Southern New Hampshire PFOA Investigation: Public Meeting in Amherst, NH

May, 18 2016

Agenda

- **Introduction**
  - Clark Freise, Assistant Commissioner
- **PFCs/PFOA Background and the Amherst Investigation**
  - Mike Wimsatt, Director, Waste Management Division
- **Health Effects**
  - Dr. Benjamin Chan, State Epidemiologist
- **Actions to Date**
  - Brandon Kernen, Manager, Hydrology/Conservation
- **Next Steps and Information/Communication**
  - Clark Freise, Assistant Commissioner
- **Questions and Answers (written)**

  Hand to Nate Jensen or DES staff during presentation please!
  - Nate Jensen, Selectman and Moderator
- **Informal Q&A (verbal – 2 minute limit)**
  - Nate Jensen, Selectman and Moderator

PFCs/PFOA Background and the Amherst Investigation

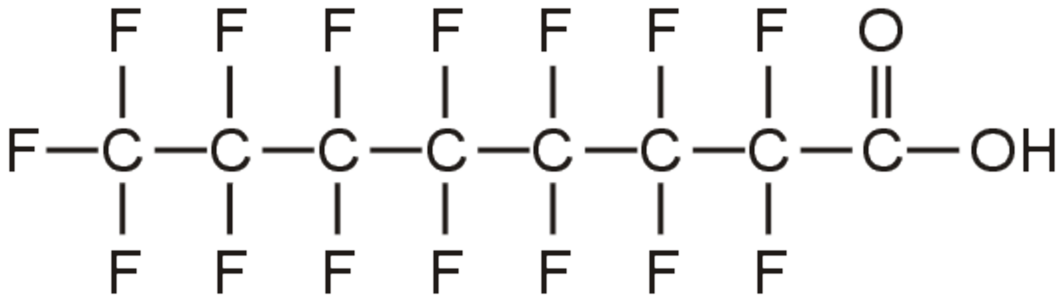
Mike Wimsatt
Director, Waste Management Division

What are Perfluorochemicals (PFCs)?

- Family of synthetic chemicals comprised primarily of long chains of carbon and fluorine
- Used for decades to make products that resist heat, oils, grease, stains and water
  - Non-stick cookware
  - Outdoor clothing
  - Stain-resistant carpet
  - Fire-fighting foam
  - Paper/packaging
  - Cleaning products
  - Pesticides

What is Perfluorooctanoic Acid (PFOA)?

- PFOA is a specific perfluorochemical (PFC)



- Used in the production of other PFCs, including Teflon^{R}
- Often produced as its ammonium salt, ammonium perfluorooctanoate (APFO)
- Produced and used since the 1940s

Fate and Transport of PFOA

- Use of PFOA in manufacturing can result in releases to air, water, and soil
- PFOA released to the air is readily adsorbed to particles and settles to the ground
- PFOA deposited into/onto the soil can be transported to and contaminate groundwater
- PFOA is very resistant to degradation and so is very persistent in the environment

Fate and Transport of PFOA (cont.)

- PFOA is found in water, soil, and sediments, and in the blood and tissue of wildlife throughout the world
- Nearly all people have some level of PFOA in their blood
- Potential health effects from exposure to low levels of PFOA are not well understood
- The Environmental Protection Agency (EPA) has identified PFOA as an “emerging contaminant”

PFOA as an Emerging Contaminant and EPA's Health Advisory

- PFOA is not currently regulated under the Safe Drinking Water Act
- 2009 - EPA established a Provisional Health Advisory (PHA) of 400 parts per trillion (ppt)
- This PHA is a health-based concentration, above which action should be taken to reduce exposure to PFOA through drinking water
- The PHA is based upon short-term exposure
- EPA is expected to establish and release a lifetime health advisory in the near future

Why are We Investigating PFOA Contamination in Southern NH?

- 2/26/16: Saint-Gobain Performance Plastics (S-G) reported to DES results of water tests at its Merrimack facility, formerly operated by ChemFab
- S-G tested in Merrimack because of contamination detected near its similar plants in New York and Vermont
- Testing detected PFOA at 30 parts per trillion in water supplied to plant by Merrimack Village District Water System (MVD)
- NHDES and MVD took immediate steps to sample drinking water in the vicinity of the plant
- Testing quickly expanded across the river to Litchfield – airborne transport pathway became evident

Evolution of Investigation – Leading to Amherst

- NHDES reviewed records to identify similar NH facilities
- Identified former Textile Coated International, Inc. (TCI) facility:
  - 105 Route 101A in Amherst
- TCI founded by former ChemFab employees
- Conducted same manufacturing activities as S-G at the Amherst facility from 1985 to 2006
- TCI used Teflon dispersions that contained APFO
- TCI had air emissions from these processes
  - TCI used emissions controls beyond S-G's process
- TCI's current facility is located in Manchester

Amherst Investigation Timeline

- 4/4/16: NHDES conducted comprehensive inspection of TCI's Manchester facility
- 4/15/16: NHDES initiated private drinking water well sampling in vicinity of the Amherst facility
- 5/11/16 NHDES announced test results/detections of PFOA (described later)
- Additional sampling ongoing (described later)
- NHDES requests to TCI for additional information and site investigation pending

Health Effects

Dr. Benjamin Chan
State Epidemiologist

“How are we exposed to PFCs?”

