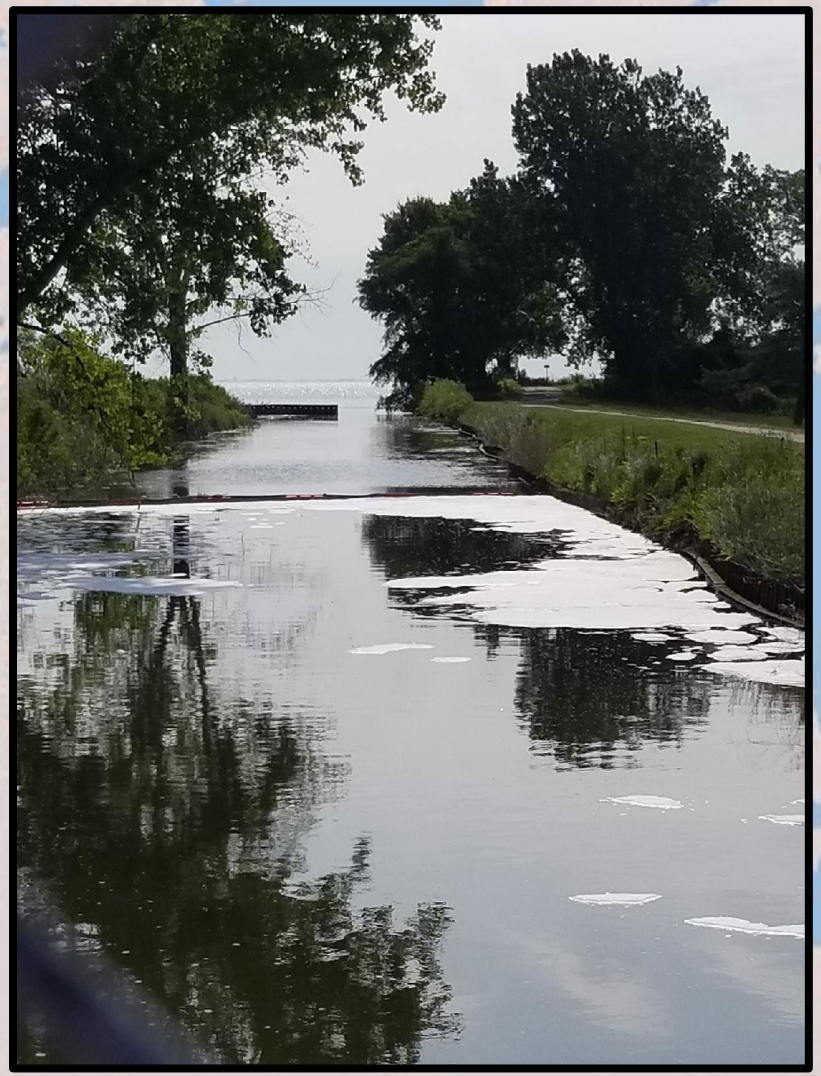
USCG AFFF Spill Response -- June 2018

Regional Response Team 1 & 2 Meeting, October 30, 2018



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PFAS Background

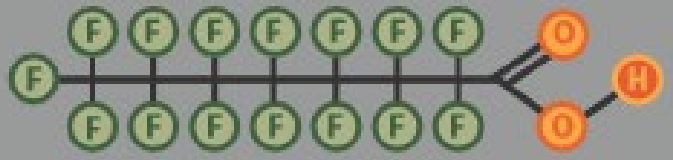
PFAS WHAT YOU NEED TO KNOW

WHAT ARE PFAS CHEMICALS?

Per- and polyfluoroalkyl substances (PFAS) are a group of man-made chemicals that includes PFOA, PFOS and GenX chemicals. Since the 1940s, PFAS have been manufactured and used in a variety of industries around the globe, including in the United States. PFOA and PFOS have been the most extensively produced and studied of these chemicals. Both are very persistent in the environment and in the human body. Exposure to certain PFAS can lead to adverse human health effects.

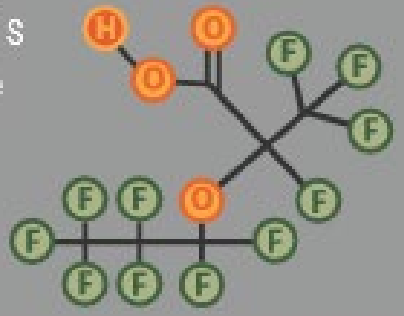
PFOA & PFOS

U.S. manufacturers voluntarily phased out PFOA and PFOS, two specific PFAS chemicals.



