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HOUSE DEMOCRATIC POLICY COMMITTEE
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House of Representatives
COMMONWEALTH OF PENNSYLVANIA

HOUSE DEMOCRATIC POLICY COMMITTEE HEARING

Topic: Radioactive and Hazardous Waste Loopholes – Impact on Communities, Worker Safety, and Public Health

Virtual – Pittsburgh, PA

October 14, 2020

AGENDA

2:00 p.m. Welcome and Opening Remarks

2:10 p.m. Rebecca Franz
Chief Deputy Attorney General for Environmental Crimes Section
Office of Pennsylvania Attorney General

2:20 p.m. *Questions & Answers*

2:40 p.m. Panel Two:

- Melissa Troutman
  Research and Policy Analyst, Earthworks
- Dr. John Stolz
  Director, Duquesne University's Center for Environmental Research and Education
- Dr. Marsha Haley
  Radiation Oncologist, Physicians for Social Responsibility

3:10 p.m. *Questions & Answers*

3:30 p.m. Panel Three:

- Justin Nobel
  Investigative Journalist
- Veronica Coptis
  Executive Director, Center for Coalfield Justice
- Lois Bower-Bjornson
  Outreach Coordinator, Clean Air Council

4:10 p.m. *Questions & Answers*

4:30 p.m. Closing Remarks

How oil & gas waste ends up in drinking water

EARTHWORKS

Melissa Troutman

Research & Policy Analyst
Earthworks

mtroutman@earthworks.com
202-887-1872 ×132

How toxic materials from oil & gas waste lead to pollution of land, water, our homes & bodies:

Exemptions from cradle-to-grave regulations (inadequate testing, tracking, handling, disposal)

Spills & underground migration of exempt fluids (contamination of soil, surfacewater & groundwater)

Improper disposal of exempt wastes (accumulation of toxics over time)

“Beneficial use” of exempt wastes (roadspreading, commodities e.g. salts, de-icer)

The Exemptions

Federal ***exemption*** of oil and gas waste from Resoure Conservation & Recovery Act (RCRA) by EPA:

- includes an exemption from EPA's streamlined "mixed use" designation for wastes that contain both hazardous and radioactive materials (oil and gas wastes contain both) making it easier for companies to comply.

State ***exemption*** = federal exemption incorporated by reference in state statue.

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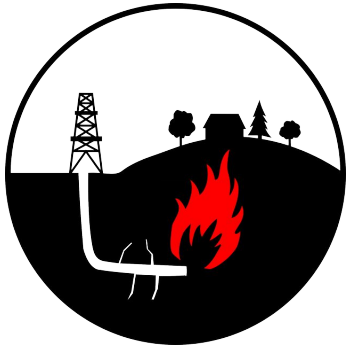
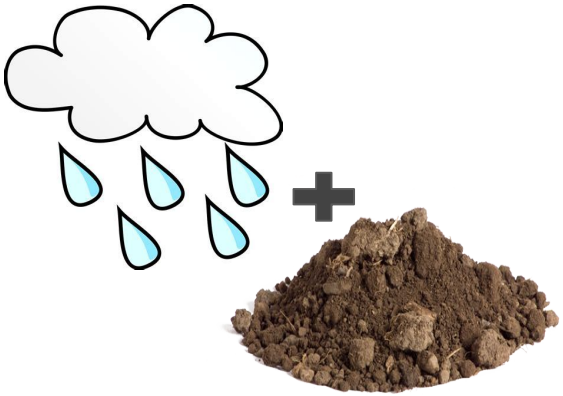
Exclusion from Atomic Energy Act (ACT) that manages radioactive materials.

Solid Waste Exemption Pathway

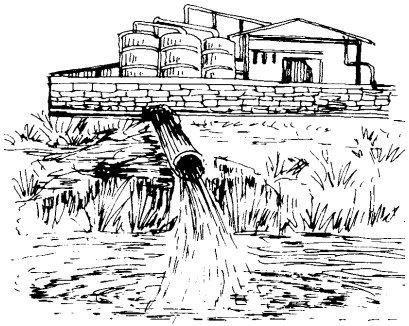


Municipal Landfill



Municipal Landfill

Toxic Leachate



Discharge Facilities

Drinking Water Supplies

So…when compliant with (limited) discharge limits…

Leachate and other facility discharges of oil and gas waste is still a problem, and it's name is RADIUM – a known human carcinogen.

- Half-life over 1,600 years, accumulation of tiny amounts over time leads to elevated levels of radioactivity in river beds.
- Water-soluble, carried through environment by water.
- Levels in industry's liquid waste have been documented by PA DEP over 26,000 piC/L. Drinking water limit is 5 piC/L.
- Levels in pipe scale documented by USGS over 400,000 piC/L.

IF YOU THINK RADIUM IS HOT, you should see it's daughters…radium gets even more radioactive as it breaks down. Longer it sits, the hotter it gets.

B-a-n-a-n-a-s

You may hear…

> “Bananas contain more radioactive material than oil and gas waste.”

Radioactive stuff in bananas and oil and gas waste are not the same…

- Bananas contain potasium-40, which breaks down into non-radioactive elements. As it decays, it gets ‘cooler’ or safer. Not true for radium-226 in oil and gas waste, which gets more radioactive with decay, not less.
- Radiation exposure from bananas is not the same as exposure to radioactive materials in waste.

Really, we’re talking apples & oranges (not bananas, and certainly not as an equivelant to o&g waste).

Denial & deflection = real harm

January 2020, Rolling Stone published “America’s Radioactive Secret” revealing industry’s knowledge of the radioactive threat of the job and worker cancer cases directly attributed to exposures on the job.

American Petroleum Institute (1982): “[a]lmost all materials of interest and use to the petroleum industry contain measurable quantities of radionuclides that reside finally in processing equipment, product streams, or waste.”

Peter Gray (Phillips Petroleum Company) & Associates (1993): “NORM [naturally-occurring radioactive material] contamination can be expected at nearly every petroleum facility…Facilities that remove ethane and propane from natural-gas are especially susceptible to NORM contamination.”

Contamination in the Commonwealth

January 2018: Duke University found that even though “conventional oil and gas wastewater is treated to reduce its radium content,” it still has created “high levels of radioactive build-up in the stream sediments” – This process continues today and would cease if properly regulated.

May 2018: Penn State University found that spreading of oil and gas wastewater on roads “released over four times more radium to the environment than [oil and natural gas] wastewater treatment facilities and 200 times more radium than spill events.” Researchers also found: “...nearly all of the metals from these wastewaters leach from roads after rain events, likely reaching ground and surface water. Release of a known carcinogen (e.g., radium) from roads treated with O&G wastewaters has been largely ignored.”

FACT #1: Oil & gas waste streams contain hazardous & radioactive materials.

FACT #2: Hazardous & radioactive materials from inadequate oil & gas waste management are contaminating the Commonwealth.

HOW WE KNOW: Industry, goverment, & academia have been documenting it for decades. Despite this, industry continues to claim that oil & gas waste is harmless. They even hold important seats within our own government & spew harmful rhetoric from these leadership positions.

THE PROBLEM: Despite containing hazardous and radioactive elements, and decades of evidence, oil and gas wastes are still exempt from hazardous and radioactive waste laws.

THE (SIMPLE, SCIENCE-BASED) SOLUTION: We must properly manage oil & gas waste streams – from full disclosure of what chemicals may be present, thorough characterization & comprehensive handling based on those disclosures & analyses. Close the loopholes.

How toxic materials from oil & gas waste lead to pollution of land, water, our homes & bodies:

PA REPORT:

- Case studies
- Data analysis
- Peer-reviewed science
- Industry compliance
- Policy proposals

FACT #3: The oil and gas industry produces astronomical amounts of waste & volumes per well are increasing.

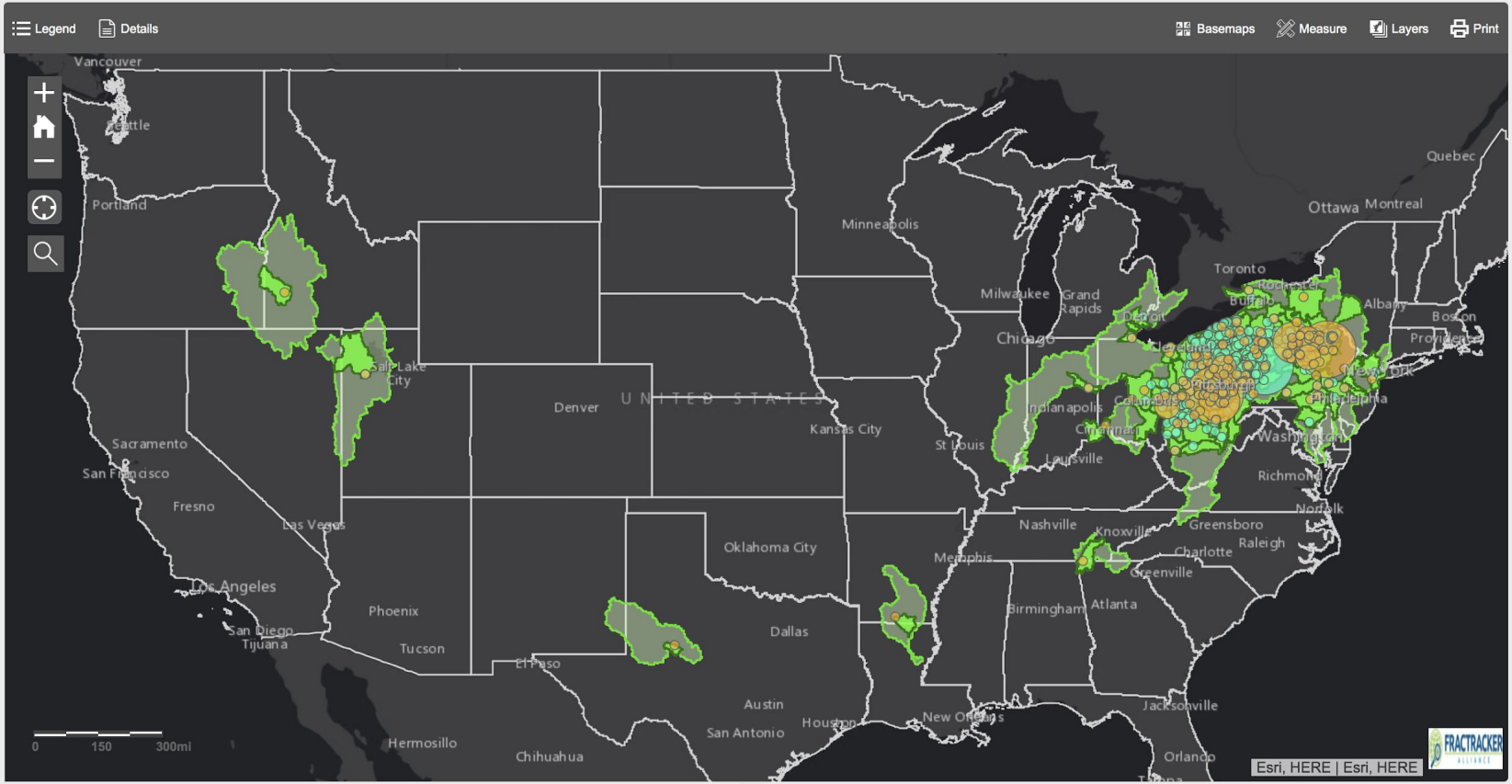
HOW WE KNOW: Data from state agencies and industry.

