

NAVAL ACTIVITY PUERTO RICO

**Restoration Advisory Board
Meeting #54**

May 11, 2023

Tonight's Agenda

-----Agenda -----

<p>Poster Session (Accomplishments, Upcoming Activities, and Status of NAPR Cleanup Program under RCRA)</p> <p><i>Sesión de afiches (Logros, Próximas Actividades y Estado del Programa de Limpieza de NAPR bajo RCRA)</i></p>	<p>Navy Team</p> <p>Equipo de la Marina</p>	<p>5:00 – 5:55PM</p>
<p>Welcome and Introductions</p> <p><i>Bienvenida y Presentaciones</i></p>	<p>Thuane Fielding</p> <p>(Navy/Marina)</p>	<p>6:00 – 6:05PM</p>
<p>SWMY 55 and SWMU 70</p>	<p>Jamie Butler</p> <p>(Navy/Marina)</p>	<p>6:05 – 6:25PM</p>
<p>Questions and Comments from the Public</p> <p><i>Preguntas y Comentarios del Público</i></p>	<p>Members of the Public/ Miembros del Público</p>	<p>6:25 – 6:55PM</p>
<p>Adjournment</p> <p><i>Clausura de la Reunión</i></p>	<p>Thuane Fielding</p> <p>(Navy/Marina)</p>	<p>6:55 – 7:00PM</p>

Solid Waste Management Units (SWMUs) 55 and 70

Jamie Butler
Navy

SWMU 55 Presentation Outline

SWMU 55 (Trichloroethene [TCE] Plume Near the Tow Way Fuel Farm)

- Site Background
- Corrective Measures
- Recent Injection Activities
- Path Forward

SWMU 55 – TCE Plume Near the Tow Way Fuel Farm



SWMU 55 – Site Background

- TCE plume south of Forrestal Drive, near former Building 2314
 - Former Building 2314 was reportedly used for the storage and maintenance of small watercraft.
 - Exact activities and materials stored are unknown
 - Source of TCE not determined based on available records, but a leaking floor drain line is suspected
- Property owned by the Commonwealth of Puerto Rico and Operated as the Ceiba Ferry Terminal
- Land Use Controls are in place to prohibit unrestricted use and prevent exposure to contaminants in groundwater
- Corrective Action Implemented in accordance with the Statement of Basis
- Corrective Action Objectives (CAOs) for Chemicals of Concern in Groundwater

Chemical of Concern	CAO
TCE	193 µg/L
cis-1,2-dichloroethene	20,901 µg/L
Vinyl chloride	39.7 µg/L



SWMU 55 – Site Background (cont.)

Corrective Measures Initiated in November 2012

- Additional source zone characterization
- Source area excavation
- Installation of a gravel infiltration gallery and injection wells for in situ chemical oxidation (ISCO) application
- Conversion of infiltration gallery into a mulch bioreactor for biological reduction of remnant contaminants
- Injection of emulsified vegetable oil (EVO) downgradient of the source across the middle of the TCE plume
- Completion of seven groundwater sampling events to evaluate overall treatment progress

Annual Groundwater Monitoring

- Groundwater monitoring data continues to demonstrate 99% reductions in TCE concentrations in the source area.
- Plume size and concentrations have also decreased. TCE concentrations in shallow groundwater are below the CAO of 193 µg/L.
- The effects of the mid-plume EVO injection were limited in deeper groundwater downgradient where concentrations remain above the CAO in monitoring wells 55MW01, 55MW09, and 55MW14.

Additional Groundwater Treatment Recommended to facilitate progress toward achievement of the CAOs

SWMU 55 – Additional Corrective Measures

Objective	Activity	Completed
Establish baseline groundwater conditions for comparison to post-injection performance monitoring and to optimize injection protocol	Collect one round of groundwater samples from select wells prior to the EVO injections	November 2022
Focus enhanced reductive dechlorination (ERD)* treatment in areas of the groundwater plume where TCE concentrations continue to exceed the CAO	Conduct the EVO injections in select injection wells (55IW04R, 55IW06R, 55IW07, 55IW13 and 55IW14)	March 2023
Monitor performance of the EVO injections	Collect groundwater samples semi-annually for 2 years	Forthcoming: September 2023 March 2024 September 2024 March 2025

*ERD is a type of enhanced in situ bioremediation that promotes anaerobic biological degradation processes to reduce contaminate concentrations.