GenX Chemicals

GenX chemicals are a replacement for PFOA.



PFAS Background

HOW ARE WE EXPOSED TO PFAS?

PFAS include a large number of important chemicals that can be used in some food packaging and can make things grease- and stain-resistant. They are also used in firefighting foams and in a wide range of manufacturing practices. Unfortunately, some of these substances don't break down over time. That means they build up in the environment and in our bodies.

Drinking water can be a source of exposure in communities where these chemicals have contaminated water supplies. Such contamination is typically localized and associated with a specific facility, for example,

- an industrial facility where PFAS were produced or used to manufacture other products, or
- locations where firefighting foam was used such as oil refineries, airfields or other training facilities for firefighters

If you are concerned about the possibility of PFAS in your drinking water, contact your local water supplier and ask for more information about PFAS.

STAIN/GREASE REPELLENT

FIREFIGHTING FOAMS

INDUSTRIAL USES

PFAS Background – why do we care?

HEALTH EFFECTS

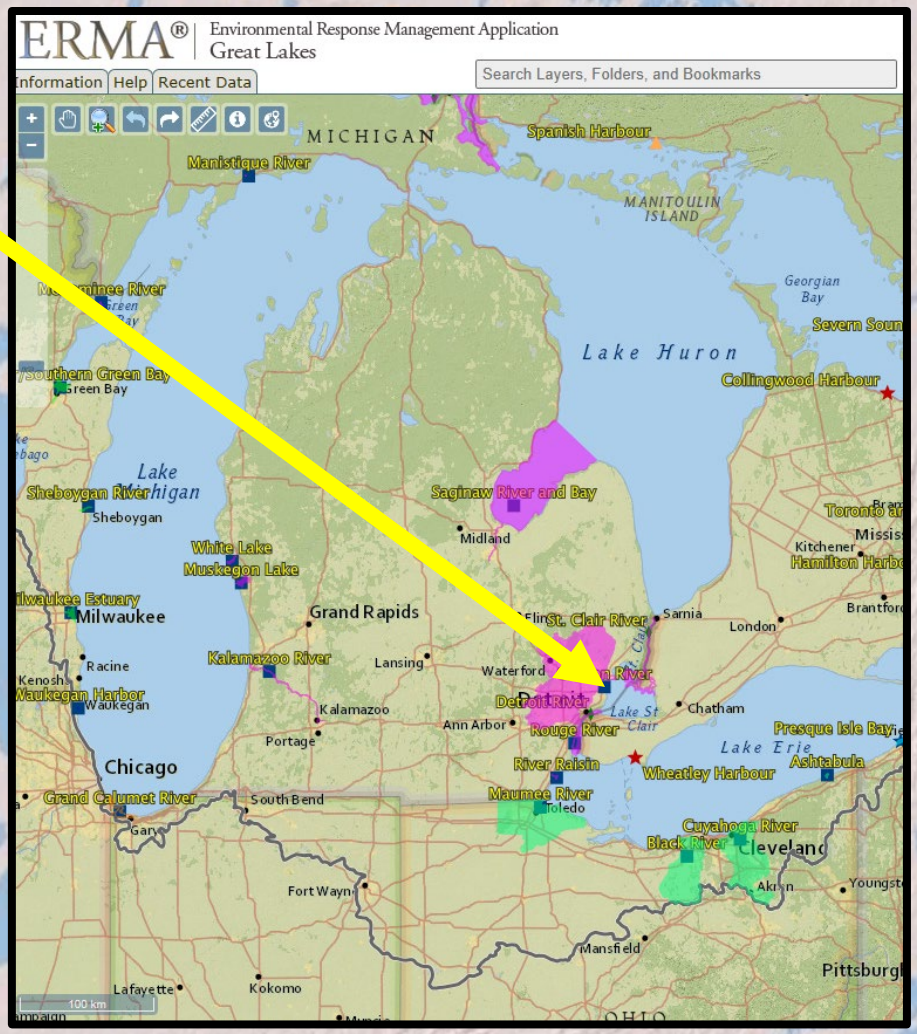
There is evidence that exposure to PFAS can lead to adverse health outcomes in humans. If humans or animals ingest PFAS (by eating or drinking food or water than contain PFAS), the PFAS are absorbed and can accumulate in the body. PFAS stay in the human body for long periods of time. In some cases, the level of PFAS in the body can increase to the point where people can suffer from adverse health effects.

