License to Dump

Despite Ban, New York Permits Pennsylvania to Dump **Radioative Fracking Waste Inside Our Borders**

ENVIRONMENTAL
ADVOCATES OF NEW YORK

Acknowledgements

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About Environmental Advocates

For more than 45 years, Environmental Advocates of New York has been at the center of every major environmental debate and cause in Albany.

As your green government watchdog, we advocate for strong environmental policies and protections, educate the public and media about critical issues, and hold decision-makers accountable. Our advocacy network is currently more than 40,000 New Yorkers strong, and growing.

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EXECUTIVE SUMMARY

New York's ban on high-volume hydraulic fracturing ("fracking") must apply to other states' fracking waste being dumped in our landfills.

When Governor Andrew Cuomo announced the fracking ban, it was a move welcomed by medical professionals, advocates, and the vast majority of New Yorkers. The Cuomo Administration consistently stated throughout their health review that a decision on fracking would be contingent on the science and that if it was determined to be unsafe, it would not be permitted.

Ultimately, the state Department of Health (DOH) Commissioner Dr. Howard Zucker declared that *"the potential risks [of fracking] are too great."*[1] Unfortunately, the state Department of Environmental Conservation (DEC) has not taken similar precaution related to regulating fracking waste. Instead, New York has allowed fracking states to landfill their waste inside our borders, with little oversight, consistency, or public access to data. In fact, information concerning fracking waste provided to the public is often incomplete or inaccurate.

"New York State landfills have not accepted and do not accept waste created by high-volume hydraulic fracturing." –

DEC [in a Freedom of Information Law request] June 13, 2014[2]

The Pennsylvania Department of Environmental Protection (DEP) reports that drillers have sent at least 23,000 barrels of liquid and 460,000 tons of solid fracking waste to New York landfills.[3] Media analyses have indicated that DEP figures grossly underrepresent the true amount of fracking waste making its way into New York landfills. Comparatively speaking, the DEC and some state lawmakers falsely allege it's not happening at all.

It is clear that DEC's engagement on the issue of fracking waste has fallen far short of the strong public health safeguards that guided Dr. Zucker's own fracking health review.

Fracking waste brings with it many public health concerns, chief among them the prevalence of radioactive material.

Environmental Advocates' research uncovered incomplete data rife with questionable accuracy. In one notable instance, Pennsylvania reported that fracking waste triggered radiation detectors more than 1,000 times in 2013, while at least one New York-based landfill accepting Pennsylvania fracking waste did not report a single trigger during that same period (meaning that basic intentional testing, or "calibration" of the equipment, failed to occur – a concern confirmed by DEC).

Meanwhile, reporting from *The New York Times* indicates that radioactivity levels of Marcellus Shale waste "*has sometimes been hundreds or thousands of times the maximum allowed by the federal standard for drinking water.*"[4]

At this time, New York State lacks regulations that require landfills to notify the DEC once they decide to accept fracking waste. Because DEC considers fracking waste to be classified as "construction debris", any landfill permitted to accept construction wastes may accept fracking waste.[5]

Before proceeding with our findings, Environmental Advocates wishes to make clear that DEC staff are committed, dedicated individuals doing the best they can under increasingly challenging circumstances. However, a lack of existing DEC regulation, further inhibited by damaging staffing level reductions, have forced the agency to rely on industries to self-regulate, with little oversight or penalty which creates a dangerous situation for New Yorkers.

Photo credit to D.Walczak.

