

| STATEMENT OF BASIS / PROPOSED FINAL SOIL REMEDY DECISION | | REGION 2 ID# PR2170027203 |
|--|--|--------------------------------------|
| NAVAL ACTIVITY PUERTO RICO (former Naval Station Roosevelt Roads) Ceiba, Puerto Rico (March 2011) | | |
| Facility/Unit Type: SWMUs 7 & 8, Tow Way Fuel Farm (fuel storage and possible sludge disposal pits) | | |
| Contaminants: | | |
| Surface Soil: arsenic, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene | | |
| Subsurface Soil: benzo(a)pyrene | | |
| Proposed Final Remedy: | | |
| No further action is recommended for arsenic, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene in site soils. | | |
| <p><u>FACILITY DESCRIPTION</u></p> <p>The Tow Way Fuel Farm and Tow Way Fuel Farm Sludge Disposal Pits at Naval Activity Puerto Rico (NAPR) have been identified as solid waste management units (SWMUs) 7 and 8, respectively, under the 1994 Resource Conservation and Recovery Act (RCRA) permit issued to the former Naval Station Roosevelt Roads by the U. S. Environmental Protection Agency (EPA). The Tow Way Fuel Farm (TWFF) is located on a hillside along Forrestal Road north of Ensenada Honda (Figure 1). The fuel farm was constructed prior to 1957, and originally consisted of nine bomb-proof underground storage tanks (USTs). The tanks were used for the storage of marine diesel fuel, jet fuel (JP-5), and Bunker C fuel. Closure for Tanks 56A and 56B was completed in November 1996. Seven USTs remain: 82, 83, 84, 85, 1080, 1082, and 1088. However, on March 31, 2004, base operations, including the storage and distribution of fuel, were discontinued and all USTs were drained and are currently empty. During the facility's operational history, numerous releases of various quantities have occurred from the various storage tanks, resulting in the release of petroleum hydrocarbons to the environment.</p> <p><u>CORRECTIVE MEASURES STUDY</u></p> <p>In November 2005, Baker Environmental Inc. (Baker) prepared a Corrective Measures Study (CMS) for NAPR. The report was an all encompassing document that established Corrective Action Objectives (CAOs) and remedial approaches to address cleanup of soil and groundwater at multiple SWMUs across the NAPR, including cleanup activities at SWMUs 7 and 8. The EPA approved the CMS in February 2006.</p> <p>The regulatory-approved remedial action to address soil contamination at SWMUs 7 and 8 includes the excavation of the upper 2-feet of soil in three areas of concern where the PAH compounds benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene, along with arsenic, exceeded their respective CAOs (Figure 2).</p> <p>The CAOs for the contaminants of concern are presented below in Table 1. Baker developed the CAOs using an industrial classification risk-exposure scenario involving construction worker contact with surface and subsurface soil.</p> | <p><u>FIELD INVESTIGATION</u></p> <p>In preparation of performing the soil excavations, a soil sampling approach was designed to improve the delineation of the areas for excavation. The objectives of the post CMS investigation were primarily to conduct confirmatory sampling in order to do the following:</p> <ul style="list-style-type: none"> • Determine the horizontal extent of excavation for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene, and arsenic. • Determine handling and disposal requirements by collecting soil samples for waste characterization. <p>On January 22 and 23, 2009, AGVIQ-CH2M HILL personnel marked locations of sampling grids (grid spacing of 50-feet) covering the three areas of concern identified in the CMS. However, due to the presence of obstructions (tanks and piping) and variations in topography (steep hillsides), several sampling locations had to be either moved or omitted. The sample locations are depicted on Figure 2.</p> <p>Soil sampling activities were conducted between June 1 and 4, 2009. In areas accessible by vehicle, a truck-mounted direct push technology (DPT) rig was used to collect continuous soil samples from the upper 2-feet of soil (0 to 2 feet below ground surface [bgs]). A hand auger was used to collect soil samples from the upper 2 feet of soil in areas that could not be accessed by the DPT rig. The homogenized soil was transferred to 4-ounce glass jars provided by the laboratory for chemical analysis. All samples were analyzed for arsenic using EPA Method 6010B, and select samples were analyzed for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene using EPA Method 8270C.</p> | |

Table 1

| Chemical | Maximum Observed Concentration | Surface Soil CAO* | Subsurface Soil CAO* | Total Soil CAO** |
|------------------------|--------------------------------|-------------------|----------------------|------------------|
| Arsenic | 4.3 | 2.65 | NA | NA |
| Benzo(a)anthracene | 6J | 2.9 | NA | 73 |
| Benzo(a)pyrene | 23J | 2.9 | 7.3 | 7.3 |
| Benzo(b)fluoranthene | 5.9J | 2.9 | NA | 73 |
| Indeno(1,2,3-cd)pyrene | 5.3J | 2.9 | NA | 73 |

CAO Corrective Action Objective
 * Based on industrial worker protection
 ** Based on construction worker protection
 J Estimated
 NA Not Applicable
 All values reported in milligrams per kilogram (mg/kg)

DISCUSSION OF RESULTS

PAH

Eighteen samples were collected and analyzed for PAH compounds benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene. PAHs were not detected in the upper 2 feet of soil in the areas of concern indicated by the CMS.