Studies indicate that high concentrations of PFOA and PFOS can cause reproductive and developmental, liver and kidney, and immunological effects in laboratory animals. Both chemicals have caused tumors in animal studies. The most consistent findings from human studies are increased cholesterol levels among exposed populations, with more limited findings related to:

- infant birth weights
- adverse effects on the immune system
- cancer (for PFOA)
- thyroid hormone effects (for PFOS)

AFFF/PFAS incident overview

- 7 June 2018 - aqueous film forming foam (AFFF) appeared at Selfridge ANGB outfall leading to Lake St. Clair
- Responders recognized AFFF can contain PFAS/PFOS
- Unified command established: USCG, MI DEQ, Selfridge ANGB; EPA R5, NOAA
- Emergency response lasted 9 days before transitioning to remediation project
- 16 June 2018 - emergency response phase (USCG-funded) concluded



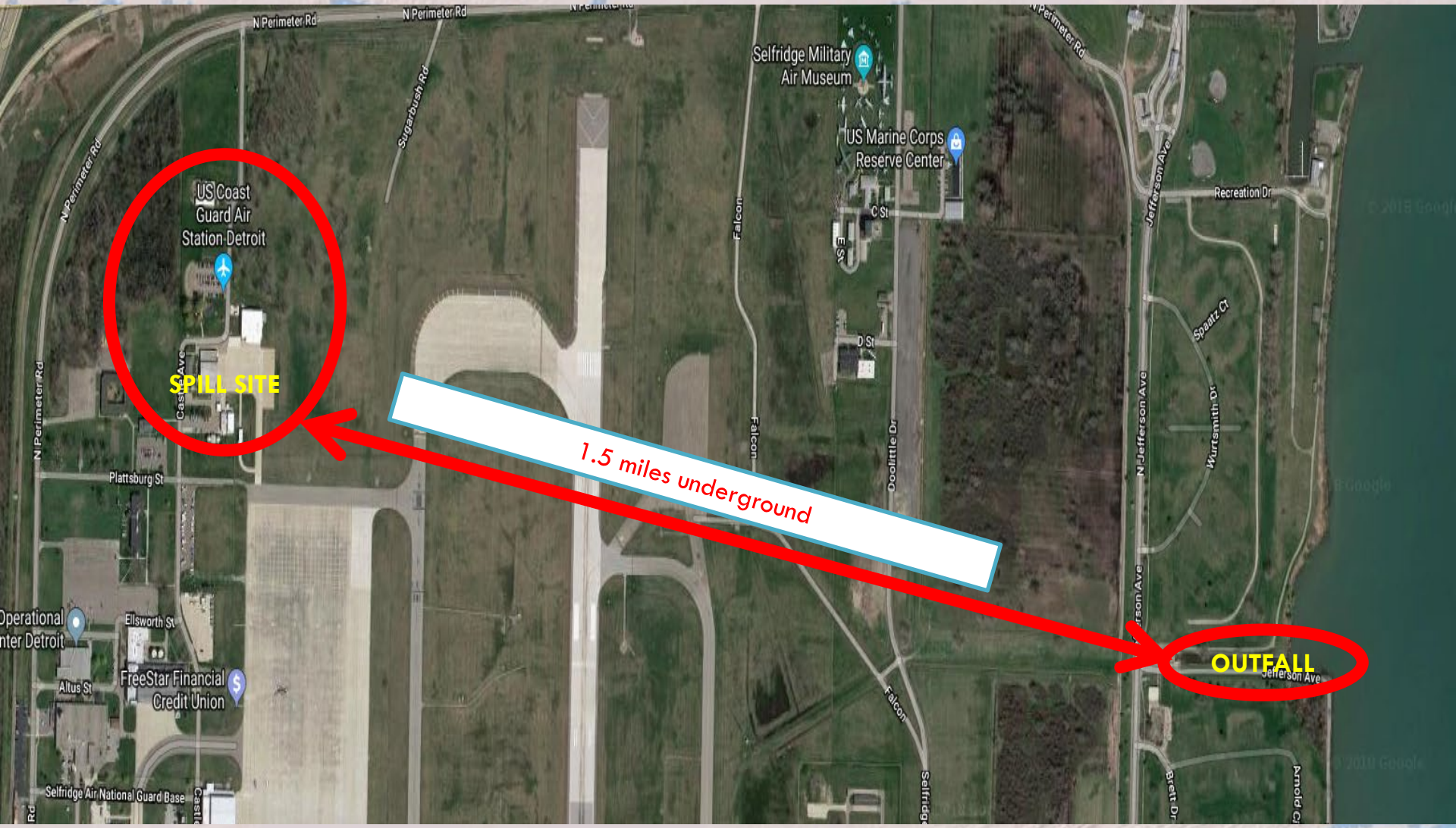
Product: Estimated 800 gallons of AFFF

- AFFF is a fire fighting product that can contain PFAS/PFOS
- Safety data sheets indicated no PFAS/PFOS, but we'll see…
- Currently no US EPA Maximum Contaminant Level (MCL) for PFAS/PFOS
- US EPA issued health advisory level of 70 parts per trillion (ppt)
  - PFOS – Michigan standard < 70 ppt for drinking water
  - PFOA - Michigan standard < 70 ppt for drinking water

