



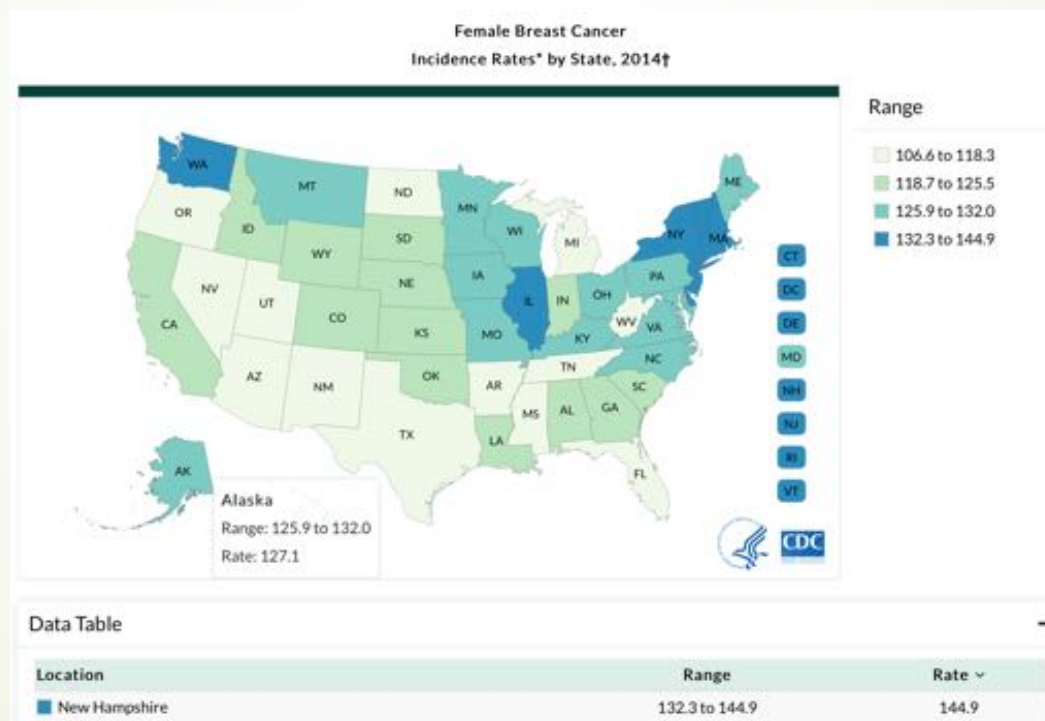
Subcommittee Meeting for Coakley Landfill Governor's Task Force for the Pediatric Cancer Investigation

August 23, 2017

New Hampshire and Cancer

CDC- Defined Double Pediatric Cancer Cluster – 5 town area of Seacoast - RMS, PPB and brain cancer

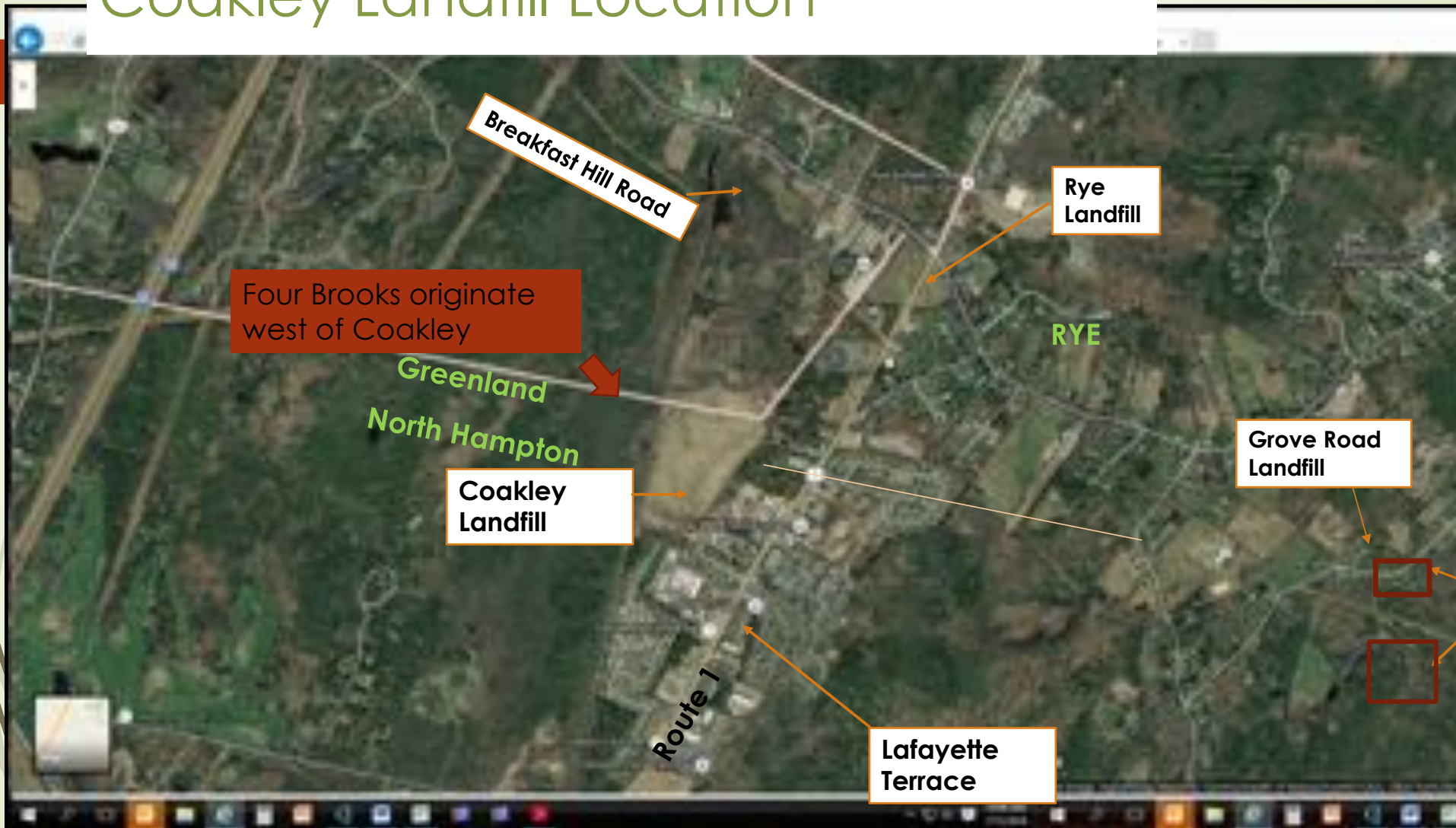
- New Hampshire has the highest incidence rate of breast cancer in the country.
- New Hampshire has a higher incidence rate for many types of cancer than Vermont.



Subcommittee Process

- **Series of Public Meetings**
- **Scientific Inquiry – had input from:**
 - **NHDES**
 - **USEPA**
 - **USGS**
 - **Rye Town Water**
 - **Public**
 - **Coakley Landfill Group**
 - **Comprehensive Historical Documentation Review**
 - **Subcommittee Members Met with Abutting Landowners**
 - **Site Walk**

Coakley Landfill Location



**1984 aerial photo – near
new development area**



1984



Finding: Bedrock is porous – lots of potential for migration of contamination.