SWMU 55 – EVO Injections

- Started: March 7, 2023
- Completed: March 30, 2023



EVO Totes and Drums w/in Secondary Containment

Sunshade over EVO containers



Dosatron Set-up



Injection Manifold and Dosatron



Injection Wellhead

SWMU 55 – EVO Injections (cont.)

Injection volumes were adjusted to best utilize the 36,000 gallons of EVO solution that was available.

Well	Target Injection Volume (gallons)	Volume Injected (gallons)	Percent Complete
55IW04R	2,000	4,086	204%
55IW06R	4,100	2,019	49%
55IW07	7,000	7,000	100%
55IW13	13,000	13,007	100%
55IW14	10,000	66	1%
55MW03	9,934	9,961	100%



TCE concentrations from November 2022 sampling event shown beneath well ID.
 Black text = no detection or detected below the TCE CAO (193 µg/L)
 Red text = exceeds TCE CAO

- Monitoring Well Screened Primarily Less than 25 ft bgs
- Injection Well Screened Primarily Less than 25 ft bgs
- Monitoring Well Screened Primarily Greater than 25 ft bgs
- Injection Well Screened Primarily Greater than 25 ft bgs
- Fire Hydrant
- Fence
- SWMU 55 Site Boundary and LUC Boundary
- Deep Trichloroethene Plume (193 µg/L)
- Dashed where inferred

SWMU 55 – EVO Injections (cont.)

Injection Radius of Influence (ROI) (based on injection volume)		
Well	Injection Volume (gallons)	ROI
55IW04R	4,086	20 feet
55IW06R	2,019	10 feet
55IW07	7,000	25 feet
55IW13	13,007	35 feet
55MW03	9,961	30 feet



SWMU 55 – Path Forward

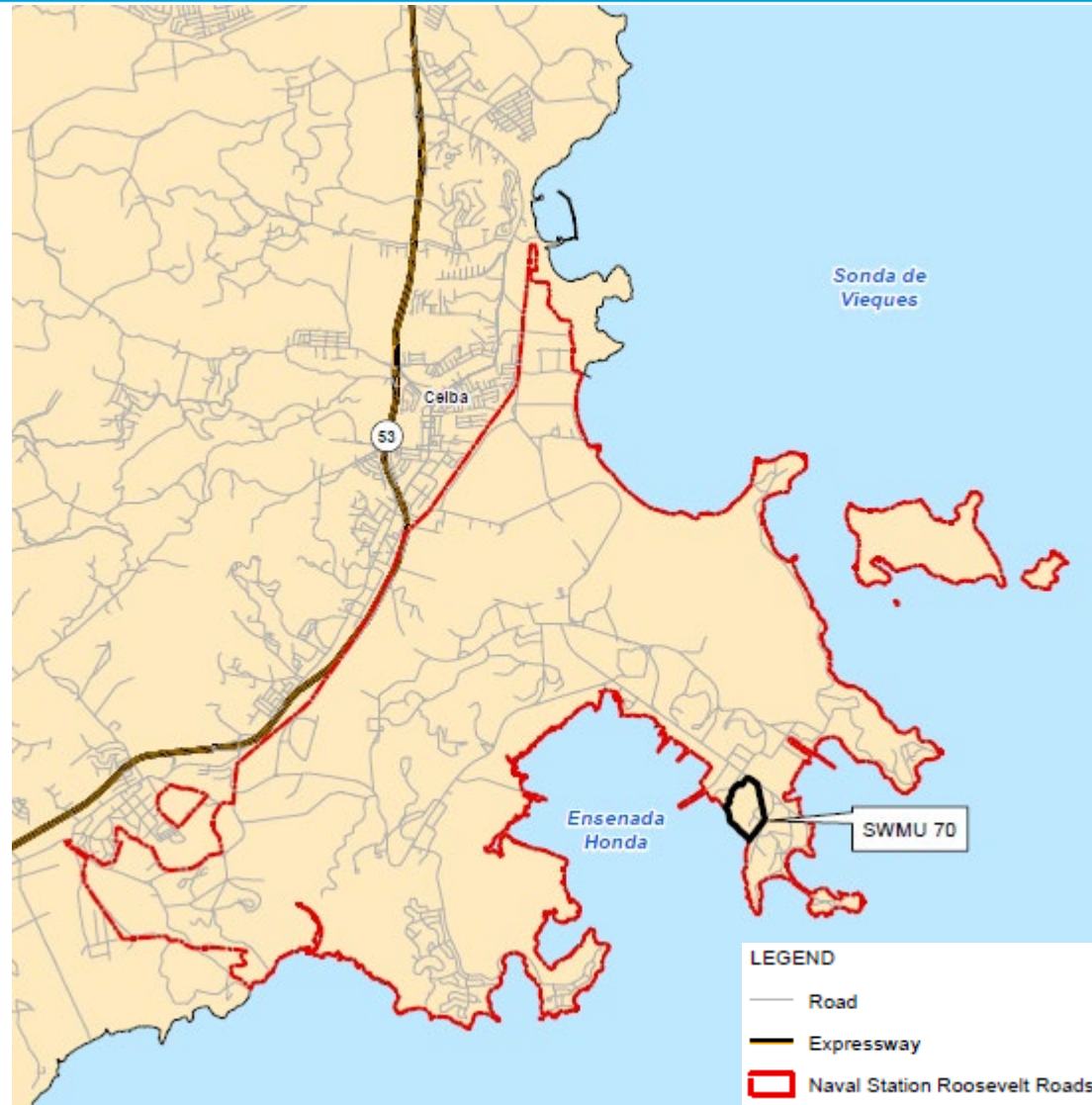
- Performance Monitoring
 - Semi-annual for 2 years.
 - Collect groundwater samples for chemicals of concern and other parameters to monitor natural attenuation and assess performance of the injections
 - The performance monitoring will also satisfy the annual monitoring requirements in the corrective measures implementation plan.
- Additional injections may be conducted in the future if data indicates it would to support achievement of CAOs.
- Reporting
 - EVO injection details
 - Performance monitoring results
 - Conclusions and recommendations