*****

THE NUMBERS:

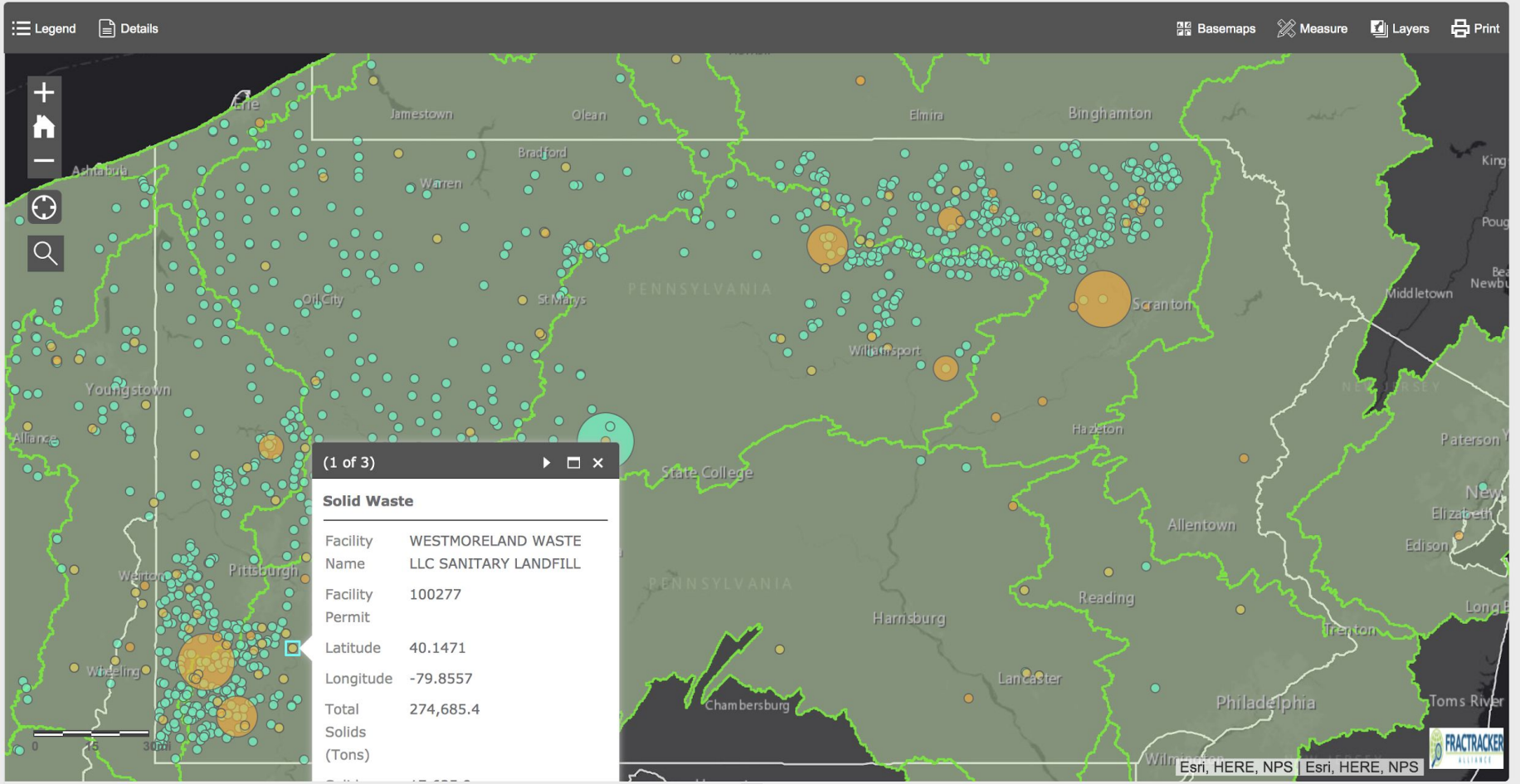
- Between January 2011 and December 2018, operators reported ***380,434,040 barrels of liquid waste*** and ***9,528,923 tons of solid waste*** produced by oil and gas operations.
- Amount of waste per well increased by 1,517% between 2003 (prior to the horizontal fracking boom) and 2018. Reporting of solid waste volumes to the state did not start until 2010.
- More than 80% of oil and gas waste stays in Pennsylvania.

Facilities Accepting Pennsylvania's O&G Waste



https://www.earthworks.org/publications/pennsylvania-oil-gas-waste/

Facilities Accepting Pennsylvania's O&G Waste

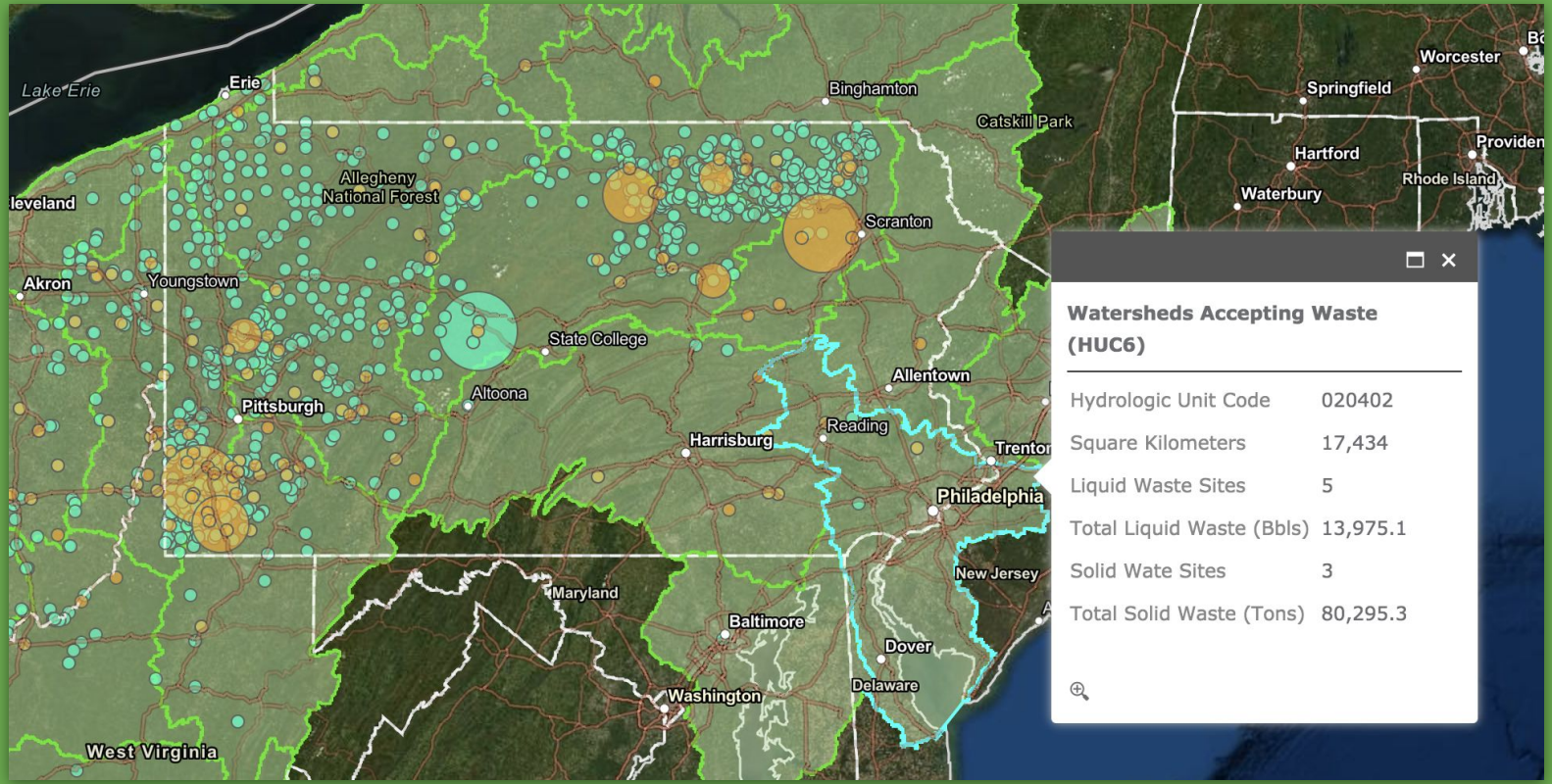


(1 of 3)

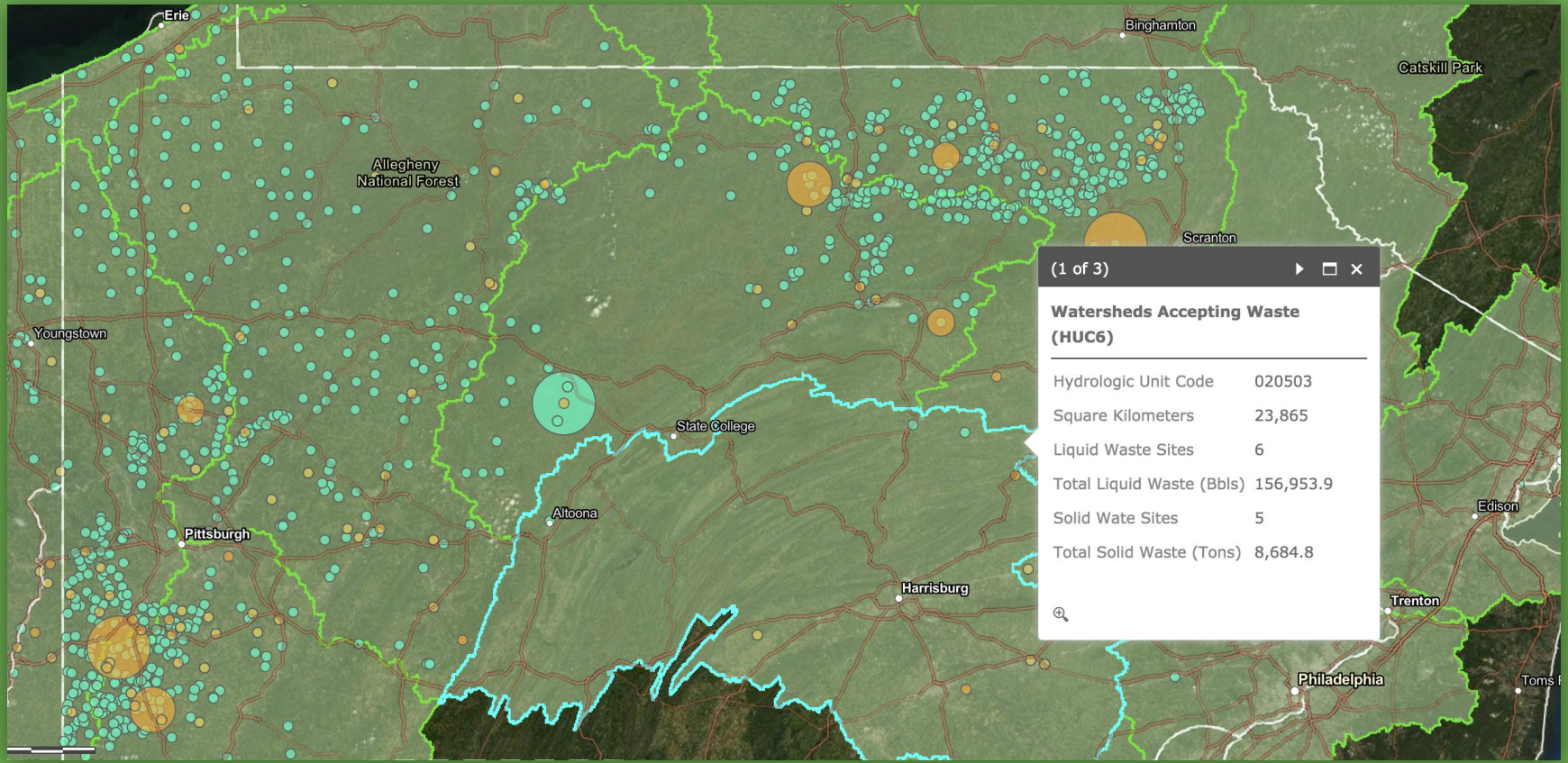
Solid Waste

Facility Name	WESTMORELAND WASTE LLC SANITARY LANDFILL
Facility Permit	100277
Latitude	40.1471
Longitude	-79.8557
Total Solids (Tons)	274,685.4

