# NH Department of Environmental Services

### July 10, 2018
### North Hampton Conservation Committee



**Legend**
- UST Sites
- Remediation_Sites
- Potential_Contam_Sources
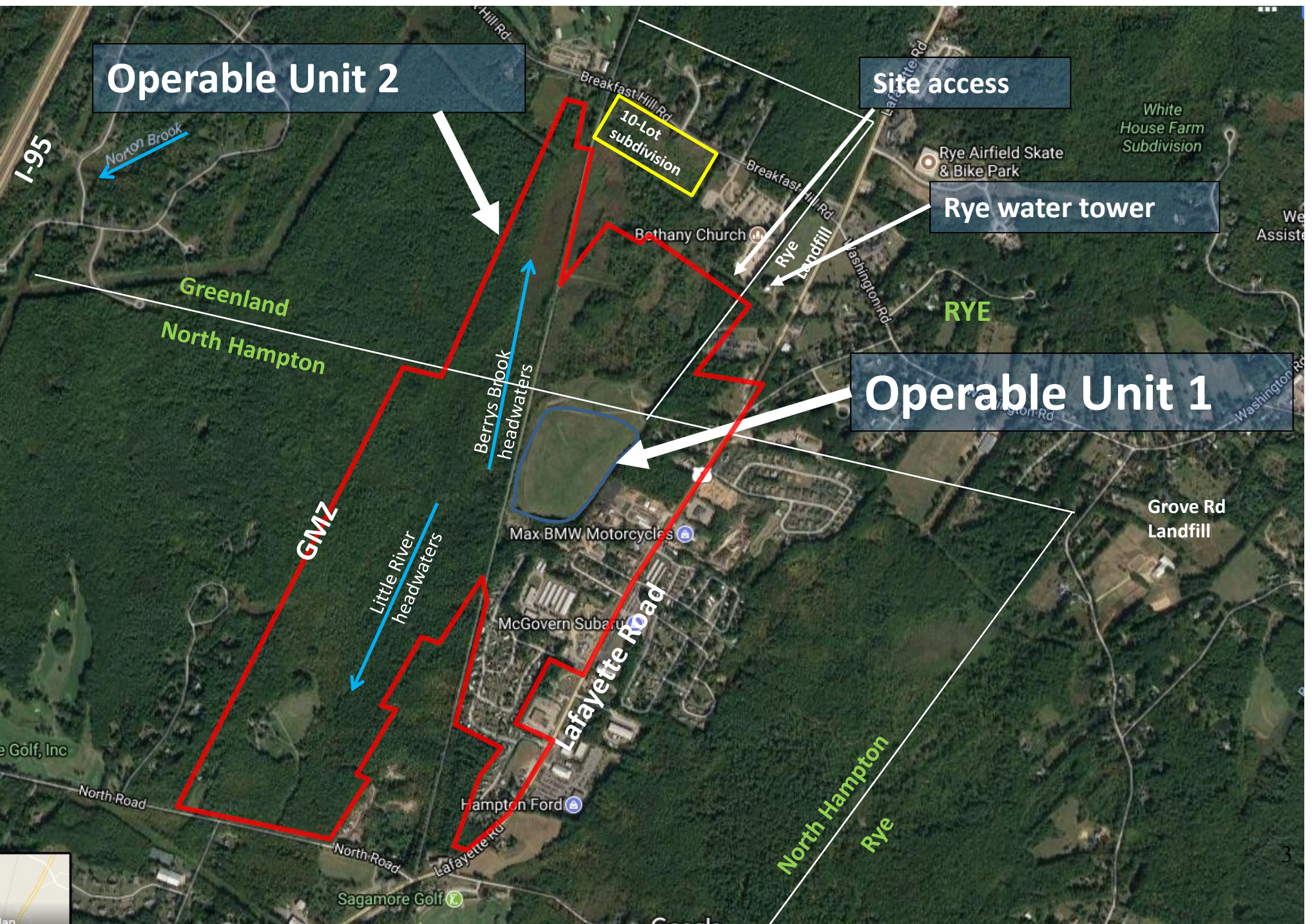- HW_Generators
- Auto_Salvage_Yards
- AST Sites
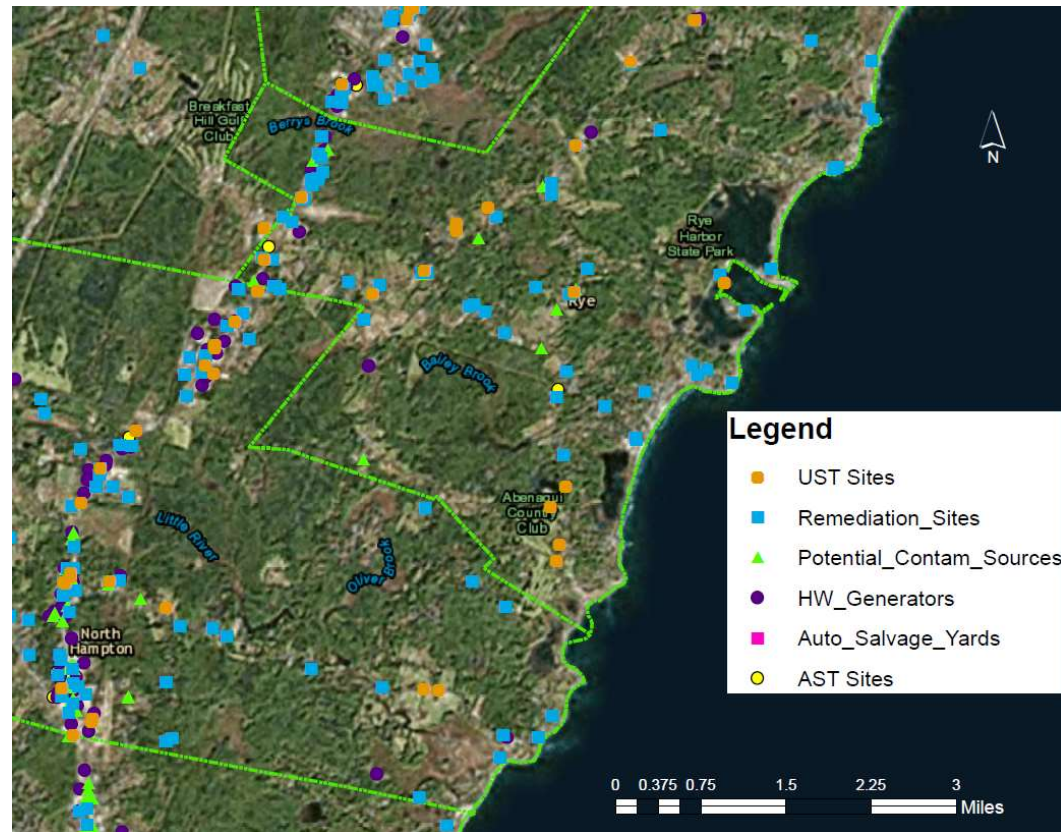
# Presentation Outline

