New York State Dismisses Radiation Threat From Gas Drilling Cuttings

Tuesday, 10 May 2011
Written by Peter Mantius

Drill cuttings. Photo: drillingcontractor.org

As they prepare final rules for high-volume hydrofracking of natural gas wells in New York, state environmental regulators are brushing aside warnings from scientists and public health organizations that radioactive **drill cuttings** from Marcellus Shale wells pose serious environmental risks.

The New York State Department of Environmental Conservation already allows three western New York landfills operated by Casella Waste Systems to import Marcellus well cuttings from Pennsylvania. And a landfill owned and operated by Steuben County is poised to become New York's fourth cuttings importer, also with the DEC's blessing.

"This stuff is so innocuous that under law and regulation and good environmental practice, it could be [buried] at the drill site," Scott Foti, a DEC official, testified in January. "It could be left right there."

The DEC expects an exponential increase in drill cuttings after the agency begins granting permits for high-volume hydrofracking of horizontal Marcellus Shale wells in New York, possibly as soon as this fall. Foti said the agency is weighing whether to allow drillers the option of disposing of cuttings at municipal landfills or at well sites.

Both those options alarms scientists, public health officials and environmental activists, who note that the Marcellus tends to be rich in naturally occurring radioactive material, or NORM.

“That’s not appropriate,” said Conrad Volz, an assistant professor at the University of Pittsburgh’s Graduate School of Public Health. “I don’t have a problem with cuttings from lots of other shale formations, but the Marcellus is unique. It’s highly enriched in radium isotopes and thorium. Cuttings from horizontal wells in the Marcellus should be taken to low-level radiological waste disposal sites.”

Conrad Volz. Photo: Protectingourwaters.wordpress.com

Volz noted that radiation levels in the Marcellus formation may vary widely from region to region and even from well to well within neighborhoods. For that reason alone, he said, each batch of cuttings should be tested before choosing a disposal option.

That is the stance the New York State Conference of Environmental Health Directors took in a December 2009 letter to the DEC, which said:

“The idea that NORM is not a problem with drill cuttings is based on two samples. This is clearly not sufficient. Since the major disposal option is burial at local landfills, NORM sampling should be done for each batch of drill cuttings prior to transport and disposal, at least until a large-scale sampling program establishes the safety of such materials.”

Instead of following that advice, the DEC has chosen to generalize based on a handful of samples, most of which were gathered and analyzed by a contractor hired by Casella, the disposal company.

The agency has acknowledged conducting its own tests on rock samples from two vertical Marcellus wells drilled in Western New York. Gamma ray spectrography analysis of rocks from those two wells revealed “essentially background values” for NORM, according to the DEC’s 2009 draft of rules for high-volume hydrofracking.

The agency plans to release a new version of the drilling rules this summer or fall. After it holds public hearings and makes the rules final, it plans to begin issuing horizontal Marcellus well permits promptly.

In order to clarify whether the agency has conducted other tests beyond the two wells mentioned in its 2009 draft of drilling rules, DCBureau.org asked the agency to specify the exact total number of Marcellus wells it had tested.

Agency officials took three weeks to respond and then declined to provide a specific number. Instead, they wrote in an email that the agency was “satisfied with the breadth and objectivity of the sampling” and believed that disposal of Marcellus cuttings in municipal landfills “does not pose an environmental concern.”

The DEC’s conclusion, the email said, “is based on analysis performed on Marcellus Shale rock samples from the New York State Museum collection and from the known properties of shale formations.” The email went on to cite a “comprehensive study” conducted for Casella by CoPhysics Corp., which “further supported the DEC position” that Marcellus cuttings are harmless.

The CoPhysics report has been sharply criticized by Volz and other scientists for weaknesses in its methodology, it relatively small sample size and its failure to report test results for alpha and beta emissions as well as gamma emissions.

Both the DEC and CoPhysics tests relied on measurements of gamma ray emissions. Volz called the decision to

test exclusively for gamma rays “ridiculous” in light of the fact that the main threat in Marcellus cuttings is radium, an alpha-particle emitter. **Alpha particles** make up 96 percent of the radiation emitted by radium, while gamma rays make up only 4 percent.

“To look for radium, you have to test for alpha,” said Marvin Resnikov, senior associate at Radioactive Waste Management Associates in New York City. “CoPhysics tested for gamma, not alpha.”

Stephen Penningroth, executive director of the Community Science Institute in Ithaca, N.Y., a state-licensed water tester, agreed with Volz and Resnikov. “The low gamma readings may be correct,” Penningroth said. “But the other part of the problem is alpha and beta, and that’s where the NORM is.”

While Geiger counters detect gamma rays effectively, they’re not much use picking up alpha particle emissions, which travel only a few centimeters and may be blocked by thin clothing or even layers of dead skin.

But alpha-emitting materials are very dangerous when they are ingested as liquids or breathed in with dust in the air.

“When alpha-emitters get in the body, they can set up business next to cells and bombard them with nuclei,” Volz said. The main dangers from NORM-contaminated drill cuttings are dust, radon and any water that leaches away from them after they are buried.

