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December 8, 2015

VIA EMAIL TO: ChemungLFEexpansion@dec.ny.gov

Kimberly A. Merchant, Deputy Regional Permit Administrator
New York State Department of Environmental Conservation
Region 8
6274 East Avon-Lima Road
Avon, NY 14414

Re: CWM Chemical Services, LLC, Draft Public Scoping Document for the RMU-2
Landfill Proposal

Dear Ms. Merchant:

Please accept the following comments on behalf of Residents for the Protection of Lowman and Chemung, a not-for-profit corporation and community group that has a long history of watchdogging this facility. These comments supplement my request for an extension of time to comment, submitted to you via email on December 2.

The following technical memoranda on specific subjects are attached hereto and should be considered fully incorporated into these comments:

- Hydrogeological impacts: Memorandum by Andrew Michalski Ph.D., CGWP, PG, LSRP, of Michalski & Associates, Inc., dated December 8, 2015. Dr. Michalski's resume is attached to his memorandum.
- Engineering and safety concerns: Memorandum by Dr. Anirban De, Assistant Professor of Civil Engineering at Manhattan College, dated July 24, 2006. Dr. De's resume is attached to his memorandum.
- Radiological impacts: Memorandum by M. Resnikoff, Ph.D., of Radioactive Waste Management Associates (RWMA), dated December 8, 2015. Dr. Resnikoff is the principal researcher at RWMA, and his resume is attached to his memorandum.

As a preliminary matter, it should be noted that the Department is not the lead agency for this project proposal. The Chemung County Legislature adopted that role over a year ago, when some of the comments below in substance were provided to the County. However, the County's interest in this matter is conflicted by the substantial revenues it obtains from the facility operator, a subsidiary of New England Waste Systems of New York, whose parent is Casella Waste Systems. The company's affiliates operate landfills in Geneva, Painted Post and Angelica, New York. Given the potential for serious adverse impacts discussed below, and the fact that

Casella diverts much of Chemung County's waste to these other landfills, the Department should consider that the company has alternatives to expanding the Chemung County Landfill, and were the County's needs to be given a priority in the use of the remaining permitted air space, the County may have adequate time to consider alternatives.

The following concerns raise substantive and significant issues that warrant an opportunity to petition to intervene in the Department's review of this matter.

I. Introduction

Although some three decades ago Department Staff determined that the landfill site was in close proximity but not directly over a principle aquifer, "Staff's aquifer determination can be reconsidered in light of the evidence presented by the Objectors, who had no avenue for intervention when Staff's determination was made. . . . The issue is not whether Department Staff's determination was arbitrary or capricious, or had a rational basis, but instead whether the determination is correct." 2003 N.Y. ENV LEXIS 51, *101-102.

As noted in the attached report by Dr. Andrew Michalski, new information made available from the USGS in October 2015 shows that the southern portion of the proposed landfill expansion area is directly over a principle aquifer. Accordingly, the site is prohibited for purposes of landfill expansion unless the applicant prepares and submits a site selection study showing, among other things, that its chosen site will have no significant adverse impacts, (6 NYCRR §§ 360-2.11(b)(2)), or applies for and obtains a variance from the siting prohibition. *See* 6 NYCRR §§ 360-1.7(c).

It is unlikely the applicant can obtain a variance because, as discussed below, it will be unable to show that increased volumes of radioactive leachate the landfill generates can be managed without significant adverse impacts on the groundwater beneath onsite leachate storage ponds and to the Chemung River. The river is hydrologically connected to the principal aquifer beneath the expansion area. In addition, the river receives all of the landfill's leachate without removing any of its radioactivity. As the attached memorandum from Dr. Marvin Resnikoff indicates, radioactivity concentrations in the leachate have become elevated several times above background levels. Over the last five years the landfill has accepted between one-half and one-third of its total waste receipts from potentially radioactive drill wastes from Pennsylvania, and there is no other waste stream that could reasonably account for the degree to which the entire landfill's leachate has become elevated in radioactivity.