## July 10, 2018

- Coakley background

- Introduction to PFAS

- EPA Health Advisory

- PFAS at Coakley

- Private well sampling for PFAS

- On-going and upcoming activities related to Coakley

- Surface water sampling

    – Berrys Brook

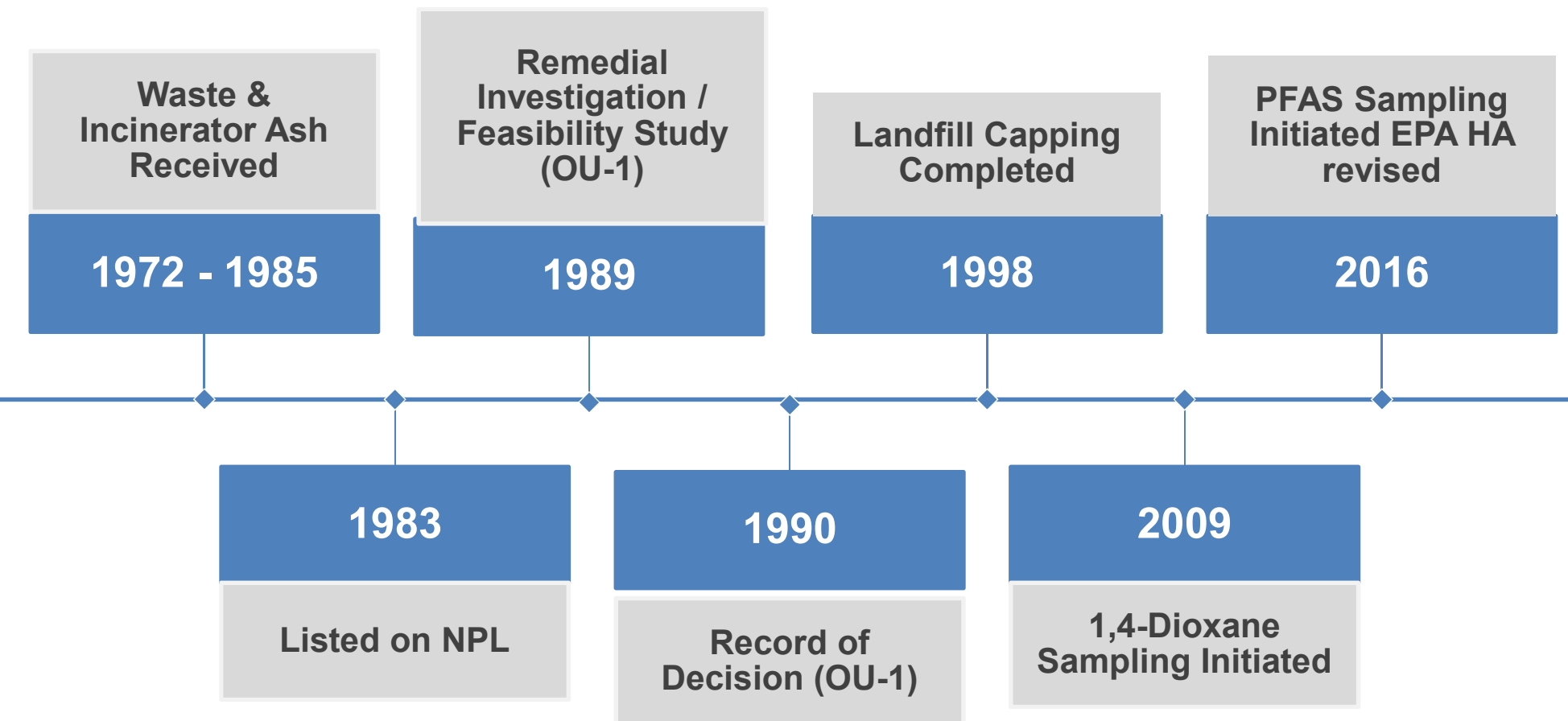    – Little River

- Questions and discussion

# Coakley Landfill Area



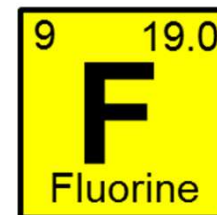**Operable Unit 2**

**Site access**

10-Lot subdivision

**Rye water tower**

**Operable Unit 1**

I-95

Greenland

North Hampton

GMZ

Berrys Brook headwaters

Little River headwaters

Lafayette Road

North Hampton

Rye

RYE

Grove Rd Landfill

3

# Background 1972 to 2016

| Waste & Incinerator Ash Received | Remedial Investigation / Feasibility Study (OU-1) | Landfill Capping Completed | PFAS Sampling Initiated EPA HA revised |
|---|---|---|---|
| **1972 - 1985** | **1989** | **1998** | **2016** |

| **1983** | **1990** | **2009** |
|---|---|---|
| Listed on NPL | Record of Decision (OU-1) | 1,4-Dioxane Sampling Initiated |