stats to remember

Tons of solid fracking waste dumped in New York to date

460,000

Barrels of liquid fracking waste dumped in New York to date

23,000

Number of New York landfills that have accepted fracking waste from other states

7

Number of years that radium takes to break down

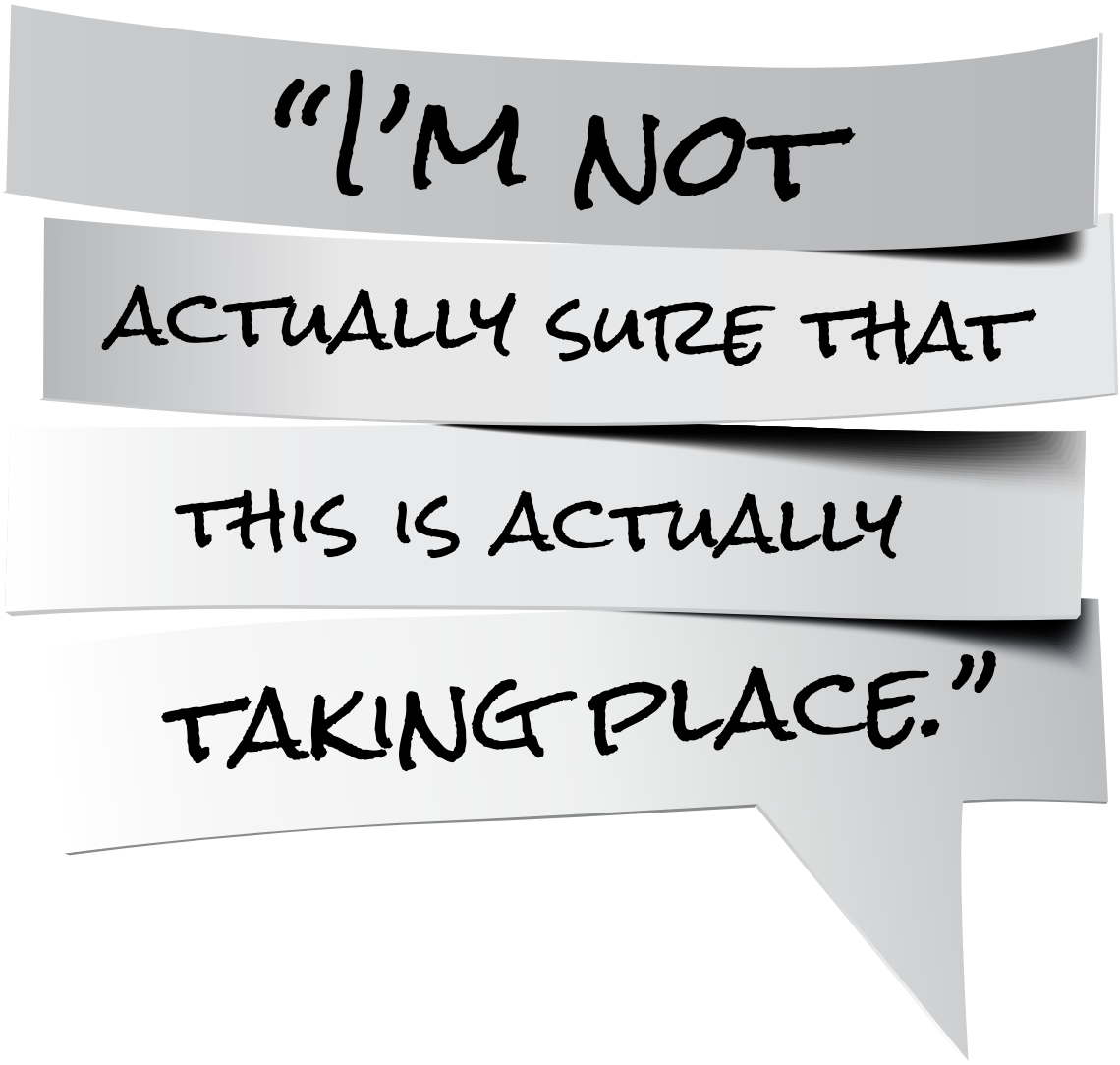
1,600

Radiation alarms triggered by fracking waste in Pennsylvania

1,000+

Radiation alarms triggered by fracking waste in New York

0



– Senator Mark Grisanti

Speaking on fracking waste being dumped in New York's landfills while chairing the Senate's Environmental Conservation Committee. April 29, 2014[6]

RECOMMENDATIONS

Governor Cuomo cannot keep his promise to protect public health from the dangers of fracking if he does not direct his administration to simultaneously ban fracking waste.

Our research confirmed five ways in which state government can act immediately – administratively or legislatively – to protect against the concerns outlined in this report:

1. Close both the hazardous waste and radioactive waste loopholes. Before waste from drilling sites is sent for disposal at landfills, it should be tested for its toxicity. Hazardous waste should be treated as hazardous and radioactive waste, and should not go to municipal landfills (see Page 14).

2. Incorporate U.S. Environmental Protection Agency's (EPA) definitions of Technologically Enhanced NORM (TENORM) into state law to ensure fracking waste is treated as radioactive waste (see Page 16).

3. Require monthly testing of leachate for radioactivity, as well as the installation of radiation monitors for all landfills, including those that do not currently accept fracking waste. Regulations for radiation monitors must be added that include standardized maintenance procedures, a uniform radioactivity level at which monitor alarms are sounded and uniform levels for acceptance and rejection of waste, and protocol for what to do with the waste when it has been rejected (see Page 16-18).

4. Prohibit leachate from being disposed of at wastewater treatment facilities if radioactivity exceeds 5 picocuries (the standard measurement of radioactivity) per liter (pCi/L). If leachate is radioactive it needs to be disposed of in a facility equipped to properly treat it (see page 18).

5. Publicly disclose the names and locations of all landfills in New York State which have ever accepted any oil and/or natural gas waste, including whether leachate testing has occurred.

Photo credit to Office of Governor Cuomo.

WHAT IS FRACKING WASTE?

Waste from high- and low-volume fracking operations comes in two forms: liquids from the process, and solids commonly known as drill cuttings.

Waste contains heavy metals, salts, and chemicals, many of which are known or suspected carcinogens, as well as significant amounts of naturally occurring radioactive material (NORM).[7]

Were it not for irresponsibly lax state and federal standards, these toxic wastes would be appropriately treated as hazardous materials.

Solid: drill cuttings are pieces of shale that come up during the drilling of the well; drilling sludge is the mud that is used to lubricate the drill bits. The biggest concern with these wastes is the radioactive nature of Marcellus Shale. Cuttings that are improperly disposed of could expose the public to radon, radium-226, and radium-228- known human carcinogens.[8]

There are also concerns that drill cuttings at some well sites are being cross contaminated with liquid wastes by disposing of them in the same waste pits as the liquid wastes.