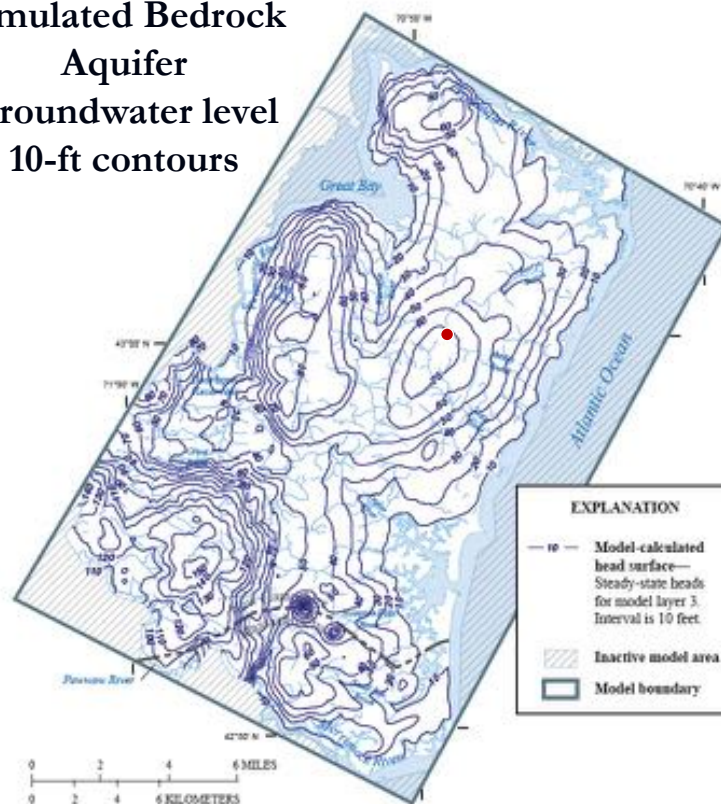
New Castle Bedrock



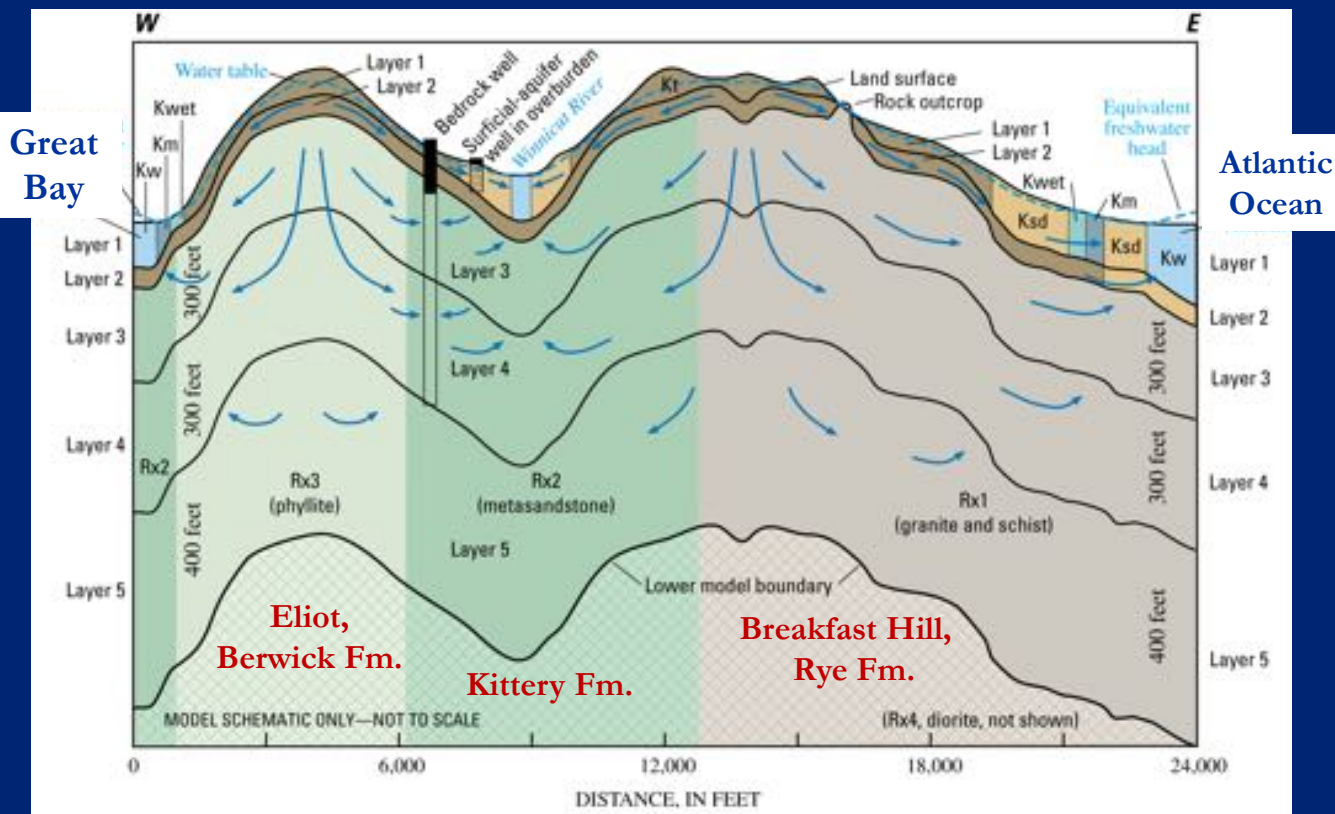
Rye Bedrock

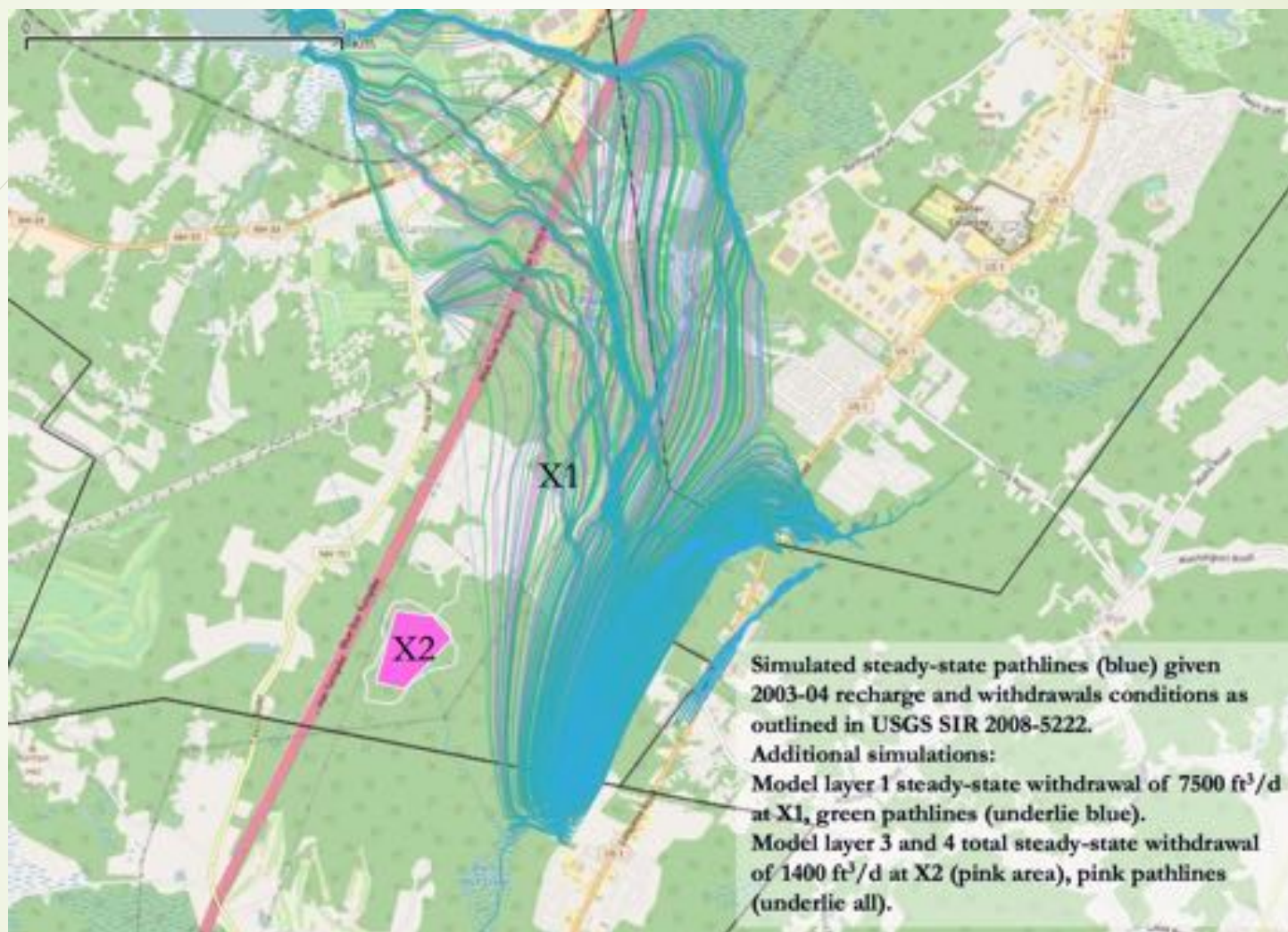
Finding: Groundwater Flow is radial (in all directions from the landfill).

