U.S. COAST GUARD CASE STUDIES:

ATLANTIC STRIKE TEAM

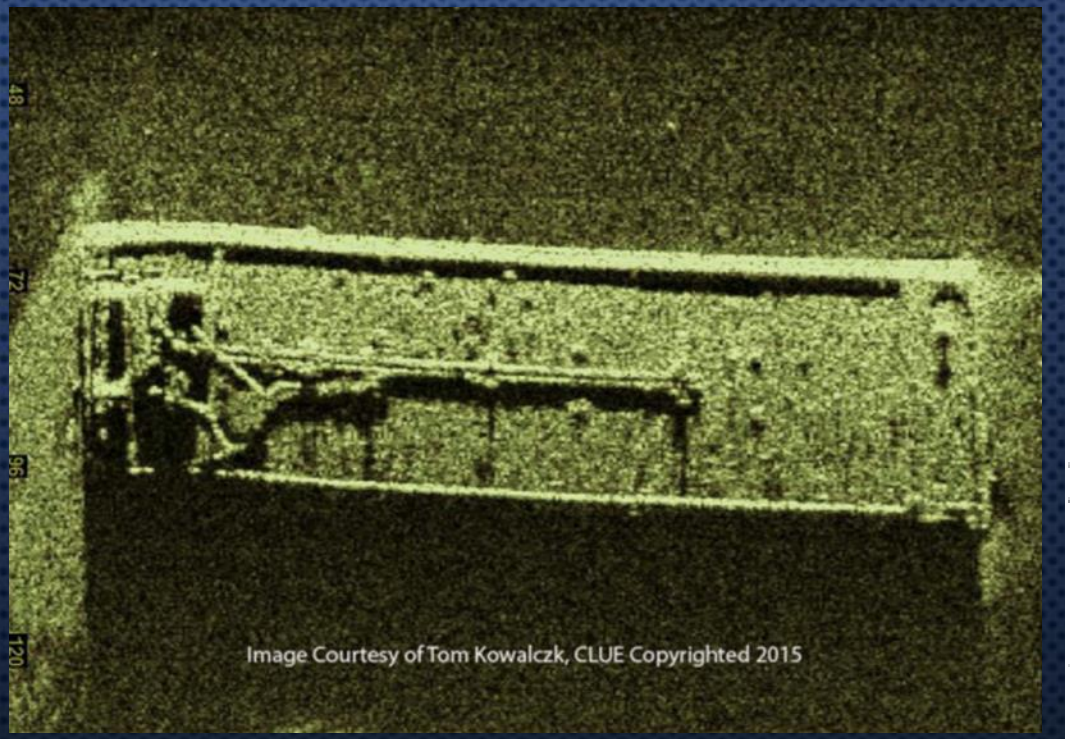
TANK BARGE ARGO

EDWARD J. PRIMEAU, CIH

TANK BARGE ARGO: BACKGROUND

Background

- ARGO built in 1911
- Sunk in 1937, thought to be in Canadian waters
- Riveted steel construction
- 120ft x 35ft x12ft
- Reported to be carrying Benzol and Light Crude Oil
- Subject of NOAA RULET project
  - Database of shipwrecks with potential to pollute
  - Ranked #1 threat to Great Lakes



CUTTERS STILL IN SEARCH OF BARGE

No Trace of Argo With Cargo of Benzol Is Found In Lake Erie Near Islands; Shipping Warned.

Two coast guard cutters, the Tahoma of Cleveland and the Frederick Lee of Toledo, continued their search of the waters of western Lake Erie today for the 135-foot barge Argo loaded with explosive benzol that broke loose from the tug Syosett near Kelleys Island during the storm that swept over the lake yesterday.