Liquid: wastes from hydraulic fracturing include drilling fluid; the sludge to lubricate and cool the drill bits; flow-back fluid; water and additives that come back up during the initial fracking of the well; and produced fluid (i.e. the water and additives that come up throughout the life of the well).

Wastewater from fracking can contain up to 300 distinct chemicals. These include known and potential carcinogens such as benzene, formaldehyde, etholene glycol, and xylene.[9] Not only laden with toxic chemicals, wastewaters also have exceptionally high levels of NORM. A 2011 study by the U.S Geological Survey (USGS) found levels of radium-226 in fracking wastewater samples as high as 16,000 pCi/L.[10]

By the time fracking waste gets to landfills it has been "solidified." The definition of solidified in this case should be interpreted loosely, because what goes to landfills is most accurately described as a slurry.[11]

According to an engineer based in DEC Region 8, Industry practice is as follows:

"The ground-up rock cuttings emerge from the boring in a slurry containing the rocks plus carrier fluids added during drilling… After recovery, the majority of the fluid is extracted from the drill cuttings for reuse, and cuttings are 'bulked-up' with cement kiln dust, sawdust, or lime to bring the solids content up to levels acceptable for handling and disposal."

Waste Coming Into New York

Data obtained from Pennsylvania's Department of Environmental Protection (DEP) indicates that New York has accepted approximately 460,000 tons of fracking waste to date. To put that into context, if the fracking waste was measured in the weight of a typical car, it would amount to 230,000 four-door passenger cars.

While conducting our research, we had to rely on data from Pennsylvania's DEP Oil and Gas Reporting website because, unlike Pennsylvania, New York does not have any website, database or reporting mechanism available to the public that shows which landfills are receiving fracking waste, or how much and of what kind they are accepting. While Pennsylvania does at least offer some information, like New York, their information also reflects a negligent lack of oversight. In 2013, the Associated Press found that one fracking company reported sending *"21 tons of drill cuttings from Marcellus shale wells to area landfills in 2013. But landfills in southwestern Pennsylvania told a different story. Six facilities… reported receiving nearly 95,000 tons of drill cuttings and fracking fluid."*[12]

There is every reason to believe that New York landfills have accepted far more waste than what has been reported by the DEP's Oil and Gas database. Data reported on the DEP Oil and Gas Reporting website also only dates back as far as 2010 for unconventional fracking wells, rendering it unclear how long wastes from Pennsylvania have been disposed of in New York.

Where In New York Does It Go?

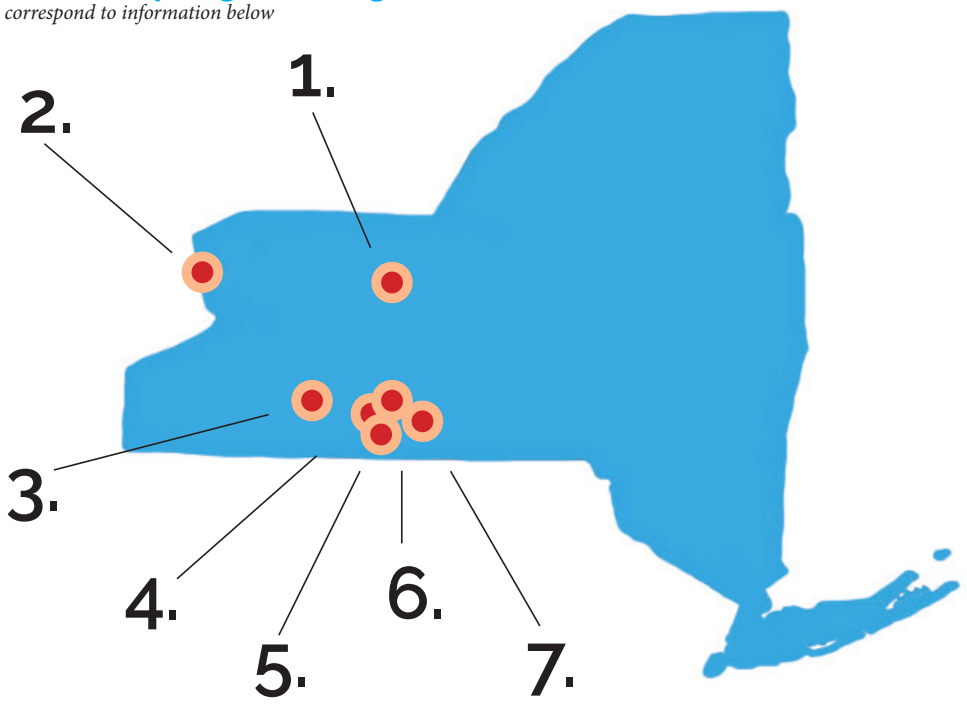
According to reports from 2010 until June of 2014, New York landfills have accepted at least 22,628 barrels and 456,393 tons of waste from fracking sites in Pennsylvania.