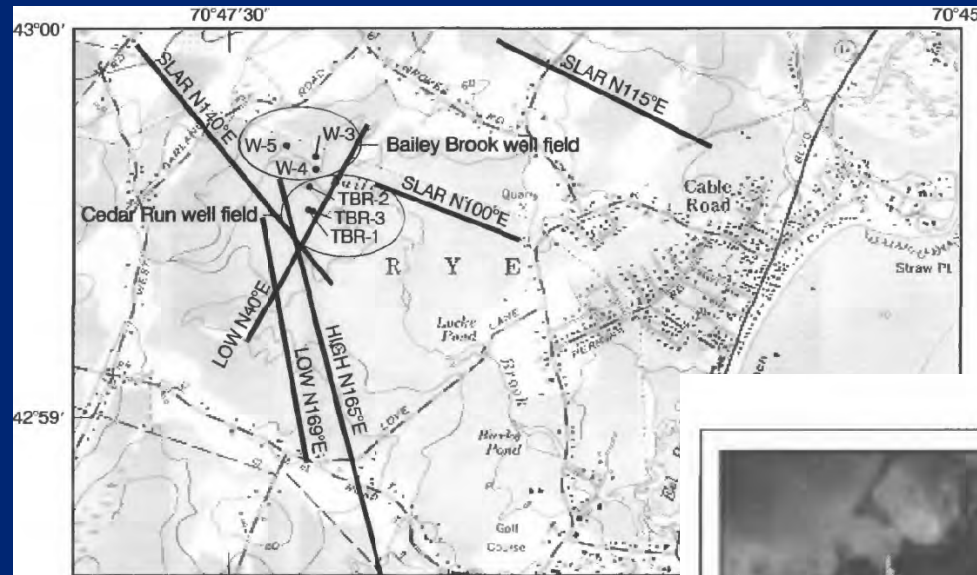
**Simulated Bedrock
Aquifer
Groundwater level
10-ft contours**



Model Cross Section







Base from U.S. Geological Survey
1:24,000 Hampton, N.H.,
1957, photorevised 1973

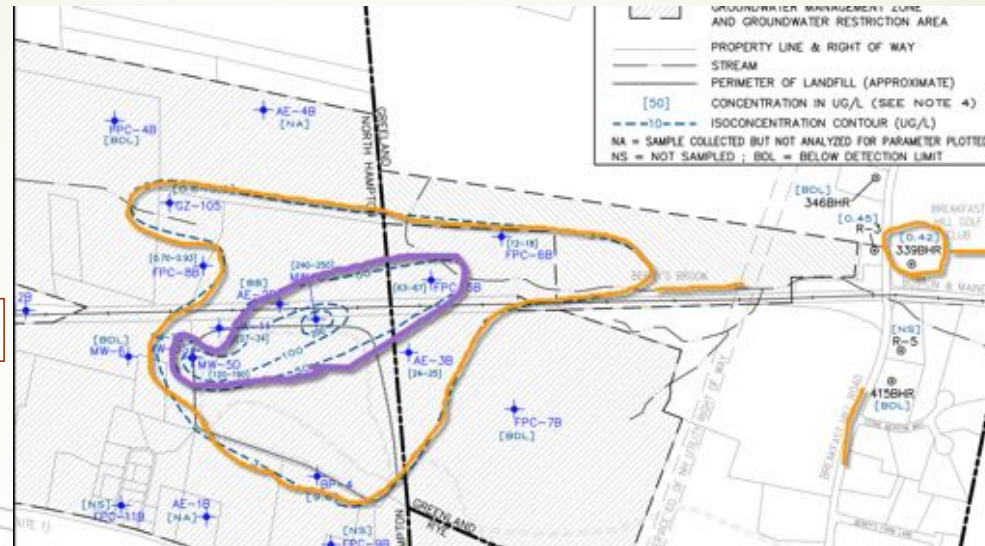
Lineaments and highly fractured bedrock
At Bailey Brook test well shown in:
USGS Open-File Report 98-558



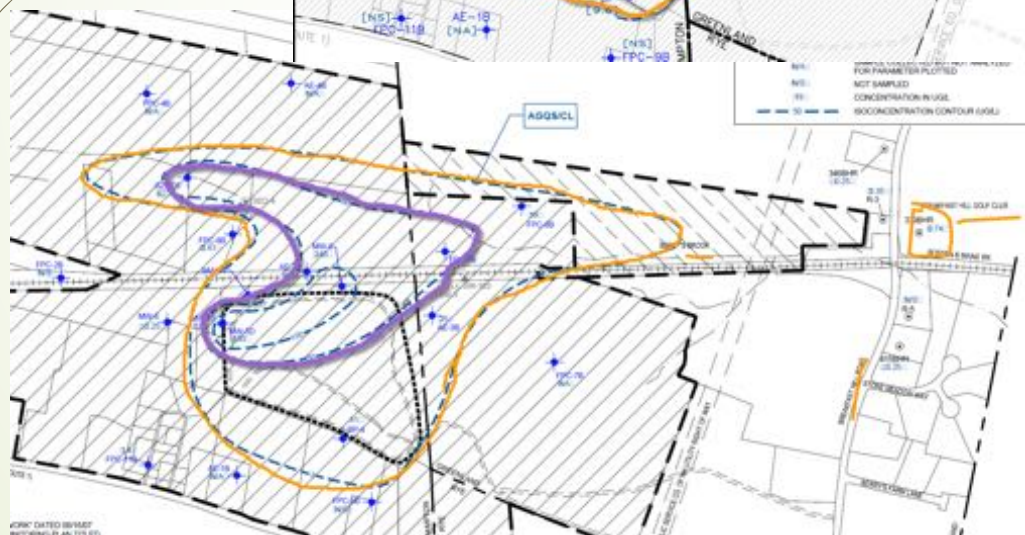
(d) Shows the zone at 393 ft where the
well collapsed at a wide, open and
enlarged fracture.