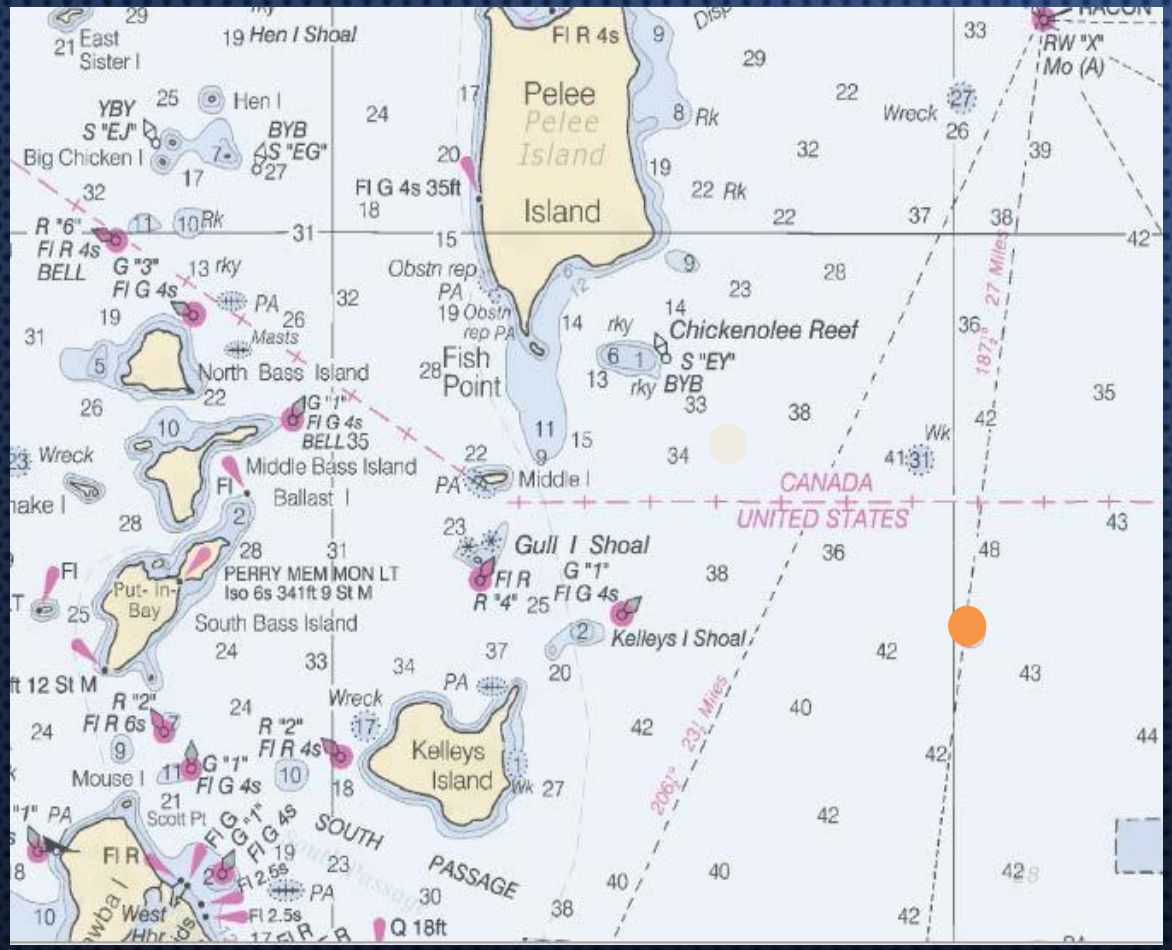
The Lake Carriers Association has warned all boats plying western Lake Erie to be on the lookout for the barge which is a menace to all shipping and believed to be floating in the ship channel.

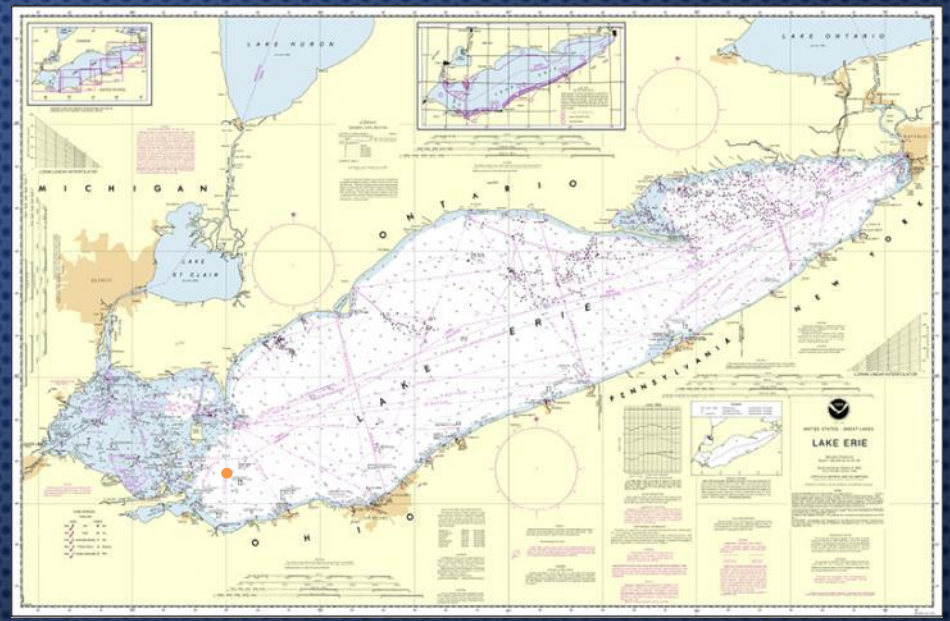
Containing 100,000 gallons of crude oil and 100,000 gallons of highly explosive benzol, the barge's cargo is valued at $30,000.

