LANDFILLS AFTER CLOSURE

JAIME M. COLBY, P.E.
SOLID WASTE MANAGEMENT BUREAU
NH DEPARTMENT OF ENVIRONMENTAL SERVICES

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

WHAT?

Post-Closure Care

- Obligations
- How Long

Post-Closure Use

- It's Optional
- Post-Closure Uses
- Examples
- Regulatory Considerations
- Got an Idea, Now What?
- For a Solid Waste Landfill

Contacts

Questions

LAW

Solid Waste Management Act, RSA 149-M

RULES

NH Solid Waste Rules, Env-Sw 100 et seq.

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

POST-CLOSURE CARE

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OBLIGATIONS

Inspect, Monitor, Maintain, and Repair

- Semi-annual inspections
- Groundwater & LFG monitoring
- Perform maintenance
- Make repairs

Lebanon Municipal Landfill, Lebanon, NH.
Taken November 8, 2016 by NHDES.

Financial Assurance

- Rolling 30-year period

Reporting

- Annual Post-Closure Report
- Incident Report

Milan Road Landfill, Berlin, NH.
Taken October 18, 2016 by NHDES.

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HOW LONG

"The post-closure period of a landfill shall be the period of time required to demonstrate the facility has achieved the performance standards …"

[ref. Env-Sw 807.05(a)]

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HOW LONG

"Performance Standards. The permittee shall implement an approved closure plan requiring that:

(a) The facility and site effectively cease generating leachate;

(b) The facility and site effectively cease generating decomposition gases;

(c) The facility and site achieve maximum settlement, with the capping system intact and no reasonable expectation that integrity of the capping system will be at risk without regular maintenance;

(d) The facility and site have no adverse impact to air, groundwater or surface water; and

(e) The facility and site not otherwise pose a risk to human health or the environment."

[ref. Env-Sw 807.04]

HOW LONG?

A Long Time

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POST-CLOSURE USE

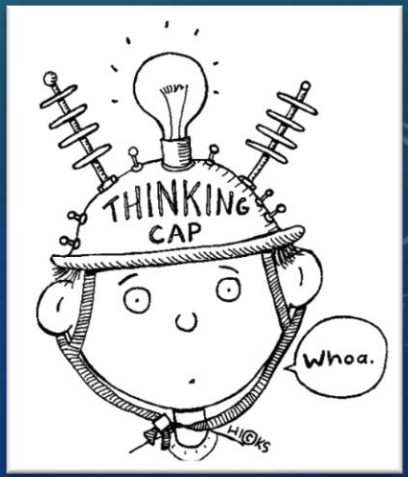
NEW HAMPSHIRE DEPARTMENT OF Environmental Services

IT'S OPTIONAL

Don't Use It: Isolate the facility

Do Use It: Reuse the landfill footprint (i.e., cap space)

Hybrid: Reuse off-footprint space
(isolate the landfill & infrastructure)



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POST-CLOSURE USES

Every closed landfill and site has a quirk;

you need to find the post-closure use that is right for your facility.

Uses Approved to Date:

- Transfer stations
- Recreational areas
- Parking areas
- Solar arrays
- Off-cap gun range

Not recommended:

- Buildings or permanent structures
- Penetrations of the cap and/or waste mass

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EXAMPLES – NOT SO SUCCESSFUL

Webster Square (Former Blueline Express), Nashua: Retail Center

- Structural deficiencies have resulted in unusable retail space
- Multiple retrofit projects required
- On-going issues in keeping landfill gas systems operational

Webster Square Landfill, Nashua, NH.
Taken May 24, 2019 by
Sanborn, Head & Associates, Inc.
as presented in report entitled,
"Site Monitoring Results: Spring 2019 Monitoring Round."

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

EXAMPLES – MIXED RESULTS

Old Nashua Landfill, Nashua: Parking Lots

- Frequent shimming of parking areas required due to settlement
- Landfill gas system being compromised by settlement
- Provides parking spaces for adjacent commercial development

Shady Lane Landfill, Nashua: Recreational Fields and Parking Lot

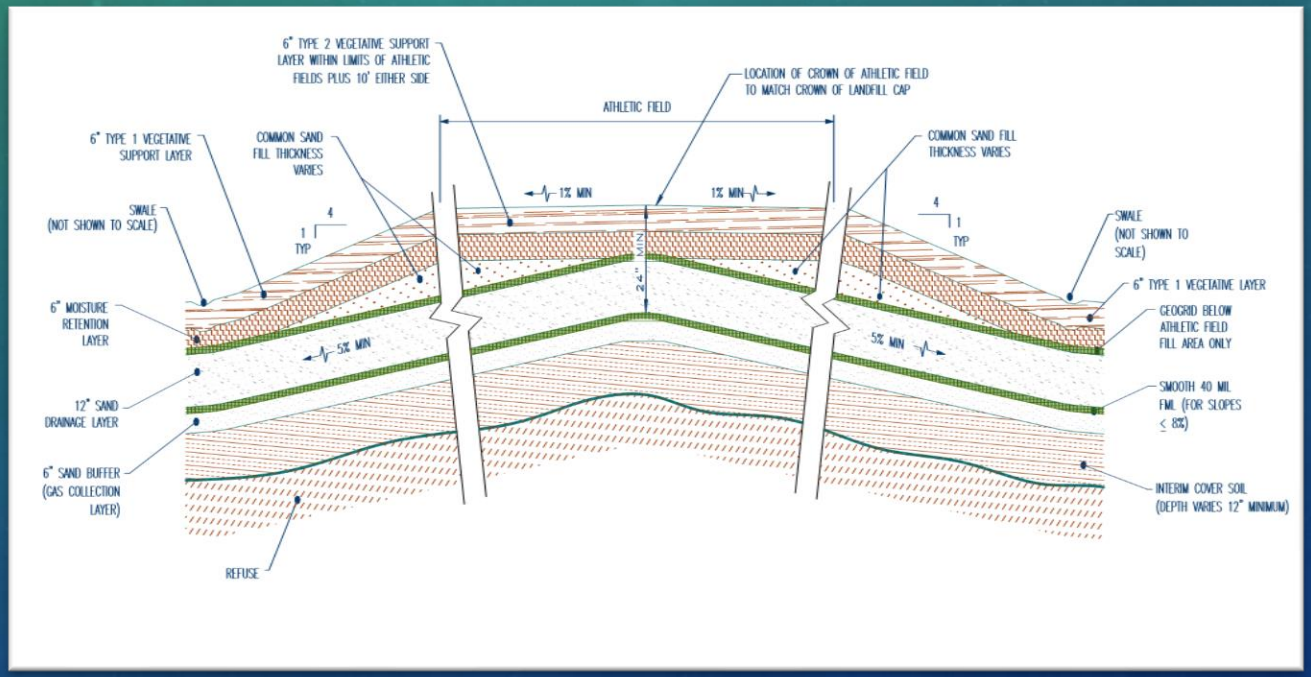
- Indoor air quality monitoring required at adjacent school
- Landfill gas system monitoring and maintenance required
- Provides parking and recreational fields for school

Old Nashua Landfill, Nashua, NH.
From NHDES files.

EXAMPLES – SO FAR, SO GOOD

Goffstown Municipal Landfill, Goffstown: Recreational Fields

- No known issues
- Proper planning for recreational fields



Goffstown Municipal Landfill, Goffstown, NH.
Conceptual cross-section from NHDES files.

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

EXAMPLES – SO FAR, SO GOOD

NH/VT Ash Landfill, Newport: Off-Cap Gun Range

- No known issues
- Generates limited income
- Hosts training for police department, and testing for local gun manufacturer

Milton Municipal Landfill, Milton: Solar Array

- No known issues
- Generates income
- Puts otherwise unusable space to work

Milton Municipal Landfill, Milton, NH. NHDES files. Taken April 20, 2016.

REGULATORY CONSIDERATIONS

- Must <u>not</u> interfere with achieving the ***Performance Standards***
  - Must not compromise the waste containment system and infrastructure, including the groundwater monitoring network
  - Must not interfere with continued inspection, monitoring, and maintenance
  - Must not restrict access for repairs, if needed
- Likely need to update the Closure Plan, which includes the post-closure requirements
- The **<u>permittee</u>** is responsible

Dunbarton Road Landfill, Manchester, NH. NHDES files. Taken April 18, 2014.

GOT AN IDEA, NOW WHAT?

Rules and NHDES program lead varies:

- Pre-’81 (Remediation Programs)
- Post-’81 (Solid Waste Bureau)
- 40 CFR 258, RCRA Subtitle D (Solid Waste Bureau)
- Superfund (Federal Sites Section and EPA)

Also consider:

- Alteration of Terrain Permit
- NPDES Permit
- Local Approval
- Other permits/approvals

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FOR A SOLID WASTE LANDFILL

Requires NHDES approval

- File an application for permit modification (Type I-B)

In addition to completing the application form, provide:

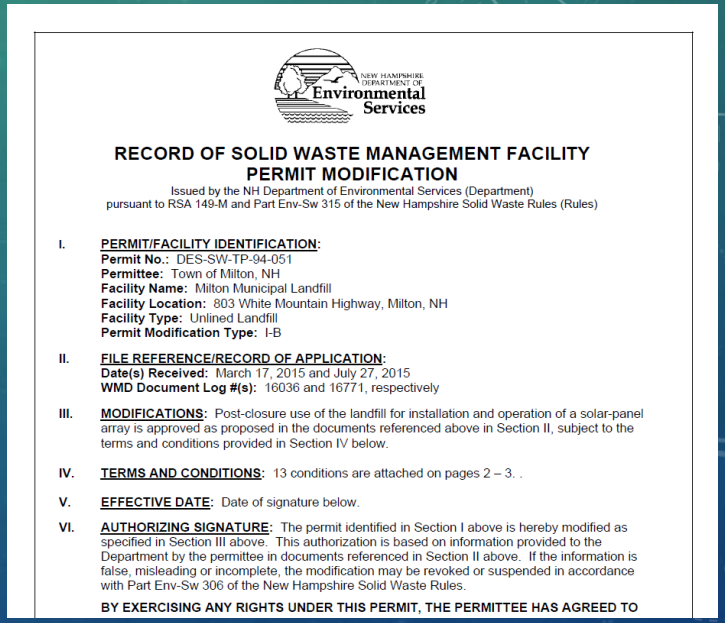
- Information and calculations demonstrating stability (e.g., cap integrity, global stability)
- Information regarding changes to stormwater design/run-off
- Information regarding protection from landfill gas/explosion hazards
- Design plans showing layout, including access roads and setbacks from landfill infrastructure and monitoring points
- Explain how vegetation control will be accomplished
- Explain plans for removal, and returning the site to pre-existing conditions (i.e., landfill with no post-closure use)

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FOR A SOLID WASTE LANDFILL

NHDES approval may include:

- Pre-construction requirements
- Construction requirements
- Post-construction requirements



NEW HAMPSHIRE DEPARTMENT OF Environmental Services

RECORD OF SOLID WASTE MANAGEMENT FACILITY PERMIT MODIFICATION

Issued by the NH Department of Environmental Services (Department) pursuant to RSA 149-M and Part Env-Sw 315 of the New Hampshire Solid Waste Rules (Rules)

I. **PERMIT/FACILITY IDENTIFICATION:**
Permit No.: DES-SW-TP-94-051
Permittee: Town of Milton, NH
Facility Name: Milton Municipal Landfill
Facility Location: 803 White Mountain Highway, Milton, NH
Facility Type: Unlined Landfill
Permit Modification Type: I-B

II. **FILE REFERENCE/RECORD OF APPLICATION:**
Date(s) Received: March 17, 2015 and July 27, 2015
WMD Document Log #(s): 16036 and 16771, respectively

III. **MODIFICATIONS:** Post-closure use of the landfill for installation and operation of a solar-panel array is approved as proposed in the documents referenced above in Section II, subject to the terms and conditions provided in Section IV below.