# PFAS Summary

- A large family of synthetic organic compounds that contain multiple Fluorine (F) atoms.
- The 2 most studied PFAS are
  - Perfluorooctanoic Acid (PFOA)
  - Perfluorooctane Sulfonate (PFOS)
- PFAS family = thousands of diverse compounds
- Manufactured and used since the late 1940s
- Used for decades to make products that resist heat, oils, grease, stains and water

# The Expansive Use of PFAS

| 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 | Pesticides |
| Soil amendments | |
| Pesticides | |
| Potting soils | |

# PFOA and PFOS

▸ Perflourooctanoic acid (PFOA or C8) primarily used as a surfactant in PFAS production and Teflon coatings
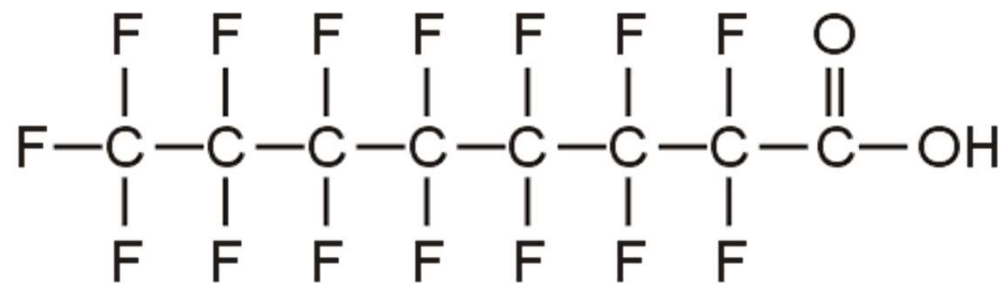


▸ Perfluorooctane sulfonate (PFOS) has variety of uses including surface treatments, paper coatings, firefighting foam
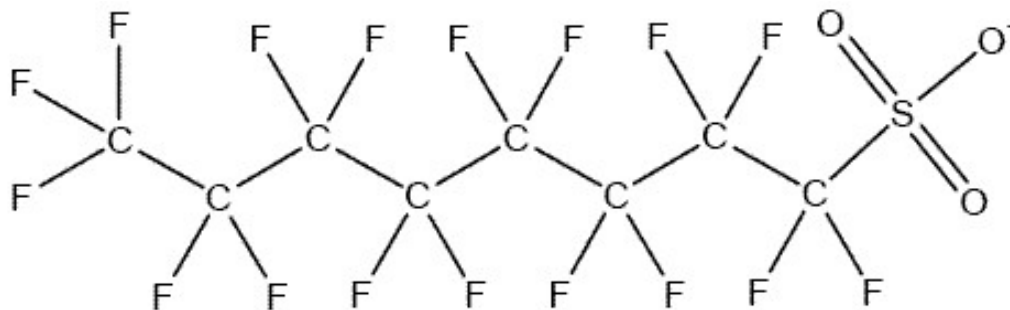
# USEPA Health Advisory (HA)

- HAs established for PFOA and PFOS = 70 ppt in *drinking water* (DES adopted as AGQS 2016)

- HAs provide information on contaminants that can cause human health effects and are known or anticipated to occur in drinking water.

- EPA's HA for PFOA and PFOS offers a margin of protection throughout a person's life from adverse health effects resulting from exposure to PFOA and PFOS in drinking water.

COAKLEY AREA PFAS INVESTIGATION & PRIVATE WELL SAMPLING PROGRAM

Lateral distribution of PFOA + PFOS in bedrock groundwater

COAKLEY LANDFILL SUPERFUND SITE
NORTH HAMPTON & GREENLAND, NEW HAMPSHIRE

FIGURE 16

SHEET TITLE: SEPTEMBER 2017 LATERAL EXTENT OF TOTAL
PFOA + PFOS IN BEDROCK GROUNDWATER

Lateral distribution of 1,4-dioxane in bedrock groundwater

**LEGEND**

| Symbol | Description |
|---|---|
| R-3 | BEDROCK WATER SUPPLY WELL |
| WELL ID | BEDROCK MONITORING WELL |
| – – – | LIMITS OF GROUNDWATER MANAGEMENT AND/OR RESTRICTION ZONE |
| ••••••• | PERIMETER OF LANDFILL (APPROXIMATE) |
| — · — | PROPERTY LINE & RIGHT OF WAY |
| ——— | STREAM |
| — — | TOWN LINE |
| [N/S] | NOT SAMPLED |
| [0.006] | CONCENTRATION IN UG/L |
| 3 | ISOCONCENTRATION CONTOUR (UG/L) |
| 50 | ISOCONCENTRATION CONTOUR (UG/L) |
| 100 | ISOCONCENTRATION CONTOUR (UG/L) |
| – – – | DASHED WHERE INFERRED |