Solid Waste Management Unit (SWMU) 70

SWMU 70 – Presentation Outline

- SWMU 70 (Disposal Area Northwest of SWMU 3 Landfill)
 - Site Background
 - Interim Corrective Measures
 - RFI Investigation Activities
 - Path Forward

SWMU 70 - Disposal Area Northwest of SWMU 3 Landfill



SWMU 70 – Site Background

- 52-acre area adjacent to and north of Ensenada Honda
 - Upland area is ~27 acres in the northern portion of the site with thick, secondary growth vegetation
 - Wetland area is ~25 acres in the southern portion of the site consisting of wetland with mangroves
- Historical site conditions included disturbed ground, cleared areas, and stressed vegetation visible in historical aerials from 1976 to 1983
- Debris consists primarily of metal, concrete, and miscellaneous waste (PVC, buoys, etc.)
- SWMU 70 Full RCRA Facility Assessment (RFA) was completed in 2015, during which surface debris removal was recommended for the site
- 83 debris piles were identified for removal prior to the Interim Corrective Measures implementation

Land Use Controls (LUCs):

- Non-residential land use only
- Restrictions on access and/or certain invasive activities where soil/sediments are contaminated
- Restrictions on groundwater use with well installation prohibited in areas of known groundwater contamination

SWMU 70 – Interim Corrective Measures Activities