IV. **TERMS AND CONDITIONS:** 13 conditions are attached on pages 2 – 3. .

V. **EFFECTIVE DATE:** Date of signature below.

VI. **AUTHORIZING SIGNATURE:** The permit identified in Section I above is hereby modified as specified in Section III above. This authorization is based on information provided to the Department by the permittee in documents referenced in Section II above. If the information is false, misleading or incomplete, the modification may be revoked or suspended in accordance with Part Env-Sw 306 of the New Hampshire Solid Waste Rules.

BY EXERCISING ANY RIGHTS UNDER THIS PERMIT, THE PERMITTEE HAS AGREED TO

Remember:
The PERMITTEE is responsible.

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

CONTACTS

Hazardous Waste Remediation Bureau

- Site-specific project manager or
  - Federal Sites: Robin Mongeon, P.E., Tel. (603) 271-7378, email: robin.mongeon@des.nh.gov
  - State Sites: Amy Doherty, P.G., Tel. (603) 271-6542, email: amy.doherty@des.nh.gov
  - Brownfield Sites: Mike McCluskey, P.E., Tel. (603) 271-2183, email: michael.mccluskey@des.nh.gov

Oil Remediation & Compliance Bureau

- Site-specific project manager or
  - Peg Bastien, P.E., Tel. (603) 271-7372, email: margaret.bastien@des.nh.gov

Solid Waste Management Bureau

- Jaime M. Colby, P.E., Tel. (603) 271-5185, email: jaime.colby@des.nh.gov

Terrain Alteration Bureau

- Bethann McCarthy, P.E., Tel. (603) 271-1087, email: bethann.mccarthy@des.nh.gov

RECAP

Post-Closure Care

- Obligations
- How Long

Post-Closure Use

- It's Optional
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Milton Municipal Landfill, Milton, NH. Google Earth. Accessed September 9, 2019.

QUESTIONS?

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Evaluation of PFAS Impacts to the City of Portsmouth Water Supply and Evaluation of Treatment Alternatives

Blake Martin, Vice President
Kyle Hay, Project Engineer

2019 NH Waste and Contaminated Sites Conference
September 11, 2019 – Manchester, NH

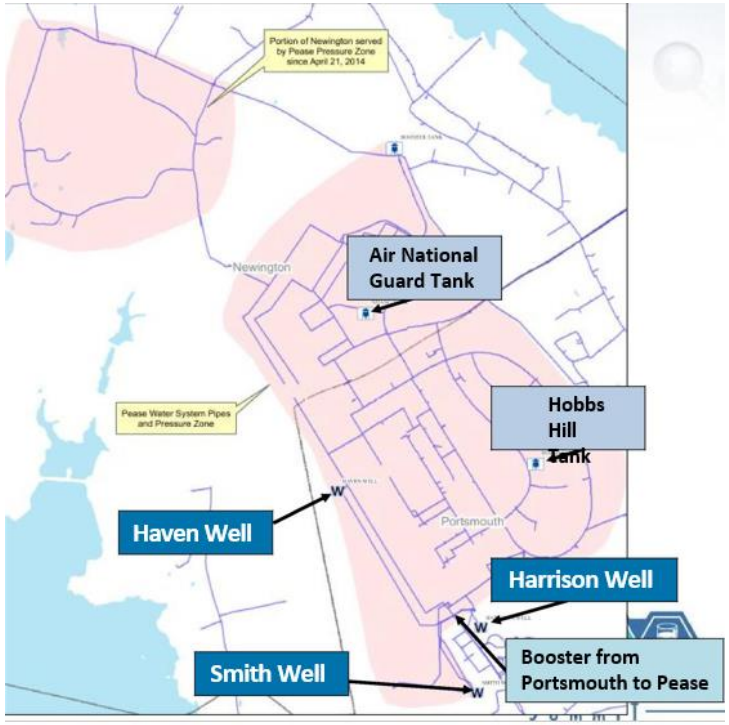
History Pease Tradeport Water System

- 1797 - Portsmouth Aqueduct Company formed by act of NH Legislature
- 1950's - Pease Air Base takes over Pease portion of the water system
- 1990's - Pease Air Base closes and water system turned over to Pease Development Authority for the Pease Tradeport
- 1992 – City of Portsmouth takes over operation of water system

The Pease Tradeport

- 250 Businesses employing 9,500 workers
- Golf course
- Commercial airport
- 5 Secondary education institutions
- Various restaurants
- Daycare providers

Pease Water System



- 3 Wells
- 2 Storage Tanks
- Booster from Portsmouth to Pease
- 30 Miles of water main
- 0.4 – 1.0 MGD demand

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Previous Ground Water Contamination

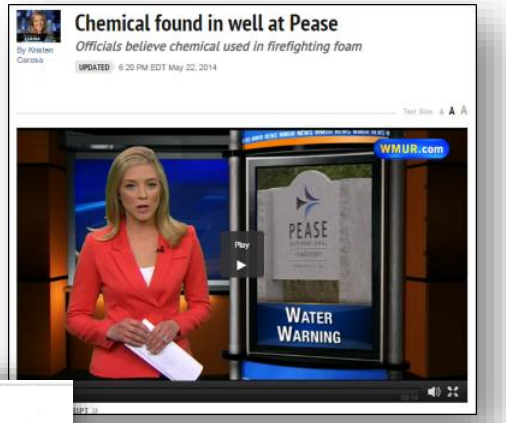
- VOCs plumes (TCE/PCE) found around Haven Well
- A WTP constructed in the mid 1980's to treat for VOCs
- 1990 site remediation started under CERCLA
- Due to low demand (base closure) and steadily improving GW quality, WTP never activated, equipment removed in 2013

Pease Well Is Shut Down After Unregulated Contaminant Discovered

By SAM EVANS-BROWN • MAY 22, 2014

Tweet Share Google+ Email

May 2014



Article published May 22, 2014

Contaminated well shut down at Pease Tradeport

PORTSMOUTH — A well that serves the Pease International Tradeport has been shut down after testing positive for a chemical contaminant, according to the state Department of Environmental Services.

Local and Federal Legislative Delegation

March 18, 2015 - Senator Shaheen addresses Pease PFC contamination to U.S. Air Force

2016 – Governor (now Senator) Hassan meets with Testing for Pease representatives

Technical Response Team Forms

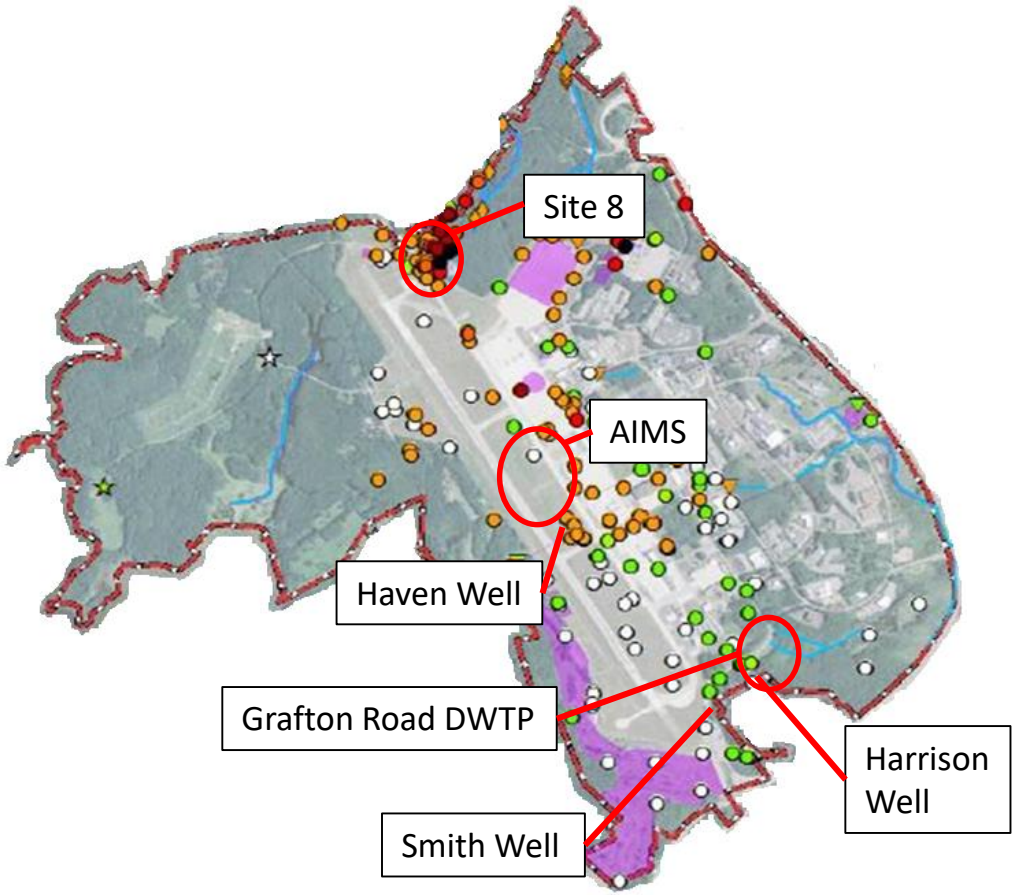
- **Weekly meetings (initially) either in-person or via teleconference:**
  - City of Portsmouth Staff
    - City consultants
  - Pease Development Authority
  - Environmental Protection Agency
  - New Hampshire Department of Environmental Services
    - Waste Division
    - Drinking Water and Groundwater Bureau
  - Air Force Civil Engineering
    - Air Force Consultants
  - New Hampshire Health and Human Services
  - Agency for Toxic Substances and Disease Registry (ATSDR)
  - Others, depending on topic

Public Involvement:

- Presentations to Portsmouth City Council
- Haven Well Community Advisory Board
  - 14 public meetings in 2014
- Blood Testing
  - March 31st, 2015 – Public Meeting where NHHS Announces Protocol for Pease Blood Testing
  - Three public meetings announcing blood test results
- ATSDR Community Assistance Panel
  - Formed in 2016 to address long-term health concerns
- Pease Restoration Advisory Board
  - Reestablished in 2016

Former Pease Air Force Base

- Three treatment systems
  - Site 8 (remediation)
  - AIMS (remediation)
  - Grafton Road (drinking water)

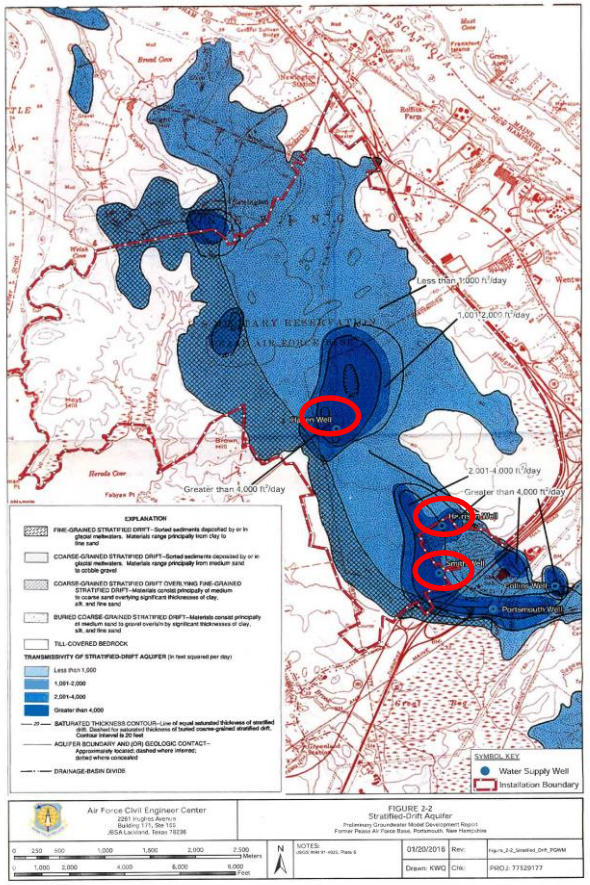


Drinking Water Sources

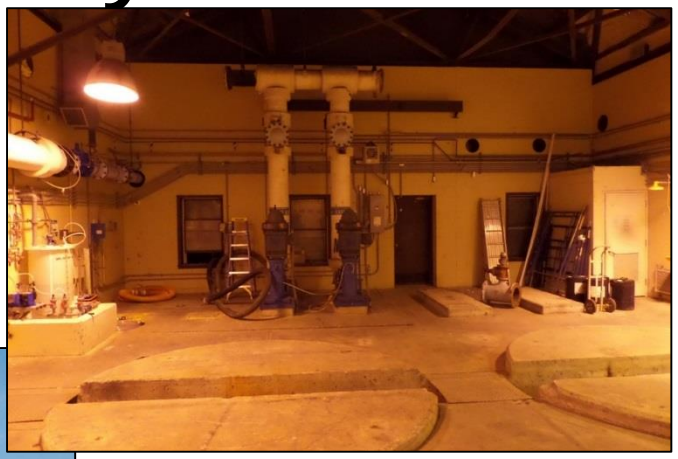
Initial Haven Well sample came back at 2.5 µg/L

Well	Flow Rate (gpm)	PFOA+PFOS (µg/L)
Harrison	286	0.029
Smith	343	0.012
Haven	534	1.495

Average PFOA+PFOS concentrations, Harrison and Smith: 2016-2017, Haven: 2016



Existing Facility



Drinking Water Technologies

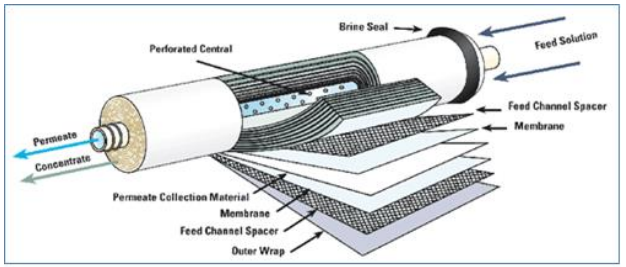
- Granular Activated Carbon
  - Advantages – cost effective, several systems in use, PFAS can be transported offsite for destruction
  - Disadvantages – may be costly to changeout for short chain breakthrough, footprint/building height

Drinking Water Technologies

- Ion Exchange Resins
  - Advantages – custom designed treatment, long service life, smaller vessels required
  - Disadvantages – expensive if single use, newer technology with limited data

Drinking Water Technologies

- Membranes



  - Advantages – >99% removals
  - Disadvantages – waste stream, high capital and O&M costs, expertise required to operate system

GAC Piloting – Harrison and Smith

Purpose – monitor GAC effects on pH

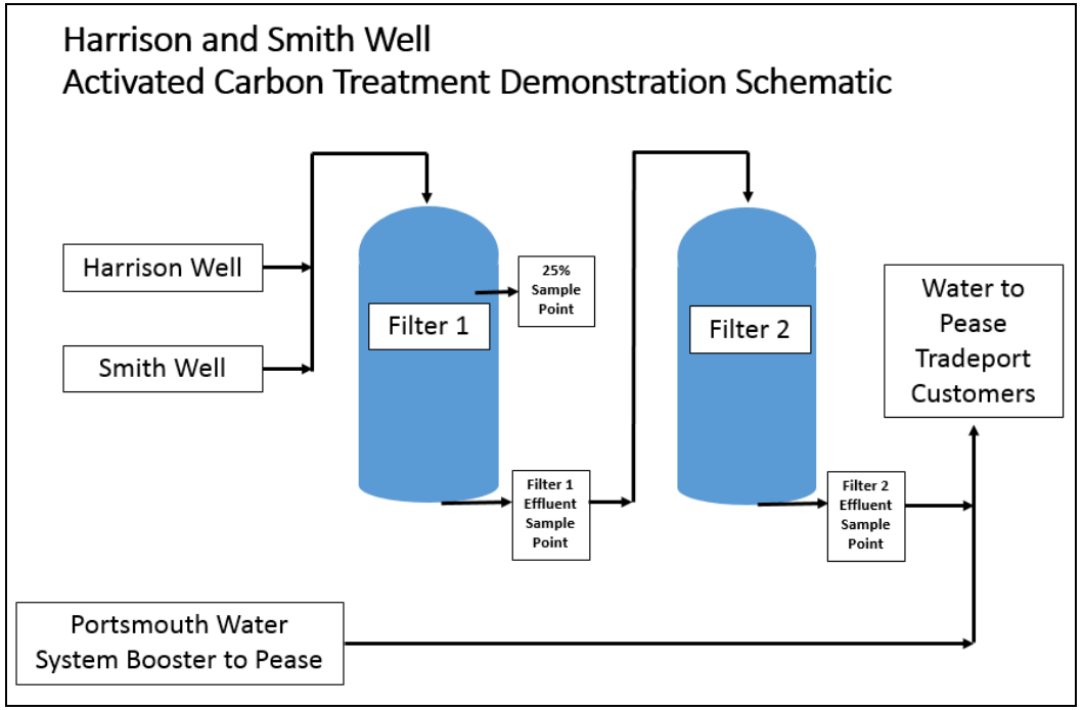
- Potential issues with orthophosphate effectiveness

Demonstration Study

Purpose

- Test GAC effectiveness on Pease (Harrison and Smith) water
- Test new media
- Further research treatment alternatives
- Evolving regulations
- Design of permanent facility

Demonstration Filter Schematic



GAC Filter Installation

Demonstration Filter Results
(September 2016 – present)

- 35 months of operation, ~425,000,000 gallons treated
  - GAC works well for low levels of PFOA/PFOS
- Media in PV2 replaced March 2018, All media replaced in November 2018
- Most recent sampling event (July 8, 2019 - 79,000,000 gallons/15,000 BV):
  - Trace levels of PFHpA, PFOA, PFBS, PFHxS, PFOS at 50% sample port of PV1
  - Trace levels of PFPeA, PFHxA at 100% sample port of PV1
  - PFBA at 100% sample port of PV2
- Concentrations near detection limits are difficult to trend
  - Now using 2 ppt reporting limit

Objectives of Haven Well Pilot Test

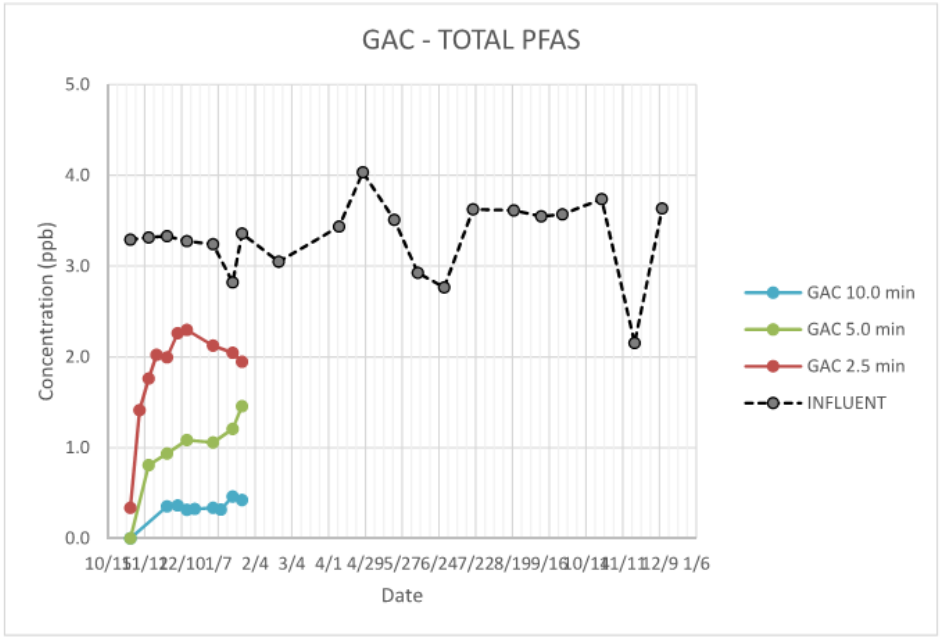
(November 2017 – December 2018)