Initial Actions

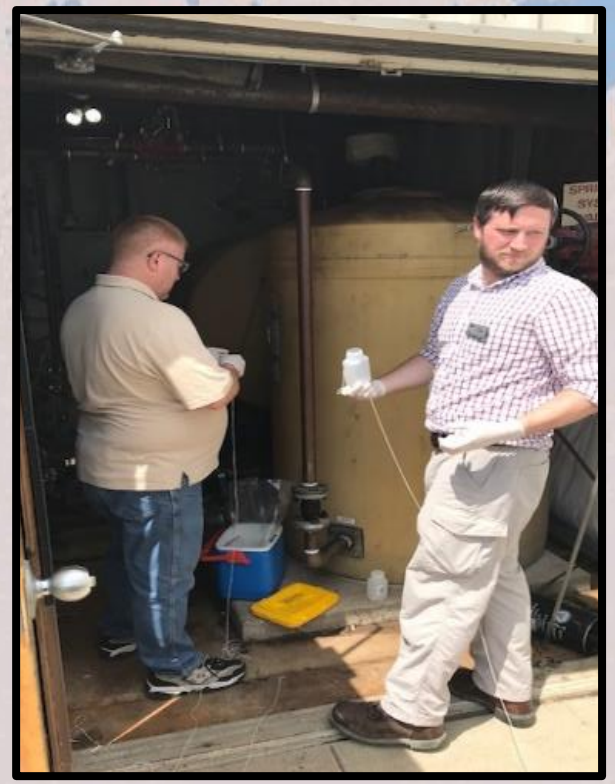
- City of Mt. Clemens water intake closed as precaution
- ANGB secured storm drain outfall station to prevent further pumping to Lake St. Clair
- Air station secured AFFF pump room deck drain (originally thought to be source)
- Sector Detroit contracted T&T Marine to flush & remove contaminants from 1.5 miles of underground storm drain system
- Investigated path of discharge after determining deck drain did not stop source & did not connect to storm drain

General path of AFFF to Lake St. Clair



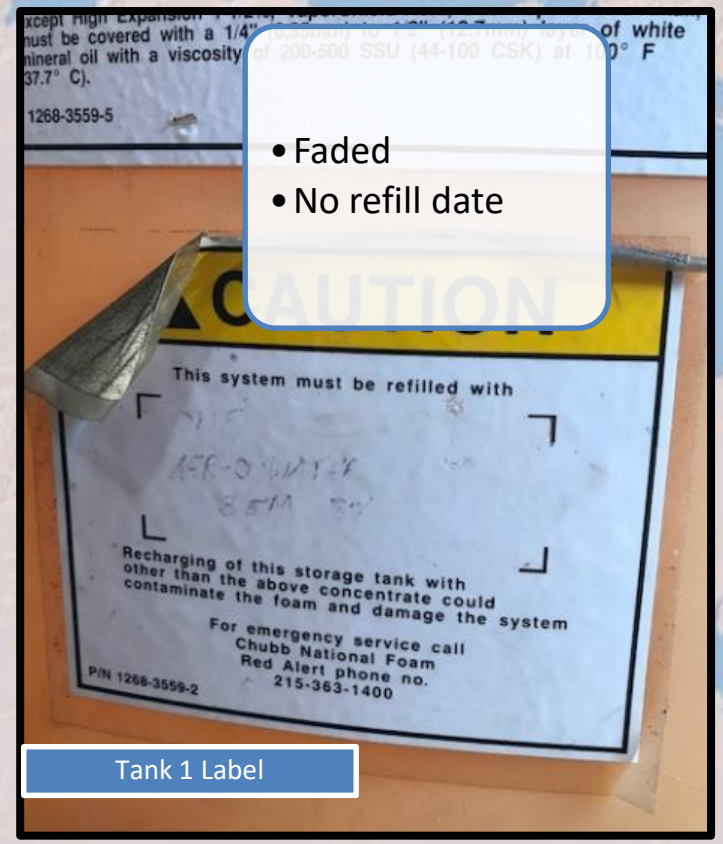
Source sampling

- US EPA and Michigan DEQ oversaw sampling process and provided responder training on site