Despite contention by DEC that no landfills in New York have accepted wastewater from fracking sites, reporting from Pennsylvania indicates that several landfills have accepted this kind of fracking waste.[13]

Fracking waste being solidified. Photo credit to USGS.

Landfills Accepting Fracking Waste

Numbers correspond to information below



Since 2010, seven different landfills at various points in time have accepted this waste:

1) **Seneca Meadows Landfill**, Waterloo, NY (2010 through 2011)
2) **Allied Waste Systems**, Niagara Falls, NY (2011 through 2013)
3) **Hyland Facility Association**, Angelica, NY (2010 through 2013)
4) **Casella Waste Systems**, Painted Post, NY (2010 through 2011)
5) **Hakes Landfill**, Painted Post, NY (2010 through 2012)
6) **Hakes C&D Landfill**, Painted Post, NY (2010 to present)
7) **Chemung County Landfill**, Lowman, NY (2010 to present)

Among the seven landfills that have accepted fracking waste, Chemung County Landfill ("Chemung") has by far accepted the most *solid* waste (192,896 tons) – nearly three times that which has been accepted by the second largest recipient, Allied Waste Systems ("Allied").

At 21,762.58 barrels, Allied has accepted far more *liquid* fracking waste than any other landfill in the state. A single barrel is equivalent to 31.5 gallons, which means Allied has accepted 685,521 gallons of fracking waste. For comparison, the average residential swimming pool takes 18,000 to 20,000 gallons to fill.

There appears to be no intention to halt this practice. In fact, at least two landfills, Chemung and Hyland, proposed permit modifications, for which they have received approval from the DEC, to increase the amount of waste that can be accepted annually.[14] [15]

Chemung County Landfill: A Case Study

Chemung County Landfill has accepted an exceptionally large amount of fracking waste, specifically drill cuttings. In 2010, when the landfill applied for a modification of their permit so they could increase the volume of waste they were accepting, residents took action.

Residents for the Protection of Lowman and Chemung (RFPLC) petitioned the DEC to challenge the legality of the disposal of fracking wastes in the landfill due to the high levels of radioactivity. The DEC Commissioner dismissed their petition asserting that, not only is the disposal of drill cuttings permissible at landfills, but also that the radioactivity of drill cuttings is not relevant to Chemung's permit modification. This was determined despite the fact that with this permit modification, more drill cuttings could be accepted by the landfill. However, Commissioner Martens directed DEC staff to investigate safety measures for the acceptance of drill cuttings.[16]

Gary Abraham, the lawyer that represented RFPLC, stated in his summary of the petition: *"Although DEC has yet to finalize its analysis of the environmental impacts of Marcellus shale gas development, including the impacts associated with managing drilling wastes from such development, in January 2010 regional DEC Staff approved disposal of Marcellus shale gas drilling wastes in the landfill, without any analysis of its radioactivity or the manner in which the waste is generated. Months before the approval, Casella began accepting such wastes at three New York landfills it operates…"*[17]

In response to the Commissioner's ruling, DEC staff was directed to assess the adequacy of the radiation alarm set points and how to determine whether a waste load should be investigated or rejected.[18]

In a letter from Lisa Schwartz, Assistant Regional Attorney of DEC Region 8 as part of the RFPLC petition to DEC Administrative Judge Buhrmaster, DEC makes the claim that drill cuttings would not be a threat to the environment or public health even if they were left on the ground.[19] This stance is highly questionable given that Pennsylvania, despite rampant reporting problems, still regulates all fracking wastes much more stringently than New York.

New York hasn't erred to the side of caution at all in the acceptance of fracking waste, and the case of Chemung County Landfill continues to be an example of that. On January 12, 2015, the Chemung County Legislature unanimously approved the Final Environmental Impact Statement (FEIS) for Chemung Landfill to expand the overall size of the landfill, and the expansion is now on track for approval. Despite numerous comments from community residents expressing concern about the increased amount of drill cuttings that could be accepted with this proposed expansion, none were taken into account with the approval of the FEIS.

HAZARDOUS WASTE LOOPHOLES

Despite the radioactive nature of fracking waste, time and again New York State has condoned the acceptance of this waste through numerous exemptions in state law and regulation due to unchecked loopholes and sloppy inconsistencies. There are two ways of closing loopholes (within state hazardous waste and radioactive waste regulations) to ban the proliferation of fracking waste in New York.

Why do these loopholes matter? NYCRR part 360 series regulations (solid waste) cover the landfills where fracking wastes currently go. A search for the words "natural gas" comes up blank, confirming that there are no regulations for the acceptance of natural gas fracking wastes in the series.

Loophole #1 (hazardous waste)

Commonly referred to as the "Hazardous Waste Loophole," natural gas waste is exempt from laws governing hazardous waste transport and disposal, despite the fact that most fracking waste meets the definition of hazardous waste.