1,4-Dioxane in Bedrock 2013 and 2015

2013



0.42
ug/L
in
2013

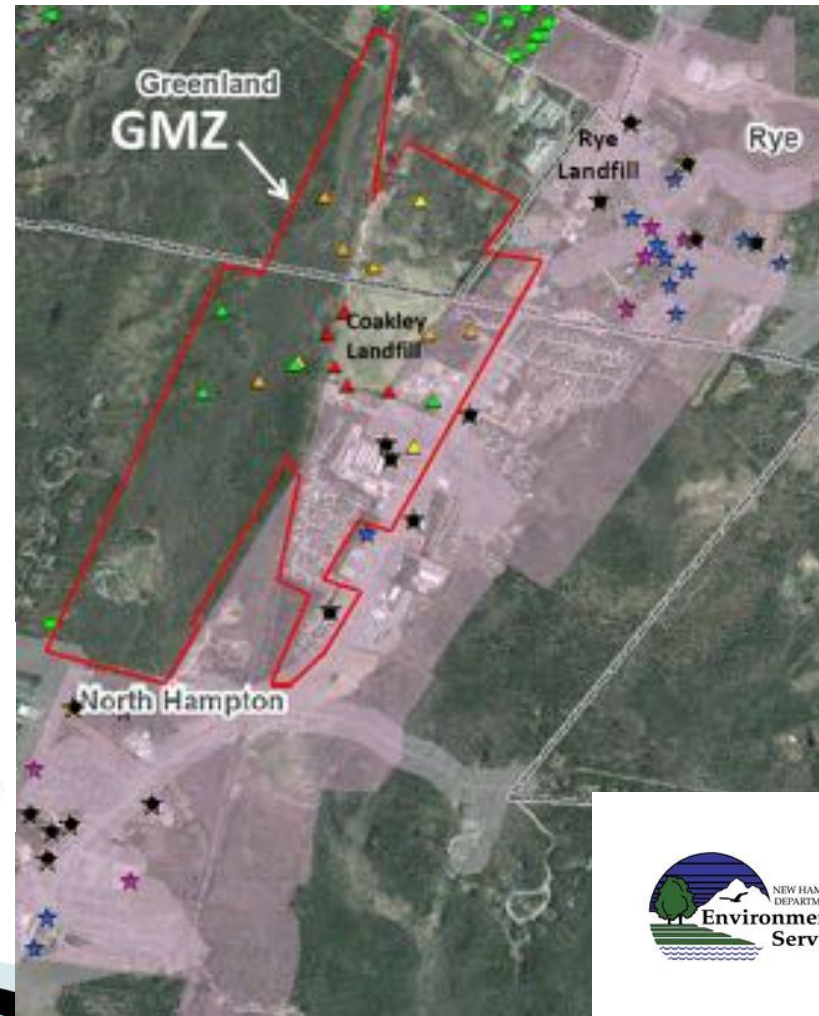


Well on
golf club
0.74 ug/l
(2015)

2015

Area Private Well Survey

- Postcards Mailed
- ★ Drinking Water Well
- ★ Non Drinking Water
- ★ Well Likely (not connected to public water)



In the beginning

- Dupont introduced Teflon in 1946
- 3M introduced Scotchgard in 1956
- Both discovered by accident!

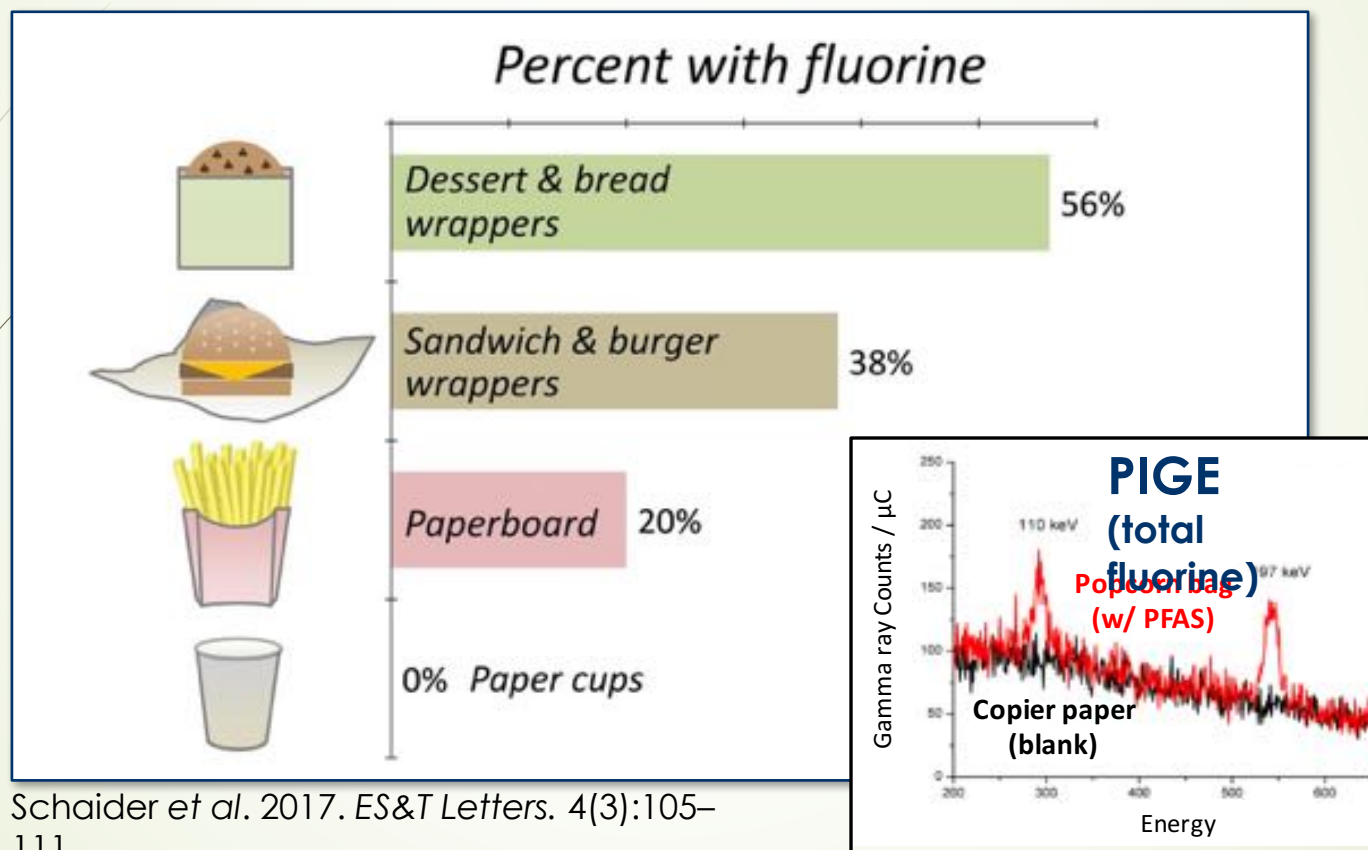


Drinking water contamination sources

- Production facilities and other manufacturing
- Fire fighting foams
 - Air force bases, airports
- Wastewater
 - Sewage treatment plants
 - Septic systems
- Landfills



Prevalence of fluorinated chemicals in U.S. fast food packaging



Schaider *et al.* 2017. *ES&T Letters*. 4(3):105–111.