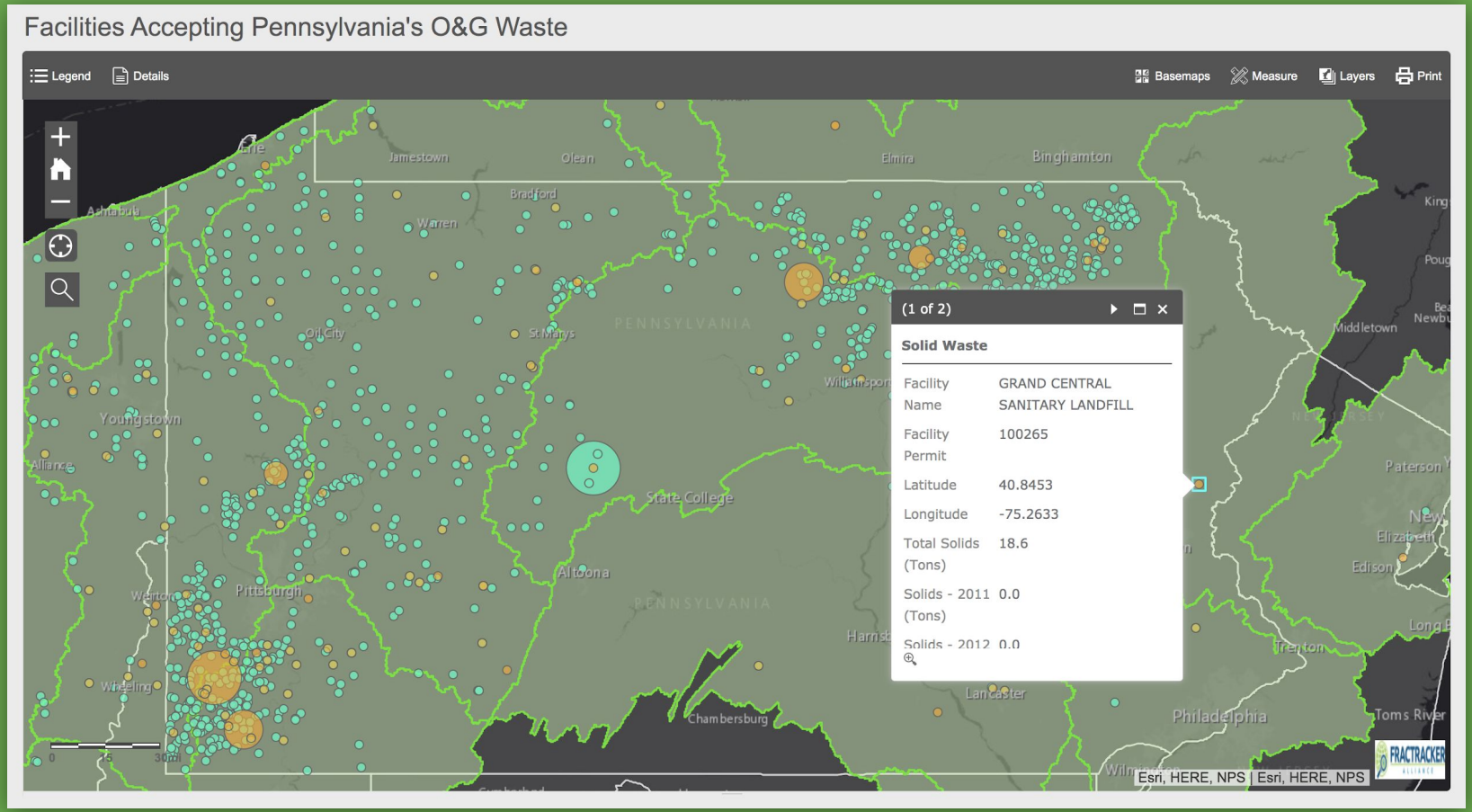
Oil & Gas Waste in Philadelphia's Watershed (2011-2018)



Oil & Gas Waste in Harrisburg's Watershed (2011-2018)



Delaware River Watershed, *Northhampton County, PA* – Grand Central Lanfill by Waste Management



WM WASTE MANAGEMENT

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GRAND CENTRAL LANDFILL

- Facility Information
- Sustainability
- Events & Resources
- Grand Central Environmental Education Center
- Contact Us
- Neighborhood Updates
- Eastern Expansion

Grand Central Landfill

The Grand Central Landfill (GCSL) is a municipal solid waste landfill located in Plainfield Township, Northampton County Pennsylvania. The facility is conveniently located between the Lehigh Valley and the Pocono Mountains. Grand Central provides safe disposal services for communities, businesses and industries. The facility has provided environmentally responsible solid waste management to the region since the late 1980's. Grand Central is one of 300 disposal facilities owned by Waste Management that employs the latest advances in landfill technology. Grand Central is engineered with environmental protection systems that meet or exceed rigorous government regulations and are subject to stringent monitoring and reporting requirements. These systems include engineered liners and capping, leachate collection and treatment systems and the landfill's gas collection system.

The Grand Central Landfill team is dedicated to wildlife habitat preservation and provides over 200 acres of grassland habitat for a variety of wildlife, including birds on the Audubon Society's decline list. The team has maintained the landfill's Wildlife Habitat Council Certification since 2007.

PA DEP Solid Waste Management Permit #100265

The facility is permited to accept municipal solid waste, construction/demolition waste, residual waste and special handling municipal waste. Grand Central Landfill does not accept hazardous waste or liquid waste.

Contact Information

Grand Central Landfill
910 W Pennsylvania Ave
Pen Argyl, PA 18072

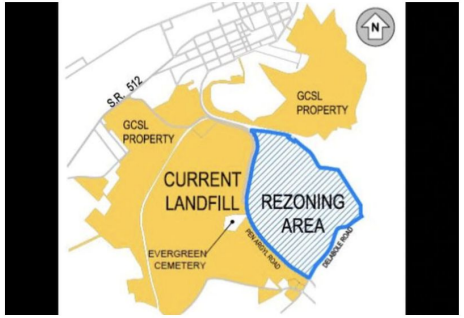
Customer Service
Phone: 1-800-621-2100

Landfill Hours:

- Monday - Friday: 7:00 am - 4:00 pm
- Saturday: 7:00 am - 9:00 am
- Sunday: Closed

Waste Management seeks rezoning for $42M expansion of Slate Belt landfill

Updated Feb 20, 2020; Posted Feb 20, 2020



Waste Management applied in February 2020 to change the zoning designation of 211 acres next to the Grand Central Sanitary Landfill in Plainfield Township so landfill operations can be expanded. Courtesy map

1,549 shares

By John Best | lehighvalleylive.com contributor

Waste Management would like to expand its landfill operations by 81 acres. But there's one major hitch. The land is zoned for use as farm and forest.

Waste Management is asking Plainfield Township to rezone 211 acres adjacent to the Grand Central Sanitary Landfill in Plainfield Township. The application seeks to rezone the land for use as solid waste processing and disposal.

PROBLEM: toxic materials from oil & gas waste end up polluting land, water, our homes & bodies.

Exemptions from cradle-to-grave regulations (inadequate testing, tracking, handling, disposal)

Spills & underground migration of exempt fluids

Improper disposal of exempt wastes (accumulation of toxics over time)

“Beneficial use” of exempt wastes (roadspreading, commodities e.g. salts, de-icer)

SOLUTION: Treat oil & gas waste based what it is, not based on exemptions. Close the loopholes.

$$ Costs $$ of Proper Management

“How much is this going to cost the regulated community?”

We *fail* to ask and *understand*, “Who’s <u>already</u> paying the cost that others don’t want to pay?”

CON: *“Additional testing, tracking and handling protocols of oil and gas waste under a hazardous waste or radiation control program places an economic burden on the industry.”*

But **<u>that’s where the burden *should* be</u>**, not on the managers of public drinking water facilities, the Commonwealth’s environmental remediation programs, and not the public.

~~**CON**~~ ***PRO:*** *The full economic burden of waste becomes the full responsibility of the same company profiting off its generation, as regular part of doing business. This protects not only the environment and public from physical harm, but also the Commonwealth from the economic burden of future remediation.*

Other Arguements

It's regulated under current statutes. True/but, those statutes are part of the giant loophole that needs to be closed, because they don't require cradle-to-grave disclosure, characterization, tracking and handling of these wastes.

It's safe. False, and any claims that it is safe are never backed by comprehensive, peer-reviewed science. Instead, small pieces of data are used to make generalized claims about all waste, ignoring whole data sets from which one or two data points are taken.

The amount of hazardous/radioactive material is negligible. True for drill cuttings per load, and false for accumulation of those amounts where cuttings are disposed load after load, year after year. Also, false for other waste streams including the industry's largest – wastewater - which can contain carcinogens at tens of thousands of times background levels or that is safe for drinking water.

Landfill Loophole Legislation Hearing October 14, 2020

I first would like to thank Representative Innamorato for holding this hearing and those representatives and senators in attendance. My name is John Stolz, I am a professor and director of the Center for Environmental Research and Education at Duquesne University. I live in Glenshaw, Pennsylvania north of Pittsburgh.

In my forty plus years in environmental microbiology, I have studied fresh water, marine, and extreme environments. The focus of the research has been on microbes that metabolize toxic metals like arsenic, selenium, and chromium. More recently, I have concentrated on water quality issues and the environmental impacts of unconventional oil and gas development. The research has been funded over the years by grants from the National Science Foundation, US Environmental Protection Agency, Department of Agriculture, Department of Energy, NASA, and the National Institutes of Health. I have published 90 peer reviewed papers, 40 book chapters, and co-authored/edited three books.

Relevant to this hearing, in researching water quality in Pennsylvania, over the past eight years, I and my students have interviewed hundreds of people who have been negatively impacted by unconventional oil and gas development. We have analyzed over 1,600 samples for their chemistry and have published the results in peer reviewed journals.

Land Fills and Public Drinking water

Today I want to tell you about my findings regarding the improper disposal of oil and gas wastes, both solid and liquid, and the threat to public drinking water sources it poses. When the shale boom began in Pennsylvania in the mid-2000's, the state allowed the companies to take their liquid wastes, including the produced water, to publicly owned sewage treatment plants, also known as POTWs for disposal. However, it was soon discovered that because the fluids were so concentrated, it could not be diluted enough, and was impacting the discharge from these plants into public water. Many of the plants were exceeding their discharge permit limits. More importantly, the increase in total dissolved solids, and bromide in particular, was causing problems downstream for public drinking water authorities. Carcinogenic trihalomethanes, such as chloroform and bromoform, were being generated at the drinking water plants during the chlorination process. Also known as disinfection by-products, these carcinogens are regulated by the US EPA, with quarterly testing and reporting required of the plants. However, the utility doesn't have to notify their customers unless they are out of compliance for four straight quarters. With more and more utilities falling out of compliance it was realize this waste disposal policy was not working. Further, the drinking water plants were incurring the costs to deal with the issue, many switching to chloramination. Chloramination can lead to issues with lead leaching from pipes and fittings. Initially, a voluntary prohibition of using POTWs for shale gas liquid waste was put in place, and as a result there was a decrease in bromide levels in the three rivers. However, this problem has reemerged over the past few years. Apparently, the oil and gas industry found a loophole and their waste was again getting into the source water for drinking. But how? My suspicions were confirmed in April of 2019 when I met with the manager of the POTW in Belle Vernon, PA. The waste treatment plant had

been receiving leachate, 100,000 to 300,000 gallons a day, from the local sanitary landfill in Rostraver PA. The leachate was so toxic, it killed the microbes that were supposed to be treating the sewage. My analysis of the land fill leachate showed it contained the same toxic constituents found in produced water from fracking, having high amounts of chloride and bromide, as well as the radioactive element radium. The discharge from the POTW, which I collected at the time, also had similar constituents, including bromide and radium, although less concentrated. The dried sludge from the plant was also radioactive (containing thousands of picoCuries of radium 226 and radium 228 per kilogram), so it was clear to me that the landfill leachate had contaminated the waste treatment facility. Furthermore, the discharge from the waste treatment plant was exceeding the permitted amount of total dissolved solids by almost 3 times and was going directly into the Monongahela River. The Charleroi drinking water facility is just down stream. So it wasn't too surprising to discover that they have been having issues with trihalomethanes since at least 2015. Thanks to a court injunction, the POTW is no longer receiving leachate from the landfill and is now back in compliance for their discharge. I confirmed this when I visited the plant and took samples at the end of May in 2019.

The PA DEP allows drilling wastes, both solid and liquid to be taken to sanitary landfills, up to 80% volume per day. The solids, such as drill cuttings are buried along with municipal waste and are often used to cover the landfill at night. The liquids, which may contain drilling fluids, flowback, and produced water, are "immobilized" with wood chips or other absorbents, and buried along with the municipal waste. Although the solid waste containers are screened for radioactivity when they arrive at the landfill, the sheer volume accumulated over time has led to elevated levels of radium and radon gas. Remember, the half life of radium 226 is 1,600 years so it's going to take a long time for this to go away naturally. As for the liquids, there currently are no requirements to test for radioactivity or toxic chemical constituents as it is defined as "residual waste" or "brine". However, based on my own research as well as PA DEP and USGS data, these fluids may contain thousands of picoCuries of radium 226 and radium 228. The Westmoreland landfill is now under a consent agreement with the PA Department of Environmental Protection to dispose of the leachate. But because it is so toxic, they can't use normal means of disposal. One idea was to install an evaporation system commonly used at other landfills to reduce leachate volumes. But if the Westmoreland landfill installed such a system, it would also concentrate the radioactivity. According the proposed permit, the daily activities would produce hundreds of gallons of concentrated leachate with tens of millions of picoCuries of radium. Radium 226 decays to Radon 222 (3.8 days), a radioactive gas, and then Lead 210 (22 years) and Polonium 210 (138 days), both also radioactive. Polonium 210, by the way, is Russia's favorite poison for eliminating ex-patriots like Alexander Litvinenko. So it's not just the radium, but the decay products it produces. In fact, if you were to seal up a container of produced water from a Marcellus Shale well, for example, in two weeks time it would be five times as radioactive due to the build up of decay products. And that is what is going into the landfills.

