

Naturally-occurring Toxins in Fracking Wastes (short list)

Radium226 & 228	Causes breast, bone & liver cancers, Associated with leukemia Radioactive half-life of 1,600 years Decays into other radioactive material & lead
Arsenic	Associated with bladder, kidney & skin cancers
Lead	Children - Brain & nervous system damage, developmental delay Adults - High blood pressure & kidney damage
Barium	Abnormal heart rhythms
Strontium	Children - Impacts bone growth
Benzene	Causes Leukemia
Toluene	Nervous system, liver & kidney damage
Xylene	Memory, stomach upset, liver & kidney changes, impacts to fetus
Chromium 6	Dermal burns, vertigo, GI hemorrhage, liver & kidney damage
PAHs	Associated with skin, lung, bladder & gastrointestinal cancers
Bromides	React synergistically with chlorine added to disinfect drinking water creating brominated trihalomethane - highly carcinogenic

(Toxins in addition to chemicals used for drilling, hydraulic fracturing & on the well site to clean & service machinery)



Consideration of Radiation in Hazardous Waste Produced from Horizontal Hydrofracking

*Report of E. Ivan White
Staff Scientist for the
National Council on Radiation
Protection*

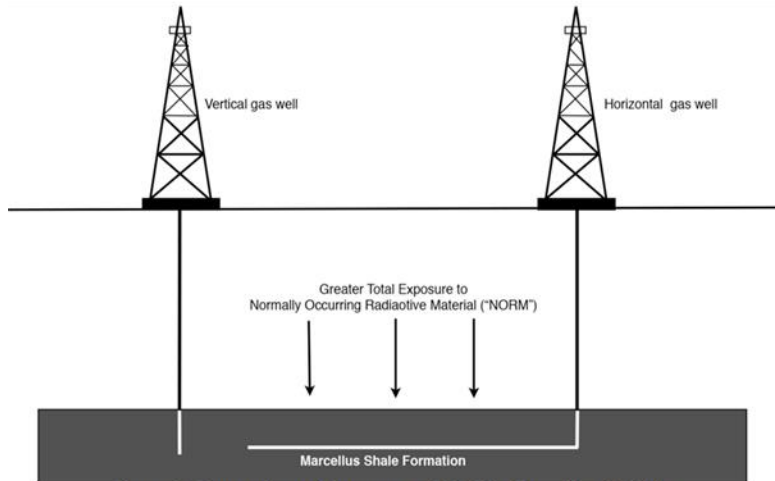


Figure 1: Comparison of Exposure to NORM in Marcellus Shale for Vertical Wells and Horizontal Wells