NYCRR part 371.1 (e) (2) (v) states: *"The following solid wastes are not hazardous wastes ... (v) drilling fluids, produced waters, and other wastes associated with the exploration, development, or production of crude oil, natural gas or geothermal energy."*

Advocates have urged the DEC to close the hazardous waste loophole since at least 2010. In the wake of agency inaction, legislative efforts gained steam but stalled in the state Senate, where a bipartisan effort supported by 34 senators (32 votes are required for passage) was stifled by pro-fracking leaders in the Senate, including Majority Leader Dean Skelos (R-Rockville Centre) and Deputy Leader Tom Libous (R-Binghamton).

Loophole #2 (radioactive)

DEC states that the only type of fracking waste New York landfills are permitted to accept is drill cuttings, even though data from Pennsylvania reveals New York landfills have accepted other types of toxic fracking wastes as well.[20]

Because the origin of the drill cuttings, the Marcellus Shale, contains large quantities of naturally occurring radioactive material (NORM), the drill cuttings, too, would contain uranium, radium-226, and radium-228.[21]

Despite this, DEC has determined that drill cuttings are not to be regulated as radioactive wastes. NYCRR §380-1.2 (e) states, *"this Part does not apply to NORM or materials containing NORM unless processed and concentrated."* DEC does not consider drill cuttings to be "processed and concentrated" thus exempting the waste from the 6 NYCRR part 380 series that regulates low-level radioactive waste.[22] This determination was last updated in 2011 and is insufficiently protective of public health and the environment.

By subjecting fracking waste to part 380 regulations (since all fracking waste is radioactive) this would bar landfills from accepting them and impose strict safety regulations by the DEC: *"Under the State LLRW [Low Level Radioactive Waste] Management Act of 1986, DEC was charged with permitting and regulating LLRW disposal facilities. 6 NYCRR Part 382 contains requirements for site and method selection. 6 NYCRR Part 383 applies to facility design, construction, operation, closure, post-closure, and institutional control. These regulations include requirements for financial assurance, site monitoring, and emergency response planning. Currently, there are no LLRW disposal facilities operating in New York State."*[23] [24]

Because there are no disposal facilities in New York that are permitted to accept low-level radioactive wastes, banning fracking waste by closing the hazardous waste and radioactive waste loopholes would effectively end Pennsylvania's practice of dumping their radioactive material within our borders.

An example of a landfill radiation detector. Photo credit to Matt Richmond as per The Allegheny Front.

RADIATION/DEC INCONSISTENCIES

Ignoring Federal TENORM

There are a variety of disconcerting inconsistencies in DEC's oversight and enforcement of its practices relating to fracking waste, much of which stem from the fact that across-the-board, DEC does not recognize the EPA definition of TENORM.

Comparatively, Pennsylvania classifies fracking waste as TENORM, and therefore has more regulations that apply to handling this waste stream. New York State does not have an official definition of TENORM and does not consider fracking waste to be radioactive, because, for reasons unclear, they do not consider it to be processed and concentrated. However, according to the EPA, a process that exposes NORM to the public (such as in the case of fracking waste) would classify it as TENORM.[25]

Inconsistent Permitting

Of all the landfills that have accepted fracking waste, Chemung's permit is the only one that states what kind of Marcellus waste can and cannot be accepted. From the Chemung County Landfill Commissioner Decision, DEC Commissioner Martens says: *"During the course of this proceeding, Department staff circulated a special condition stating that, with respect to Marcellus Shale wastes, only drill cuttings may be accepted for disposal. This special condition reflects Department staff's earlier approval of drill cutting disposal at the landfill, and is to be incorporated into the revised landfill permit."* [26]

Bypassing DEC's "Drill Cuttings Only" Rule

DEC states (see Chemung case study section) that the only acceptable fracking waste for disposal in New York is drill cuttings. However, as per Part 360, waste headed to landfills must only be 20 percent solid to meet "levels acceptable for handling and disposal."

This allows vast amounts of liquid waste to slip through and means that 80 percent of fracking wastes being brought to New York may be contaminated liquids.

The nature of this waste confirms firsthand accounts from residents living near the landfills who describe fracking waste as "*wet and dripping, like chocolate pudding.*" [27]

A Radioactive Mess

With proper regulations in place, the first step in assuring that radioactive waste doesn't get into water is to properly dispose of the waste from the start, not dump it into landfills. Properly calibrated "drive through" radiation detectors at the entrances of landfills are our first line of defense to prevent radioactive contamination.

DEC does not require all landfills to have radiation detectors. While those that have been accepting fracking waste do have radiation detectors at this time (Allied, Chemung, Hakes C&D, and Hyland), in the cases of Chemung, Hakes C&D, and Hyland, it appears they were installed after the fact and only required by the landfills respective operating procedures, not by New York state regulations.[28] Therefore, radioactive waste was more than likely accepted prior to the installationof radiation detectors.

Without clear standards in state regulations, additional landfills that are permitted to accept construction debris waste could begin accepting fracking waste without first installing radiation detectors.

Inconsistent Testing

An examination of the Operation and Maintenance manuals for each of the landfills that have accepted fracking waste within the past two years found that Chemung, Hakes C&D, and Hyland all monitor radiation in the same fashion. However, there are inconsistencies in practice which likely allow radiation into our state at much higher levels than should be permitted.

For instance, while accepting fracking waste in 2013, Allied's operation and maintenance manual contained no information dedicated to radiation monitoring.