CLEAN UP STANDARD

GMZ
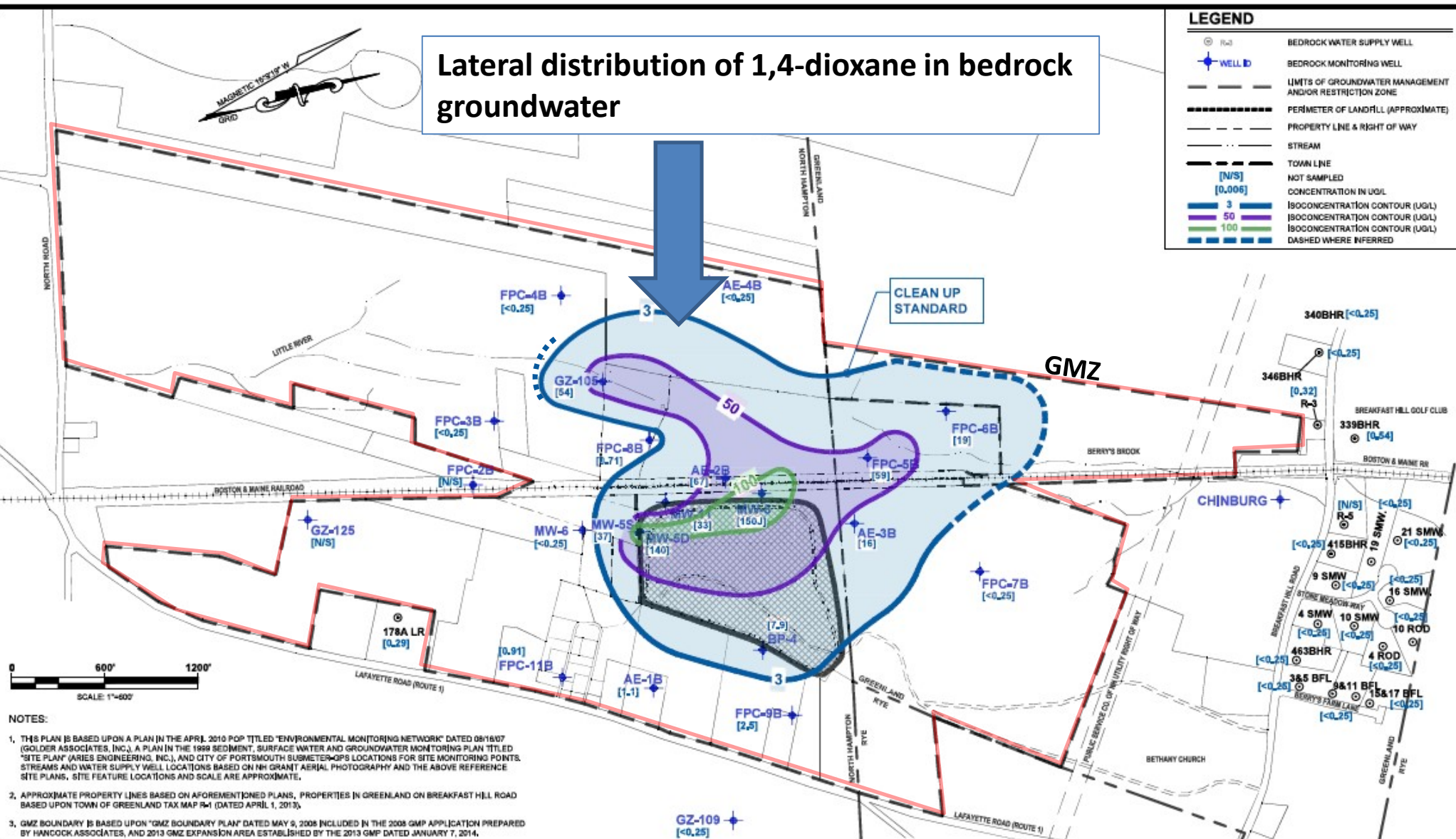
**NOTES:**

1. THIS PLAN IS BASED UPON A PLAN IN THE APRIL 2010 POP TITLED "ENVIRONMENTAL MONITORING NETWORK" DATED 08/16/07 (GOLDER ASSOCIATES, INC.), A PLAN IN THE 1989 SEDIMENT, SURFACE WATER AND GROUNDWATER MONITORING PLAN TITLED "SITE PLAN" (ARIES ENGINEERING, INC.), AND CITY OF PORTSMOUTH SUBMETER-GPS LOCATIONS FOR SITE MONITORING POINTS. STREAMS AND WATER SUPPLY WELL LOCATIONS BASED ON NH GRANIT AERIAL PHOTOGRAPHY AND THE ABOVE REFERENCE SITE PLANS. SITE FEATURE LOCATIONS AND SCALE ARE APPROXIMATE.

2. APPROXIMATE PROPERTY LINES BASED ON AFOREMENTIONED PLANS. PROPERTIES IN GREENLAND ON BREAKFAST HILL ROAD BASED UPON TOWN OF GREENLAND TAX MAP R-1 (DATED APRIL 1, 2013).

3. GMZ BOUNDARY IS BASED UPON "GMZ BOUNDARY PLAN" DATED MAY 9, 2008 INCLUDED IN THE 2008 GMP APPLICATION PREPARED BY HANCOCK ASSOCIATES, AND 2013 GMZ EXPANSION AREA ESTABLISHED BY THE 2013 GMP DATED JANUARY 7, 2014.