There are at least 16 sanitary landfills in Pennsylvania that are reported to be taking oil and gas wastes. It is clear to me that this practice is affecting the quality of the leachate, rendering it more toxic and radioactive. Further, allowing this leachate to be disposed of at POTWs

threatens the operation of these facilities and is facilitating the discharge of oil and gas wastes into the waters of Pennsylvania. Regardless of the future of oil and gas development in the state, the more than 11,000 unconventional wells already drilled will continue to generate the toxic and radioactive brine. We need laws that will address the proper disposal of this waste to make sure it doesn't wind up in our drinking water. I encourage you to support the legislation proposed by representative Innamorato.

Thank you.

John F Stolz, PhD

Marsha Haley, M.D.
Assistant Professor of Radiation Oncology
University of Pittsburgh School of Medicine
MPH Candidate
University of Pittsburgh School of Public Health

House Policy Committee
October 14th, 2020

Radiation Exposure

- High Level Radiation Exposure
- Acute Radiation Syndrome
  - Very rare; events like a nuclear explosion
- Low Level Radiation Exposure
  - Increase in cancer risk
- Measurement
  - Millisieverts (International)
  - Millirem (mrem) (U.S.)

https://www.epa.gov/radiation/radiation-health-effects

Radiation Exposure

- **Radiation dose limits**
  - 5000 mrem for radiation workers
  - 100 mrem for general public
- **Common exposures**
  - Chest x-ray – 10 mrem
  - CT scan – 2000 mrem
  - Radon – 228 mrem

www.energy.gov

Radiation Exposure in Oil and Gas Operations

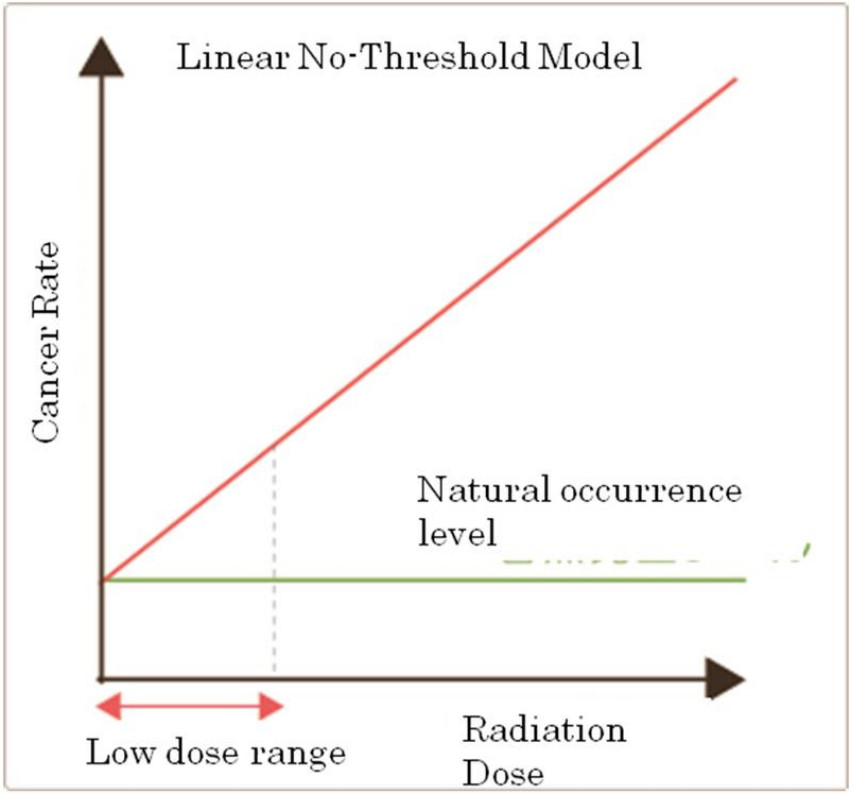
- **Radium and associated products***
  - Radon
  - Lead-210
  - Polonium-210
- **TENORM radioactivity levels are highest in water handling equipment***
  - Can exceed 1 milliRoentgen/hr*
  - Converts to 0.877 mrem/hr
  - 8-hour shift = 7 mrem
  - 40 hrs/week = 280 mrem

*https://www.epa.gov/radiation/tenorm-oil-and-gas-production-wastes

Radiation Exposure in Oil and Gas Operations

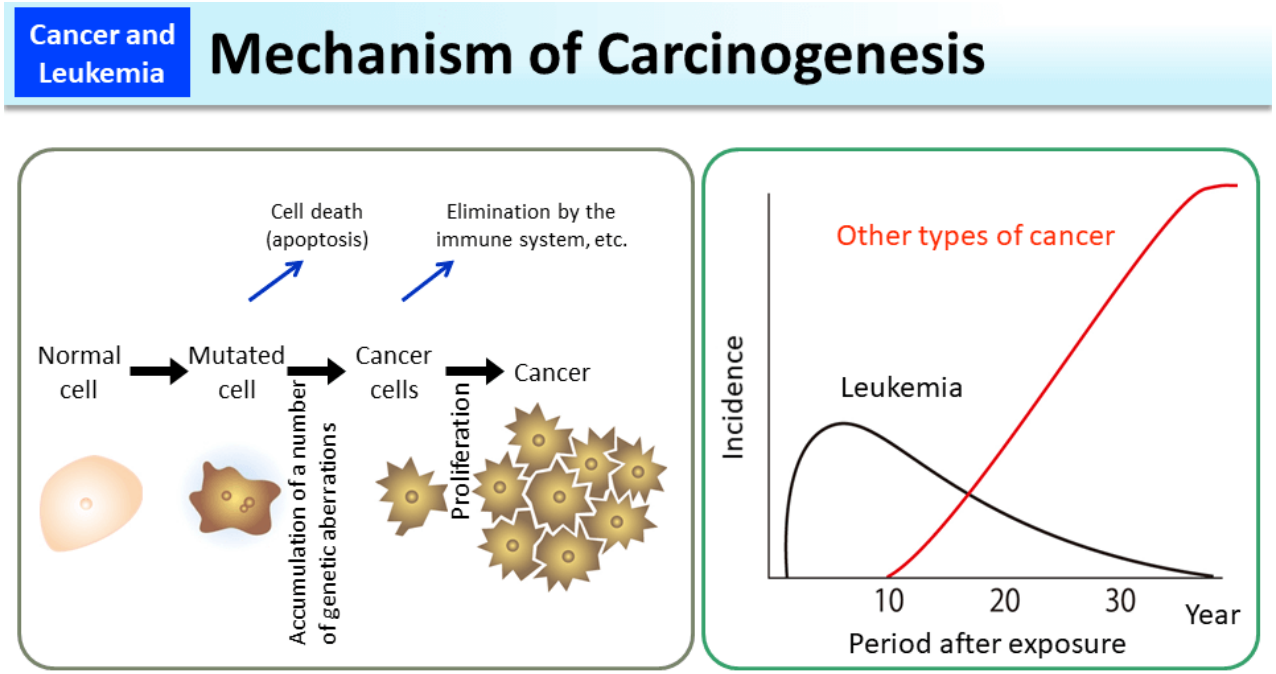
- Low level radiation exposure
  - Linear no-threshold (LNT) model
  - Assumes that the risk of cancer due to a low-dose exposure is proportional to dose, with no threshold

https://www.epa.gov/radiation/radiation-health-effects



https://energyeducation.ca/encyclopedia/Linear_no-threshold_model

Radiation Exposure and Cancer



- Radiation is only one of various factors that induce cancer.

- Mutated cells follow multiple processes until developing into cancer cells.
  → It takes several years to decades.

https://www.env.go.jp/en/chemi/rhm/basic-info/1st/03-07-01.html

Radiation Exposure and Cancer

- People exposed to radiation
  - Atomic bomb survivors
  - Medical radiation
  - Occupational
  - Environmental
- Leukemia and most solid cancers have been linked with radiation exposure
- Children have especially high relative risks for many cancers

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2859619/

Radiation Exposure in Oil and Gas Operations

- **Louisiana**
  - Coleman et al v. H.C. Price Co. et al
  - Worker exposures over 100 rem
  - Over 20,000 pCi/g of Ra-226
    - EPA limit is 5 pCi/g up to 15 cm depth*
    - EPA limit is 15 pCi/g deeper than 15 cm*

*https://www.atsdr.cdc.gov

Radiation Exposure in Oil and Gas Operations

- **Pennsylvania**
  - PA TENORM Study (2016)
  - Potential for leachate from landfills that accept oil and gas waste to contain TENORM
  - > 20,000 pCi/L of Ra-226 in fluids
  - > 350 pCi/L of Ra-226 in leachate
  - "…potential for radiological environmental impact"

www.dep.pa.gov/Business/Energy/OilandGasPrograms/OilandGasMgmt/Oil-and-Gas-Related-Topics/Pages/Radiation-Protection.aspx

Radiation Exposure in Oil and Gas Operations

- Unconventional oil and gas development (UOGD) could induce adverse health effects to residents living close to UOGD by elevating ambient particle radioactivity
- Suggests the existence of pathways by which UOGD activities could release NORM into the air

https://www.nature.com/articles/s41467-020-18226-w

Conclusions

- Radiation exposures increase cancer risk
- Cancer has a latency period which is shorter for leukemia; children are the most vulnerable
- Studies in oil and gas areas show high levels of radiation, often above EPA limits
- Leachate treatment does not remove Ra-226 and therefore downstream drinking water could be impacted
- Emerging data show potential for air contamination with radiation beyond the work site

Justin Nobel testimony for Waste Loophole Policy Hearing

contact: justinnobel@gmail.com

[SLIDE 1 – 1982 AMERICAN PETROLEUM INSTITUTE REPORT]

Good Day, My name is Justin Nobel. I have a dual master's degree in earth and environmental science and journalism, write regularly on issues of science and the environment for US magazines and investigative sites, recently published a lengthy story for Rolling Stone magazine entitled, "America's Radioactive Secret" on the issue of the radioactivity brought to the surface in oil and gas production and the many different pathways of contamination posed to the industry's workers, the public and communities, and the environment, and I am presently writing a book on this topic to be published with Simon & Schuster. I have spent the last three years speaking to oil and gas industry workers across Pennsylvania, Ohio, West Virginia, North Dakota, Michigan, Montana, Colorado, Oklahoma, New Mexico, and Texas as well as residents, regulators, scientists, and I have made a deep dive into the research on this topic. Unfortunately the oil and gas industry has known, for decades, that their waste is hazardous, and that it puts the women, men, mothers, fathers, son, daughters, who work with it, and live with it, at great risk.

I quote, "Almost all materials of interest and use to the petroleum industry contain measurable quantities of radionuclides that reside finally in process equipment, product streams, or waste. In addition, groundwater used for waterflood and brine solutions from operating wells contain biologically significant quantities of Radium 226 and Radon 222." These lines do not come from a research scientist at some elite university far removed from the oil patch, they do not come the newsletter of an environmental action group which may have a vested interest in halting oil and gas production. These lines, in fact, come from a 1982 report of the Department of Medicine and Biology, of the American Petroleum Institute. The report goes on to describe the radioactivity risks of the industry's waste, quote, "Radium 226 is a potent source of radiation exposure, both internal and external…Radon 222 and its daughters cause the most severe impact to the public health."

The 1982 American Petroleum Institute report also invalidates the popular idea, in this state and others, of encouraging the recycling or re-use of produced water. Again, I quote from the American Petroleum Institute report, "Any control methodology proposed for radioactive materials must recognize the fact that radioactivity can not be modified or made inert by chemical means. It also must recognize that radioactivity dissipates at fixed rates through fixed sequences or series. Decay to daughter products cannot be guaranteed to reduce the hazard..." And just a few lines later the American Petroleum Institute report points out that any attempt to remove radioactivity is merely transforming, quote, "a very dilute source of radioactive materials into a very concentrated source of radioactivity."

And this, as the oil and gas industry knows full well when it speaks without blinders, is the conundrum we end up in when we take something that is clearly hazardous and label it non-hazardous, thus allowing human beings to intimately interact with it. Those human beings are at risk. Those human beings will get sick. Those human beings are not being protected or paid

appropriately given the materials they are handling. Those human beings are the oil and gas workers whose jobs many in this chamber like to boast about. Well let me tell you something, you are killing these people. And I wish that were hyperbole, but unfortunately the facts exist to prove it.