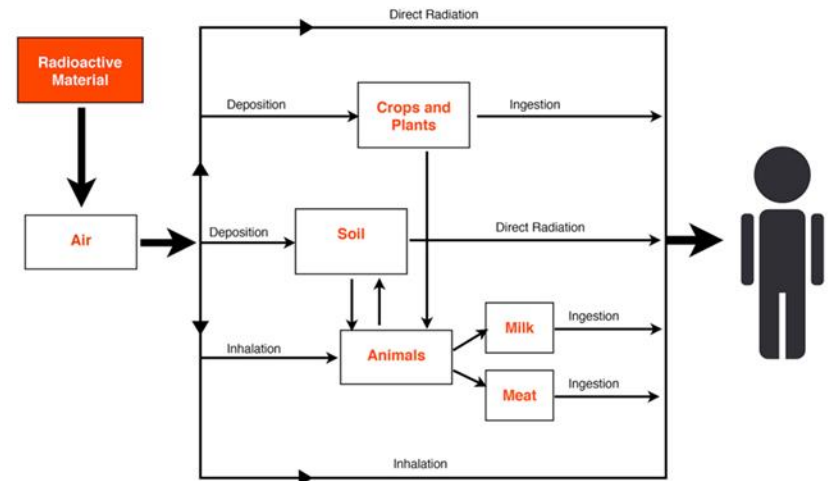


Figure 2: Pathways for Radiation Migration Through Air

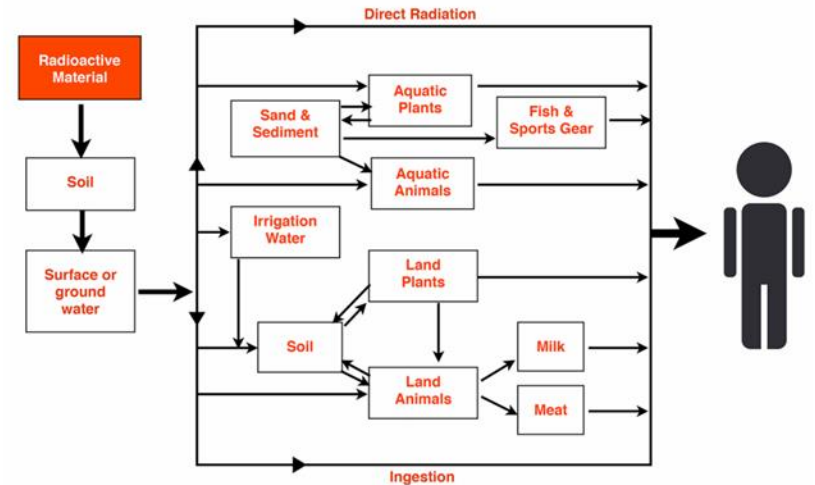


Figure 3: Pathways for Radiation Migration Through Soil and Water

Yale SCHOOL OF PUBLIC HEALTH

- 119 Carcinogens, known & suspected, can travel through air & water
- Toxins linked to developmental & reproductive health problems
- 1,157 known chemical additives



DARTMOUTH

High levels of radioactivity, chlorides, carcinogens & endocrine disruptors
12 miles from treatment facilities.



- Radioactive sediment in waterways in PA & ND
Spills and post-treatment discharge causing contamination
- Iodide, Bromide + Chlorine = Carcinogenic Trihalomethane
- 6,648 spills in 4 states over 10 years - 50% storing & moving waste

Yale SCHOOL OF ENGINEERING & APPLIED SCIENCE

Elevated Levels of Diesel-like Chemicals Found in 65 Home Wells
Tied to surface spills Trace amounts found 3-5 years later



Study: Fracking associated with migraines, fatigue, chronic nasal and sinus symptoms

Johns Hopkins study links fracking to premature births, high-risk pregnancies

Researchers look at nearly 11,000 births in north, central Pennsylvania

colorado school of
public health

Age 5-24 Leukemia
4.3 x likely live near
dense drilling activity



Increased Hospitalizations in
Heavily-drilled PA Counties:

Cardiology
Neurology
Dermatology
Neonatology
Urology
Oncology

Potential Chain of Radioactive & Chemical Contamination in CT

Transport*	Accidents, leaks, spills Run-off, leaching into soil, ground & surface water	
Transfer & Storage*	Accidents, leaks, spills Run-off, leaching into soil, ground & surface water	
Hazardous Waste Facility*	Concentrated residuals transferred out of state Effluent Discharged to local sewage system Effluent to POTW or City Waste Water Facilities	
Effluent to POTW*	Effluent discharged to waterways Sludge to incinerators	
Trash to Energy Incinerator	Incinerator emissions Disposal of incinerator ash	
Beneficial Use (BUD) Permits**	Solids Construction fill Road base Brownfield capping De-watered salts	Liquids Sprayed on roads De-icer Dust control
	Run-off, leaching into soil & surface water	

* Contamination &/or remediation costs in other states with regulations

** PADEP reversed policy for solid waste BUD permits 5 years after permitting, "lack of transparency"

Comparison of Local Ordinance Prohibitions vs Current CT Law and Proposed 2018 Senate Bill 103

Types of Oil & Gas Drilling & Extraction Waste	Bans in 37 of 38 CT Towns	Current CT Law	SB 103 TBD
Gas Drilling Process (DP) Drilling Muds	X		? X
Gas DP Drill Cuttings	X		? X
Gas DP Liquid Leachate from Solid Wastes	X		? X
Gas Hydraulic Fract. Process (HFP) Flowback	X	X	? X
Gas HFP Flowback w/ Drill Cuttings Mix	X	X	? X
Gas HFP Flowback w/ Brine Mix	X	X	? X
Gas HFP Flowback w/ Used Frac Sand	X	X	? X
Gas Chemicals Used on Rig/Service Fluids	X	X	? X
Gas Production Process Brine w/ Gas Flow	X	?	? X
Gas Dehydration Process Brine/Impurities	X	?	? X
Gas Underground Storage Waste	X		? X
Liquified Petroleum Gas Waste	X		? X
Oil DP Drilling Muds	X		? X
Oil DP Drill Cuttings	X		? X
Oil DP Liquid Leachate from solid wastes	X		? X
Oil HFP Flowback	X		? X
Oil HFP Flowback w/ Drill Cuttings Mix	X		? X
Oil HFP Flowback w/ Brine Mix	X		? X
Oil HFP Flowback w/ Used Frac Sand	X		? X
Oil Production Process Brine w/ Oil Flow	X		? X
Oil Chemicals Used on Rig/Service Fluids	X		? X

Current law is a temporary moratorium with a mandate for future regulations. The CT state legislature has had opportunity 3x in 5 years to create a permanent ban. It is not yet known if Senate Bill 103, a stronger bill, will pass this year, or if it will be signed by Governor Malloy.