Two crew members, Charles Warrick, 24, and Peter Boszuk, 26, both of New York, were rescued by the tug Syosett when they were thrown into the water as the barge turned over.

An investigation was to be held in Lorain today by the marine inspection department to determine the cause of the loss of the barge.

TANK BARGE ARGO: BACKGROUND





Discovery

- On Friday, August 28, 2015, while performing a historical shipwreck side scan sonar search in the waters of Lake Erie, Cleveland Underwater Explorers (CLUE) detected a target of interest
- Discovered in U.S. waters 9 mi east of Kelly's Island

TANK BARGE ARGO: ASSESSMENT

Initial Dive Assessments- 21 OCT

•Determine barge identity

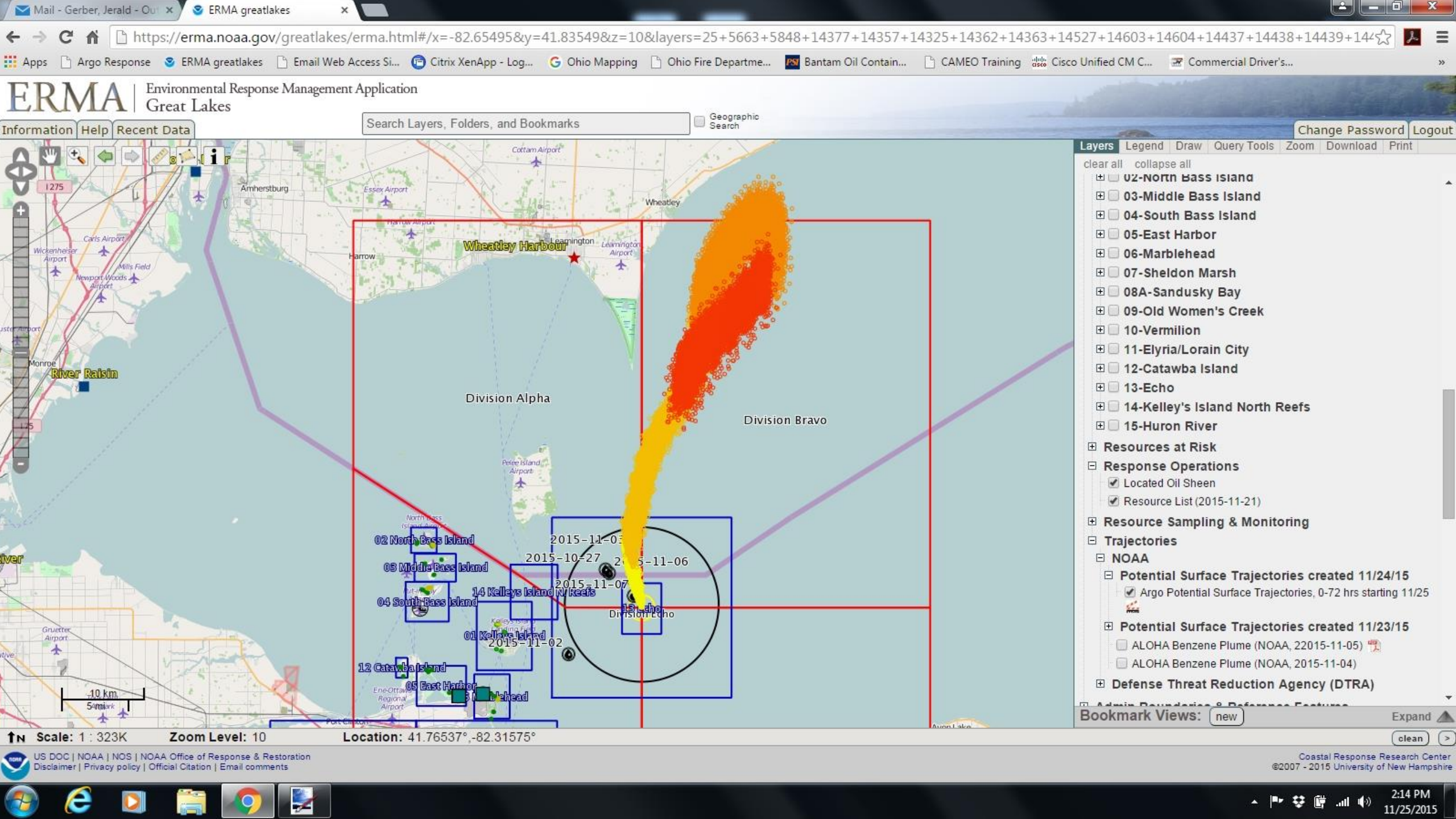
•Assess condition of vessel

•Signs of active discharge- 23 OCT

- Matched dimensions
- Heavy marine growth
- Partially buried within sediment
- Periodic sheening originating from barge
- Strong solvent smell