[SLIDE 2 – BRINE TRUCK IN DOWNTOWN BARNESVILLE OHIO, CAMBRIDGE OHIO]

First, a quick recap. What is oil and gas waste? We are talking about an extremely salty stream of liquid waste that the industry innocently refers to as "brine" or "produced water"—it is loaded with human carcinogens such as benzene, toxic heavy metals such as arsenic and lead, and it can be loaded with extraordinarily high levels of the radioactive element radium. We are talking about massive amounts of drill cuttings brought to the surface in the process of drilling through the highly radioactive Marcellus shale. We are talking about various scales and sludges that form in wellhead pipes, pumps, valves and tanks and can have radioactivity levels according to EPA's own page on oil and gas waste, that can be nearly 100,000 times the limits set for soil at Superfund sites and uranium mills. The 1976 Resource Conservation and Recovery Act, or RCRA, was an attempt to appropriately define and characterize the nation's hazardous waste in an effort to keep workers and communities safe. And yet all of this epic amount of oil and gas waste, despite containing clear hazardous properties, received a stunning exemption under what is known as the Bentsen and Bevill Amendments, enabling it to be labeled as non-hazardous.

Well, that means when it goes into a truck to go off to an injection well, there is absolutely no labeling or wording on that truck to convey to the driver, communities the driver drives through, other road-users, or first responders such as EMT and firefighters, what is in that truck. This is the untold catastrophe of this industry's *regulatory relief.* We can run trucks filled with hazardous waste through Pennsylvania communities and not tell people what is in the trucks and we can take those trucks to places called injection wells, typically located in Ohio, such as this one, which is literally on the edge of a shopping plaza in Cambridge Ohio. You can eat at Taco Bello, or Starbucks, or get your iPhone fixed at Verizon, and you can watch trucks unload hazardous waste right in front of your eyes, as you finish your taco or Frappuccino. Oil and gas's hazardous waste exemption makes this shameful public health disaster possible.

[SLIDE 3 –OIL & GAS WORKER COVERED IN WASTE]

But oil and gas's hazardous waste exemption makes something even more concerning possible. This is a photo of an oil and gas worker in Ohio, but I know from talking to workers in Pennsylvania that this type of job is performed in this state as well.

These workers wear regular work uniform (FRs), hard hat with a face shield, typically no respirator, no dosimeter, no mask. They crawl inside the truck's "clamshell" or manhole, with a shovel and pressure washer and shovel everything out the bottom, then use a steam cleaner to clean the sides and the bottom. "They just keep chasing the waste to the back, just like you would with your dad's garage floor. These guys will challenge each other to spend a lot of time in

there, trying to be tough, if you complain to your boss they'll say, 'Shut up, don't like it go home, you are lucky to have a job.'"

[SLIDE 4 – LOUISIANA OIL & GAS WORKER LEGAL CASES, CANCERS LISTED]

Just because you do not believe the science or know the science or care to read a few research papers to understand the science does not mean the science doesn't exist, and does not mean the science won't eventually lead to lethal cancers in the Pennsylvania workers you are charged with protecting. I sincerely hope the state of Pennsylvania will close the oil and gas waste loophole.

But either way, your paltry regulations have already enabled an easily traceable trail of contamination to be spilled across the great state of Pennsylvania, and quite literally, deposited in the bones and bodies of its people. Unbeknown to most people there have been legal cases in Louisiana, one settled as recently as 2016, showing that various cancers received by oil and gas workers, including chronic lymphocytic leukemia, lymphoblastic leukemia, prostate cancer, lung cancer, liver cancer, colon cancer, have been linked to radioactivity exposure received on the job. These workers, 33 of them in this one case, over a number of years were exposed to various types of radioactive oil and gas waste—waste that our US laws say is "non-hazardous."

And yet, a program developed by the CDC for nuclear weapons workers called the Interactive RadioEpidemiological Program or IREP was used to determine the likelihood that these worker's cancers came from their occupational exposures—many of the numbers returned by the IREP program are in the range of 95 to 99 percent. These numbers are undeniable. All of these workers cases were settled by the oil and gas industry. As has been explained to me by the attorney on these cases, the big majors who have been drilling for oil and gas for decades know full well that their work exposes human workers to radioactivity, it is simply too expensive to appropriately protect them. I will say that again, it is simply too *expensive* to appropriately protect them. But the oil and gas industry is not about to take that analysis to a jury. They settle. They *settle*. But the workers still suffer, of course. They still die of cancer.

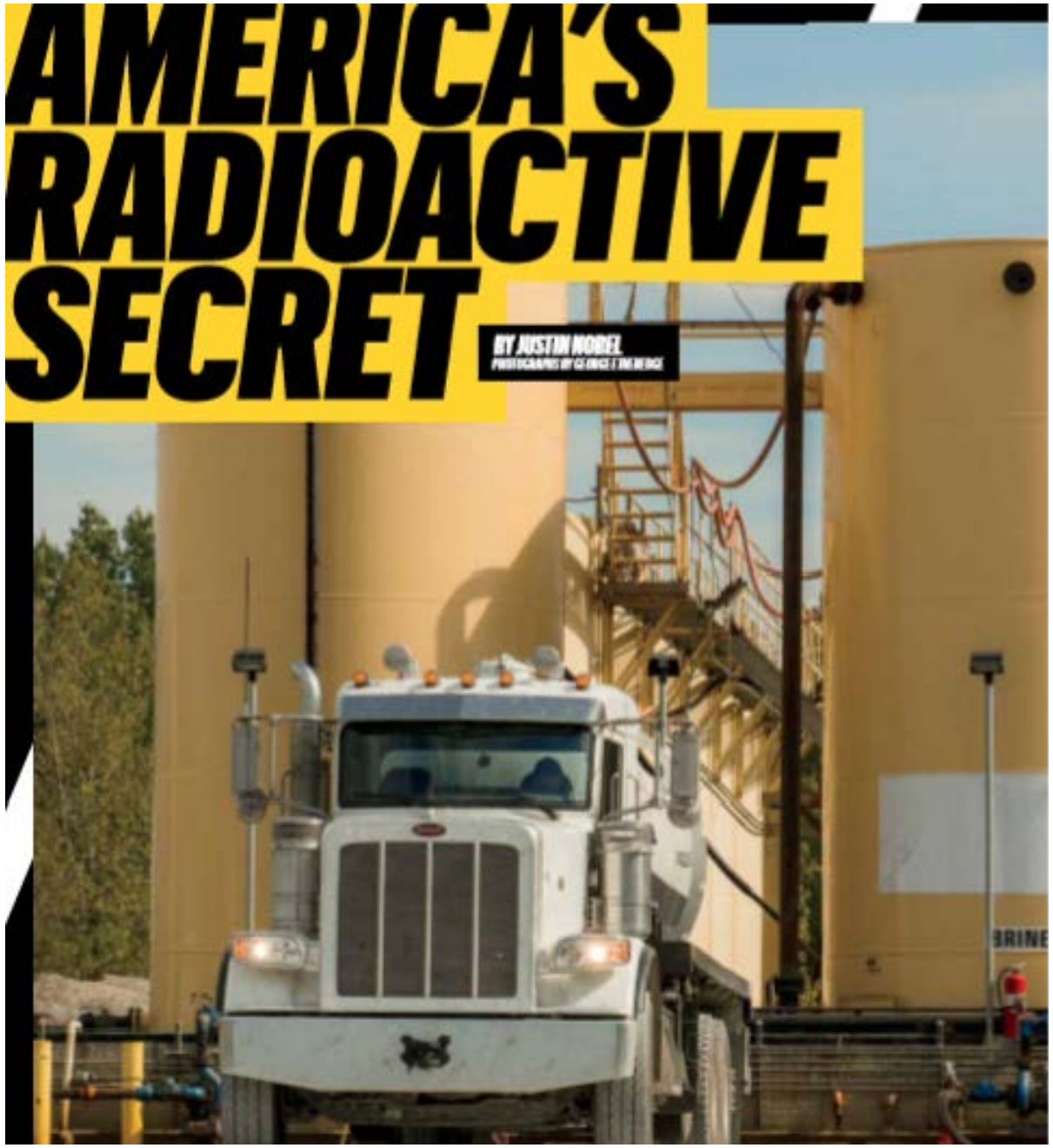
Why have we not seen a cluster of oil and gas worker cancers in the Marcellus? The answer is actually tragic—no one is really looking for them, and many of these cancers take on the order of 15 to 20 years to develop, so there has not been ample time for them to emerge. Well, we are now 15 years on. And we are now looking. And I want folks voting on this legislation to remember that, we are looking, we will find. But you have an opportunity now to address what is a clear public health emergency, you have an opportunity now to keep communities safe, and keep oil and gas workers safe. Thank you very much.

-- END --

An Analysis of the Impact of the Regulation of "Radionuclides" as a Hazardous Air Pollutant on the Petroleum Industry

Prepared for the Committee for Environmental Biology and Community Health, Department of Medicine and Biology, American Petroleum Institute

October 19, 1982



SOURCE: Photo at left by George Etheredge, Silcor Oilfield Services injection well, Cambridge Ohio. Photo at right by Justin Nobel, downtown Barnesville Ohio.

An Ohio “swamper” (this job exists in Pennsylvania too)

These workers wear regular work uniform (FRs), hard hat with a face shield, no dosimeter, often no respirator, often no mask. They crawl inside the truck’s “clamshell” or manhole, with a shovel and pressure washer and shovel everything out the bottom, then use a steam cleaner to clean the sides and the bottom. “They just keep chasing the waste to the back, just like you would with your dad’s garage floor,” one Ohio brine hauler told me.

The trucks they are cleaning could have been filled with brine, fracking flowback, various sludges, fracking chemicals, condensate mixed with brine.

They can spend up to an hour inside the truck. Typically, with the average brine hauling company, each day at least one or more trucks will have to be cleaned.

“These guys will challenge each other to spend a lot of time in there, trying to be tough, if you complain to your boss they’ll say, ‘Shut up, don’t like it go home, you are lucky to have a job.’”

Table 2a. Cancer Types, Total Radiation Doses, and Assigned Shares for Coleman vs. H.C. Price Co. Pipe yard Plaintiffs

Plaintiff Name	Primary Cancer Type	Total Radiation Dose		IREP Assigned Share
		Low (rem)	High (rem)	
Worker 2	CGL	118.65	1868.78	99.73%
Worker 3	APL	12.34	455.65	97.49%
Worker 4	Lung	927.57	32933.65	99.63%
Worker 5	Colon	97.9	268	88.52%
Worker 6	Colon	273.51	905.77	90.29%
Worker 7	MM	369.1	6336.4	98.08%
Worker 10	MM	25.49	517.57	81.49%
Worker 11	Lung	783.30	30938.29	99.39%
Worker 12	Gastric	278.8	1233.3	95.5%
Worker 13	CLL, NHL	655.0	20153.1	99.43%
Worker 14	CKD*	155.2	1273.19	94.79%
Worker 16	ML	101.02	1161.02	99.36%
Worker 17	Kidney	169.82	14684.48	99.62%
Worker 19	Rectal	23.60	109.85	32.20%
Worker 22	TLL	259.96	841.12	89.53%
Worker 25	Colon	739.73	1869.19	95.49%
Worker 27	Liver	229.8	8726.2	99.79%
Worker 31	Stomach	6.26	16.82	29.94%
Worker 33	Pancreatitis*	154.68	452.46	NON-CANCER

* Indicated a non-cancer ailment

Cancer Type Abbreviations:

MM: Multiple Myeloma
CGL: Chronic Granulocytic Leukemia
APL: Acute Promyeloctic Leukemia
CLL: Chronic Lymphocytic Leukemia
NHL: Non-Hodgkin's Lymphoma
CKD: Chronic Kidney Disease
ML: Myelogenous Leukemia
TLL: T-Cell Lymphoblastic Lymphoma
CML: Chronic Myelocytic Leukemia
AML: Acute Myelogenous Leukemia
LL: Lymphoblastic Leukemia

SOURCE: "Occupational Exposures to Radioactive Scale and Sludge" Coleman et al v H.C. Price Co. et al. December 2013.

Testimony of
Lois Bower-Bjornson
Outreach Coordinator
Clean Air Council


FREDERICK
DANGER

Fredericktown Pennsylvania

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

CHEMICAL OR RADIOLOGICAL MAXIMUM CONTAMINANT LEVEL (MCL) EXCEEDANCE

ESTE INFORME CONTIENE INFORMACIÓN IMPORTANTE ACERCA DE SU AGUA POTABLE. HAGA QUE ALGUIEN LO TRADUZCA PARA USTED, O HABLE CON ALGUIEN QUE LO ENTIENDA.

Tri County Joint Municipal Authority Has Levels of (SOC) benzo(a)pyrene Above Drinking Water Standards

Our water system recently violated a drinking water standard. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did to correct this situation.

We routinely monitor for drinking water contaminants. Testing results we received on 6/16/2017 show that our system exceeds the standard, or maximum contaminant level (MCL), for (SOC) benzo(a)pyrene The standard for (SOC) benzo(a)pyrene is 0.0002mg/L and a level of 0.00303 mg/L was found at entry point 101.