PFCs do not degrade in the environment and
“bioaccumulate” in our bodies through a variety of
ex

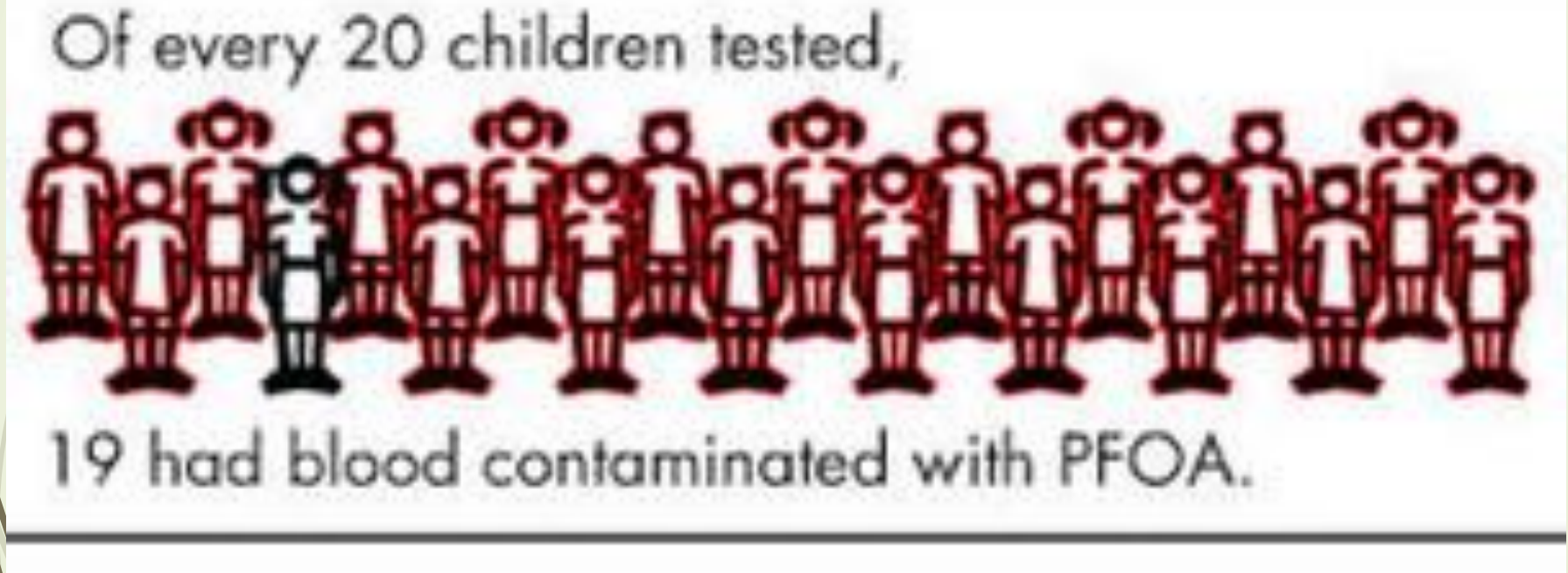


Photo Credit: The Sensitive Life www.thesensitivelife.weebly

In May 2016, EPA issued stricter drinking water guidelines for PFOS and PFOA

- 2009 guidelines:
 - 200 ng/L PFOS, 400 ng/L PFOA
- 2016 guideline:
 - PFOS + PFOA: 70 ng/L
- Guidelines lacking for other PFASs
- Some states have lower guidelines
 - NJ - noted effects on mammary gland development, proposed 14 ppt for PFOA
 - Vermont - 20 ppt total PFCs, early childhood
 - Minnesota – 35 ppt for PFOA and 27 for PFOS - infant



Most of the PFCs come from Drinking Water Exposure – serum levels 5 to 8 times higher than the US average from drinking 70 ppt PFOA

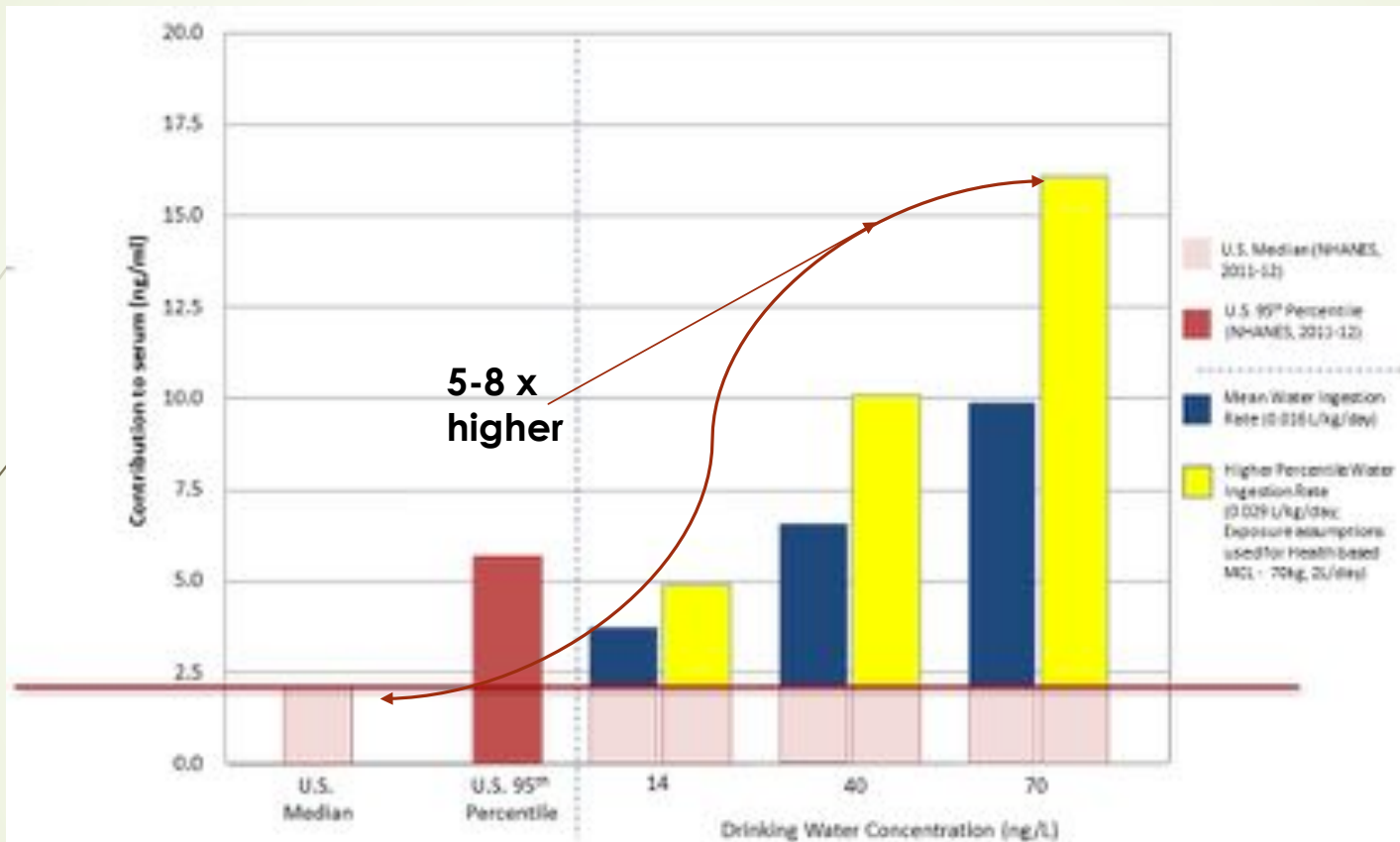
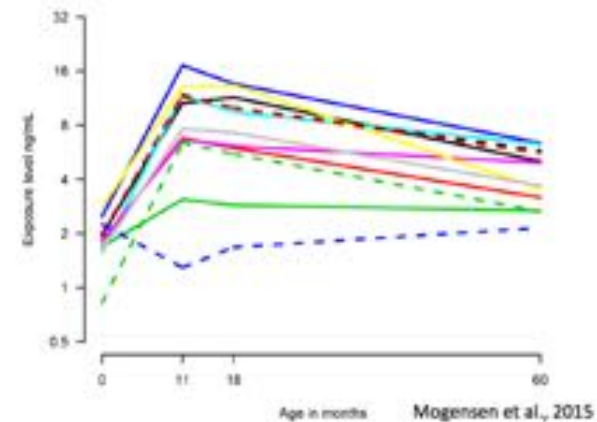
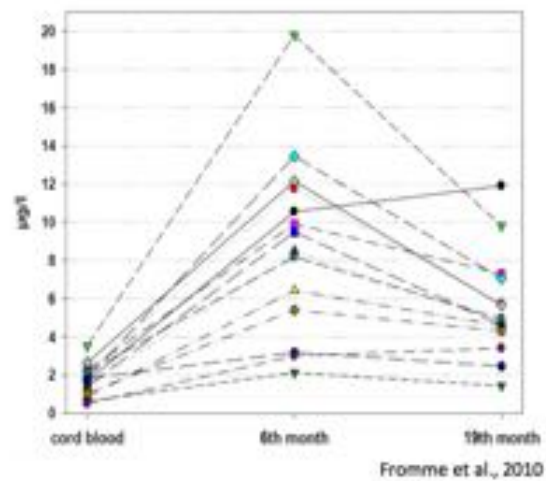
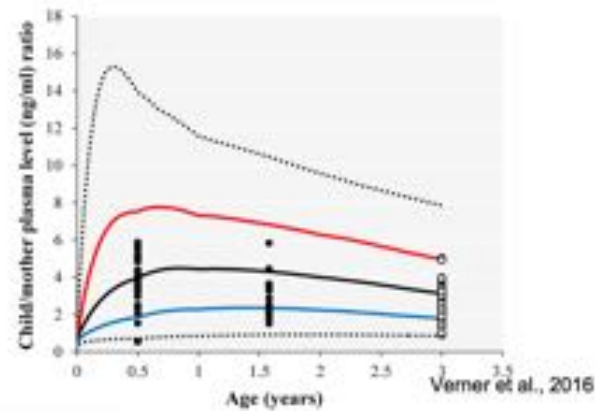