Emergency Response initiated

•Substantial threat to public health and environment


Mail - Gerber, Jerald - Out
ERMA greatlakes
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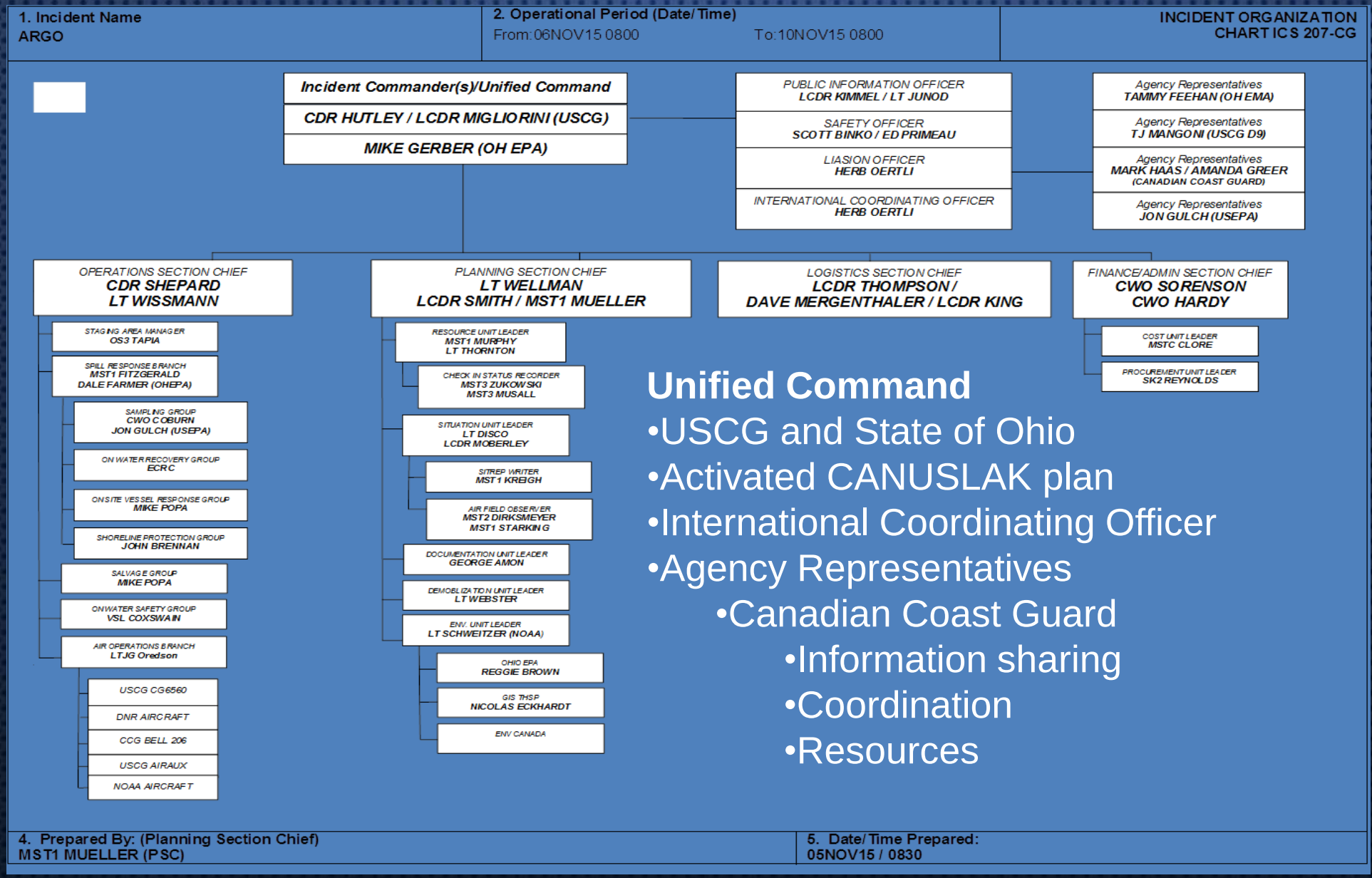
Apps
Argo Response
ERMA greatlakes
Email Web Access Si...
Citrix XenApp - Log...
Ohio Mapping
Ohio Fire Departme...
Bantam Oil Contain...
CAMEO Training
Cisco Unified CM C...
Commercial Driver's...
ERMA
Environmental Response Management Application
Great Lakes
Information
Help
Recent Data
Search Layers, Folders, and Bookmarks
Geographic Search
Change Password
Logout
Layers
Legend
Draw
Query Tools
Zoom
Download
Print
clear all
collapse all
02-North Bass Island
03-Middle Bass Island
04-South Bass Island
05-East Harbor
06-Marblehead
07-Sheldon Marsh
08A-Sandusky Bay
09-Old Women's Creek
10-Vermilion
11-Elyria/Lorain City
12-Catawba Island
13-Echo
14-Kelley's Island North Reefs
15-Huron River
Resources at Risk
Response Operations
Located Oil Sheen
Resource List (2015-11-21)
Resource Sampling & Monitoring
Trajectories
NOAA
Potential Surface Trajectories created 11/24/15
Argo Potential Surface Trajectories, 0-72 hrs starting 11/25
Potential Surface Trajectories created 11/23/15
ALOHA Benzene Plume (NOAA, 22015-11-05)
ALOHA Benzene Plume (NOAA, 2015-11-04)
Defense Threat Reduction Agency (DTRA)
Bookmark Views:
new
Expand
clean
Cottam Airport
Amherstburg
Essex Airport
Wheatley
Harrow Airport
Wheatley Harbour
Harrow
Leamington Airport
Carls Airport
Wickenheiser Airport
Mills Field
Newport Woods Airport
Monroe
River Raisin
Division Alpha
Division Bravo
Pelee Island Airport
02 North Bass Island
03 Middle Bass Island
04 South Bass Island
14 Kelleys Island N. Reefs
13 Echo
Division Echo
01 Kelleys Island
12 Catawba Island
05 East Harbor
Gruetter Airport
Ene-Ottawa Regional Airport
2015-11-02
2015-10-27
2015-11-06
2015-11-07
10 km
5 mi
Scale: 1 : 323K
Zoom Level: 10
Location: 41.76537°,-82.31575°
US DOC | NOAA | NOS | NOAA Office of Response & Restoration
Disclaimer | Privacy policy | Official Citation | Email comments
Coastal Response Research Center
©2007 - 2015 University of New Hampshire
2:14 PM
11/25/2015