What should I do?

You do not need to use an alternative (e.g., bottled) water supply. However, if you have specific health concerns, consult your doctor.

What does this mean?

This is not an immediate risk. If it had been, you would have been notified immediately. However, the Authority is conducting increased monitoring to monitor and further evaluate this concern.

What happened?

This was an isolated event and the specific source of benzo(a)pyrene detected in this sample is unknown. Previous and subsequent sample results have been non-detectable.

What was done?

TCJMA is working with the DEP and the frequency of monitoring has been increased to confirm that levels are reliably and consistently compliant. We anticipate resolving the problem within the appropriate timeframe.

For more information, please contact Fred Roberts - Working Foreman at (724) 377-2211.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by Tri County Joint Municipal Authority.

PWS ID#: 5630045 Date distributed: August 31, 2017

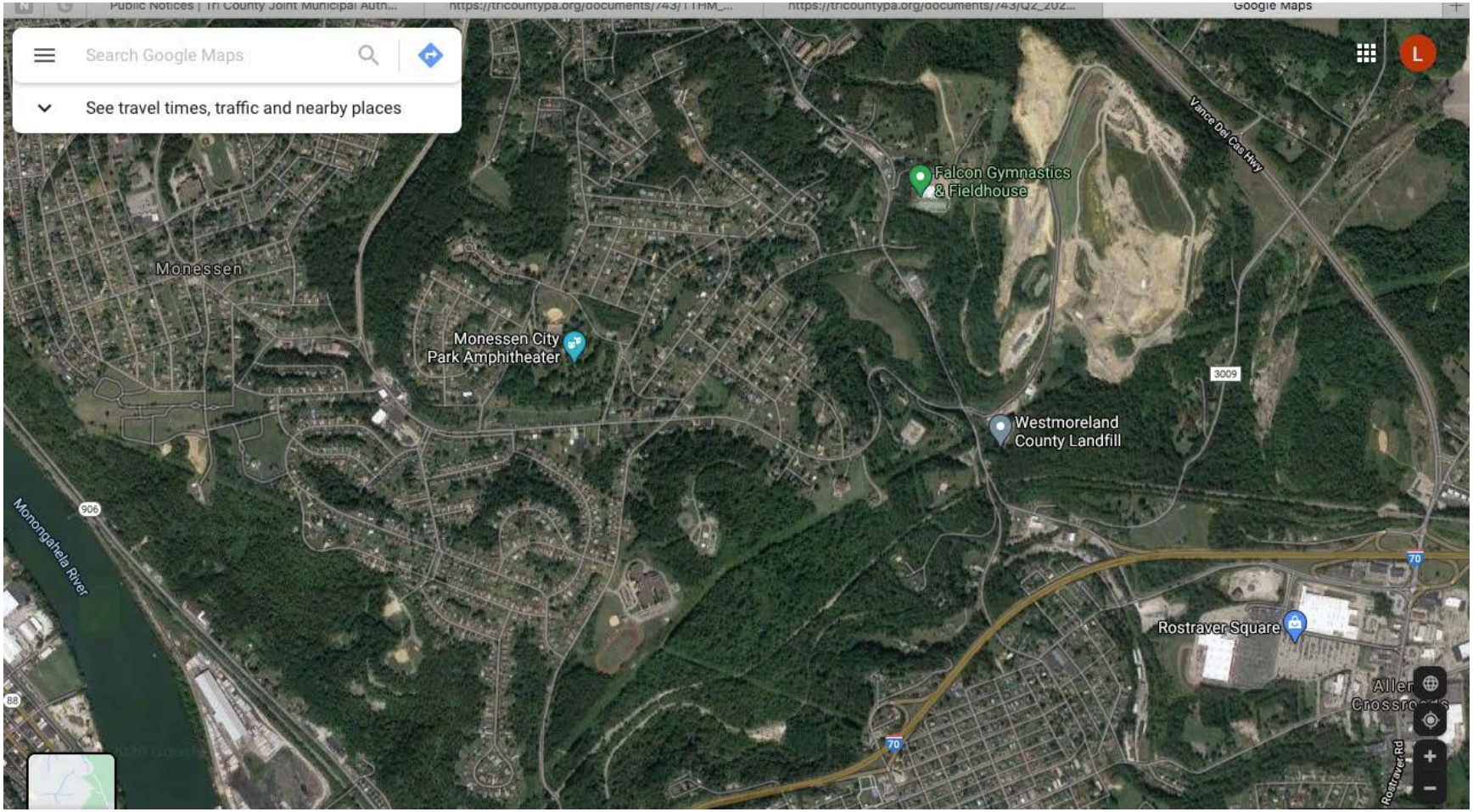
Brine trucks filling/Dumping

Leaking impoundment

Trucks dumping/filling

Scenery Hill, Pennsylvania

Westmoreland Landfill



3930-FM-BSDW0191 Rev. 2/2018

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

CHEMICAL OR RADIOLOGICAL MAXIMUM CONTAMINANT LEVEL (MCL) EXCEEDANCE

ESTE INFORME CONTIENE INFORMACIÓN IMPORTANTE ACERCA DE SU AGUA POTABLE. HAGA QUE ALGUIEN LO TRADUZCA PARA USTED, O HABLE CON ALGUIEN QUE LO ENTIENDA.

Tri-County Joint Municipal Authority Has Levels of TTHM's that exceed the Locational Running Annual Average (LRRA)
Above Drinking Water Standards

Our water system recently violated a drinking water standard. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did to correct this situation.

We routinely monitor for drinking water contaminants. Testing results we received on 7/10/2020 show that our system exceeds the standard, or maximum contaminant level (MCL), for LRAA of TTHM's. The standard for LRRA of TTHM's is .080. One of our test sites LRRA was found at a level of .0811 in your drinking water.

What should I do?

- There is nothing you need to do. You do not need to boil your water or take other corrective actions. However, if you have specific health concerns, consult your doctor.
- If you have a severely compromised immune system, have an infant, are pregnant, or are elderly, you may be at increased risk and should seek advice from your health care providers about drinking this water.

You do not need to use an alternative (e.g., bottled) water supply. However, if you have specific health concerns, consult your doctor.

What does this mean?

This is not an immediate risk. If it had been, you would have been notified immediately. However, some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys or central nervous system and may have an increased risk of getting cancer. If you have specific health concerns, consult your doctor.

What happened? What was done? TTHM's are the by-products produced by every public water system that uses disinfectants. We are continually working to meet the DEP standards through upgrades to our system including new equipment, reviewing new and alternate treatment process and routine flushing.

We anticipate resolving the problem within our next testing cycle.

For more information, please contact Keith Marucci at 724-377-2211.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by Tri-County Joint Municipal Authority.

PWS ID#: 5630045 Date distributed: August 6, 2020

Testimony of the

Pennsylvania Department of Environmental Protection

Before the

House Democratic Policy Committee

Public Hearing on Radioactive and Hazardous Waste Loopholes – Impact on Communities, Worker Safety and Public Health

October 14, 2020

The Department of Environmental Protection (DEP) would like to thank you for the opportunity to submit written testimony to explain DEP's approach to managing radioactive and hazardous waste in Pennsylvania. Thank you for your interest in ensuring that DEP's regulations are protective of public health and the environment.

DEP recognizes the importance of regulatory oversight relating to the management of waste derived from oil and gas exploration and production. DEP's oversight role is primarily set by the Solid Waste Management Act (SWMA), the Clean Streams Law, and the 2012 Oil and Gas Act.

Disclosure of Drilling Chemicals

Under the 2012 Oil and Gas Act and Chapter 78a regulation, unconventional gas well operators must submit to DEP all chemical information, including any designated trade secrets or confidential proprietary information after the well is hydraulically fractured. Unconventional operators must also complete a chemical disclosure registry and post it on the publicly available website FracFocus. In response to DEP's recognition that the public needs greater accessibility to information regarding the oil and gas industry, it created a website that includes the numbers and locations of issued well permits, dates when wells are drilled, dates when wells are completed, the identity of chemicals used to hydraulically fracture each well, the volume of gas produced at each well, the volume of waste produced, quarterly reports on well integrity, data on air emissions, emergency response plans for well sites, inspection reports, results of water supply impact investigations, water samples collected and analyzed by DEP, Notices of Violations, and enforcement actions taken by DEP to enhance the transparency of DEP's oversight of this industry sector and to help the public better understand how they are being protected. One limitation on public disclosure of these chemicals pertains to the operator's ability under both the 2012 Oil and Gas Act (Act 13) and the Pennsylvania Right to Know Law

to designate information as a trade secret. Pursuant to Act 13, if an operator claims that part of the chemical information is a trade secret and requests that DEP treat it as confidential, DEP must treat it as confidential. Further, the Chapter 78a regulations prohibit the use of chemicals in well drilling in the shallower depths where the drilling could come into contact with fresh groundwater and prescribe the specifications that must be met related to casing and cementing of wells. These provisions were specifically aimed at protecting groundwater, preventing gas migration, and setting standards of performance for how a well is to be drilled and hydraulically fractured.

Regulatory Structure for Management of Oil and Gas-derived Wastes

Pennsylvania has specific regulations and guidance for exploration and production wastes that have been adopted under multiple DEP-program areas, including DEP's residual waste and oil and gas programs. Wastes generated from crude oil and natural gas exploration and production are exempt from regulation as hazardous waste under Subtitle C of Resource Conservation and Recovery Act (RCRA) and are generally subject to non-hazardous regulation under Subtitle D of RCRA and state regulations. Under Pennsylvania's regulatory framework, this waste constitutes residual waste and is regulated under DEP's residual waste regulations.

Section 2002(b) of RCRA requires every regulation promulgated under RCRA to be reviewed and, where necessary, revised not less frequently than every three years. On May 4, 2016, the Environmental Integrity Project and others filed a lawsuit with the U.S. District Court for the District of Columbia that alleged EPA had failed to perform its non-discretionary duty under Section 2002(b) to evaluate the federal Subtitle D solid waste regulatory requirements for the management of wastes associated with exploration, development, and production wastes from crude oil, natural gas, and geothermal energy (oil and gas) activities.

In response, EPA entered into a consent decree to conduct a review and determine whether revisions to the federal solid waste management regulations were necessary. To support this effort, EPA conducted an extensive literature review of government, industry, and academic sources to supplement the information available from previous Agency actions. This review, to determine whether changes to the federal solid waste regulations were necessary, evaluated factors such as waste characteristics, management practices, damage cases, and the coverage of state programs.

Based on the information gathered for this review, EPA concluded that revisions to the federal regulations for the management of exploration, development, and production wastes of crude oil, natural gas, and geothermal energy under Subtitle D of RCRA (title 40 of the Code of Federal Regulations in Part 257) were not necessary at this time. Therefore, in Pennsylvania, oil and gas waste remains regulated as non-hazardous waste under Pennsylvania's residual waste program.

Transportation of Oil and Gas-derived Wastes

It has been implied that the transportation of gas-derived wastes and wastewater is not safe because the vehicles are marked as carrying "residual waste" and not "hazardous". Since this waste is exempt by definition from the federal hazardous waste requirements under the RCRA and the corresponding state hazardous waste requirements under the SWMA, under Pennsylvania's regulatory framework, this waste is a residual waste. The classification of waste as residual waste does not mean that the waste is handled carelessly or could be disposed of at a municipal waste landfill. Pennsylvania's residual waste regulations are among the most robust and protective non-hazardous waste management regulations in the nation. The residual waste regulations, among other things, require specified transportation signage and include provisions related to the

special handling and disposal of radioactive waste. In short, waste transported in compliance with Pennsylvania's residual waste regulations is being transported safely.

Reuse of Oil and Gas-derived Wastewater

Oil and gas operators move waste fluids from one well to another for reuse because the Chapter 95 regulations require operators to develop a plan for maximizing the recycling of wastewater to fracture other wells. In fact, recycling wastewater is one of the solutions to disposal issues and recycling minimizes freshwater withdrawals thereby protecting surface water and groundwater sources.

DEP developed a statewide general permit for the processing of oil and gas liquid waste for beneficial use to hydraulically fracture or develop an oil and gas well, General Permit No. WMGR123, which has encouraged the development of a cottage infrastructure aimed at treating oil and gas-derived wastewater for use at another well. This permit creates a closed-loop system whereby chemicals that cannot be adequately treated are not discharged into a receiving water. General Permit No. WMGR123 is in the process of being revised and renewed by DEP.

The unconventional well regulations in Chapter 78a impose stringent requirements related to storage, transportation, use and disposal of waste from unconventional well development, as well as requirements related to preventing or responding to spills and releases. As a result, virtually all unconventional well wastewater is now recycled in the next hydraulic fracturing operation or taken to disposal wells out of state.