Commercial and Industrial Products That Use PFCs

Commercial Products	Industrial Uses
Cookware (Teflon®, Nonstick)	Photo Imaging
Fast Food Containers	Metal Plating
Candy Wrappers	Semiconductor Coatings
Microwave Popcorn Bags	Aviation Hydraulic Fluids
Personal Care Products (Shampoo, Dental Floss)	Medical Devices
Cosmetics (Nail Polish, Eye Makeup)	Firefighting Aqueous Film-Forming Foam
Paints and Varnishes	Insect Baits
Stain Resistant Carpet	Printer and Copy Machine Parts
Stain Resistant Chemicals (Scotchgard®)	Chemically Driven Oil Production
Water Resistant Apparel (Gore-Tex®)	Textiles, Upholstery, Apparel and Carpets
Cleaning Products	Paper and Packaging
Electronics	Rubber and Plastics
Ski Wax	

List Produced by CDC/ATSDR

PFOA Exposure Decreasing

- Most people have been exposed to PFOA through everyday commercial products
- In 2006, PFOA manufacturers joined an EPA global stewardship program:
  - On track to phase out these chemicals by the end of 2015

EPA. 2010/2015 PFOA Stewardship Program. Accessed at: http://www.epa.gov/opptintr/pfoa/pubs/stewardship/

PFOA Exposure is Through Oral Ingestion

- Consumption of food and water is the most important source for exposure to PFCs (includes migration of PFCs into food from boxes/packaging)
- Ingestion of contaminated dust is a significant source of exposure (carpets, upholstery, clothing)
- In infants, toddlers, and children, hand-to-mouth behavior is a significant source of exposure
- Limited exposure through breathing
- Minimal exposure through skin contact

Trudel et al. Estimating Consumer Exposure to PFOS and PFOA. Risk Analysis. 2008;28(2):251-69.

“What does finding PFOA in our water mean for our health?”

Long Term Health Effects are Unclear

- Animal studies: varied health effects
- Studies of PFC exposure in animals do not necessarily predict the same health impacts in humans
- Human studies have evaluated a variety of health effects without consistent findings

Health Effects Being Studied

- Changes to the liver enzymes levels
- Increases in total cholesterol levels
- Increases in uric acid levels, which may affect blood pressure
- Changes in sex hormone levels that could affect reproductive development and puberty
- Changes in thyroid hormone levels
- Lower immune function (lower antibody response to immunization)
- Growth and development (lower birth weight in infants, obesity in adolescents/adults, cognitive and behavioral development)
- Decreased kidney function
- Incidence of insulin resistance and diabetes
- Occurrence of some types of cancers: prostate, kidney, and testicular cancer

C8 (PFOA) Health Project, 2005-2006

- Environmentally exposed study of 69,030 participants from West Virginia and Ohio (Ohio-River Valley)
- Exposed to PFOA from a Chemical Plant
- One of the largest and most important studies of health effects in an environmentally exposed community

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

Link Report

- Health “links” were determined by three independent epidemiologists that reviewed the science
- “Probable link" – “more likely than not that among class members a connection exists between PFOA exposure and a particular human disease.”
- Based on a class action lawsuit settlement
- Reports do not represent the consensus of the medical/scientific community about the health effects from PFOA

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

C8 Science Panel Link Reports:

No "Probable Link":

- HTN
- Coronary Heart Disease
- Stroke
- Chronic kidney disease
- Liver disease
- Osteoarthritis
- Parkinson's disease
- Other autoimmune diseases (other than UC)
- "Common infections" (i.e. influenza)
- Neurodevelopmental disorders, including ADHD and learning disabilities
- Asthma or COPD
- DM type 2
- Birth defects
- Miscarriage or stillbirths
- Preterm birth or low birth weight

"Probable Link":

- High cholesterol
- Thyroid disease
- Ulcerative colitis
- Testicular cancer
- Kidney cancer
- Pregnancy-induced hypertension

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

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New Hampshire Department of Health & Human Services

Difficulty Interpreting the Science

- Studies are not consistent: some studies found associations, but others looking at the same health effect did not
- Even though some studies have found associations between PFCs and health outcomes, it does not mean that PFCs *caused* these effects
- The effects may have been due to other factors that were not considered by the researchers
- Changes identified often are not clinically (biologically) relevant

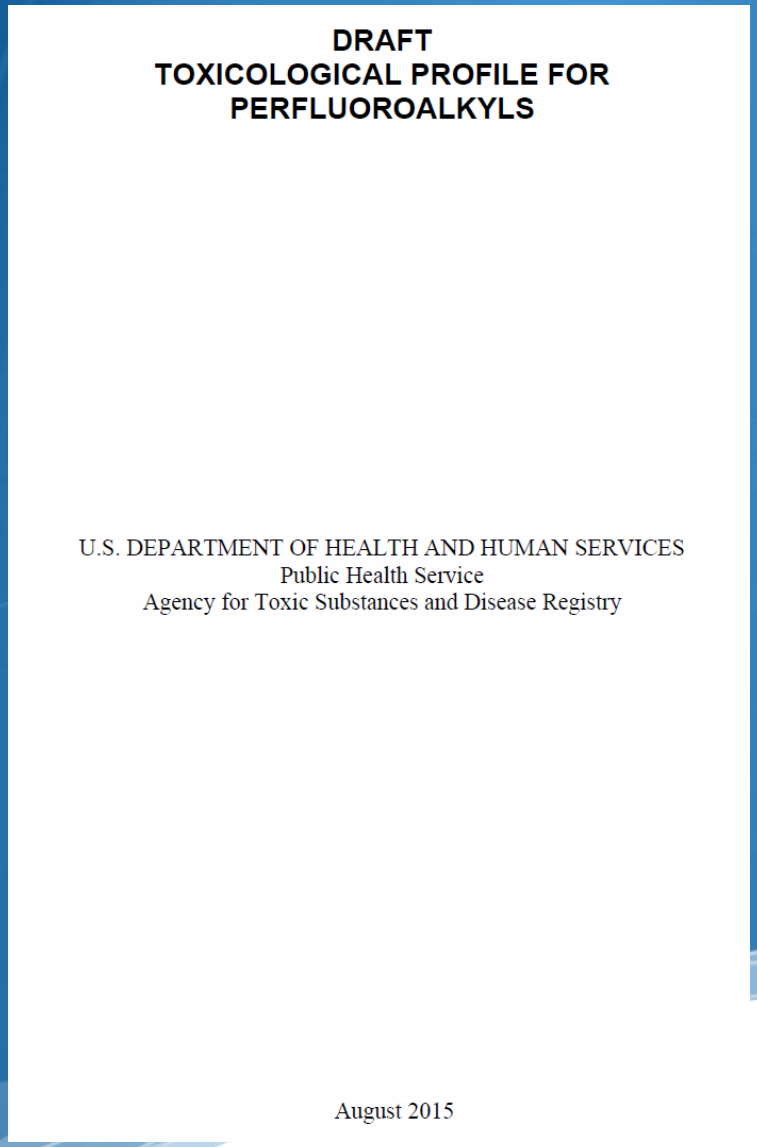
Studies Have More Consistently Suggested an Association With:

- Increases in blood cholesterol
- Increases in blood uric acid levels
- Increases in some liver function tests
- Lower infant birth weights

What do these ultimately mean for a person's health?

ATSDR Perfluoroalkyl Toxicological Profile, August 2015. Available at: gov/substances/toxsubstance.asp?toxid=237

Comprehensive Review of the Science Evaluating Cancer and PFCs



DRAFT
TOXICOLOGICAL PROFILE FOR
PERFLUOROALKYLS

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry

August 2015

NH DIVISION OF
Public Health Services
Improving health, preventing disease, reducing costs *for all*
New Hampshire Department of Health & Human Services

ATSDR's Conclusions on PFCs and Cancer

"There is no conclusive evidence that perfluoroalkyls cause cancer in humans. Some increases in prostate, kidney, and testicular cancers have been seen in individuals exposed to high levels. These results should be interpreted cautiously because the effects were not consistently found and most studies did not control for other potential factors such as smoking."

ATSDR TOX FAQs. Available at: http://www.atsdr.cdc.gov/tfacts200.pdf

Summary

- There is a lot of uncertainty about what PFC exposure means for a person's health
- The health changes with more consistent findings related to PFC exposure (i.e. liver function tests) have unclear health implications
- Associations found between PFOA and several cancers are unclear and inconsistent, and need to be interpreted cautiously
- Further study is ongoing

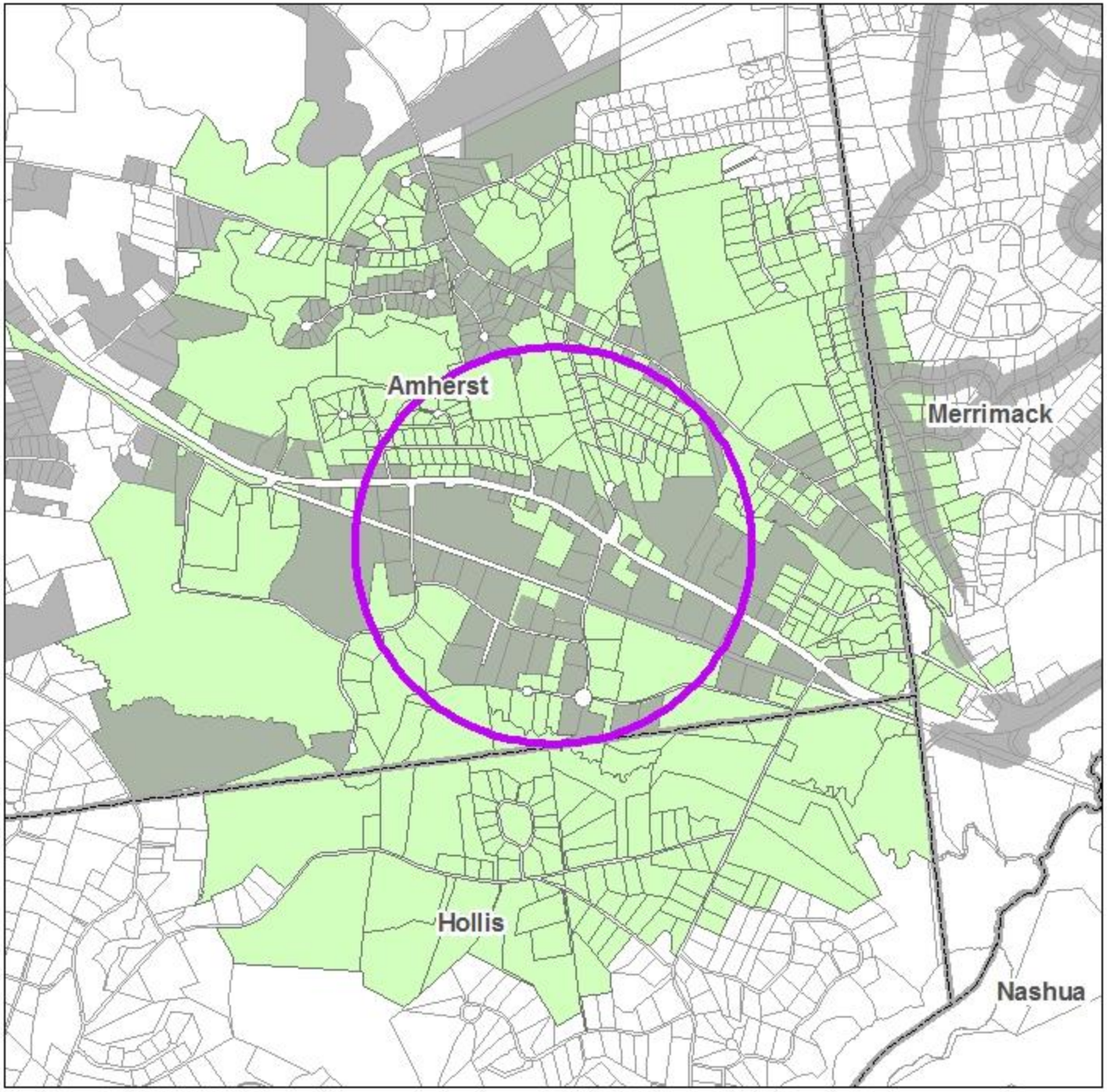
Should we get our blood tested for PFOA?

