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January 30, 2015

VIA EMAIL TO: dsdenk@gw.dec.state.ny.us and U.S.P.S
David Denk, Regional Permit Administrator
New York State Department of Environmental Conservation
Region 9
270 Michigan Avenue
Buffalo, NY 14203

Re: Hyland Landfill Part 360 Permit Modification Request (design capacity expansion from 312,000 to 465,000 tons per year)

Dear Mr. Denk:

Please accept comments on the above-referenced matter in this letter on behalf of Concerned Citizens of Allegany County ("CCAC"). I understand that members of CCAC will also be submitting individual letters.

As an initial matter, I note that a public hearing was scheduled in this matter for October 2014, and noticed in the Department's *Environmental Notice Bulletin* in September 2014, but no one attended, despite the submission of over 4,000 public comment letters regarding this proceeding in 2013. The failure of the 2014 notice[1] can be inferred from the lack of attendance at the October 2014 hearing. Arguably, stakeholders who participated in the 2013 comment opportunity should have received actual notice, not just public notice. Nevertheless, we are most pleased the Department has acted to rectify the failure of notice, in response to CCAC chair Fred Sinclair's communications with Judge McBride and yourself, in early January 2015.

In response to Mr. Sinclair, the Department has reopened the public comment period. Accordingly, these comments raise substantive and significant issues regarding the effects of expanding Hyland Landfill on slope stability and the release of radioactive contaminants contained in the waste and landfill leachate managed by the landfill. We offer to support these issues with testimony from Dr. Anirban De on landfill engineering issues, and Dr. Marvin Resnikoff on radioactive waste issues. Dr. De's resume accompanies a brief expert report enclosed with this letter, and Dr. Resnikoff's resume is also enclosed. As Dr. De states at the conclusion of his report, insufficient time has been provided to review relevant engineering reports for this facility. Dr. Resnikoff has not had sufficient time to prepare an expert report, but a report on similar issues submitted in the matter of the Chemung County Landfill in 2010 is

[1] Confusion of the public may have resulted from the applicant's decision to change local newspapers in which to publish notice of the 2014 hearing. In 2013 Hyland published a notice of this proceeding in the Olean *Times Herald*, but the 2014 local notice was published in the Wellsville *Daily Reporter*.

enclosed, as preliminary support for his opinions.[2] In addition, Dr. Resnikoff offers to prove assertions made below regarding radiological release and exposure risks.

Notwithstanding the Department's reopening of the comment period in this matter, we request additional time to prepare for an issues conference, warranted both by the substance of the issues raised here and 2013, and by the high level of public interest reflected in the number of public comment letters the Department has received and can be anticipated to receive in response to the reopening of the opportunity to comment.

Additional time is also called for in order to review a recently issued major report by the Pennsylvania Department of Environmental Protection ("PADEP"), reporting on the results of a study of the fate and transport of radionuclides known to be contained in drilling wastes generated by the development of the Marcellus Shale formation in Pennsylvania.[3] I note that in a December 17 press conference discussing its public health review of the risks of high-volume horizontal fracking, New York State Department of Health Acting Commissioner Dr. Howard Zucker specifically identified the unacceptable risks of managing radioactive drilling wastes as grounds for his recommendation that fracking be banned in New York.[4] The PADEP study was not available at that time and should, in light of the comments below and those anticipated from others, be considered. I am reliably informed that the PADEP study shows that the kinds of drilling wastes accepted by Hyland is substantially more radioactive than background soils, and the risk of release of radioactive constituents in the waste to local waterways as a result of leachate treatment, spills and leaks from landfills accepting such wastes, like Hyland, is substantial. Policy considerations weigh in favor of such consideration, since the continued importation from out of state of wastes New York has deemed too risky to be generated and safely managed in this state is clearly at odds with New York's policies.

Since the issues discussed below in some respects build on those identified in my July 22, 2013 comment letter, I am summarizing relevant information provided in that letter. This information is important for understanding the engineering and radiological release and exposure issues newly raised in subsequent sections of this letter.

Volumes and character of Marcellus Shale drilling wastes disposed at Hyland

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[2] It should be noted that while similar radiological issues as raised here were also raised in the Chemung County Landfill matter, those issues were deemed irrelevant in 2010 because no design capacity modification or any other physical modification of the landfill was requested. Accordingly, these issues were not reached in the Chemung County Landfill matter.

[3] PADEP, *Technologically Enhanced Naturally Occurring Radioactive Materials (TENORM) Study Report* (January 2015), available at <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-105822/PA-DEP-TENORM-Study Report Rev. 0 01-15-2015.pdf>.