SCALE: 1"=600'

| PROJECT TITLE: | | DWG: | BY: | REV: | DESCRIPTION: | |
|---|---|---|---|---|---|---|
| **COAKLEY LANDFILL SUPERFUND SITE** **NORTH HAMPTON & GREENLAND, NEW HAMPSHIRE** | | **FIGURE 13** | BLQ | | | |
| | | | DATE: 2017-12-04 | REV DATE: | | |
| SHEET TITLE: SEPTEMBER 2017 LATERAL DISTRIBUTION OF 1,4 - DIOXANE IN BEDROCK GROUNDWATER | | JN: 10424.011 | APPROVED BY: SLY | ISSUE: | DESCRIPTION: | **CES INC** Engineers • Environmental Scientists • Surveyors |
| | | SCALE: AS SHOWN | CHECKED BY: SLY | ISSUE DATE: | | |

# Recent, Ongoing and Upcoming Activities

**EPA Develops Surface Water Screening Levels for PFOA/PFOS/PFBS (site spec)**

**EPA Develops Fish Tissue Screening Levels for PFOA/PFOS/PFBS (site spec)**

January 2017

January 2018

**EPA Directs CLG to Conduct Bedrock Investigation**

**January 2018**

**Chinburg Well Packer Testing Results**

**February 2018**

**Berrys Brook Fish Tissue Sampling Completed**

**June 2018**

**NHDES Sampling of Little River**

**June 2018**

Feb 2018

Spring 2018

**January 2018**

2017 Annual Report Submitted to EPA and NHDES

**February 2018**

EPA Directs CLG to Sample Fish Tissue in Berrys Brook

**Spring 2018**

Initiate Bedrock Investigation

**June 2018**

Deep Bedrock Well Installation

12

# Deep Bedrock Investigation

❖ Objective is to determine extent of contaminant migration in bedrock and associated risk of exposure

### Investigation will include:

➢ Geophysical surveying of existing bedrock boreholes and surface features

➢ Discrete sampling of groundwater in bedrock

➢ Installation of new bedrock wells

- Geophysics
- Sampling

➢ Update bedrock mapping and determine extent of contaminant migration

➢ Pump test

➢ Iterative process

# COAKLEY PHASE I
# DEEP BEDROCK EXPLORATION PLAN



**Approximate location of new well couplets**

**Chinburg Well**

**Coakley Groundwater Management Zone (GMZ)**

Coakley Landfill

LEGEND:

- OU-1 monitoring well.
- OU-2 monitoring well.
- Residential well.
- Monitoring well.
- Groundwater monitoring well.
- Water supply well.
- Coakley Landfill fence.
- Brook.
- Approximate property boundary of Greenland, Rye and North H...
- Hampton Water Works Line.
- Rye Water District Line.
- Railroad tracks.

188   Bedrock well and depth (6 inch open borehole) potentially viable for additional data collection.

Bedrock wells sampled by CLG for Site contaminants.

APPROXIMATE SCALE: 1" = 800'

# Watershed Boundaries

From NH GRANIT

# Berrys Brook Surface Water Sampling Results for PFOA & PFOS

September 2017 results
Locations approximate

| Site-Specific SW Screening Levels | PFOA (ppt) | PFOS (ppf) |
|---|---|---|
| 45 days/year (child) | 2,030 | 2,030 |
| 120 days/year (child) | 760 | 760 |