Additionally, a recent letter from DEC regarding operations at Chemung indicates that the landfill has not been following the protocol prescribed in the operation and maintenance manual for proper correlation of the detectors. The letter goes on to note that the monitors at the landfill have not once been triggered.[29]

This is particularly worrisome because in Pennsylvania, fracking waste loads triggered radiation detectors over 1,000 times in 2013 alone.[30] Certain loads that triggered detectors are comprised of drill cuttings, which are the fracking waste most commonly accepted by New York landfills. It therefore seems likely that alarms would be triggered at New York landfills if they were properly calibrated.

Radiation detector alarms are set to trigger at no higher than 5 times background radiation levels (i.e. levels people are exposed to on a daily basis). Background radiation varies depending on location and altitude.[31] For all three landfills, 5 times background level was determined to be 15 (pCi/grams).

If the waste exceeds 50 pCi/g, the waste is to be rejected; if the waste falls in between 15 pCi/g and 50 pCi/g, and the waste content is not considered processed and concentrated, it can be disposed of in the landfill. If the detectors are not properly calibrated and tested, highly radioactive waste will slip through the gates.

Radiation Passing Through New York's Wastewater Treatment Plants

Chemicals, NORM or other contaminants at landfills – due to rainfall and natural decomposition of the waste – eventually collect in leachate pools. The contents of the leachate pools are brought to municipal wastewater treatment facilities and, after treatment, the effluent is then discharged into nearby water bodies, which may or may not serve as drinking water supplies for communities. Inadequately treated leachate may be a pathway to long-term health maladies.

Ingestion of radium, which is soluble in water, can cause lymphoma, bone cancer, and leukemia.[32] Radium does not simply go away; radium-226 (a derivative of uranium) remains in the environment for 1,600 years.[33] Additionally, radium can be bioaccumulated in plants and animals over time, and the radium can be transferred up the food chain to humans.[34]

Wastewater treatment facilities in New York are not capable of treating any level of radiation, which means the discharges from these facilities could potentially pollute streams, rivers, and drinking water with irreversible radioactive contamination.

Testing the leachate for radionuclides, Radium-226, Radium-228 and total Uranium is required at Chemung, Hakes C&D landfill and the Hyland landfill.[35] [36] [37]

For reasons unclear, other landfills that have accepted fracking waste, such as Allied, do not have requirements to test their leachate for radionuclides.

The Environmental Monitoring Plans for the landfills, modified between the years of 2011 and 2013, state that for three years leachate will be analyzed for radioactivity twice per year. At the end of that period, the frequency of the testing would be revisited.

Limited Testing Delivers Limited Results

For Chemung, the leachate testing period was to end in June 2014. However, it was determined by DEC that the frequency of testing would continue indefinitely.[38] DEC came to this conclusion because the available data set, as they required, is too small and does not yet show a clear pattern.[39]

Testing from Chemung shows that on several occasions, radium-226 and radium-228 levels have exceeded 5 pCi/L, which is the EPA's Maximum Contaminant Level for drinking water.[40] [41] There have also been slight increases with each round of testing. In January of 2012, radium-226 measured at 2.43 pCi/L. In June of 2013, radium measured at 9.43 pCi/L.[42] This is cause for concern for residents of Chemung County; leachate from Chemung is sent to the Chemung County Sewer District, which discharges into the Chemung River after treatment.[43]

In 2013, the Chemung River provided 63.7% of the Elmira Water Board's water supply.[44] The Elmira Water Board distributes water for the 65,000 residents of Elmira, Horseheads, and surrounding communities.[45]

It has not been determined if testing will continue for Hyland and Hakes C&D, but

Pennsylvania's Disappointing "Study"

In January of 2013, then Pennsylvania Governor Tom Corbett directed the DEP to study "radioactivity levels in flowback waters, treatment solids and drill cuttings, as well as transportation, storage and disposal of drilling wastes." On January 15, 2015, this study was finally released and reveals unsubstantiated conclusions.[46]

The data included in the report is startling, but the conclusions of the study do not remotely reflect this. For example, the study states, "there is little potential for radiological exposure to workers and members of the public from leachate at landfills," yet the study provides no context for this conclusion.[47] Levels of radium-226 in leachate at Pennsylvania landfills were as high as 416 pCi/L, and the average for all of the landfills sampled was 112 pCi/L.[48] These numbers do not, by any means, justify the conclusion that leachate from landfills accepting fracking wastes is safe for the public.

Pennsylvania's TENORM report does not contain reliable conclusions. To protect the public from radioactive water contamination, much more weight must be given to the high levels of radioactivity in fracking wastes than Pennsylvania's report cares to give.

test results for radium have been exceptionally high on numerous occasions. In February of 2014, a sample from Hyland's leachate showed radium-226 levels as high as 120 pCi/L.[49] In 2013, radium levels were as high as 25 pCi/L in Hyland's leachate.[50] Surpassing Hyland, radium-226 levels in Hakes C&D's leachate were as high as 180 pCi/L in 2013, which is 36 times above what is considered safe for drinking water. In 2012, Hakes C&D's leachate measured as high as 37 pCi/L.[51]

Testing for all three landfills shows that, over time, levels of radium in leachate have been increasing. Because leachate testing did not begin at these landfills until after they began accepting fracking waste, we do not know what earlier levels of radium have been in the leachate. However, it is likely that the source of the high levels of radium is oil and gas waste because there are few other wastes disposed of in landfills that contain radium.