Source sample findings

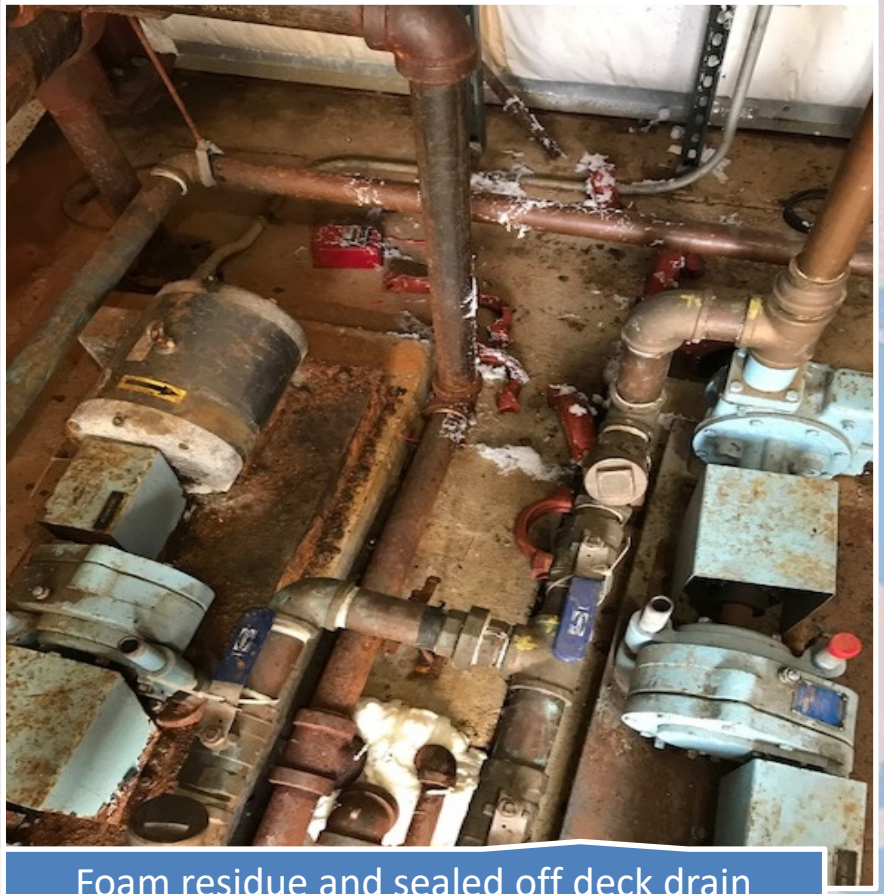
- Despite contrary indication on safety data sheets, PFAS was found to be present



