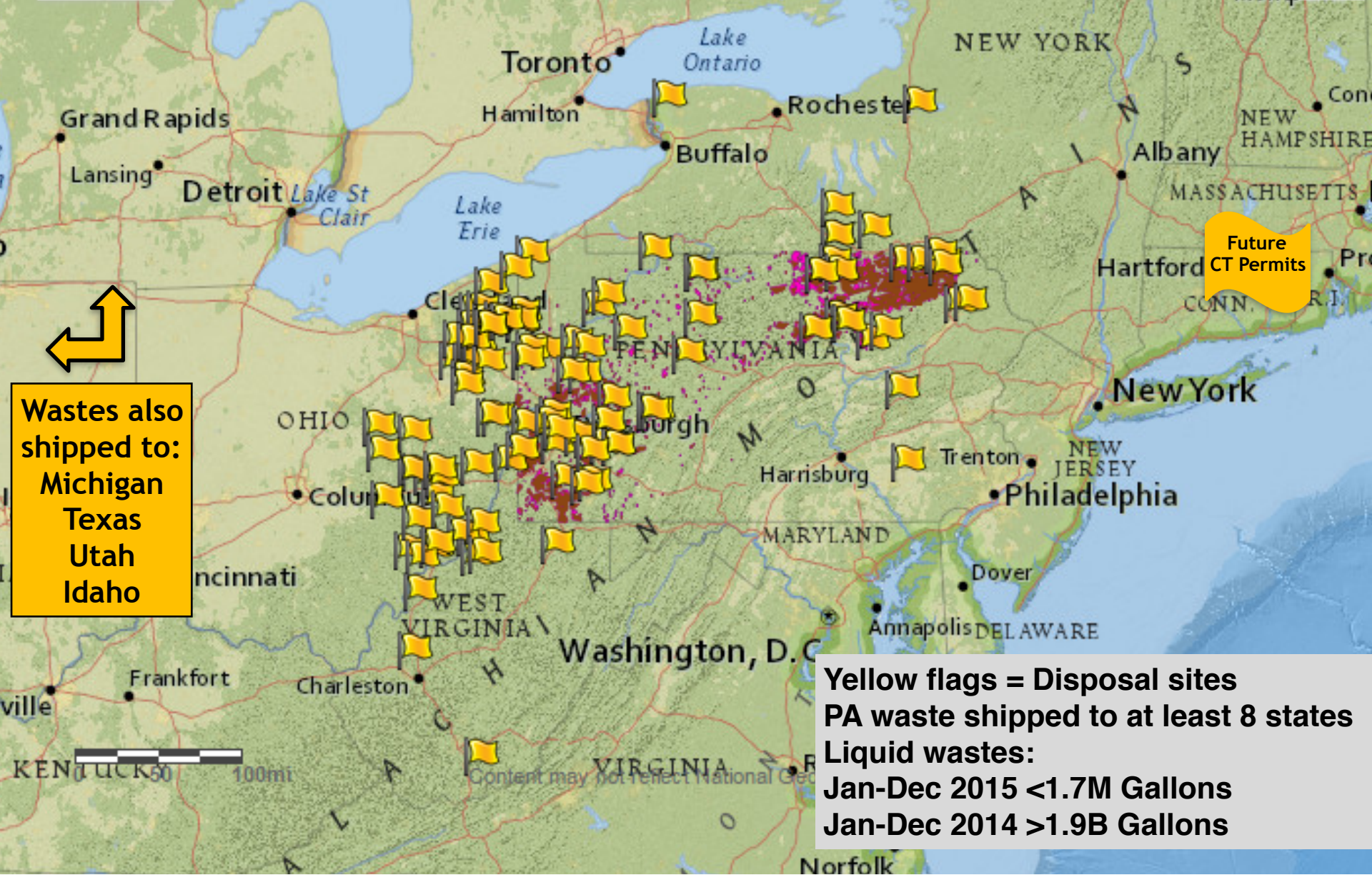




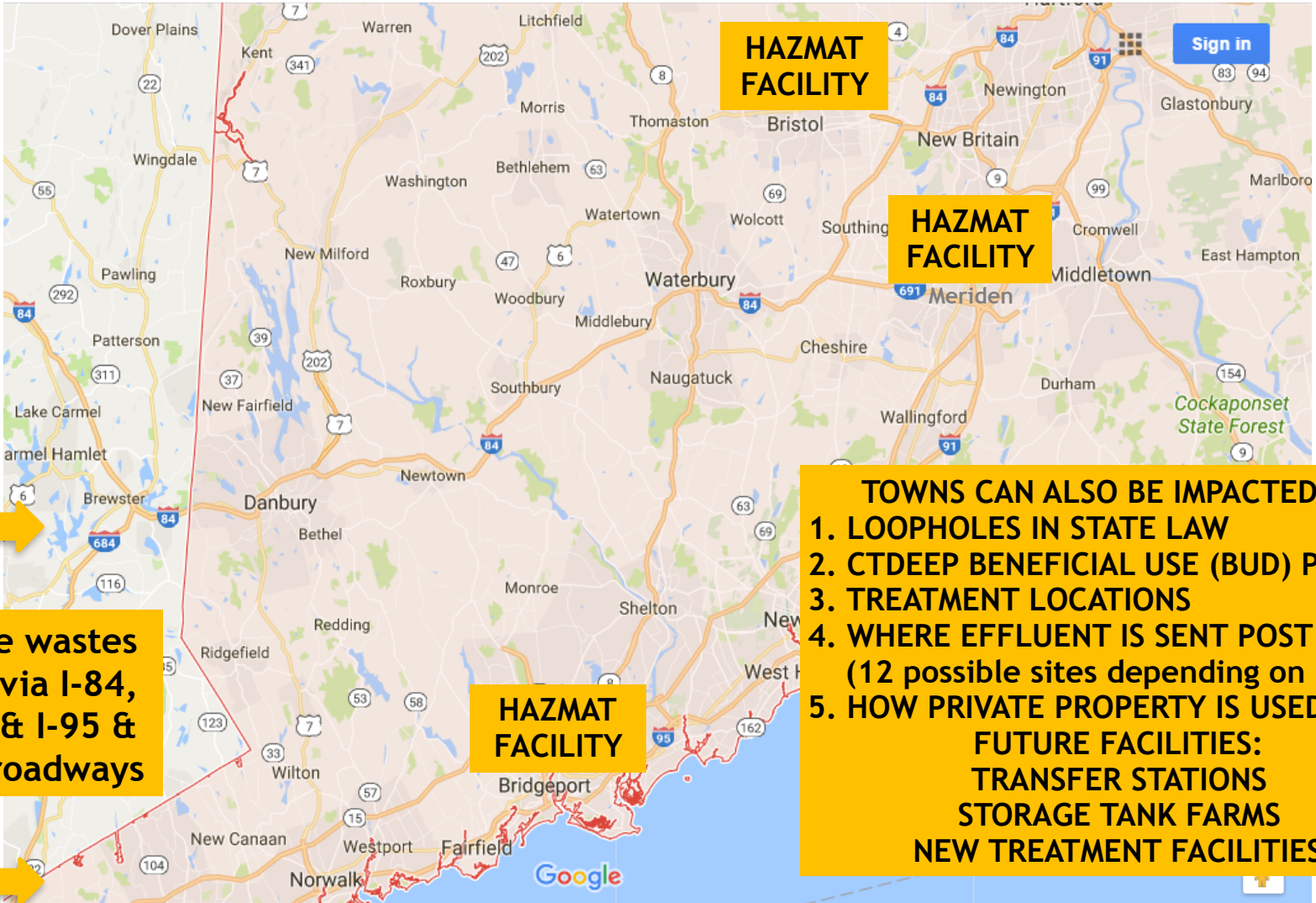
Fracking Waste in Connecticut

Protecting Towns from Future State Regulations & Loopholes
Toxins & Risks of Radioactive & Chemical Contamination
Jen Siskind, Local Coordinator, jsiskind@fwwlocal.org





Current State Law: Temporary moratorium + Mandate for future regulations
Current Leg Session: Senate Bill 103 On Senate calendar



Future wastes to CT via I-84, RT 7, & I-95 & local roadways

- TOWNS CAN ALSO BE IMPACTED BY:**
1. LOOPHOLES IN STATE LAW
 2. CTDEEP BENEFICIAL USE (BUD) PERMITS
 3. TREATMENT LOCATIONS
 4. WHERE EFFLUENT IS SENT POST TX (12 possible sites depending on Regs)
 5. HOW PRIVATE PROPERTY IS USED
- FUTURE FACILITIES:**
TRANSFER STATIONS
STORAGE TANK FARMS
NEW TREATMENT FACILITIES