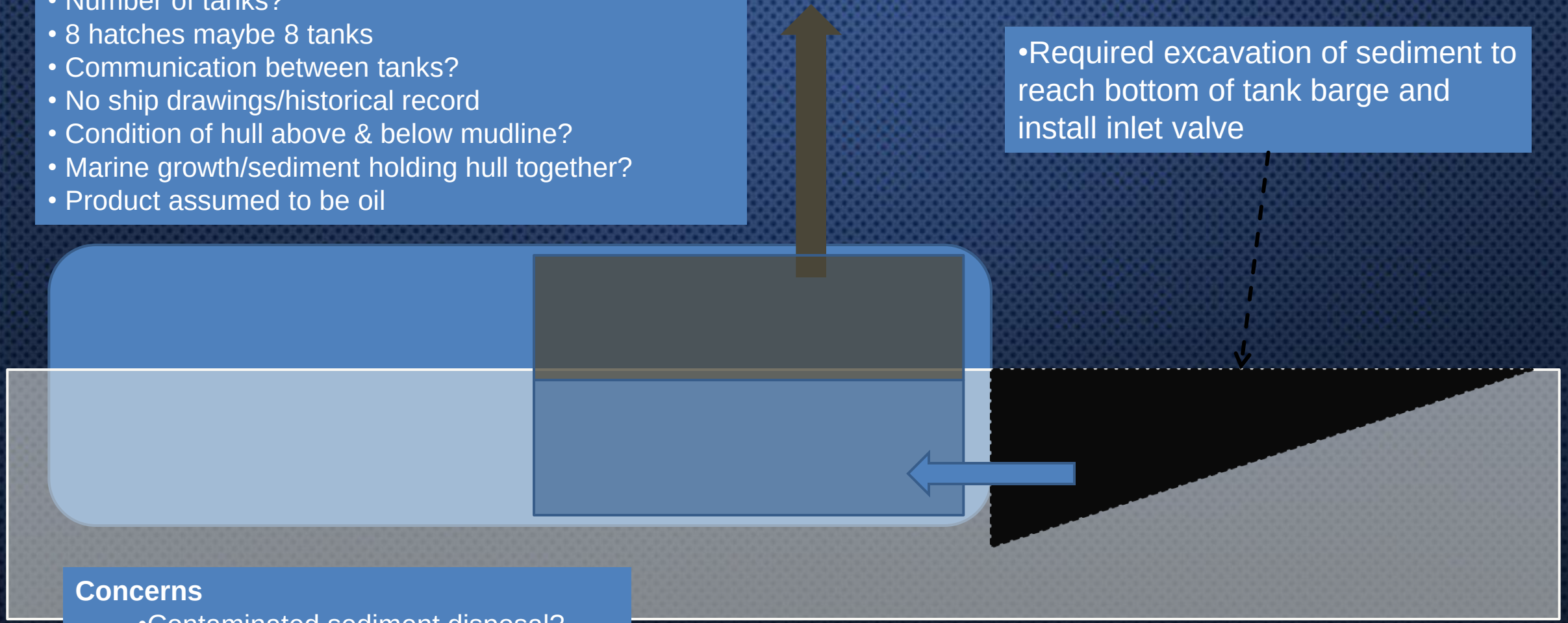
TANK BARGE ARGO: UNIFIED COMMAND



TANK BARGE ARGO: INITIAL REMOVAL PLAN

Many Unknowns and Assumptions
- Number of tanks?
- 8 hatches maybe 8 tanks
- Communication between tanks?
- No ship drawings/historical record
- Condition of hull above & below mudline?