Findings in Pennsylvania's recently released TENORM study also suggest that fracking waste is the source of the high levels of radium found in the leachate. Leachate sampled at Pennsylvania landfills had a maximum radium-226 level of 416 pCi/L, a minimum of 54 pCi/L, and an average of 112 pCi/L.[52] The radium-226 levels found in Hyland and Hakes C&D's leachate fit well within Pennsylvania's dataset. This could also indicate that the fracking waste stream being accepted at New York landfills does not differ from the waste stream going to Pennsylvania landfills.

Continued leachate testing may reveal more instances of high radioactivity levels. It is disconcerting that other landfills that have accepted fracking waste do not have to test for radioactivity in their leachate. Allied has accepted some of the most radioactive fracking wastes. The levels of radium in Allied's leachate could be exceptionally high, but without testing results it remains unknown to the public. Leachate testing for radioactivity should be mandated for all landfills.

These high levels of radium in the leachate could be an indication that rejection levels at landfills are too high or that the radiation detectors at landfills aren't working properly.

CONCLUSION

New York has inadequate regulations in place to protect New Yorkers from the harmful effects of hazardous fracking waste coming from other states.

Exposing our water, environment and communities to radium has lasting, irreversible impacts.

Governor Cuomo's Administration came to the conclusion that it would be unsafe to proceed with fracking. If fracking isn't safe for New Yorkers, then waste from other states' fracking operations isn't safe for New Yorkers, and the DEC should close the hazardous waste loophole as part of the Supplemental Generic Environmental Impact Statement (SGEIS) process which will ban fracking based on its negative public health and environmental impacts.

Environmental Advocates five actionable recommendations can happen immediately and will ensure that Governor Cuomo's goal of protecting New Yorkers from the dangers of fracking occurs.

Hyland Landfill. Photo credit to Roger Downs.

01 Close hazardous waste and radioactive waste loopholes to ban dangerous fracking waste

02 Acknowledge and incorporate federal TENORM standards into state regulations

03 Require monthly leachate testing for radioactivity, and the installation of radiation monitors at all landfills

04 Prohibit leachate >5pCi/L from being disposed of at wastewater treatment facilities

05 Disclose publicly all past and ongoing details surrounding landfills accepting oil and gas waste

REFERENCES

1. Thomas Kaplan, "Citing Health Risks, Cuomo Bans Fracking in New York State," New York Times, December 17, 2014.

2. Ruth Earl, Ruth Earl to Ms. Sarah Eckel, Albany, NY, June 13, 2014.

3. "Waste Reports by Waste Facility," PA DEP Oil and Gas Reporting Website, accessed October 16, 2014, https://www.paoilandgasreporting.state.pa.us/publicreports/Modules/Waste/WasteByWasteFacility.aspx.

4. Ian Urbina, "Regulation Lax as Gas Wells' Tainted Water Hits Rivers," New York Times, February 26, 2011, http://www.nytimes.com/2011/02/27/us/27gas.html?ref=drillingdown.

5. See #2.

6. New York State Senate, Environmental Conservation Committee Hearing, April 29, 2014, http://www.nysenate.gov/event/2014/apr/29/environmental-conservation-meeting.

7. Katherine Nadeau, "Out of Site, Out of Mind," Environmental Advocates of New York, pg. 3-4, May 2012.

8. Sperger, Courtney, Kristin Cook, and Kenneth Klemow. "Does Marcellus Shale Pose a Radioactivity Risk?" Wilkes. August 1, 2012. Accessed October 30, 2014. http://energy.wilkes.edu/pages/184.asp

9. See #7.

10. E.L. Rowan, M.A. Engle, C.S. Kirby, and T.F. Kraemer, "Radium Content of Oil- and Gas-Field Produced Waters in the Northern Appalachian Basic (USA): Summary and Discussion Data," USGS, pg. 26, 2011.

11. Gary Abraham, "Chemung County Landfill," Gary A. Abraham, Esq., last modified March 17th, 2014, http://www.garyabraham.com/ChemungLF.html.

12. "Marcellus Drillers Underreported Waste," Construction Equipment Guide, September 17, 2014, http://www.constructionequipmentguide.com/Marcellus-Shale-Drillers-Underreported-Waste/23614/.

13. Marc Gertsman, Marc Gerstman to Assemblymen Maisel, Colton, and Englebright, Albany, NY, September 28, 2011.

14. See #9.

15. Gary Abraham, "Hyland Landfill," Gary A. Abraham, Esq., modified February 5th, 2014, http://www.garyabraham.com/Hyland.html.

16. Joseph Martens, Chemung County Landfill-Commissioner Decision, DEC, August 4, 2011, http://www.dec.ny.gov/hearings/76112.html.