Even if a variance could be obtained, the Department should add permit conditions that enhance the groundwater monitoring system, including enhanced monitoring well spacing around the perimeter of the landfill, leachate storage ponds and BUD materials stockpiles, because the landfill, leachate ponds and BUD stockpiles are all potentially or in fact contaminated with radioactivity originating from deep shale drilling-associated wastes. *See* 6 NYCRR §§ 360-2.11(b). Additional permit conditions should require alternative treatment for the landfill's

leachate, since the Elmira water treatment is unable to remove or manage radioactivity in the leachate.

II. Air pollution issues

According to the Department's public notice in this matter,¹ the emission points at the landfill do not include a landfill gas-to-energy plant planned under the County's contract with Casella, and assumed in the FEIS, where its potential impacts were considered. Since the FEIS, the County and Casella have decided to delay but not abandon the GTE plant. It is not difficult to discern why: in the intervening time EPA issued an Order finding that the GTE plant at another landfill operated by Casella is likely under "common control" with the landfill, the GTE plant is a major source of both carbon monoxide and nitrogen dioxide, and the Department's failure to combine emissions of the two facilities as a single source was lacking in basis, requiring EPA to object to the Department-issued Title V permit.² However, under Title V permitting rules, withdrawal of the GTE plant from the Chemung County Landfill Expansion proposal does not dispense with the Department's obligation to consider the effect of the plant on the landfill facility's potential to emit regulated pollutants.

"The fragmentation of an operation such that the operation avoids regulation by a relevant standard" is prohibited circumvention of applicable requirements under the Clean Air Act. 40 CFR § 63.4(b). Thus, since the GTE plant is included in the FEIS, and since it can be demonstrated that the County and Casella continue to plan for the eventuality of a GTE plant, emissions from the GTE plant must be included in the calculation of potential emissions for purposes of modifying the expansion proposal's Title V permit.

Unless the Department obtains a binding commitment from the County not to construct the GTE during the permitted lifetime of the expansion landfill, if permitted, the Department is obligated to consider the emissions of the GTE plant. As noted above, these emissions potentially include major source levels of carbon monoxide and nitrogen dioxide. Accordingly, the type and quantity of pollutants potentially emitted by the GTE plant should be provided, and the total potential to emit regulated pollutants by the facility should be recalculated to reflect the addition of this emission source.

In addition, the Department's public notice acknowledges the need to "limit odors at the facility," a concern raised in public comments in the past and in connection with the present

¹ Available at <<http://www.dec.ny.gov/enb/103823.html>>.

² USEPA, In the Matter of Seneca Energy II, LLC, DEC Permit No. 8-3244-00040/0002, *Order Responding to the December 22, 2012 Request for Objection to the Issuance of a Title V Operating Permit* (June 29, 2015), at 14-17, available at <http://www.epa.gov/sites/production/files/2015-09/documents/seneca_response2012.pdf>.

proposal. In addition to a requirement under Part 360 to control odors at the facility, (6 NYCRR § 360-1.14(m)), adequate control of odors is required under the Department's general prohibition against air pollution, which defines odor as an air pollutant. 6 NYCRR § 211.2. Given that odor complaints remain ongoing at this time,³ ~~Accordingly~~, the Department should consider requiring continuous emissions monitors to monitor air toxics emitted by this facility. Although the notice notes that 40 CFR 60 Subpart WWW applies to this facility, it should be emphasized that Subpart WWW regulates the odorous components of landfill gas, not carbon dioxide or methane, which account for about 99 percent of the landfill's emissions. The remaining approximate one percent is toxic at very low concentrations. Annoyance by odors generated by the landfill therefore indicates those nearby are being exposed to air toxics, since methane and carbon dioxide are odorless.