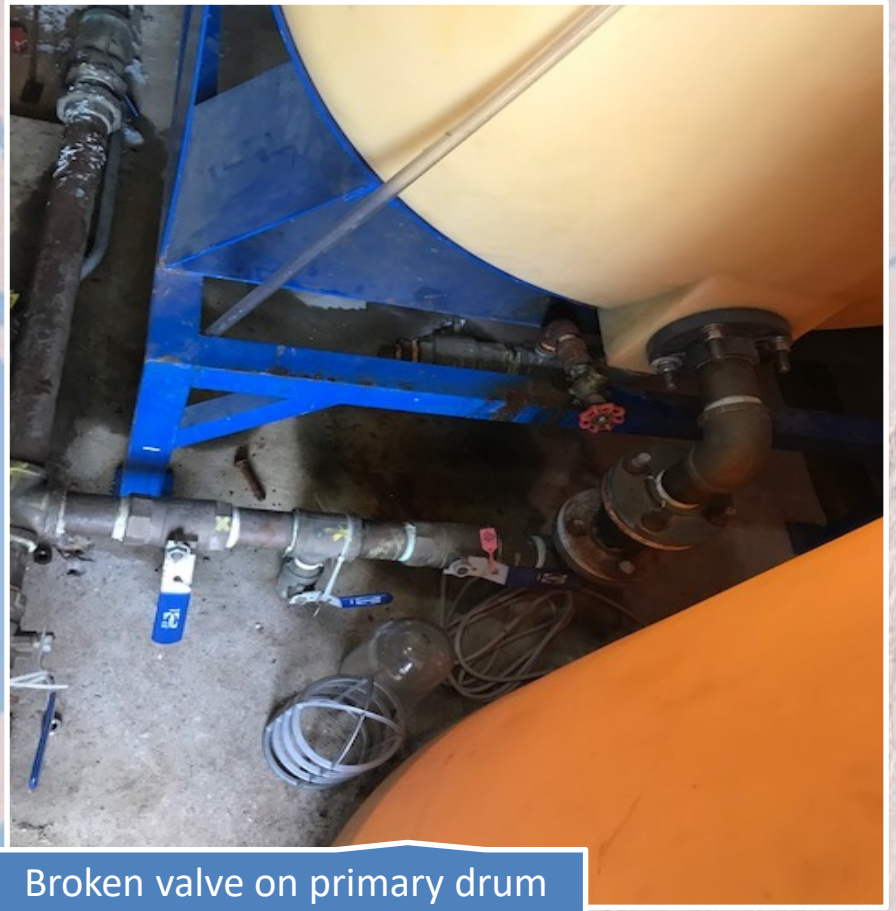
Tank 1 Label

Tank 2 Label

Source site findings



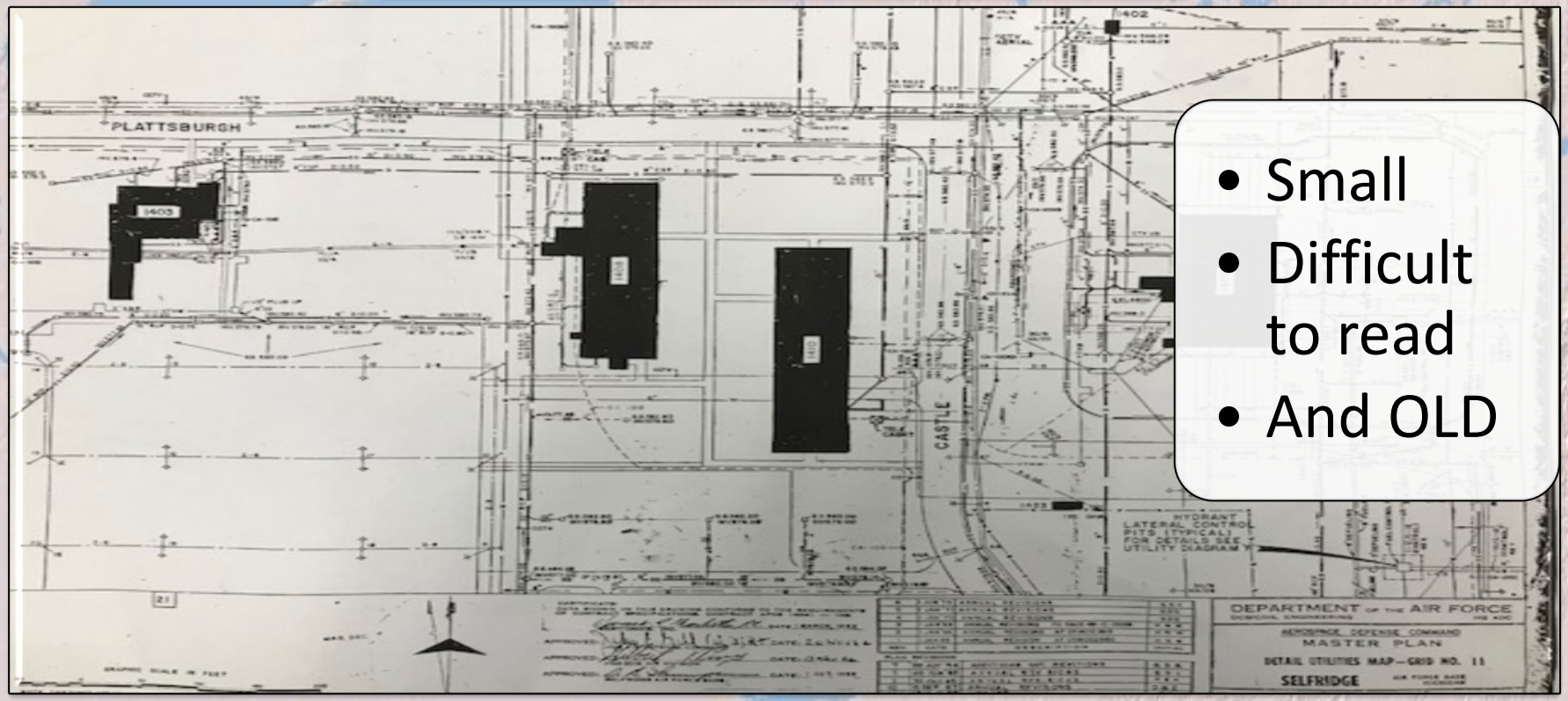
Foam residue and sealed off deck drain



Broken valve on primary drum

Old blueprints

Blueprints - 1962

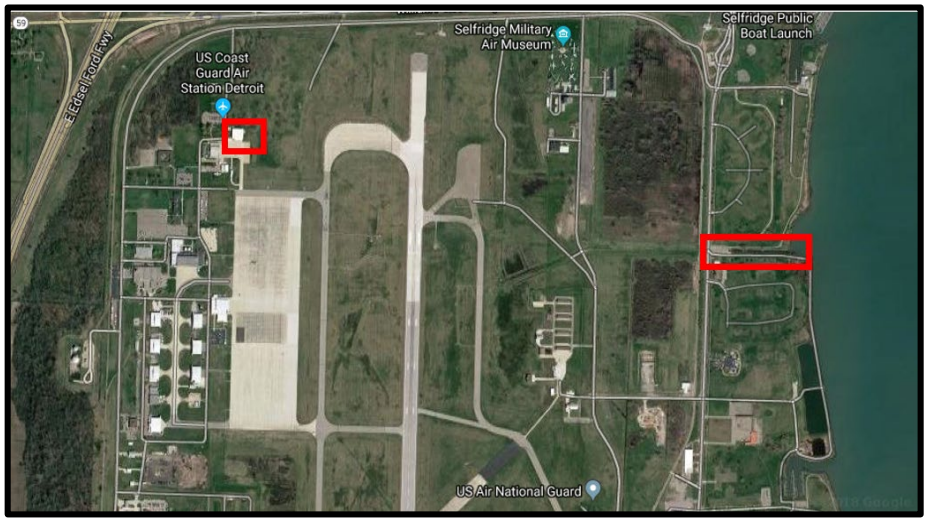


- Small
- Difficult to read
- And OLD

Newer blueprints

Updated Blueprints – 1982

Path of AFFF to Lake St. Clair



Air Station Detroit – Ops Hangar

AFFF Tanks A1

B1 - OWS

B2

Pipe Blanked Off. Site of Product Removal

Division A

Division B

North

12"

48"

Flow

C1

C2

60"

C3

72"

C4

C5

Flow

C6

C7

72"