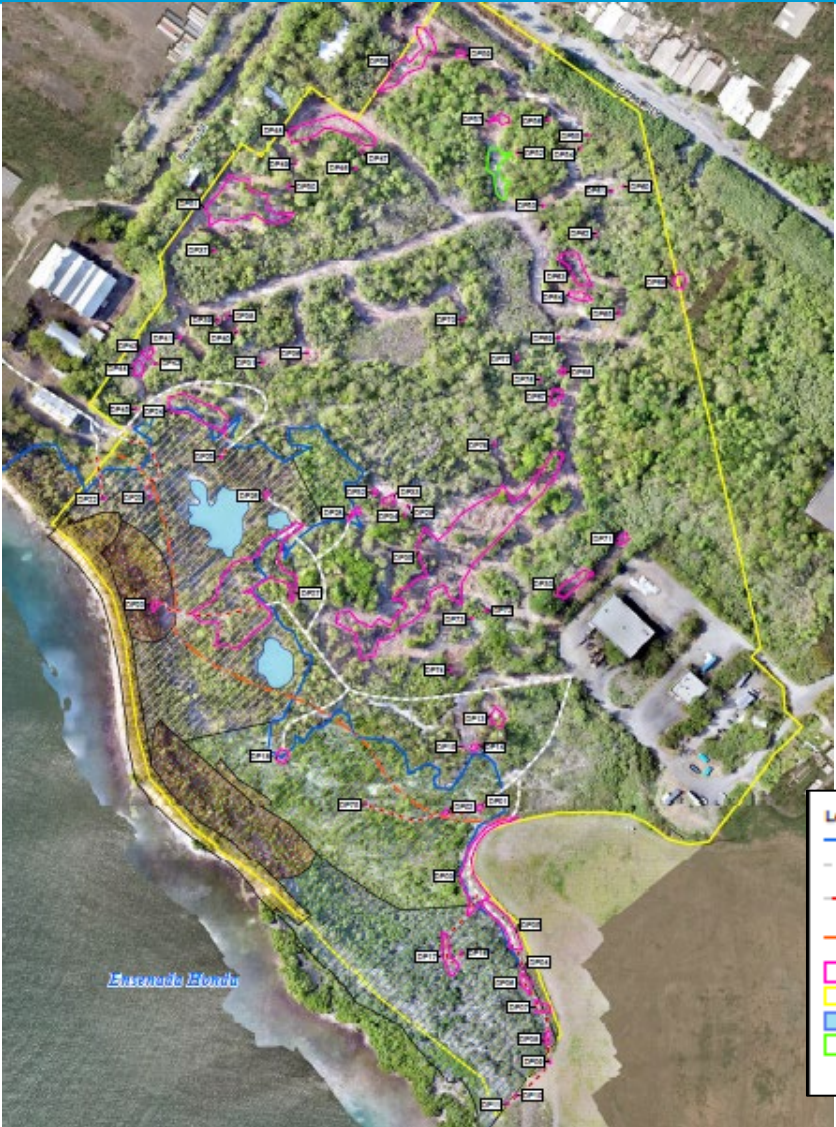
Wetland Debris Removal

- 26 debris piles were removed from the wetland area
- Removal of 9,800 cubic yards of various metals and inert waste (wood, tires, rubber, and plastic) within and adjacent to the wetlands
- The removal effort occurred in two phases due to COVID-19, December 2019 – March 2020 and April 2022 – July 2022.
- Monitoring for mangrove regrowth following the debris removal will be performed at 6-, 12-, 18-, and 24-months following the debris removal.

Upland Debris Removal

- 58 debris piles were removed from the upland portion of the site
- Removal of 366 tons of various material (concrete, buoys, metals, and other mixed waste) metals and inert waste
- The removal effort occurred from March – July 2022.

SWMU 70 – Interim Corrective Measures Activities (cont.)



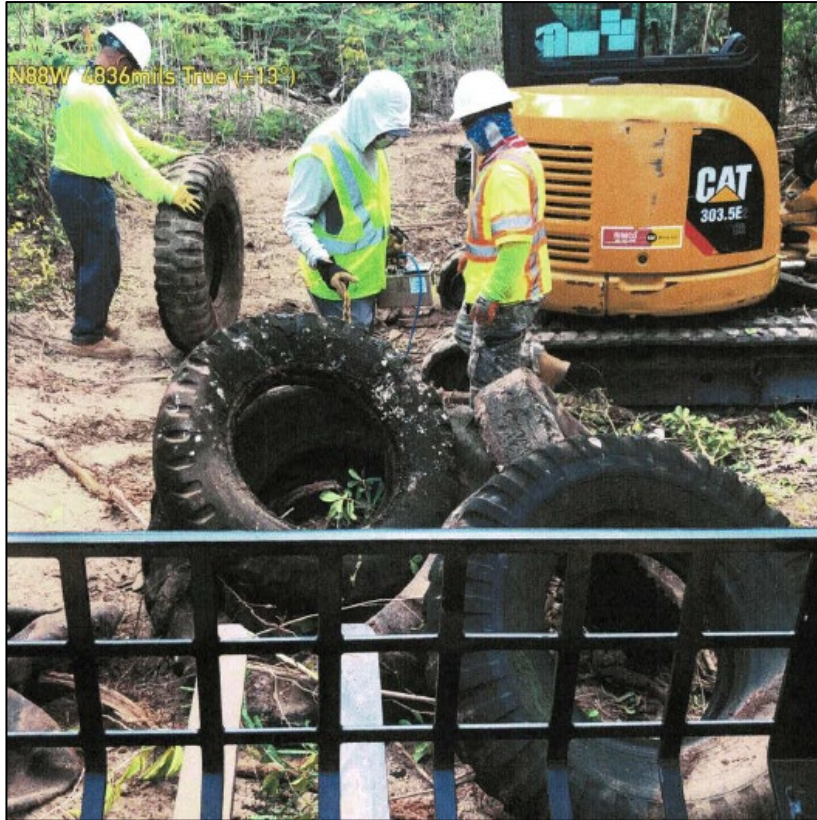
Legend

- Mangrove Line
- - - Access Not Impacting Natural Resources
- - - Accessible by Foot and Debris Removal by Hand (No Impact to Natural Resources)
- - - Access by Foot and Debris Removal by Hand Southwest of this Dashed Line (No Impact to Natural Resources)
- Debris Pile to be Removed
- SWMU 70 Boundary
- Inland Water Body
- Freshwater Wetland
- White and Black Mangrove, and Buttonwood Wetland
- White and Black Mangrove Wetland
- Red and Black Mangrove Wetland
- Red Mangrove Wetland
- Upland Sand Ridge

