PFAS CASE STUDY: AFFF SPILL – SELFridge ANGB

RRT 4/5 – COVINGTON, KY

18 OCT 2018

LTJG Rahnal Harris – USCG Sector Detroit
OVERVIEW

• 07 JUN 2018 - AQUEOUS FILM FORMING FOAM (AFFF) APPEARED AT SELFRIDGE AIR NATIONAL GUARD BASE OUTFALL LEADING TO LAKE ST. CLAIR

• ENVIRONMENTAL CONCERNS – AFFF HAS BEEN KNOWN TO CONTAIN HAZARDOUS CHEMICALS PFOS/PFOA

• UNIFIED COMMAND WAS ESTABLISHED TO MITIGATE THE SPILL TO STATE AND FEDERAL SATISFACTION

• EMERGENCY RESPONSE LASTED 9 DAYS BEFORE TRANSITIONING TO REMEDIATION PROJECT

• 16 JUN 2018 - $347K SPENT ON EMERGENCY RESPONSE – NOT AN OSLTF OR CERCLA FUNDED PROJECT
AGITATED AFFF AT OUTFALL TO LAKE ST. CLAIR

Canal Boom

From Pump Station
PRODUCT: ESTIMATED 800 GALLONS OF AFFF

- AFFF is a popular product for fire fighting on ships, shipyards, aircraft hangars and air fields/bases.
- AFFF known to contain unmonitored or unregulated hazardous chemicals typically found in man-made chemical products.
  - PFAS – any combination of per- and polyfluoroalkyl substances
    - PFOS – state standard <70 ppt for drinking water
    - PFOA - state standard <70 ppt for drinking water
RESPONSE: UNIFIED COMMAND

• USCG AIR STATION DETROIT – RESPONSIBLE PARTY
• USCG SECTOR DETROIT – FEDERAL ON SCENE COORDINATOR
• MICHIGAN DEQ – STATE ON SCENE COORDINATOR
• US EPA (REGION V) – COMMAND STAFF ENVIRONMENTAL LIAISON
• SELFridge ANGB - ENVIRONMENTAL LIAISON
RESPONSE: INITIAL ACTIONS

• BASE SECURED STORM DRAIN OUTFALL STATION TO PREVENT FURTHER PUMPING TO LAKE ST. CLAIR

• AIR STATION SECURED AFFP PUMP ROOM DECK DRAIN (ORIGINALLY THOUGHT TO BE SOURCE TO BASE STORM DRAIN)

• SECTOR DETROIT CONTRACTED T&T MARINE TO FLUSH AND REMOVE CONTAMINANTS FROM 1.5 MILES OF UNDERGROUND STORM DRAIN SYSTEM

• SECTOR DETROIT INVESTIGATED PATH OF DISCHARGE AFTER DETERMINING DECK DRAIN DID NOT STOP SOURCE AND DID NOT CONNECT TO STORM DRAIN.

• SECTOR DETROIT REQUESTED CIVIL ENGINEERING UNIT (CEU) CLEVELAND TO JOIN UNIFIED COMMAND IN INVESTIGATION
RESPONSE ACTIONS – SOURCE SAMPLING

Great partnering! - EPA and DEQ oversaw sampling process and provided responder training on site.

Tank 1 vs Tank 2

Tank 2 - Weathered?
INVESTIGATION: SOURCE SAMPLE FINDINGS

**Tank 1 Label**
- Faded
- No refill date

**Tank 2 Label**
- Clearly marked
- No refill date
- No product name
INVESTIGATION: SOURCE SITE FINDINGS

Foam residue and sealed off deck drain

Broken valve on primary drum
RESPONSE ACTIONS: SITE SAMPLING & RESULTS

- HIGH LEVELS OF PFAS AT WELL SITE – 2490 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
RESPONSE ACTIONS: SITE TREATMENT

- T&T Marine subcontracted a granular 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 EMERGENCY PHASE

- Worked with State OSC and responsible party 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

• PRE-EXISTING CONDITIONS OF PFAS TESTED IN FEB 2018
• UNDERSTANDING OF DEGRATED AFFF SOLUTIONS
• LARGE EQUIPMENT AND VARIOUS CONTRACTORS ARRIVING AT A SECURE BASE/FACILITY
• WORKSITE NEARLY CAUSED BASE TO FLOOD DUE TO SECURED STORM DISCHARGE
• SAMPLING:
  • HEIGHT OF DRAINS (10-20FT DEPTH FOR SOME SAMPLES)
  • METHOD OF SAMPLING
  • SPEED OF SAMPLING RESULTS
• BLUEPRINTS:
  • GROUNDWATER COMMUNICATION TO DRAINS
  • BASE SEWER SYSTEM BLUEPRINTS – 1962
  • CEU CLEVELAND BLUEPRINTS – 1982
  • 1.5 MILES OF UNDERGROUND DRAINS CROSSING STREETS AND AIR FIELDS REQUIRING SPECIAL ESCORT
Blueprints - 1962

- Small
- Difficult to read
- And OLD
Updated Blueprints – 1982
BEST PRACTICES/LESSONS LEARNED

• CLOSE LOOP FILTRATION PROCESS – WORKED!

• GREAT PARTNERSHIPS – ALLOWED EXPEDITIOUS SETUP OF SAMPLING, UNDERSTANDING OF CONTAMINANT, AND TREATMENT SOLUTION

• SPECIAL SAMPLING – STATE APPROVED LABORATORY VICE USCG OR OTHER LOCAL LAB

• MILITARY BASE ACCESS REQUIREMENTS FOR CONTRACTORS NEED TO BE PRE-APPROVED AND VETTED TO PREVENT DELAYS

• MANNING FOR CONTRACTOR OVERSIGHT

• UTILIZING BASE RESOURCES AND PERSONNEL