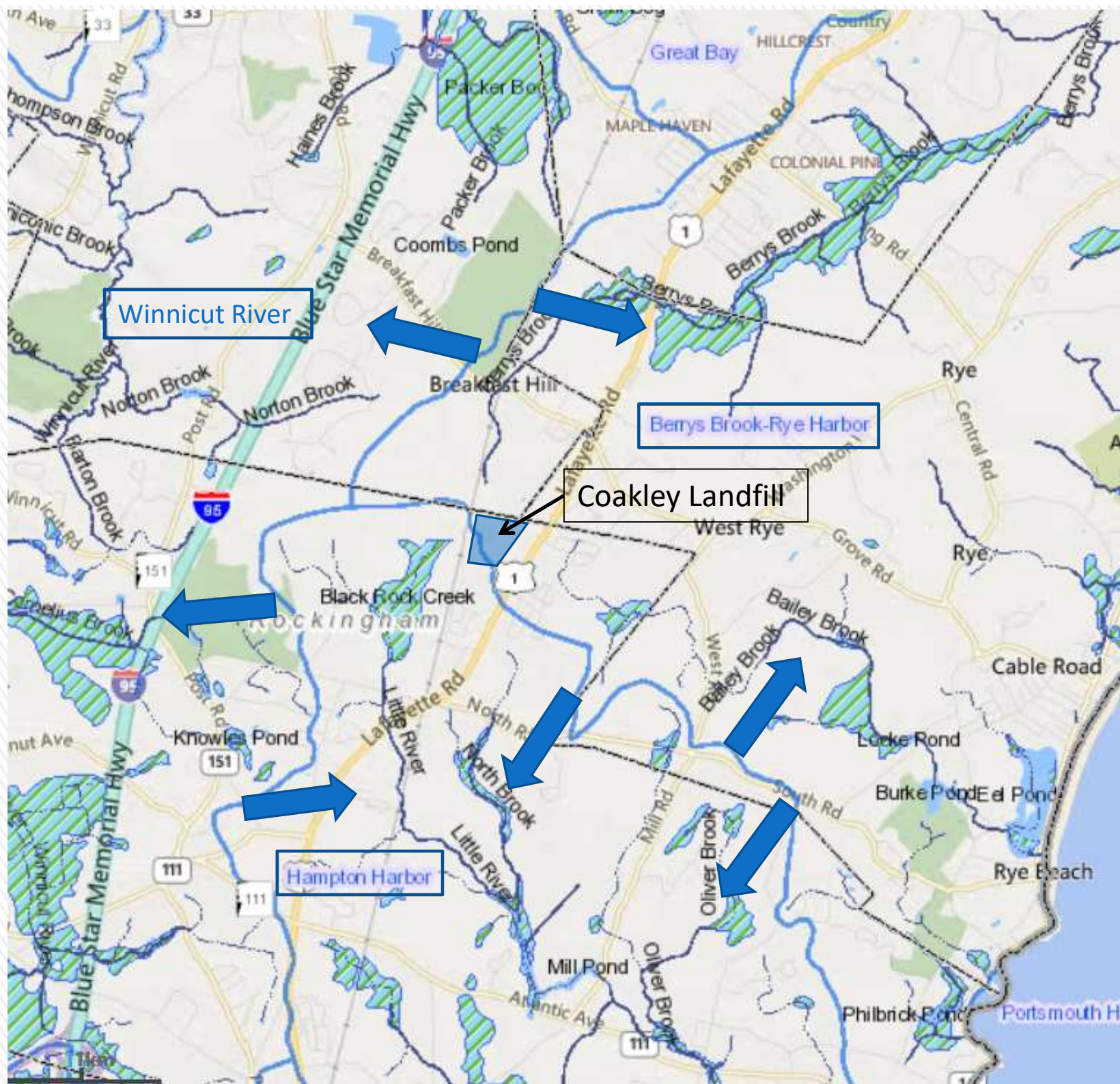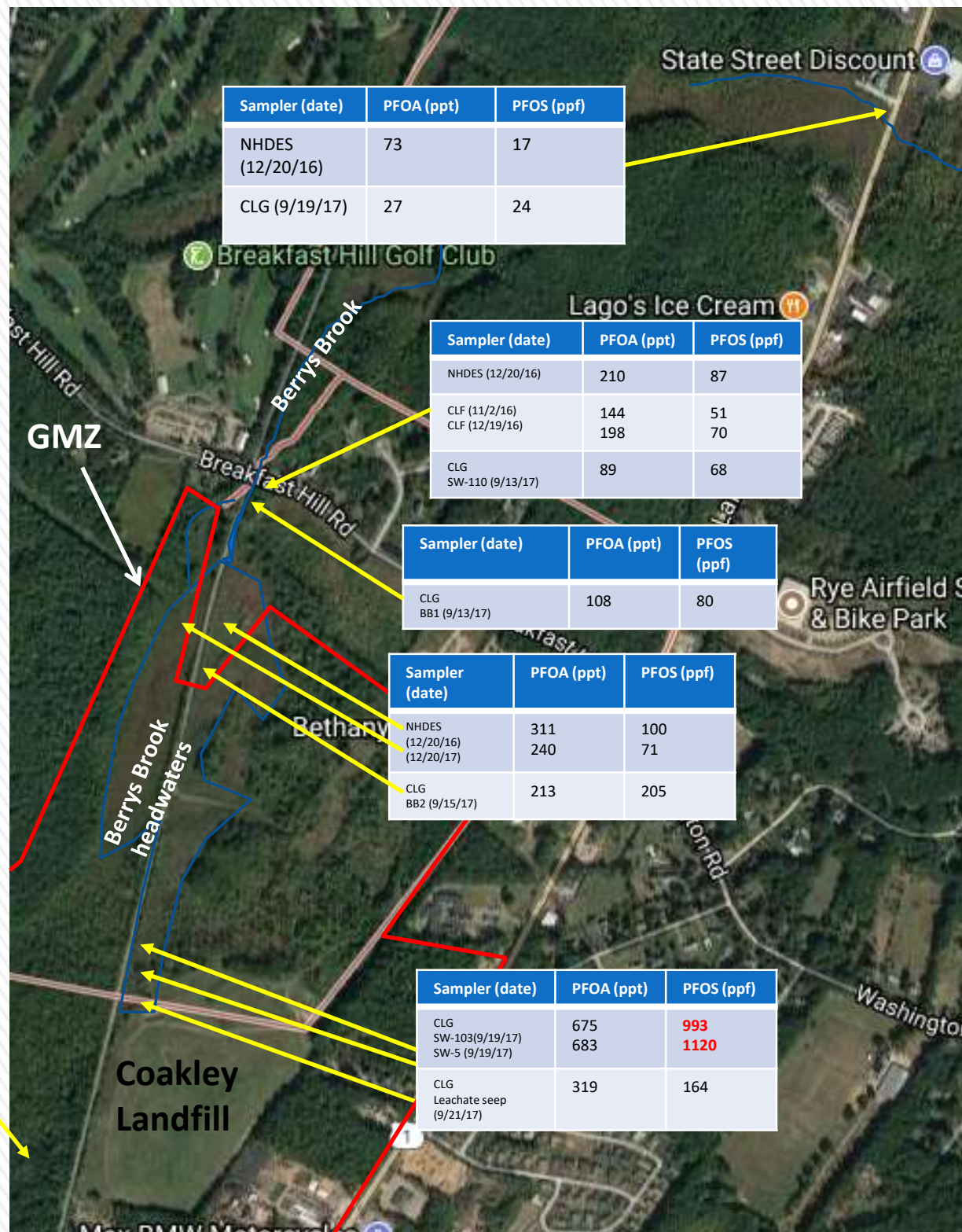| Sampler (date) | PFOA (ppt) | PFOS (ppf) |
|---|---|---|
| NHDES (12/20/16) | 73 | 17 |
| CLG (9/19/17) | 27 | 24 |