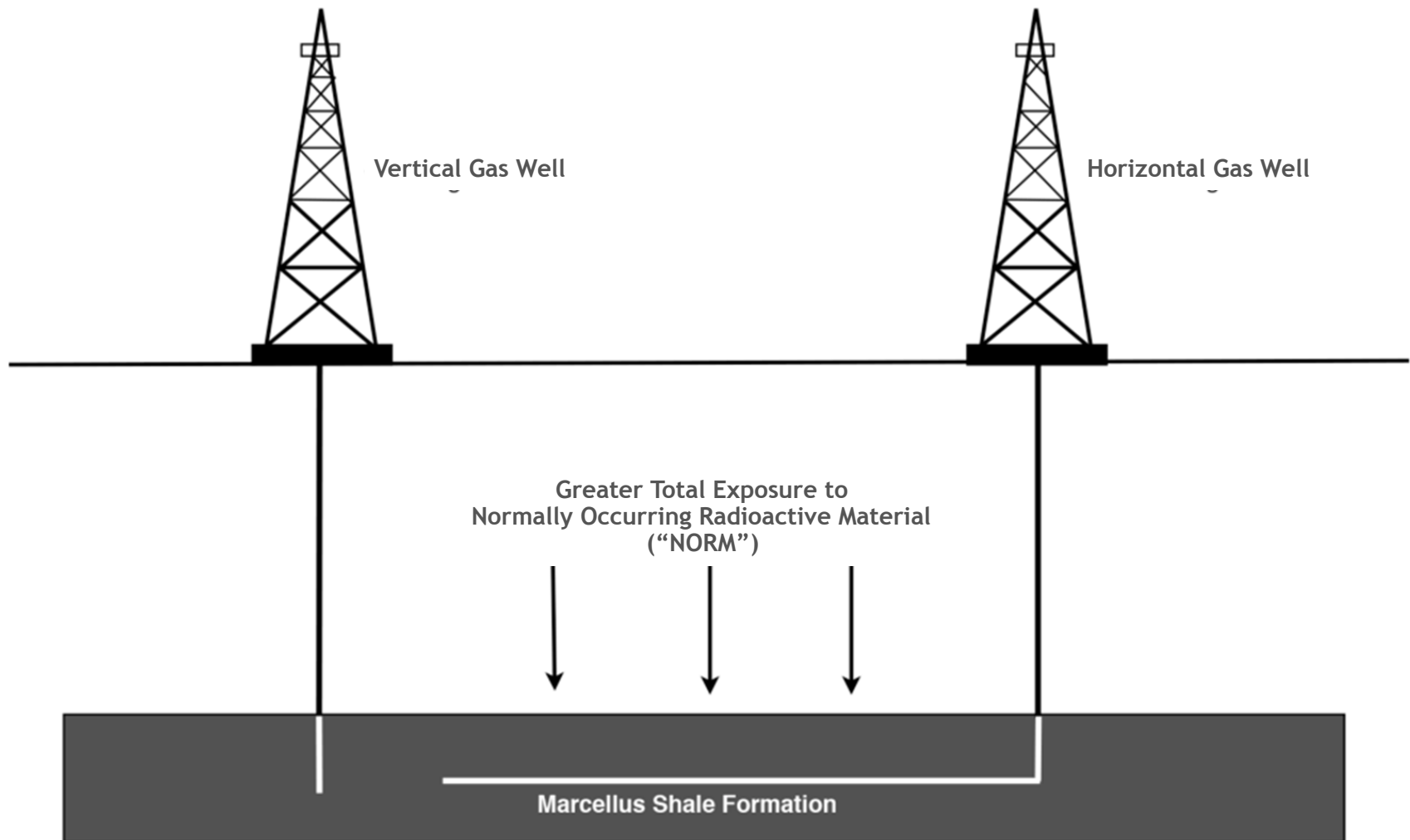


Figure 1: Comparison of Exposure to NORM in Marcellus Shale for Vertical Wells and Horizontal Wells