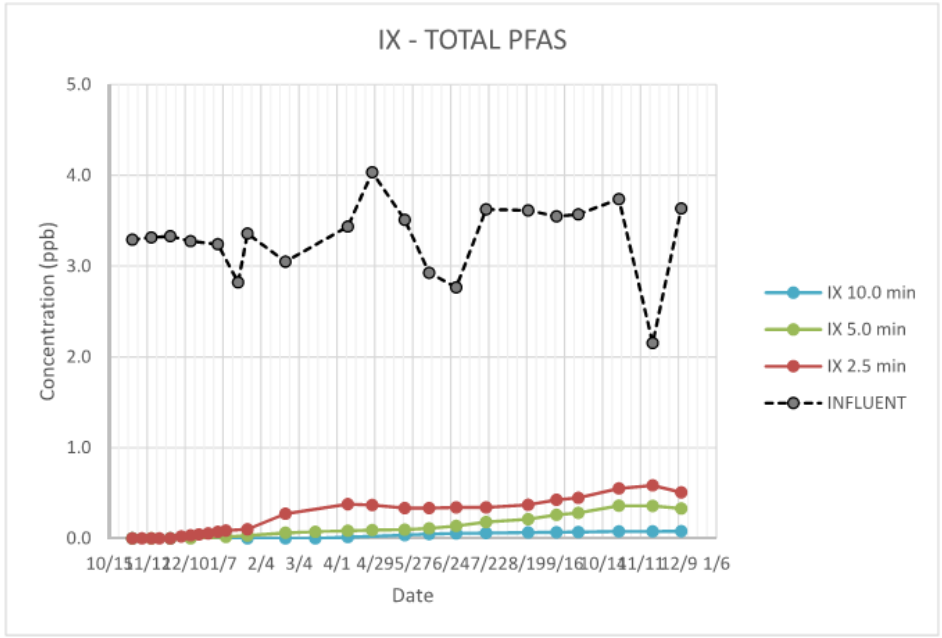
- Uncertain if GAC would perform well for significantly higher levels of PFAS.
- Compare the ability of media to remove PFAS from the Haven Well
  - IX Resin = ECT's SORBIX LC1
  - GAC = Calgon's F400
- Confirm design parameters and system sizing to be used in the preparation of the full-scale treatment system technology evaluation.
- Select PFAS-removal technology for full-scale implementation based on lifecycle cost comparison and risk

Haven Pilot Setup

- Fabricated dual sided pilot skid for side-by-side testing: IX Resin vs. GAC
  - Each side:
    - Design flowrate of 112 gpd
    - 4 columns in series, 2.5-min EBCT each
    - 1.25-inch column diameter
    - 30-inch media bed height
- Sampled & analyzed for 23 PFAS compounds out of each column

Haven Pilot Results





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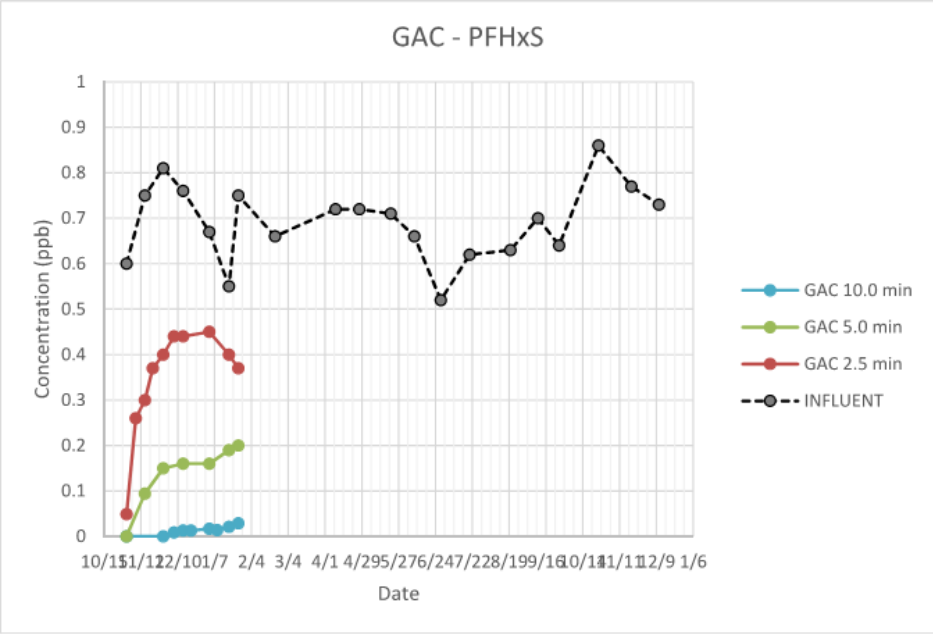
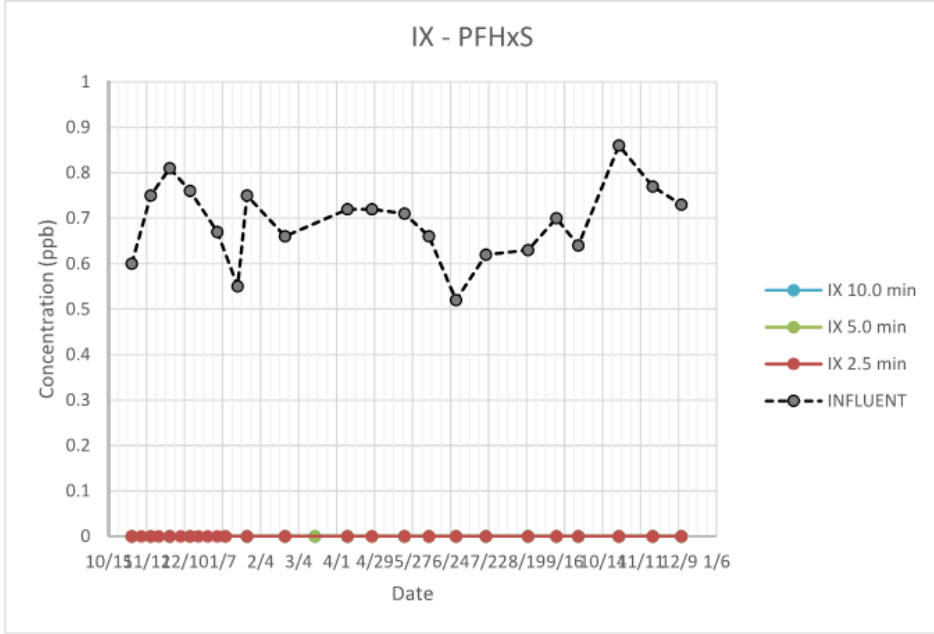
Haven Pilot Results





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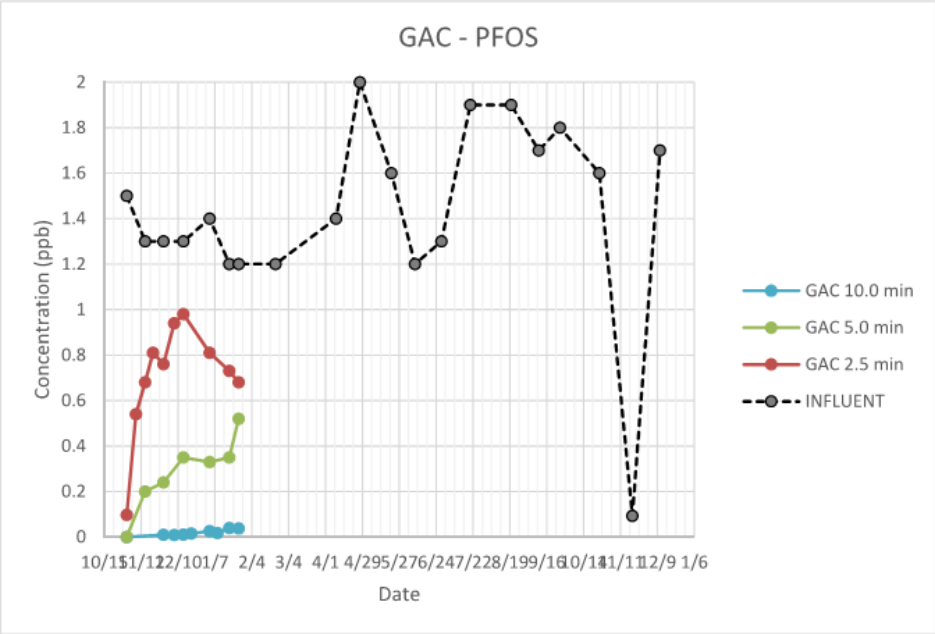
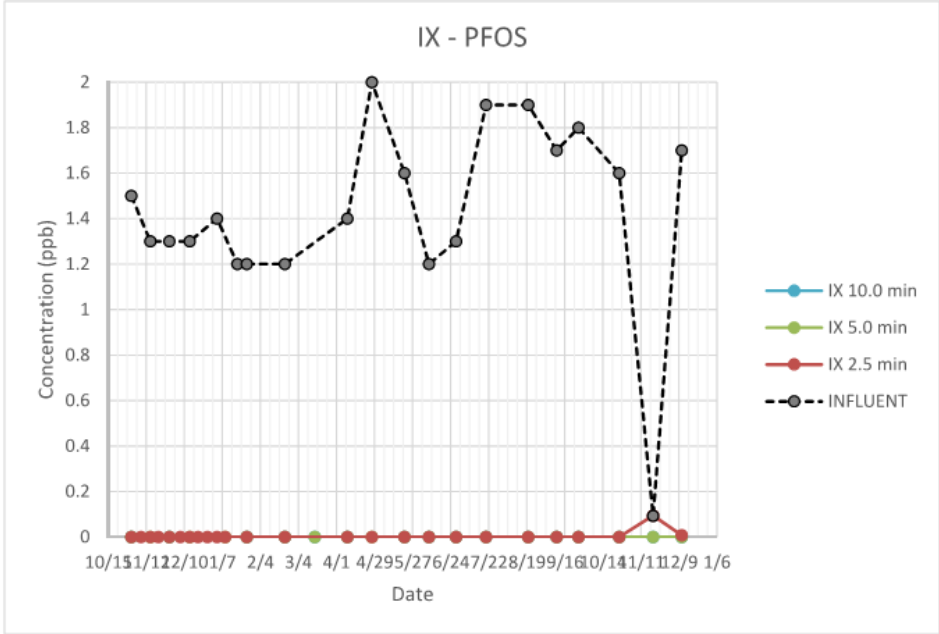
Haven Pilot Results