| Sampler (date) | PFOA (ppt) | PFOS (ppf) |
|---|---|---|
| NHDES (12/20/16) | 210 | 87 |
| CLF (11/2/16) CLF (12/19/16) | 144 198 | 51 70 |
| CLG SW-110 (9/13/17) | 89 | 68 |

| Sampler (date) | PFOA (ppt) | PFOS (ppf) |
|---|---|---|
| CLG BB1 (9/13/17) | 108 | 80 |

| Sampler (date) | PFOA (ppt) | PFOS (ppf) |
|---|---|---|
| NHDES (12/20/16) (12/20/17) | 311 240 | 100 71 |
| CLG BB2 (9/15/17) | 213 | 205 |

| Sampler (date) | PFOA (ppt) | PFOS (ppf) |
|---|---|---|
| CLG SW-4 (9/17/17) | 145 | 42 |

| Sampler (date) | PFOA (ppt) | PFOS (ppf) |
|---|---|---|
| CLG SW-103(9/19/17) SW-5 (9/19/17) | 675 683 | 993 1120 |
| CLG Leachate seep (9/21/17) | 319 | 164 |

GMZ

Berrys Brook

Berrys Brook headwaters

Coakley Landfill

State Street Discount
Breakfast Hill Golf Club
Lago's Ice Cream
Breakfast Hill Rd
Rye Airfield S & Bike Park
Washington
Max BMW Motorcycles
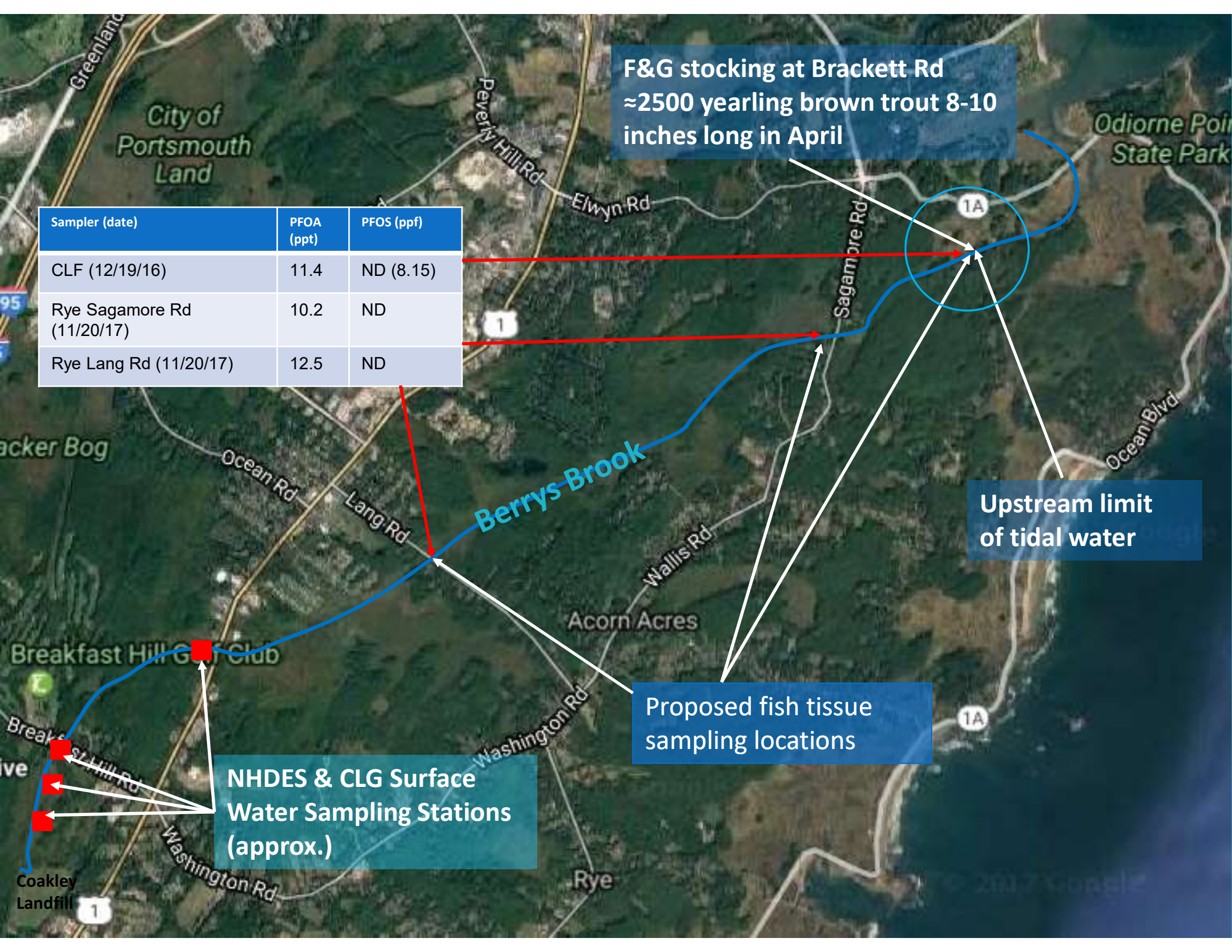
F&G stocking at Brackett Rd ≈2500 yearling brown trout 8-10 inches long in April

| Sampler (date) | PFOA (ppt) | PFOS (ppf) |
|---|---|---|
| CLF (12/19/16) | 11.4 | ND (8.15) |
| Rye Sagamore Rd (11/20/17) | 10.2 | ND |
| Rye Lang Rd (11/20/17) | 12.5 | ND |