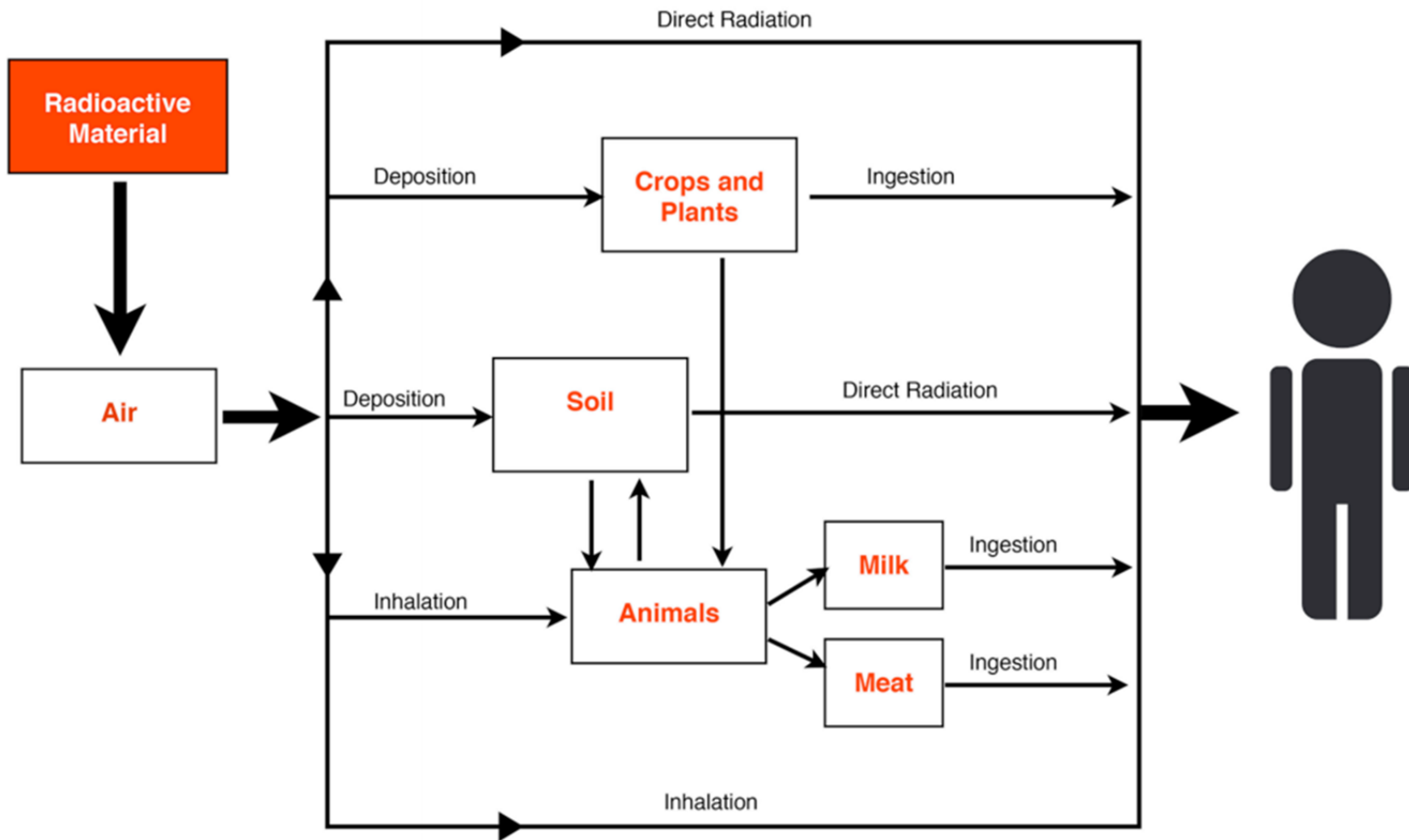


Figure 2: Pathways for Radiation Migration Through Air