- Marine growth/sediment holding hull together?
- Product assumed to be oil

•Required excavation of sediment to reach bottom of tank barge and install inlet valve



Concerns
- •Contaminated sediment disposal?
- •Integrity of hull?
- •Catastrophic discharge?

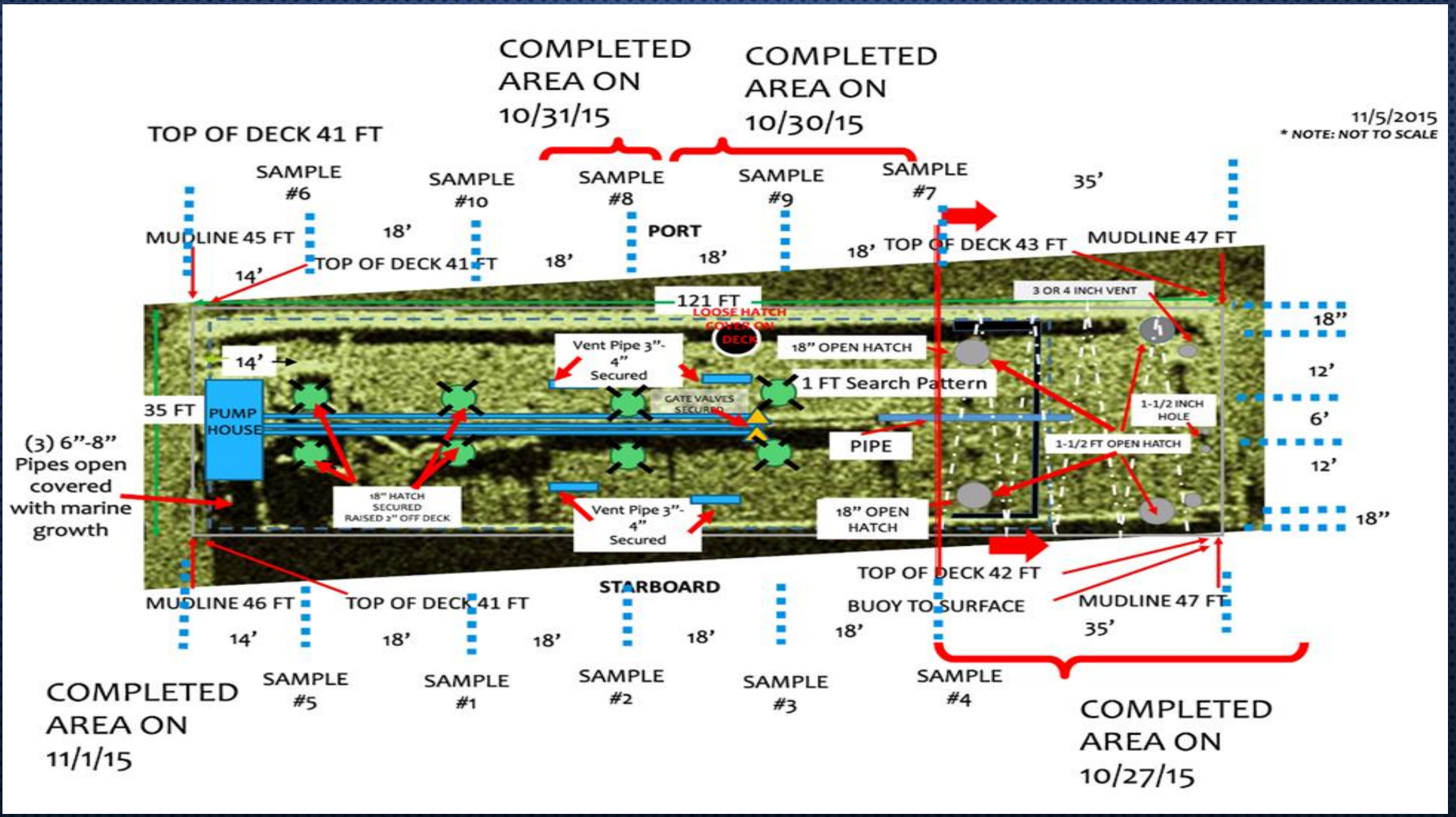
TANK BARGE ARGO: HAND OVER HAND ASSESSMENT