- PFOA blood testing is not commonly available
- There is no medical need or recommendation to get your blood tested for PFOA
- A blood test **can** tell you how much PFOA is in your body at the time of the test
- A PFOA blood test **cannot**:
  - Tell you where or how you were exposed to the PFOA found in your body
  - Tell you what, if any, health problems might occur, or have occurred, because of the PFOA in your body

Actions to Date

Brandon Kernen

Manager of Hydrology and Conservation, Drinking Water and Groundwater Bureau



1/2 Mile

Properties within 1 mile not connected to public water

Public Water Supplies

Water Distribution

Political Boundary

1 in = 2,000 feet

1:24,000

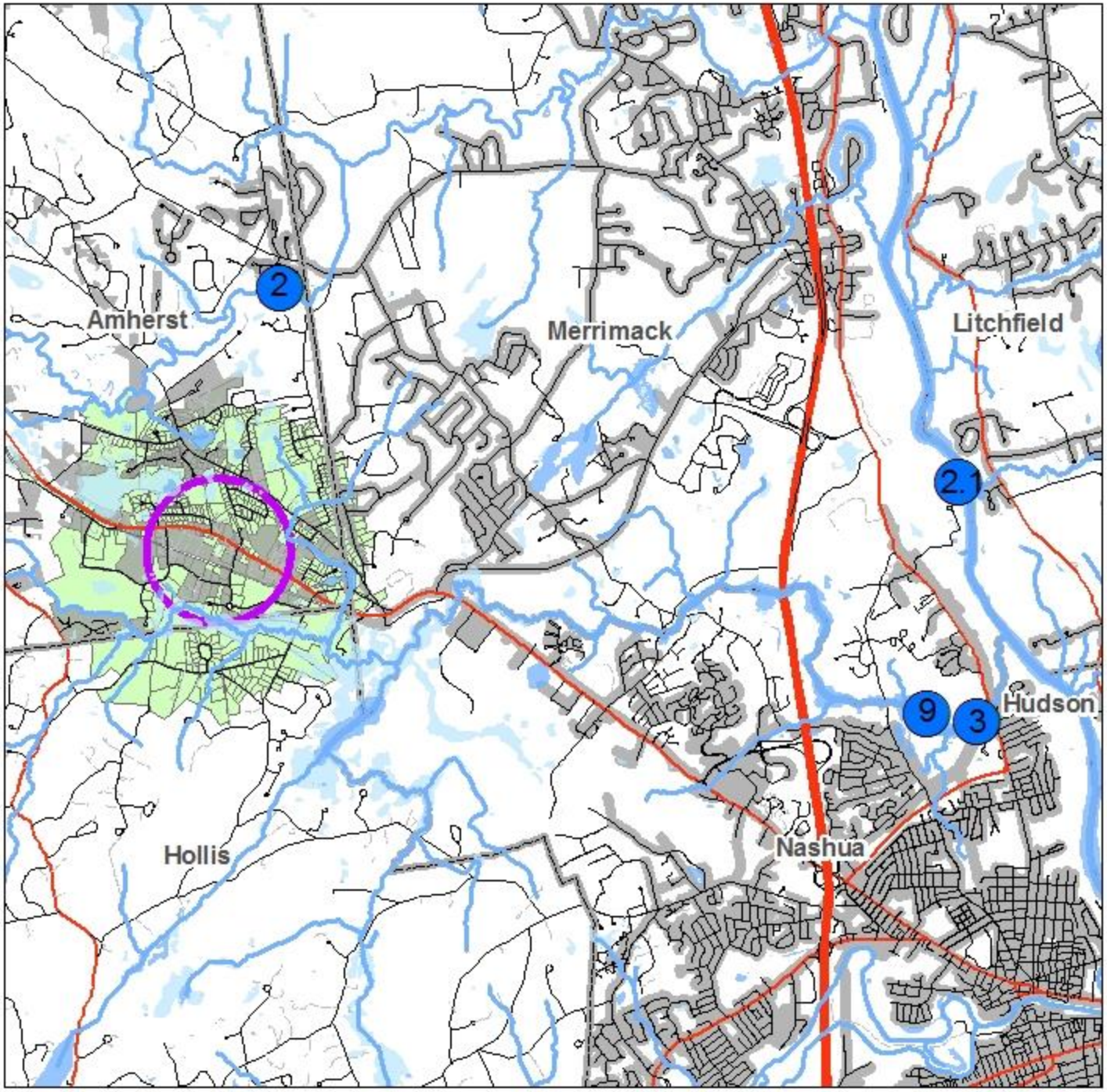
NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Amherst Sampling Timeline

- Early April: Identified potential for emissions at former facility at 105 Route 101A
- April 15: Collected samples at 11 locations near former facility. Requested expedited lab services
- May 11: Received results and immediately notified homeowners. Made arrangements for bottled water delivery for homes with PFOA >100 ppt
- May 12-13: Mailed sampling invitations to approximately 70 homeowners.

Amherst Sampling Timeline

- May 12-present: Sampling 70 drinking water supply wells within ½ mile of former TCI site. Results expected 2-3 weeks after sampling
- Sampling some wells between 0.5-1.0 miles from former TCI site.