Figure 1. Increases in serum PFOA concentrations predicted from consumption of drinking water with various concentrations of PFOA (14 ng/L – Recommended Health-based MCL; 40 ng/L – NJDEP guidance (2007); 70 ng/L – USEPA Lifetime Health Advisory).

Increases in Infant PFOA Serum Levels after Birth



C8 Science Panel Study

1. Minimum exposure of 50 ppt PFOA
2. 69,000 exposed People Studied
3. Probable links to testicular and kidney cancer, thyroid disease, pregnancy-induced hypertension, autoimmune disease, high cholesterol. Other studies determined ADHD.
4. Total so far of \$1.5B in DuPont Payouts



(http://www.c8sciencepanel.org/prob_link.html)

The Low Cost of Cancer - C8 Settlement v. DuPont now totaling \$1.5B. DuPont pays base \$1.35M for testicular cancer
<https://t.co/js61PoipbW>



The Low Cost of Cancer | Shaun Assael

The Low Cost of Cancer by shaun | Aug 10, 2017 | blog, GenX Chronicles | 0 comments While federal and state officials spent this week in Wilmington, NC, trying to clean up the mess that DuPont has made of the Cape Fear...

SHAUNASSAEL.COM



Health effects of PFOS and PFOA

- Laboratory studies of animals
 - cancer (liver, testicular, pancreatic)
 - liver enlargement
 - mammary gland tumors, altered breast development
 - immunotoxicity and changes in cholesterol
- Studies of human populations
 - high cholesterol
 - thyroid disease
 - cancer (testicular, kidney)
 - pregnancy-induced hypertension
 - ulcerative colitis
 - immunotoxicity in children





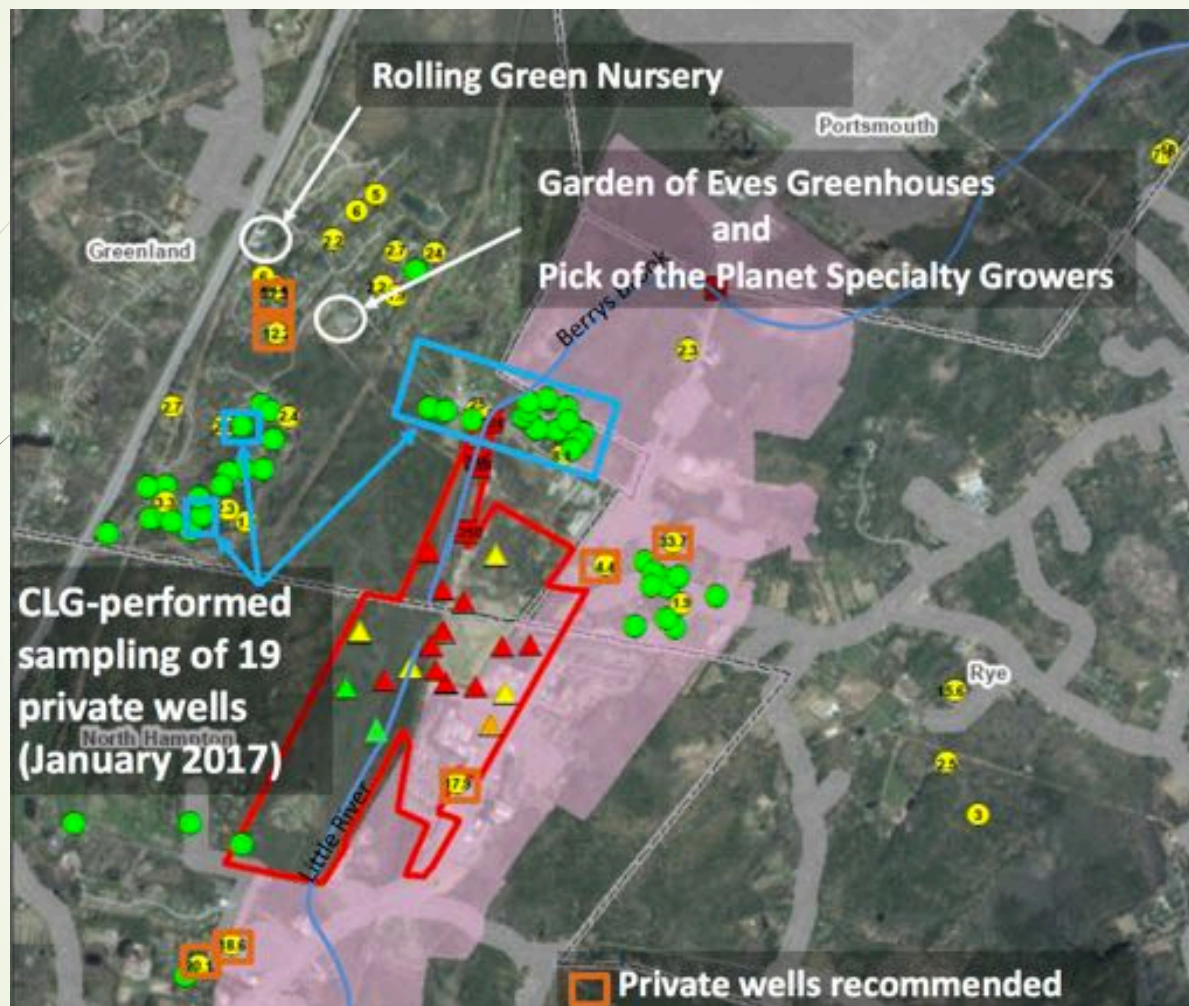
PFOA/PFOS and Antibody Response

- There is strong evidence of antibody suppression with increased concentrations of both PFOA and PFOS in animal studies.
- Human studies suggest a similar pattern of reduced antibody response to specific vaccines with increasing concentrations of PFOA and PFOS.
 - Results were not consistent among studies for all vaccines
 - Reduced response demonstrated to rubella, diphtheria, mumps, and (for PFOA) tetanus vaccines



HB485 retained in finance.