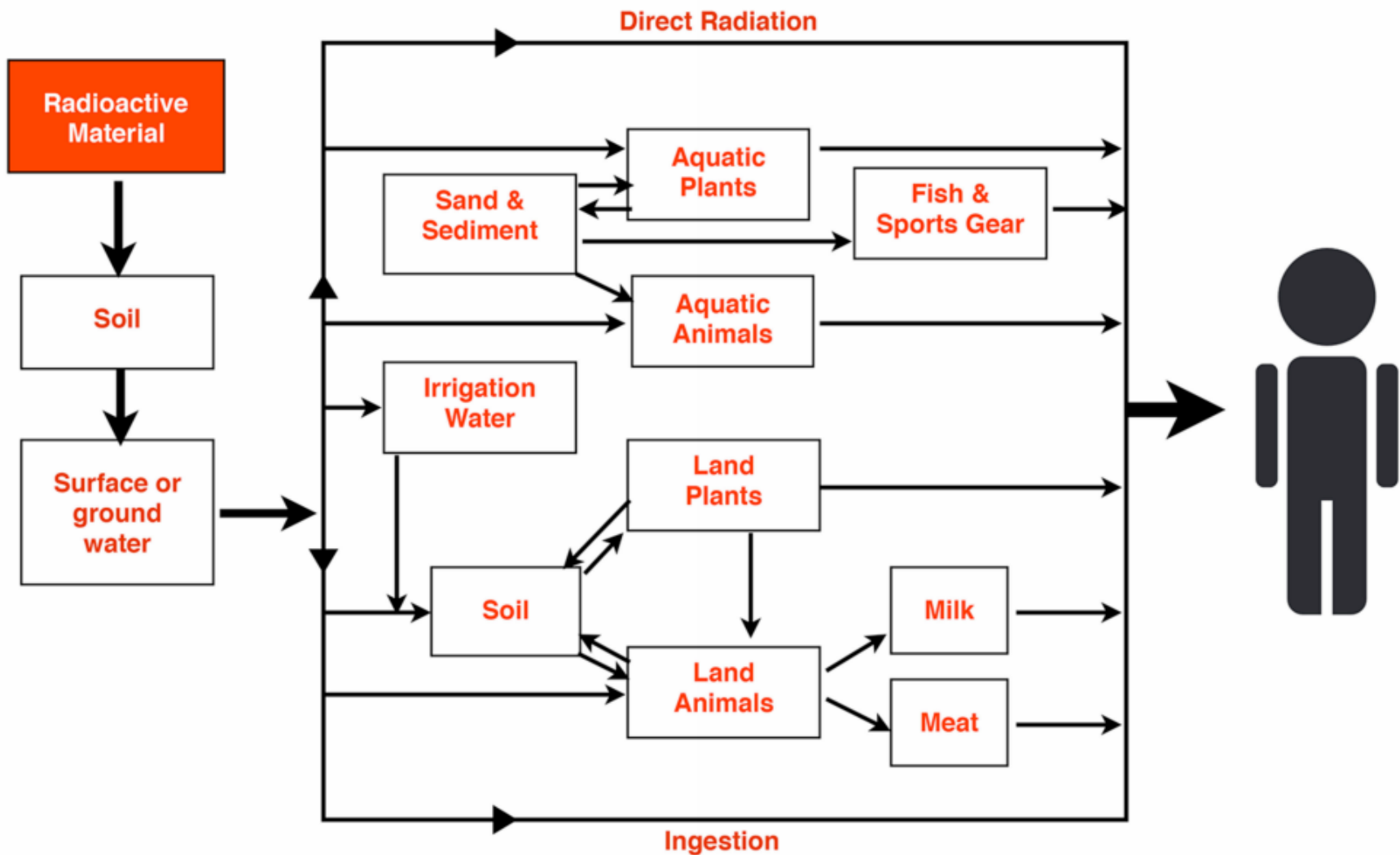


Figure 3: Pathways for Radiation Migration Through Soil and Water

JS/FWW added notes below:

26,600 pCi/L

5 pCi/L
Safe Drinking Water Limit

1,600 yr radioactive half-life
Cumulative
Bioaccumulates

Causes Breast
Bone and
Liver Cancers

Associated with
Adult and Childhood Leukemias

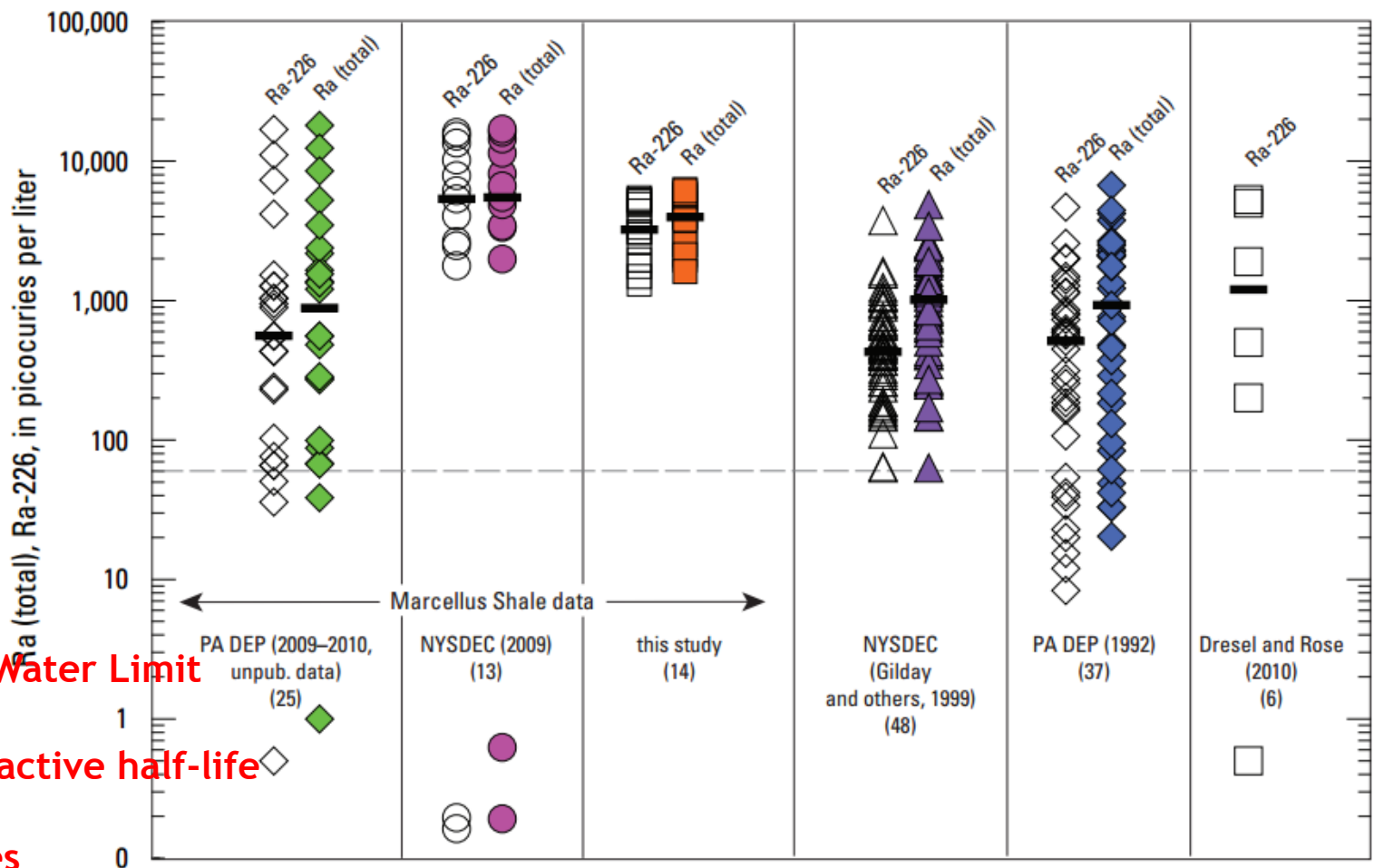


Figure 4. Measured activities for total radium (Ra-226 + Ra-228) and Ra-226 for each of the data sources used in the study. The three datasets for produced water from Marcellus Shale wells are shown on the left; the remaining three datasets are for non-Marcellus Shale wells. The number of points in each dataset is shown in parentheses, and the median values are plotted as heavy black lines. For reference, the dashed line shows the industrial effluent discharge limit (60 pCi/L) for Ra-226 (U.S. Nuclear Regulatory Commission, <http://www.nrc.gov/reading-rm/doc-collections/cfr/part020/appb/Radium-226.html>).

US Geological Survey (USGS) Radium Content of Oil- and Gas-Field Produced Waters in the Northern Appalachian Basin (USA): Summary and Discussion of Data By E.L. Rowan,¹ M.A. Engle,¹ C.S. Kirby,² and T.F. Kraemer¹

Health Affects of Naturally-occurring Toxins

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

649 Known chemicals in 2011

56% Examined & reported here-363*

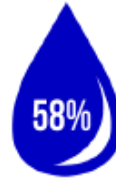
44% No information available
on these chemicals

Soluble in water = Run-off & leaching
Impact drinking water supplies
Impact soil, property & surface waters

Volatile = Vaporize
Travel through air - Inhaled
Settle on surfaces, water & crops
- Absorbed by skin
- Ingested