0 100 200
Feet

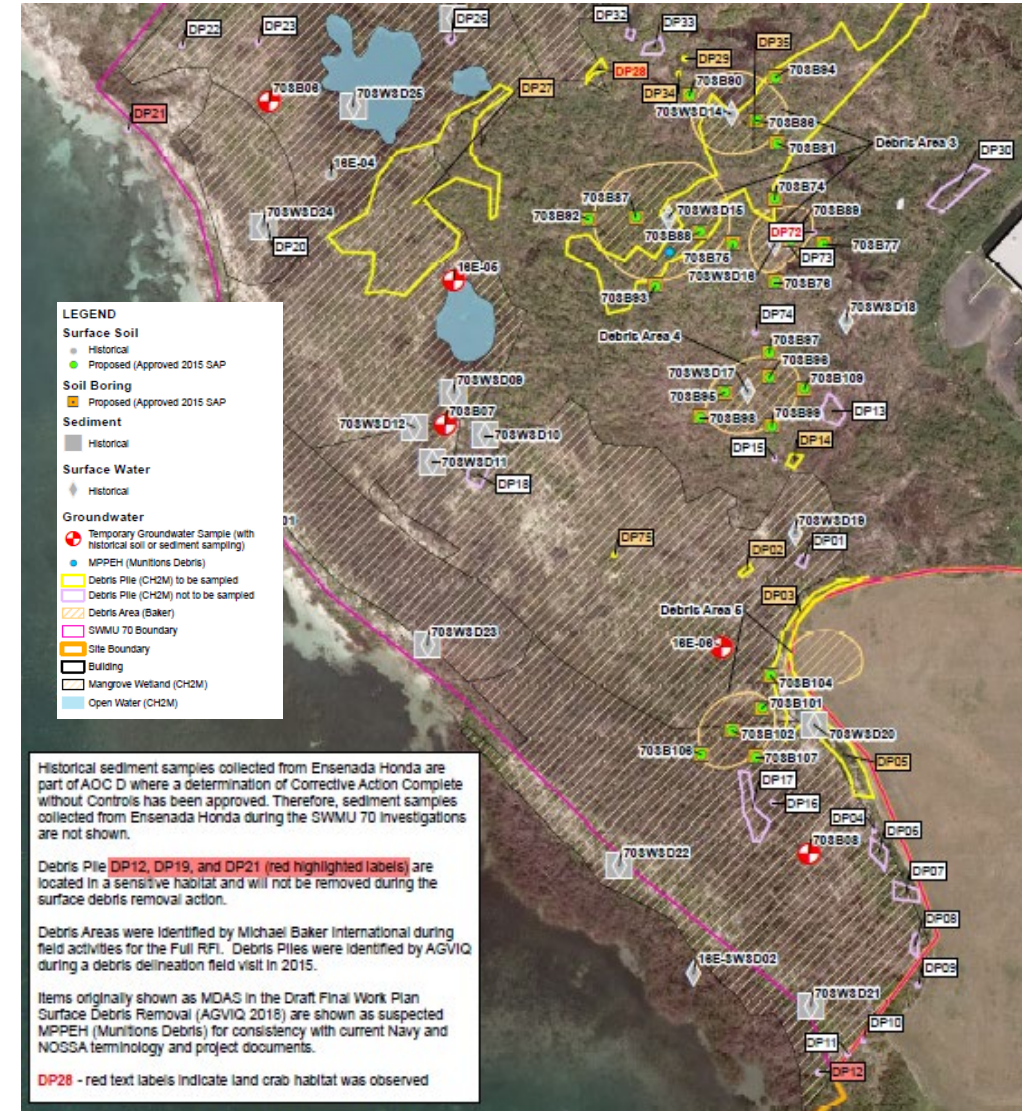
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 FAA UAS Pilot: James Frank
 UAV Platform: Jacobs - DJI Inspire 2