The DEC confirmed that the Marcellus Shale in New York tends to have dangerous levels of NORM when it tested the brine from all 12 of the state’s conventional Marcellus wells in 2008 and 2009. It found levels of Radium 226, a dangerous alpha-emitter, to be far above allowable limits for drinking water (5 picocuries/liter) or for release into the environment (60 picocuries/liter). The DEC’s readings for Radium 226 in brine from four of the tested wells exceeded 10,000 picocuries/liter.

Radium 226 has a half-life of about 1,600 years and decays into radon gas, the world’s second leading cause of lung cancer. Only smoking causes more.

That’s why Dr. Earl Robinson, a pulmonologist from Elmira, and others who live near to the Chemung County landfill were upset to learn Marcellus drilling wastes from Pennsylvania were being dumped near their homes.

New England Waste Services of New York, a unit of Casella that operates the Chemung Landfill under a 25-year, $90-million contract, began accepting Marcellus wastes from Pennsylvania early last year, even before notifying the DEC.

Robinson leads a citizens group that has mounted a legal challenge to Casella’s authority to bring radioactive waste into a landfill that is not licensed to handle it. An administrative law judge at the DEC heard evidence last summer, but he is still considering the matter -- seven months after an attorney for Casella filed a motion for an expedited ruling.

As the months have ticked by without a ruling, the Chemung Landfill and other Casella-operated New York State landfills in Painted Post and Angelica have continued to import Marcellus cuttings from Pennsylvania.

Several months ago, Steuben County began to consider accepting Marcellus cuttings at its municipal landfill.

Vince Spagnoletti, the county's public works commissioner, said that he studied the environmental issues carefully and decided to recommend that county officials vote to accept between 10,000 and 15,000 tons of Pennsylvania cuttings a year-- two or three dump trucks a day -- beginning later this summer. That vote could come in June, he added.

That volume of cuttings would generate more than $300,000 in fees for the county, Spagnoletti said in a recent interview. And the county might eventually triple that volume, he said.

Casella has no involvement in the Steuben initiative, though Spagnoletti said he has drawn on data and advice from two contractors hired by Casella, CoPhysics and Barton & Loguidice of Syracuse.

The CoPhysics report was introduced in the Chemung Landfill case and is public record. A study by Barton & Loguidice, a follow-up to the CoPhysics report that has not been made part of the public record, is based on the samplings taken for the CoPhysics report.

CoPhysics analyzed drill cuttings taken from four Marcellus wells in Bradford and Tioga counties in Pennsylvania, cuttings transported to Casella's Chemung, Painted Post and Angelica landfills, and "local background soil and rock" from the same three Casella landfills.

The CoPhysics report concluded that "rock cuttings from the gas drilling operations, as sampled during this project, have radionuclide levels that do not pose any environmental health problem even if they were deposited in areas accessible by the general public. Therefore, they are certainly acceptable for landfill disposal."

At a public hearing Feb. 3, several Steuben County residents expressed skepticism about the conclusion. They also took issue with the DEC's (and Spagnoletti's) willingness to accept them at face value despite the fact that they were paid for by Casella, which stands to gain financially from a conclusion the cuttings are harmless.

At an public meeting in Steuben County on January 11, Foti acknowledged that questions might be raised about reliance on data from potentially biased private sources, but he dismissed the concern, saying:

"There were some people who were concerned about this technique of a company who has an interest in the outcome being involved in paying for the samples," Foti testified. "We'll, I've got to tell you, it's very, very routine. … I do trust the data."

Foti also wrote a Feb. 14 letter to Spagnoletti that said the DEC had determined that disposal of Marcellus drill cuttings in non-hazardous-waste landfills "is consistent with regulatory requirements and the protection of the environment."

That finding was based on the DEC's conclusion that for purposes of regulation, Marcellus drill cuttings were neither "hazardous waste" nor "industrial waste" nor "radioactive waste," Foti explained.

Cuttings are neither hazardous nor industrial waste because statutes exempt wastes from natural gas development from those categories, no matter how contaminated. Neither can the drill cuttings be regulated as “radioactive waste,” he said, because NORM is exempt from the definition of radioactive waste unless it has been “processed and concentrated.”

The DEC confirmed in its recent email that it had concluded that the drill cuttings are never “processed and concentrated” and therefore do not fall under the regulatory definition of radioactive waste.

Three expert witnesses in the Chemung Landfill case -- Volz, Resnikov and Tony Ingraffea, a Cornell University professor of rock fracture mechanics -- disputed that interpretation of the regulation. But as long as the Chemung Landfill case remains stalled within the DEC, the agency’s interpretation holds.

“The DEC plays with regulations. They’re not charged with looking after public health. They’re not trying to prevent disease,” said Volz, who plans to leave the University of Pittsburgh to write a book on the environmental costs of extracting oil and natural gas worldwide.

The DEC’s interpretation that Marcellus drill cuttings cannot be regulated as radioactive waste because they are not “processed and concentrated” raises questions about the agency’s authority to regulate Marcellus brine, a confirmed health risk that is no more “processed and concentrated” than the cuttings.