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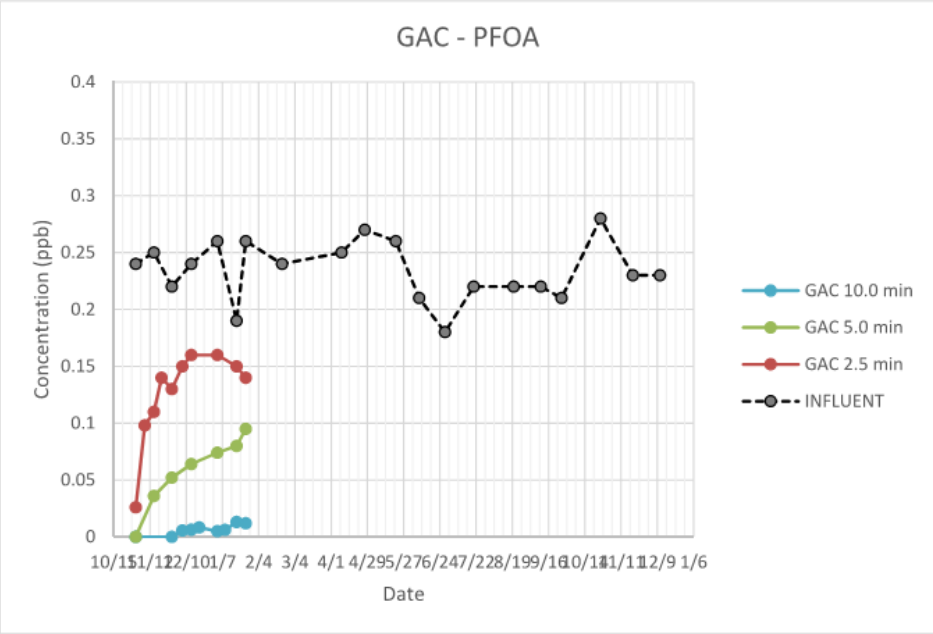
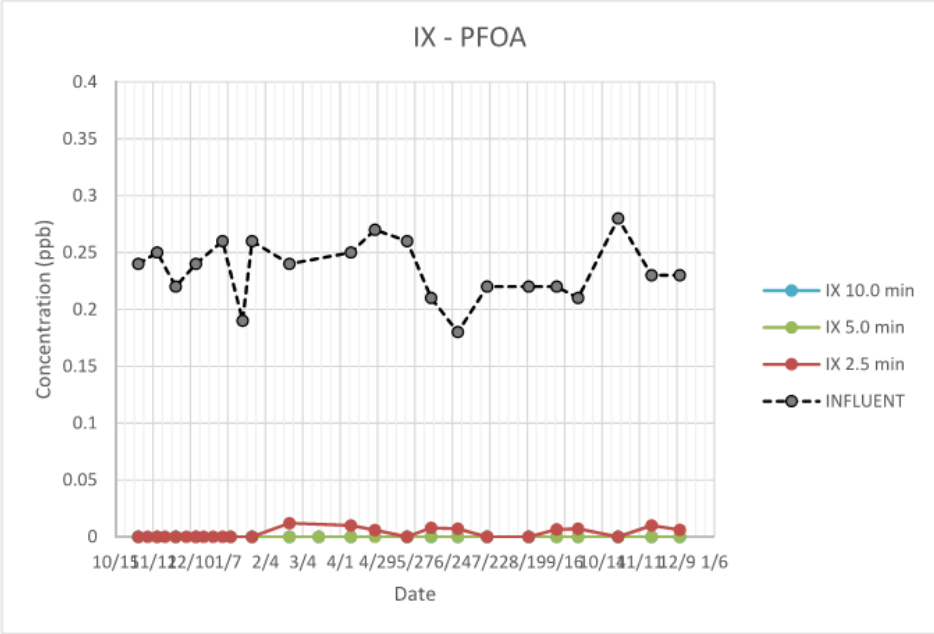
Haven Pilot Results





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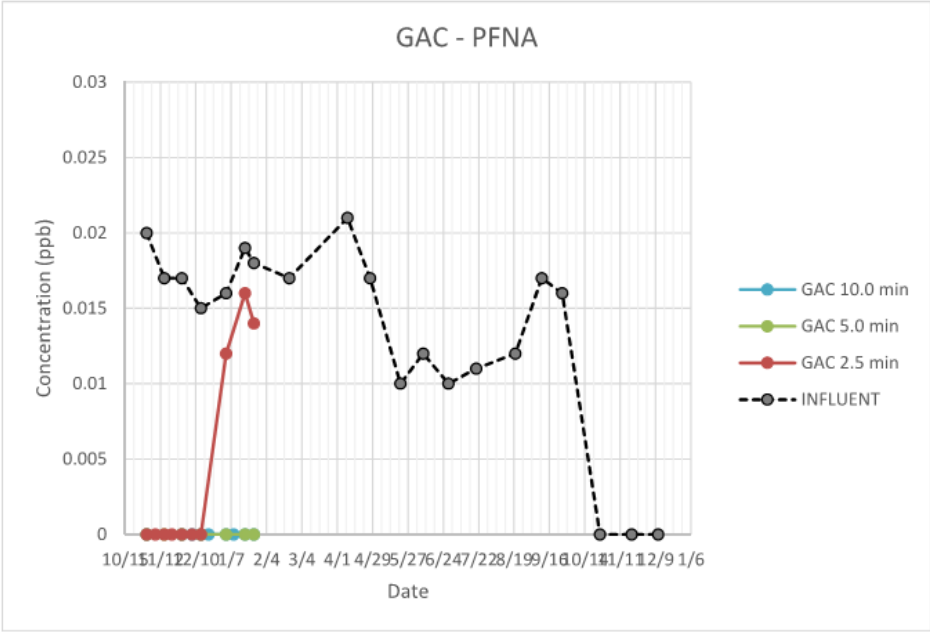
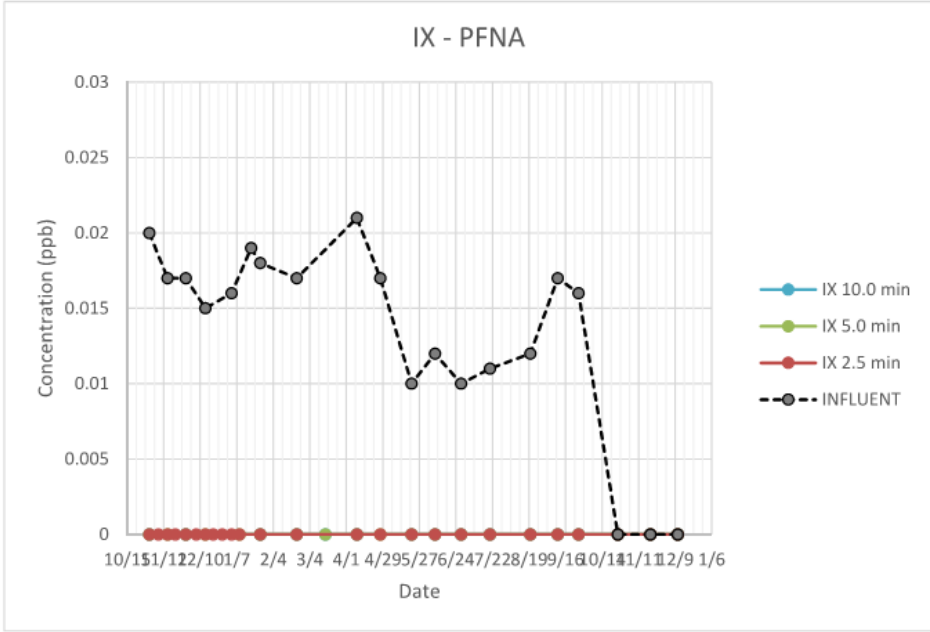
Haven Pilot Results





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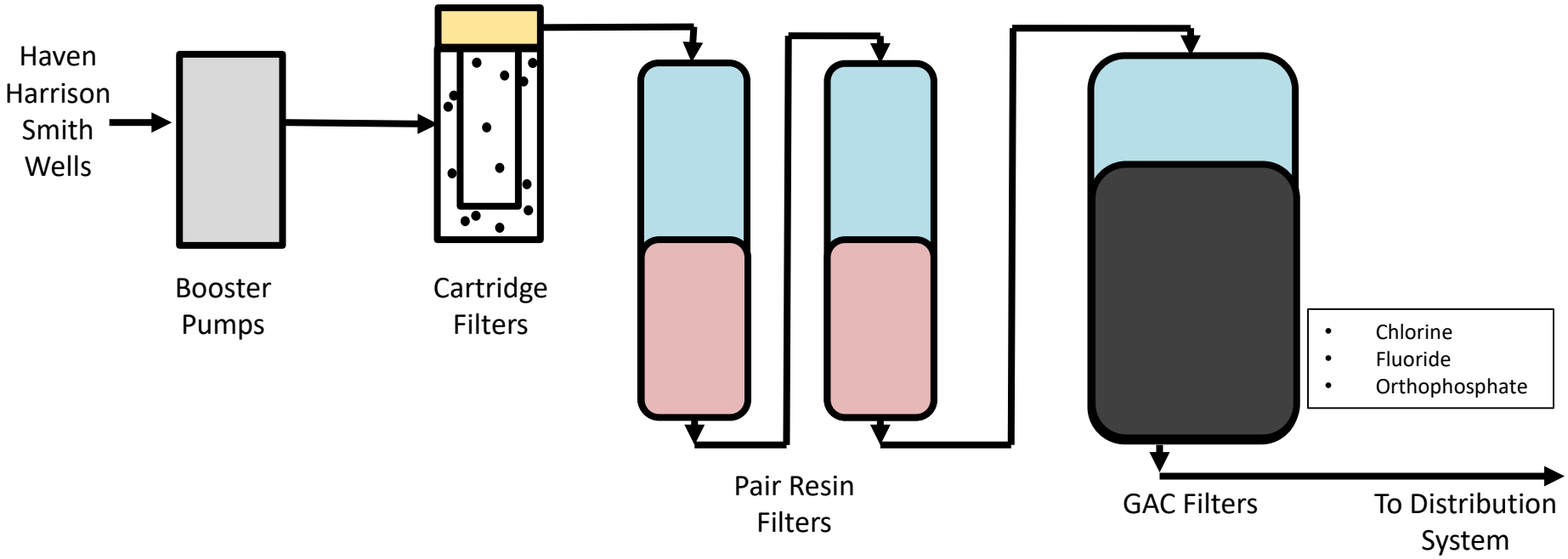
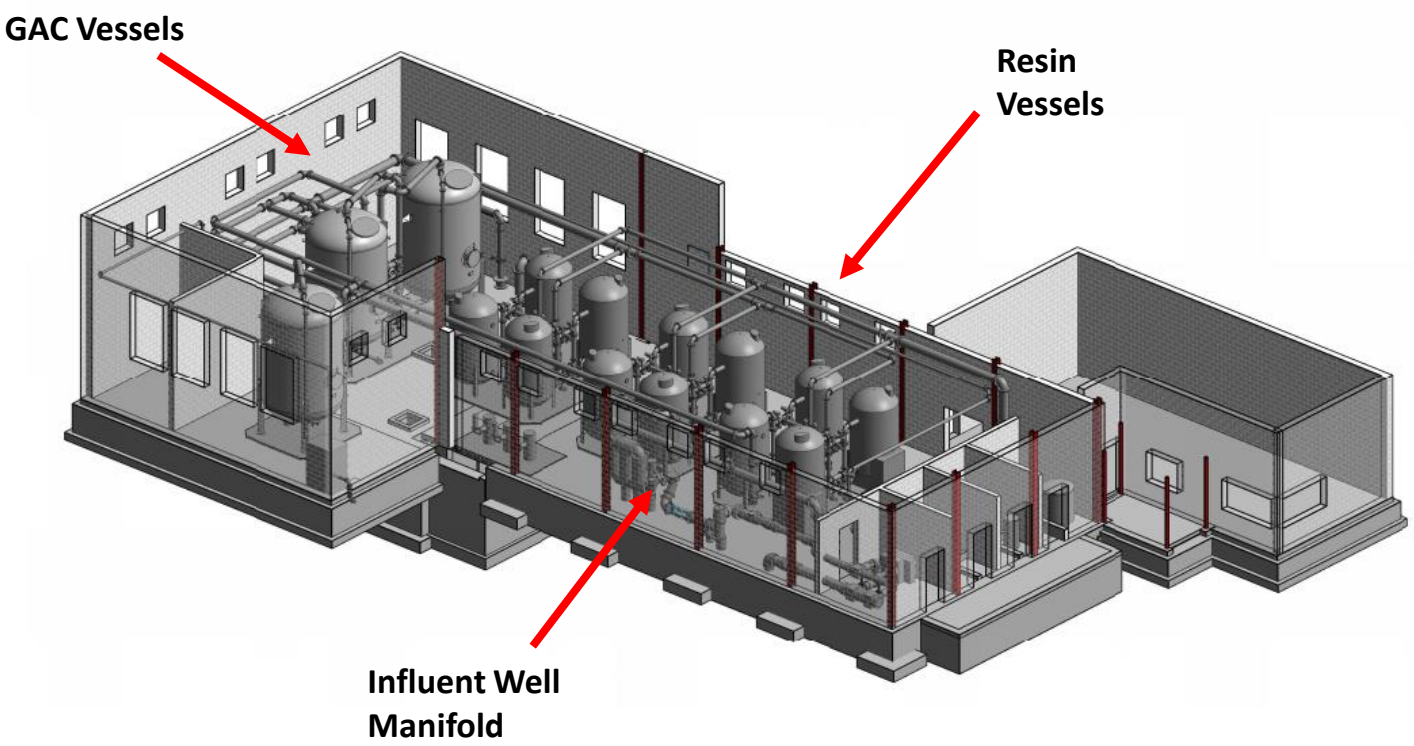
Haven Pilot Conclusions