SWMU 70 – Debris Removal

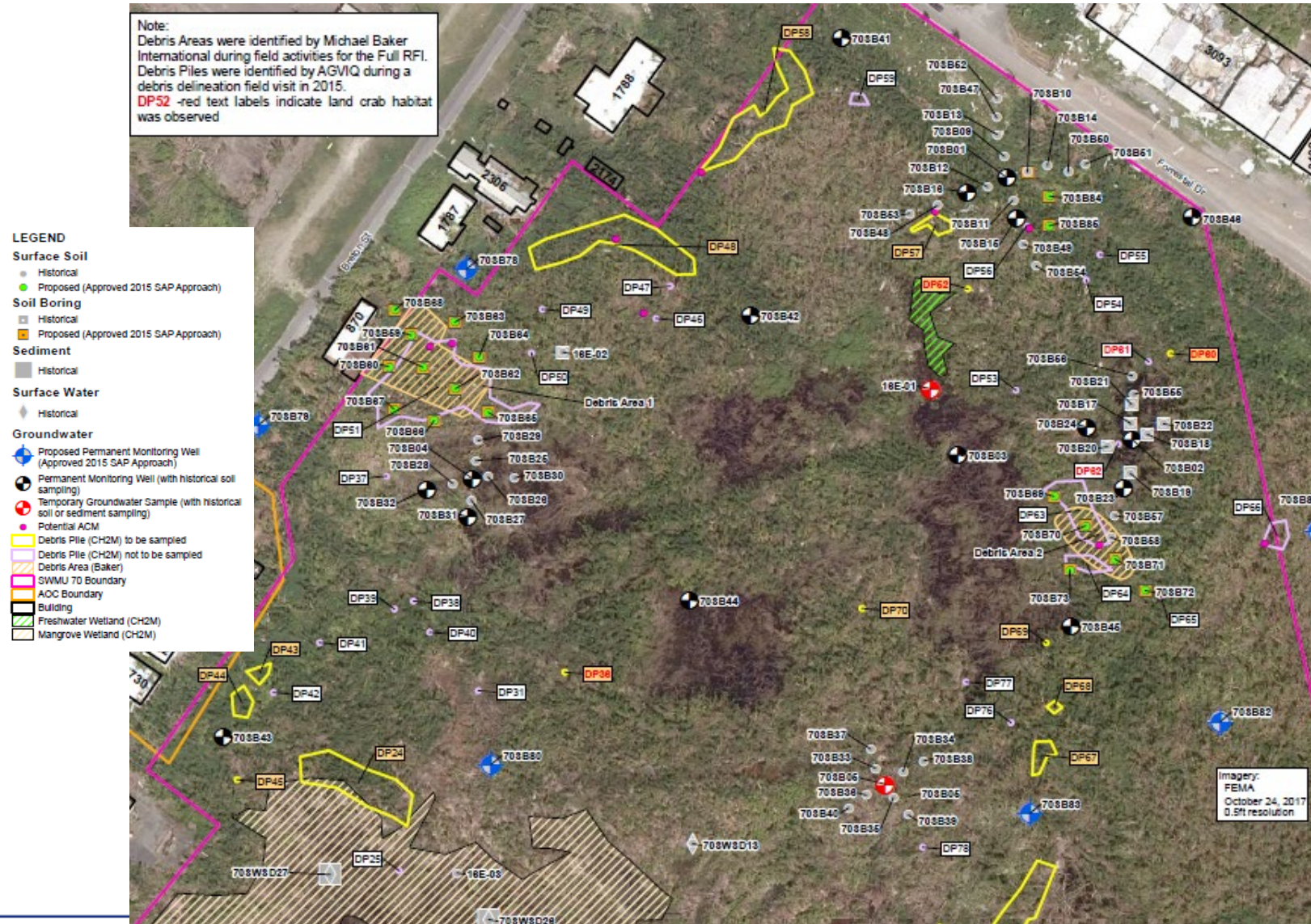


SWMU 70 Data Gap Investigation

- Environmental investigation (groundwater/soil sampling and associated tasks) was conducted in January – March 2023
- Following data evaluation, a Data Gap Report will be prepared to summarize the investigation findings, including updated human health and ecological risk assessments



SWMU 70 Data Gap Investigation (cont.)



SWMU 70 – Path Forward

- Construction Completion Reports for the surface debris removal associated with the upland and wetland portions of the site are currently being prepared.
- The Data Gap Report will be prepared following receipt of validated analytical results.



Questions/Comments from the Public