Open Hatch Cover

Penetration in Bow Area

Capped Piping on top of Hatch Cover

~50 ft underwater
Poor visibility
Heavy marine growth
~5 ft above mudline


COMPLETED AREA ON 10/31/15
COMPLETED AREA ON 10/30/15
11/5/2015
* NOTE: NOT TO SCALE
TOP OF DECK 41 FT
SAMPLE #6
SAMPLE #10
SAMPLE #8
SAMPLE #9
SAMPLE #7
35'
MUDLINE 45 FT
18'
PORT
18'
18'
18'
TOP OF DECK 43 FT
MUDLINE 47 FT
14'
TOP OF DECK 41 FT
121 FT
3 OR 4 INCH VENT
LOOSE HATCH COVER ON DECK
18"
Vent Pipe 3"-4" Secured
18" OPEN HATCH
14'
1 FT Search Pattern
12'
35 FT
PUMP HOUSE
GATE VALVES SECURED
1-1/2 INCH HOLE
6'
PIPE
1-1/2 FT OPEN HATCH
(3) 6"-8" Pipes open covered with marine growth
12'
18" HATCH SECURED RAISED 2" OFF DECK
Vent Pipe 3"-4" Secured
18" OPEN HATCH
18"
TOP OF DECK 42 FT
STARBOARD
MUDLINE 46 FT
TOP OF DECK 41 FT
BUOY TO SURFACE
MUDLINE 47 FT
14'
18'
18'
18'
18'
35'
SAMPLE #5
SAMPLE #1
SAMPLE #2
SAMPLE #3
SAMPLE #4
COMPLETED AREA ON 11/1/15
COMPLETED AREA ON 10/27/15

DISCHARGE DURING DIVE OPERATIONS

Discharge during dive operations- 04 NOV

- Rivet came out during hull preparations
- Personnel exposures
- 459 ppm-isobutylene units total VOCs
  - Action Level- 5ppm
- 94 ppm Benzene with the Ultra Rae
  - Action Level- 0.5ppm
- Leak patched; dive suit showed signs of degradation
- Safety stand-down
- Medical evaluation
- <u>Reevaluate the way forward</u>

TANK BARGE ARGO: REVISED REMOVAL PLAN

- Minimal hull disruption
  - Non destructive tests
- Reduced potential for rivet failure & discharge
- Required no excavation of sediment

Planning for both Oil & Benzene
- Temporary storage
- Compatibility
- Vapor control
- Disposal

Logistical challenges
- Weather / Sea state
- Temporary Storage
- Winter / Ice approaching