C8

C9

Storm Water Lift Stations D

Site of1 Product Removal

Containment Boom

Discharge Channel

Lake St. Clair

Approx. 6,000 ft

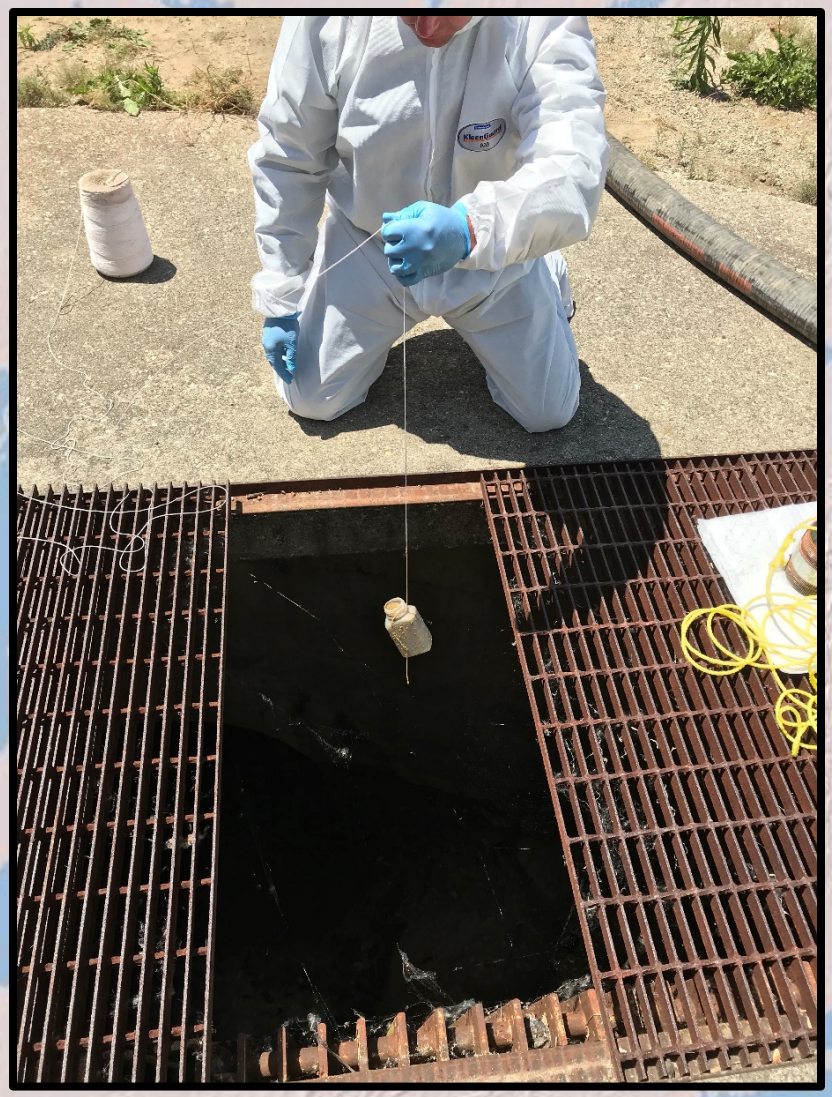
Division C

Division D

Disclaimer: Not drawn to scale. Other underground pipes present but not suspected at this time to be contributing to the release or transport of AFFF

Site sampling and results

- High levels of PFAS at well site – 2,490 ppt
- Concentrated levels at source – excess of 1 million ppt
- Historical levels of PFAS were at 490 ppt (at this particular location) as of February 2018
- State minimum drinking water requirement for any combination of PFAS to be below 70 ppt



Site treatment

- T & T Marine subcontracted a granulated activated carbon (GAC) filtration system – recommended by US EPA based on current treatment projects occurring elsewhere in the state.
- Dual stage GAC was implemented for redundancy to prevent filtration loss due to high quantity of water needed to be pumped
- Frac tanks linked to create sediment reduction system prior to filtration

End of response phase

- Worked with state OSC and Coast Guard Civil Engineering Unit (CEU) to transition to remediation using closed loop filtration process
- Sector Detroit concluded emergency response and transitioned on-site response equipment to CEU
- CEU Cleveland negotiated new contract with T & T Marine for long term remediation down to pre-existing Selfridge base levels

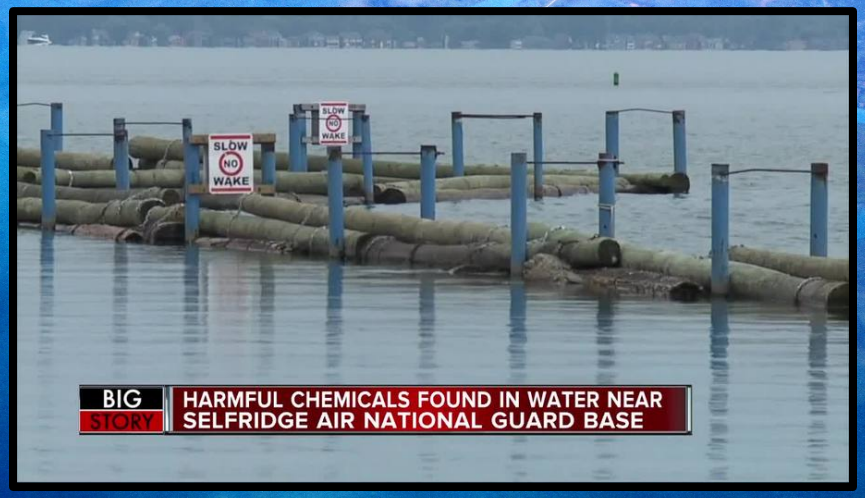
Challenges

- Worksite nearly caused base to flood due to secured storm discharge
- Sampling:
  - Height of drains (10-20’ depth for some samples)
  - Method of sampling
  - Speed of sampling results
- Drains:
  - Old system blueprints
  - Groundwater communication to drains
  - 1.5 miles of underground drains crossing streets and air fields requiring special escort
- Understanding of degraded AFFF
- Funding source

Lessons learned

- Close loop filtration process very effective
- Great partnerships – allowed expeditious setup of sampling, understanding of contaminant & treatment solution
- Special sampling – state-approved laboratory vice USCG or other local lab
- Military base access requirements for contractors need to be pre-approved & vetted to prevent delays
- Manning for contractor oversight

Questions?


SLOW
NO
WAKE
BIG
STORY
HARMFUL CHEMICALS FOUND IN WATER NEAR
SELFRIDGE AIR NATIONAL GUARD BASE