Disposal of Oil and Gas-derived Wastes

Pennsylvania landfills that are permitted to accept residual waste, including oil and gas-derived waste, must comply with the full breadth of the residual waste management regulations. The landfills, while designated as Subtitle D facilities under RCRA, are constructed to meet RCRA Subtitle C standards. Pennsylvania's municipal and residual waste landfills are precluded by regulation from accepting liquid or hazardous wastes. In addition, each landfill must have an approved waste acceptance plan that is specific to each facility and identifies concentration-based limits for individual constituents to ensure that each waste approved for acceptance can be adequately managed based on the facility's design. The blending of waste prior to disposal to 'dilute' the concentration of constituents is also prohibited.

TENORM-containing Waste Disposal

DEP has the responsibility of protecting the health and safety of the citizens of the Commonwealth and the environment from exposure to toxic and hazardous materials. This includes most sources of radiation. In 2000, DEP required the installation of radiation monitors at all Pennsylvania waste management facilities. The monitors measure external gamma radiation levels in micro-roentgens per hour (μR/hr) and were required to preclude the disposal of acutely radioactive material that may be inappropriately or unintentionally mixed with regular solid waste. Shortly thereafter, DEP developed supporting guidance to allow landfills to accept Technologically Enhanced Naturally Occurring Radioactive Material (TENORM) for disposal provided certain limitations were not exceeded and DEP's protocols were followed. TENORM is a material in which radionuclide concentrations or potential for human exposure have been increased above levels encountered in the natural state by human activities. TENORM is not subject to any EPA or NRC statutes, nor is it regulated by any federal agency or under DEP's Radiation Protection Program. However, when

disposed of, TENORM is regulated under the Solid Waste Management Act and DEP's Bureau of Waste Management. The many sources of TENORM include residual wastes from industrial and resource extraction activities, demolition wastes, and wastes resulting from drinking water, and municipal and industrial wastewater treatment.

In practice, each waste load that registers on the radiation monitors, which are set to detect material that is more than 10 μR/hr above background levels, is investigated by the landfill operator to identify the nature of the TENORM material and to determine if it is acceptable for disposal. In some instances, where the material is unusual or has a high level of activity, the landfill operator will coordinate with DEP to determine its acceptability for disposal or if the material should be rejected. If the material is rejected, it is returned to the generator for proper shipment to a facility authorized to take that material. Pennsylvania does not host any facilities that are permitted to accept rejected TENORM.

In 2015, DEP revised its TENORM disposal protocols to address trends identified in DEP's tracking efforts indicating an uptick in the amount of TENORM-containing wastes generated by oil and gas activities that were being disposed of in Pennsylvania landfills. In addition to monitoring incoming waste for radioactivity to limit the amount of TENORM-containing waste accepted at a Pennsylvania landfill, DEP also implements a waste acceptance procedure, known as the Form U process, to determine if landfills could accept certain wastes, including TENORM. The Form U provides a waste characterization that is submitted by the landfill operators to the Department for review and approval, prior to the disposal of the waste. If issues are identified in the Form U, DEP has the option of denying the disposal or asking for more information in order to make a final determination. The Form U review ensures that there is no adverse reaction from the disposal of the waste material due to interaction or mixing with other wastes

already disposed of in the landfill. All TENORM-containing material that is more than 10 µR/hr above background and accepted by landfills is also recorded by the landfill operators and reported monthly to DEP. DEP's existing procedure for the disposal of TENORM-containing waste accounts for varying radiological properties of these wastes that can be exhibited over time, by type, by source, by process, and by generator. DEP evaluates its protocol for disposal of TENORM-containing waste annually to ensure that it continues to function as intended and identify any changes that may be needed.

Leachate at Landfills accepting TENORM-containing Waste

DEP's 2016 TENORM Study evaluated samples of leachate from nine landfills selected based on the volume of oil and gas industry waste received using gamma spectroscopy for Ra-226 and Ra-228. Based on the results, the study concluded that there is limited potential for radiological environmental impacts from landfill leachate from landfills that accept oil and gas derived waste for disposal. The study also concluded that there exists little difference in the radium detected in leachate from the landfills that accept higher volumes of oil and gas derived waste versus radium detected in leachate from the remaining landfills in Pennsylvania. It is important to note, radium is naturally occurring and is found in varying concentrations in all rocks, soils, surface and ground water.

The landfill leachate contains contaminants that must be treated regardless of the kind of waste the landfill accepts. DEP's analysis of data on leachate from Westmoreland Sanitary Landfill did not indicate that any parameters in the landfill's leachate were significantly greater than what would be expected from a municipal/residual waste solid waste facility. DEP evaluated available information and data from sources that include Westmoreland Sanitary Landfill, the Belle Vernon Sewage Treatment Plant, and Monongahela River monitoring stations and found no evidence of any increase in

constituents attributable to the landfill's leachate that would adversely impact aquatic life in the Monongahela River or the safety of downstream public water systems.

Conclusion

There have been and will continue to be concerns related to the impacts of oil and gas development on the health and safety of the Commonwealth's citizens and our environment. DEP shares these concerns and is committed to continually improving the regulatory program to better serve Pennsylvanians.

Testimony on Radioactive and Hazardous Waste Loopholes – Impact on Communities, Worker Safety

House Democratic Policy Committee Hearing

Ray Barishansky

Deputy Secretary, Health Preparedness and Community Protection

PA Department of Health

October 14, 2020

Good afternoon Chairman Sturla, Representative Innamorato and members of the House Democratic Policy Committee. Thank you for the opportunity to discuss the Department of Health's work on the intersection of environmental health and oil and natural gas drilling in Pennsylvania.

The Department of Health's vision is to create a healthy Pennsylvania for all. To achieve this vision, the department must not only address public health concerns such as the current global pandemic of COVID-19, but it is also imperative for the department to hear citizen concerns regarding their physical health that result from environmental factors. This important work is carried out by the department's Division of Environmental Health, which partners closely with the Pennsylvania Department of Environmental Protection in the effort to provide a safe and healthy Commonwealth.

This Division exists to be responsive to environmental health concerns raised by Pennsylvanians. The Division regularly partners with sister agencies within the administration, as well as federal and local partners to perform investigations and reviews of environmental health issues. As part of this work, the department maintains an Oil and Natural Gas Production Health Concerns Registry to allow citizens an opportunity to report environmental health complaints specifically related to oil and natural gas drilling or production related activities to the department for follow up. This registry has been in existence since 2011; however, the department has worked over the last several years to improve the registry. The department has standardized the questionnaire and interview process, increased the number of questions asked and provided a quarterly summary of findings that is posted on the department's website. The data posted presents information on the age, gender, and region or county of the complainant as well as the health effects experienced by the complainant or complainant's family and friends.

The Department' biggest challenge has been having persons reach out to provide complaints through the registry. In in recent years, the department has received very few complaints through that mechanism, despite working with DEP on numerous steps to publicize the fact of the registry and to encourage the public to use it to make complaints. In the most recent quarterly report, covering the months of April to June, the department received only two complaints – and only four for the year 2020 to date. The department urges any Pennsylvanian concerned with potential environmental health impacts to contact registry staff at 717-787-3350 to make a complaint. The registry is an important conduit that allows the department to be responsive to the needs of residents. Pennsylvanians should know that the department stands ready to receive and respond to these concerns.

In addition to fielding complaints through the registry, the Wolf Administration has heard from families expressing concerns that local health impacts such as childhood cancers, asthma, or negative birth outcomes are the result of oil and gas drilling. The administration is committed to researching and to understanding the full depth of the health impacts of oil and natural gas drilling in Pennsylvania, including any potential physical health effects experienced by residents living near oil and gas drilling operations. To achieve this goal, the department is currently formalizing a partnership with an academic research institution to conduct epidemiological research on the health effects of hydraulic fracturing from Pennsylvania's shale reserves.

The academic research institution will be responsible for designing two observational epidemiological studies focusing on known, or suspected, health effects of hydraulic fracturing. The first study will exclusively investigate the suspected relationship between hydraulic fracturing and the development of childhood cancers, such as Ewing's Sarcoma, in Southwestern Pennsylvania. This will be a case control study and is likely to involve multiple years of PA cancer registry data, interviews of cases and controls,

and assessment of possible exposures.

The second study will be similar to earlier studies on acute conditions, such as asthma and birth outcomes, using data from Southwestern Pennsylvania. The study will utilize medical record abstraction, survey design and administration, development of a proxy oil and gas well exposure metric, and statistical analysis. At its conclusion, this study will be circulated for publishing in academic journals as well as a final public document to be published on the department's website.

It is the department's goal through these studies to better understand both long term impacts and short term, acute impacts. Both studies are targeted for completion by December 2022 with periodic public updates throughout the study period. The department is working to finalize the details of these studies as well as the agreements with the anticipated research institution and are eager to begin this important work to offer important information to residents living near drilling operations.

While the department continues to battle against the global pandemic, the department also continues to pursue this other important work so that it can offer the public critical knowledge of the impacts that our surroundings have on our physical health. Thank you for the opportunity to offer this testimony.

Protect PT

3344 Route 130, PO Box 137
Harrison City, PA 15636
(724) 392-7023

October 14, 2020

Sent by Email

House Democratic Policy Committee
Attn: Rep. Mike Sturla, Policy Committee Chair
Rep. Sara Innamorato, Bill Sponsor

Dear Representatives Sturla and Innamorato,

We are writing on behalf of the members of our organization, Protect PT (Penn-Trafford). Protect PT is a nonprofit citizens group dedicated to ensuring that the safety, security, and quality of life of community members are protected from the effects of unconventional natural gas development in Westmoreland and Allegheny Counties.

The health and safety of Pennsylvanians is at risk due to a massive 1,500% increase in the volume of toxic, potentially radioactive waste generated by oil and gas operations between 2003 and 2018, and a loophole that exempts this dangerous waste from rules that require making treatment and disposal safer for Pennsylvanians. Radioactive oil and gas waste is dangerous at any level. More than 1,100 sites process fracking waste in multiple states each year at facilities near homes or schools. Most of this waste is also transported on public roads. Drill cuttings from Marcellus shale are often enriched with radioactive materials, including uranium and radium.[1]

As shale drilling activity expands, radiation alarms are routinely triggered at POTWs and other wastewater processing sites. In Pittsburgh from 2008-2012, radiation detectors alarming tripled from 423 to 1325. According to the USGS, the average radium content in Marcellus shale wastewater samples was more than double the content found in wastewater from other gas-producing formations in 2011.[2]

For example, in 2019, the Washington County District Attorney and Westmoreland County District Attorney obtained an injunction against the Municipal Authority of Belle Vernon and the Westmoreland Sanitary Landfill because the landfill's leachate was found to be toxic and radioactive. The municipal authority had been accepting

WSL's radioactive leachate through piping. According to the National Pollutant Discharge Elimination System (NPDES) permit, only 50,000 gallons of leachate may be treated per day. WSL was piping 100,000 to 300,000 gallons of leachate per day. This overwhelmed the municipal authority's capacity to treat the wastewater and toxic leachate was dumped into the Monongahela River.[3]

In a review of the PA DEP's TENORM report, the report author states,"As the number of wells that have been drilled into Marcellus shale increase, [Total Dissolved Solids] concentrations have risen in the Monongahela River, the correlation clearly showing a trend that indicates that gas companies may have been dumping wastewater into surface waters".[2]

Furthermore, the Westmoreland Sanitary Landfill (WSL) entered into a Consent Order Agreement with the PA DEP in February 2020 after it was discovered that they were violating their Waste Permit by trucking their leachate to the Altoona Water Authority-Westerly Wastewater Treatment Facility, Eastern Ohio Regional Wastewater Authority, City of Alliance Municipal Sanitary Authority, and Seneca Landfill, Inc. The trucking of toxic leachate exponentially increases the harms upon communities as the liquid is spilled onto roads. It also increases the exposure of the truck drivers to the radioactive waste they are transporting. For example it takes two and a half hours to drive from WSL to the City of Alliance Municipal Sanitary Authority.

In June 2020, WSL submitted a plan for approval to evaporate 45,000 gallons of leachate per day. If this evaporator facility is built the toxicity and amount of radioactivity of the reduced volume produced daily, will be thousands fold higher (potentially tens of millions of pCi of radioactivity). The current permit only requires the landfill to monitor the emissions, not toxicity or radioactivity.