[4] A video recording of the press conference is available at <http://blog.timesunion.com/capitol/archives/226249/watch-zucker-martens-on-fracking-cuomo-qa/>.

Before deciding whether to approve the proposed landfill expansion, the Department should request additional information from Hyland regarding the actual volumes of drilling wastes disposed in the landfill, including "non-counted" wastes. The Department should also request a characterization of each of the drilling waste streams Hyland accepts. This characterization should include testing of waste streams for radionuclides and moisture content.

Hyland's operating permit allows up to 20% of "counted" waste to be disposed as "alternative daily cover" (ADC), another 10% as materials for which a "beneficial use determination" has been made by the Department ("BUD"). In other words, to its permitted annual waste acceptance volume, Hyland may add up to 30% of "non-counted" ADC and BUD materials. Marcellus Shale drill cuttings are accepted in all three categories, ADC, BUD and regular "counted" waste, and all three categories of waste are buried in the landfill.

In addition to drilling wastes, other dense or heavy waste streams include contaminated soil (approximately one-half of ADC + BUD). In "counted" waste there are substantial volumes of sewage treatment plant sludge and industrial process sludges (including residues from the processing of drilling wastes; we believe most of this volume is drilling waste), averaging ~15% of total tons disposed.[5]

The following table summarizes selected categories of waste as provided in Hyland's annual reports to NYSDEC.[6] The 2014 annual report has not yet been submitted.

Hyland Landfill, waste stream volumes by year (in tons unless noted otherwise)

	drill cuttings ADC	drilling waste[1]	ADC + BUD (all other waste streams)[2]	"counted" wastes[2]	total drilling waste	total other wastes	% drilling of all wastes disposed	cumulative waste in place[3]
2011	2312	90315	53070	166862	92627	219932	29.6	3.10M (2.2M)
2012	0	9033	102024	237407	9033	330398	2.6	3.27M (4.8M)
2013	1048	204	84589	206154	1252	291995	0.4	3.27M (5.1M)

[5] As discussed at greater length in my July 22, 2013 comment letter, including all materials mixed with landfilled wastes affects the time the landfill should be considered to trigger applicability of certain emissions control programs because "non-counted" wastes contain toxic organic compounds that can be expected to be stripped from the waste mass of the landfill and emitted with methane, comprising about one-half of landfill gas generated by the facility.

[6] In Hyland's annual reports to the Department, Section 5 provides ADC and BUD volumes broken down by waste streams; Section 6 provides volumes of "counted" waste; Section 9 provides volumes for waste in place at the end of the reporting year.

NOTES

1. assume ~100% drill cuttings
2. less drilling waste
3. tons (airspace in cu. yds.); only 2012 and 2012 are noted "from survey"; tonnage for 2013 appears to be in error

In 2008 the Department approved four leachate injection wells in the landfill, allowing a maximum of 6,000 gallons per well per day. In 2009 the Department approved an additional 18,000 gallons of leachate applied to the surface of the landfill working face. In 2011 Casella announced it would build a wastewater treatment facility at its landfill in McKean County, PA, to treat "brackish, salty water produced from drilling for natural gas in the Marcellus Shale basin."[7] In 2012 Casella characterized operations at the facility as follows: "Drillers will be able to dispose of their cuttings and have their water purified for recycling, with the contaminants disposed in the landfill."[8] We believe some of these residual contaminants have been and will continue to be transported to Hyland for disposal.

Also in 2012 NYSDEC allowed disposal at Hyland Landfill of solidified liquid wastes, solidified by adding absorbent material to achieve at least 20% solids in this waste stream. In 2012 Hyland reporting receiving as waste over 10.9 million gallons of leachate.

Substantial volumes of other permitted wet waste streams have been allowed and continue to be allowed, including sewage sludge, industrial sludge, wet drill cuttings, and sludges from the treatment of liquid wastes generated at Pennsylvania drilling sites. Each of these waste streams is subject to the 20% solids limit and therefore potentially have added 80% of their mass to the landfill as liquid.[9]

Risk of radiological releases and exposure

The radiological character of the landfill's leachate can be expected to become elevated in radioactivity as a result of acceptance of substantial volumes of Marcellus Shale drilling wastes. As noted in my March 22, 2013 letter, Hyland acknowledges that drilling wastes imported from Pennsylvania contain elevated levels of naturally occurring radioactive materials ("NORM") compared to other waste streams. In fact, the Chemung County Landfill, operated by the same parent company as Hyland and with a comparable history of acceptance of Marcellus Shale

[7] Altela, Press Release, "New Recycling Solution Introduced to Treat Marcellus Shale Flowback Frac Water," October 25, 2011, attached hereto (announcing a joint partnership with Casella).