III. Hydrogeological issues

Recent aquifer mapping made available in October 2015 by USGS shows that the southern portion of the landfill expansion area is located directly over a primary aquifer. See 6 NYCRR §§ 360-2.11(b). As Dr. Michalski notes in his attached report, the areal extent and productivity of the aquifer exceed the criteria for designating a principle aquifer under the Department's guidance, TOGS 2.1.3. Dr. Michalski shows that the applicant's own hydrogeological investigations confirm that the aquifer is significantly threatened by the high permeability of bedrock overburden deposited beneath the site, and a vertical permeability window from the shallow overburden into the aquifer. In addition, Dr. Michalski notes that an unintended effect of the applicant's groundwater suppression system is that a release from the portion of the expansion area to the north, outside the mapped area of the principle aquifer, can be expected to be drawn southward, across the vertical permeability window and into the aquifer.

Too few groundwater monitoring wells are screened in the lower overburden aquifer. There are only two such wells at the facility, and data from these was omitted from the applicant's hydrogeological investigation report. The absence of data from such wells is substantive and significant because the critical stratigraphic section beneath the site must be properly defined in order to ensure that groundwater monitoring is capable of detecting any contaminants escaping from the base of the landfill. 6 NYCRR § 360-1.2(b)(47).

IV. Engineering and safety concerns

Based on his review of the engineering report prepared for this project proposal, Dr. Anirban De concludes that constructing the expansion landfill on steep slopes with unconventionally dense, heavy and wet wastes compromises the stability and safety of the

³ See, e.g., Robin Stroman (RFPLC member), Letter to Kimberly A. Merchant, this matter, dated December 7, 2015, and attaching Ms. Stroman's letter to USEPA Region 2, dated April 2010 (noting chronic odors near the Chemung County Landfill).

landfill, and is contrary to assumptions the applicant used in design. Roughly half the waste disposed in this landfill is industrial waste, drilling wastes and sludge from the processing of drilling wastes, but the design assumes only municipal solid waste (MSW) will be accepted.

Specifically, the unit weight and shear strength of the wastes that would be disposed in the landfill does not reflect modern landfill waste in general, and the distinctive characteristics of waste that would be received at the expansion landfill in particular. The unit weight is assumed from 20-year-old guidance for MSW-only landfills. Site specific unit weights that reflect the actual waste streams for direct disposal and beneficial use materials used as landfill cover should be provided.

In addition, the character of the wastes that would be disposed in the expansion landfill would subject the leachate collection layer to high pressures such that the layer's transmissivity would be diminished, thereby compromising the leachate collection function.

Nor are the applicant's calculations for leachate head above the primary bottom liner sufficiently conservative to assure compliance with Part 360 limits on allowable leachate head. *See* 6 NYCRR § 360-2.13(a)(1), limiting leachate head to one foot. Dr. De concludes that leachate head would be about four times too high to meet the regulation.

In addition, the anticipated leachate quantity and head on a per-cell basis was not analyzed. Instead, the applicant made an arbitrary decision to analyze one acre within a cell. This is not a realistic approach, since landfill cells receive rainfall and snow melt over their entire area at once. The applicant has compounded this problem by utilizing average rainfall amounts over a 24-hour period, rather than peak hourly rainfall, which ordinarily is substantially greater.

In addition, stresses at the tie-in between the expansion landfill and the existing operating landfill were not considered. Nor were stresses in the final cover system at the tie-in.

In addition, the applicant's slope stability analysis did not consider the steepest slopes on which the landfill would be constructed. For purposes of understanding the potential for shear strength failure, the interface between the secondary soil liner and secondary polyethylene geomembrane presents the critical interface. The applicant avoided consideration of the friction angle governing this interface, with the result that the factor of safety utilized in the engineering report should be substantially lower than calculated by the applicant.

The engineering report relies on a site specific friction angle value reflecting clay soils the applicant would use for bottom liner material. However, this friction angle is higher than typical values for soil liner material, with the result that block failure, which is reported already to have the lowest factor of safety among several design parameters, should be considered lower than reported.

Hydration of clay soils diminishes their shear strength, or ability to withstand stresses

tending toward failure, but hydration conditions expected at this site were not considered, and the values for shear strength assumed in design are not supported by any literature reference.

These deficiencies in design are made more serious by the steep subgrade at this site which, according to Dr. De, will have “severe adverse effects on stability” without additional engineering modifications.

