocol. The EMP is a major component of the O&M Manual. It describes all on-site and off-site monitoring, including location of all environmental, facility and other monitoring points, sampling schedule, analyses to be reported, statistical methods, and reporting requirements. For leachate management, the leachate and leachate pond sediment are required to be sampled and analyzed for parameters required in 6 NYCRR Part 360. The Department has also requested, and NEWSNY has agreed to, the modification of the EMP to include

testing the leachate and the leachate lagoon sediment for radioactivity. Samples will be analyzed for radium-226, radium-228, and total uranium. A gamma spectroscopic analysis will also be included. During the next three years, leachate will be analyzed for radioactivity twice per year, and lagoon sediments will be analyzed annually. At the end of the three year period, the frequency of testing will be reviewed and adjusted as appropriate. However, the sampling frequency will not be reduced to below once per year during landfill operation. With respect to radioactivity, this sample suite will be adequate to monitor the quality of the leachate at this landfill.

I hope this adequately responds to your direction. Please contact me if you have any questions or concerns.

Respectfully,

A handwritten signature in black ink, appearing to read "Lisa P. Schwartz". The signature is fluid and cursive, with a large, stylized initial "L" and "S".

Lisa P. Schwartz
Assistant Regional Attorney

Encs.

cc: Gary A. Abraham, Esq.- by Email and US Mail
Ronald G. Hull, Esq. – by Email and US Mail
Mr. Michael Krusen, Deputy County Executive – by US Mail
Thomas S. West, Esq. / Yvonne Hennessey, Esq. – by Email and US Mail