[8] "Casella says N.Y. fracking likely delayed until 2013," *Bennington Banner*, March 19, 2012, attached hereto (reporting on a conference call between Casella Waste Systems Chairman John Casella and investors).

[9] The liquid content of solidified liquid waste streams disposed in the landfill is equal to the volume of the liquid waste before solidification, since solidification does not remove any liquid.

drilling wastes, has tested samples of landfill leachate since 2011, finding elevated levels of radioactivity. Both landfills accepted conventional waste streams for about 20 years prior to accepting Marcellus Shale drilling wastes. However, in the three years since Marcellus Shale drilling wastes have been accepted, levels of radioactivity in the leachate at both landfills has become elevated.

In addition, as discussed in more detail in a comment letter being submitted today by James Bacon on behalf of the Community Watersheds Clean Water Coalition and Elmer Lange, whose property is adjacent to Hyland's, water samples collected immediately downstream from Hyland Landfill's permitted outfalls are elevated two to three times the levels detected elsewhere in the same stream. Sediment samples have been taken in the same areas but analytical results are not yet available. Because Ra-226 in water preferentially binds to sediments, it is expected that concentrations in the sediments will be even more elevated.

Reliance on radiation portal monitors at the landfill receiving gate is not sufficient to protect workers and nearby receptors from exposure to radon. The portal monitors may detect radioactivity in the transported load, but the cumulative volume of low radioactive waste in the landfill will continue to generate radon from the decay of Ra-226, and the transport trucks themselves, which must be covered until disposed, are likely to contain harmful levels of radon gas. According to the January 2015 PADEP study: "The evaluation of waste containing Ra-226 is subject to the buildup of radon gas and the other short-lived progeny of Ra-226, complicating any decision made to transport or dispose of such materials based on an exposure rate survey of the container." Accordingly, an evaluation of the risk of exposure to radon should be conducted for Hyland Landfill prior to any decision to approve expansion.

It should be emphasized that Ra-226 originates from the Marcellus Shale formation, that the Marcellus is more radiogenic than other shale formations in the U.S., and that formation water and returned drilling fluids generated during the drilling phase can be as radioactive as wastewater produced during the production phase at Pennsylvania oil and gas drilling sites.

Risk of slope failure

As Dr. De concludes in the report enclosed with this letter, the slope stability of the landfill is seriously compromised if substantial volumes of dense and wet wastes are disposed. As noted above, in 2011 about one-third of the material disposed in Hyland Landfill was unconventional drilling wastes, which are substantially more sense and wet than conventional waste streams, and Hyland has been permitted to add substantial volumes of liquid to the landfill in the form of recirculated leachate, bulked up liquids and industrial sludges.

Slope stability generally depends on the landfill's load (primarily determined by the density of the waste) and resistance to the load (strength of the waste or soil). Generally, a denser waste would add more load. Relatively wet waste creates increased load and has less strength to resist the load. In addition, relatively wet wastes create free pore water in the waste

that creates added pressure, compared to conventional wastes. This added pressure adds to the load and reduces strength of the landfill, exacerbating the combined load and diminished resistence that results from disposal of dense wastes in drilling waste streams.

As Dr. De notes in the enclosed report, the landfill's original design was provided in the early 1990s, in support of approval in 1995 of a Part 360 permit to dispose incinerator ash. As noted in CCAC chair Fred Sinclair's comment letter, submitted to you under separate cover, the Commissioner approved permitting against the recommendations of the hearing officer, who found that the applicant had failed to provide sufficient information to overcome the risk of slope instability created by the site soils. The Commissioner's decision, however, did not reject any of the hearing officer's findings. Rather, the Commissioner based his decision on the need for incinerator ash disposal capacity in the state at that time.

Subsequently, the facility could not be operated as an ash monofill, as permitted, and was allowed to accept conventional municipal and industrial solid wastes. However, the requested expansion, in light of the unconventionally dense and wet waste streams accepted in recent years, should be tested against the slope stability analysis provided at the time of siting to determine whether the analysis addresses high water content in the waste mass. If the original design does not consider the level of water content that now exists in the landfill, then expansion of the landfill poses a risk of slope failure that has not been considered.

Evidence of slope instability can be found in the Department's on-site monitor's reports for Hyland Landfill over the last several years. These reports identify chronic seeps of landfill leachate from the landfill slope, many of which have escaped from the landfill and can be expected to contaminate area streams. We believe these leachate releases are linked to elevated radioactivity found downstream.

The Department should invoke the landfill's permit condition requiring a corrective action investigation upon "physical evidence of a waste release." When doing so, radiological parameters should be added to the routine parameters for which potentially contaminated downstream waters are tested.

Sincerely yours,

Gary A. Abraham
Attorney for CCAC

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