Colborn, et al 2011
Physicians for Social Responsibility-LA
www.PSA-LA.org

FOR THE 56% OF
FRACKING
CHEMICALS WE
CAN IDENTIFY



SOLUBLE
IN WATER



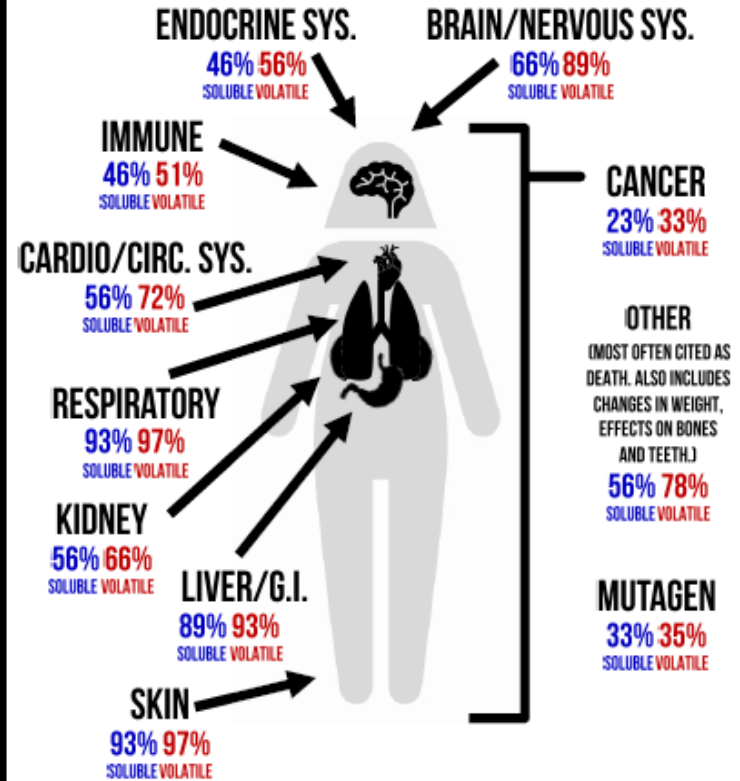
VOLATILE

SMALLER PERCENTAGE,
BUT BIGGER IMPACT. THESE
CHEMICALS CAN BE
INHALED, SWALLOWED,
AND/OR ABSORBED
THROUGH THE SKIN

ALL IMAGES FROM
THE NDJN PROJECT —
FRACKING: TOM ANANTWERP,
STOMACH: SERIO DELGADO
GARCIA, HEART: CATHERINE
PLEASE, LUNGS: JORIS HOOGEN-
DOORN, WATER DROP: CRIS
DOBBINS, CLOUD: JAMES FEN-
TON, QUESTION CLOUD: ANAS
RAMADAN, WOMAN: LUIS PRADO

BODY SYSTEMS AFFECTED BY FRACKING CHEMICALS*

SHOWN WITH % OF CHEMICALS AFFECTING EACH BODY SYSTEM
(SOLUBLE CHEMICALS IN BLUE AND VOLATILE CHEMICALS IN RED)



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 disrupters
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



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



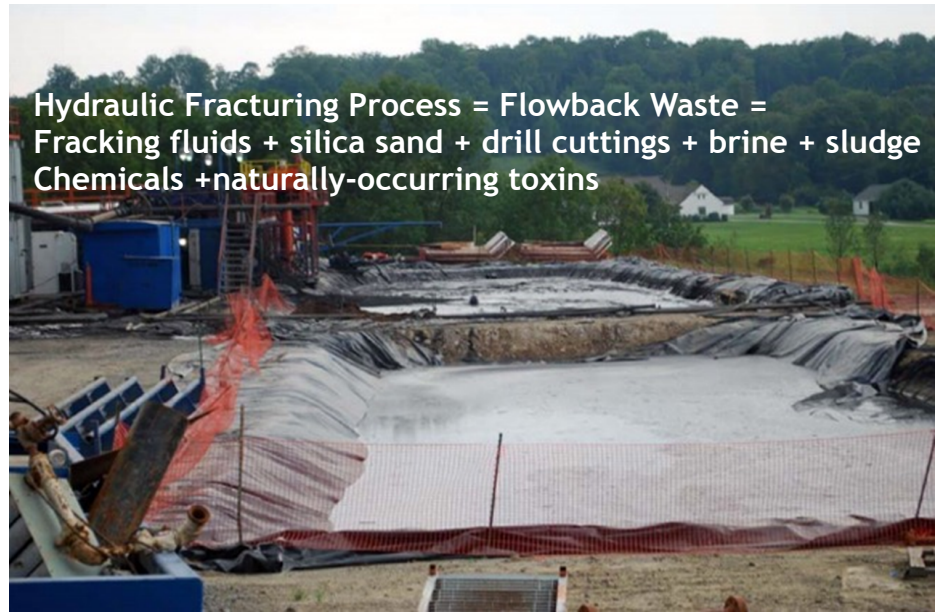
Increased Hospitalizations in
Heavily-drilled PA Counties:

Cardiology
Neurology
Dermatology
Neonatology
Urology
Oncology

Drilling Process = Drill Cuttings & drilling muds
Chemicals + naturally-occurring toxins



Hydraulic Fracturing Process = Flowback Waste =
Fracking fluids + silica sand + drill cuttings + brine + sludge
Chemicals + naturally-occurring toxins



Production/Dehydration Process
Produced Water or Brine
Residual chemicals + naturally-occurring toxins



"Fresh Water" (Industry term)
Partially treated & re-used many times
Finally too contaminated to use & needs disposal
Chemicals + naturally-occurring toxins



EPA Violations



www.riversalliance.org

Click on:

- Priority Topics
- HazWaste Treatment
- CT HazWaste Treatment Facility Compliance Overview

Clean Harbors of CT Inc. of Bristol													
(USEPA ECHO ID: 110002083478)													
	QTR. 2	QTR. 3	QTR. 4	QTR. 5	QTR. 6	QTR. 7	QTR. 8	QTR. 9	QTR. 10	QTR. 11	QTR. 12	QTR. 13*	
Clean Water Act Permit Compliance For The Past Three Years	Apr Jun 2013	Jul Sep 2013	Oct Dec 2013	Jan Mar 2014	Apr Jun 2014	Jul Sep 2014	Oct Dec 2014	Jan Mar 2015	Apr Jun 2015	Jul Sep 2015	Oct Dec 2015	Jan Mar 2016	Apr Jun 2016
Facility Status During That Quarter:	In Viol	In Viol	In Viol	In Viol	In Viol	In Viol	In Viol (Rslvd)	No Viol (Rslvd)	No Viol	In Viol	No Viol	In Viol	In Viol*