HB 463; Amendment 2017-1678s proposes the adoption of criteria for emerging contaminants in drinking water with the most conservative approach to exposure for children and other vulnerable populations-





Surface water issues need attention

1. Only brook really evaluated Berry's Brook
2. Fish stocking – 5,000 per year in Berry's Brook
3. Need full length investigation of all brooks originating at Coakley
4. PFCs at high levels in Berry's Brook tied to Coakley

PFNA in Seacoast Waterway Tied Second Highest Ever Detected



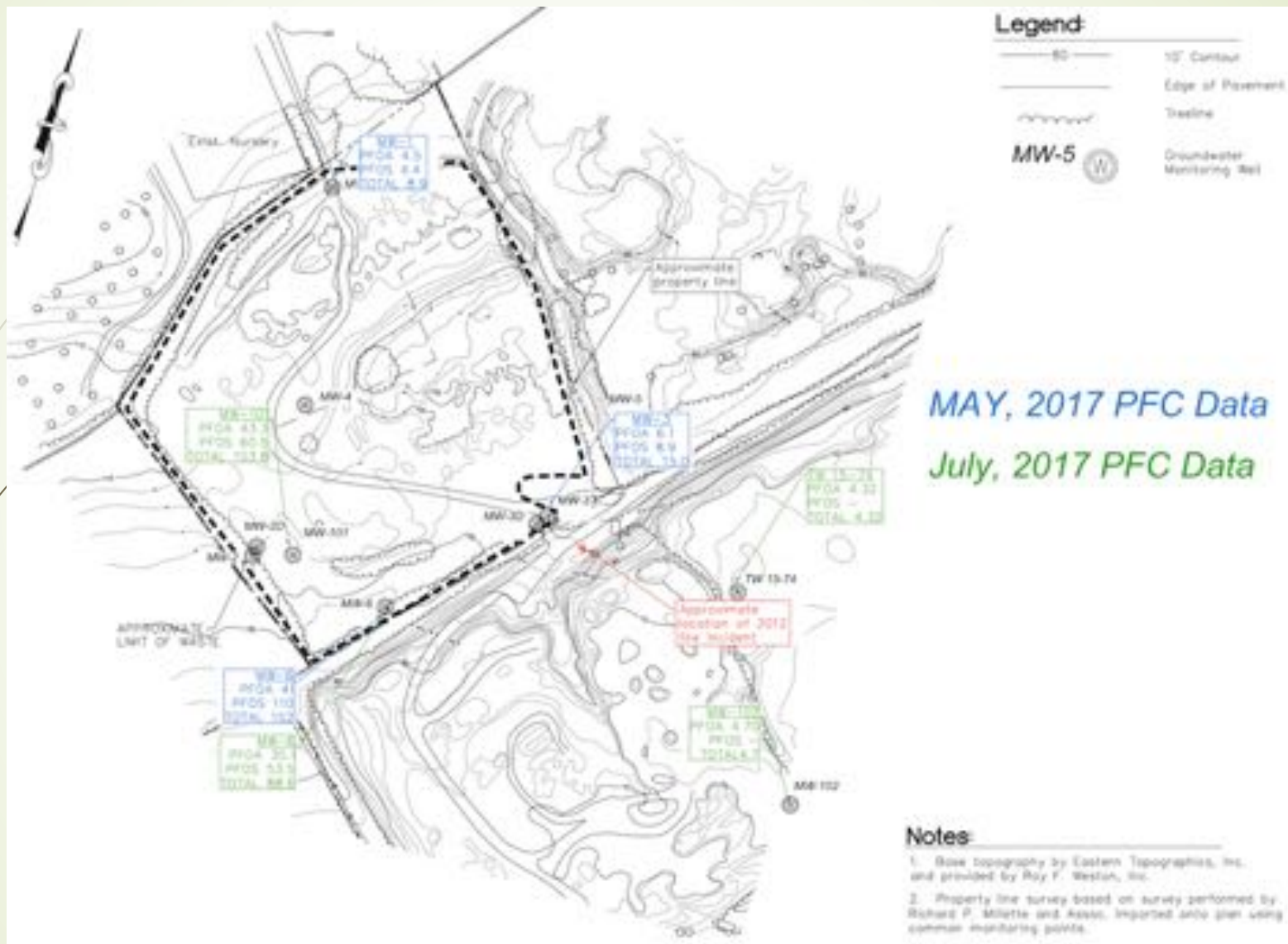
Once again, I have been pushed into making a public criticism of the New Hampshire Department of Environmental Services (DES) and U.S. Environmental Protection Agency (EPA) over something

that they have had fair warning about. For several months now, I have been speaking in emails to the regulators and in public meetings about my concerns relating to the unmitigated contamination of waterways which originate near Coakley Landfill located in Greenland, New Hampshire. I have publicly discussed the fact that the concentration of one perfluorinated chemical (PFAS), perfluorononanoic acid (PFNA), was detected in Berry's Brook on now three occasions at very high concentrations, some of the highest in the world.

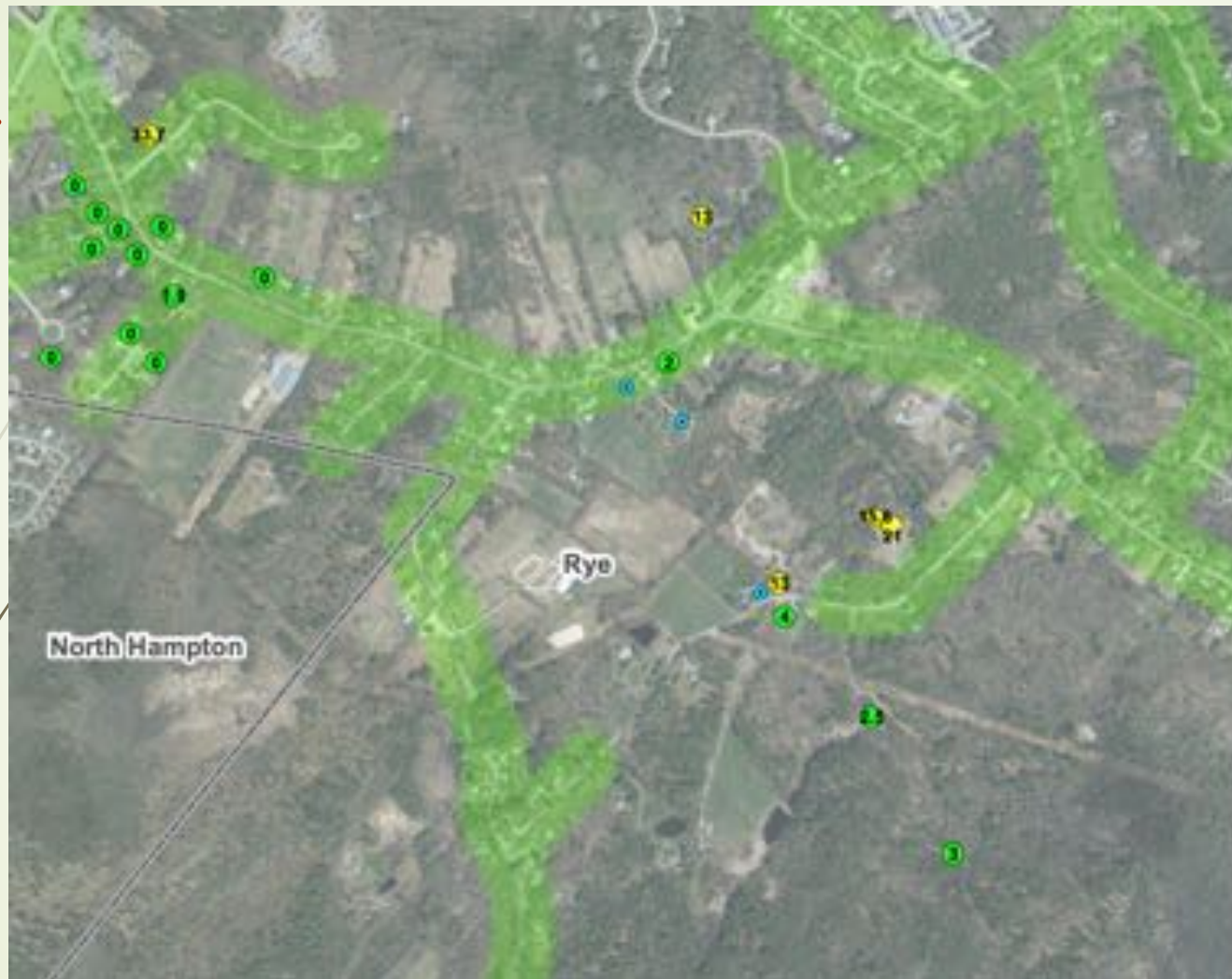
**Aquarion
Wells in North
Hampton
and Hampton**