In fact, the DEC has downplayed the results of its own tests of Marcellus brine, even as other agencies have expressed alarm about them.

For example, the New York City Department of Environmental Protection said the data “raise serious issues for public health.” The city’s top environmental officer, Steven W. Lawitts, wrote the DEC in 2009, saying the agency was obliged to do further testing. “Such an analysis must be completed before any activity that is likely to generate radioactive waste can move forward.” The DEC rejected that advice, saying it would wait and see the results of actual drilling in the New York Marcellus.

The regulatory loopholes that restrain the DEC from taking a more rigorous look at waste from Marcellus gas wells have drawn the attention of two members of the New York General Assembly.

Assemblyman Alan Maisel (D-Brooklyn) has introduced a bill that would place a moratorium on the importation from other states of all Marcellus wastes, both liquid and solid, until the U.S. Environmental Protection Agency reports on the public health effects of high-volume hydrofracking. There is no companion bill in the state Senate.

Meanwhile, Assemblyman Robert Sweeney (D-Lindenhurst), the chair of the Assembly’s Environmental Conservation Committee, is sponsoring a bill that would remove the oil and natural gas industries’ special exemption from the regulation as hazardous waste. A similar bill has been introduced in the state Senate.

“There is no compelling reason why waste produced from oil and natural gas activities that meets the definition of hazardous waste, should not be subject to the same laws regarding generation, transportation, treatment, storage and disposal as other hazardous wastes,” Sweeney said in a memo explaining the bill’s purpose.

DEC officials declined to comment on the Maisel and Sweeney bills, saying the agency does not take a position on pending legislation. Yet the DEC drafts and actively sponsors bills that it favors, such as this year’s proposed overhaul of the state’s water withdrawal rules.

Although the controversy over Marcellus drill cuttings has focused on NORM, some environmental advocates raise concerns about other potentially hazardous substances that may be headed to the landfills with the solid waste.

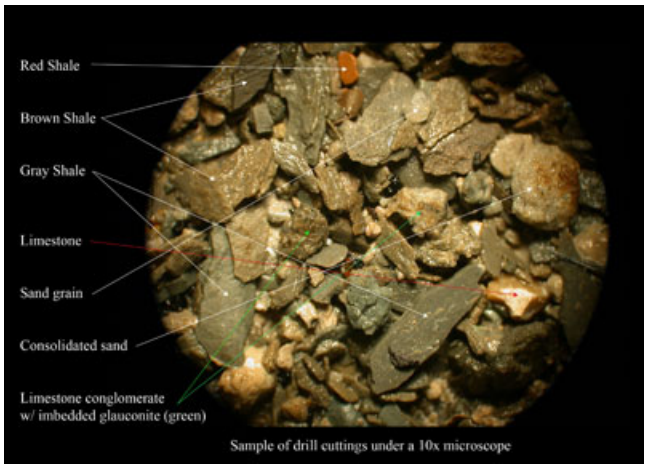
In his testimony before Steuben legislators Jan. 11, Foti described cuttings as dry rock chips that were less radioactive than the marble counters in his kitchen at home.

But in his Feb. 14 letter to Spagnoletti, he acknowledged that ground-up rock cuttings emerge from natural gas wells in a slurry of rocks and drilling mud, which is added to facilitate drilling and the removal of cuttings. That mixture is saturated with naturally-occurring brine.

A dewatering process removes most of the liquids, and the remaining rocky residue is then bulked up with sawdust in preparation for disposal.

But municipal landfills are permitted to accept the cuttings even if they contain up to 20 percent liquids.

Kate Bartholomew, the chair of the Schuyler County Environmental Management Council in Watkins Glen, N.Y., said she was concerned about the residual drilling mud and brine disposed of with the cuttings.



A microscopic view of Drill cuttings of shale and sand. Photo: Wikicommons / Mudgineer

In horizontal wells such as those used to tap the Marcellus Shale, drillers use an oil-based mud that includes **potentially dangerous chemicals**, she noted. While some batches of the rock-liquid mix may be innocuous, she said, others may be so contaminated that they belong in landfills specially licensed to handle hazardous waste or radioactive waste.

Like this? Let your friends know now!

Latest articles from Peter Mantius

New York State Dismisses Radiation Threat From Gas Drilling Cuttings posted on Tuesday, 10 May 2011

As they prepare final rules for high-volume hydrofracking of natural gas wells in New York,…

Local N.Y. Environmentalists Fight Fast Tracking of Water Bill as Increased Marcellus Gas Drilling Looms posted on Monday, 18 April 2011

ALBANY, N.Y. -- A bill in the New York State Legislature with broad support from…

Showdown: It's Wind Energy v. Shale Gas for Cavern Storage posted on Monday, 28 March 2011

WATKINS GLEN, N.Y. -- Federal and state agencies are convinced that salt caverns three miles…

back to top

Next >US Intelligence Homing In On Bin Laden Allies in Saudi and Pakistani Intelligence Services