1/2 Mile

Properties within 1 mile not connected to public water

Public Water Supplies

Water Distribution

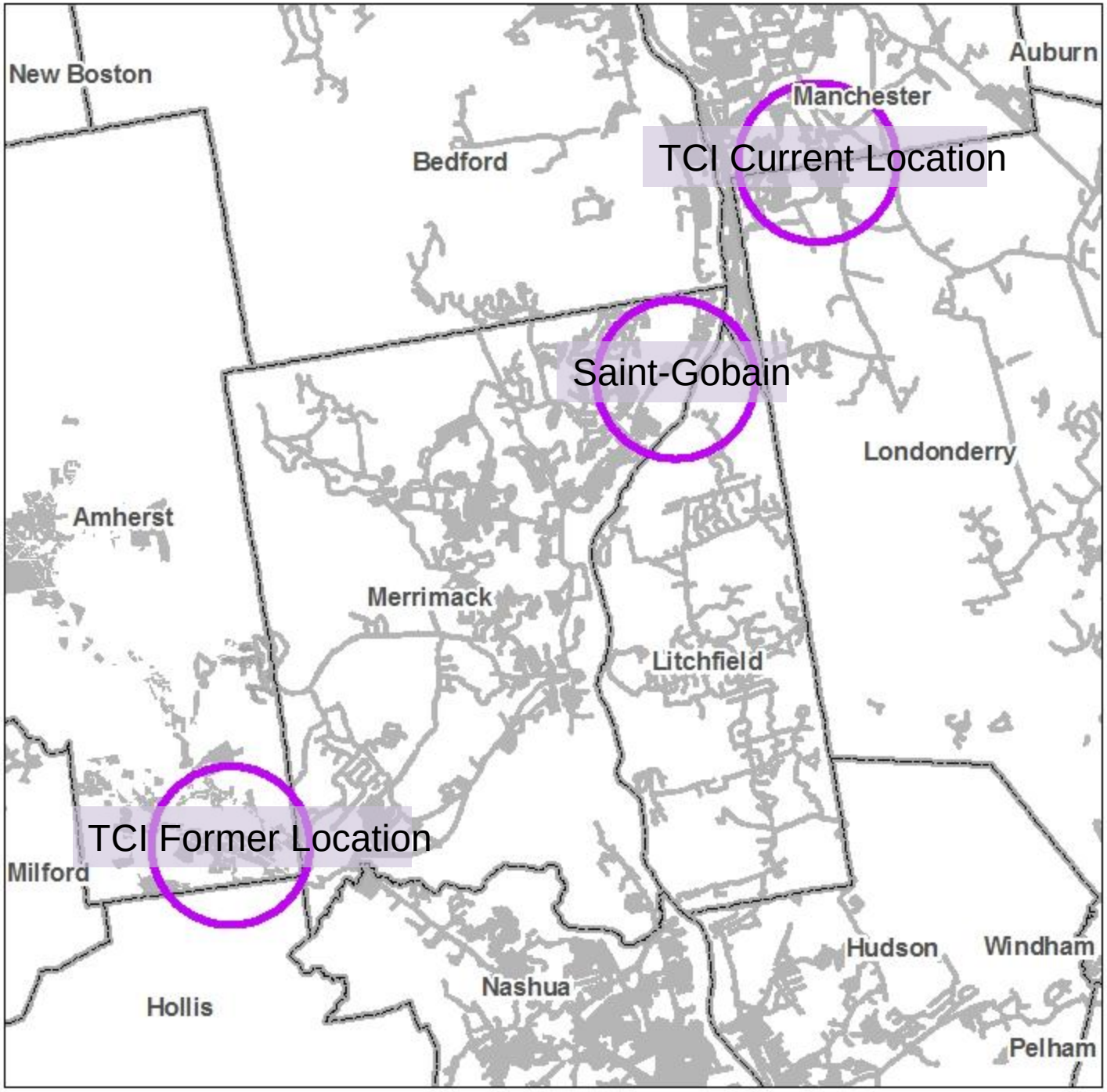
Pennichuck Water Source

Political Boundary

1 in = 5,500 feet

1:66,000

NEW HAMPSHIRE DEPARTMENT OF Environmental Services