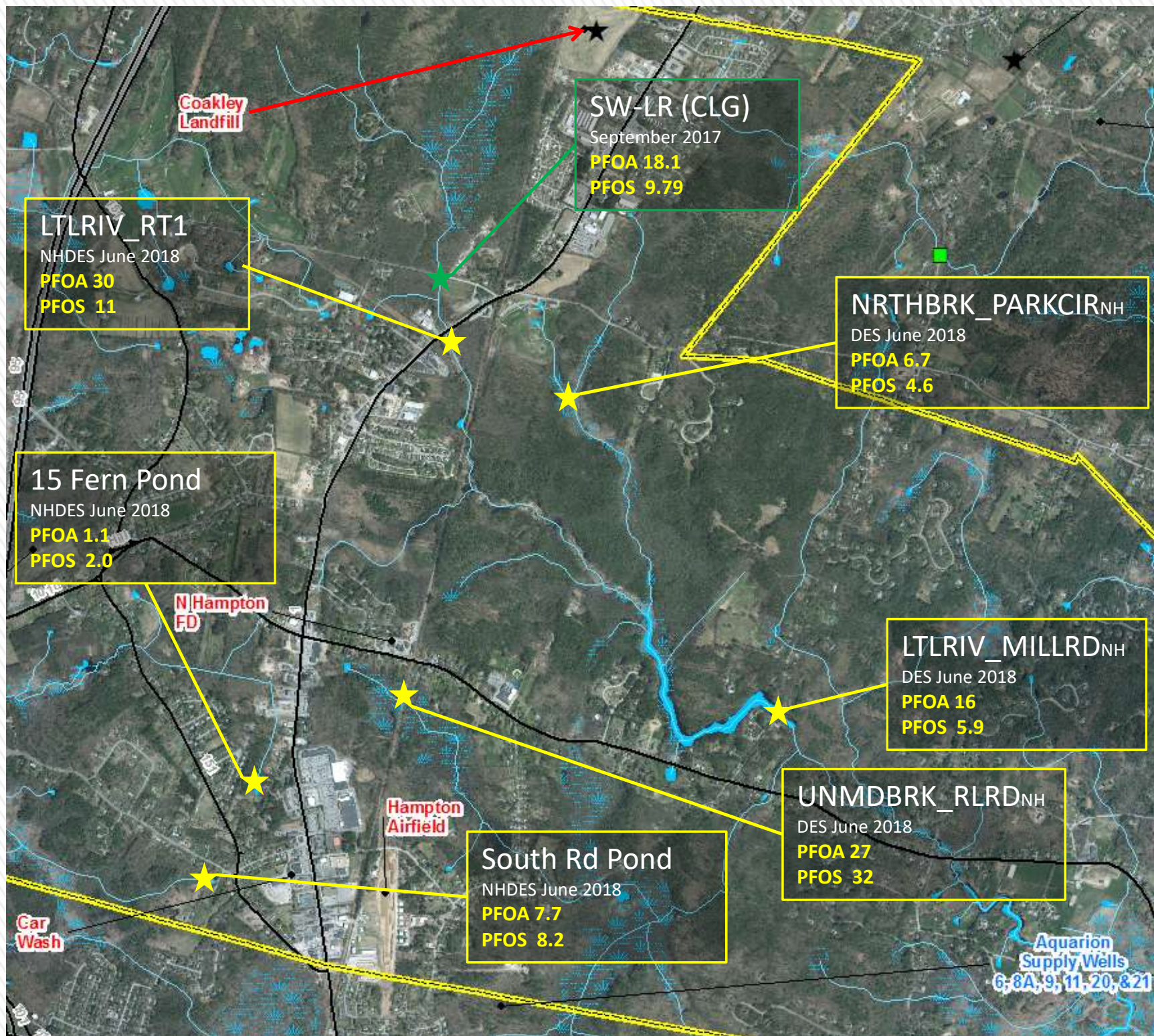Berrys Brook

Upstream limit of tidal water

Proposed fish tissue sampling locations

NHDES & CLG Surface Water Sampling Stations (approx.)

Coakley Landfill

**North Hampton Surface Water PFOA/PFOS Summary**

**Updated July 2, 2018**

Coakley Landfill

SW-LR (CLG)
September 2017
**PFOA 18.1**
**PFOS 9.79**

LTLRIV_RT1
NHDES June 2018
**PFOA 30**
**PFOS 11**

NRTHBRK_PARKCIR_NH
DES June 2018
**PFOA 6.7**
**PFOS 4.6**

15 Fern Pond
NHDES June 2018
**PFOA 1.1**
**PFOS 2.0**

N Hampton FD

LTLRIV_MILLRD_NH
DES June 2018
**PFOA 16**
**PFOS 5.9**

Hampton Airfield

UNMDBRK_RLRD_NH
DES June 2018
**PFOA 27**
**PFOS 32**

South Rd Pond
NHDES June 2018
**PFOA 7.7**
**PFOS 8.2**

Car Wash

Aquarion Supply Wells
6, 8A, 9, 11, 20, &21

# Overview of SLs for Recreational Ingestion of Surface Water, Sediment & Fish Tissue

## Risk-Based Screening Levels

| | Surface Water (ng/L) | | Sediment (mg/kg) | | Fish (mg/kg) |
|---|---|---|---|---|---|
| Assumptions | 120 day/yr | 45 day/yr | 120 day/yr | 45 day/yr | 6 grams/day |
| PFOS/PFOA | 760 | 2,030 | 0.369 | 0.98 | 0.00521 |
| PFBS | 760,000 | 2,030,000 | 369 | 983 | 5.21 |

# Coakley Landfill
# Contact Information

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