- Resin significantly outperforms GAC when raw water PFAS concentrations are high
- Resin removed short chain compounds better than GAC
- As regulations move PFAS limits lower, the advantages of resin over GAC goes up

Grafton Road Water Facility Process Schematic
New Treatment System



Proposed Final Layout



Twenty Year Present Worth Analysis
Grafton Road Drinking Water Treatment Plant

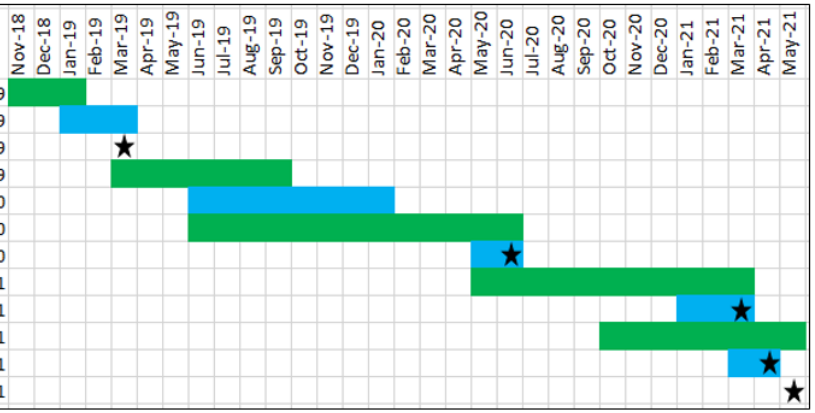
Treatment Option	Construction Cost		Operations Costs		Present Worth Cost (20 year, 4%)
	Vessels and Media	Credits*	Annual Media Cost	Increase Electrical Cost Due to Additional Headloss	
GAC Only Treatment	$2,140,000	-	$304,000	-	$6,271,000
Resin in Parallel and GAC in Series	$2,430,000	-	$91,300	$2,000	$3,698,000
Resin in Series and GAC in Parallel	$2,625,000	$(910,000)	$99,300	$8,000	$3,173,000

* Credits associated with reduction in building footprint and elimination of backwash supply and recycle tanks.

- Third-party estimated construction cost - **$14,000,000**
- Low Bid - **$10,343,000**

Anticipated Construction Schedule

Activity	Duration	Start	Finish
Bidding	61	11/15/2018	1/15/2019
Contract Award	56	1/15/2019	3/12/2019
Notice to Proceed	0	3/12/2019	3/12/2019
Submittals	181	3/13/2019	9/10/2019
Equipment Procurement	224	6/4/2019	1/14/2020
Phase 1 - Building Addition & GAC Filters	379	6/10/2019	6/23/2020
GAC Filters On-Line with Smith & Harrison	27	5/27/2020	6/23/2020
Phase 2 - Resin Skid, Cartridge Filters, Booster Pumps	279	5/29/2020	3/4/2021
Full System Start-Up with Smith & Harrison	48	1/15/2021	3/4/2021
Phase 3 - Admin Area, Site Work, Haven Well Online	200	10/15/2020	5/3/2021
Full System Start-Up with Haven	42	3/4/2021	4/15/2021
Final Completion	4	4/29/2021	5/3/2021



Milestones:

- Spring 2019 – Begin Construction
- June 2020 – New GAC Filters (switchover of Harrison/Smith Wells)
- Spring 2021 – Startup with Resin/GAC filters (Harrison/Smith Wells)
- Summer 2021 – Haven Well Startup

Weston & Sampson SM

Questions?

SAFETANK FINANCIAL ASSISTANCE PROGRAM

AND

HOW IT RELATES TO PETROLEUM REIMBURSEMENT FUND ELIGIBILITY

Genevieve Al-Egaily
New Hampshire
Department of Environmental Services

Fuel Oil Discharge Cleanup Fund for On-Premise-Use Heating Oil Use

SAFETANK is important part of the process for low income homeowner's

Eligibility for the Petroleum Reimbursement Fund is Determined Based on the Presence of a “Compliant” AST System

Odb 402.01

Financial Assistance Program

- Available to income qualified homeowners
  - Upgrade home heating oil tank system

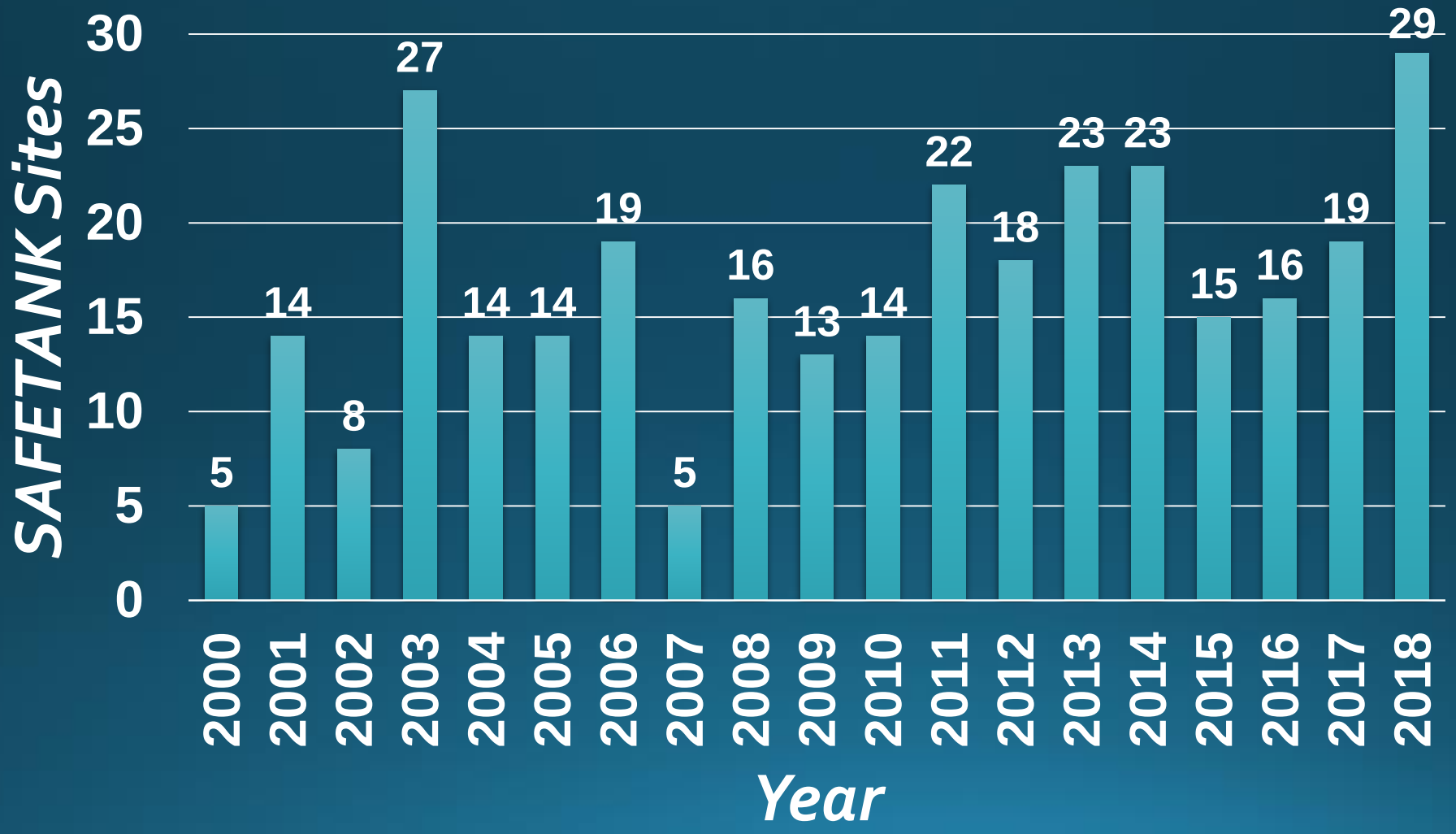
- Provides up to $2,250
  - Upgrade or removal & replacement aboveground tank system