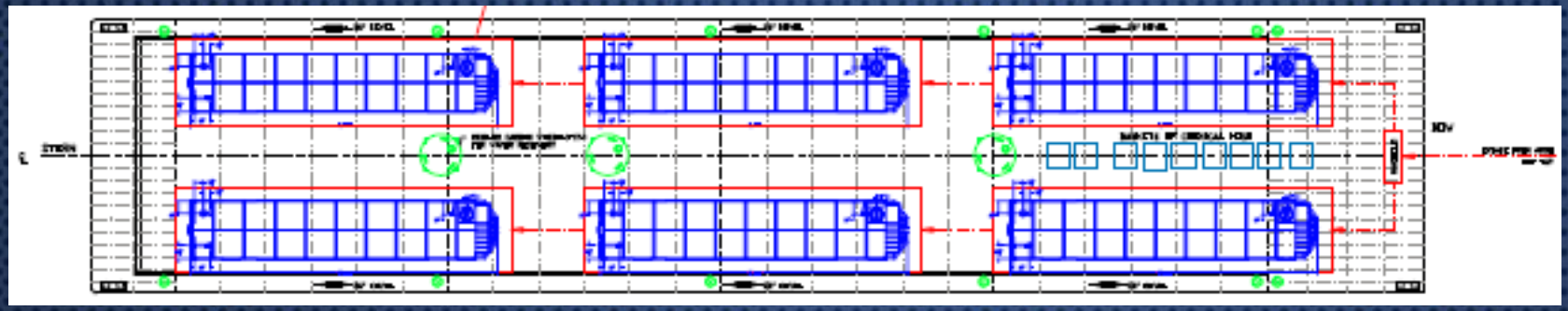
Hot Tap and Lighter from Tank Top

TANK BARGE ARGO: RESPONSE CHANGES

Sampling and Characterization- 09 NOV

- Upgraded dive suit
- Sample drawn from rivet hole
- Volatile Analysis
  - Benzene – 79.2%
  - Toluene – 17.2%
  - Ethylbenzene – 0.16%
  - Meta & para Xylenes – 2.56%
  - Ortho Xylenes – 0.71%

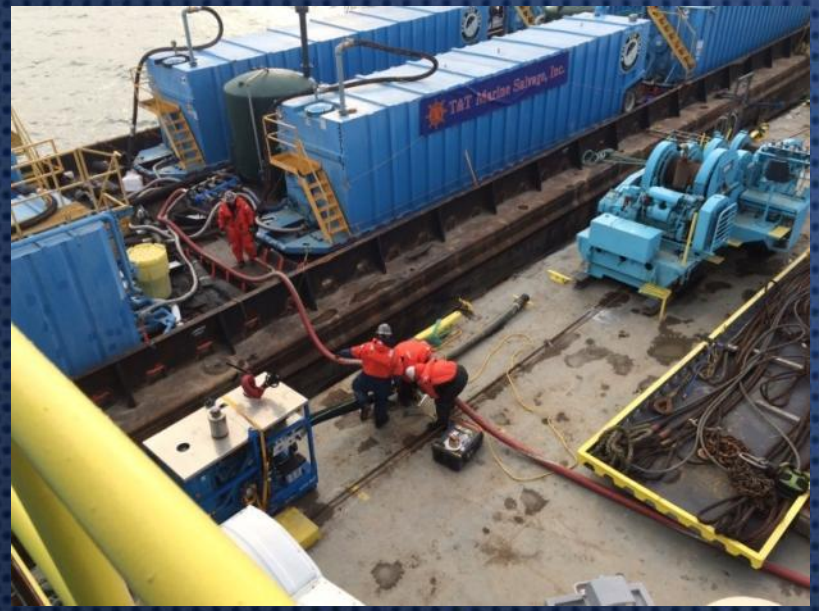
TANK BARGE ARGO: TEMPORARY STORAGE BARGE



No barges on Great Lakes suitable for product

- Built temporary storage system on deck barge
  - FRAC tanks
  - Vapor Control System
- Naval Architect and Chemical Engineer reviewed each component of system for compatibility

TANK BARGE ARGO: SUMMARY



Recovery Summary

- Lightering was complete on 2 DEC 2015
  - 48,821 gal of contaminated water 1,600 gallons of pure product (BTEX)
  - 10,000 lbs of spent carbon from vapor recovery system
- Response duration: 24 OCT to 14 DEC 2015
- USCG lifted exclusion zone opening site for recreational divers
- Ohio EPA closed emergency phase & referred incident to remediation assessment
- Costs:
  - OSLTF: ~$3.7M
  - CERCLA: ~$403K

TANK BARGE ARGO: CHALLENGES

- Weather on Lake Erie
- Lack of available resources on the Great Lakes
- Core sampling- how much is enough?
- Funding- OSLTF vs CERCLA

TANK BARGE ARGO: LESSONS LEARNED

Incident Command System
•Unified Command; Effective management of complex high risk operations

CANUSLAK Plan
•Frequent exercising of plan led to close coordination between US & Canada
•Eliminated delays associated with moving resources across borders

Proactive engagement with Media and Stakeholders
•Joint Information Center pushed information to media; controlled message
•Outreach to community leaders

Environmental Response Management Application (ERMA)
• Excellent platform for maintaining common operating picture and sharing information with all stakeholders
    • USCG District 9 initiating project to input all Great Lakes Geographic Response Plans into ERMA

Use of "special teams" to assist local USCG unit
• Scientific Support Coordinator
• Atlantic Strike Team
• Salvage Engineering Response Team
• Incident Management Assist Team

Use of reputable/professional Salvage company
•T&T Marine Salvage company

QUESTIONS