1 Mile

Public Water Supplies

Water Distribution

Political Boundary

1 in = 10,000 feet

1:120,000

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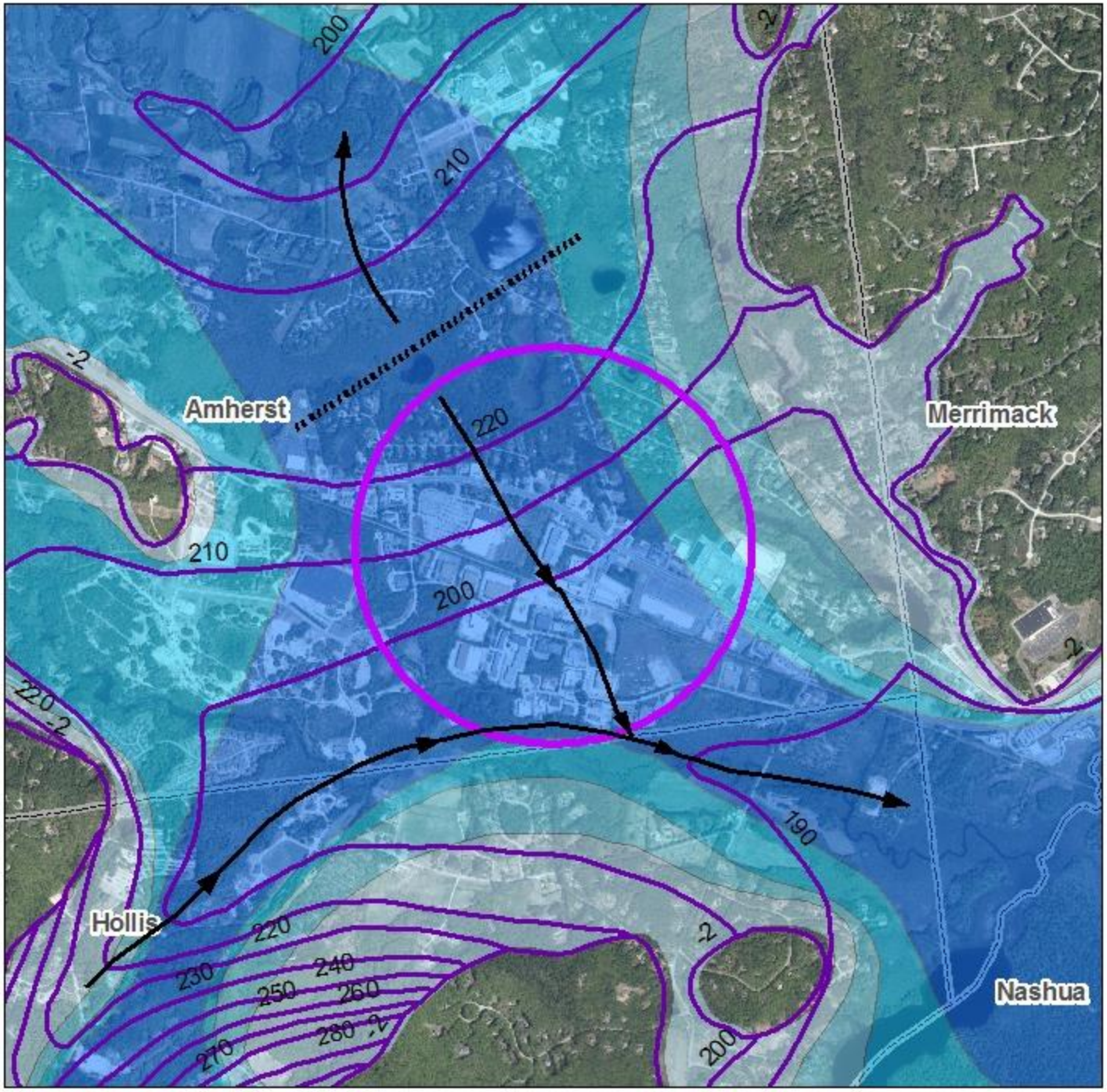
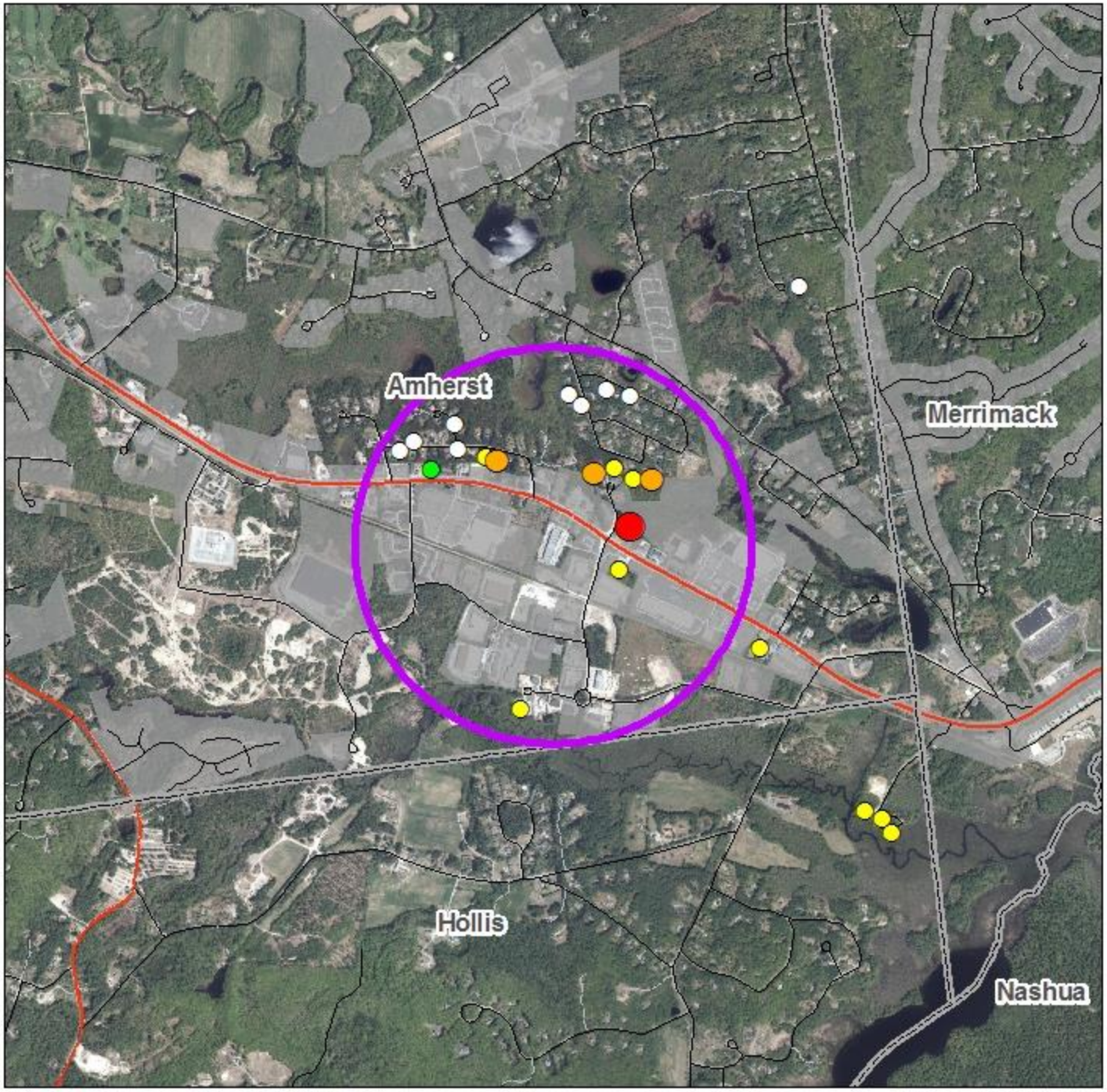