V. Radiological issues

Several of the concerns outlined above regarding the risky hydrogeological setting of the expansion site and the deficiencies in design from the standpoint of safety are relevant to assessing the nature of the risk of accepting low-level radioactive waste from Pennsylvania oil and gas shale drilling-related sources. These risks have not been adequately considered. However, a basis for considering such risks is available now that was not available at the time of the applicant’s 2010 application for a permit modification. As Dr. Resnikoff notes, in the time that has elapsed since the 2010 review, radium concentrations in the landfill’s leachate have exceeded 14 pCi per liter, substantially higher than background for the region—and substantially higher than the concentration of radioactivity in rock cuttings reported by the applicant; the leachate is stored onsite in surface impoundments, or open air ponds; and the leachate is periodically pumped from the ponds and transported to the Elmira publicly-owned treatment works (POTW), which is unable to remove any radioactivity from the leachate before treating it and discharging it directly to the Chemung River. Because the landfill’s leachate has become contaminated with elevated radioactivity, it cannot be accurate, as the County states in the FEIS, that “the portal radiation monitoring system is sufficiently sensitive to detect waste loads containing [radiologically] elevated concentration waste materials and prevent their disposal in the landfill.”⁴

As reflected in public comments on the expansion proposal, the prospect of long-term, bioaccumulative pollution of both groundwater and the river is a substantial public concern. Accordingly, the Department should consider the basis for these concerns on their merits.

In 2014 alone, the landfill sent over 4 millions gallons of radiologically contaminated leachate to the Elmira POTW. Because of its bioaccumulative properties, and its tendency to bind to sediments in water bodies, continued discharge of such volumes of leachate can be anticipated to degrade the quality of the river and its biota, including fish caught for consumption.

In addition, the low level of Radium in the landfill’s leachate, in conjunction with the large volume of leachate sent to the Elmira publicly owned treatment works (POTW), presents a risk

⁴ FEIS, 21.

of harmful exposure to workers in the confined spaces inside the POTW.⁵

In addition, the landfill's current permit provides that "industrial wastes" may not be disposed in the landfill "which are incompatible with municipal waste, as determined by the Department."⁶ This provision authorizes the Department to direct the applicant to stop accepting such wastes upon a finding that they are incompatible with the proper treatment of the landfill's leachate. Because radioactive components found in the leachate are not treated before being discharged to the Chemung River like other components of the leachate, the Department may determine that disposal of deep shale drilling waste is incompatible with municipal waste because it renders the leachate generated by such waste unmanageable. That is, the radioactivity found in deep shale drilling waste is contaminating the leachate of the entire landfill, making its management through a POTW untenable.

In addition, the storage of radioactive landfill leachate onsite for long periods of time threatens the principle aquifer beneath portions of the expansion area and in close proximity to the aquifer in other portions of the expansion area. The Department has designated principle aquifers as sensitive environments. 6 NYCRR § 360-1.2(a)(150). As noted above, the concentration of radium in leachate stored on the ground on site has exceeded the groundwater standard for releases to groundwater of radium. *See* 6 NYCRR § 703.5 (Ra-226, 3 pCi/L; total radium, 5 pCi/L).

Since the significance of such threats was not considered in the FEIS, (*see below*), the Department should obtain the information necessary to address this concern. To do so, the Department may direct the applicant to prepare a supplemental EIS on the subject. *See* 6 NYCRR 624.4(c)(6)(ii)(b).

Even without an SEIS, the applicant should be required to submit an antidegradation analysis showing how water quality in the Chemung River will not be degraded by the discharge of millions of gallons of radium-contaminated leachate into the river. According to the Department's *Antidegradation Policy*, O&D Memo 85-40 (September 9, 1985), at 2:

Water quality based effluent limitations derived for SPDES permits provide for the protection and maintenance of attained higher uses above those included in standards currently assigned to waters receiving the effluent discharge. Variations in numerical water quality criteria that are not significant and do not interfere with the attained higher use are permitted.