- Provides up to $2,500
  - Remove underground home heating oil tank

- Minimize Risk of Contamination
  - Best Management Practices (BMP)’s

The SAFETANK Program averages 162 tank installations per fiscal year

Fund Eligible sites with SAFETANK

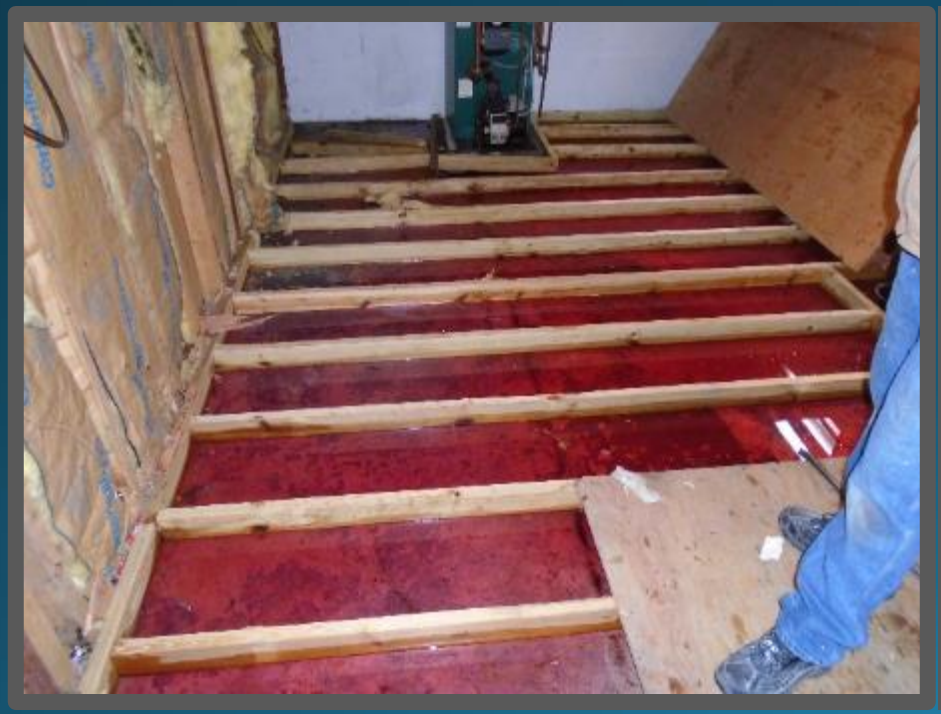


Removal of Underground Home Heating Oil Tank up to $2,500

Upgrade, or Remove and Replace Aboveground Residential Tank System up to $2,250

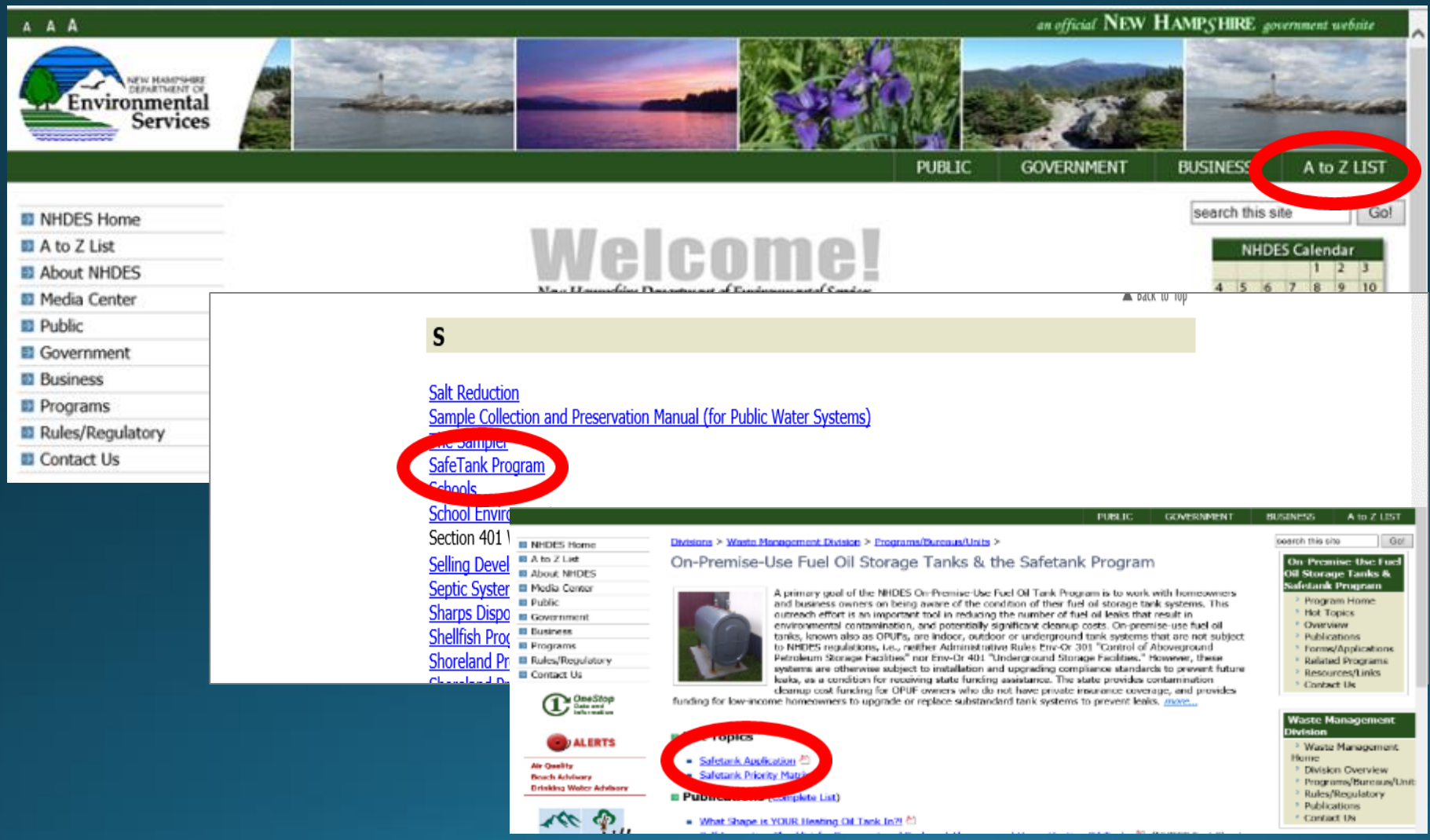
Replace tanks that are not up to code and NH DES Best Management Practices

Less expensive to replace a tank than to clean up a leak!



Safetank Program

des.nh.gov



https://www.des.nh.gov/organization/divisions/waste/orcb/ocs/ofost-safetank/index.htm

Safetank Application

Approval Required Prior to any Work

NHDES-S-04-020

SAFETANK PROGRAM

Financial Assistance For Residential
On-Premise-Use Fuel Oil Facility Tank Upgrade
Application

Oil Remediation & Compliance Bureau

RSA 146-D:6, III.

Owners of on-premise-use heating oil facilities, who demonstrate financial need, may apply for reimbursement of costs to meet the requirements of RSA 146-D:6, III in amounts not to exceed **$2,250**. Reimbursement may be to the owner, or to the contractor, after inspection of the completed work and a review of itemized invoices to verify the work was; (1) completed in a satisfactory manner, and (2) the costs are appropriate.

To qualify for the program, the owner shall meet the definition of "low-income" by U.S. Department of Housing and Urban Development. "Low-income" is defined as 80% of the area Median income (Income criteria is provided on the last page of this application).

Providing documentation of total household income is required and is described in more detail below. Additional qualifying requirements are addressed by answering the following questions.

Be advised that applications must be processed and approval obtained from New Hampshire Department of Environmental Services (NHDES) **prior** to any work being performed, to qualify for reimbursement.

If you have any questions regarding this program or this application, please contact the OPUF Release Prevention Coordinator at (603) 271-3577.

****IMPORTANT:** Answer **all four** of the following questions to determine if you should submit this application.**

1. Do you, as the applicant, own or are you an owner of the subject dwelling and tank system? If "Yes," go on to the next question. If "No," you do not qualify. Yes ___ No ___

2. Is the subject location your primary residence, and is it a single-family home, a duplex, a manufactured home, a farm, or a property where you also operate a small business? If "Yes," go on to the next question. If "No," you do not qualify. Yes ___ No ___

3. Do you hold title to, or have an interest in, any *income-producing property*, other than your primary residence, including but not limited to, stocks or real property held either individually, or through a business, trust, or other related entity? If "No," go on to the next question. If "Yes," you do not qualify. Yes ___ No ___

4. Is the Total Household Annual Income *at or below* the income criteria listed on the chart included in this application for the town, city, or county of residence, based on Household Size? [*Total Household Income* includes the income for all occupants of the household other than tenants. *Household Size* is the total number of occupants other than tenants. All income includes taxed and non-taxed income typically declared for federal income tax purposes, even if no federal tax returns are filed. However, note that if the owner generates any income from property other than the Primary residence, (see Question 2.) he/she cannot qualify.] If "Yes," complete the application. If "No," you do not qualify. Yes ___ No ___

NHDES SAFETANK Program
P O Box 95, Concord, NH 03302-0095
Phone: (603) 271-3577 Fax: (603) 271-2181
www.des.nh.gov

I. Owner Information: (be sure to include location address if different from mailing address)

Name(s): _____

Physical Address: _____

City/Town: _____ State: _____ Zip: _____ County: _____

Mailing Address: (if different) _____

Name of mobile home park if applicable: _____

Home phone: _____ Cell: _____ Work: _____

Email: _____

II. Site (Property) Information:

Is the property served by (check one): private well _____ public water supply _____

If a private well, is it: a shallow well (dug or point well) _____ a drilled/bedrock well _____

Approximate distance between oil tank and well: _____ feet

If public water is it: Community water supply _____ municipal (town or city) water supply _____

Does the property abut surface water? Yes ____ No ____ If yes, name or description of the body of water: _____

III. Income:

To qualify for the SAFETANK program, annual Total Household Income (whether that income is taxable or not) must be at or below 80% of the area (county) median income as calculated by the U.S. Department of Housing and Urban Development. The income criteria for the ten New Hampshire counties, is provided on the last page of this application. When submitting this application for approval, provide written documentation of Total Household Income. The documentation may include: a copy of the most recent federal tax return(s), Social Security benefit statement(s), W-2 forms from the previous tax year, annual pension or retirement statement(s), annual statement(s) or indication of direct deposit(s) of other benefits or income(s). As an alternative, include a copy of the two most recent pay stubs for those household members that are employed. **Please note that tax documentation including but not limited to federal tax return(s), Social Security benefit statement(s) and W-2 forms cannot be accepted via email.**

Total Annual Household Income: $_____

Household Size: (including yourself, the total number of occupants other than tenants living in the subject household)_____

IV. Affirmation: I declare under penalty of perjury that the representation made in this application is, to the best of my knowledge, true, complete, and correct. I agree to reimburse the fund for any payments made to me based on incorrect or inaccurate information.