200
210
-2
Amherst
220
210
200
220
-2
Hollis
230
240
250
260
280
270
?
-2
190
200
Merrimack
2
Nashua
1/2 Mile
Transmissivity
(feet squared per day)
0-2000
2000-4000
4000-8000
>8000
Water Table Elevation
Political Boundary
1 in = 2,000 feet
1:24,000
NEW HAMPSHIRE DEPARTMENT OF
Environmental Services



1/2 Mile

PFOA (PPT)

- ≥400
- 100-399
- <100
- Non Detect (<2)
- Result Pending

Public Water Supplies

Water Distribution

Political Boundary

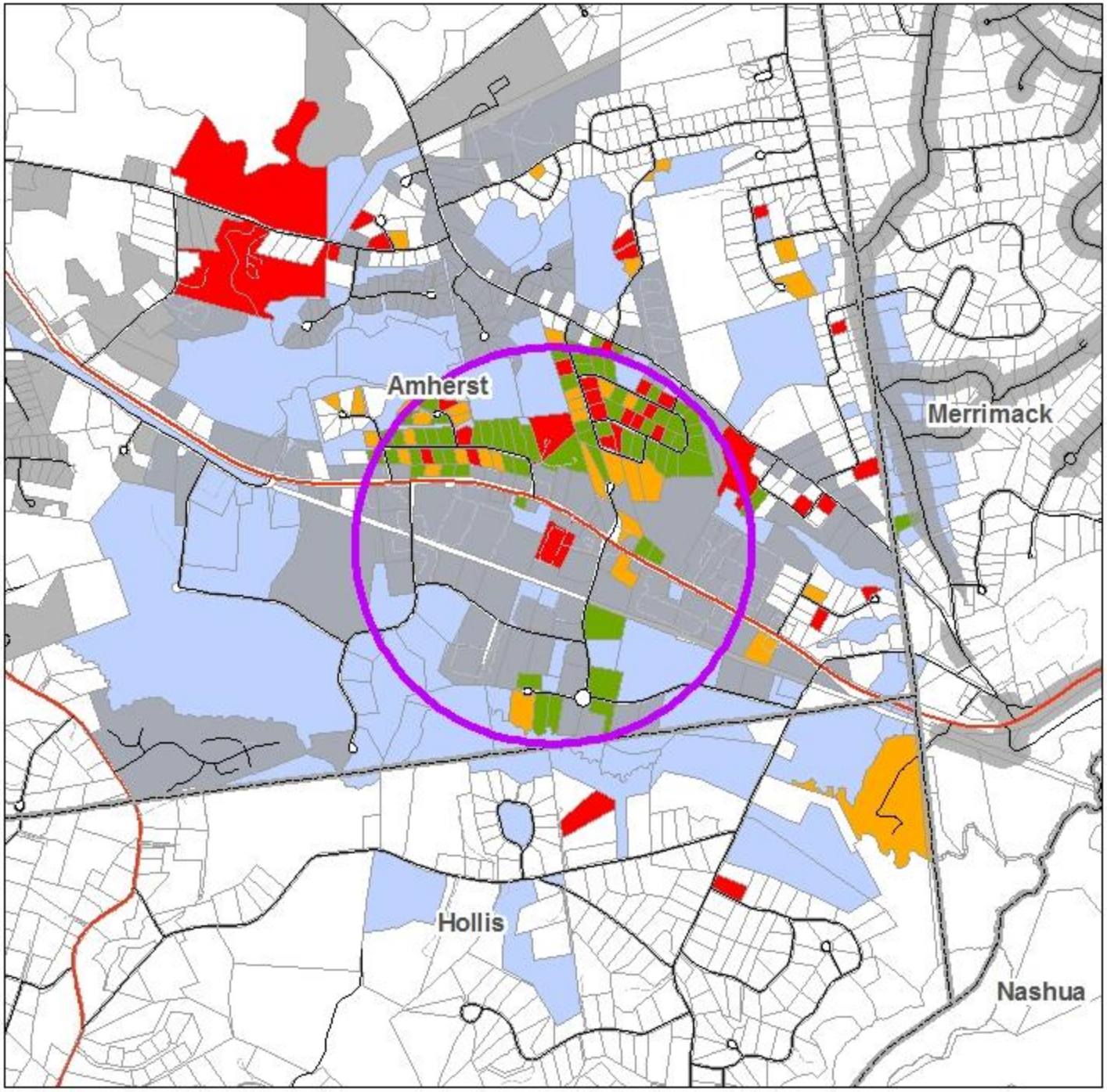
1 in = 2,000 feet

1:24,000

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

PRIVATE DRINKING WATER WELL SAMPLING STATUS

TOWN (mile radius)	SAMPLING REQUESTS SENT TO HOMES MAY 11-13	SAMPLED	HOMES SCHEDULED
Amherst (0.5 miles)	70	21	23
Amherst (0.5-1.0 miles)	---	9	16
Hollis (0.5 -1.0 miles)	---	---	2
Merrimack (0.5 -1.0 miles)	---	1	2