Evaporating toxic leachate from fracking waste in any landfill site is concerning for a myriad of reasons. Several of the toxins found in leachate from shale gas drilling waste include Arsenic, Selenium, Strontium, and Volatile Organic Compounds (VOCs) such as Benzene, Toluene, and Xylene.[4] These compounds are known carcinogens and cause a range of other health impacts, including heart and respiratory impacts and other severe conditions. Pumping these toxins into the air puts residents at risk, particularly vulnerable populations like pregnant women, children, the elderly, and people with existing medical conditions.

The leachate is fracking waste is known to contain different forms of radioactivity, only one of which can be easily measured. Simple measures, such as Geiger counter tallies gamma radiation from Uranium (U), greatly underestimate the total radiation hazard. Radioactivity from radium is especially high in Marcellus deposits and common in gas industry waste.

Radium changes to the well-known hazard, Radon (Rn) gas, at different rates, called decay half-lives. The rates differ for each variety, or numbered isotope, of radium. Ra-224 half-life is 3.5 days, Ra-226 decays in 1600 years and Ra-228 converts in 6.7 years.[5]

Radon gas exposure increases cancer risk, especially lung cancer and is in fact the second leading cause of lung cancer in the United States. Yet with this body of evidence, fracking waste is not classified as hazardous or toxic waste.

"At the federal level, radioactive oil and gas waste is exempt from nearly all the regulatory processes the general public might expect would govern it. Neither the Atomic Energy Act of 1954 nor the Low-Level Radioactive Waste Policy Act covers NORM. The Nuclear Regulatory Commission has no authority over radioactive oil and gas waste."[6]

We are respectfully requesting that the lawmakers in Pennsylvania close the loophole on oil and gas waste in order to keep Pennsylvania residents safe. Every day, municipal landfills continue to accept more toxic fracking waste forever contaminating the landfill with radioactive and toxic material. Municipal landfills are not equipped to handle toxic waste and their attempts at handling this waste have failed. Please take action now to address this critical situation to prevent further harms to Pennsylvania residents.

Sincerely,

Gillian Graber
Executive Director
Protect PT
gillian@protectpt.org

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STATEMENT FOR THE 10/14/20 HEARING'S RECORD

Subject: Legislation against drill waste going into landfills

I, Debby Fought, wish to submit testimony concerning Westmoreland Landfill LLC , ROSTRAVER Twp./ Belle Vernon Pa. There acceptance of drilling waste into this landfill has gone on for at least 10 years. Our fight against this facility has been documented with DEP, EPA, ROSTRAVER Township Commissioners and solicitors , State representatives , Simon and Simon Law Firm, the Attorney Generals office, Gov. Wolf, the ASTDR, the Pa. Health Dept. channel, 11, Channel 4, Pittsburgh Post Gazette, Valley Independent, Herald Standard, just to name a few of the people we have written to or spoken with. We have always been concerned about the health impact this landfill has on residents in our area. For the past 10 years i have campaigned against this facility. I would like to start by giving you a brief history.

In 2010 I could no longer stand the stench on my property. Being recently retired from the Brentwood Public School system, I found myself with time to go to 600 homes and talk to people about the nauseating problem. I found that no one was able to sit outside and enjoy their property by Aug. of 2011. Our Pa. right to clean air and water was the grounds on which I decided to organize families and get involved with local Rotraver commissioners about the problem. A local individual Mr. Gigliotti sold the land fill to CCS Midstream , run by Ron Levine and John McGarvey, then Trevita , of Alberta Canada a firm with interests in Marcellus shale took over. We attended years of meetings with our ROSTRAVER Twp. Commissioners and Trevita . We spoke with DEP officers George Sabochek, his supervisor David Lieford, constantly, making calls about the stench. Pa DEP air officers Tim Kunitz, Fred Walter, Sept. 14, 2012 . Finally in 2012 then State Representative Ted Harhai requested an air monitor unit to be brought to the area to see if there was the off gassing we all smelled. Becoming acutely aware of another problem our thoughts went not only to the smell but what was chemically in the smell. This monitor would not arrive until March 2013.

In a letter sent Dec. 7, 2012 by State Rep. Ted Harhai to Dave Leiford, Ted asked many questions for us about the new Oder system. This was DEP Lieford's comment " since the Dept. Does not employ health physicists, I can not accurately assess what health hazards the landfill odors/ dust may present or what additional health hazards may occur from masking the landfill odors. This issue would need to be brought before a qualified entity such as the federal Agency for Toxic Substances and Disease Registry". To say the least that was never done!

In Jan. Of 2013, Jack Kruell started bringing up radiation readings around the Belle Vernon Landfill, residual waste being hazardous, hydrogen sulfide and our ROSTRAVER commissioners just said they were not chemists. In 2013 the landfill put in a spray system they referred to as the Oder Neutralization system. We were very concerned what was in the Benzaco product being sprayed. As State Rep . Ted Harhai put it " if I have a bad knee and you give me a pill to take away the pain, I still have a bad knee. We can take care of the smell, but we're treating the symptoms. Once you mask the smell, that's only half the battle" at that time DEP regional spokesperson John Poister said air testing around the landfill perimeter was planned.

Also in Jan. 25,of 2013 the Dept. of environmental protection said Gov. Tom Corbett ordered a study on radioactivity in gas waste by products. Specifically, natural occurring radioactivity in underground water that comes back to the surface after drilling, as well as radiation levels during transportation, storage and disposal of drill waste. The study was to take 12 - 14 months. NEVER heard another word about the study!!!

In Jan. 2013 the Harald Standard recognizing that there were huge loopholes in the fracking industry wrote a 4 part series called " So Who is in Charge Anyway? Fracking falls through the cracks" written by Rachel Morgan . She pointed out how there is no regulatory body except perhaps the Pa. Dept. Of Environmental Protection . Not the Dept. Of Transportation, Nuclear Regulatory Commissioner, etc. NO ONE! Is Watching.

So by June of 2012 150 families sought to hire the Simon Law firm to represent us against the loss and enjoyment of our properties. We specifically were only able to hire them for that, not what was chemically coming out of the fumes that bombarded our properties. By then the Mobile unit had documented our case, the off gassing was occurring. The settlement was handled out of court for a million dollars against Trevita. This took several years to obtain.

In the meantime in April 26, 2013 the Pennsylvania Dept of Health , division of Environmental Health Epidemiology, wrote an "Evaluation of Ambient Air Monitoring Data Trevita Landfill, ROSTRAVER Township, Westmoreland County! Pennsylvania . On page 4 of the document under conclusions and recommendations " PADOH and ASTDR concluded that the potential exists for unhealthy exposures to these chemicals in the air and community. However, given the limitations of the OP-FTIR monitoring data generally, it is not possible for health agencies to quantitatively assess the potential health impacts of exposures to the chemicals detected in the air of the community using this data set." BUT ONCE AGAIN NOTHING WAS DONE TO FOLLOW with further testing.

So we would continue to call our DEP officers and ROSTRAVER Township about noise, smell, spray, etc . in April 2013, I reached out to EPA Senior Environmental Engineer Kurt Elster, US EPA Region 3 Air Protection Division (3A P00) He arranged a three way conversation with Zelma Maldonado, EPA, himself and me to discuss questions/ concerns about Trevita. Also during April 19, 2013 I spoke with th Pa. Dept of Health, Farhad Ahmad, Bob Helverson and Bob Strojan Region 3 they were going to send a letter of recommendation concerning health problems and levels to Dave Lieford of the DEP stating off site odor problems needed corrected. I also reached out to the Pitt Environmental Law Clinic Salim Oday ,Esq. staff attorney & adjunct professor . Unfortunately , after 3 years at the time, Zelma Maldonado, EPA, felt everything was being "addressed appropriately" with the Trevita landfill. It was so disheartening !!!!to learn this from Kurt Eisner, EPA. In June of 2013 we also wrote at length about our issues to Auditor General Eugene De Pasquale, telling him then that we did not ask for a radiation dumping ground in our community! Also in June of 2013 we wrote to Pa. Attorney General Kathleen Kane, included in our letters were our concerns for the previous 2 1/2 years the landfills foul odors and the disposal of drill cuttings, fracking fluid, fracking sand, and other produced fluids from the Marcellus gas's drilling industry.
It was becoming very obvious that the Marcellus Industry had deep pockets and our concerns continued to fall on deaf ears..or paid off ears!!

While we continued to attend meetings with the ROSTRAVER Township commissioners and Trevita officials, they would often come to the meetings with VP Mike Woods from Alberta, John Schwabe, Dale Burns (who had worked for the DEP but then went to work for the landfill), Adam Selker, and countless others to baffle officials with BS! We were to have a hearing board but because of our ROSTRAVER solicitor taking months to get back to the DEP it was dropped and we were denied a public hearing.

In April of 2013, Jack Kruell was able to talk to Mr. Krepps at the water treatment plant her in Belle Vernon. He told Jack at that time the sediment reports are from Trevita, every report was on an honesty trust evaluation, once the sample was checked it went back into the landfill.
So because of lack of time to discuss 6 more years of ongoing crap from the landfill I will get to the current issues. However if you ever really have time to sit down and discuss all 10 years I would be glad to and show you every document so you could review the entire situation.
So now let me skip way ahead to 2019. When those tests now came home to roost. The Belle Vernon Sewage Authority was unable to clean up the Leachate being sent to them from THE Westmoreland sanitary landfill LLC. Which is now owned by Noble Environmental , bought from Trevita..which sold off 27 other landfills they owned in the USA. We are now dealing with new DEP officer Matt Shawley, his supervisor MicK Plansenak (has now passed) now Ben Williams, new ROSTRAVER. Twp. Commissioners, new State Reps, some old EPA reps, Kurt Elster, The new Attorney Generals office, Josh Shapiro, Rebecca Franz, Tom Wolf, Ben Kosoglow and countless others. Commissioner Doug Chew, Protect PT, Dr. John Stolz, Paul Van Osdol of channel 4, and any one else that will listen to us. And this now includes you, Representative Sara Innamorato and Senator Katie Muth.

A year ago In 2019 Guy Krupa whistle blew on his own Belle Vernon Sewage Authority, because he did not want to do what the DEP wanted him to. That was to “dump” contaminated leachate that could not be sufficiently cleaned of chemicals into the river. The DEP said they should accept the fine money from the landfill and shut up about it. Fortunately Mr. Krupa has a set of morals and did not want this contaminated water dumped into the river. This contaminated flow would have been directly across from adjoining communities intake valves. Josh Shapiro shut off the pipe line from the landfill to the sewage authority for a short amount of time but after having time to investigate the problem Josh Shapiro has extended that order. Now that creates a huge problem for Rich Walton and Nick Stork and other investors that own Nobel Environmental, because that “Dump of a Mountain “ is still producing all that contaminated leachate. And they have to get rid of it. Dr. John Stoltz wrote a letter to Melissa Jativa, DEP, this past year telling of the contaminates found in those leachate samples. Saying how the composition of the leachate has high concentrations of chloride, bromide, barium etc. I wish to leave those results to be discussed by Dr. John Stoltz. But when I read a report that says there is a need for “ radiological testing” I have many concerns for our community. I know that Westmoreland Landfill LLC wants to have the DEP approve Permit application 65-00767C an evaporation system that would take “46,000 gallons “of leachate a day and put it into the air...and I quote the Westmoreland Landfills applications from the Valley Independent May

14,15, 2020. The evaporation system will put out:
2 tons of nitrogen oxide
2 tons of Carbon monoxide
8 tons of particulate matter
.2 tons of sulfur dioxide
1 ton of volatile organic compounds ..Look up the word Volatile!!! Change any minute!
.5 tons of hazardous pollutants HAZARDOUS

Are they kidding me!! Unfortunately They are not. No one waved a magic wand over the mountain of trash that now sits higher than anything in our valley. We are all down wind of it. Those same compounds that Dr. John Stolz spoke of did not go away!!!

And yet every day more from the Fracking industry continues to come in and be mixed with the garbage. I have long lists of all the violations that have occurred there this year in 2020.They have Letters of deficiency some of them are the leachate evaporation system,the major operating renewal permit, etc. at least 37violations. None of which the DEP sited the landfill For 2 fires and an explosion that sent a man by life-flight to a burn unit in Pittsburgh in 2020.

As of June 30 2020, this landfill contains 366,000 tons of residual waste from the fracking industry. West Virginia has sent 121,877 tons of residual waste from fracking that is high in radioactive materials. This landfill also contains 62,584 tons of sewage sludge that came from treatment plants which handled radioactive contaminated leachate. Unfortunately , I was only given a day to bring all of this to your attention. There is far more , like the 300 signatures we obtained in 4 days to try to stop the evaporation system in June. Once again , we only had days to submit signatures to the DEP. I would like to be able to meet with you, there is so much more to discuss. I hope you will be able to succeed in changing legislation about the fracking industry and landfills.

Very Sincerely,
Debby Fought