⁵ See FEIS, vol. 1, 30 ("Radon's primary risk is associated with its occurrence in confined spaces such as basements where inadequate ventilation allows concentrations to increase.").

⁶ Chemung County Landfill, Part 360 Permit, Special Cond. 31(d).

Discharges of large volumes of wastewater contaminated with low levels of Radium “interfere with the attained higher use” of the reach of Chemung River immediately downstream from the Elmira POTW, which is fish propagation.⁷ The most recent biological assessment (macroinvertebrate) of the reach of the river downstream from the Elmira POTW was conducted in 2002.⁸ Without additional information, therefore, the Department has no basis for assessing the consequences of additional periodic discharges of low levels of radioactivity to the river.

Chemung County, acting as SEQRA lead agency, omitted from its SEQRA review consideration of the significance of impacts of low levels of radioactivity in the large volume of drilling wastes disposed in the landfill,⁹ despite acknowledging that these wastes are characterized by radioactivity levels several times higher than background concentrations, and radioactivity detected in landfill’s leachate has exceeded the level of radioactivity detected in drilling wastes disposed in the landfill.¹⁰

In addition to waste accepted for immediate disposal, the landfill utilizes several waste streams as landfill cover material, under a beneficial use determination (BUD), from Pennsylvania. These materials should be presumed to be generated from drilling sites or their ancillary facilities, including contaminated soil, de-watered sludge, filter cake, and solidification pit remnants.¹¹ In 2014, these four waste streams amounted to over 11,000 tons of materials stockpiled and ultimately disposed in the landfill. The Department should ask the applicant to identify all BUD materials associated with the oil and gas drilling industry. See 6 NYCRR § 360-1.15(d)(1)(iv)(a)(1). “Periodic testing” of such waste is required, (6 NYCRR §

⁷ See NYSDEC, “Chemung River”, at <<http://www.dec.ny.gov/outdoor/88333.html>> (“Quality fishing opportunities in the Chemung River exist primarily in the spring, summer and fall months. . . . Most walleye are caught in the deep pools in the Corning area or downstream of Elmira during late spring or early fall.”).

⁸ See NYSDEC, “Chemung River/Lower Chemung Watershed”, at <http://www.dec.ny.gov/docs/water_pdf/wichemnglchmg.pdf>. The reach of the river downstream from Wellsburg, NY, immediately below the landfill and about six miles downstream from the Elmira POTW, is a Class A water body. *Id.*

⁹ See FEIS, vol. 1, 13 (“no further environmental review related to drill cuttings is necessary”); 23 (“the facility accepts a large quantity of drill cutting waste”); and 44 (“Issues related to Marcellus shale wastes are not relevant to this SEQRA review.”).

¹⁰ See *id.*, 33 (“The results from Chemung Landfill LLC’s 2010 study of the radioactivity of drill cuttings . . . found a concentration of 4.3 pCi/l.”), and 38 (“leachate sampling for Radium 226 and Radium 228, the radioactive isotopes most commonly linked to Marcellus shale drill cuttings, have never exceeded 9.43 pCi/L, and in most cases have been well below this limit.”).

¹¹ Chemung County Landfill, 2014 Annual Report, sec. 5.

360-1.15(d)(1)(iv)(a)(2)), as is acceptable “procedures for run-on and run-off control of the storage areas for the solid waste”. 6 NYCRR § 360-1.15(d)(1)(iv)(a)(5). If analysis of any BUD materials show there is more than a “little potential” for adverse impacts not found at the time of the initial BUD determination, the Department should revoke the determination for that waste stream. 6 NYCRR §§ 360-1.15(d)(3), (4). Since, as contended below, it is the mass of landfilled drilling wastes rather than their radioactive concentration that likely accounts for the elevated radioactivity level in the landfill’s leachate, increasing the volume of such wastes represents a change in permit conditions than can be expected to result in specific significant adverse environmental impacts, discussed below. Since the elevated concentration of radioactivity in the landfill’s leachate is new information, not available during the Department’s 2010 review of the consequences of accepting deep shale drilling waste streams, the significance of the threats posed by managing the leachate and its potential effects to sensitive environments, (6 NYCRR § 360-1.2(a)(150)), has not previously been addressed.¹²