1/2 Mile

Sampling Status

- Sampled
- Scheduled
- Contacted
- Water Distribution
- Undeveloped Lot

Political Boundary

1 in = 2,000 feet

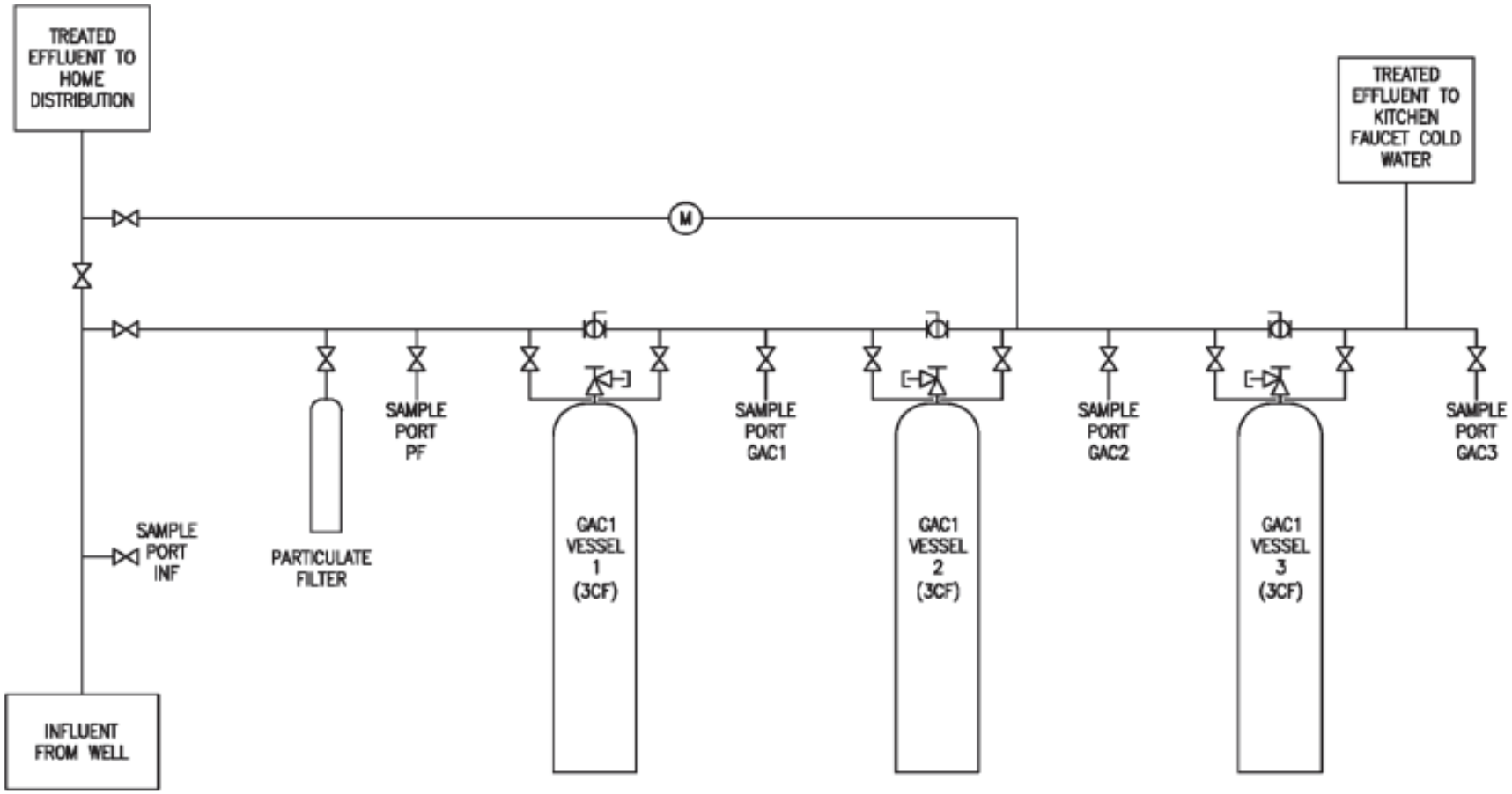
1:24,000

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Water Treatment

- NHDES developed a PFC Treatment Factsheet
- Need to pay attention to “traditional contaminants”
  - They are not good for you either
- A lot of information being shared from Hoosick Falls, homeowners & water treatment companies
- Point of Use
  - Reverse Osmosis (removes PFCs & Other Contaminants)
  - Granular Activated Carbon
    - Certain units have been tested and shown to remove PFCs to non-detect levels
    - Certain faucet, water pitcher, refrigerator based filters likely reduce but do not remove PFCs to non-detect levels.
- Point-of-entry treatment
    - Granular Activated Carbon(not an “off-the-shelf” product)
      - Radon build-up in granular activated carbon needs to be addressed
      - Does not remove other common contaminants in well water

Typical Design of a Point of Entry for a Home



Available information suggests treatment systems with two (2 cubic foot) granular activated carbon vessels may be adequate. Pease system has three (3 cubic foot) vessels

Next Steps and Information/Communication

Clark Freise
Assistant Commissioner

Next Steps

- Any properties that test over 100 ppt will have bottled water delivered
  - Alternatives are being examined (filter, public water, etc.)
- Testing for remaining private wells within one half mile of the former TCI facility is underway, preparing for expansion if necessary
  - Why ½ mile versus 1 miles?
    - We will follow the data
  - Letters requesting access have been mailed
  - Sign-up form at https://www.surveymonkey.com/r/NHDES-S-03-008

Next Steps (cont.)

- TCI Investigation
  - Information Request being developed with Amherst staff
  - Identifying key testing points desired in nearest term
  - TCI to date has communicated that they will work with us to resolve this
- EPA
  - Expect long-term health advisory soon
    - This is not a regulatory level
- State of New Hampshire
  - Paths to regulation
  - We will involve public in the process

Information/Communication

- Southern NH PFOA Investigation Website:
  - http://des.nh.gov/organization/commissioner/pfoa.htm
- Handouts (all available on the Investigation website)
  - EPA PFOA Fact Sheet
  - Well Testing Information
  - Water Treatment Options Fact Sheet
  - Blood Testing Fact Sheet
- We will share information through further face-to-face meetings as results arrive
  - We will continue to communicate with your town

Questions and Answers (written)

Nate Jensen

Questions and Answers (verbal)

Nate Jensen