ARSENIC

Seventy-two samples were collected and analyzed for arsenic. Arsenic was detected in 69 of the 72 samples at concentrations ranging from 0.81J (C2) to 4.3 mg/kg (B23). Of the 69 samples collected, arsenic was detected above the CAO of 2.65 mg/kg in the following nine borings: A30, B9, B14, B23, B26, C3, C7, C9, and C12 (Figure 2). However, results of a statistical evaluation indicate the current comparable statistical value (UCL95%) for arsenic is 2.5 mg/kg. Therefore, site arsenic levels are within background levels and are below the CAO of 2.65 mg/kg.

Based upon the horizontal extent sampling results described above, the following objectives were added to the evaluation of the data:

- Determine if arsenic contamination found in SWMU 7/8 is naturally occurring based on historical background levels.
- Determine extent of soil contamination areas above CAOs by comparing site-wide statistical upper bound mean concentration values against the CAOs.
- Comprehensively address the potential presence and specific concentration levels of the identified chemicals of concern (COCs)

PROPOSED FINAL REMEDY

Based on the analytical results for the surface soil samples, there is no soil contamination at the site that requires corrective actions. PAH concentrations are below detection limits and do not present human or ecological exposure concern. Therefore, no further action at SWMUs 7 and 8 is recommended for PAHs in site soils.

Based on the extensive sampling conducted across the site, detected arsenic is randomly distributed across the site. The distribution patterns indicate absence of specific elevated areas, and statistical evaluation of the data indicate site arsenic upper-bound estimates are between 1.9 mg/kg and 2.5 mg/kg, which are below the CAO target level of 2.65 mg/kg. No single detection is indicative of extremely elevated values. Therefore, the detected arsenic levels at SWMUs 7 and 8 are considered naturally occurring within the surface soil and no further action is recommended for arsenic in site soils.

In summary, no land use restrictions are necessary for site soils, as residual concentrations are similar to background levels for arsenic and PAHs are below detection levels.

PUBLIC PARTICIPATION

Public review and comment on the proposed remedy for SWMUs 7 and 8 will be implemented as part of the public comment period for the proposed Administrative Order on Consent between the Navy and EPA. A public notice of that public comment period will be published in both Spanish and English in select Puerto Rico newspapers.

NEXT STEPS

Following completion of public review and comment on the proposed remedy, the EPA will advise of any required modifications based on the public comments, or its acceptability.

KEY DOCUMENTS

Revised Final Corrective Measures Study Report Final Report Tow Way Fuel Farm, dated November 22, 2005.

Corrective Measures Study Addendum SWMUs 7 and 8 – Revised Soil Remedy, dated March 2011.

FURTHER INFORMATION

The key documents may be reviewed at:

U.S. Environmental Protection Agency,
Region 2 RCRA File Room
290 Broadway, 15th floor
New York, NY 1007-1866
Attn: Mr. David Abrines, phone 212-637-3043; or

U. S. Environmental Protection Agency
Caribbean Environmental Protection Division
Centro Europa Building, Suite 417
1492 Ponce de Leon Ave
Santurce, PR 00907-4127
Attn: Mr. Luis Negron, phone 787-
977-5855; and

Puerto Rico Environmental Quality Board
Oficina del Presidente – Piso 5
Ave. Ponce de Leon #1308
Carr Estatal 8838
Sector El Cinco
Rio Piedras, PR 00926
Attn: Ms. Wilmarie Rivera, phone 787- 767-8181
Ext. 6141

Or at the following internet web page address:

<http://nsrr-ir.org/>



- Fence
- Former Fuel Tank

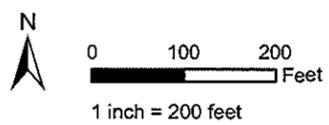
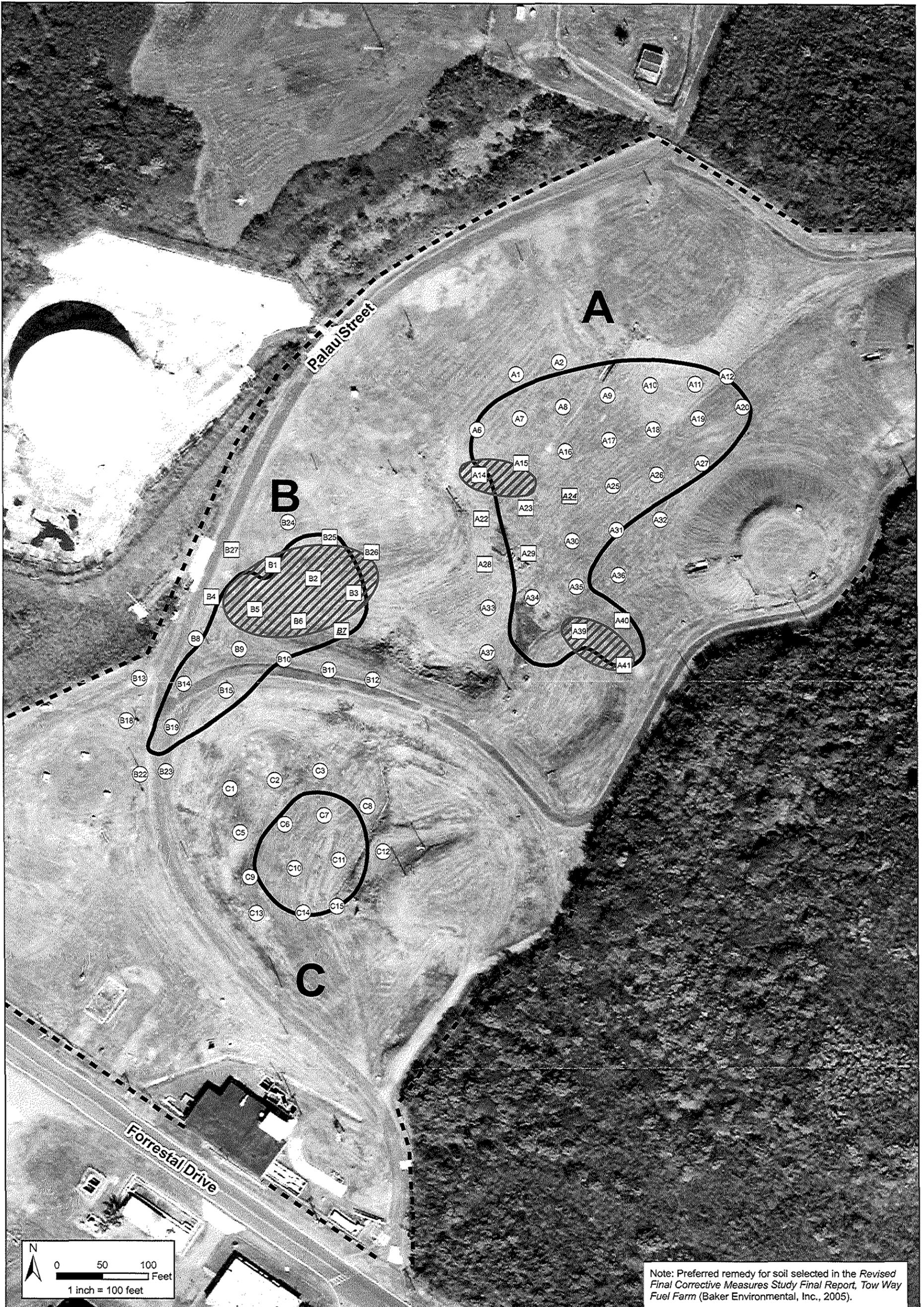


FIGURE 1
 SWMU 7/8 Base Map
 Tow Way Fuel Farm
 Naval Station Roosevelt Roads, Puerto Rico



Note: Preferred remedy for soil selected in the *Revised Final Corrective Measures Study Final Report, Tow Way Fuel Farm* (Baker Environmental, Inc., 2005).

Soil Delineation Sampling Point

- Arsenic
- Arsenic and Polynuclear Aromatic Hydrocarbons (PAHs)

- Fence
- ▭ Assumed Arsenic Impacted Soil Area (See Note)
- ▨ PAH Excavation Area (See Note)

- PAHs = Benzo(a)anthracene
Benzo(a)Pyrene
Benzo(a)fluoranthene
Benzo(1,2,3-cd)Pyrene
- A24 = Asphalt present in soil sample. Sample only tested for arsenic.

FIGURE 2
Soil Delineation Sample Locations
Tow Way Fuel Farm
Naval Station Roosevelt Roads, Puerto Rico