Despite rejecting the public’s urging that it take a hard look at the consequences of continued acceptance of radioactive drilling-related waste streams, as Dr. Resnikoff notes in his memorandum, without any evidence the County in its FEIS asserts that Ra-226 is not soluble in water and thus should not be expected to be found in elevated concentrations in wet shale drilling-related wastes. The contrary is true: based on relevant research, the potentially substantial liquid component in the wastes has concentrations of radioactivity thousands of times higher than background, much higher than Marcellus Shale rock cuttings, decalcified and analyzed in a laboratory. The landfill’s current Part 360 permit allows wastes with as much as 80% liquid component to be deemed “solid waste” and thus disposed in the landfill.


New York is alone among jurisdictions in failing to recognize deep shale drilling waste as “technologically enhanced naturally occurring radioactive materials” (TENORM), recognizing its potential health and environment impacts, and regulating it accordingly. Instead, under the Department’s Parts 380 and 382 regulations, NORM is not regulated unless it is “processed and concentrated,” regardless of its potential for harm. The matter of the Chemung County Landfill expansion proposal is not the forum for urging the Department to change its regulations. However, the Department’s Part 360 regulations require the landfill proposal to demonstrate that even “a small contaminant release” of radioactive materials, and specifically Radium-226, because it is a bioaccumulative chemical of concern, would not be threatened “due to proximity to . . . primary water supply aquifers” or to the Chemung River and the Chesapeake watershed. 6 NYCRR § 360-1.2(a)(150). Even though the concentrations of Radium in the landfill’s leachate are below applicable discharge limits, because the landfill discharges a large volume of leachate, a substantial mass of radionuclides is being released to the Chemung River and stored and managed in close proximity to a principle aquifer. Even “a small contaminant release” of radioactive materials to sensitive environments should be considered “a significant adverse

¹² Cf. FEIS, 12 (“the prior review of disposal of acceptable wastes, including drill cuttings, occurred several years ago or longer”).

impact on public health, safety, or welfare, the environment or natural resources.” 6 NYCRR § 360-1.4(a)(1)(iv). However, given the volume of leachate generated by the landfill, and the larger volume expected under the expansion proposal, it is unreasonable to conclude that the risk of significant adverse impacts posed by the expansion would be insignificant. As USEPA has said, regarding the discharge of BCCs into the sensitive environment of the Great Lakes Basin, because BCCs “accumulate in organisms living in the water and become more concentrated as they move up the food chain—from biota to fish and wildlife to humans,” and “[b]ecause the effects of these chemicals are not mitigated by dilution, . . . it is the mass of BCCs that poses a problem, not just the concentration.”¹³

As noted above, in Section III, the applicant is likely to require a variance from the siting standard prohibiting landfill expansions over a principle aquifer. In that case, the applicant must meet the burden imposed on applicants for a variance, to “demonstrate that the proposed activity will have no significant adverse impact on the public health, safety or welfare, the environment or natural resources and will be consistent with the provisions of the ECL and the performance expected from application of this Part [360].” 6 NYCRR § 360-1.7(c)(2)(iii). Even if the applicant could meet this burden, the Department is required to impose additional permit conditions that would “assure that the subject activity will have no significant adverse impact on the public health, safety or welfare, the environment or natural resources.” 6 NYCRR § 360-1.7(c)(3). *See also* 6 NYCRR § 360-1.11(a) (parallel language).

Respectfully submitted,


Gary A. Abraham
Counsel for RFPLC

gaa/encs.

cc: Dudley D. Loew, Esq., NYSDEC Senior Regional Attorney, Region 8 (via email)

¹³ EPA, *Final Rule To Amend the Final Water Quality Guidance for the Great Lakes System To Prohibit Mixing Zones for Bioaccumulative Chemicals of Concern*, 65 Fed.Reg. 67638, 67640-67641 (November 13, 2000).