17. Gary Abraham. Gary Abraham to Lawmakers, Allegany, NY, September 8, 2010, http://www.garyabraham.com/files/gas_drilling/NEWSNY_in_Chemung/summary5.pdf.

18. Lisa Schwartz, Lisa Schwartz to Commissioner Joseph Martens, October 19, 2011, http://www.garyabraham.com/files/Chemung_Co/Staff_response_10-19-11_OCR.pdf.

19. Lisa Schwartz, Lisa Schwartz to Judge Buhrmaster, Avon, NY, May 18, 2010. http://www.garyabraham.com/files/gas_drilling/NEWSNY_in_Chemung/DEC_ltr_to_ALJ_5-18-10.pdf.

20. Scott Foti, Scott Foti to Mr. Vincent Spagnoletti, Avon, NY, January 14, 2011.

21. Sperger, Courtney, Kristin Cook, and Kenneth Klemow. "Does Marcellus Shale Pose a Radioactivity Risk?" Wilkes. August 1, 2012. Accessed October 30, 2014. http://energy.wilkes.edu/pages/184.asp.

22. Scott Foti, Scott Foti to Mr. Vincent Spagnoletti, Avon, NY, January 14, 2011.

23. NYCRR § 360-1.5 (b) Prohibited Disposal.

24. "Radiation," DEC, accessed December 30, 2014, http://www.dec.ny.gov/chemical/296.html.

25. "Technologically-Enhanced, Naturally-Occurring Radioactive Materials," U.S EPA, last modified on July 16, 2013, http://www.epa.gov/radiation/tenorm/.

26. Joseph Martens, Chemung County Landfill - Commissioner Decision, DEC, August 4, 2011, http://www.dec.ny.gov/hearings/76112.html.

27. Bette Ek (Chemung County resident in disussion with the author), August, 2014.

28. Ruth Earl, Ruth Earl to Saraj Eckel, Albany, June 13, 2014.

29. Gary Maslanka, Gary Maslanka to Mr. Larry Schilling, Avon, NY, June 23, 2014.

30. Anya Litvak, "Marcellus Shale Waste Trips More Radioactivity Alarms Than Other Products Left at Landfills," Post-Gazette, August 22, 2013.

31. "Background Radiation," Wikipedia, accessed January 5, 2015, http://en.wikipedia.org/wiki/Background_radiation

32. "Radium," U.S EPA, last modified March 6, 2012, http://www.epa.gov/radiation/radionuclides/radium.html.

33. Ibid.

34. "Toxic Profile for Radium," U.S EPA, pg. 45, December, 1990, http://www.atsdr.cdc.gov/toxprofiles/tp144.pdf.

35. Lisa Schwartz, Lisa Schwartz to Joseph Martens, October 19, 2011.

36. Hakes C&D Environmental Monitoring Plan, Section 2.6.3 Leachate.

37. Hyland Environmental Monitoring Plan, Section 2.5.3 Leachate.

38. Gary Maslanka, Gary Maslanka to Mr. Larry Schilling, June 23, 2014.

39. Ibid.

40. Chemung County Radionuclide Leachate Data Results, January 2012 through June 2013.

41. "Radium," U.S EPA, last modified March 6, 2012, http://www.epa.gov/radiation/radionuclides/radium.html.

42. Chemung County Landfill Radionuclide Leachate Data Results, June 2013.

43. Gary Abraham, Gary Abraham to Ms. Linda Palmer, pg. 4, March 4, 2014.

44. "Annual Drinking Water Quality Report 2013," Elmira Water Board, issued February, 2014, http://www.elmirawaterboard.org/pdf/awqr.pdf.

45. "The 2004 Chemung River Basin Waterbody Inventory and Priority Waterbodies List," DEC, pg. 6, May, 2007, http://www.dec.ny.gov/docs/water_pdf/pwlchmg07.pdf.

46. "DEP Study Shows There is Little Potential for Radiation Exposure from Oil and Gas Development." Commonwealth of Pennsylvania Dept. of Environmental Protection, January 15th, 2015, http://www.portal.state.pa.us/portal/server.pt/community/newsroom/14287?id=20677&typeid=1.

47. "PA DEP TENORM Study Report", Commonwealth of Pennsylvania Dept. of Environmental Protection, Section 9.1.3, page 9-8, January, 2015 http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-105822/PA-DEP-TENORM-Study_Report_Rev._0_01-15-2015.pdf.

48. "PA DEP TENORM Study Report", Commonwealth of Pennsylvania Dept. of Environmental Protection, Table 5-1, page 5-8, January, 2015 http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-105822/PA-DEP-TENORM-Study_Report_Rev._0_01-15-2015.pdf

49. Hyland Radionuclide Testing, March 2014.

50. Hyland Radionuclide Testing, November 2013.

51. Hakes C&D Painted Post 4th Quarter 2013 Radiological Test Results.

52. "PA DEP TENORM Study Report", Commonwealth of Pennsylvania Dept. of Environmental Protection, Table 5-1, page 5-8, January, 2015 http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-105822/PA-DEP-TENORM-Study_Report_Rev._0_01-15-2015.pdf.

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