Tradebe Treatment and Recycling Northeast LLC of Meriden													
(USEPA ECHO ID: 110000316248)													
	QTR. 1	QTR. 2	QTR. 3	QTR. 4	QTR. 5	QTR. 6	QTR. 7	QTR. 8	QTR. 9	QTR. 10	QTR. 11	QTR. 12	QTR. 13*
Clean Water Act Permit Compliance For The Past Three Years	Apr Jun 2013	Jul Sep 2013	Oct Dec 2013	Jan Mar 2014	Apr Jun 2014	Jul Sep 2014	Oct Dec 2014	Jan Mar 2015	Apr Jun 2015	Jul Sep 2015	Oct Dec 2015	Jan Mar 2016	Apr Jun 2016
Facility Status During That Quarter:	In Viol (ResPend)	In Viol (ResPend)	In Viol (ResPend)	In Viol	SNC / Cat 1	In Viol	In Viol ****	In Viol ****	In Viol	In Viol ****	In Viol	In Viol (ResPend)	In Viol*

Tradebe Treatment and Recycling of Bridgeport													
(USEPA ECHO ID: 110000317069)													
	QTR. 1	QTR. 2	QTR. 3	QTR. 4	QTR. 5	QTR. 6	QTR. 7	QTR. 8	QTR. 9	QTR. 10	QTR. 11	QTR. 12	QTR. 13*
Clean Water Act Permit Compliance For The Past Three Years	Apr Jun 2013	Jul Sep 2013	Oct Dec 2013	Jan Mar 2014	Apr Jun 2014	Jul Sep 2014	Oct Dec 2014	Jan Mar 2015	Apr Jun 2015	Jul Sep 2015	Oct Dec 2015	Jan Mar 2016	Apr Jun 2016
Facility Status During That Quarter:	In Viol	SNC / Cat 1	SNC / Cat 1	In Viol (Rslvd)	SNC / Cat 1	In Viol (Rslvd)	In Viol **	SNC / Cat 1	SNC / Cat 1	No Viol (Rslvd)	SNC / Cat 1	SNC / Cat 1	In Viol*

Partially-treated effluent is discharged into the sewage systems of Bristol, Meriden & Bridgeport. Depending of future regulations, there is risk of still contaminated & radioactive effluent to also be sent to additional Publicly Owned Treatment Works (POTW) in CT. See slide 17 for locations.



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	Liquids
	Construction fill & concrete	Sprayed on roads
	Road base	De-icer
	Brownfield capping	Dust control
	De-watered salts	
		Run-off, leaching into soil & surface water Premature crumbling of concrete Slippage of fill underneath roads or at projects

* Contamination & remediation costs in other states with regulations

** PADEP reversed policy for solid waste BUD permits 5 years after permitting

Oil & Gas Drilling & Extraction Wastes	Local Bans in 39 of 40 CT Towns JF Senate Bill 103 on Senate Calendar	Moratorium	
		2017 HB	Raised 2018 SB 103
Gas Drilling Muds	X		
Gas Drill Cuttings	X		
Gas Hydraulic Fracturing Flowback	X		X
Gas Flowback & Drill Cuttings Mix	X		X
Gas Flowback & Brine Mix	X		X
Gas Flowback & Used Frac Sand	X		X
Gas Brine Produced During Gas Flow	X		?
Gas Chemicals Used on Pad Surface	X		?
Gas Underground Storage Waste	X		
Gas Liquified Petroleum Gas Waste	X		
Oil Drilling Muds	X		
Oil Drill Cuttings	X		
Oil Hydraulic Fracturing Flowback	X		
Oil Flowback & Drill Cuttings Mix	X		
Oil Flowback & Brine Mix	X		
Oil Flowback & Used Frac Sand	X		
Oil Brine Produced During Oil Flow	X		
Oil Chemicals Used on Pad Surface	X		

Section 561 Budget Bill - Passed December 2017

(CGA Env Committee may raise House Bill 5454 to address in 2018 Session)

Sec. 561. (NEW) (*Effective from passage*)

Notwithstanding (“regardless of”) any provision of the general statutes, the Department of Energy and Environmental Protection shall review and make a final determination on each of the following (45) types of permit applications not later than ninety days after receipt of such application:

- (1) Air permits for the temporary use of radiation DTX or the temporary use of radiation RMI
- (8) disposal of special waste
- (12) waste transportation
- (39) solid waste facility operator
- (40) wastewater treatment facility operator certification

Following such ninety-day period, if a final determination on such an application is not made by said agency, such application shall be deemed approved.