Rye – Grove Road Landfill



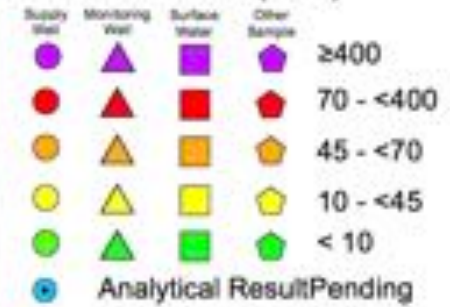
Rye - Grove Road Landfill



PFAS INVESTIGATION
Updated: August 8, 2017

Please note that the data presented is under constant revision as new sites or facilities are added. The data may not contain all of the potential or existing sites or facilities. NHDES is not responsible for the use or interpretation of this information. Not intended for legal purposes.

PFOA + PFOS (PPT)



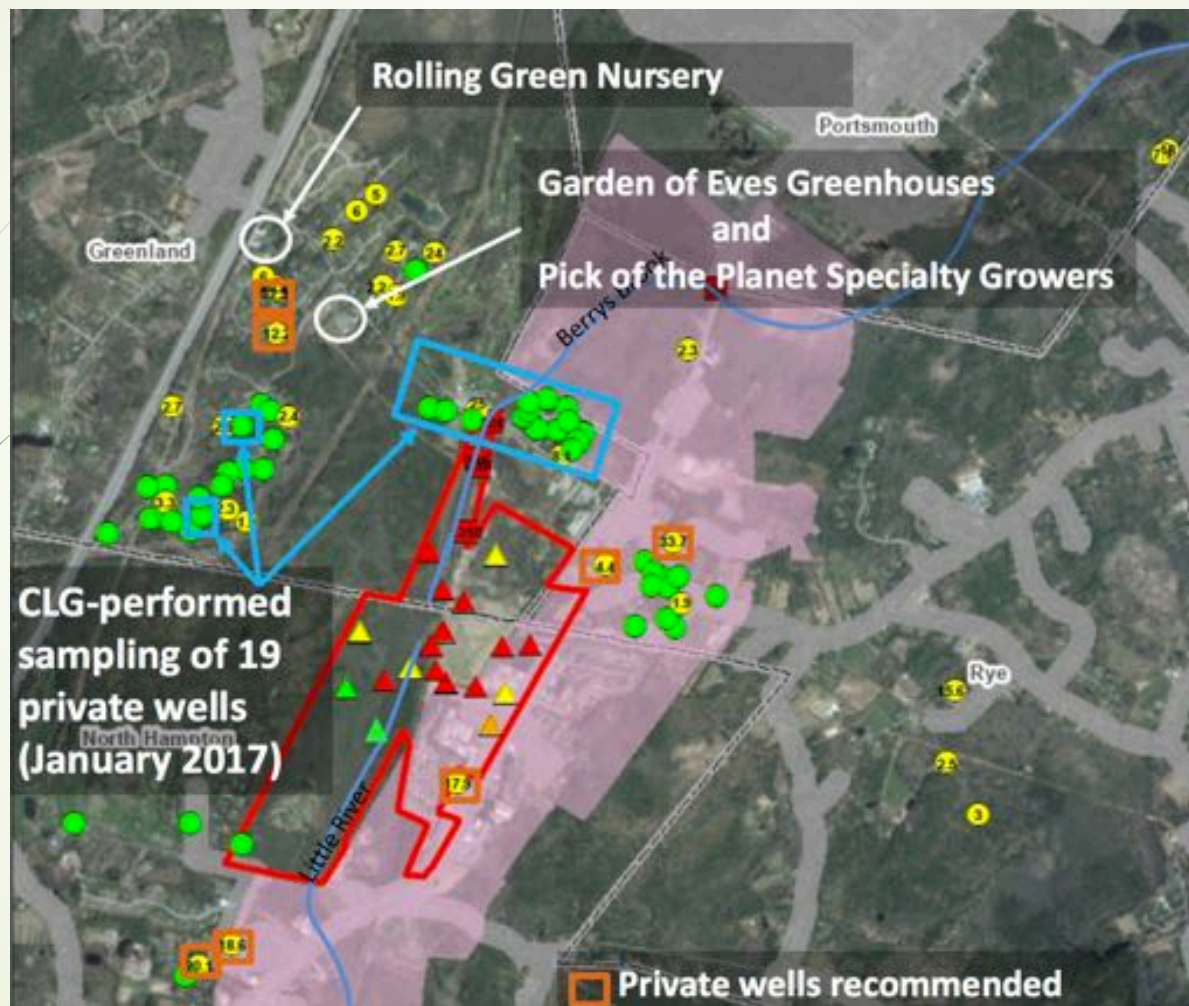
Political Boundary

Public Water Distribution

0 500 1,000 2,000 Feet

1 inch equals 1,000 feet







Draft Recommendations

- 1. DRINKING WATER PROTECTION
- 2. SLOW/MONITOR ASSESS THE MIGRATION
- 3. ASSESSING THE PROBLEM
- 4. PUBLIC HEALTH ASSESSMENT
- 5. FUTURE COMMITTEE/REGULATORY COORDINATION

Updates Since Interim Report

- 1. DES Letter
 - Signs need to be posted 👍
 - Fish need to be assessed in Berry's Brook
 - Need to mitigate contamination in brooks
 - BUT DES and EPA say they have no authority to compel remediation
- Greenland and Portsmouth have submitted a proposal to the MTBE fund to access funding for water lines to serve Breakfast Hill Road
- Rye Landfills – PFCs detected at levels in excess of AGWQS
 - All Rye wells show increasing PFOA and PFOS not decline
- Hampton/North Hampton Aquarion wells, closing of Well MW-6 (20 ppt to 87 ppt in a year).
 - Other wells nearby also saw increasing concentrations



Recommendations

- We have elevated levels of pediatric cancers
- We know there is unmitigated flow in surface water and groundwater.
 - Original remediation plan relied on natural attenuation
 - PFCs don't attenuate
 - Flow into Greenland private wells and residential areas
 - Flow into Rye (Bedrock), North Hampton and Hampton
 - Historical cancer cases in North Hampton – Lafayette Terrace
 - Increasing PFC concentrations year over year in Aquarion wells and RWD wells
 - Private wells exist in Greenland, Rye (Bedrock wells RWD), North Hampton where levels of PFCs are below current NHDES AGWQS
- **THEREFORE - REMEDIATE!**