_____ _____
Owner's signature Date signed

****Pages 3-4 to be completed by contractor or oil company technician****

Safetank Application

Third Party Verification

Fuel Oil Facility Condition Checklist	Yes	No
Is there evidence that the tank or any portion of the facility is presently leaking?		
Are the tank legs unstable, tilting or on an uneven foundation?		
Is the tank resting on or in contact with the ground?		
Are there visible signs of rust, weeps, wet spots, or dents on the tank surface?		
Are there any drips or signs of leakage around the oil filter or valves?		
Is the fuel line underground or through concrete without being encased in a non-metallic sleeve?		
Is the tank located outside where it can be damaged by falling ice or snow from the roof?		
Are there signs of the vent pipe being clogged with ice, snow, or insect nests?		
Is the overfill vent whistle missing or obstructed and silent when the tank is being filled?		
Are there any signs of spills around the fill pipe or from the area of the vent pipe?		
Is the tank sight gauge missing, cracked, stuck or frozen? Is there oil or staining on the top of the tank?		
Is the existing tank located: (check all that apply) Indoors? ____ On a concrete floor? ____ On a dirt floor? ____ Outdoors? _____ On concrete pad? _____ On concrete blocks? _____ Resting on the ground? _____ Partially buried? _____ Fully underground? _____ Other? (such as in shed or out building) _____		

IMPORTANT!! Contractor - *Provide a brief narrative describing the condition of the existing tank system.*

_____

_____

_____

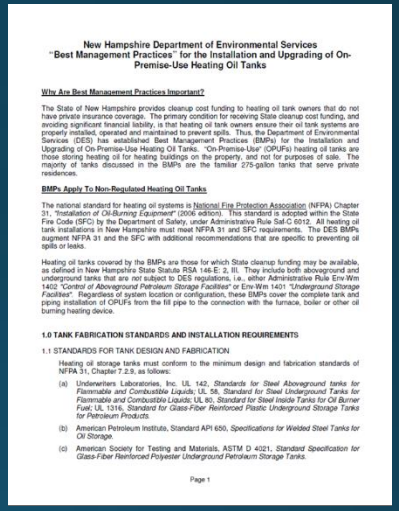
HUD Income Criteria for NH

	HOUSEHOLD SIZE					
COUNTY [2]	**1 PERSON**	**2 PERSON**	**3 PERSON**	**4 PERSON**	**5 PERSON**	**6 PERSON**
BELKNAP	$ 45,150	$ 51,600	$ 58,050	$ 64,500	$ 69,700	$ 74,850
CARROLL	$ 45,150	$ 51,600	$ 58,050	$ 64,500	$ 69,700	$ 74,850
CHESHIRE	$ 45,550	$ 52,050	$ 58,550	$ 65,050	$ 70,300	$ 75,500
COOS	$ 45,150	$ 51,600	$ 58,050	$ 64,500	$ 69,700	$ 74,850
GRAFTON	$ 45,150	$ 51,600	$ 58,050	$ 64,500	$ 69,700	$ 74,850
HILLSBOROUGH	$ 49,200	$ 56,200	$ 63,250	$ 70,250	$ 75,900	$ 81,500
[a] Nashua MSA	$ 50,350	$ 57,550	$ 64,750	$ 71,900	$ 77,700	$ 83,450
[b] Manchester MSA	$ 46,300	$ 52,900	$ 59,500	$ 66,100	$ 71,400	$ 76,700
MERRIMACK	$ 49,250	$ 56,250	$ 63,300	$ 70,300	$ 75,950	$ 81,550
ROCKINGHAM	$ 50,350	$ 57,550	$ 64,750	$ 71,900	$ 77,700	$ 83,450
[c] Boston MSA	$ 56,800	$ 64,900	$ 73,000	$ 81,100	$ 87,600	$ 94,100
[d] Lawrence MSA	$ 50,350	$ 57,550	$ 64,750	$ 71,900	$ 77,700	$ 83,450
[e] Western Rockingham	$ 50,350	$ 57,550	$ 64,750	$ 71,900	$ 77,700	$ 83,450
[f] Portsmouth-Roch MSA	$ 50,350	$ 57,550	$ 64,750	$ 71,900	$ 77,700	$ 83,450
STRAFFORD	$ 50,350	$ 57,550	$ 64,750	$ 71,900	$ 77,700	$ 83,450
SULLIVAN	$ 45,150	$ 51,600	$ 58,050	$ 64,500	$ 69,700	$ [illegible]

April '18

Compliant System
NHDES Best Management Practices (BMP's)

- Concrete pads - reinforced
- Proper location of the tank
- Tank coating
- Poly-coated copper lines
- Floor flanges
- Unprotected outdoor filters - Not permitted
- Compliance with fire code NFPA 31
- Local codes



New Hampshire Department of Environmental Services
"Best Management Practices" for the Installation and Upgrading of On-Premise-Use Heating Oil Tanks

Why Are Best Management Practices Important?

The State of New Hampshire provides cleanup cost funding to heating oil tank owners that do not have private insurance coverage. The primary condition for receiving State cleanup cost funding, and avoiding significant financial liability, is that heating oil tank owners ensure their oil tank systems are properly installed, operated and maintained to prevent spills. Thus, the Department of Environmental Services (DES) has established Best Management Practices (BMPs) for the Installation and Upgrading of On-Premise-Use Heating Oil Tanks. "On-Premise-Use" (OPUFs) heating oil tanks are those storing heating oil for heating buildings on the property, and not for purposes of sale. The majority of tanks discussed in the BMPs are the familiar 275-gallon tanks that serve private residences.

BMPs Apply To Non-Regulated Heating Oil Tanks

The national standard for heating oil systems is National Fire Protection Association (NFPA) Chapter 31, "*Installation of Oil-Burning Equipment*" (2006 edition). This standard is adopted within the State Fire Code (SFC) by the Department of Safety, under Administrative Rule Saf-C 6012. All heating oil tank installations in New Hampshire must meet NFPA 31 and SFC requirements. The DES BMPs augment NFPA 31 and the SFC with additional recommendations that are specific to preventing oil spills or leaks.

Heating oil tanks covered by the BMPs are those for which State cleanup funding may be available, as defined in New Hampshire State Statute RSA 146-E: 2, III. They include both aboveground and underground tanks that are not subject to DES regulations, i.e., either Administrative Rule Env-Wm 1402 "*Control of Aboveground Petroleum Storage Facilities*" or Env-Wm 1401 "*Underground Storage Facilities*". Regardless of system location or configuration, these BMPs cover the complete tank and piping installation of OPUFs from the fill pipe to the connection with the furnace, boiler or other oil burning heating device.

1.0 TANK FABRICATION STANDARDS AND INSTALLATION REQUIREMENTS

1.1 STANDARDS FOR TANK DESIGN AND FABRICATION

Heating oil storage tanks must conform to the minimum design and fabrication standards of NFPA 31, Chapter 7.2.9, as follows:

(a) Underwriters Laboratories, Inc. UL 142, *Standards for Steel Aboveground tanks for Flammable and Combustible Liquids*; UL 58, *Standard for Steel Underground Tanks for Flammable and Combustible Liquids*; UL 80, *Standard for Steel Inside Tanks for Oil Burner Fuel*; UL 1316, *Standard for Glass-Fiber Reinforced Plastic Underground Storage Tanks for Petroleum Products*.

(b) American Petroleum Institute, Standard API 650, *Specifications for Welded Steel Tanks for Oil Storage*.

(c) American Society for Testing and Materials, ASTM D 4021, *Standard Specification for Glass-Fiber Reinforced Polyester Underground Petroleum Storage Tanks*.

Page 1

Fund eligibility for sites using SAFETANK require written conformation from the program that the new tank system is "compliant"

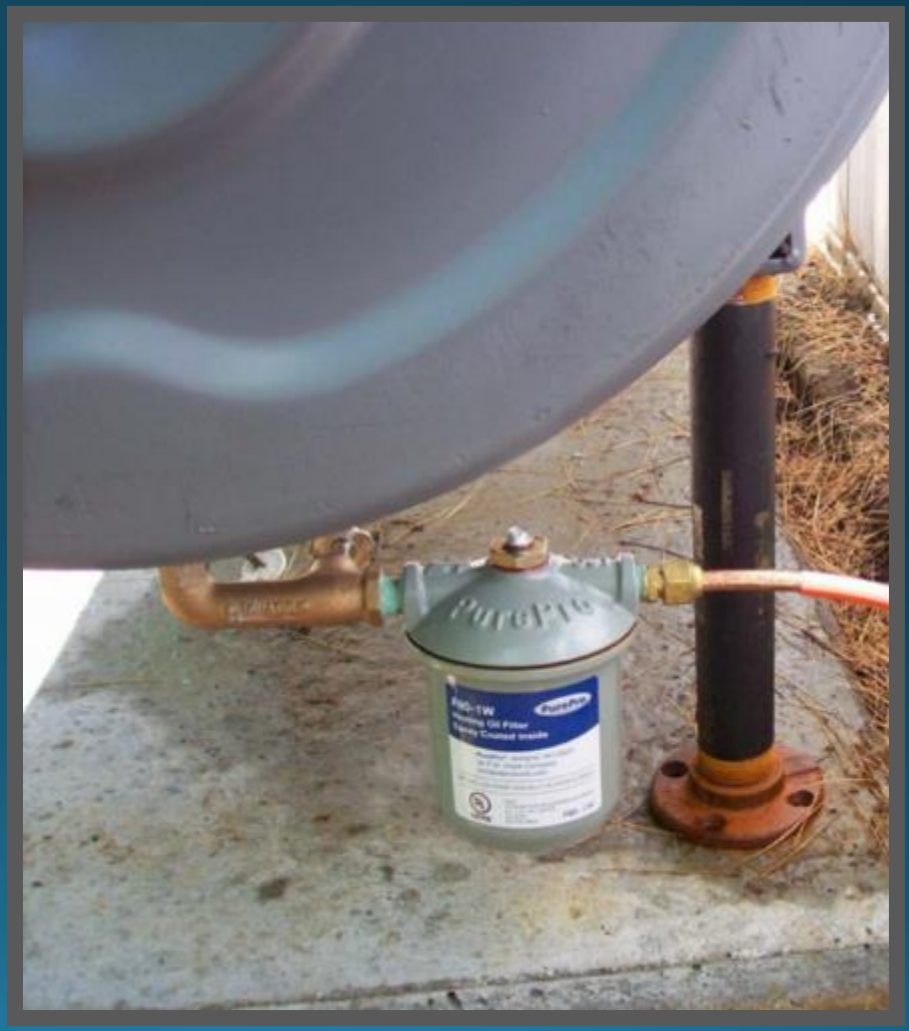
Concrete Pad or Floor

Proper Location of the Tank

- Gabel end
- Ice and snow protection
- 18 inches from drip line

Floor Flanges
on Tank Legs

Tank Coating
Repair Scratches



Poly-Coated Copper Lines

- Continuous from tank to furnace
- One horizontal coil at both ends

Unprotected Outdoor Filters
Not Permitted

Vent Cap
NFPA 31 compliant required

Screen No. 4 mesh
or coarser
compliant

Mushroom vent cap
No. 30 mesh
noncompliant

Secondary Containment

Questions?

Genevieve Al-Egaily
NH Department of Environmental Services
Waste Management Division

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Concord, NH 03302-0095
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(603) 271-3577